

# ASCIDIACEA

The Ascidiacea, the largest class of the Tunicata, are fixed, filter feeding organisms found in most marine habitats from intertidal to hadal depths. The class contains two orders, the Enterogona in which the atrial cavity (atrium) develops from paired dorsal invaginations, and the Pleurogona in which it develops from a single median invagination. These ordinal characters are not present in adult organisms. Accordingly, the subordinal groupings, Aplousobranchia and Phlebobranchia (Enterogona) and Stolidobranchia (Pleurogona), are of more practical use at the higher taxon level.

In the earliest classification (Savigny 1816; Milne-Edwards 1841) ascidians-including the known salps, doliolids and later (Huxley 1851), appendicularians-were subdivided according to their social organisation, namely, solitary and colonial forms, the latter with zooids either embedded (compound) or joined by basal stolons (social). Recognising the anomalies this classification created, Lahille (1886) used the branchial sacs to divide the group (now known as Tunicata) into three orders: Aplousobranchia (pharynx lacking both internal longitudinal vessels and folds), Phlebobranchia (pharynx with internal longitudinal vessels but lacking folds), and Stolidobranchia (pharynx with both internal longitudinal vessels and folds). Subsequently, with thaliaceans and appendicularians in their own separate classes, Lahille's suborders came to refer only to the Class Ascidiacea, and his definitions were amplified by consideration of the position of the gut and gonads relative to the branchial sac (Harant 1929).

Kott (1969) recognised that the position of the gut and gonads are linked with the condition and function of the epicardium. These are significant characters and are informative of phylogenetic relationships. However, although generally conforming with Lahille's orders, the new phylogeny cannot be reconciled with a too rigid adherence to his definitions based solely on the branchial sac. Definitions of Lahille's taxa have been adjusted to confer the flexibility needed to accommodate the various evolutionary trends evident in this diverse group of animals. The presence of uninterrupted longitudinal branchial vessels in *Ciona* and some diazonids indicates a relationship with Phlebobranchia but is not the only indicator of affinity at subordinal rank. Rather, internal longitudinal branchial vessels are primitive, occurring in all suborders. They tend to be reduced in numbers with size reduction and simplification and are lost altogether in Aplousobranchia, in which evolution is dominated by replication, size reduction and simplification (Kott 1990a).

Ascidians have evolved in two major lines, one (Aplousobranchia) primarily associated with replication and the development of colonial systems, progressive size reduction and simplification of zooids, increasing colony organisation and the relatively small ovaries associated with internal fertilisation and viviparity. In the other line (Phlebobranchia and Stolidobranchia) evolution generally is associated with growth of the individual (rather than development of colonies), sophistication of various organs which enhance the efficiency of solitary individuals (including digestive glands) and the large ovaries associated with external fertilisation and oviparity. Occasionally replication and a colonial habit also occur in certain families in the latter two suborders, and when this occurs, the adaptive changes (including size reduction of zooids, development of colonial systems, internal fertilisation and viviparity) parallel the changes associated with colony development in Aplousobranchia. In the most highly organised colonies (in Stolidobranchia as well as Aplousobranchia), the replicate zooids are entirely embedded in common test material and their excurrent apertures open into large internal cloacal spaces (canals and cavities). In less well organised colonial species (in all suborders), the excurrent apertures open directly to the exterior (as they do in solitary forms). In less well developed colonies in all suborders, zooids are only partially embedded or they are separate and connected only by basal stolons.

The only exceptions to these generalisations are, in Aplousobranchia, the primitive and solitary *Ciona intestinalis* and some taxa in Diazonidae that form simple colonies which are fertilised externally; and in the invariably solitary stolidobranch genera *Polycarpa* (Styelidae) and *Molgula* (Molgulidae), a few species are internally fertilised and brood their embryos.

This subordinal phylogeny and classification followed in this work is based on Kott's revisions (Kott 1985, 1990a, 1992a, 2001). In Aplousobranchia (including the Cionidae and Diazonidae), the gut loop and gonads are posterior to the pharynx; and persistent endodermal epicardial sacs generally participate in regeneration of tissues, especially in replication. Only in clavelinids does mesodermal tissue generate replicates. In Phlebobranchia and Stolidobranchia, the gut loop and gonads are in the parietal body wall beside the pharynx; and the epicardium is modified for an excretory role, replication (when it occurs) being effected by the ectoderm.

### The Australian Ascidian Fauna

The known Australian ascidian fauna numbers about 700 species, although this number is expected to increase as new species are found. The diversity of the fauna is greater than is known for other geographic areas of comparable size (Kott 1985, 1990, 1992, 2001)). Several factors may explain this, namely:

- The northern Australian coast is in the middle of the vast Indo-West Pacific tropical coralline region. The Australian continental shelf fauna acquires recruits and gains genetic diversity from that region.
- The Australian continent forms a bridge between the tropical and temperate waters and provides a diversity of habitats for colonisation and speciation.
- The temperate waters of the southern coast contain Gondwanan elements and recruits from the Southern Ocean, as well as the indigenous species that appear to be isolated in these habitats.

The oviparous larvae of solitary species are free-swimming for periods of one to 24 hours, and prior to hatching have been floating free in the water for up to three days (Anderson *et al.* 1975). Accordingly, they are subject to dispersal which could contribute to gene flow and remove risks of isolation. However, dispersal could also affect population maintenance, reducing the success of fertilisation for these sessile organisms. The viviparous larvae of colonial species are seldom free-swimming for more than one hour (Berrill 1950) and failure to effect recruitment to neighbouring populations could be the cause of isolation of populations in temperate rocky coastal habitats. The profusion of suitable habitats in coral reef environments may prevent such isolation in the tropics.

In Australian waters, most of the known ascidian families are well represented relative to their diversity in other parts of the world, although certain families, especially colonial ones, appear to have radiated more than others. Of particular interest is the family Holozoidae which is represented by a number of genera that only occasionally are represented in waters north of the equator. Some of these are diverse (*Sigillina* Savigny, 1816, *Hypodistoma* Tokioka, 1967 and *Sycozoa* Lesson, 1832) and others are not so diverse (*Hypsistozoa* Brewin, 1953, *Neodistoma* Kott, 1990 and *Polydistoma* Kott, 1990). In this family, only the genus *Distaplia* Della Valle, 1881 is cosmopolitan. The polycitorid genus *Eudistoma* Caullery, 1909 and two polyclinid genera, *Aplidium* Savigny, 1816 and *Polyclinum* Savigny, 1816, are particularly well represented. Some taxa are restricted in both diversity and range, *e.g.* in the Clavelinidae the monotypic *Nephtheis fascicularis* (Drasche, 1882) is indigenous to the West Pacific tropical region. The family Didemnidae is especially diverse, with a rich temperate indigenous fauna as well as a component of tropical species from the wider Indo-West Pacific (see Kott 2005).

Diversity in growth-form and choice of habitat occurs in most ascidian families and even genera. For example, a suite of species in the genus *Clavelina* Savigny, 1816 demonstrates a range of different levels of colony organisation including solitary species, species with individuals joined basally, and others with the zooids entirely embedded in the common test. The related cosmopolitan family Pycnoclavellidae displays a similar range in colony form and has a range of species in Australian waters which exploit a similar variety of habitats. Other aplousobranch taxa with prolific replication, probably rapid colony growth that is not constrained by the existence of cloacal systems (namely, Ritterellidae, Pseudodistomidae, Protopolyclinidae and Euherdmaniidae), have a range of different colonies from solitary zooids to branching, plate-like or compact colonies and also are found in a range of habitats.

In the Phlebobranchia, *Ascidia* Linnaeus, 1767 contains numerous and diverse species, and some (e.g. *Ascidia thompsoni* Kott, 1952 and *Ascidia scaevola* (Sluiter, 1904)) are unusual in having sand embedded in the test. *Ascidia scaevola* is especially well adapted to a sandy sea floor habitat, as are many species of the Agneziidae which use their body muscles to close folds of test across their apertures. The Plurellidae, one of the few western Pacific indigenous families also show remarkable adaptations for sandy sea-floor habitats by having the gonads in a projection from the body wall that is actually embedded in the sandy test.

In the Stolidobranchia, which usually have a characteristically tough, leathery test, a number of stalked species in Styelidae and Pyuridae favour habitats where currents change direction. The *pachydermatina* group in the genus *Pyura* Molina, 1782, includes species with especially long, narrow stalks. It has one representative in New Zealand, but other species are indigenous in Australian temperate waters. However, temperate Australian species are often indigenous possibly having speciated following isolation from their tropical sister groups. This occurs also at genus level, in the case of the genus *Polycarpa* Heller, 1877, which is conspicuous in Australian temperate as well as tropical waters. It appears to have tropical affinities, and does not occur south of the subtropical convergence.

### Investigations on the Australian Ascidian Fauna

The early exploration of the Australian ascidian fauna was by European-mounted expeditions visiting these waters. The French corvettes *la Coquille* (1822-25), *Uranie* and *la Physicienne* (1817-20), and the *Astrolabe* (1826-29) and the British *Challenger* (1873-76) expeditions took material from temperate as well as tropical Australian waters (Lesson 1830-32; Quoy & Gaimard 1824, 1833, 1834; Herdman 1882, 1886). Later, the Swedish Expedition (Dr E. Mjöberg) to north-western Australia (Hartmeyer 1919) and the German expedition to south-western Australia (Hartmeyer & Michaelsen 1928, Michaelsen 1930) sampled the fauna of the western side of the continent. Along the more populated eastern coast, the Australian Museum and the NSW Fisheries Research Vessel *Thetis* made collections reported on by Herdman (1899) and Herdman & Riddell (1913). Various collections from Australian locations made by Professor Schmarda (Heller 1878) also added significantly to the knowledge of the ascidian fauna, as did Danish expeditions to the western Pacific (including New Zealand and Australian waters) in the *Dana*, and later the *Galathea*, reported on by Michaelsen (1922, 1924) and Millar (1975).

The Australian tropical fauna, nevertheless, was largely unexplored until the second half of the 20th century, the only exception being the small collection made during the Great Barrier Reef Expedition (Hastings 1931). However, the Dutch exploration of Indonesian waters by the *Siboga* (Sluiter 1904, 1909), other works by Sluiter (1885, 1890, 1895) and Pizon (1908), as well as the American *Albatross* collection (Van Name 1918) from the Philippines, continuing European and Japanese exploration (Tokioka 1950-1975; C. Monniot 1987-1991; F. Monniot 1987-1995; C. & F. Monniot 1987; F. & C. Monniot 1996, 2001; Monniot *et al.* 1991; and Nishikawa 1984, 1986) and a report on the Fijian fauna (Kott 1981) have continued to reveal a diverse tropical western Pacific fauna containing many species with ranges that include tropical Australian waters.

Savigny's (1816) work on collections from the Red Sea, and Herdman's (1906) on a small collection from Sri Lanka indicating that the tropical Indian Ocean ascidian fauna has much in common with the western Pacific fauna were confirmed by the later reports on German collections from the western Indian Ocean of Hartmeyer (1912) and Michaelsen (1918a, 1918b, 1919, 1920) and more recent works of C. & F. Monniot and F. & C. Monniot (1997). Indeed, many tropical species have been shown to have a range from the West Pacific to the eastern coast of the African continent and the northern Australian fauna appears to be the middle of the geographic range of this Indo-West Pacific fauna.

Investigations on the Japanese fauna by Oka (from the end of World War I), and Tokioka (from the end of World War II), followed by Nishikawa, and a survey in the South China Sea (Kott & Goodbody 1982) demonstrate a temperate fauna not closely related to the Australian fauna, the northern limits of the tropical fauna generally being in the Tokhara Islands.

Indigenous studies of the Australian ascidian fauna began after World War II (Kott 1952, 1957 *et seq.*). Before that, it is estimated, only about one fifth of the currently known Australian ascidians had been described. The taxonomy and biology of the Australian fauna are gradually being revised (Kott 1985; 1990a, b; 1992a, b; 1998; 2001; 2002a-c; 2003; 2004a-c; 2005).

### Type Specimens of the Australian Ascidian Fauna

The type material that represents the initial (European) phase (which extended up to World War I) in the investigation of the Australian ascidian fauna is in European museum collections. In Paris (Muséum National d'Histoire Naturelle), some (though not all) of the type material of Quoy and Gaimard is retained, and also the modern collections of C. and F. Monniot. Unfortunately, none of Savigny's collection remains (Bouchet & Danrigal 1982). Collections from the *Challenger* Expedition and from Sri Lanka are in the Natural History Museum, London (BMNH)-formerly the British Museum (Natural History). Collections from north-western Australia (Hartmeyer 1919) are in the Swedish Natural History Museum. Large collections from south-western Australia (Hartmeyer & Michaelsen 1928) and Michaelsen (1930) are held in the Zoologisches Museum Hamburg and the Museum für Naturkunde, Berlin. Some South African material (Hartmeyer 1912) is in the Natural History Museum, Vienna. Material collected by Professor Schmarda and reported on by Heller (1878) is also in Hamburg and in the Natural History Museum, Vienna. Specimens from the Danish *Dana* and *Galathea* expeditions are in the Zoological Museum of the University of Copenhagen. The most comprehensive European collection of types relating to the Australian fauna is in the Zoological Museum of the University of Amsterdam, where most of Sluiter's collections from Indonesia are carefully curated and preserved (see Spoel, 1969). Station locations of the Siboga expeditions are recorded in Tydeman (1902). Pizon's (1908) types are held in the Muséum d'Histoire Naturelle, Geneva.

Japanese collections are held in the University of Tsukuba (Oka's material), in the Biological Laboratory of the Imperial Household of Japan (Tokioka 1953), in the National Science Museum (Tokyo) and in the Seto Marine Biological Laboratory (Tokioka 1949 *et seq.* and Nishikawa 1984, 1986: see Harada, 1991).

Although the material reported on by Herdman (1899) was lodged in the Australian Museum (Sydney), no other ascidian material of any significance was held in any Australian museum until after World War II — it was all in Europe. The established Australian State museums now hold significant collections of type and other material representing the ascidian fauna of each respective geographic region of the Australian coast. Types held in the Australian Museum (the NSW State Museum) are set out in Rowe & Marshall (1979).

In this *Catalogue*, the registration numbers in parentheses refer to a sampled portion of the preceding specimen held in another museum.

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# APLOUSOBRANCHIA

The suborder Aplousobranchia (order Enterogona) is characterised by the division of the body into thorax, abdomen and sometimes posterior abdomen. Gonads are unpaired and are in the gut loop (in the abdomen), or posterior to it. Paired epicardial sacs (embryonic endodermal outgrowths of the posterior end of the pharynx) persist in adult zooids, although (with the exception of the Cionidae) their connection with the pharynx is lost and often they are fused. The endodermal tissue of the epicardial sacs is the regenerative tissue involved in repair and replication in all but the family Clavelinidae, in which the regenerative tissue is mesodermal (Berrill 1950). Most aplousobranch families are primarily colonial; although the monotypic Cionidae (genus *Ciona*) always is solitary and some exceptional solitary species occur also in Diazonidae, Clavelinidae and Euherdmaniidae.

The overall tendency in this suborder to form colonies through replication, interrupts the growth of individual zooids resulting in their progressive size reduction and simplification, and subsequently to the evolution of integrated colonies with zooids arranged in complex cloacal or other systems that enhance colony interactions with the environment (Kott 1989). Internal longitudinal branchial vessels (present in *Ciona* and Diazonidae) are usually absent although their remains (in the form of papillae) persist in some Protopolyclinidae, Ritterellidae and Polyclinidae. Eggs are fertilised externally only in Cionidae and Diazonidae. Associated with reduction in zooid size and increase in the numbers of replicates of a single genotype, gonads are relatively small in zooids of colonial taxa, the relatively few eggs produced are fertilised internally, and embryos, brooded either in the zooids or in the colonial test, are liberated as tailed larvae.

Australian Aplousobranchia have been revised by Kott (1990, 1992a,b, 2001, 2002, 2003, 2004a-c, 2005). Family level taxa are characterised by their colonial organisation; position, size and form of the gonads; site of fertilisation and brooding of embryos; size of the thorax and condition of the branchial sac including the number of stigmata and transverse branchial vessels; length of the oesophagus and shape of the stomach; and differences in larval adhesive organs and accessory adhesive apparatus.

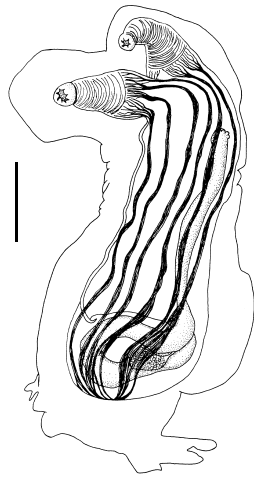
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# CIONIDAE



**Fig. 1.** *Ciona intestinalis* (Linnaeus, 1767), individual in test showing gut loop and muscles. (Scale bar = 5.0 mm). [from Kott 1990]

The family Cionidae Lahille, 1887, containing a single genus, *Ciona* Fleming, 1822, is thought to be the most primitive of the extant ascidian families. It is characterised by solitary habit, a horizontal gut loop posterior to the branchial sac, a persistent opening into the posterior end of the pharynx from each of the pair of endodermal epicardial sacs, a large perforated pharynx (branchial sac) with internal longitudinal vessels, and numerous rows of stigmata.

The family Cionidae, once regarded as a member of the Phlebobranchia due to its large flat branchial sac and internal longitudinal vessels, was proposed as a member of the Aplousobranchia by Kott (1969). Cionids lack the renal vesicles (derived from the epicardial sac) that crowd around the gut in Phlebobranchia and Stolidobranchia (Berrill 1950). Further, the epicardial sacs remain entire as in other Aplousobranchia, and their role in the regeneration of lost or damaged

tissue is homologous with their role in the replicative process of colonial Aplousobranchia. Cionids also resemble other aplousobranchs in having the gut behind the thorax (rather than alongside), the body being divided into thorax and abdomen.

This family resembles the aplousobranch family Diazonidae most closely, having a similar soft, elastic, translucent test, large branchial sac with internal longitudinal vessels, an oviparous (externally fertilised) habit, and small larvae with few larval or adult organs other than the simple triradially arranged adhesive organs. Cionidae are separated from the Diazonidae by a horizontal (rather than vertical) gut loop. Some Diazonidae form colonies, constituting a further distinction.

Cionidae are represented in Australia by a single species, *Ciona intestinalis* (Linnaeus, 1767). Records of *C. intestinalis* are from ports and harbours in all oceans, including all Australia ports, and many estuaries (Kott 1990). However, records from Australian locations later than 1983, are only from St Vincent Gulf (South Australia), Port Phillip Bay (Victoria) and Port Kembla (New South Wales).

Species of the genus *Ciona* have been reviewed by Hoshino & Nishikawa (1985). Detailed accounts of morphology are given by Roule (1884) and Millar (1953).

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***Ciona* Fleming, 1822**

***Ciona*** Fleming, J. (1822). *The Philosophy of Zoology*. Vol. 2. Edinburgh and London pp. 508–518. [512] [*nomen conservandum*, see Melville, R.V. (1981). Opinion 1172. *Ascidia intestinalis* Linnaeus, 1767 (Tunicata) conserved. *Bull. Zool. Nomencl.* **38**(2): 100–101].

Type species: *Ascidia intestinalis* Linnaeus, 1767 by monotypy.

Extralimital distribution: Palaearctic Region; worldwide, rare in polar waters. See: Hartmeyer, R. (1924). Ascidiacea, part II. Zugleich eine Übersicht über die Arktische und boreale Ascidienfauna auf tiergeographischer Grundlage. *Ingolf-Exped.* **2**(7): 1–275; Van Name, W.G. (1945). The North and South American ascidians. *Bull. Am. Mus. Nat. Hist.* **84**: 1–476; Hoshino, Z. & Nishikawa, T. (1985). Taxonomic studies of *Ciona intestinalis* (L.) and its allies. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **30**(1–3): 61–79; Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

***Ciona intestinalis* (Linnaeus, 1767)**

***Tethyum sociabile*** Gunnerus, J.E. (1765). Sõe-Pungen (*Tethyum sociabile*) fulständige beskreven. *Trondhj. Selsk. Skrift.* **3**: 81–102 [99] [Translated 1767: Vollständige Beschreibung des Seebeutels. *Drontheim Gesellsh. Shrift* **3**: 69 [100]; suppressed under Plenary Powers, see Melville, R.V. (1981). Opinion 1172. *Ascidia intestinalis* Linnaeus, 1767 (Tunicata) conserved. *Bull. Zool. Nomencl.* **38**(2): 100–101].

Type data: type status unknown (lost).

Type locality: Trondheimsfjorden, Norway.

***Ascidia intestinalis*** Linnaeus, C. (1767). *Systema Naturae* per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Editio duodecim. Holmiae : Laurentii Salvii Tom. 2, pp. 1087, 1089, 1294, 1295, 1319 [1087] [conserved as type species of genus *Ciona* Fleming, 1822, see Melville, R.V. (1981). Opinion 1172. *Ascidia intestinalis* Linnaeus, 1767

(Tunicata) conserved. *Bull. Zool. Nomencl.* **38**(2): 100–101].

Type data: type status and whereabouts unknown.

Type locality: European oceans.

***Ascidia canina*** Mueller, O.F. (1776). pp. 224–226 in, *Zoologiae Danicae*. Copenhagen : Prodrum. [225].

Type data: type status unknown.

Type locality: Denmark.

***Ascidia corrugata*** Mueller, O.F. (1776). pp. 224–226 in, *Zoologiae Danicae*. Copenhagen : Prodrum. [225].

Type data: type status unknown.

Type locality: Norwegian fjord.

***Ascidia virens*** Fabricius, J.C. (1779). pp. 295, 383 in, *Reise nach Norwegen mit Bemerkungen aus der Naturhistorie und Oekonomie*. Hamburg : Carl Ernst Bohn. [295].

Type data: type status unknown.

Type locality: Norway.

***Ascidia viridiscens*** Brugière, J.G. (1792). Histoire Naturelle des Vers. pp. 23–24, 26, 141–157, 178–188 pl. 75 fig. 5 in, *Encyclopédie Méthodique* Vol. 1. Paris and Liege : Panckoucke. [152].

Type data: type status unknown.

Type locality: Le Havre, France.

***Ascidia membranosa*** Renier, S.A. (1807). *Tavola per servire alla classificazione e conoscenza degli animale*. 8 tables. Padua. [t. 7].

Type data: type status unknown.

Type locality: Anglesey, Wales.

***Ascidia virescens*** Pennant, T. (1812). pp. 99–100 in, *British Zoology*. 5th Edn Vol. 4. London : Wilkie & Robinson. [99].

Type data: type status unknown.

Type locality: Anglesey, Wales.

***Ascidia diaphanaea*** Quoy, J.R.C. & Gaimard, J.P. (1834). Zoologie, Mollusques pp. 559–626. in, *Voyages de découvertes de l'Astrolabe 1826–1829*, Vol. 3. Paris : Pilet Ainé. [612].

Type data: type status unknown MNHP (depository uncertain, not found).

Type locality: Hobart, TAS.

***Ascidia ocellata*** Agassiz, J.L.R. (1850). On the embryology of *Ascidia* and the characteristics of new species from the shores of Massachusetts. *Proc. Am. Ass.* **1849**: 157–159 [159].

Type data: type status unknown.

Type locality: New Bedford, North Atlantic coast of North America.

*Ascidia tenella* Stimpson, W. (1852). Several new ascidians from the coast of the United States. *Proc. Bost. Soc. Nat. Hist.* **4**: 228–232 [228].

Type data: type status unknown.

Type locality: Great Duck Is., Grand Manan, North Atlantic coast of North America.

*Ascidia pulchella* Alder, J. (1863). Observations on the British Tunicata with descriptions of several new species. *Ann. Mag. Nat. Hist.* (3)**11**: 153–173 [157].

Type data: holotype HMN 4–3–7\*.

Type locality: Guernsey, Channel Is., see Hoshino, Z. & Nishikawa, T. (1985). Taxonomic studies of *Ciona intestinalis* (L.) and its allies. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **30**(1–3): 61–79.

*Ciona fascicularis* Hancock, A. (1870). On the larval state of *Molgula* with a description of several new species of simple ascidians. *Ann. Mag. Nat. Hist.* (4)**6**: 353–368 [364].

Type data: holotype HMN 1–6–2\*, paratype(s) BMNH 98.5.7.293\*.

Type locality: Kilkieran Bay, Connemara, Republic of Ireland, see Hoshino, Z. & Nishikawa, T. (1985). Taxonomic studies of *Ciona intestinalis* (L.) and its allies. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **30**(1–3): 61–79.

*Ciona (Pleurociona) edwardsi* Roule, L. (1883). Sur deux nouvelles espèce d'ascidies simples. *Compt. Rend. Acad. Sci. Paris* **99**: 613–614 [614].

Type data: type status unknown.

Type locality: Marseille, France.

*Ciona robusta* Hoshino, Z. & Tokioka, T. (1967). An unusually robust *Ciona* from the northeastern coast of Honshu Island, Japan. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **15**(4): 275–290 [275].

Type data: type status and whereabouts unknown.

Type locality: Onagawa Fisheries Laboratory fish-rearing tanks, Miyagi, Prefecture, Honsyu Island, Japan.

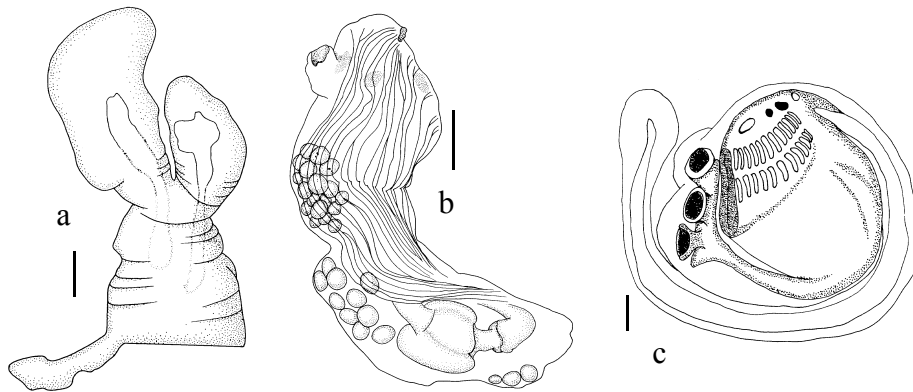
Taxonomic decision for synonymy: Hartmeyer, R. (1924). Ascidiacea, part II. Zugleich eine Übersicht über die Arktische und boreale Ascidiendfauna auf tiergeographischer Grundlage. *Ingolf-Exped.* **2**(7): 1–275 [90]; Hoshino, Z. & Nishikawa, T. (1985). Taxonomic studies of *Ciona intestinalis* (L.) and its allies. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **30**(1–3): 61–79 [63].

Distribution: Japan, China (People's Republic), Greenland, Alaska, California, Massachusetts, NSW (Lower E coast), QLD (NE coast), SA (S Gulfs coast), TAS (Bass Strait, Tas. coast), VIC (Bass Strait), WA (Lower W coast); west coast N America from south Alaska to south California, Europe and Mediterranean Sea, Greenland to southern Massachusetts, Arctic.

Ecology: benthic, marine; on ships' hulls and harbour installations.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

## CLAVELINIDAE



**Fig. 2.** *Clavelina fecunda* (Sluiter, 1904): **a**, colony; **b**, zooid showing numerous eggs and incubating embryos in distal part of oviduct; **c**, larva. (Scale bars: a = 2.0 mm; b = 1.0 mm; c = 0.1 mm).  
[from Kott 1990]

Species of the family Clavelinidae Forbes & Hanley, 1848, usually are colonial with partially or completely embedded zooids, length about 10 to 100 mm, and with four to 40 rows of stigmata. A few solitary species have been described in which a connection to another zooid has not been detected. In all species, the branchial and atrial apertures have smooth rims, internal longitudinal branchial vessels are not present in the pharynx and the gut loop is of various lengths-sometimes short, with the stomach halfway along the abdomen but sometimes three or four times the length of the thorax with the stomach near the distal end of the loop. Large gonads-a sac-like to tubular ovary and a mass of small pear-shaped male follicles-are enclosed by the gut loop. Strong thoracic longitudinal muscles extend from around the apertures or from each side of the endostyle, and converge to form a band along each side of the abdomen. Zooids are very contractile. The test is soft and transparent and usually does not have sand included. Buds are formed in the isolated terminal ampullae of a posterior abdominal vascular stolon. In this family, the regenerative tissue is mesodermal. Endodermal tissue from either the gut or the epicardial sacs is not involved in replication, although epicardial sacs, as in other aplousobranch families, are present. Eggs are fertilised in the atrial cavity or in the top of the oviduct at the posterior end of the thorax, where embryos are brooded in large numbers (up to 100). They are liberated as tailed larvae. The larval trunk is from 0.5 mm to 1.5 mm long, with wide, shallow adhesive organs, arranged triradially on a robust frontal plate.

Only two genera, *Clavelina* Savigny, 1816, and the monotypic *Nephtheis* Gould, 1856, are now recognised in this family (Kott 1990). The genus *Clavelina* is well represented in Australian tropical and temperate waters, but is not known from the Antarctic. *Nephtheis* occurs in tropical waters, which are part of its western Pacific range. The Australian fauna, which includes temperate species, appears to have tropical affinities.

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- Clavelina** Savigny, 1816
- Clavelina** Savigny, J.C. (1816). Recherches anatomiques sur les ascidies composées et sur les ascidies simples—Système de la classe des Ascidies pp. 1–239. In *Mémoires sur les Animaux sans Vertèbres*, Pt 2. Paris : G. Dufour. [109].  
Type species: *Ascidia lepadiformis* Mueller, 1776 by subsequent designation, see Hartmeyer, R. (1924). Ascidiacea, part II. Zugleich eine Übersicht über die Arktische und boreale Ascidenfauna auf tiergeographischer Grundlage. *Ingolf-Exped.* **2**(7): 1–275.
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Type species: *Chondrostachys macdonaldi* Bronn, 1862 (= *Clavelina cylindrica* Quoy & Gaimard, 1834) by subsequent designation, see Bronn, H.G. (1862). Weichthiere. pp. 103–223 In, *Die Klassen und Ordnungen des Tier-Reichs*. Leipzig : C.F. Winter. Vol. 3(1).
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Type species: *Clavelina borealis* Savigny, 1816 by original designation.
- Stereoclavella** Herdman, W.A. (1890). On the genus *Ecteinascidia* and its relations; with descriptions of two new species, and a classification of the family Clavelinidae. *Proc. Trans. Liverpool Biol. Soc.* **5**: 144–163 [160].  
Type species: *Clavelina oblonga* Herdman, 1880 by original designation.
- Synclavella** Caullery, M. (1900). Sur des clavelines nouvelles (*Synclavella* n.g.), constituant de cormus d'ascidies composées. *Compt. Rend. Acad. Sci. Paris* **13**: 1418–1420 [1420].  
Type species: *Synclavella lessoni* Caullery, 1900 by subsequent designation, see Kott, P. (1998). Tunicata. pp. 51–259 in Wells, A. & Houston, W.W.K. (eds) *Zoological Catalogue of Australia*. Hemichordata, Tunicata, Cephalochordata. Melbourne : CSIRO Publishing, Australia Vol. 34 298 pp. [70] (the first-named species is here selected).
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Type species: *Diazona picta* Verrill, 1900 by original designation.
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Type species: *Dendroclavella elegans* Oka, 1927 by monotypy.
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- Extralimital distribution: worldwide except Antarctic waters. See: Van Name, W.G. (1945). The North and South American ascidians. *Bull. Am. Mus. Nat. Hist.* **84**: 1–476; Berrill, N.J. (1950). The Tunicata. *Ray Soc. Publs* **133**: 1–354; Kott, P. (1969). Antarctic Ascidiacea. A monographic account of the known species based on specimens collected under U.S. Government auspices 1947 to 1963. *Antarct. Res. Ser.* **13**: i–xv 1–239; Tokioka, T. & Nishikawa, T. (1976). Contributions to the Japanese ascidian fauna XXX. Further notes on Japanese clavelinids. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **23**(3–5): 341–350; Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.
- Clavelina amplexa** Kott, 2002
- Clavelina amplexa** Kott, P. (2002). Ascidiacea (Tunicata) from Darwin, Northern Territory, Australia. *Beagle, Rec. Mus. Art Galleries NT* **18**: 19–55 [21].  
Type data: holotype NTM E155.  
Type locality: off East Point, Darwin, 6–8 m, NT.
- Distribution: NT (N coast).  
Ecology: benthic, marine.



***Clavelina arafurensis*** Tokioka, 1952

***Clavelina (Synclavella) arafurensis*** Tokioka, T. (1952). Ascidiens collected by Messrs Renzi Wada and Seizi Wada from the Pearl Oyster bed in the Arafura Sea in 1940. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* 2(2): 91–142 [97].

Type data: syntypes SMBL 107\*.

Type locality: off Melville Is., Arafura Sea.

Distribution: Philippines, Palau, NT (N coast), WA (N coast, NW coast).

Ecology: benthic, marine; under ledges.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* 29(1): 1–266 [38].

***Clavelina australis*** (Herdman, 1899)

***Stereoclavella australis*** Herdman, W.A. (1898). Note on the Tunicata fauna of Australian seas. *Ann. Mag. Nat. Hist.* 7(1): 443–450 [447] [nom. nud.].

***Stereoclavella australis*** Herdman, W.A. (1899). Descriptive catalogue of the Tunicata in the Australian Museum. *Australian Museum, Sydney, Catalogue* 17: 1–139 [6].

Type data: holotype AM U132, paratype(s) AM G63.

Type locality: Port Jackson, NSW.

Distribution: NSW (Central E coast, Lower E coast), QLD (Central E coast), VIC (Bass Strait).

Ecology: benthic, marine.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* 29(1): 1–266 [39].

***Clavelina baudinensis*** Kott, 1957

***Clavelina baudinensis*** Kott, P. (1957). Ascidiens of Australia II. Aplousobranchiata Lahille; Clavelinidae Forbes and Hanley and Polyclinidae Verrill. *Aust. J. Mar. Freshwat. Res.* 8(1): 64–110 [87].

Type data: syntypes AM Y801, AM Y1118.

Type locality: Cape Vlamingh, Rottnest Is., WA.

Distribution: WA (Lower W coast, SW coast).

Ecology: benthic, marine; 2–12 m.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* 29(1): 1–266 [41].

***Clavelina cylindrica*** (Quoy & Gaimard, 1834)

***Polyclinum cylindricum*** Quoy, J.R.C. & Gaimard, J.P. (1834). Zoologie, Mollusques pp. 559–626. in: *Voyages de découvertes de l'Astrolabe 1826–1829*, Vol. 3. Paris : Pilet Ainé. [618].

Type data: holotype MNHP A3 POD1\*.

Type locality: Western Port, VIC.

***Chondrostachys macdonaldi*** Bronn, H.G. (1862). Weichthiere. pp. 1281–1772. In: *Die Klassen und Ordnungen des Tier-Reichs*. Vol. 3 Suppl. (89–98). Leipzig : C. F. Winter. [1427].

Type data: type status unknown.

Type locality: Bass Strait, 20–22 m, VIC.

Taxonomic decision for synonymy: Caullery, M. (1909). Recherches sur la famille des Distomidae. *Bull. Scient. Fr. Belg.* 42: 1–59 [52].

Distribution: SA (Great Australian Bight, S Gulfs coast), TAS (Bass Strait, Tas. coast), VIC (Bass Strait), WA (Central W coast, Great Australian Bight, Lower W coast, NW coast, SW coast).

Ecology: benthic, marine; in storm debris, washed up or floating free in surface currents.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* 29(1): 1–266 [42].

***Clavelina dagysa*** (Kott, 1957)

***Podoclavella dagysa*** Kott, P. (1957). Ascidiens of Australia II. Aplousobranchiata Lahille; Clavelinidae Forbes and Hanley and Polyclinidae Verrill. *Aust. J. Mar. Freshwat. Res.* 8(1): 64–110 [93].

Type data: syntypes AM Y1188, Y1189, Y1191.

Type locality: Rottnest Is., WA.

Distribution: WA (Central W coast, Lower W coast).

Ecology: benthic, marine; to 20 m.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* 29(1): 1–266 [45].

***Clavelina fecunda*** (Sluiter, 1904)

***Podoclavella fecunda*** Sluiter, C.P. (1904). Die Tunicaten der Siboga-Expedition. Pt. I, Die sozialen und holosomen Ascidiens. *Siboga Exped.* 56A: 1–126 [7].

Type data: lectotype ZMA TU761.2, paralectotype(s) ZMA TU1256.

Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* 1(13): 157–200 [184].

Type locality: Banda-anchorage, Banda Is., 18–36 m, Indonesia.

Distribution: Indonesia, NT (N coast), QLD (Great Barrier Reef), WA (Lower W coast); west Pacific Ocean.

Ecology: benthic, marine; black sand, coral, *Lithothamnion* [Rhodophyta] bank, shallow waters to 20 m.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* 29(1): 1–266 [47].

***Clavelina meridionalis*** (Herdman, 1891)

***Podoclavella meridionalis*** Herdman, W.A. (1891). A revised classification of the Tunicata, with definitions of the orders, sub-orders, families, sub-families and genera, and analytical keys to the species. *J. Linn. Soc. Lond. Zool.* 23: 558–652 [603].

Type data: holotype AM U133 (G2091), paratype(s) QM G12247.

Type locality: Port Jackson, NSW.

***Podoclavella procera*** Sluiter, C.P. (1904). Die Tunicaten der Siboga-Expedition. Pt. I, Die sozialen und holosomen Ascidiens. *Siboga Exped.* 56A: 1–126 [8].

Type data: lectotype ZMA TU761.3, paralectotype(s) ZMA TU1257.

Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [185].

Type locality: 70 m, Indonesia [8°23'30"S 19°04'36"E].

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [48].

Distribution: Indonesia, NSW (Lower E coast), QLD (NE coast), WA (Lower W coast).

Ecology: benthic, marine; tropical, subtropical, sandy bottoms to 20 m.

***Clavelina mirabilis* Kott, 1972**

*Clavelina mirabilis* Kott, P. (1972). The ascidians of South Australia II. Eastern Sector of the Great Australian Bight and Investigator Strait. *Trans. R. Soc. S. Aust.* **96**(4): 165–196 [165].

Type data: holotype SAM E902, paratype(s) SAM E903.

Type locality: Waldegrave Is., 23 m, SA.

Distribution: SA (Great Australian Bight), TAS (Tas. coast).

Ecology: benthic, marine; gravelly sand, attached to limestone.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

***Clavelina moluccensis* (Sluiter, 1904)**

*Podoclavella moluccensis* Sluiter, C.P. (1904). Die Tunicaten der Siboga-Expedition. Pt. I, Die sozialen und holosomen Ascidien. *Siboga Exped.* **56A**: 1–126 [5].

Type data: syntypes ZMA TU762, ZMA TU763.1, ZMA TU763.2, ZMA TU763.3, ZMA TU763.4.

Type locality: Saleyer Is. reef, Ambon Is. reef, Banda Is. reef, Solor-Strait, to 113 m, Indonesia [8°30'S 119°07'E].

Distribution: Singapore, Philippines, Indonesia, QLD (Great Barrier Reef, NE coast), SA (Great Australian Bight, S Gulfs coast), VIC (Bass Strait), WA (Central W coast, Lower W coast, NW coast, SW coast).

Ecology: benthic, marine; seasonal in SA waters, dies off beginning of summer and reappears early winter.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

***Clavelina nigra* Kott, 1990**

*Clavelina nigra* Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [53].

Type data: holotype QM G9486.

Type locality: Roe Reef, Rottnest Is., 18 m, WA.

Distribution: WA (Lower W coast); known only from type locality.

Ecology: benthic, marine.

***Clavelina oliva* Kott, 1990**

*Clavelina oliva* Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [55].

Type data: holotype WAM 983.83, paratype(s) WAM 217.75.

Type locality: Ransonnet Rocks, Dirk Hartog Is., Shark Bay, WA.

Distribution: NT (N coast), QLD (Great Barrier Reef), WA (Central W coast, Lower W coast).

Ecology: benthic, marine; seagrass–*Cymadocea* [Cymodoceaceae] beds and coral rubble.

***Clavelina ostrearium* (Michaelsen, 1930)**

*Podoclavella ostrearium* Michaelsen, W. (1930). Ascidiae Krikobbranchiae. *Fauna Südwest-Aust.* **5**(7): 463–558 [467].

Type data: holotype (probable) ZMB 3903\*, paratype(s) (probable) ZMH K1683\*.

Type locality: Oyster Harbour, Albany, 0.75–5.5 m, WA.

Distribution: SA (Great Australian Bight, S Gulfs coast), WA (Great Australian Bight, SW coast).

Ecology: benthic, marine.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

***Clavelina pseudobaudinensis* (Kott, 1976)**

*Oxycorynia pseudobaudinensis* Kott, P. (1976). Ascidian fauna of Western Port Bay, Victoria and a comparison with that of Port Phillip Bay. *Mem. Natl. Mus. Vic.* **37**: 53–96 [54].

Type data: holotype AM Y1113, paratype(s) AM Y1112, Y1122.

Type locality: Laverton Bay, VIC.

Distribution: Lord Howe Island, NSW (Lower E coast), SA (Great Australian Bight, S Gulfs coast), VIC (Bass Strait), WA (Lower W coast).

Ecology: benthic, marine.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

***Clavelina robusta* Kott, 1990**

*Clavelina robusta* Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [61].

Type data: holotype WAM 753.83 (QM GH2140), paratype(s) WAM 755.83.

Type locality: Beacon, Goss Passage Wallabi Group, Houtman Abrolhos, 20–30 m, WA.

Distribution: Japan, Philippines, Palau, NT (N coast), QLD (NE coast), WA (Central W coast, Lower W coast, N coast, NW coast).

Ecology: benthic, marine.

***Nephtheis* Gould, 1856**

*Nephtheis* Gould, A.A. (1856). Mollusca and shells. In, *United States Exploring Expedition during the Years 1838–1842 under the Command of Charles Wilkes* Atlas: 1–16,

pls 1–56. London : Wiley & Putnam. [16] [without originally included species].

Type species: *Oxycorynia fascicularis* Drasche, 1882 by subsequent designation, see Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [63].

***Oxycorynia*** Drasche, R. von (1882). *Oxycorinia*, eine neue Synascidien-Gattung. *Verh. Zool.-Bot. Ges. Wien* **32**: 175–178 [175] [junior objective synonym of *Nephtheis* Gould, 1856].

Type species: *Oxycorynia fascicularis* Drasche, 1882 by monotypy.

Extralimital distribution: tropical west Pacific Ocean. See: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

Generic references: Hartmeyer, R. (1909). Ascidien (continuation of work by Seeliger). pp. 1281–1488 in Bronn, H.G. *Klassen und Ordnungen des Tier-Reichs*. Leipzig : C.F. Winter Vol. 3, suppl. pts 81–87 [1439]; Van Name, W.G. (1931). New North and South American ascidians. *Bull. Am. Mus. Nat. Hist.* **61**: 207–225 [63].

***Nephtheis fascicularis*** (Drasche, 1882)

***Oxycorynia fascicularis*** Drasche, R. von (1882). *Oxycorinia*, eine neue Synascidien-Gattung. *Verh. Zool.-Bot. Ges. Wien* **32**: 175–178 [175].

Type data: holotype ZMH 540K.

Type locality: Rouk Is., Hogolen, Caroline Is.

***Colella thomsoni*** Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiæ compositæ. *Zool. Chall. Exped.* **14**(38): 1–425 [94].

Type data: syntypes BMNH 1887.2.3.226–230.

Type locality: 20 m, Philippines [6°54'N 122°18'E].

***Nephtheis centripetens*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [38].

Type data: syntypes ZMA TU695, ZMA TU696.1–5\*.

Type locality: off Java, Gebé, Saleyer, Kei and Aru IIs,

Siboga Expedition Stations 7, 149, 213, 258, 273, see Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200.

***Nephtheis faciformis*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [39].

Type data: lectotype ZMA TU1067, paralectotype(s) ZMA TU1300.

Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [184].

Type locality: 369 m, Indonesia [8°20'30"S 119°04'36"E], see Tydeman, G.F. (1902). Liste des stations de la campagne scientifique du *Siboga* pp. 1–15 in, Weber, M. Introduction et description de l'expédition *Siboga Exped.* 1 mono., livre 3 + 2 maps. 176 pp.

***Nephtheis malayensis*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [36].

Type data: lectotype ZMA TU1270, paralectotype(s) ZMA TU697.

Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [184].

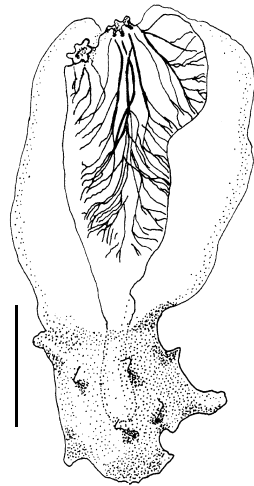
Type locality: Saleyer Is., reef, Indonesia, see Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200.

Taxonomic decision for synonymy: Michaelsen, W. (1930). Ascidiæ Krikobranchiæ. *Fauna Südwest-Aust.* **5**(7): 463–558 [469]; Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [63].

Distribution: Philippines, Indonesia, New Caledonia, NT (N coast), QLD (NE coast), WA (N coast, NW coast); Ponape Is., Sulu Sea.

Ecology: benthic, marine; from low tide.

# DIAZONIDAE



**Fig. 3.** *Rhopalaea crassa* (Herdman, 1880), a young individual. (Scale bar = 5.0 mm).  
[from Kott 1990]

Members of the family Diazonidae Seeliger, 1906, are characterised by their large pharynx with numerous stigmata and longitudinal branchial vessels, vertical gut loop posterior to the pharynx, oviparous habit, and gonads usually enclosed by, but sometimes behind, the gut loop.

*Rhopalaea* Philippi, 1843 is a solitary genus, but others form colonies with zooids either partially or completely embedded. Replication occurs by transverse division of the abdomen, and is initiated by constriction of the ectoderm in a process similar to that of most other aplousobranch families. The regenerative tissue is the endodermal epicardium. Larvae, like those of *Ciona* Fleming, 1822 (family Cionidae), are small and primitive with three simple, sessile, triradially arranged adhesive organs.

The family is not especially diverse, nor are its members generally recorded in particularly dense populations. Apart from two species of *Rhopalaea* (one of which, *R. crassa*, is particularly abundant in tropical waters), the genus is represented in Australian waters only by *Pseudodiazona claviformis* (Kott, 1963), although *Syndiazona* Oka occurs in the western Pacific and in due course may be found to occur in tropical waters off this continent. The Antarctic genera *Tylobranchion* Herdman, 1886 and *Pseudodiazona* Millar, 1963 have a posterior abdomen, suggesting an affinity with the family Protopolyclinidae Kott, 1990.

## References

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- Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiae compositae. *Zool. Chall. Exped.* **14**(38): 1–425
- Kott, P. (1963). The ascidians of Australia IV. Aplousobranchiata Lahille; Polyclinidae Verrill (continued). *Aust. J. Mar. Freshwat. Res.* **14**(1): 70–118
- Kott, P. (1990). The Australian Ascidacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266
- Millar, R.H. (1963). Australian ascidians in the British Museum (Natural History). *Proc. Zool. Soc. Lond.* **141**(4): 689–746
- Philippi (1843). *Rhopalaea* eine neues genus der einfachen Ascidien. *Arch. Anat. Physiol.* **1**: 45–47
- Seeliger, O. (1906). Appendicularien und Ascidien, Tunicata. Manteltiere. pp. 1041–1168 in Bronn, H.G. *Klassen und Ordnungen des Tier-Reichs*. Leipzig : C.F. Winter Vol. 3 Suppl.

***Pseudodiazona* Millar, 1963**

***Pseudodiazona*** Millar, R.H. (1963). Australian ascidians in the British Museum (Natural History). *Proc. Zool. Soc. Lond.* **141**(4): 689–746 [718].

Type species: *Pseudodiazona sabulosa* Millar, 1963 by monotypy.

***Patridium*** Kott, P. (1975). The ascidians of South Australia III. Northern sector of the Great Australian Bight and additional records. *Trans. R. Soc. S. Aust.* **99**(1): 1–20 [4].

Type species: *Patridium pulvinatum* Kott, 1975 by monotypy.

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [30].

Extralimital distribution: abyssal east Atlantic Ocean. See: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

***Pseudodiazona claviformis* (Kott, 1963)**

***Protopolyclinum claviforme*** Kott, P. (1963). The ascidians of Australia IV. Aplousobranchiata Lahille; Polyclinidae Verrill (continued). *Aust. J. Mar. Freshwat. Res.* **14**(1): 70–118 [72].

Type data: holotype AM U3920, paratype(s) AM U3919. Type locality: Haystack, VIC.

***Pseudodiazona sabulosa*** Millar, R.H. (1963). Australian ascidians in the British Museum (Natural History). *Proc. Zool. Soc. Lond.* **141**(4): 689–746 [718].

Type data: holotype BMNH 85.11.20.34, paratypes BMNH 85.11.20.35, BMNH 85.11.20.36, BMNH 85.11.20.37, BMNH 85.11.20.38, BMNH 85.11.20.39–43.

Type locality: Port Phillip, VIC.

***Patridium pulvinatum*** Kott, P. (1975). The ascidians of South Australia III. Northern sector of the Great Australian Bight and additional records. *Trans. R. Soc. S. Aust.* **99**(1): 1–20 [4].

Type data: holotype SAMA E1043.

Type locality: northern Great Australian Bight, 42 m, SA [32°24'S 133°30'E].

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [31].

Distribution: NSW (Lower E coast), SA (Great Australian Bight, S Gulfs coast), VIC (Bass Strait).

Ecology: benthic, marine, rock bottom; 10–100 m.

***Rhopalaea* Philippi, 1843**

***Rhopalaea*** Philippi (1843). *Rhopalaea* eine neues genus der einfachen Asciden. *Arch. Anat. Physiol.* **1**: 45–47 [45].

Type species: *Rhopalaea neapolitana* Philippi, 1843 by monotypy.

***Rhopalona*** Roule, L. (1886). Revision des espèces de Phallusiadées des côtes de Provence. *Rec. Zool. Suisse* **2**: 209–258 [214] [unnecessary *nom. nov.* for *Rhopalaea* Philippi, 1843].

***Rhopalopsis*** Herdman, W.A. (1890). On the genus *Ecteinascidia* and its relations; with descriptions of two new species, and a classification of the family Clavelinidae. *Proc.*

*Trans. Liverpool Biol. Soc.* **5**: 144–163 [160].

Type species: *Ecteinascidia crassa* Herdman, 1880 by original designation.

Taxonomic decision for synonymy: Van Name, W.G. (1921). Ascidians of the West Indian region and south-eastern United States. *Bull. Am. Mus. Nat. Hist.* **44**: 283–494 [370].

Extralimital distribution: Mediterranean Sea, tropical Indo-West Pacific Ocean, west Atlantic Ocean. See: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

***Rhopalaea crassa* (Herdman, 1880)**

***Ecteinascidia crassa*** Herdman, W.A. (1880). Preliminary report on the Tunicata of the *Challenger* expedition. Part 2. Ascidiidae. *Proc. R. Soc. Edinb.* **10**: 714–726 [723].

Type data: type status unknown BMNH (depository uncertain, not found).

Type locality: Ki Is., 260 m, Indonesia [5°42'S 132°25'E].

***Ecteinascidia fusca*** Herdman, W.A. (1880). Preliminary report on the Tunicata of the *Challenger* expedition. Part 2. Ascidiidae. *Proc. R. Soc. Edinb.* **10**: 714–726 [723].

Type data: type status unknown BMNH (depository uncertain, not found).

Type locality: Banda Is., 34 m, Indonesia.

***Ciona indica*** Sluiter, C.P. (1904). Die Tunicaten der Siboga-Expedition. Pt. I, Die socialen und holosomen Asciden. *Siboga Exped.* **56A**: 1–126 [24].

Type data: syntypes ZMA TU332, TU333\*.

Type locality: 8°23'30"S 119°4'36"E, 274 m, 8°19'S 117°41'E, 69 m, Indonesia.

***Ecteinascidia (Rhopalopsis) solida*** Herdman, W.A. (1906). Report on the Tunicata. *Ceylon Pearl Oyster Fisheries Suppl. Rept.* **39**: 295–348 [299] [as *Ecteinascidia* (?*Rhopalopsis*) *solida*].

Type data: holotype BMNH 1907.8.30.3.

Type locality: Galle, Coral Reef, Sri Lanka.

***Rhopalaea sagamiana*** Oka, A. (1927). Über zwei neue *Rhopalaea*-Arten aus Japan. *Proc. Imp. Acad. Japan* **3**: 681–683 [681].

Type data: syntypes UTZM 58-1 (M208), 339 (M482)\*.

Type locality: south of Misaki, Sagami Province, Honshu, 150–300 m, Japan.

***Rhopalaea macrothorax*** Tokioka, T. (1953). *Ascidians of Sagami Bay*. Tokyo : Iwanami Shoten 313 pp. 79 pls [212].

Type data: syntypes BLIH 216, 250, 251\*.

Type locality: east half of Sagami Bay, Japan.

***Rhopalaea perlucida*** Monniot, C. (1997). Ascides phlébobranches du Canal du Mozambique. *Zoosystema* **19**(4): 557–571.

Type data: holotype MNHP P1 Rho A21.

Type locality: Nosy-Bé, banc de Sakatia, 20 m, Mozambique.

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [26]; Kott, P. (2003). New syntheses and new species in the Australian Ascidiacea. *J. Nat. Hist.* **37**: 1611–1653 [1613].

Distribution: Japan, Sri Lanka, Philippines, Indonesia, Hong Kong, Mozambique, QLD (Central E coast, Great Barrier Reef), WA (Lower W coast).

Ecology: benthic, marine; common in coral reef habitats.

Reference: Kott, P. (2003). New syntheses and new species in the Australian Ascidiacea. *J. Nat. Hist.* **37**: 1611–1653 [1613].

***Rhopalaea tenuis*** (Sluiter, 1904)

***Rhopalopsis tenuis*** Sluiter, C.P. (1904). Die Tunicaten der Siboga-Expedition. Pt. I, Die socialen und holosomen Ascidien. *Siboga Exped.* **56A**: 1–126 [15].

Type data: syntypes ZMA TU968.14.

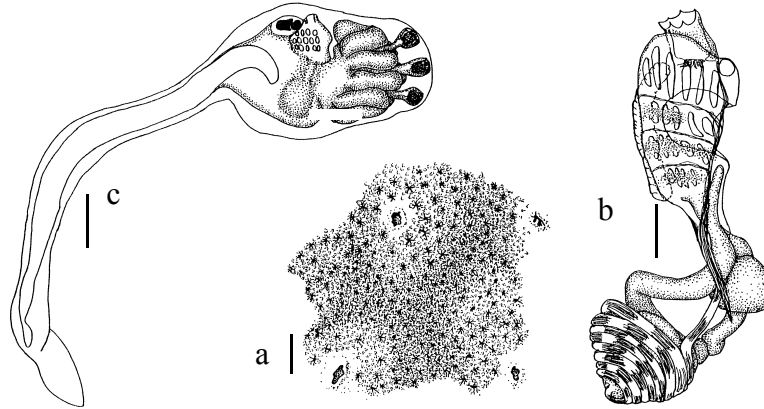
Type locality: 82 m, Indonesia [6°05'S 114°07'E].

Distribution: Indonesia, QLD (NE coast).

Ecology: benthic, marine.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

## DIDEMNIDAE



**Fig. 4.** *Didemnum* sp.: **a**, surface of a colony showing four common cloacal apertures and numerous star-shaped branchia apertures; **b**, zooid; **c**, larva. (Scale bars: **a** = 1.0 mm; **b**, **c** = 0.1 mm). [from Kott 1998]

Didemnidae Giard, 1872 are a relatively uniform although very speciose family in the Aplousobranchia. The family is characterised by small zooids divided into thorax (with three or four rows of stigmata), and abdomen (containing a small ovary with only one egg maturing at a time, a dome-shaped to spherical or conical testis sometimes subdivided into circular or grape-like clusters of clavate testis follicles, and a gut loop with its distal end often ventrally flexed). The gut is divided into a vertical oesophagus, smooth stomach, a cylindrical duodenal section, an oval posterior stomach and a large rectum, the latter often divided into a proximal chamber and a narrow distal chamber (see *Polysyncraton* and *Clitella*). A pyloric gland extends from the posterior end of the stomach and ends in tubules that encircle the proximal end of the rectum in a more or less conspicuous band. In *Atrium*, *Didemnum* and *Trididemnum* (with undivided testis) and *Polysyncraton* and *Leptoclinides* (with the testis divided into many follicles) the vas deferens, from the central or terminal point of the testis, coils around it in a spiral of increasing diameter and then turns anteriorly from the base, or outer coil, of the spiral to open in the atrial aperture. In *Lissoclinum*, *Clitella* and *Diplosoma* (with the testis entire or subdivided) the vas deferens extends in a straight line from its opening from the posterior margin of the testis to the atrial aperture, sometimes in the groove between the two halves when the testis is divided. Body musculature is confined to the thorax, longitudinal bands of muscle occurring in the parietal body wall, narrow transverse bands in the interstigmatal vessels and a pair of broad dorsal pharyngeal longitudinal muscle bands in the wall of the pharynx, one band on each side of the dorsal mid-line. In most species of all genera except *Atrium* and *Leptoclinides*, each dorsal pharyngeal band joins the parietal muscles from the same side of the thorax posterior to the atrial cavity, extends in the body wall around the outside of the posterior end of the thorax or around the oesophageal neck and with the muscles from the opposite side projects away from the ventral margin of the body and into the test as a retractor muscle. The retractor muscle is especially strong in *Clitella*. *Atrium* and *Leptoclinides* generally have relatively large zooids (up to about 5 mm long in *Atrium*), but both dorsal pharyngeal and parietal muscles fade out at the posterior end of the thorax and there is never a retractor muscle. In *Atrium*, *Leptoclinides* and most species of *Trididemnum* (which have relatively small zooids), the atrial aperture is on a posteriorly orientated muscular siphon often with five lobes around the rim where it opens

into the cloacal cavity. *Didemnum*, *Polysyncraton*, *Lissoclinum*, *Clitella* and *Diplosoma* have large sessile atrial openings that often expose the branchial sac directly to the cloacal cavity. The anterior margin of these sessile atrial apertures often are drawn out into a muscular lip which, when inserted into the test around the common cloacal cavity and apertures ensures that the zooid muscles can exercise some control over them. *Trididemnum* (with coiled vas deferens and undivided testis) is the only genus with three rows of stigmata (all others having four rows). *Didemnum* and *Trididemnum* larvae have three rows of stigmata in the larval pharynx, although there are four rows in the larval pharynx of *Polysyncraton*, *Leptoclinides*, *Atriolum*, *Lissoclinum* and *Diplosoma*. In most species in the family, the oesophageal buds appear to have similar numbers of stigmata as in the adult zooids. This contributes to accurate assessments of the number of stigmata as the buds are not subject to the same degree of contraction as the adult zooids.

With the exception of *Diplosoma* and a few species in other genera, minute (seldom more than 0.1 mm diameter) calcareous spicules, synthesised by an ectodermal (lateral) organ of the external thoracic parietal body wall, are in the test (Lafargue & Kniprath 1978; Ballan-Dufrançaise *et al.* 1995). Sand or other particles are not incorporated into the test in this family, although in one species faecal pellets are included. In a polyphyletic group of species, cyanophyte or *Prochloron* [Prochlorophyta] obligate symbionts occur in the test or in the cloacal cavities, or non-obligate symbionts occur on the surface of the colony (Kott 1980; Parry & Kott 1988). Such species are, at least partly, autotrophic.

Didemnid colonies are sometimes cushion or sheet-like, often thin (encrusting the substrate); or they may be more substantial flasks or massive arborescent structures, or stalked heads or complex, 3-dimensional trabeculae with a zooid-free internal test core and the zooids themselves in a layer at the surface. Zooids are arranged around a simple common cloacal cavity or along each side of long, branching two or three-dimensional systems of canals; and the colony may consist of a single system served by a single common cloacal aperture, or there may be many. This family is unusual in that the zooids are always short, and the greater part of thicker colonies consists of zooid-free basal or central test, in which embryos are incubated. Usually living colonies are kept inflated by positive pressure in the excurrent water as it passes through large cloacal cavities, behind or around the zooids. Calcareous spicules embedded in the test can also be crowded together to form a supportive internal skeleton for large branching colonies.

Replication in the Didemnidae is by oesophageal budding involving the epicardial sacs. It is a modification of transverse strobilation in other aplousobranchs (Berrill 1950). Colonies of several species of the didemnid-*Prochloron* symbioses are known to subdivide or lobulate (Ryland 1990). This is associated with colonies moving apart to space themselves, although movements also can occur independently of lobulation (Cowan 1981; Birkeland *et al.* 1981).

In the Didemnidae, eggs (fertilised through an otherwise vestigial oviduct: Burighel & Martinucci 1994) usually rupture directly from the abdomen and move into the base or centre of the colony where they are incubated. They are liberated as tailed larvae into the cloacal cavity or directly to the exterior through the surface of the colony. The genus *Atriolum* and a few *Leptoclinides* species are the only exceptions, with embryos being brooded in a thoracic brood pouch as in some Holozoidae.

The larvae are relatively uniform, with lateral ampullae each side of three adhesive organs in the anterior median vertical line. A blastozooid, as well as the oozooid, occurs in the larvae of a few species of *Didemnum*, *Lissoclinum* and *Diplosoma*, and in most species of *Polysyncraton*, but never in *Leptoclinides*, *Atriolum*, or *Trididemnum*. *Polysyncraton* and some *Didemnum* species have up to eight pairs of lateral ampullae, although usually there are not more than six on each side in other taxa. The monotypic genus *Clitella* has highly modified adhesive organs forming a convoluted band of adhesive cells on frontal lobes of the large larval trunk and prolific budding takes place in the larvae.

The Didemnidae have long been regarded as the most highly evolved of the Aplousobranchia. Certainly colony organisation and zooid size reduction and simplification are more marked in this family than in others. Nevertheless, these developments do not imply a direct linear relationship with other aplousobranchs. Compelling evidence for an earlier origin (from a common ancestor) for Didemnidae than for most other aplousobranch families exists in the presence in *Leptoclinides* of high concentrations of vanadium (Hawkins *et al.* 1983). This



element is present in similar high concentrations in the more primitive families of Aplousobranchia and Phlebobranchia. Unless the Didemnidae are polyphyletic, the presence of vanadium in *Leptoclinides* suggests an origin for the Didemnidae directly from a diazonid ancestor, and implies that the evolution of complex cloacal systems parallels their evolution in other Aplousobranchia.

All genera of the Didemnidae are well represented in the tropical Indo-west Pacific and in Australian temperate and tropical waters, although their diversity is much reduced in the Antarctic and Subantarctic.

The basis for the study of the Didemnidae in Australian waters are the reports on the collections made by European expeditions of 19th century, namely, HMS *Challenger* (Herdman 1886) and the Dutch *Siboga* Expedition (Sluiter 1909). An account of existing Australian collections (by Kott 1962), did not advance the understanding of the family to any great extent; although later studies (Kott 1980, 1981, 1982) elucidated the taxonomy of the large group of didemnid-algal symbioses. A major revision of the family in Australian waters by Kott (2001), followed by supplementary works (Kott 2002, 2004a-c, 2005) has resulted in the documentation of 255 species, of which 190 have been described since 1960. Of the species known to occur in Australian waters, 103 are indigenous temperate species recorded from the southern half of the Australian continent and 82 are tropical species with a range in the wider Indo-West Pacific tropical region. Another 70 species are known only from Australian tropical waters but, in due course, may be found to be part of that wider tropical fauna.

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***Atriolum* Kott, 1983**

***Atriolum*** Kott, P. (1983). Two new genera of didemnid ascidians from tropical Australian waters. *The Beagle, Rec. N.T. Mus. Arts Sci.* **1**(2): 13–19 [13].  
Type species: *Atriolum robustum* Kott, 1983 by monotypy.

Extralimital distribution: Torres Strait, west Indian Ocean. See: Millar, R.H. (1988). Ascidiaceans collected during the International Indian Ocean Expedition. *J. Nat. Hist.* **22**: 823–848; Monniot, F. (1989). Ascidiées de Nouvelle-Calédonie VII. Les genres *Atriolum* et *Leptoclinides* dans le lagon sud. *Bull. Mus. Natl. Hist. Nat. Paris* (4) **11A**(4): 673–691.

***Atriolum bucinum* Kott, 2001**

***Atriolum bucinum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [21].  
Type data: holotype QM G304670.  
Type locality: Houtman's Abrolhos, Wallabi Group, WA.

Distribution: WA (Lower W coast); known only from type locality.  
Ecology: benthic, marine.

***Atriolum eversum* Kott, 2001**

***Atriolum eversum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [22].  
Type data: holotype WAM 366.80.  
Type locality: Houtman's Abrolhos, SW of Split Is., Morning Reef, Wallabi Group, 180 m, WA.

Distribution: WA (Lower W coast); known only from type locality.  
Ecology: benthic, marine.

***Atriolum glauerti* (Michaelsen, 1930)**

***Leptoclinides glauerti*** Michaelsen, W. (1930). Ascidiæ Krikobranchiæ. *Fauna Südwest-Aust.* **5**(7): 463–558 [511].  
Type data: holotype ZMB Pch 3884.  
Type locality: Shark Bay, about 3 mls NW of Denham, 3 m, WA.

Distribution: WA (Central W coast).

Ecology: benthic, marine.

Reference: Kott, P. (2004). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2465].

***Atriolum lilium* Kott, 2001**

*Atriolum lilium* Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [24].

Type data: holotype QM GH2385.

Type locality: Flinders Is., Investigator Group, eastern Great Australian Bight, SA.

Distribution: SA (Great Australian Bight); known only from type locality.

Ecology: benthic, marine.

***Atriolum marinense* Kott, 2001**

*Atriolum marinense* Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [25].

Type data: holotype QM G301616.

Type locality: Marion Reef, 8 m, Coral Sea.

Distribution: New Caledonia, QLD (NE oceanic); Coral Sea, West Indian Ocean.

Ecology: benthic, marine.

***Atriolum robustum* Kott, 1983**

*Atriolum robustum* Kott, P. (1983). Two new genera of didemnid ascidians from tropical Australian waters. *The Beagle, Rec. N.T. Mus. Arts Sci.* **1**(2): 13–19 [13].

Type data: holotype QM GH285, paratypes QM GH286, QM GH1410, NTME18.

Type locality: Murray Is., between Maer and Dewar Is., 20 m, QLD.

Distribution: QLD (Great Barrier Reef, NE coast); Torres Strait.

Ecology: benthic, marine.

***Atriolum tubiporum* Kott, 2001**

*Atriolum tubiporum* Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [29].

Type data: holotype QM G302885.

Type locality: bay at western end of Breaksea Is., Albany Harbour, 20 m, WA.

Distribution: WA (Lower W coast, SW coast).

Ecology: benthic, marine.

***Clitella* Kott, 2001**

*Clitella* Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [332].

Type species: *Clitellum nutricula* Kott, 2001 by monotypy.

***Clitella nutricula* Kott, 2001**

*Clitellum nutricula* Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [332].

Type data: holotype SAMA E2678.

Type locality: Marun Is., Sir Joseph Banks Group, SA.

Distribution: SA (S Gulfs coast).

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2466].

***Didemnum* Savigny, 1816**

*Didemnum* Savigny, J.C. (1816). Recherches anatomiques sur les ascidies composées et sur les ascidies simples—Système de la classe des Ascidies pp. 1–239. In *Mémoires sur les Animaux sans Vertèbres*, Pt 2. Paris : G. Dufour. [194].

Type species: *Didemnum candidum* Savigny, 1816 by subsequent designation, see Hartmeyer, R. (1909). Hartmeyer, R. (1908). Zur Terminologie der Didemnidae. *Sitzungs-Ber. Ges. naturforsch. Freunde Ber.* **1909**: 575–581 [580].

*Leptoclinum* Milne-Edwards, H. (1841). Observations sur les ascidies composées des côtes de la Manche. *Mem. Acad. Sci. Inst. Fr.* **18**: 217–326 [297].

Type species: *Leptoclinum fulgens* Milne-Edwards, 1841 by designation under Plenary Powers, see Tubbs, P.K. (1986). Opinion 1412. *Leptoclinum fulgens* Milne-Edwards, 1841 designated as type species of *Leptoclinum* Milne-Edwards, 1841 (Tunicata, Asciacea). *Bull. Zool. Nomencl.* **43**(3): 253–254.

*Tetradidemnum* Della Valle, A. (1881). Nuove contribuzioni alla storia naturale delle ascidie composte del Golfo di Napoli. *Atti Accad. nag. Lincei Series 3, Memoir* **10**: 431–498 [pl. 5 fig. 47, 69] [pl. 7 fig. 69].

Type species: *Tetradidemnum gigas* Della Valle, 1881 by original designation.

*Didemnoides* Drasche, R. von (1883). Die Synascidien der Bucht von Rovigno (Istrien). In *Ein Beitrag zur Fauna der Adria* Wien : Carl Gerolds Sohn. 41 pp. [37].

Type species: *Didemnoides resinaceum* Drasche, 1883 by original designation.

*Diplosomoides* Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiae compositae. *Zool. Chall. Exped.* **14**(38): 1–425 [399].

Type species: none designated; originally included nominotypical species: *Diplosoma pseudoleptoclinum* Drasche, 1883; *Diplosomoides molle* Herdman, 1886.

*Sarcodidemnoides* Oka, A & Willey, A. (1892). On a new genus of synascidian from Japan. *Q. J. Microsc. Sci.* **33**(2): 313–324 [313].

Type species: *Sarcodidemnoides misakiense* Oka & Willey, 1892 by monotypy.

*Hypurgon* Sollas, I.B.J. (1903). On *Hypurgon skeati* a new genus and species of compound ascidian. *Q. J. Microsc. Sci. (ns)* **46**: 729–735 [729].

Type species: *Hypurgon skeati* Sollas, 1903 by monotypy.

Taxonomic decision for synonymy: Harant, H. (1929). Ascides provenant des croisières du Prince Albert 1er de Monaco. *Résultats de Campagnes Scientifique accomplies (Monaco)* **75**: 1–110 [21]; Tokioka, T. (1967). Pacific Tunicata of the United States National Museum. *Bull. U.S. Natl Mus.* **251**: 1–242 [75].

Extralimital distribution: Australian Region—Chatham Island; worldwide, including polar regions (not at abyssal depths). See: Hartmeyer, R. (1924). Ascidiacea, part II. Zugleich eine Übersicht über die Arktische und boreale Ascidenfauna auf tier-geographischer Grundlage. *Ingolf-Exped.* **2**(7): 1–275; Harant, H. (1929). Ascides provenant des croisières du Prince Albert 1er de Monaco. *Résultats de Campagnes Scientifique accomplies (Monaco)* **75**: 1–110; Van Name, W.G. (1945). The North and South American ascidians. *Bull. Am. Mus. Nat. Hist.* **84**: 1–476; Kott, P. (1962). The ascidians of Australia III. Aplousobranchiata Lahille: Didemnidae Giard. *Aust. J. Mar. Freshwat. Res.* **13**(3): 265–334; Millar, R.H. (1962). Further descriptions of South African ascidians. *Ann. S. Afr. Mus.* **56**(7): 113–221; Kott, P. (1969). Antarctic Ascidiacea. A monographic account of the known species based on specimens collected under U.S. Government auspices 1947 to 1963. *Antarct. Res. Ser.* **13**: i–xv 1–239; Millar, R.H. (1982). The marine fauna of New Zealand. *Mem. N.Z. Oceanogr. Inst.* **85**: 1–117; Nishikawa, T. (1990). The ascidians of the Japan Sea 1. *Publ. Seto Mar. Biol. Lab.* **34**(4–6): 73–148; Monniot, F. (1995). Ascides de Nouvelle-Calédonie XV. Le genre *Didemnum*. *Bull. Mus. Natl. Hist. Nat. Paris* (4)**16A**(2–4): 299–344.

Generic reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2416].

***Didemnum albopunctatum* Sluiter, 1909**

*Didemnum albopunctatum* Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Asciden. *Siboga Exped.* **56B**: 1–112 [58].  
Type data: lectotype ZMA TU433.2.  
Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [172].  
Type locality: Ambon, Indonesia.

*Didemnum biglutinum* Monniot, F. (1995). Ascides de Nouvelle-Calédonie XV. Le genre *Didemnum*. *Bull. Mus. Natl. Hist. Nat. Paris* (4)**16A**(2–4): 299–344 [300].  
Type data: holotype MNHP A2. DID.C 219.  
Type locality: New Caledonia.

Taxonomic decision for synonymy: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [148].

Distribution: Indonesia, Cocos (Keeling) Islands (Aust. Terr.), Palau, New Caledonia, Fiji, NT (N coast), QLD (Great Barrier Reef, NE coast), WA (Lower W coast, N coast, NW oceanic).  
Ecology: benthic, marine.

***Didemnum arancium* Kott, 2001**

*Didemnum arancium* Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [150].  
Type data: holotype QM G308115, paratype(s) QM G308120.  
Type locality: Wistari reef, QLD.

Distribution: French Polynesia, QLD (Great Barrier Reef).  
Ecology: benthic, marine.

***Didemnum aratore* Kott, 2004**

*Didemnum aratore* Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [53].  
Type data: holotype NTM E256.  
Type locality: Ashmore Reef, 3–6 m, Timor Sea.

Distribution: WA (N coast); known only from type locality.  
Ecology: benthic, marine.

***Didemnum asterix* Kott, 2004**

*Didemnum asterix* Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [747].  
Type data: holotype WAM 633.88.  
Type locality: Cape Legendre, 40–42 m, WA.

Distribution: WA (NW coast); known only from type locality.  
Ecology: benthic, marine.

***Didemnum astrum* Kott, 2001**

*Didemnum astrum* Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [151].  
Type data: holotype QM G308015, paratype(s) QM G308204.  
Type locality: Wistari Reef, QLD.

Distribution: QLD (Great Barrier Reef), WA (Lower W coast, N coast); Indian Ocean.  
Ecology: benthic, marine; rubble fauna, low tide.  
Reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2437].

***Didemnum bicolor* Kott, 2001**

*Didemnum bicolor* Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [152].  
Type data: holotype QM GH2410, paratype(s) QM GH2409.  
Type locality: Top Gallant Is., Investigator Group, SA.

Distribution: SA (Great Australian Bight); known only from type locality.  
Ecology: benthic, marine; in caves.

***Didemnum bisectatum* Kott, 2001**

***Didemnum bisectatum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [154].  
Type data: holotype QM G302599.  
Type locality: Flat Top Bank, Timor Sea, NT.

Distribution: WA (NW coast); known only from type locality.  
Ecology: benthic, marine.

***Didemnum caesium* Sluiter, 1909**

***Didemnum caesium*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [53].  
Type data: holotype ZMA TU434.  
Type locality: between Nusa Besi and the NE point of Timor, 27–54 m, Indonesia [8°25.2 'S 127°18.4 'E].

Distribution: Indonesia, New Caledonia, WA (NW coast).  
Reference: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [155].

***Didemnum candidum* Savigny, 1816**

***Didemnum candidum*** Savigny, J.C. (1816). Recherches anatomiques sur les ascidies composées et sur les ascidies simples—Système de la classe des Ascidies pp. 1–239. In *Mémoires sur les Animaux sans Vertèbres*, Pt 2. Paris : G. Dufour. [194].  
Type data: neotype LA 1247–51.  
Subsequent designation: Lafargue, F. (1974). Description d'un néotype de *Didemnum candidum* Savigny, 1816 espèce-type de Mer Rouge (Ascidie composée). *Vie Milieu* **24**(2): Sér. A: 341–356 [341].  
Type locality: Red Sea.

***Leptoclinum cretaceum*** Sluiter, C.P. (1898). Beiträge zur Kenntnis der Fauna von Südafrika II. Tunicaten. *Zool. Jahrb. Syst.* **11**: 1–64 [36].  
Type data: lectotype ZMA TU602, paralectotype(s) ZMA TU578.  
Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [180].  
Type locality: coast of Mozambique.

***Didemnum yolky*** Monniot, C. & Monniot, F. (1997). Records of ascidians from Bahrain, Arabian Gulf, with three new species. *J. Nat. Hist.* **31**: 1623–1643 [1626].  
Type data: holotype MNHP A2 DID. C 389.  
Type locality: Mozambique, Iboi Is., 3 m.

Taxonomic decision for synonymy: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [157].

Distribution: Tanzania, Mozambique, Mauritius, NT (N coast), WA (NW coast); Gulf of Suez, Gulf of Aquaba, Gulf of Arabia.  
Ecology: benthic, marine; tropical latitudes.

***Didemnum chartaceum* Sluiter, 1909**

***Didemnum chartaceum*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [57].  
Type data: syntypes ZMA TU437.  
Type locality: Flores Is., Indonesia.

Distribution: Indonesia, Fiji, QLD (Great Barrier Reef).  
Ecology: benthic, marine.  
Reference: Kott, P., Parry, D.L. & Cox, G.C. (1984). Prokaryotic symbionts with a range of ascidian hosts. *Bull. Mar. Sci.* **34**(2): 308–312.

***Didemnum cilicium* Kott, 2005**

***Didemnum cilicium*** Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2438].  
Type data: holotype SAMA E3251.  
Type locality: : between Western River Cove and Snug Cove, Pissy Boy Rock, W side, on rock wall, 6–8 m, Kangaroo Is., SA.

Distribution: SA (S Gulfs coast); known only from type locality.  
Ecology: benthic, marine.

***Didemnum clavum* Kott, 2001**

***Didemnum clavum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [162].  
Type data: holotype QM G308161, paratype(s) QM G308402.  
Type locality: Heron Is., filter of aquarium seawater intake, QLD.

Distribution: Indonesia, NT (N coast), QLD (Great Barrier Reef), WA (Lower W coast, N coast, NW coast).  
Ecology: benthic, marine.

***Didemnum complexum* Kott, 2001**

***Didemnum complexum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [164].  
Type data: holotype AM Y820.  
Type locality: Little Turiel Point, Port Hacking, 60–70 m, NSW.

Distribution: NSW (Lower E coast), TAS (Tas. coast).  
Ecology: benthic, marine.

***Didemnum coralliforme* Kott, 2004**

***Didemnum coralliforme*** Kott, P. (2004). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [748].

Type data: holotype NTM E34.

Type locality: W of Port Hedland, 50 m, WA.

Distribution: NT (N coast), WA (NW coast).

Ecology: benthic, marine.

Reference: Kott, P. (2004). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2490].

***Didemnum corium* Kott, 2005**

***Didemnum corium*** Kott, P. (2005). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2440].

Type data: holotype SAMA E3249.

Type locality: Port Davey, Bathurst Channel, Beebee Point, 6–8 m on silt, TAS.

Distribution: TAS (Tas. coast); known only from type locality.

Ecology: benthic, marine.

***Didemnum crescente* Kott, 2001**

***Didemnum crescente*** Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [166].

Type data: holotype QM G308495.

Type locality: Eden, NSW.

Distribution: NSW (Lower E coast), SA (S Gulfs coast), VIC (Bass Strait).

Ecology: benthic, marine.

Reference: Kott, P. (2004). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2491].

***Didemnum cygnuus* Kott, 2001**

***Didemnum cygnuus*** Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [169].

Type data: holotype WAM 362.92.

Type locality: Rocky Bay, Swan River estuary on seagrass, WA.

Distribution: NT (N coast), WA (Lower W coast, NW coast).

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2440].

***Didemnum delectum* Kott, 2001**

***Didemnum delectum*** Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [171].

Type data: holotype SAMA E2632, paratype(s) SAMA E2662.

Type locality: Bonaparte Creek, Tourville Bay, SW of Ceduna, 6–8 m, SA.

Distribution: SA (Great Australian Bight, S Gulfs coast).

Ecology: benthic, marine.

Reference: Kott, P. (2004). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2492].

***Didemnum diversum* Kott, 2004**

***Didemnum diversum*** Kott, P. (2004). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [749].

Type data: holotype WAM 159.93.

Type locality: Passage Is, NW Long Is., 16–15 m, WA.

Distribution: WA (NW coast); known only from type locality.

Ecology: benthic, marine.

***Didemnum domesticum* Kott, 2004**

***Didemnum domesticum*** Kott, P. (2004). Ascidacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [54].

Type data: holotype NTM E237.

Type locality: Ashmore Reef, 4–7 m, Timor Sea.

Distribution: NT (N coast); known only from type locality.

Ecology: benthic, marine.

***Didemnum effusium* Kott, 2001**

***Didemnum effusium*** Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [173].

Type data: holotype QM G10139.

Type locality: Kingston South East, SA.

Distribution: SA (S Gulfs coast), VIC (Bass Strait).

Ecology: benthic, marine.

***Didemnum elongatum* Sluiter, 1909**

***Didemnum elongatum*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [66].

Type data: syntypes ZMA TU444, TU445.

Type locality: sounding due West, 1300 m distant from N point of Kabia Is. reef, 701 m, Indonesia.

Distribution: Indonesia, WA (NW coast).

Ecology: benthic, marine.

Reference: Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [173].

***Didemnum etiolum* Kott, 1982**

***Didemnum etiolum*** Kott, P. (1982). Didemnid-algal symbioses: host species in the western Pacific with notes on the symbiosis. *Micronesica* **18**(1): 95–127 [104].

Type data: syntypes QM GH247, GH272, GH459.

Type locality: Martha Ridgeway Reef, northern Great Barrier Reef, QLD.

Distribution: Philippines, QLD (Great Barrier Reef).

Ecology: benthic, marine; obligate *Prochloron* [Prochlorophyta] symbionts.

References: Parry, D.L. & Kott, P. (1988). Cosymbiosis in the Ascidiacea. *Bull. Mar. Sci.* **42**(1): 149–153; Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [175].

***Didemnum fibriae* Kott, 2004**

*Didemnum fibriae* Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [750].

Type data: holotype WAM 175.91.

Type locality: Woodman's Point, Cockburn Sound, 18 m, WA.

Distribution: WA (Lower W coast); known only from type locality.

Ecology: benthic, marine.

***Didemnum flavoviride* Monniot, 1995**

*Didemnum flavoviride* Monniot, F. (1995). Ascidies de Nouvelle-Calédonie XV. Le genre *Didemnum*. *Bull. Mus. Natl. Hist. Nat. Paris* (4) **16A**(2–4): 299–344 [308].

Type data: holotype MNHP A2 DID. C 198.

Type locality: New Caledonia.

Distribution: New Caledonia, QLD (Great Barrier Reef); west Pacific Ocean.

Ecology: benthic, marine.

Reference: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [176].

***Didemnum fragile* Sluiter, 1909**

*Didemnum fragile* Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [56].

Type data: lectotype ZMA TU446.3, paralectotype(s) ZMA TU446.1, 446.2.

Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [172].

Type locality: Wunoh-Bay, NW coast of Waigeu Is., 32 m, Indonesia.

*Didemnum proliferum* Kott, P. (1981). The ascidians of the reef flats of Fiji. *Proc. Linn. Soc. N.S.W.* **105**(3): 147–212 [171].

Type data: holotype QM G12577.

Type locality: Viti Levu, Vuda Point, LWM, Fiji.

Taxonomic decision for synonymy: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [177].

Distribution: Palau, French Polynesia, Fiji, NT (N coast), QLD (Great Barrier Reef, NE coast), WA (N coast); west Pacific Ocean.

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2441].

***Didemnum fragum* Kott, 2001**

*Didemnum fragum* Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [179].

Type data: holotype SAMA E2680, paratypes SAMA E2832, E2838, QM GH5438\*.

Type locality: Nora Creina Bay, Gulf St Vincent, SA.

Distribution: NSW (Central E coast), SA (Great Australian Bight, S Gulfs coast), TAS (Tas. coast), VIC (Bass Strait).

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2441].

***Didemnum fucatum* Sluiter, 1909**

*Didemnum fucatum* Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [47].

Type data: syntypes ZMA TU448.

Type locality: Pulu Kaniungan ketjil, 11 m, Indonesia.

Distribution: Indonesia, QLD (Great Barrier Reef).

Ecology: benthic, marine.

Reference: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [182].

***Didemnum fuscum* Sluiter, 1909**

*Didemnum fuscum* Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [52].

Type data: syntypes ZMA TU451.

Type locality: 32 m, Indonesia [1°42.5'S 130°47'E].

Distribution: Indonesia, NT (N coast), QLD (Great Barrier Reef), WA (NW coast); west Pacific Ocean.

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2443].

***Didemnum grande* (Herdman, 1886)**

*Leptoclinum albidum grande* Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiæ compositæ. *Zool. Chall. Exped.* **14**(38): 1–425 [291] [as *Leptoclinum albidum* var. *grande* Verrill, 1871].

Type data: type status unknown BMNH\* (depository uncertain, not found).

Type locality: off Cebu, 190 m, Philippines [10°14'N 123°54'E].

***Didemnum makropnous*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112.

Type data: syntypes ZMA TU461.3–5.

Type locality: 32 m; Saleyer Is., 36 m; Dammar Is., 45 m [1°42.5'S 130°47.5'E].

Taxonomic decision for synonymy: Kott, P. (1962). The ascidians of Australia III. Aplousobranchiata Lahille: Didemnidae Giard. *Aust. J. Mar. Freshwat. Res.* **13**(3): 265–334 [325].

Distribution: Philippines, Indonesia, NT (N coast), QLD (Great Barrier Reef, NE coast), WA (Central W coast, Lower W coast).

Ecology: benthic, marine.

References: Kott, P. (2004). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2492]; Kott, P. (2005). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2444].

***Didemnum granulatum*** Tokioka, 1954

***Didemnum granulatum*** Tokioka, T. (1954). Contributions to Japanese ascidian fauna VII. Invertebrate fauna of the intertidal zone of the Tokara Islands. VII Ascidians. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **3**(3): 239–264 [244].

Type data: syntypes SMBL Type 130.

Type locality: Takarazima, Tokara Is.

Distribution: Hawaii, French Polynesia, Fiji, NT (N coast), QLD (Great Barrier Reef), WA (Lower W coast, NW coast); Tokara Is.

Ecology: benthic, marine.

References: Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [188]; Kott, P. (2004). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2491].

***Didemnum guttatum*** F. & C. Monniot, 1996

***Didemnum guttatum*** Monniot, F. & Monniot, C. (1996). New collections of ascidians from the western Pacific and Southeastern Asia. *Micronesica* **29**(2): 133–279 [153].

Type data: holotype MNHP A2DID C229.

Type locality: north Sulawesi, west of Talisei Is., Indonesia, 1 m [1°51.87'N 125°04.08'E].

Distribution: Indonesia, QLD (Great Barrier Reef); Coral Sea.

Ecology: benthic, marine.

***Didemnum herba*** Kott, 2001

***Didemnum herba*** Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [189].

Type data: holotype QM G308641.

Type locality: Big Broadhurst Reef, 11 m, QLD.

Distribution: QLD (Great Barrier Reef); known only from type locality.

Ecology: benthic, marine.

***Didemnum hiopaa*** C. & F. Monniot, 1987

***Didemnum hiopaa*** Monniot, C. & Monniot, F. (1987). Les ascidies de Polynésie française. *Mém. Mus. Natl. Hist. Nat. Paris* **136**: 1–155 [32].

Type data: holotype MNHP A2 DID C 92.

Type locality: Station 6, NE Mooréa, French Polynesia.

Distribution: New Caledonia, French Polynesia, QLD (Great Barrier Reef).

Ecology: benthic, marine.

Reference: Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [191].

***Didemnum incanum*** (Herdman, 1899)

***Leptoclinum incanum*** Herdman, W.A. (1899). Descriptive catalogue of the Tunicata in the Australian Museum. *Australian Museum, Sydney, Catalogue* **17**: 1–139 [90].

Type data: type status unknown (depository uncertain, not found; not listed in Rowe, F.W.E. & Marshall, J.I. (1979). A catalogue of the ascidian type-specimens in the Australian Museum, Sydney. *Rec. Aust. Mus.* **32**(17): 547–562).

Type locality: Port Jackson, NSW.

Distribution: New Zealand, NSW (Lower E coast), SA (S Gulfs coast), TAS (Tas. coast), VIC (Bass Strait).

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2444].

***Didemnum inveteratum*** Kott, 2001

***Didemnum inveteratum*** Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [193].

Type data: holotype QM G302922.

Type locality: Lord Mayor Shoal, 21 m, WA [16°31.2'S 122°36.4'E].

Distribution: WA (NW coast); known only from type locality.

Ecology: benthic, marine.

***Didemnum jedanense*** Sluiter, 1909

***Didemnum jedanense*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [59].

Type data: lectotype ZMA TU454.1.

Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [173].

Type locality: Pulu Kaniungan ketjil, 11 m, Indonesia.

***Didemnum reticulatum*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [60].

Type data: syntypes ZMA TU475.4, 475.5.

Type locality: off Kawio- and Kamboling islands, Karkaralong group, 23–31m, Indonesia; off Pulu Jedan, east coast of Aru islands (Pearl banks), 13 m, Indonesia.



Taxonomic decision for synonymy: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [194].

Distribution: Indonesia, New Caledonia, NT (N coast), QLD (Great Barrier Reef, NE coast), WA (N coast).

Ecology: benthic, marine.

Reference: Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [55].

***Didemnum jucundum* Kott, 2001**

*Didemnum jucundum* Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [197].

Type data: holotype SAMA E2646, paratype(s) SAMA E2693.

Type locality: Portsea Pier piles 4–6 m, Port Phillip Bay, VIC.

Distribution: SA (S Gulfs coast), TAS (Tas. coast), WA (SW coast).

Ecology: benthic, marine.

References: Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2495]; Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2446].

***Didemnum lacertosum* Monniot, 1995**

*Didemnum lacertosum* Monniot, F. (1995). Ascidies de Nouvelle-Calédonie XV. Le genre *Didemnum*. *Bull. Mus. Nat. Hist. Nat. Paris (4)* **16A**(2–4): 299–344 [311].

Type data: holotype MNHP A2 DID. C 261.

Type locality: Loyalty Is., Lifou, 10–30 m, New Caledonia.

Distribution: New Caledonia, QLD (Great Barrier Reef).

Ecology: benthic, marine.

Reference: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [199].

***Didemnum leopardus* Kott, 2005**

*Didemnum leopardus* Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2447].

Type data: holotype QM G308719.

Type locality: Dawson Rock, Bynoe Harbour, 5–8 m, muddy bottom, NT.

Distribution: NT (N coast); known only from type locality.

Ecology: benthic, marine.

***Didemnum levitas* Kott, 2001**

*Didemnum levitas* Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [200].

Type data: holotype QM G308224, paratype(s) QM G308220.

Type locality: Heron Is., intertidal, QLD.

Distribution: QLD (Great Barrier Reef); known only from type locality.

Ecology: benthic, marine.

***Didemnum lillipution* Kott, 2004**

*Didemnum lillipution* Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [55].

Type data: holotype NTM E250.

Type locality: Ashmore Reef, 3–6 m, Timor Sea.

Distribution: WA (N coast).

Ecology: benthic, marine.

***Didemnum linatum* Kott, 2001**

*Didemnum linatum* Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [200].

Type data: holotype WAM 40.89.

Type locality: 51 n miles NNE of Port Hedland, 38 m, WA.

Distribution: WA (NW coast); known only from type locality.

Ecology: benthic, marine.

***Didemnum lissoclinum* Kott, 2001**

*Didemnum lissoclinum* Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [202].

Type data: holotype SAMA E2665, paratype(s) SAMA E2607.

Type locality: 49 m, Great Australian Bight, SA [32°24'S 113°30'E].

Distribution: SA (Great Australian Bight, S Gulfs coast), VIC (Bass Strait), WA (Lower W coast).

Ecology: benthic, marine.

***Didemnum macrosiphonium* Kott, 2001**

*Didemnum macrosiphonium* Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [202].

Type data: holotype SAMA E2657, paratype(s) SAMA E2658.

Type locality: Aldinga drop off, Gulf St Vincent, 10–25 m, SA.

Distribution: SA (S Gulfs coast), VIC (Bass Strait).

Ecology: benthic, marine.

***Didemnum madeleinae* F. & C. Monniot, 2001**

*Didemnum madeleinae* Monniot, F. & Monniot, C. (2001). Ascidians from the tropical western Pacific. *Zoosystema* **23**(2): 201–383 [268].

Type data: holotype MNHP A2 DID.C 470.

Type locality: Louisiade Archipelago, Deboyne Lagoon, Nivani Is., overhang [10°47.46'S 152°23.08'E].

Distribution: Papua New Guinea, NT (N coast).

Ecology: benthic, marine.

Reference: Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [35].

***Didemnum mantile* Kott, 2001**

***Didemnum mantile*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [203].

Type data: holotype QM G302881.

Type locality: Southern French Is., Tortoise Head, Western Port, 3 m, VIC.

Distribution: SA (Great Australian Bight), VIC (Bass Strait), WA (SW coast).

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2447].

***Didemnum membranaceum* Sluiter, 1909**

***Didemnum membranaceum*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Asciden. *Siboga Exped.* **56B**: 1–112 [58].

Type data: syntypes ZMA TU471.1, TU471.2.

Type locality: Pater Noster and Flores Is., Indonesia.

***Didemnum turritum*** Michaelsen, W. (1930). Ascidae Krikobanchiae. *Fauna Südwest-Aust.* **5**(7): 463–558 [521].

Type data: syntypes MGH K1701.

Type locality: NNW of North Point of Heirisson Prong, Shark Bay, WA.

Distribution: Indonesia, Hong Kong, Andaman Islands, French Polynesia, Federated States of Micronesia, NT (N coast), QLD (Central E coast, Great Barrier Reef), SA (S Gulfs coast), WA (Central W coast, Lower W coast).

Ecology: benthic, marine.

References: Kott, P., Parry, D.L. & Cox, G.C. (1984). Prokaryotic symbionts with a range of ascidian hosts. *Bull. Mar. Sci.* **34**(2): 308–312; Kott, P. (2002). Ascidiacea (Tunicata) from Darwin, Northern Territory, Australia. *Beagle, Rec. Mus. Art Galleries NT* **18**: 19–55 [36]; Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2497].

***Didemnum microthoracicum* Kott, 2001**

***Didemnum microthoracicum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [207].

Type data: holotype SAMA E2656.

Type locality: Avoid Bay, SA.

Distribution: SA (Great Australian Bight, S Gulfs coast).

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2448].

***Didemnum minisculum* Kott, 2001**

***Didemnum minisculum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [207].

Type data: holotype SAMA E2647.

Type locality: Stansbury jetty on seagrass, 2–3 m, Yorke Peninsula, SA.

Distribution: SA (S Gulfs coast); known only from type locality.

Ecology: benthic, marine.

***Didemnum molle* (Herdman, 1886)**

***Diplosomoides molle*** Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiaceae compositae. *Zool. Chall. Exped.* **14**(38): 1–425 [310].

Type data: holotype BMNH 87.2.4.446.

Type locality: Aru Is., Torres Strait.

***Didemnum sycon*** Michaelsen, W. (1920). Die Ascidae Krikobanchiae des Roten Meeres: Clavelinidae und Synoicidae. Expedition S.M. Schiff *Pola* in das Rote Meer, nördliche und südliche Hälfte 1895/1896–1897/1898 Zoologische Ergebnisse xxxiii. *Denkschr. Akad. Wiss. Wien* **97**: 1–38 [44].

Type data: syntypes ZMH K1088, ZMH K1089.

Type locality: Comoren, Malagasy.

Taxonomic decision for synonymy: Kott, P. (1980). Algal-bearing didemnid ascidians in the Indo-west Pacific. *Mem. Queensl. Mus.* **20**(1): 1–47 [2].

Distribution: Indonesia, Guam, Fiji, NT (N coast), QLD (Great Barrier Reef), WA (Lower W coast); west Pacific Ocean including Okinawa, west Indian Ocean.

Ecology: benthic, marine; obligate *Prochloron* [Prochlorophyta] symbionts.

References: Olson, R.R. (1985). The consequences of short distance larval dispersal in a sessile marine invertebrate. *Ecology* **66**(1): 30–39; Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [208].

***Didemnum monile* Kott, 2001**

***Didemnum monile*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [211].

Type data: holotype SAMA E2683.

Type locality: West Island, Nuyts Archipelago, SA.

Distribution: SA (S Gulfs coast); known only from type locality.

Ecology: benthic, marine.

***Didemnum moseleyi*** (Herdman, 1886)

***Leptoclinum moseleyi*** Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiaceae compositae. *Zool. Chall. Exped.* **14**(38): 1–425 [272].

Type data: type status unknown BMNH (depository uncertain, not found).

Type locality: unknown.

Distribution: Indonesia, NSW (Central E coast, Lower E coast), QLD (Central E coast, NE coast), SA (S Gulfs coast), TAS (Bass Strait, Tas. coast), VIC (Bass Strait), WA (Lower W coast); west Pacific Ocean, Gulf of Suez, west Indian Ocean.

Ecology: benthic, marine.

References: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [211]; Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2448].

***Didemnum multispirale*** Kott, 2001

***Didemnum multispirale*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [213].

Type data: holotype QM G308017, paratype(s) QM G308044.

Type locality: Heron Is., under rubble, 0.5 m, QLD.

Distribution: Indonesia, QLD (Great Barrier Reef, NE coast), WA (NW coast).

Ecology: benthic, marine.

***Didemnum mutabile*** C. & F. Monniot, 1987

***Didemnum mutabile*** Monniot, C. & Monniot, F. (1987). Les ascidies de Polynésie française. *Mém. Mus. Natl. Hist. Nat. Paris* **136**: 1–155 [37].

Type data: holotype MNHP A2 DID C 109.

Type locality: Moorea, Tahiti, French Polynesia.

Distribution: French Polynesia, QLD (Great Barrier Reef).

Ecology: benthic, marine.

Reference: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [215].

***Didemnum nambucciensis*** Kott, 2004

***Didemnum nambucciensis*** Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [753].

Type data: holotype QM G10025, paratype(s) QM G10026.

Type locality: Nambucca Heads, 13 m, NSW.

Distribution: NSW (Lower E coast); known only from type locality.

Ecology: benthic, marine.

***Didemnum nekozita*** Tokioka, 1967

***Didemnum nekozita*** Tokioka, T. (1967). Pacific Tunicata of the United States National Museum. *Bull. U.S. Natl. Mus.* **251**: 1–242 [67].

Type data: holotype USNM 11381, paratype(s) USNM 11801, 11418.

Type locality: Palau Is., Barrier reef 8 mi.[les] NW of Koror Island [7°24'30"N 134°21'20"E].

***Didemnum anoi*** Monniot, C. & Monniot, F. (1987). Les ascidies de Polynésie française. *Mém. Mus. Natl. Hist. Nat. Paris* **136**: 1–155 [25].

Type data: holotype MNHP A2 DID C 94.

Type locality: French Polynesia, Teavatia, Tikehau Atoll.

Taxonomic decision for synonymy: Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [754].

Distribution: Philippines, Palau, French Polynesia, Fiji, QLD (Great Barrier Reef), WA (Central W coast, Lower W coast, N coast); also Eniwetak.

Ecology: benthic, marine.

Reference: Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [57].

***Didemnum oblitum*** Kott, 2001

***Didemnum oblitum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [215].

Type data: holotype QM G308380, paratype(s) QM G308363, 305733, 305605, 308386.

Type locality: Price Cay, Swain Reefs, 20 m, QLD.

Distribution: QLD (Great Barrier Reef, NE coast).

Ecology: benthic, marine.

***Didemnum ossium*** Kott, 2001

***Didemnum ossium*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [216].

Type data: holotype QM G300986, paratype(s) QM G302927, 300967.

Type locality: Fenelon Is., Institut Is., Bonaparte Archipelago, 20 m, WA.

Distribution: Philippines, New Caledonia, NT (N coast), WA (NW coast).

Ecology: benthic, marine.

Reference: Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [57].

***Didemnum parancium*** Kott, 2001

***Didemnum parancium*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [218].

Type data: holotype QM GH5353.

Type locality: Bowden Reef, off Townsville, 10 m, QLD.

Distribution: QLD (Great Barrier Reef); known only from type locality.

Ecology: benthic, marine.

***Didemnum parau* C. & F. Monniot, 1987**

***Didemnum parau*** Monniot, C. & Monniot, F. (1987). Les ascidies de Polynésie française. *Mém. Mus. Natl. Hist. Nat. Paris* **136**: 1–155 [39].

Type data: holotype MNHP A2 DID C 101.

Type locality: Mataiva, French Polynesia, centre of lagoon.

Distribution: Philippines, French Polynesia, NT (N coast).

Ecology: benthic, marine.

Reference: Kott, P. (2002). Ascidiacea (Tunicata) from Darwin, Northern Territory, Australia. *Beagle, Rec. Mus. Art Galleries NT* **18**: 19–55 [37].

***Didemnum patulum* (Herdman, 1899)**

***Leptoclinum patulum*** Herdman, W.A. (1898). Note on the Tunicata fauna of Australian seas. *Ann. Mag. Nat. Hist.* **7**(1): 443–450 [448] [*nom. nud.*].

***Leptoclinum patulum*** Herdman, W.A. (1899). Descriptive catalogue of the Tunicata in the Australian Museum. *Australian Museum, Sydney, Catalogue* **17**: 1–139 [92].

Type data: type status unknown AM (depository uncertain, not found; not listed in Rowe, F.W.E. & Marshall, J.I. (1979). A catalogue of the ascidian type-specimens in the Australian Museum, Sydney. *Rec. Aust. Mus.* **32**(17): 547–562).

Type locality: Port Jackson, NSW.

Distribution: NSW (Lower E coast), SA (S Gulfs coast), TAS (Tas. coast), VIC (Bass Strait).

Ecology: benthic, marine.

References: Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [756]; Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2450].

***Didemnum pecten* Kott, 2001**

***Didemnum pecten*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [220].

Type data: holotype QM G300929.

Type locality: Kangaroo Is., 6 m, SA.

Distribution: NSW (Lower E coast), SA (S Gulfs coast), VIC (Bass Strait).

Ecology: benthic, marine.

Reference: Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2498].

***Didemnum pellucidum* Kott, 2001**

***Didemnum pellucidum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [222].

Type data: holotype SAMA E2622, paratypes SAMA E2696, QM G300985.

Type locality: Edithburgh, Yorke Peninsula, 2–3 m, SA.

Distribution: SA (S Gulfs coast), TAS (Tas. coast), WA (Lower W coast).

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2450].

***Didemnum perplexum* Kott, 2001**

***Didemnum perplexum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [224].

Type data: holotype QM G300985, paratype(s) QM G302960, G308046.

Type locality: Heron Is., QLD.

Distribution: Indonesia, New Caledonia, NT (N coast), QLD (Great Barrier Reef).

Ecology: benthic, marine.

Reference: Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [757].

***Didemnum plebium* Kott, 2005**

***Didemnum plebium*** Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2451].

Type data: holotype WAM 155.93.

Type locality: N of Rosemary Is., Dampier Archipelago, 60–64 m, WA [19°45'S 116°45'E].

Distribution: WA (NW coast); known only from type locality.

Ecology: benthic, marine.

***Didemnum poecilomorpha* F. & C. Monniot, 1996**

***Didemnum poecilomorpha*** Monniot, F. & Monniot, C. (1996). New collections of ascidians from the western Pacific and Southeastern Asia. *Micronesica* **29**(2): 133–279 [160].

Type data: holotype MNHP A2 DID C 230.

Type locality: Indonesia, north Sulawesi, W side of Talisei Is., 40 m [1°51.52'N 125°03.84'E].

Distribution: Philippines, Indonesia, Papua New Guinea, Palau, WA (Central W coast, NW coast).

Ecology: benthic, marine.

Reference: Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2498].

***Didemnum precocinum* Kott, 2001**

***Didemnum precocinum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [160].

Type data: holotype QM G308026, paratype(s) QM G308028.

Type locality: Wistari Reef, low tide rubble, QLD.

Distribution: NT (N coast), QLD (Great Barrier Reef), WA (N coast).

Ecology: benthic, marine.

***Didemnum psammatode*** (Sluiter, 1895)

***Leptoclinum psammatode*** Sluiter, C.P. (1895). Tunicaten. In, Semon, R. Zoologische Forschungsreisen in Australien und den Malayischen Archipel. *Denkschr. Med.-Naturw. Ges. Jena* **8**: 163–186; Nachtrag zu den tunicaten: 325–326. [171] [as *Leptoclinum psamathodes*, lapsus].  
Type data: holotype ZMA TU588.  
Type locality: Thursday Is., Torres Strait.

***Hypurgon skeati*** Sollas, I.B.J. (1903). On *Hypurgon skeati* a new genus and species of compound ascidian. *Q. J. Microsc. Sci. (ns)* **46**: 729–735 [729].  
Type data: type status unknown BMNH (depository uncertain, not found).  
Type locality: Pulau Bidang, Malaysia.

***Hypurgon fuscum*** Oka, A. (1931). Ueber eine neue Art von der Merkwürdigen Synascien-Gattung *Hypurgon*. *Proc. Imp. Acad. Japan* **7**: 287–290 [287] [junior homonym of *Didemnum fuscum* Sluiter, 1909].  
Type data: syntypes (probable) UTZM 463 (S61), 332 (S81)\*.  
Type locality: Japan.

***Didemnum dorotubu*** Tokioka, T. (1967). Pacific Tunicata of the United States National Museum. *Bull. U.S. Natl Mus.* **251**: 1–242 [74] [*nom. nov.* for *Hypurgon fuscum* Oka, 1931].  
Taxonomic decision for synonymy: Kott, P. (1981). The ascidians of the reef flats of Fiji. *Proc. Linn. Soc. N.S.W.* **105**(3): 147–212 [173].

Distribution: Japan, Malaysia, Indonesia, New Zealand, NSW (Central E coast), QLD (Central E coast, Great Barrier Reef, NE coast), VIC (Bass Strait); west Indian Ocean, Red Sea.  
Ecology: benthic, marine.  
Reference: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [229].

***Didemnum roberti*** Michaelsen, 1930

***Didemnum roberti*** Michaelsen, W. (1930). Ascidiace Krikobanchiae. *Fauna Südwest-Aust.* **5**(7): 463–558 [516].  
Type data: holotype ZMB 3886\*.  
Type locality: NNW Heirisson Prong, Shark Bay, 22–25 m, WA.

Distribution: NT (N coast), WA (Central W coast, Lower W coast, NW coast).  
Ecology: benthic, marine.  
Reference: Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [58].

***Didemnum rota*** Kott, 2004

***Didemnum rota*** Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [58].  
Type data: holotype NTM E241.  
Type locality: Ashmore Reef, 4–7 m, Timor Sea.

Distribution: WA (N coast); known only from type locality.  
Ecology: benthic, marine.

***Didemnum scopi*** Kott, 2001

***Didemnum scopi*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [232].  
Type data: holotype QM G308216, paratype(s) QM G308221, G308478.  
Type locality: Gorgonia pools, Heron Is., QLD.

Distribution: QLD (Central E coast, Great Barrier Reef, NE coast).  
Ecology: benthic, marine.  
Reference: Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2499].

***Didemnum sordidum*** Kott, 2001

***Didemnum sordidum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [234].  
Type data: holotype QM G4970, paratype(s) QM G308304.  
Type locality: Noosa Heads, 1 m, QLD.

Distribution: Philippines, Hong Kong, French Polynesia, QLD (Central E coast, Great Barrier Reef, NE coast), WA (NW coast); Indian Ocean.  
Ecology: benthic, marine.

***Didemnum spadix*** Kott, 2001

***Didemnum spadix*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [236].  
Type data: holotype SAMA E2841, paratype(s) SAMA E2694.  
Type locality: Elliston Bay, 6 m, cave roof, SA.

Distribution: SA (Great Australian Bight), WA (Lower W coast).  
Ecology: benthic, marine.

***Didemnum spongioides*** Sluiter, 1909

***Didemnum spongioides*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [67].  
Type data: lectotype ZMA TU472, paralectotype(s) ZMA TU1272.  
Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [174].  
Type locality: Pearl Banks, E coast Aru Is., Torres Strait.

Distribution: Indonesia, QLD (NE oceanic), TAS (Tas. coast), WA (Lower W coast); Aru Is., Indonesia.  
Ecology: benthic, marine.  
Reference: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [236].

***Didemnum spumante*** Kott, 2004

***Didemnum spumante*** Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2500].

Type data: holotype WAM 195.90, paratype(s) WAM 194.90.

Type locality: Green Head, near Leeman, in crevice, WA.

Distribution: WA (Lower W coast); known only from type locality.

Ecology: benthic, marine.

***Didemnum spumosum* Kott, 2004**

***Didemnum spumosum*** Kott, P. (2004). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [758].

Type data: holotype NMV F53285.

Type locality: Coffs Harbour on jetty piles, 0–5 m, NSW.

Distribution: NSW (Central E coast); known only from type locality.

Ecology: benthic, marine.

***Didemnum stragulum* Kott, 2001**

***Didemnum stragulum*** Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [238].

Type data: holotype WAM 610.89.

Type locality: West Is., intertidal, Cocos (Keeling) Is., east Indian Ocean.

Distribution: Cocos (Keeling) Islands (Aust. Terr.).

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2452].

***Didemnum sucosum* Kott, 2001**

***Didemnum sucosum*** Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [240].

Type data: holotype QM G300980.

Type locality: Corinella Jetty piles, Western Port, VIC.

Distribution: TAS (Tas. coast), VIC (Bass Strait).

Ecology: benthic, marine.

***Didemnum tabulatum* Sluiter, 1909**

***Didemnum tabulatum*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [49].

Type data: syntypes ZMA TU480.1–3.

Type locality: off Pulu Sarassa, Postillon Is., 36 m; off Kawio and Kambooling islands, Karkaralong group, 23–31 m; off Pulu Jedan, east coast of Aru Islands (Pearl banks), Indonesia.

Distribution: Indonesia, WA (Central W coast, NW coast).

Ecology: benthic, marine.

Reference: Kott, P. (2004). New and little known

species of Didemnidae (Asciacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2501].

***Didemnum ternerratum* Kott, 2001**

***Didemnum ternerratum*** Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [241].

Type data: holotype SAMA E2653.

Type locality: Elliston Bay, Great Australian Bight, SA.

Distribution: SA (Great Australian Bight, S Gulfs coast), TAS (Tas. coast), VIC (Bass Strait).

Ecology: benthic, marine.

References: Kott, P. (2004). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2500]; Kott, P. (2005). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2452].

***Didemnum theca* Kott, 2001**

***Didemnum theca*** Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [243].

Type data: holotype WAM 121.93.

Type locality: 41 n miles WNW of Port Hedland, 36 m, WA.

Distribution: WA (NW coast).

Ecology: benthic, marine.

***Didemnum tonga* (Herdman, 1886)**

***Didemnum tonga*** Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiae compositae. *Zool. Chall. Exped.* **14**(38): 1–425 [269].

Type data: holotype BMNH 1887.2.4.402–403\*.

Type locality: off Tongatabu (an error, presumably for Tongatapu), Friendly Is., 9 m [20°58'S 175°09'E].

***Didemnum productum*** Monniot, F. (1995). Ascidies de Nouvelle-Calédonie XV. Le genre *Didemnum*. *Bull. Mus. Natl. Hist. Nat. Paris (4)* **16A**(2–4): 299–344 [323].

Type data: holotype MNHP A2 DID. C 263.

Type locality: Marion Reef, Coral Sea Plateau, 35 m.

Taxonomic decision for synonymy: Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [243].

Distribution: Coral Sea, west Pacific Ocean.

Ecology: benthic, marine.

***Didemnum tumulatum* Kott, 2004**

***Didemnum tumulatum*** Kott, P. (2004). Asciacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [58].

Type data: holotype NTM E279.

Type locality: Ashmore Reef, 6–8 m, Timor Sea.

Distribution: WA (NW coast); known only from type locality.

Ecology: benthic, marine.

***Didemnum usitatum* Kott, 2004**

***Didemnum usitatum*** Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [59].

Type data: holotype NTM E259.

Type locality: Ashmore Reef, 4–6 m, Timor Sea.

Distribution: WA (N coast); known only from type locality.

Ecology: benthic, marine.

***Didemnum uturoa* C. & F. Monniot, 1987**

***Didemnum uturoa*** Monniot, C. & Monniot, F. (1987). Les ascidies de Polynésie française. *Mém. Mus. Natl. Hist. Nat. Paris* **136**: 1–155 [43].

Type data: holotype MNHP A2 DID C 99.

Type locality: Tahiti, Toafini reef in centre of lagoon, 10–20 m.

Distribution: New Caledonia, French Polynesia, QLD (Great Barrier Reef).

Ecology: benthic, marine.

Reference: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [244].

***Didemnum vahatuio* C. & F. Monniot, 1987**

***Didemnum vahatuio*** Monniot, C. & Monniot, F. (1987). Les ascidies de Polynésie française. *Mém. Mus. Natl. Hist. Nat. Paris* **136**: 1–155 [43].

Type data: holotype MNHP A2 DID C 111.

Type locality: Tahiti, Toafini reef in centre of lagoon, 10–20 m.

Distribution: New Caledonia, French Polynesia, QLD (Great Barrier Reef).

Ecology: benthic, marine.

Reference: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [246].

***Didemnum verdantum* Kott, 2001**

***Didemnum verdantum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [247].

Type data: holotype QM GH5358.

Type locality: 35 n miles W of Bathurst Is., 16 m, NT.

Distribution: NT (N coast); known only from type locality.

Ecology: benthic, marine; obligate *Prochloron* [Prochlorophyta] symbionts.

***Didemnum vesperi* Kott, 2004**

***Didemnum vesperi*** Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [xx].

Type data: holotype NTM E239.

Type locality: Ashmore Reef, 4–7 m, Timor Sea.

Distribution: WA (N coast); known only from type locality.

Ecology: benthic, marine.

***Didemnum via* Kott, 2001**

***Didemnum via*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [248].

Type data: holotype QM GH808.

Type locality: Heron Is., 15–20 m, QLD.

Distribution: QLD (Great Barrier Reef); known only from type locality.

Ecology: benthic, marine.

***Didemnum viride* (Herdman, 1906)**

***Leptoclinum viride*** Herdman, W.A. (1906). Report on the Tunicata. *Ceylon Pearl Oyster Fisheries Suppl. Rept.* **39**: 295–348 [337].

Type data: holotype BMNH 07.8.30.41, paratype(s) ZMA TU598.

Type locality: 2.5 m[iles] south of Periya Paar, 26 m, Sri Lanka.

Distribution: Malagasy, QLD (Great Barrier Reef); west Pacific Ocean.

Ecology: benthic, marine; obligate cyanophyte symbionts.

Reference: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [248].

***Didemnum vulgare* Kott, 2001**

***Didemnum vulgare*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [250].

Type data: holotype SAMA E2684.

Type locality: 100 n miles SSW Eucla, 175 m, WA [33°17'S 128°12'E].

Distribution: SA (S Gulfs coast), VIC (Bass Strait), WA (Great Australian Bight).

Ecology: benthic, marine.

***Diplosoma* Macdonald, 1859**

***Diplosoma*** Macdonald, J.D. (1859). On the anatomical characters of a remarkable form of compound Tunicata. *Trans. Linn. Soc. Lond. (Zool.)* **22**: 373–375 [375].

Type species: *Diplosoma rayneri* Macdonald, 1859 by monotypy.

***Lioclinum*** Verrill, A.E. (1871). Descriptions of some imperfectly known and new ascidians from New England. *Amer. J. Sci. (3)* **1**: 54–58, 93–100, 211–212, 288–294, 443–446 [444].

Type species: *Didemnum viscosum* Savigny, 1816 by original designation.

***Astellium*** Giard, A.M. (1872). Recherches sur les ascidies composées ou synascidies. *Arch. Zool. Exp. Gén.* **1**: 613–662 [657].

Type species: *Astellium spongiforme* Giard, 1872 by original designation.

***Arenadiplosoma*** Menker, D. & Ax, P. (1970). Zur Morphologie von *Arenadiplosoma migrans* n. gen., n. sp. einer vagilen Ascidiien-Kolonie aus dem Mesopsammal der Nordsee (Tunicata, Ascidiacea). *Z. Morphol. Tiere* **66**: 323–336 [323].

Type species: *Arenadiplosoma migrans* Menker & Ax, 1970 by monotypy.

Taxonomic decision for synonymy: Lafargue, F. (1972). Les Didemnidae (Prochordata) d'Helgoland. *Helgolander Wiss Meeresunters* **23**: 100–116 [110].

Extralimital distribution: worldwide, including polar regions (not at abyssal depths). See: Hartmeyer, R. (1924). Ascidiacea, part II. Zugleich eine Übersicht über die Arktische und boreale Ascidiienfauna auf tiergeographischer Grundlage. *Ingolf-Exped.* **2**(7): 1–275; Harant, H. (1929). Ascidiées provenant des croisières du Prince Albert 1er de Monaco. *Résultats de Campagnes Scientifique accomplies (Monaco)* **75**: 1–110; Van Name, W.G. (1945). The North and South American ascidians. *Bull. Am. Mus. Nat. Hist.* **84**: 1–476; Kott, P. (1962). The ascidians of Australia III. Aplousobranchiata Lahille: Didemnidae Giard. *Aust. J. Mar. Freshwat. Res.* **13**(3): 265–334; Millar, R.H. (1962). Further descriptions of South African ascidians. *Ann. S. Afr. Mus.* **56**(7): 113–221; Kott, P. (1969). Antarctic Ascidiacea. A monographic account of the known species based on specimens collected under U.S. Government auspices 1947 to 1963. *Antarct. Res. Ser.* **13**: i–xv 1–239; Millar, R.H. (1982). The marine fauna of New Zealand. *Mem. N.Z. Oceanogr. Inst.* **85**: 1–117; Nishikawa, T. (1990). The ascidians of the Japan Sea I. *Publ. Seto Mar. Biol. Lab.* **34**(4–6): 73–148; Monniot, F. (1994). Ascidiées de Nouvelle-Calédonie XIV. Le genre *Diplosoma* (Didemnidae). *Bull. Mus. Natl. Hist. Nat. Paris* (4) **16A**(1): 3–11.

***Diplosoma fecundum*** Kott, 2004

***Diplosoma fecundum*** Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2515].

Type data: holotype SAMA E2919.

Type locality: Kingscote Jetty piles, 3–4 m, Kangaroo Is., SA.

Distribution: SA (S Gulfs coast); known only from type locality.

Ecology: benthic, marine.

***Diplosoma listerianum*** (Milne-Edwards, 1841)

***Leptoclinum gelatinosum*** Milne-Edwards, H. (1841). Observations sur les ascidiées composées des côtes de la Manche. *Mem. Acad. Sci. Inst. Fr.* **18**: 217–326 [295].

Type data: type status and whereabouts unknown.

Type locality: English Channel.

***Leptoclinum listerianum*** Milne-Edwards, H. (1841). Observations sur les ascidiées composées des côtes de la Manche. *Mem. Acad. Sci. Inst. Fr.* **18**: 217–326 [295].

Type data: neotype BMNH 1966.2.14.2\*.

Subsequent designation: Rowe, F.W.E. (1966). A review of the genus *Diplosoma* Macdonald, 1959, (Ascidiacea, Didemnidae) with a description of the proposed neotype of *Diplosoma listerianum* (Milne-Edwards, 1841). *Ann. Mag. Nat. Hist.* **9**(13): 457–467 [458].

Type locality: Brighton, Sussex, England.

***Diplosoma rayneri*** Macdonald, J.D. (1859). On the anatomical characters of a remarkable form of compound Tunicata. *Trans. Linn. Soc. Lond. (Zool.)* **22**: 373–375 [373].

Type data: type status and whereabouts unknown.

Type locality: Port Jackson, NSW.

***Diplosoma macdonaldi*** Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiacea compositae. *Zool. Chall. Exped.* **14**(38): 1–425 [315].

Type data: type status unknown BMNH (depository uncertain, not found).

Type locality: Bahia, Brazil.

***Diplosoma mitsukurii*** Oka, A. (1892). Die periodische Regeneration der oberen Körperhälfte bei den Diplosomiden. *Biol. Centralblatt* **12**(9): 265–268 [265].

Type data: type status unknown UTZM (depository uncertain, not found).

Type locality: Pacific coast of Honsyû, Japan.

***Diplosoma atropunctatum*** Van Name, W.G. (1902). The ascidians of the Bermuda Islands. *Trans. Conn. Acad. Arts Sci.* **11**: 325–412 [370].

Type data: holotype AMNH 1249 (AMNH 1386)\*.

Type locality: Bermuda.

***Diplosoma lacteum*** Van Name, W.G. (1902). The ascidians of the Bermuda Islands. *Trans. Conn. Acad. Arts Sci.* **11**: 325–412 [369].

Type data: holotype AMNH 1248\*, paratype(s) AMNH 1396\*.

Type locality: Bermuda.

***Diplosoma pizoni*** Ritter, W.E. & Forsyth, R.A. (1917). Ascidians of the littoral zone of southern California. *Univ. Calif. Publ. Zool.* **16**: 439–512 [474].

Type data: type status unknown USNM (depository uncertain, not found).

Type locality: San Diego Bay, California, USA.

***Diplosoma okai*** Tokioka, T. (1949). Contributions to the Japanese ascidian fauna I. Ascidians collected by Prof. Mijadi and Mr Masui during the bottom survey 1934–1940. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **1**: 1–18 [5].

Type data: syntypes SMBL 355\*.

Type locality: Matoya Bay, Japan.

***Leptoclinum macrolobium*** Tokioka, T. (1949). Contributions to the Japanese ascidian fauna II. Notes on some ascidians collected chiefly along the coast of Kii Peninsula. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **1**(2): 39–64 [44].

Type data: syntypes SMBL 118\*.

Type locality: Kii Peninsula, Seto Naikai Sea, Japan.

Taxonomic decision for synonymy: Rowe, F.W.E. (1966). A review of the genus *Diplosoma* Macdonald, 1959, (Ascidiacea, Didemnidae) with a description of the proposed neotype of *Diplosoma listerianum* (Milne-Edwards, 1841). *Ann. Mag. Nat. Hist.* **9**(13): 457–467 [457].

Distribution: Japan, Indonesia, New Zealand, California, QLD (Central E coast), VIC (Bass Strait), WA (Lower W coast, SW coast); north and south



Atlantic Ocean, English Channel and Mediterranean, west Indian Ocean, Indonesia, west Pacific Ocean, New Zealand, Japan, east Pacific Ocean, California to Vancouver Is.

Ecology: benthic, marine.

Reference: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [339].

***Diplosoma simile*** (Sluiter, 1909)

***Leptoclinum simile*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [77].

Type data: syntypes ZMA TU591.1, TU591.2.

Type locality: off Pulu Jedan, east coast Aru Is., Indonesia.

***Leptoclinum midori*** Tokioka, T. (1954). Contributions to Japanese ascidian fauna VII. Invertebrate fauna of the intertidal zone of the Tokara Islands. VII Ascidiaceans. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **3**(3): 239–264.

Type data: holotype SMBL 132\*.

Type locality: Tokara Is., Japan.

Taxonomic decision for synonymy: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [341].

Distribution: Japan, Singapore, Indonesia, QLD (Great Barrier Reef); west Pacific Ocean, Tokara Is.

Ecology: benthic, marine; obligate *Prochloron* [Prochlorophyta] symbionts.

***Diplosoma translucidum*** (Hartmeyer, 1910)

***Leptoclinum perspicuum*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [79] [junior homonym of *Leptoclinum perspicuum* Giard, 1872].

Type data: syntypes ZMA TU586.

Type locality: off Pulu Jedan, east coast Aru Is., Indonesia.

***Leptoclinum translucidum*** Hartmeyer, R. (1910). Ascidien (continuation of work by Seeliger). pp. 1489–1680 in Bronn, H.G. *Klassen und Ordnungen des Tier-Reichs*. Vol. 3, suppl. pts 88–94. Leipzig: C.F. Winter [1490] [*nom. nov.* for *Leptoclinum perspicuum* Sluiter, 1909].

Distribution: Indonesia, VIC (Bass Strait), WA (NW coast, SW coast).

Ecology: benthic, marine.

Reference: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [341].

***Diplosoma velatum*** Kott, 2001

***Diplosoma velatum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [345].

Type data: holotype SAMA E2612.

Type locality: Point Turton Jetty piles on *Posidonia* seagrass, 3–4 m, York Peninsula, SA.

Distribution: SA (Great Australian Bight, S Gulfs coast), TAS (Tas. coast), VIC (Bass Strait), WA (SW coast).

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2468].

***Diplosoma versicolor*** Monniot, 1994

***Diplosoma versicolor*** Monniot, F. (1994). Ascidies de Nouvelle-Calédonie XIV. Le genre *Diplosoma* (Didemnidae). *Bull. Mus. Natl. Hist. Nat. Paris* (4) **16A**(1): 3–11 [9].

Type data: holotype MNHP A2-Dip-82\*.

Type locality: near Redika Is., Woodin canal, W of Isle of Pines, 15–40 m, New Cale.

***Diplosoma ferrugineum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [337].

Type data: holotype QM G302262, paratype(s) QM G308027.

Type locality: Heron Is., rubble fauna, low tide, QLD.

Taxonomic decision for synonymy: Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [67].

Distribution: New Caledonia, Lord Howe Island, QLD (Great Barrier Reef), WA (Lower W coast, N coast, NW coast).

Ecology: benthic, marine.

***Diplosoma virens*** (Hartmeyer, 1909)

***Diplosoma viride*** Herdman, W.A. (1906). Report on the Tunicata. *Ceylon Pearl Oyster Fisheries Suppl. Rept.* **39**: 295–348 [341] [junior homonym of *Leptoclinum viride* Herdman, 1906 = *Didemnum viride* (Herdman, 1906)].

Type data: holotype BMNH 1907.8.30.42, paratype(s) ZMA TU489.

Type locality: coral reef, Galle, Sri Lanka.

***Leptoclinum calificiforme*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [82].

Type data: holotype ZMA TU573.

Type locality: west of North Ubian, Indonesia, see Tydeman, G.F. (1902). Liste des stations de la campagne scientifique du *Siboga* pp. 1–15 in, Weber, M. Introduction et description de l'expédition *Siboga Exped.* 1 mono., livre 3 + 2 maps. 176 pp. (station localities).

***Leptoclinum varium*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [80].

Type data: syntypes ZMA TU599.6, TU599.8, TU597.

Type locality: Siboga Stations 37, 86, 89, 172, 213, 231, 240, 279, 282, 296, Indonesia, see Tydeman, G.F. (1902). Liste des stations de la campagne scientifique du *Siboga* pp. 1–15 in, Weber, M. Introduction et description de l'expédition *Siboga Exped.* 1 mono., livre 3 + 2 maps. 176 pp. (station localities).

***Leptoclinum virens*** Hartmeyer, R. (1909). Ascidien (continuation of work by Seeliger). pp. 1281–1488 in Bronn, H.G. *Klassen und Ordnungen des Tier-Reichs*. Leipzig: C.F. Winter Vol. 3, suppl. pts 81–87 [1456] [*nom. nov.* for *Diplosoma viride* Herdman, 1906].

***Diplosoma pavonia*** Monniot, C. & Monniot, F. (1987). Les ascidies de Polynésie française. *Mém. Mus. Natl. Hist. Nat. Paris* **136**: 1–155 [60].

Type data: holotype MNHP A2 DIPA 45.

Type locality: Solomon Is., French Polynesia.

Taxonomic decision for synonymy: Kott, P. (1980). Algal-bearing didemnid ascidians in the Indo-west Pacific. *Mem. Queensl. Mus.* **20**(1): 1–47 [22]; Kott, P. (2001). The Australian Asciadiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [347].

Distribution: Sri Lanka, Indonesia, Marshall Islands, Fiji, NT (N coast), QLD (Great Barrier Reef); west Pacific Ocean.

Ecology: benthic, marine; obligate *Prochloron* [Prochlorophyta] symbionts.

Reference: Kott, P. (1982). Didemnid-algal symbioses: host species in the western Pacific with notes on the symbiosis. *Micronesica* **18**(1): 95–127.

#### ***Leptoclinides* Bjerkan, 1905**

***Leptoclinides*** Bjerkan, P. (1905). Ascidian von dem norwegischen Fishereidampfer 'Michael Sars' in den Jahren 1900–1904 gesammelt. *Bergens Mus. Aarbog* **5**: 1–29 [20]. Type species: *Leptoclinides faeroensis* Bjerkan, 1905 by monotypy.

***Askonides*** Kott, P. (1962). The ascidians of Australia III. Aplousobranchiata Lahille: Didemnidae Giard. *Aust. J. Mar. Freshwat. Res.* **13**(3): 265–334 [291].

Type species: *Askonides coelenteratus* Kott, 1962 by original designation.

Taxonomic decision for synonymy: Kott, P. (1972). The ascidians of South Australia I. Spencer Gulf, St Vincent Gulf and Encounter Bay. *Trans. R. Soc. S. Aust.* **96**(1): 1–52 [17].

Extralimital distribution: worldwide, excluding polar regions. See: Hartmeyer, R. (1924). Asciadiacea, part II. Zugleich eine Übersicht über die Arktische und boreale Ascidienfauna auf tiergeographischer Grundlage. *Ingolf-Exped.* **2**(7): 1–275; Harant, H. (1929). Ascidies provenant des croisières du Prince Albert 1er de Monaco. *Résultats de Campagnes Scientifique accomplies (Monaco)* **75**: 1–110; Van Name, W.G. (1945). The North and South American ascidians. *Bull. Am. Mus. Nat. Hist.* **84**: 1–476; Millar, R.H. (1962). Further descriptions of South African ascidians. *Ann. S. Afr. Mus.* **56**(7): 113–221; Millar, R.H. (1982). The marine fauna of New Zealand. *Mem. N.Z. Oceanogr. Inst.* **85**: 1–117; Monniot, F. (1989). Ascidies de Nouvelle-Calédonie VII. Les genres *Atriolum* et *Leptoclinides* dans le lagon sud. *Bull. Mus. Natl. Hist. Nat. Paris* (4) **11A**(4): 673–691; Nishikawa, T. (1990). The ascidians of the Japan Sea I. *Publ. Seto Mar. Biol. Lab.* **34**(4–6): 73–148.

Generic reference: Kott, P. (2005). New and little known species of Didemnidae (Asciadiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2414].

#### ***Leptoclinides aciculus* Kott, 2001**

***Leptoclinides aciculus*** Kott, P. (2001). The Australian Asciadiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [37].

Type data: holotype WAM 124.93 (20 m).

Type locality: 24 n miles NNW of Port Hedland, WA [19°57.2'S 118°25.1'E].

Distribution: Philippines, Papua New Guinea, Palau, NT (N coast), QLD (Great Barrier Reef, NE coast), WA (NW coast).

Ecology: benthic, marine.

References: Kott, P. (2002). Asciadiacea (Tunicata) from Darwin, Northern Territory, Australia. *Beagle, Rec. Mus. Art Galleries NT* **18**: 19–55 [29]; Kott, P. (2004). Asciadiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [48].

#### ***Leptoclinides albamaculatus* Kott, 2001**

***Leptoclinides albamaculatus*** Kott, P. (2001). The Australian Asciadiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [38].

Type data: syntypes QM G308274.

Type locality: Heron Is., QLD.

Distribution: QLD (Great Barrier Reef); known only from type locality.

Ecology: benthic, marine.

#### ***Leptoclinides brandi* Kott, 2001**

***Leptoclinides brandi*** Kott, P. (2001). The Australian Asciadiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [40].

Type data: holotype QM GH918, paratype(s) QM GH917.

Type locality: Blue Pools, Heron Is., QLD.

Distribution: NT (N coast), QLD (Great Barrier Reef).

Ecology: benthic, marine.

Reference: Kott, P. (2004). Asciadiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [49].

#### ***Leptoclinides caelestis* Kott, 2001**

***Leptoclinides caelestis*** Kott, P. (2001). The Australian Asciadiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [42].

Type data: holotype WAM 794.88.

Type locality: W side of Goss Passage, 30–35 m, Wallabi Group, Houtman's Abrolhos, WA.

Distribution: WA (Lower W coast); known only from type locality.

Ecology: benthic, marine.

#### ***Leptoclinides carduus* Kott, 2001**

***Leptoclinides carduus*** Kott, P. (2001). The Australian Asciadiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [43].

Type data: holotype QM G308154.

Type locality: Coral Gardens, Heron Is., QLD.

Distribution: QLD (Great Barrier Reef); known only from type locality.

Ecology: benthic, marine.

***Leptoclinides cavernosus* Kott, 2001**

*Leptoclinides cavernosus* Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [44].

Type data: holotype QM G300896, paratype(s) QM G302102.

Type locality: N of meteorological tower, rubble zone, Heron Is., QLD.

Distribution: Coral Sea Islands Territory, QLD (Great Barrier Reef), WA (Lower W coast, NW coast).

Ecology: benthic, marine.

Reference: Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2468].

***Leptoclinides coelenteratus* (Kott, 1962)**

*Askonides coelenteratus* Kott, P. (1962). The ascidians of Australia III. Aplousobranchiata Lahille: Didemnidae Giard. *Aust. J. Mar. Freshwat. Res.* **13**(3): 265–334 [292].

Type data: holotype AM Y1343, paratype(s) AM Y1344, Y1345, Y1346, Y1347.

Type locality: Rottnest Is., WA.

Distribution: WA (Lower W coast).

Ecology: benthic, marine.

Reference: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [46].

***Leptoclinides comitus* Kott, 2001**

*Leptoclinides comitus* Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [48].

Type data: holotype SAMA E2614, paratype(s) SAMA E2615.

Type locality: rock slope with *Hormosira*, off Eve Point, 1–10 m, Bathurst Channel, Port Davey, TAS.

Distribution: SA (S Gulfs coast), TAS (Tas. coast).

Ecology: benthic, marine.

Reference: Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2468].

***Leptoclinides compactus* Kott, 2001**

*Leptoclinides compactus* Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [49].

Type data: holotype QM G302052.

Type locality: Price Is., Avoid Bay, Great Australian Bight, SA.

Distribution: SA (Great Australian Bight).

Ecology: benthic, marine.

***Leptoclinides complexus* Kott, 2002**

*Leptoclinides complexus* Kott, P. (2002). Ascidiacea (Tunicata) from Darwin, Northern Territory, Australia. *Beagle, Rec. Mus. Art Galleries NT* **18**: 19–55 [30].

Type data: holotype NTM E13, paratype(s) NTM E12.

Type locality: Table Head, Port Essington, NT.

Distribution: NT (N coast); known only from type locality.

Ecology: benthic, marine.

***Leptoclinides confirmatus* Kott, 2001**

*Leptoclinides confirmatus* Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [50].

Type data: holotype SAMA E2619.

Type locality: Bathurst Channel off Jean Point, 21 m, Port Davey, TAS.

Distribution: TAS (Tas. coast); known only from type locality.

Ecology: benthic, marine.

***Leptoclinides constellatus* Kott, 2001**

*Leptoclinides constellatus* Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [51].

Type data: holotype QM G302924, paratype(s) QM GH5420.

Type locality: Solway Pass, 15 m, Haselwood Is., Whitsunday Group, QLD.

Distribution: NT (N coast), QLD (Great Barrier Reef).

Ecology: benthic, marine.

Reference: Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [49].

***Leptoclinides cucurbitus* Kott, 2004**

*Leptoclinides cucurbitus* Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [733].

Type data: holotype SAMA E2905.

Type locality: Paterson's Arch on rock wall, Waterfall Bay, Tasman Peninsula, TAS.

Distribution: TAS (Tas. coast); known only from type locality.

Ecology: benthic, marine.

***Leptoclinides cuspidatus* Sluiter, 1909**

*Leptoclinides cuspidatus* Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [57].

Type data: syntypes ZMA TU 440.1–2.

Type locality: between Nusa Besi and the NE point of Timor, 27–54 m; Sailus ketjil, Paternoster Is, 27 m; Indonesia [8°25.2'S 127°18.4'E].

*Leptoclinides oscitans* Monniot, F. & Monniot, C. (1996). New collections of ascidians from the western Pacific and Southeastern Asia. *Micronesica* **29**(2): 133–279 [177].

Type data: holotype MNHP A2 Lep 32.

Type locality: Ruang Is., north Sulawesi, 25 m, Indonesia [2°17.24'N 125°21.84'E].

Taxonomic decision for synonymy: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [52].

Distribution: Philippines, Indonesia, QLD (Great Barrier Reef), WA (NW coast); west Pacific Ocean.

Ecology: benthic, marine.

#### *Leptoclinides decoratus* Kott, 2004

*Leptoclinides decoratus* Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2469].

Type data: holotype SAMA E3213, paratype(s) SAMA E3214.

Type locality: The Arch between Snug Cave and Western River Cave, Kangaroo Is., SA.

Distribution: SA (S Gulfs coast); known only from type locality.

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2417].

#### *Leptoclinides dubius* (Sluiter, 1909)

*Polysyncraton dubium* Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [69].

Type data: lectotype ZMA TU1275, paralectotype(s) ZMA TU834.1, TU834.2.

Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [188].

Type locality: inner side Moearas reef, east coast of Borneo.

Distribution: Philippines, Indonesia, New Caledonia, 200 m bathymetric (Central W coast, Great Barrier Reef, Lower W coast, NE coast).

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2418].

#### *Leptoclinides durus* Kott, 2001

*Leptoclinides durus* Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [57].

Type data: holotype QM G302350, paratypes QM G300893, QM G302045.

Type locality: Heron Is., QLD.

Distribution: QLD (Great Barrier Reef), WA (N coast); Arafura Sea, Micronesia.

Ecology: benthic, marine.

#### *Leptoclinides echinus* Kott, 2001

*Leptoclinides echinus* Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [59].

Type data: holotype WAM 865.83(1) QM GH2121, paratype(s) QM G302871.

Type locality: 8.5 n miles NWN Port Hedland, 18 m, WA [20°13'S 118°28'E].

Distribution: NT (N coast), WA (NW coast).

Ecology: benthic, marine.

References: Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [50]; Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2471] (as *Leptoclinides levitatus*).

#### *Leptoclinides erinaceus* Kott, 2001

*Leptoclinides erinaceus* Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [61].

Type data: holotype WAM 128.93.

Type locality: 24 n miles NNW Port Hedland, 22–24 m, WA [19°57.2'S 118°25.1'E].

Distribution: QLD (Great Barrier Reef), WA (NW coast).

Ecology: benthic, marine.

#### *Leptoclinides exiguus* Kott, 2001

*Leptoclinides exiguus* Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [62].

Type data: holotype QM G300947, paratype(s) QM G10166.

Type locality: Turton jetty, 5 m, Spencer Gulf Point, SA.

Distribution: SA (S Gulfs coast), VIC (Bass Strait).

Ecology: benthic, marine.

Reference: Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2471].

#### *Leptoclinides frustus* Kott, 2005

*Leptoclinides frustus* Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2419].

Type data: holotype SAMA E3255.

Type locality: between Western River Cove and Snug Cove, west of the Arch, Fred's, on rock wall, 10–12 m, Kangaroo Is., SA.

Distribution: SA (S Gulfs coast); known only from type locality.

Ecology: benthic, marine.

***Leptoclinides fungiformis* Kott, 1972**

***Leptoclinides fungiformis*** Kott, P. (1972). The ascidians of South Australia II. Eastern Sector of the Great Australian Bight and Investigator Strait. *Trans. R. Soc. S. Aust.* **96**(4): 165–196 [180].

Type data: syntypes SAMA E911.

Type locality: Pearson Is., SA.

Distribution: SA (S Gulfs coast); known only from type locality.

Ecology: benthic, marine.

***Leptoclinides grandistellus* Kott, 2004**

***Leptoclinides grandistellus*** Kott, P. (2004). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [735].

Type data: holotype WAM Z10920.

Type locality: SW of Cliff head Dongara, 44 m, WA [29°4'S 114°42.5'E].

Distribution: WA (Lower W coast); known only from type locality.

Ecology: benthic, marine.

***Leptoclinides imperfectus* (Kott, 1962)**

***Askonides imperfectus*** Kott, P. (1962). The ascidians of Australia III. Aplousobranchiata Lahille: Didemnidae Giard. *Aust. J. Mar. Freshwat. Res.* **13**(3): 265–334 [294].

Type data: holotype AM Y1348.

Type locality: Reevesby Is., SA.

Distribution: SA (Great Australian Bight, S Gulfs coast), TAS (Tas. coast), VIC (Bass Strait), WA (SW coast).

Ecology: benthic, marine.

References: Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [65]; Kott, P. (2005). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2420].

***Leptoclinides kingi* Michaelsen, 1930**

***Leptoclinides dubius kingi*** Michaelsen, W. (1930). Ascidiae Krikobranchiae. *Fauna Südwest-Aust.* **5**(7): 463–558 [507] [proposed with subspecific rank in *Leptoclinides dubius* (Sluiter, 1909)].

Type data: syntypes (probable) ZMB 3887, 3888, 3889\*.

Type locality: Shark Bay, WA.

Distribution: QLD (Great Barrier Reef, NE coast), WA (Central W coast, NW coast).

Ecology: benthic, marine.

References: Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [67]; Kott, P. (2005). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2421].

***Leptoclinides levitatus* Kott, 2001**

***Leptoclinides levitatus*** Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [69].

Type data: holotype QM GH5380, paratype(s) QM GH5456.

Type locality: QLD, Little Black Reef, 15 m [19°46.25'S 149°22.0'E].

Distribution: QLD (Great Barrier Reef), WA (Lower W coast).

Ecology: benthic, marine.

***Leptoclinides lissus* Hastings, 1931**

***Leptoclinides lissus*** Hastings, A.B. (1931). Tunicata. *Sci. Repts. Gt Barrier Reef Exped.* **4**(3): 69–109 [93].

Type data: holotype AM G13449.

Type locality: Low Is., Great Barrier Reef, QLD.

Distribution: NT (N coast), QLD (Great Barrier Reef).

Ecology: benthic, marine.

References: Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [70]; Kott, P. (2005). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2422].

***Leptoclinides longicollis* Kott, 2001**

***Leptoclinides longicollis*** Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [70].

Type data: holotype QM G300898.

Type locality: Moreton Bay, QLD.

Distribution: QLD (Central E coast); known only from type locality.

Ecology: benthic, marine.

***Leptoclinides maculatus* Kott, 2001**

***Leptoclinides maculatus*** Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [72].

Type data: holotype SAMA E2609, paratypes QM G9303, QM G301572.

Type locality: Point Turton jetty piles, 3–4 m, Yorke Peninsula, SA.

Distribution: SA (S Gulfs coast), VIC (Bass Strait).

Ecology: benthic, marine.

Reference: Kott, P. (2004). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2472].

***Leptoclinides magnistellus* Kott, 2001**

***Leptoclinides magnistellus*** Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [73].

Type data: holotype AM Y1481.

Type locality: Oyster Bay, 10 m, TAS.

Distribution: TAS (Tas. coast); known only from type locality.

Ecology: benthic, marine.

***Leptoclinides minimus* Kott, 2005**

***Leptoclinides minimus*** Kott, P. (2005). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2422].

Type data: holotype WAM 30.84.

Type locality: Marmion Lagoon, WA.

Distribution: WA (Lower W coast); known only from type locality.

Ecology: benthic, marine.

***Leptoclinides multilobatus* Kott, 1954**

***Leptoclinides multilobata*** Kott, P. (1954). Tunicata, Ascidiaceae. *Rep. B.A.N.Z. Antarct. Res. Exped.* **1**(4): 121–182 [166].

Type data: holotype AM Y1492.

Type locality: off Maria Is., TAS.

Distribution: NSW (Lower E coast), SA (S Gulfs coast), TAS (Bass Strait, Tas. coast), VIC (Bass Strait).

Ecology: benthic, marine.

***Leptoclinides placidus* Kott, 2001**

***Leptoclinides placidus*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [75].

Type data: holotype QM GH372, paratype(s) QM G300902.

Type locality: Smith's Reef, 15 m, Moreton Bay, QLD.

Distribution: NSW (Central E coast), QLD (Central E coast, NE coast).

Ecology: benthic, marine.

***Leptoclinides prunus* Kott, 2004**

***Leptoclinides prunus*** Kott, P. (2004). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2473].

Type data: holotype SAMA E2915.

Type locality: Portsea Pier on piles, 4–5 m, VIC.

Distribution: VIC (Bass Strait); known only from type locality.

Ecology: benthic, marine.

***Leptoclinides pulvinus* Kott, 2005**

***Leptoclinides pulvinus*** Kott, P. (2005). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2424].

Type data: holotype QM G308742.

Type locality: Moira Reef, Bynoe Harbour, rocky reef on rock 5–8 m, NT.

Distribution: NT (N coast); known only from type locality.

Ecology: benthic, marine.

***Leptoclinides rigidus* Kott, 2001**

***Leptoclinides rigidus*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [77].

Type data: holotype QM GH5371, paratype(s) QM G300987.

Type locality: Deloraine Is., 10 m, Whitsunday Group, QLD.

Distribution: NT (N coast), QLD (NE coast), WA (Central W coast, NW coast).

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2425].

***Leptoclinides rufus* (Sluiter, 1909)**

***Polysyncrator rufum*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidiaceen. *Siboga Exped.* **56B**: 1–112 [77].

Type data: syntypes ZMA TU840.1, ZMA TU840.2.

Type locality: off Pulu Kwawassang, Paternoster Is., Indonesia.

***Leptoclinides oscitans*** Monniot, F. & Monniot, C. (1996). New collections of ascidians from the western Pacific and Southeastern Asia. *Micronesica* **29**(2): 133–279 [177].

Type data: holotype MNHP A2 Lep 32\*.

Type locality: Indonesia, North Sulawesi, Ruang Is., 25 m.

Taxonomic decision for synonymy: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [79].

Distribution: Indonesia, Palau, QLD (Central E coast, Great Barrier Reef, NE coast).

Ecology: benthic, marine.

***Leptoclinides seminudus* Kott, 2001**

***Leptoclinides seminudus*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [82].

Type data: holotype SAMA E2671 (growing on *Pinna* and *Cellepora* spp.).

Type locality: Gulf St Vincent, off Port Gawler, 18–20 m, SA.

Distribution: NSW (Central E coast), SA (S Gulfs coast), TAS (Bass Strait), VIC (Bass Strait).

Ecology: benthic, marine.

References: Kott, P. (2004). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [736]; Kott, P. (2005). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2426].

***Leptoclinides sulawesi* F. & C. Monniot, 1996**

***Leptoclinides sulawesi*** Monniot, F. & Monniot, C. (1996). New collections of ascidians from the western Pacific and Southeastern Asia. *Micronesica* **29**(2): 133–279 [180].

Type data: holotype MNHP A2 Lep 30\* (1°23.52'N 124°32.64'E).

Type locality: W of Manado, north Sulawesi, Indonesia, 38 m.

Distribution: Indonesia, Palau, NSW (Lower E coast), WA (Lower W coast, N coast).

Ecology: benthic, marine.

Reference: Kott, P. (2004). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2475].

***Leptoclinides tuberculatus* Kott, 2004**

***Leptoclinides tuberculatus*** Kott, P. (2004). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [737].

Type data: holotype QM G308540, paratypes QM G308536, QM G308539.

Type locality: Shelburne Bay, 22 m, QLD.

Distribution: QLD (NE coast); known only from type locality.

Ecology: benthic, marine.

***Leptoclinides umbrosus* Kott, 2001**

***Leptoclinides umbrosus*** Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [83].

Type data: holotype QM G308279, paratype(s) QM G308283.

Type locality: Heron Is., QLD.

Distribution: QLD (Great Barrier Reef); known only from type locality.

Ecology: benthic, marine.

***Leptoclinides variegatus* Kott, 2001**

***Leptoclinides variegatus*** Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [86].

Type data: holotype QM GH2426, paratype(s) QM GH2428.

Type locality: Topgallant Is., in caves, SA.

Distribution: SA (Great Australian Bight, S Gulfs coast).

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2427].

***Leptoclinides volvus* Kott, 1975**

***Leptoclinides volvus*** Kott, P. (1975). The ascidians of South Australia III. Northern sector of the Great Australian Bight and additional records. *Trans. R. Soc. S. Aust.* **99**(1): 1–20 [8].

Type data: holotype SAMA E1034, paratypes SAMA E1033, QM G7511.

Type locality: north Great Australian Bight, SA [32°24'S 133°30'E].

Distribution: SA (Great Australian Bight).

Ecology: benthic, marine; to 42 m.

Reference: Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [87].

***Lissoclinum* Verrill, 1871**

***Lissoclinum*** Verrill, A.E. (1871). Descriptions of some imperfectly known and new ascidians from New England. *Amer. J. Sci.* (3) **1**: 54–58, 93–100, 211–212, 288–294, 443–446 [444].

Type species: *Lissoclinum aureum* Verrill, 1871 by subsequent designation, see Van Name, W.G. (1910). Compound ascidians of the coasts of New England and neighbouring British Provinces. *Proc. Bost. Soc. Nat. Hist.* **34**: 339–424.

***Echinoclinum*** Van Name, W.G. (1902). The ascidians of the Bermuda Islands. *Trans. Conn. Acad. Arts Sci.* **11**: 325–412 [372].

Type species: *Echinoclinum verrilli* Van Name, 1902 by monotypy.

Taxonomic decision for synonymy: Kott, P. (1998). Tunicata. pp. 51–259 in Wells, A. & Houston, W.W.K. (eds) *Zoological Catalogue of Australia*. Hemichordata, Tunicata, Cephalochordata. Melbourne : CSIRO Publishing, Australia Vol. 34 298 pp. [87].

Extralimital distribution: east Pacific Ocean off south America to California, West Indies, north Atlantic Ocean to Arctic Ocean and northwest of Iceland, west Pacific Ocean. See: Hartmeyer, R. (1924). Asciacea, part II. Zugleich eine Übersicht über die Arktische und boreale Ascidienfauna auf tier-geographischer Grundlage. *Ingolf-Exped.* **2**(7): 1–275; Van Name, W.G. (1945). The North and South American ascidians. *Bull. Am. Mus. Nat. Hist.* **84**: 1–476; Kott, P. (1962). The ascidians of Australia III. Aplousobranchiata Lahille: Didemnidae Giard. *Aust. J. Mar. Freshwat. Res.* **13**(3): 265–334; Millar, R.H. (1962). Further descriptions of South African ascidians. *Ann. S. Afr. Mus.* **56**(7): 113–221; Millar, R.H. (1982). The marine fauna of New Zealand. *Mem. N.Z. Oceanogr. Inst.* **85**: 1–117; Nishikawa, T. (1990). The ascidians of the Japan Sea 1. *Publ. Seto Mar. Biol. Lab.* **34**(4–6): 73–148; Monniot, F. (1992). Ascidies de Nouvelle-Calédonie XII. Le genre *Lissoclinum* (Didemnidae) dans le lagon sud. *Bull. Mus. Natl. Hist. Nat. Paris* (4) **14A**(3–4): 565–589.

Generic reference: Kott, P. (2005). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2417].

***Lissoclinum agriculum* Kott, 2005**

***Lissoclinum agriculum*** Kott, P. (2005). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2459].

Type data: holotype WAM 179.93.

Type locality: east of Montebello Is., 7–8 m, WA.

Distribution: WA (NW coast); known only from type locality.

Ecology: benthic, marine.

***Lissoclinum badium*** F. & C Monniot., 1996

***Lissoclinum badium*** Monniot, F. & Monniot, C. (1996). New collections of ascidians from the western Pacific and Southeastern Asia. *Micronesica* **29**(2): 133–279 [170].  
Type data: holotype MNHP A2 Lis A 109\*.  
Type locality: Eastern Fields Atoll, 140 km SW of Port Moresby, Coral Sea, 10 m, Papua New Guinea [10°01.47'S 145°38.49'E].

Distribution: Papua New Guinea, Palau, Coral Sea Islands Territory, NT (N coast), QLD (Great Barrier Reef), WA (NW coast).

Ecology: benthic, marine.

Reference: Kott, P. (2002). Ascidiacea (Tunicata) from Darwin, Northern Territory, Australia. *Beagle, Rec. Mus. Art Galleries NT* **18**: 19–55 [40].

***Lissoclinum bistratum*** (Sluiter, 1905)

***Didemnum bistratum*** Sluiter, C.P. (1905). Tuniciers récoltés en 1904 par M. Ch. Gravier dans la golfe de Tadjourah (Somalie Française). *Bull. Mus. Natl. Hist. Nat. Paris* **11**: 100–103 [103].  
Type data: syntypes ZMH K1107, K1108, MNHP A2 LIS 24.  
Type locality: Gulf of Tadjourah, Gulf of Aden, Somalia.

***Didemnum gottschalldti*** Tokioka, T. (1950). Ascidians from the Palao Is. I. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **1**(3): 115–150 [118] [publication date established from Tokioka, T. (1967). Pacific Tunicata of the United States National Museum. *Bull. U.S. Natl Mus.* **251**: 1–242; junior homonym of *Didemnum gottschalldti* Hartmeyer, 1905].  
Type data: syntypes SMBL 75\*.  
Type locality: Palau Is., west Pacific Ocean.

***Lissoclinum pulvinum*** Tokioka, T. (1954). Contributions to Japanese ascidian fauna VII. Invertebrate fauna of the intertidal zone of the Tokara Islands. VII Ascidians. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **3**(3): 239–264 [247] [nom. nov. for *Didemnum gottschalldti* Tokioka, 1950].

Taxonomic decision for synonymy: Kott, P. (1980). Algal-bearing didemnid ascidians in the Indo-west Pacific. *Mem. Queensl. Mus.* **20**(1): 1–47 [16].

Distribution: Singapore, Philippines, Indonesia, Palau, New Caledonia, Fiji, Malagasy, NSW (Central E coast), NT (N coast), QLD (Central E coast, Great Barrier Reef), WA (Central W coast, NW coast); Red Sea, Gulf of Aden, Tokara Is., Caroline Is., Coral Sea.  
Ecology: benthic, marine; cryptic habitats, behind reef crest and in tidal pools; obligate *Prochloron* [Prochlorophyta] symbionts.

References: Parry, D.L. (1987). Selected Chemistry of the Ascidiacea. Unpubl. Ph.D. Thesis. Brisbane : University of Queensland. 221 pp.; Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [298]; Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [64]; Kott, P. (2005). New and

little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2460].

***Lissoclinum caliginosum*** Kott, 2001

***Lissoclinum caliginosum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [300].

Type data: holotype QM G308082, paratype(s) QM G308083.

Type locality: Heron Is., QLD.

Distribution: QLD (Great Barrier Reef).

Ecology: benthic, marine.

***Lissoclinum calycis*** Monniot, 1992

***Lissoclinum calycis*** Monniot, F. (1992). Ascidiées de Nouvelle-Calédonie XII. Le genre *Lissoclinum* (Didemnidae) dans le lagon sud. *Bull. Mus. Natl. Hist. Nat. Paris* (4) **14A**(3–4): 565–589 [568].

Type data: holotype MNHP A2 Lis 55\*.

Type locality: Lagoon, 20–35 m, Woodin Canal, New Caledonia.

Distribution: New Caledonia, NT (N coast), QLD (Great Barrier Reef).

Ecology: benthic, marine.

References: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [302]; Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2461].

***Lissoclinum clavatum*** Kott, 2005

***Lissoclinum clavatum*** Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2462].

Type data: holotype SAMA E3260, paratype(s) SAMA E3258.

Type locality: between Western River Cove and Snug Cove, W. of the Arch, on rock wall, 10–12 m, Kangaroo Is., SA.

Distribution: SA (S Gulfs coast); known only from type locality.

Ecology: benthic, marine.

***Lissoclinum coactum*** Kott, 2004

***Lissoclinum coactum*** Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2506].

Type data: syntypes WAM 1136.89.

Type locality: Five Mile Reef, 10km E of Hopetoun, 0–3 m, WA [33°56'S 120°12'E].

Distribution: WA (SW coast).

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2463].



***Lissoclinum concavum* Kott, 2001**

***Lissoclinum concavum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [303].

Type data: holotype SAMA E2691.

Type locality: South Australia, Franklin Is.

Distribution: SA (Great Australian Bight), TAS (Tas. coast).

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2464].

***Lissoclinum conchylum* Kott, 2001**

***Lissoclinum conchylum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [305].

Type data: holotype QM G308321.

Type locality: Heron Is., QLD.

Distribution: NT (N coast), QLD (Central E coast, Great Barrier Reef).

Ecology: benthic, marine.

***Lissoclinum diversum* Kott, 2004**

***Lissoclinum diversum*** Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2508].

Type data: holotype WAM 140-93.

Type locality: NE end of Kendrew Is., under boulders, Dampier Archipelago, WA.

Distribution: WA (Central W coast, NW coast); known only from type locality.

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2465].

***Lissoclinum durable* Kott, 2001**

***Lissoclinum durable*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [306].

Type data: holotype SAMA E2663, paratype(s) SAMA E2667.

Type locality: West Is., under boulder, 5 m, SA.

Distribution: NSW (Central E coast), NT (N coast), SA (S Gulfs coast), VIC (Bass Strait), WA (SW coast).

Ecology: benthic, marine.

Reference: Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2509].

***Lissoclinum laneum* Kott, 2004**

***Lissoclinum laneum*** Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2510].

Type data: holotype SAMA E2923.

Type locality: Port Victoria Jetty, Yorke Peninsula, 3–4 m, SA.

Distribution: SA (S Gulfs coast); known only from type locality.

Ecology: benthic, marine.

***Lissoclinum levitum* Kott, 2001**

***Lissoclinum levitum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [307].

Type data: holotype QM GH2420.

Type locality: Ward Is., in caves, Investigator Group, SA.

Distribution: SA (Great Australian Bight, S Gulfs coast), TAS (Tas. coast).

Ecology: benthic, marine.

References: Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [767]; Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2465].

***Lissoclinum limosum* Kott, 2001**

***Lissoclinum limosum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [308].

Type data: holotype QM G301746, paratypes QM G308357, QM G302325.

Type locality: Heron Is., north reef, low tide rubble fauna, QLD.

Distribution: NT (N coast), QLD (Great Barrier Reef).

Ecology: benthic, marine.

***Lissoclinum maculatum* Kott, 2001**

***Lissoclinum maculatum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [310].

Type data: holotype QM G302236.

Type locality: Lizard Is., north reef, low tide rubble fauna, QLD.

Distribution: QLD (Great Barrier Reef); known only from type locality.

Ecology: benthic, marine.

***Lissoclinum multifidum* Sluiter, 1909**

***Lissoclinum multifidum*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [83].

Type data: holotype ZMA TU 590\*.

Type locality: Moearas Reef, inner side, east coast of Borneo, 54 m, Indonesia.

***Polysoma testiculatum*** Kott, P. (1983). Two new genera of didemnid ascidians from tropical Australian waters. *The Beagle, Rec. N.T. Mus. Arts Sci.* **1**(2): 13–19 [16].

Type data: holotype NTM E 11, paratype(s) QM GH802.

Type locality: Coral Bay, Port Essington, 3 m, NT.

***Lissoclinum concavum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [303].

Type data: holotype SAMA E2691.

Type locality: Franklin Is., SA.

Taxonomic decision for synonymy: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [311]; Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [65].

Distribution: Thailand, Indonesia, Mauritius, NT (N coast), SA (S Gulfs coast), TAS (Tas. coast), VIC (Bass Strait).

Ecology: benthic, marine.

***Lissoclinum nebulosum*** F. & C. Monniot, 1996

***Lissoclinum nebulosum*** Monniot, F. & Monniot, C. (1996). New collections of ascidians from the western Pacific and Southeastern Asia. *Micronesica* **29**(2): 133–279 [173].

Type data: holotype MNHP A2 Lis A 118\*.

Type locality: Chuuk Lagoon, Polle Is., 10–30 m, Federated States of Micronesia [7°21.54'N 151°35.63'E].

Distribution: Federated States of Micronesia, QLD (Great Barrier Reef).

Ecology: benthic, marine.

Reference: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [311].

***Lissoclinum ostrearium*** (Michaelsen, 1930)

***Diplosomoides ostrearium*** Michaelsen, W. (1930). Ascidiaceae Krikobanchiae. *Fauna Südwest-Aust.* **5**(7): 463–558 [526].

Type data: holotype (probable) ZMB Pch 3878\*.

Type locality: Oyster Harbour, Albany, WA, 0.75–5 m.

Distribution: QLD (Great Barrier Reef), SA (Bass Strait, S Gulfs coast), WA (Lower W coast).

Ecology: benthic, marine.

Reference: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [314].

***Lissoclinum pacificense*** (Kott, 1981)

***Echinoclinum pacificense*** Kott, P. (1981). The ascidians of the reef flats of Fiji. *Proc. Linn. Soc. N.S.W.* **105**(3): 147–212 [193].

Type data: holotype QM 12584, paratype(s) QM 12463.

Type locality: Suva barrier reef, Viti Levu, Fiji.

Distribution: Fiji, QLD (Great Barrier Reef).

Ecology: benthic, marine.

Reference: Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [768].

***Lissoclinum patella*** (Gottschaldt, 1898)

***Didemnoides patella*** Gottschaldt, R. (1898). Synascidien von Ternate. *Abh. Senckenb. Naturforsch. Ges.* **24**: 641–666 [651].

Type data: holotype ZMH K1087.

Type locality: Ternate Is., Indonesia.

***Didemnoides sulcatum*** Gottschaldt, R. (1898). Synascidien von Ternate. *Abh. Senckenb. Naturforsch. Ges.* **24**: 641–666 [651].

Type data: holotype ZMH.

Type locality: Ternate, Indonesia.

***Didemnoides ternatanum*** Gottschaldt, R. (1898). Synascidien von Ternate. *Abh. Senckenb. Naturforsch. Ges.* **24**: 641–666 [648].

Type data: holotype ZMH K595.

Type locality: Ternate Is., Indonesia.

***Didemnum maeandrium*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [64].

Type data: lectotype ZMA TU457, paralectotype(s) ZMA TU459.

Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [173].

Type locality: Pulu Kaniungan Ketjil, Indonesia, see Tydeman, G.F. (1902). Liste des stations de la campagne scientifique du *Siboga* pp. 1–15 in, Weber, M. Introduction et description de l'expédition *Siboga Exped.* 1 mono., livre 3 + 2 maps. 176 pp.

***Diplosomoides tropicum*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [88].

Type data: lectotype ZMA TU500, paralectotype(s) ZMA TU473.1–13.

Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [175].

Type locality: Elat, W coast Great Kei Is., Indonesia, see Tydeman, G.F. (1902). Liste des stations de la campagne scientifique du *Siboga* pp. 1–15 in, Weber, M. Introduction et description de l'expédition *Siboga Exped.* 1 mono., livre 3 + 2 maps. 176 pp. (station localities).

Taxonomic decision for synonymy: Kott, P. (1980). Algal-bearing didemnid ascidians in the Indo-west Pacific. *Mem. Queensl. Mus.* **20**(1): 1–47 [18].

Distribution: Philippines, Indonesia, Borneo, Palau, Guam, QLD (Great Barrier Reef), WA (Lower W coast).

Ecology: benthic, marine; obligate *Prochloron* [Prochlorophyta] symbionts.

References: Parry, D.L. (1987). Selected Chemistry of the Ascidiacea. Unpubl. Ph.D. Thesis. Brisbane : University of Queensland. 221 pp.; Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [315].

***Lissoclinum punctatum* Kott, 1977**

***Lissoclinum punctatum*** Kott, P. (1977). Algal supporting didemnid ascidians of the Great Barrier Reef. pp. 615–621 in Taylor, D.L. (ed.) *Proceedings of the Second International Coral Reef Symposium Miami 1*. Biology. Miami : University of Miami [620].

Type data: holotype QM G9920, paratypes QM G9426, QM G9926.

Type locality: North-west Is., Capricorn Group, Great Barrier Reef, QLD, see Parry, D.L. & Kott, P. (1988). Cosymbiosis in the Ascidacea. *Bull. Mar. Sci* **42**(1): 149–153.

Distribution: Singapore, Palau, New Caledonia, Fiji, QLD (Great Barrier Reef).

Ecology: benthic, marine; cryptic, in interstices of algae mats and rubble, obligate *Prochloron* [Prochlorophyta] symbionts.

References: Parry, D.L. (1987). Selected Chemistry of the Ascidacea. Unpubl. Ph.D. Thesis. Brisbane : University of Queensland. 221 pp.; Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [318].

***Lissoclinum reginum* Kott, 2001**

***Lissoclinum reginum*** Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [319].

Type data: holotype QM G308077, paratype(s) QM G308088.

Type locality: Heron Is., eastern end, below low tide, on *Halimeda* sp., QLD.

Distribution: Cocos (Keeling) Islands (Aust. Terr.), NT (N coast), QLD (Great Barrier Reef), WA (N coast, NW coast).

Ecology: benthic, marine.

Reference: Kott, P. (2004). Ascidacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [65].

***Lissoclinum roseum* Kott, 2001**

***Lissoclinum roseum*** Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [322].

Type data: holotype QM G308053, paratype(s) QM G308312.

Type locality: Wistari Reef, low tide rubble fauna, QLD.

Distribution: QLD (Great Barrier Reef, NE coast), WA (NW coast).

Ecology: benthic, marine.

***Lissoclinum scopulosum* Kott, 2004**

***Lissoclinum scopulosum*** Kott, P. (2004). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [770].

Type data: holotype WAM 163.93.

Type locality: NW Long Is., Passage Is., WA.

Distribution: WA (NW coast); known only from type locality.

Ecology: benthic, marine.

***Lissoclinum sente* Kott, 2001**

***Lissoclinum sente*** Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [323].

Type data: holotype QM G9467.

Type locality: Heron Is., south reef opposite cay, 8–9 m, QLD.

Distribution: French Polynesia, Fiji, NSW (Lower E coast), QLD (Great Barrier Reef).

Ecology: benthic, marine.

***Lissoclinum spongium* Kott, 2001**

***Lissoclinum spongium*** Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [325].

Type data: holotype QM GH4372, paratype(s).

Type locality: Lord Howe Is., lagoon, 1 m.

Distribution: Lord Howe Island; known only from type locality.

Ecology: benthic, marine.

***Lissoclinum stellatum* Kott, 2004**

***Lissoclinum stellatum*** Kott, P. (2004). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2514].

Type data: holotype SAMA E2926.

Type locality: Waterfall Bay, Dog Leg Cave on rock wall, 10–12 m, Tasman Peninsula, TAS.

Distribution: TAS (Tas. coast); known only from type locality.

Ecology: benthic, marine.

***Lissoclinum taratara* C. & F. Monniot, 1987**

***Lissoclinum taratara*** Monniot, C. & Monniot, F. (1987). Les ascidies de Polynésie française. *Mém. Mus. Natl. Hist. Nat. Paris* **136**: 1–155 [52].

Type data: holotype MNHP A2 LIS 39\*.

Type locality: outer reef, Papetoai, Mooréa, French Polynesia.

Distribution: Indonesia, French Polynesia, NT (N coast), QLD (Great Barrier Reef).

Ecology: benthic, marine.

Reference: Kott, P. (2004). Ascidacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [66].

***Lissoclinum tasmanense* (Kott, 1954)**

***Cystodytes tasmanensis*** Kott, P. (1954). Tunicata, Ascidians. *Rep. B.A.N.Z. Antarct. Res. Exped.* **1**(4): 121–182 [155].

Type data: holotype whereabouts unknown (not in AM).

Type locality: off Maria Is., TAS, 155–174 m.

Distribution: SA (S Gulfs coast), TAS (Tas. coast).  
Ecology: benthic, marine; 5–174 m depth, undersides of boulders, protected conditions.

References: Kott, P. (1998). Tunicata. pp. 51–259 in Wells, A. & Houston, W.W.K. (eds) *Zoological Catalogue of Australia*. Hemichordata, Tunicata, Cephalochordata. Melbourne : CSIRO Publishing, Australia Vol. 34 298 pp. [88] ('*Echinoclinum verrili*' of Kott, P. (1972). The ascidians of South Australia I. Spencer Gulf, St Vincent Gulf and Encounter Bay. *Trans. R. Soc. S. Aust.* **96**(1): 1–52 [21] is here referred to *Lissoclinum tasmanense*); Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [326].

***Lissoclinum timorense*** (Sluiter, 1909)

*Didemnum timorensis* Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [51].

Type data: lectotype ZMA TU1274, paralectotype(s) ZMA TU482.

Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [174].

Type locality: southern coast of Timor, 8–36 m.

*Didemnum voeltzkowi* Michaelsen, W. (1920). Die Ascidiae Krikobranchiae des westlichen Indischen Ozeans. Didemniden. *Jahrb. Hamb. Wiss. Anst.* **37**: 1–76 [54].

Type data: holotype ZMH K1099, paratype(s) ZMH K1111. Type locality: Malagasy, west Indian Ocean.

Taxonomic decision for synonymy: Kott, P. (1998). Tunicata. pp. 51–259 in Wells, A. & Houston, W.W.K. (eds) *Zoological Catalogue of Australia*. Hemichordata, Tunicata, Cephalochordata. Melbourne : CSIRO Publishing, Australia Vol. 34 298 pp. [89].

Distribution: Philippines, Indonesia, Palau, New Caledonia, Guam, Fiji, Malagasy, QLD (Great Barrier Reef); also Caroline Is.

Ecology: benthic, marine; non cryptic reef flat habitats; obligate *Prochloron* [Prochlorophyta] symbionts.

References: Kott, P. (1980). Algal-bearing didemnid ascidians in the Indo-west Pacific. *Mem. Queensl. Mus.* **20**(1): 1–47 [13] (as *Lissoclinum voeltzkowi*); Kott, P. (1982). Didemnid-algal symbioses: host species in the western Pacific with notes on the symbiosis. *Micronesica* **18**(1): 95–127; Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [328].

***Lissoclinum triangulum*** (Sluiter, 1909)

*Diplosomoides triangulum* Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [86].

Type data: holotype ZMA TU499.

Type locality: Pulu Pasi Tanette, Indonesia.

*Echinoclinum philippinense* Tokioka, T. (1967). Pacific Tunicata of the United States National Museum. *Bull. U.S. Natl. Mus.* **251**: 1–242 [93].

Type data: holotype USNM 11790, paratype(s) USNM 11791.

Type locality: Punta Natangol, Basilan Is., Philippines.

Taxonomic decision for synonymy: Kott, P. (1980). Algal-bearing didemnid ascidians in the Indo-west Pacific. *Mem. Queensl. Mus.* **20**(1): 1–47 [21].

Distribution: Philippines, Indonesia, QLD (Great Barrier Reef).

Ecology: benthic, marine; obligate *Prochloron* [Prochlorophyta] symbionts.

Reference: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [330].

***Lissoclinum variabile*** Kott, 2001

*Lissoclinum variabile* Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [331].

Type data: holotype QM G308008.

Type locality: Heron Is., E end of reef, low tide, QLD.

Distribution: QLD (Great Barrier Reef); known only from type locality.

Ecology: benthic, marine.

***Polysyncraton*** Nott, 1892

*Polysyncraton* Nott, J.T. (1892). On the composite ascidians of the North Shore Reef. *Trans. N.Z. Inst.* **24**: 305–334 [318]. Type species: *Polysyncraton paradoxum* Nott, 1892 by original designation.

Extralimital distribution: worldwide, including polar regions. See: Hartmeyer, R. (1924). Ascidiacea, part II. Zugleich eine Übersicht über die Arktische und boreale Ascidienfauna auf tiergeographischer Grundlage. *Ingolf-Exped.* **2**(7): 1–275; Van Name, W.G. (1945). The North and South American ascidians. *Bull. Am. Mus. Nat. Hist.* **84**: 1–476; Millar, R.H. (1962). Further descriptions of South African ascidians. *Ann. S. Afr. Mus.* **56**(7): 113–221; Kott, P. (1969). Antarctic Ascidiacea. A monographic account of the known species based on specimens collected under U.S. Government auspices 1947 to 1963. *Antarct. Res. Ser.* **13**: i–xv 1–239; Millar, R.H. (1982). The marine fauna of New Zealand. *Mem. N.Z. Oceanogr. Inst.* **85**: 1–117; Nishikawa, T. (1990). The ascidians of the Japan Sea I. *Publ. Seto Mar. Biol. Lab.* **34**(4–6): 73–148; Monniot, F. (1993). Ascidiées de Nouvelle-Calédonie XIII. Le genre *Polysyncraton* (Didemnidae). *Bull. Mus. Natl. Hist. Nat. Paris* (4) **15A**(1–4): 3–17.

Generic reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2415].

***Polysyncraton alingulum* Kott, 2004**

***Polysyncraton alingulum*** Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [xxx].  
Type data: holotype NTM E311, paratype(s) NTM E310.  
Type locality: Mandorah jetty pylons, 5–8 m, Darwin Harbour, NT.

Distribution: NT (N coast); known only from type locality.

Ecology: benthic, marine.

***Polysyncraton arafurensis* Tokioka, 1952**

***Polysyncraton arafurensis*** Tokioka, T. (1952). Ascidiacea collected by Messrs Renzi Wada and Seizi Wada from the Pearl Oyster bed in the Arafura Sea in 1940. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **2**(2): 91–142 [91].  
Type data: holotype SMBL 110\*.  
Type locality: Arafura Sea.

Distribution: NT (N coast), WA (Lower W coast).

Ecology: benthic, marine.

Reference: Kott, P. (2002). Ascidiacea (Tunicata) from Darwin, Northern Territory, Australia. *Beagle, Rec. Mus. Art Galleries NT* **18**: 19–55 [30].

***Polysyncraton arvum* Kott, 2004**

***Polysyncraton arvum*** Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [51].  
Type data: holotype NTM E289.  
Type locality: Ashmore Reef, 3–5 m, Timor Sea.

Distribution: WA (N coast); known only from type locality.

Ecology: benthic, marine.

***Polysyncraton catillum* Kott, 2004**

***Polysyncraton catillum*** Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2476].  
Type data: holotype WAM 1046.88.  
Type locality: Ashmore Reef, 6–16 m, Timor Sea.

Distribution: WA (N coast); known only from type locality.

Ecology: benthic, marine.

***Polysyncraton circulum* Kott, 1962**

***Polysyncraton circulum*** Kott, P. (1962). The ascidians of Australia III. Aplousobranchiata Lahille: Didemnidae Giard. *Aust. J. Mar. Freshwat. Res.* **13**(3): 265–334 [298].  
Type data: holotype AM Y1489, paratypes AM U3947, AM U3948.  
Type locality: south of Peel Is., Moreton Bay, QLD.

Distribution: QLD (Central E coast, NE coast).

Ecology: benthic, marine.

Reference: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [94].

***Polysyncraton cuculliferum* (Sluiter, 1909)**

***Diplosomoides cuculliferum*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [90].  
Type data: holotype ZMA TU490\*.  
Type locality: off Pulu Jedan, east coast of Aru Is (pearl banks), 13 m, Indonesia.

***Polysyncraton echinatum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [101].

Type data: holotype QM G302987, paratype(s) QM G300911.

Type locality: Wistari Reef, near landing stage, low tide, Great Barrier Reef.

Taxonomic decision for synonymy: Kott, P. (2002). Ascidiacea (Tunicata) from Darwin, Northern Territory, Australia. *Beagle, Rec. Mus. Art Galleries NT* **18**: 19–55 [30].

Distribution: Indonesia, NT (N coast), QLD (Great Barrier Reef).

Ecology: benthic, marine.

References: Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2476]; Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2427].

***Polysyncraton dentatum* Kott, 2001**

***Polysyncraton dentatum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [96].

Type data: holotype SAMA E2677.

Type locality: E of Cape Naturaliste, western end of Bunker Bay, 4–5 m on rocks, WA.

Distribution: WA (Lower W coast); known only from type locality.

Ecology: benthic, marine.

***Polysyncraton discoides* Kott, 1962**

***Polysyncraton discoides*** Kott, P. (1962). The ascidians of Australia III. Aplousobranchiata Lahille: Didemnidae Giard. *Aust. J. Mar. Freshwat. Res.* **13**(3): 265–334 [303].

Type data: holotype AM Y1482.

Type locality: Fish Hook Bay, Rottnest Is., WA.

Distribution: SA (Great Australian Bight), TAS (Tas. coast), WA (Lower W coast).

Ecology: benthic, marine.

References: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [98]; Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2429].

***Polysyncraton dromide* Kott, 2001**

***Polysyncraton dromide*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [99].

Type data: holotype QM G301568.

Type locality: Robert Is., 16–30 m, from back of a dromid crab, Torres Strait, N Australia [9°59'S 143°07'E].

Distribution: NT (N coast), QLD (NE oceanic), WA (Lower W coast).

Ecology: benthic, marine.

Reference: Kott, P. (2002). Ascidiacea (Tunicata) from Darwin, Northern Territory, Australia. *Beagle, Rec. Mus. Art Galleries NT* **18**: 19–55 [32].

***Polysyncraton flammeum* Kott, 2001**

***Polysyncraton flammeum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [103].

Type data: holotype QM G308461.

Type locality: low tide under rubble, Kings Beach, Caloundra, QLD.

Distribution: QLD (Central E coast); known only from type locality.

Ecology: benthic, marine.

***Polysyncraton galaxum* Kott, 2004**

***Polysyncraton galaxum*** Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2478].

Type data: holotype SAMA E3200, paratype(s) SAMA E2927.

Type locality: Pissy Boy Rock, 14–17 m, W of Western River Cove, Kangaroo Is., SA.

Distribution: SA (S Gulfs coast), TAS (Tas. coast); known only from type locality.

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2429].

***Polysyncraton glaucum* Kott, 2001**

***Polysyncraton glaucum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [104].

Type data: holotype QM G305628, paratypes QM G305589, QM G308057.

Type locality: Swain Reefs, Frigate Cay, 20 m, Great Barrier Reef, QLD.

Distribution: NT (N coast), QLD (Great Barrier Reef).

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2431].

***Polysyncraton infundibulum* Kott, 2001**

***Polysyncraton infundibulum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [106].

Type data: holotype SAMA E2610.

Type locality: Bathurst Channel, off Jean Point, steep rock slope, 5–21 m, Port Davey, TAS.

Distribution: TAS (Tas. coast); known only from type locality.

Ecology: benthic, marine.

***Polysyncraton jugosum* (Herdman & Riddell, 1913)**

***Leptoclinum jugosum*** Herdman, W. & Riddell, W. (1913). The Tunicata of the 'Thetis' Expedition. In, Scientific results of the Trawl Expedition Thetis, Part 17. *Mem. Aust. Mus.* **4**: 873–889 [886].

Type data: syntypes AM G12205, AM G12209 (Rowe, F.W.E. & Marshall, J.I. (1979). A catalogue of the ascidian type-specimens in the Australian Museum, Sydney. *Rec. Aust. Mus.* **32**(17): 547–562 [533] list 10 syntypes for this species. However, only 4 specimens were examined by the authors of the species, and qualify as types. Kott, P. (1962). The ascidians of Australia III. Aplousobranchiata Lahille: Didemnidae Giard. *Aust. J. Mar. Freshwat. Res.* **13**(3): 265–334 [296] assigned one of these, AM G12208, to the genus *Didemnum*).

Type locality: Port Jackson, Botany Bay and off Cape Three points, NSW.

Distribution: NSW (Lower E coast).

Ecology: benthic, marine.

***Polysyncraton linere* Kott, 2004**

***Polysyncraton linere*** Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [738].

Type data: holotype NMV F70228.

Type locality: Western Port, 23 m, VIC.

Distribution: VIC (Bass Strait); known only from type locality.

Ecology: benthic, marine.

***Polysyncraton lodix* Kott, 2001**

***Polysyncraton lodix*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [108].

Type data: holotype QM GH5751.

Type locality: Deloraine Is., 18 m, Whitsunday Passage, QLD.

Distribution: QLD (Great Barrier Reef); known only from type locality.

Ecology: benthic, marine.

***Polysyncraton longitubis* Kott, 2004**

***Polysyncraton longitubis*** Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2480].

Type data: holotype SAMA E2929.

Type locality: between Western River Cove and Snug Cove, The Arch on rock wall, 10–14 m, Kangaroo Is., SA.

Distribution: SA (S Gulfs coast); known only from type locality.  
Ecology: benthic, marine.

***Polysyncraton luteum* Kott, 2004**

***Polysyncraton luteum*** Kott, P. (2004). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [739].  
Type data: holotype QM G308565.  
Type locality: Flinders Pier, 4–6 m, VIC.

Distribution: VIC (Bass Strait); known only from type locality.  
Ecology: benthic, marine.

***Polysyncraton magnetae* (Hastings, 1931)**

***Didemnum (Polysyncraton) magnetae*** Hastings, A.B. (1931). Tunicata. *Sci. Repts Gt Barrier Reef Exped.* **4**(3): 69–109 [100].  
Type data: holotype AM G13485.  
Type locality: Low Is., Great Barrier Reef, QLD.

Distribution: QLD (NE coast).  
Ecology: benthic, marine.

Reference: Kott, P. (2004). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [741].

***Polysyncraton meandratum* Monniot, 1993**

***Polysyncraton meandratum*** Monniot, F. (1993). Ascidiées de Nouvelle-Calédonie XIII. Le genre *Polysyncraton* (Didemnidae). *Bull. Mus. Natl. Hist. Nat. Paris* (4) **15A**(1–4): 3–17 [6].  
Type data: holotype MNHP A2 POL 42.  
Type locality: New Caledonia.

Distribution: New Caledonia, QLD (Great Barrier Reef, NE coast).  
Ecology: benthic, marine.  
Reference: Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [111].

***Polysyncraton millepore* Vasseur, 1969**

***Polysyncraton millepore*** Vasseur, P. (1969). Deuxième contribution à l'étude des ascidies de Madagascar région de Tuléar. *Bull. Mus. Natl. Hist. Nat. Paris* **40**(5): 912–933 [917].  
Type data: type status unknown (no type designated).  
Type locality: Great reef of Tuléar, Pente Est de la Grand Vasque à proximité de la passe, Malagasy.

***Polysyncraton thallomorpha*** Monniot, F. (1993). Ascidiées de Nouvelle-Calédonie XIII. Le genre *Polysyncraton* (Didemnidae). *Bull. Mus. Natl. Hist. Nat. Paris* (4) **15A**(1–4): 3–17 [14].  
Type data: holotype MNHP A2 POL 50\*.  
Type locality: New Caledonia.

Taxonomic decision for synonymy: Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [113].

Distribution: Philippines, New Caledonia, QLD (Great Barrier Reef), WA (Lower W coast, NW coast); west Indian Ocean.

Ecology: benthic, marine.

References: Kott, P. (2004). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [741]; Kott, P. (2005). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2433].

***Polysyncraton miniastrum* Kott, 2004**

***Polysyncraton miniastrum*** Kott, P. (2004). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [743].  
Type data: holotype QM G308537.  
Type locality: Shelburne Bay, 22 m, encrusting worm tube, QLD.

Distribution: QLD (NE coast); known only from type locality.  
Ecology: benthic, marine.

***Polysyncraton montanum* Kott, 2004**

***Polysyncraton montanum*** Kott, P. (2004). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2481].  
Type data: holotype SAMA E3244.  
Type locality: between Western River Cove and Snug Cove, Pissy Boy Rock, 8–10 m, Kangaroo Is., S.

Distribution: SA (S Gulfs coast); known only from type locality.  
Ecology: benthic, marine.

***Polysyncraton multiforme* Kott, 2001**

***Polysyncraton multiforme*** Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [114].  
Type data: holotype QM G304641, paratype(s) QM G304673.  
Type locality: Houtman's Abrolhos, WA.

Distribution: WA (Lower W coast); known only from type locality.  
Ecology: benthic, marine.

***Polysyncraton niveum* Kott, 2004**

***Polysyncraton niveum*** Kott, P. (2004). Ascidacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [xx].  
Type data: holotype NTM E233, paratype(s) NTM E258.  
Type locality: West Lagoon, 3–6 m, Ashmore Reef, Timor Sea.

Distribution: NT (N coast), WA (N coast).  
Ecology: benthic, marine.

***Polysyncraton oceanum* Kott, 2001**

***Polysyncraton oceanum*** Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [115].

Type data: holotype QM GH143.

Type locality: Great Astrolabe Reef, Dravuni, low tide rubble fauna, Fiji.

Distribution: Fiji, QLD (Great Barrier Reef); known only from type locality.

Ecology: benthic, marine.

***Polysyncrator orbiculum* Kott, 1962**

***Polysyncrator orbiculum*** Kott, P. (1962). The ascidians of Australia III. Aplousobranchiata Lahille: Didemnidae Giard. *Aust. J. Mar. Freshwat. Res.* **13**(3): 265–334 [300].

Type data: holotype AM Y1486, paratype(s) AM Y1479.

Type locality: Mary Cove, Rottnest Is., WA.

Distribution: SA (S Gulfs coast), VIC (Bass Strait), WA (Lower W coast, SW coast).

Ecology: benthic, marine.

References: Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [117]; Kott, P. (2005). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2432].

***Polysyncrator otuetue* C. & F. Monniot, 1987**

***Polysyncrator otuetue*** Monniot, C. & Monniot, F. (1987). Les ascidies de Polynésie française. *Mém. Mus. Natl. Hist. Nat. Paris* **136**: 1–155 [45].

Type data: holotype MNHP A2 POL 20.

Type locality: Tahiti, 3–10 m, between two parts of Manunutau Reef, French Polynesia.

Distribution: French Polynesia, QLD (Great Barrier Reef).

Ecology: benthic, marine.

Reference: Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [118].

***Polysyncrator palliolum* Kott, 2001**

***Polysyncrator palliolum*** Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [118].

Type data: holotype QM G300988.

Type locality: Rottnest Is., 0.5 n miles off Charlotte Point, 18 m, WA.

Distribution: WA (Lower W coast); known only from type locality.

Ecology: benthic, marine.

***Polysyncrator papyrus* Kott, 2001**

***Polysyncrator papyrus*** Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [120].

Type data: holotype AM Y1520.

Type locality: north-eastern coast of Tasmania, 128–676 m.

Distribution: SA (S Gulfs coast), TAS (Tas. coast).

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2433].

***Polysyncrator pavementum* Monniot, 1993**

***Polysyncrator pavementum*** Monniot, F. (1993). Ascidies de Nouvelle-Calédonie XIII. Le genre *Polysyncrator* (Didemnidae). *Bull. Mus. Natl. Hist. Nat. Paris* (4) **15A**(1–4): 3–17 [9].

Type data: holotype MNHP A2 POL 46.

Type locality: Barrier reef, Cape N'Doua, New Caledonia.

Distribution: New Caledonia, NT (N coast); Coral Sea.

Ecology: benthic, marine.

Reference: Kott, P. (2002). Ascidacea (Tunicata) from Darwin, Northern Territory, Australia. *Beagle, Rec. Mus. Art Galleries NT* **18**: 19–55 [32].

***Polysyncrator pedunculatum* Kott, 2001**

***Polysyncrator pedunculatum*** Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [121].

Type data: holotype NMV F68818, paratype(s) NMV F68944.

Type locality: Investigator Strait, SA.

Distribution: SA (Great Australian Bight, S Gulfs coast).

Ecology: benthic, marine.

References: Kott, P. (2004). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2482]; Kott, P. (2005). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2435].

***Polysyncrator peristroma* Kott, 2004**

***Polysyncrator peristroma*** Kott, P. (2004). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2482].

Type data: holotype QM G308608.

Type locality: Darwin, Angler Reef, 10–12 m, NT.

Distribution: NT (N coast); known only from type locality.

Ecology: benthic, marine.

***Polysyncrator polysystema* Kott, 2005**

***Polysyncrator polysystema*** Kott, P. (2005). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2435].

Type data: holotype NTM E170.

Type locality: Plater Rock, 8–10 m, Darwin Harbour, NT.

Distribution: NT (N coast); known only from type locality.

Ecology: benthic, marine.



***Polysyncraton pontoniae* C. & F. Monniot, 1987**

***Polysyncraton pontoniae*** Monniot, C. & Monniot, F. (1987). Les ascidies de Polynésie française. *Mém. Mus. Natl. Hist. Nat. Paris* **136**: 1–155 [47].

Type data: holotype MNHP A2 POL 26\*.

Type locality: Mooréa, French Polynesia.

Distribution: French Polynesia, QLD (Great Barrier Reef).

Ecology: benthic, marine.

Reference: Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [122].

***Polysyncraton pseudomagnetæ* Kott, 2004**

***Polysyncraton pseudomagnetæ*** Kott, P. (2004). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2483].

Type data: holotype QM G308612.

Type locality: Darwin, Angler Reef, 10–12 m, NT.

Distribution: NT (N coast); known only from type locality.

Ecology: benthic, marine.

***Polysyncraton pseudorugosum* Monniot, 1993**

***Polysyncraton pseudorugosum*** Monniot, F. (1993). Ascidies de Nouvelle-Calédonie XIII. Le genre *Polysyncraton* (Didemnidae). *Bull. Mus. Natl. Hist. Nat. Paris* (4) **15A**(1–4): 3–17 [10].

Type data: holotype MNHP A2 POL 41\*.

Type locality: Woodin canal, 32 m, New Caledonia.

Distribution: New Caledonia, NT (N coast), QLD (NE coast); Coral Sea.

Ecology: benthic, marine.

Reference: Kott, P. (2004). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2483].

***Polysyncraton pulchrum* Kott, 2001**

***Polysyncraton pulchrum*** Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [125].

Type data: holotype WAM 137.93, paratype(s) WAM 176.91.

Type locality: Cockburn Sound, WA.

Distribution: WA (Lower W coast).

Ecology: benthic, marine.

***Polysyncraton purou* C. & F. Monniot, 1987**

***Polysyncraton purou*** Monniot, C. & Monniot, F. (1987). Les ascidies de Polynésie française. *Mém. Mus. Natl. Hist. Nat. Paris* **136**: 1–155 [49].

Type data: holotype MNHP A2 POL 24\*.

Type locality: Tahiti, Tapuaerha passage, 10–20 m, French Polynesia.

Distribution: Philippines, French Polynesia, NT (N coast), QLD (Great Barrier Reef, NE coast).

Ecology: benthic, marine.

References: Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [126]; Kott, P. (2005). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2436].

***Polysyncraton regulum* Kott, 2001**

***Polysyncraton regulum*** Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [128].

Type data: holotype QM G308474.

Type locality: Hervey Bay rubble fauna, QLD.

Distribution: QLD (NE coast); known only from type locality.

Ecology: benthic, marine.

***Polysyncraton reticulum* Kott, 2004**

***Polysyncraton reticulum*** Kott, P. (2004). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2484].

Type data: holotype SAMA E2917.

Type locality: Kangaroo Is., between Snug Cove and Western River, 10–12 m, SA.

Distribution: SA (S Gulfs coast); known only from type locality.

Ecology: benthic, marine.

***Polysyncraton rica* Kott, 2001**

***Polysyncraton rica*** Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [130].

Type data: holotype QM GH5426, paratype(s) QM G308487.

Type locality: Kangaroo Is., D'Estrées Bay, 6 m, SA.

Distribution: SA (Great Australian Bight, S Gulfs coast).

Ecology: benthic, marine.

References: Kott, P. (2004). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2486]; Kott, P. (2004). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [745]; Kott, P. (2005). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2437].

***Polysyncraton robustum* Kott, 2001**

***Polysyncraton robustum*** Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [130].

Type data: holotype AM Y2315, paratype(s) AM Y2313–4.

Type locality: Point Peron west of Point John, sheltered pools, WA.

Distribution: WA (Lower W coast).

Ecology: benthic, marine.

***Polysyncraton rostrum* Kott, 2004**

***Polysyncraton rostrum*** Kott, P. (2004). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2486].  
Type data: holotype QM G308631, paratype(s) QM G308628.

Type locality: South Shell Is., 7–11 m, NT.

Distribution: NT (N coast).

Ecology: benthic, marine.

***Polysyncraton rubitapum* Kott, 2001**

***Polysyncraton rubitapum*** Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [131].

Type data: holotype QM GH1330.

Type locality: Top Gallant Is., 5 m, SA.

Distribution: SA (Great Australian Bight); known only from type locality.

Ecology: benthic, marine.

***Polysyncraton rugosum* Monniot, 1993**

***Polysyncraton rugosum*** Monniot, F. (1993). Ascidiées de Nouvelle-Calédonie XIII. Le genre *Polysyncraton* (Didemnidae). *Bull. Mus. Natl. Hist. Nat. Paris (4)* **15A**(1–4): 3–17 [12].

Type data: holotype MNHP A2 POL 48\*.

Type locality: New Caledonia.

Distribution: New Caledonia, QLD (Great Barrier Reef).

Ecology: benthic, marine.

Reference: Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [132].

***Polysyncraton scobinum* Kott, 2001**

***Polysyncraton scobinum*** Kott, P. (2001). The Australian Ascidacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [139].

Type data: holotype WAM 390.75.

Type locality: W of Long Is., Wallabi Group, Houtman's Abrolhos, WA.

Distribution: WA (Lower W coast); known only from type locality.

Ecology: benthic, marine.

***Polysyncraton textus* Kott, 2004**

***Polysyncraton textus*** Kott, P. (2004). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2487].

Type data: holotype WAM 556.88.

Type locality: 8.5 n miles NW of Port Hedland, 18 m, WA.

Distribution: WA (NW coast); known only from type locality.

Ecology: benthic, marine.

***Polysyncraton turris* Kott, 2004**

***Polysyncraton turris*** Kott, P. (2004). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [746].

Type data: holotype QM G308538.

Type locality: Shelburne Bay, 43 m, QLD.

Distribution: QLD (NE coast); known only from type locality.

Ecology: benthic, marine.

***Trididemnum* Della Valle, 1881**

***Trididemnum*** Della Valle, A. (1881). Nuove contribuzioni alla storia naturale delle ascidie composte del Golfo di Napoli. *Atti Accad. nag. Lincei Series 3, Memoir* **10**: 431–498 [478].

Type species: *Lissoclinum tenerum* Verrill, 1871 by subsequent designation, see Hartmeyer, R. (1924). Ascidacea, part II. Zugleich eine Übersicht über die Arktische und boreale Ascidienfauna auf tiergeographischer Grundlage. *Ingolf-Exped.* **2**(7): 1–275.

***Didemnopsis*** Hartmeyer, R. (1903). Die Ascidien der Arktis. *Fauna Arct.* **3**(2): 93–412 [33].

Type species: *Didemnum inarmata* Drasche, 1883 by original designation.

Taxonomic decision for synonymy: Huus, J. (1937). Ascidaceae. pp. 545–692 in Kükenthal, W. & Krumbach, T. (eds) *Handbuch der Zoologie*. Berlin: Walter de Gruyter Vol. 5(2)6 [670].

Extralimital distribution: worldwide. See: Hartmeyer, R. (1924). Ascidacea, part II. Zugleich eine Übersicht über die Arktische und boreale Ascidienfauna auf tiergeographischer Grundlage. *Ingolf-Exped.* **2**(7): 1–275; Harant, H. (1929). Ascidiées provenant des croisières du Prince Albert 1er de Monaco. *Résultats de Campagnes Scientifique accomplies (Monaco)* **75**: 1–110; Van Name, W.G. (1945). The North and South American ascidians. *Bull. Am. Mus. Nat. Hist.* **84**: 1–476; Kott, P. (1962). The ascidians of Australia III. Aplousobranchiata Lahille: Didemnidae Giard. *Aust. J. Mar. Freshwat. Res.* **13**(3): 265–334; Millar, R.H. (1962). Further descriptions of South African ascidians. *Ann. S. Afr. Mus.* **56**(7): 113–221; Kott, P. (1969). Antarctic Ascidacea. A monographic account of the known species based on specimens collected under U.S. Government auspices 1947 to 1963. *Antarct. Res. Ser.* **13**: i–xv 1–239; Millar, R.H. (1982). The marine fauna of New Zealand. *Mem. N.Z. Oceanogr. Inst.* **85**: 1–117; Nishikawa, T. (1990). The ascidians of the Japan Sea I. *Publ. Seto Mar. Biol. Lab.* **34**(4–6): 73–148; Monniot, F. (1991). Ascidiées de Nouvelle-Calédonie IX. Le genre *Trididemnum*. *Bull. Mus. Natl. Hist. Nat. Paris (4)* **12A**(3–4): 517–529.

Generic reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2417].

***Trididemnum amiculum* Kott, 2001**

***Trididemnum amiculum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [256].

Type data: holotype NMV F70259.

Type locality: 39 km NNE Devonport, 68 m, TAS [40°49.8'S 146°31.3'E].

Distribution: NSW (Lower E coast), TAS (Tas. coast).

Ecology: benthic, marine.

References: Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [760]; Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2453].

***Trididemnum areolatum* (Herdman, 1906)**

***Trididemnum areolatum*** Herdman, W.A. (1906). Report on the Tunicata. *Ceylon Pearl Oyster Fisheries Suppl. Rept.* **39**: 295–348 [337].

Type data: holotype (probable) BMNH [19]07.8.30.36 (part) slide only.

Type locality: Chiulaw Paa, Gulf of Manaar, 4–5 m.

***Trididemnum banneri*** Eldredge, L.G. (1967). A taxonomic review of the Indo-Pacific didemnid ascidians and descriptions of twenty three central Pacific species. *Micronesica* **2**: 162–261 [177].

Type data: syntypes BPBM Y204\*.

Type locality: Penguin Spit, Palmyra Is., Line Islands, 0–4 m [5°52'N 162°06'W].

Taxonomic decision for synonymy: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [258].

Distribution: Sri Lanka, French Polynesia, NT (N coast), QLD (Great Barrier Reef, NE coast); Central Pacific, west Pacific Ocean.

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2455].

***Trididemnum caelatum* Kott, 2001**

***Trididemnum caelatum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [260].

Type data: holotype SAMA E2670.

Type locality: Great Australian Bight, SW Eucla, SA.

Distribution: SA (Great Australian Bight); known only from type locality.

Ecology: benthic, marine.

***Trididemnum clinides* Kott, 1977**

***Trididemnum clinides*** Kott, P. (1977). Algal supporting didemnid ascidians of the Great Barrier Reef. pp. 615–621 in Taylor, D.L. (ed.) *Proceedings of the Second International Coral Reef Symposium Miami* 1. Biology. Miami : University

of Miami [617].

Type data: holotype QM G9928, paratype(s) QM G9931.

Type locality: lagoon, Heron Is., QLD.

Distribution: Philippines, Guam, French Polynesia, Fiji, QLD (Great Barrier Reef); west Pacific Ocean, Eniwetak.

Ecology: benthic, marine; obligate *Prochloron* [Prochlorophyta] symbionts.

References: Parry, D.L. & Kott, P. (1988). Cosymbiosis in the Ascidiacea. *Bull. Mar. Sci.* **42**(1): 149–153; Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [261].

***Trididemnum cristatum* Kott, 2001**

***Trididemnum cristatum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [262].

Type data: holotype AM Y2321.

Type locality: NE coast Tasmania, 128–676 m.

Distribution: TAS (Tas. coast), VIC (Bass Strait).

Ecology: benthic, marine.

***Trididemnum cyclops* Michaelsen, 1921**

***Trididemnum cyclops*** Michaelsen, W. (1921). Ascidien von westlichen Indischen ozeans; aus dem Reichsmuseum zu Stockholm. *Ark. Zool.* **13**(23): 1–25 [19].

Type data: syntypes ZMH K1110.

Type locality: Malagasy.

***Trididemnum symbioticum*** Pérès, J.M. (1962). Sur une collection d'ascidies de la côte Israélienne de la Mer Rouge et de la Péninsule du Sinai. Contributions to knowledge of the Red Sea. 24. *Bull. Res. Stat. Haifa* **30**: 39–47 [40].

Type data: syntypes MNHP A2 TRI 74\*.

Type locality: Red Sea.

Taxonomic decision for synonymy: Kott, P. (1982). Didemnid-algal symbioses: host species in the western Pacific with notes on the symbiosis. *Micronesica* **18**(1): 95–127 [111].

Distribution: Philippines, Palau, New Caledonia, Kiribati, French Polynesia, Fiji, Malagasy, NT (N coast), QLD (Great Barrier Reef); also Caroline Is, Eniwetak, Red Sea.

Ecology: benthic, marine; obligate *Prochloron* [Prochlorophyta] symbionts.

References: Thinh, L.V. (1979). *Prochloron* (Prochlorophyta) associated with the ascidian *Trididemnum cyclops* Michaelsen. *Phycologia* **18**(1): 77–82; Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [263].

***Trididemnum discrepans* (Sluiter, 1909)**

***Leptoclinum discrepans*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [77].

Type data: syntypes ZMA TU579.1–TU579.2.

Type locality: Gisser, Nusa-laut Is., Indonesia.

***Didemnopsis jolense*** Van Name, W.G. (1918). Ascidians from the Philippines and adjacent waters. *Bull. U.S. Natl Mus.* **100**(1): 49–174 [147].

Type data: holotype USNM 6040.

Type locality: Jolo, Philippines, 20 m.

Taxonomic decision for synonymy: Kott, P. (1998). Tunicata. pp. 51–259 in Wells, A. & Houston, W.W.K. (eds) *Zoological Catalogue of Australia*. Hemichordata, Tunicata, Cephalochordata. Melbourne : CSIRO Publishing, Australia Vol. 34 298 pp. [91].

Distribution: Thailand, Philippines, Indonesia, Cocos (Keeling) Islands (Aust. Terr.), Tonga, Palau, New Caledonia, Kiribati, Fiji, NT (N coast), QLD (Great Barrier Reef, NE coast), SA (S Gulfs coast), WA (N coast).

Ecology: benthic, marine.

Reference: Kott, P. (2004). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [761].

***Trididemnum dispersum*** (Sluiter, 1909)

***Didemnum dispersum*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [54].

Type data: syntypes ZMA TU443.1, ZMA TU 443.2.

Type locality: Salibabu Is., Samau Is., Indonesia.

***Trididemnum tegulum*** Kott, P. (1984). Related species of *Trididemnum* in symbiosis with Cyanophyta. *Proc. Linn. Soc. N.S.W.* **107**(4): 515–520 [515].

Type data: holotype QM GH1492, paratypes QM GH892, QM GH1337, QM GH1350, QM GH1493–5.

Type locality: under boulders on weed and rubble, Heron Is., Great Barrier Reef, QLD.

Taxonomic decision for synonymy: Kott, P. (1998). Tunicata. pp. 51–259 in Wells, A. & Houston, W.W.K. (eds) *Zoological Catalogue of Australia*. Hemichordata, Tunicata, Cephalochordata. Melbourne : CSIRO Publishing, Australia Vol. 34 298 pp. [91].

Distribution: Indonesia, NT (N coast), QLD (Great Barrier Reef), WA (Central W coast).

Ecology: benthic, marine; obligate cyanophyte symbionts.

References: Larkum, A.W.D., Cox, G.C., Hiller, R.G., Parry, D.L. & Dibbayawan, T.P. (1987). Filamentous cyanophytes containing PUB and in symbiosis with sponges and ascidians of coral reefs. *Mar. Biol.* **95**: 1–13; Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [267]; Kott, P. (2004). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [761]; Kott, P. (2005). New and little known species of Didemnidae (Asciacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2455].

***Trididemnum farrago*** Kott, 2004

***Trididemnum farrago*** Kott, P. (2004). Asciacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [xx].

Type data: holotype NTM E253.

Type locality: Ashmore Reef, inner West Lagoon, 3–6 m, Timor Sea.

Distribution: WA (NW coast); known only from type locality.

Ecology: benthic, marine.

***Trididemnum lapidosum*** Kott, 2001

***Trididemnum lapidosum*** Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [270].

Type data: holotype QM G308687, paratype(s) QM G304634.

Type locality: NW of Surrurier Is., Long Is., 18 m, WA [21°33.5'S 114°40.0'E].

Distribution: WA (Lower W coast, NW coast).

Ecology: benthic, marine.

***Trididemnum marmoratum*** (Sluiter, 1909)

***Leptoclinum marmoratum*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [84].

Type data: lectotype ZMA TU 1277, paralectotype(s) ZMA TU584.

Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [180].

Type locality: not determined.

Distribution: Indonesia, NT (Gulf of Carpentaria, N coast).

Ecology: benthic, marine.

Reference: Kott, P. (2004). Asciacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [61].

***Trididemnum miniatum*** Kott, 1977

***Trididemnum miniatum*** Kott, P. (1977). Algal supporting didemnid ascidians of the Great Barrier Reef. pp. 615–621 in Taylor, D.L. (ed.) *Proceedings of the Second International Coral Reef Symposium Miami* 1. Biology. Miami : University of Miami [617].

Type data: syntypes QM G9927, G9945.

Type locality: lagoon, Heron Is., Great Barrier Reef, QLD.

Distribution: Indonesia, New Caledonia, French Polynesia, Fiji, QLD (Great Barrier Reef).

Ecology: benthic, marine; obligate *Prochloron* [Prochlorophyta] symbionts.

References: Parry, D.L. & Kott, P. (1988). Cosymbiosis in the Asciacea. *Bull. Mar. Sci.* **42**(1): 149–153; Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [271].

***Trididemnum nobile*** Kott, 2001

***Trididemnum nobile*** Kott, P. (2001). The Australian Asciacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [272].

Type data: holotype SAMA E2630, paratypes SAMA E2633, QM GH2371.

Type locality: W of Ceduna, Tourville Bay, Davenport Creek, 6–8 m, South Australia.

***Trididemnum vermiforme*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [289].

Type data: holotype QM G300960, paratype(s) QM G11925. Type locality: Beachport Jetty, on jetty piles, South Australia.

Taxonomic decision for synonymy: Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [763].

Distribution: QLD (Central E coast), SA (Great Australian Bight, S Gulfs coast), TAS (Tas. coast), VIC (Bass Strait), WA (Lower W coast, NW coast).

Ecology: benthic, marine.

Reference: Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2456].

***Trididemnum nubilum*** Kott, 1980

***Trididemnum nubilum*** Kott, P. (1980). Algal-bearing didemnid ascidians in the Indo-west Pacific. *Mem. Queensl. Mus.* **20**(1): 1–47 [9].

Type data: syntypes USNM 11641.

Type locality: Amoyloi Reefs, southern part of Basilan Is., 0.5–1 m, Philippines.

Distribution: Philippines, Fiji, QLD (Great Barrier Reef).

Ecology: benthic, marine; obligate *Prochloron* [Prochlorophyta] symbionts.

References: Kott, P. (1982). Didemnid-algal symbioses: host species in the western Pacific with notes on the symbiosis. *Micronesica* **18**(1): 95–127; Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [274].

***Trididemnum paraclinides*** Kott, 1982

***Trididemnum paraclinides*** Kott, P. (1982). Didemnid-algal symbioses: host species in the western Pacific with notes on the symbiosis. *Micronesica* **18**(1): 95–127 [107].

Type data: holotype QM GH575, paratype(s) QM GH144, GH91.

Type locality: Nemelis, 1m, Palau Is.

Distribution: Cocos (Keeling) Islands (Aust. Terr.), Palau, Fiji.

Ecology: benthic, marine; obligate *Prochloron* [Prochlorophyta] symbionts.

Reference: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [276].

***Trididemnum paracyclops*** Kott, 1980

***Trididemnum paracyclops*** Kott, P. (1980). Algal-bearing didemnid ascidians in the Indo-west Pacific. *Mem. Queensl. Mus.* **20**(1): 1–47 [12].

Type data: holotype QM 12627, paratype(s) QM 12628.

Type locality: in pools behind reef crest, Heron Is., Great Barrier Reef, QLD.

Distribution: Philippines, New Caledonia, Guam, French Polynesia, Fiji, QLD (Great Barrier Reef), WA (Lower W coast).

Ecology: benthic, marine; obligate *Prochloron* [Prochlorophyta] symbionts.

References: Kott, P. (1982). Didemnid-algal symbioses: host species in the western Pacific with notes on the symbiosis. *Micronesica* **18**(1): 95–127; Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2503].

***Trididemnum pigmentatum*** Kott, 2001

***Trididemnum pigmentatum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [278].

Type data: holotype QM G308134, paratype(s) QM GH325.

Type locality: Heron Is., low tide rubble fauna, QLD.

Distribution: Indonesia, Fiji, NT (N coast), QLD (Great Barrier Reef, NE coast), WA (N coast, NW coast).

Ecology: benthic, marine.

References: Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2503]; Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2457].

***Trididemnum planum*** Sluiter, 1909

***Trididemnum planum*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [42].

Type data: lectotype ZMA TU 1273, paralectotype(s) ZMA TU 1098.

Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [197].

Type locality: Karang Lintang and Pulu Palabangan islands, on *Lithothamnion*, shore collecting, Indonesia.

Distribution: Indonesia, NT (N coast).

Ecology: benthic, marine.

Reference: Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [62].

***Trididemnum pseudodiplosoma*** (Kott, 1962)

***Didemnum pseudodiplosoma*** Kott, P. (1962). The ascidians of Australia III. Aplousobranchiata Lahille: Didemnidae. *Giard. Aust. J. Mar. Freshwat. Res.* **13**(3): 265–334 [321].

Type data: holotype AM Y1527, paratype(s) AM Y1526.

Type locality: Port Noarlunga, Gulf St Vincent, SA.

***Trididemnum crystallinum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [263].

Type data: holotype QM G302608.

Type locality: Gulf of Carpentaria, Northern Territory, 21 m.

***Trididemnum inermum*** F. & Monniot, F. & Monniot, C. (2001). Ascidiaceans from the tropical western Pacific. *Zoosystema* **23**(2): 201–383 [263].

Type data: holotype MNHP A2 TRI 150\*.

Type locality: Eastern Fields, Coral Sea, 31 m, Papua New Guinea [10°09.35'S 145°33.92'E].

Taxonomic decision for synonymy: Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [xx] (*T. crystallinum*); Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 2). *J. Nat. Hist.* **38**(19): 2455–2526 [2504] (*T. inermum*).

Distribution: NT (N coast), SA (S Gulfs coast); Coral Sea.

Ecology: benthic, marine.

Reference: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [279].

***Trididemnum pusillum*** Kott, 2004

***Trididemnum pusillum*** Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [764].

Type data: holotype NTM E32.

Type locality: W of Port Hedland, 40 m, WA.

Distribution: WA (NW coast); known only from type locality.

Ecology: benthic, marine.

***Trididemnum reticulatum*** Kott, 2004

***Trididemnum reticulatum*** Kott, P. (2004). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (part 1). *J. Nat. Hist.* **38**(6): 731–774 [765].

Type data: holotype QM G308535.

Type locality: Slashers Reef, central Great Barrier Reef, 4 m, QLD.

Distribution: QLD (Great Barrier Reef); known only from type locality.

Ecology: benthic, marine.

***Trididemnum savignii*** (Herdman, 1886)

***Didemnum savignii*** Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiaceae compositae. *Zool. Chall. Exped.* **14**(38): 1–425 [261].

Type data: syntypes BMNH 1887.2.4.398\*, BMNH 1887.2.4.399\*.

Type locality: ?Bermuda, see Van Name, W.G. (1945). The North and South American ascidians. *Bull. Am. Mus. Nat. Hist.* **84**: 1–476 [100].

***Didemnum tenebricosum*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [48].

Type data: neotype ZMA TU481.

Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [174].

Type locality: Roti Is., Indonesia.

Taxonomic decision for synonymy: Kott, P. (1998). Tunicata. pp. 51–259 in Wells, A. & Houston, W.W.K. (eds) *Zoological Catalogue of Australia*. Hemichordata, Tunicata, Cephalochordata. Melbourne : CSIRO Publishing, Australia Vol. 34 298 pp. [92].

Distribution: Indonesia, Bermuda, Florida, NT (N coast), QLD (NE coast), WA (NW coast); ?West Indies.

Ecology: benthic, marine.

References: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [281]; Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2458].

***Trididemnum sibogae*** (Hartmeyer, 1910)

***Didemnum ramosum*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [63] [junior homonym of *Didemnum ramosum* Gottschaldt, 1898].

Type data: lectotype ZMA TU476.3, paralectotypes ZMA TU1271, ZMA 476.1-2.

Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [173].

Type locality: Jedan Is., Aru Is., 13 m, Indonesia.

***Didemnum sibogae*** Hartmeyer, R. (1910). Ascidien (continuation of work by Seeliger). pp. 1489–1680 in Bronn, H.G. *Klassen und Ordnungen des Tier-Reichs*. Vol. 3, suppl., pts 88–94. Leipzig : C.F. Winter [1489] [*nom. nov.* for *Didemnum ramosum* Sluiter, 1909].

Distribution: Indonesia, New Caledonia, NSW (Central E coast, Lower E coast), NT (Gulf of Carpentaria, N coast), QLD (Gulf of Carpentaria, NE coast), SA (Great Australian Bight, S Gulfs coast), TAS (Tas. coast), VIC (Bass Strait), WA (NW coast); Gulf of Manaa.

Ecology: benthic, marine; facultative *Prochloron* [Prochlorophyta] symbionts.

References: Parry, D.L. & Kott, P. (1988). Cosymbiosis in the Ascidiacea. *Bull. Mar. Sci.* **42**(1): 149–153 (as *Tridemnum cerebriforme*); Monniot, F. (1995). Ascidiées de Nouvelle-Calédonie XV. Le genre *Didemnum*. *Bull. Mus. Natl. Hist. Nat. Paris* (4) **16A**(2–4): 299–344 [328]; Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [283]; Kott, P. (2005). New and little known species of Didemnidae (Ascidiacea, Tunicata) from Australia (Part 3). *J. Nat. Hist.* **39**(26): 2409–2479 [2458].

DIDEMNIDAE

***Trididemnum spumosum* Kott, 2001**

***Trididemnum spumosum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [286].

Type data: holotype SAMA E2616.

Type locality: on *Posidonia*, 3–4 m, Edithburgh, Yorke Peninsula, SA.

Distribution: SA (S Gulfs coast); known only from type locality.

Ecology: benthic, marine.

***Trididemnum tectum* Kott, 2001**

***Trididemnum tectum*** Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [288].

Type data: holotype SAMA E2834.

Type locality: intertidal rock pools, Franklin Is., Nuyts Archipelago, SA.

Distribution: SA (Great Australian Bight); known only from type locality.

Ecology: benthic, marine.

***Trididemnum tomarahi* C. & F. Monniot, 1987**

***Trididemnum tomarahi*** Monniot, C. & Monniot, F. (1987). Les ascidies de Polynésie française. *Mém. Mus. Natl. Hist. Nat. Paris* **136**: 1–155 [22].

Type data: holotype MNHP A2-TRI-54\*.

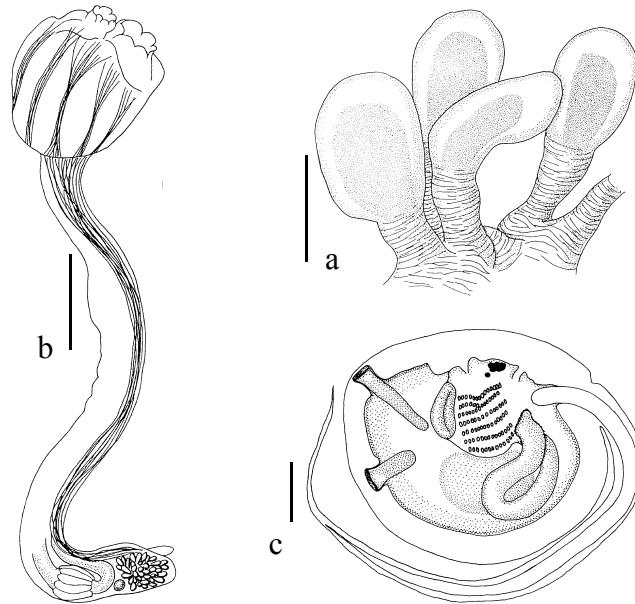
Type locality: Tikehau, southern part of back reef, 2 m, French Polynesia.

Distribution: Philippines, Palau, Hawaii, French Polynesia, QLD (Great Barrier Reef).

Ecology: benthic, marine.

Reference: Kott, P. (2001). The Australian Ascidiacea Pt 4, Didemnidae. *Mem. Queensl. Mus.* **47**(1): 1–410 [288].

## EUEHERDMANIIDAE



**Fig. 5.** *Euherdmania digitata* Millar, 1963: **a**, part of a colony; **b**, single zooid; **c**, larva. (Scale bars: **a** = 5.0 mm; **b** = 2.0 mm; **c** = 0.2 mm). [from Kott 1992]

In the family Euherdmaniidae Ritter, 1904 (as in the Placentelidae, Protopolychinidae, Ritterellidae and Pseudodistomidae), atrial and branchial apertures open separately to the exterior by 6-lobed apertures, zooids are either separate (usually joined by basal stolons) or embedded in common test, and gonads are in a posterior abdomen. The Euherdmaniidae are distinguished by certain characters that suggest a close relationship with Pycnoclavellidae, namely, the stomach at the posterior end of a long narrow gut loop; embryos fertilised at the base of the oviduct and incubated as they move up the oviduct to the atrial cavity; and larval adhesive organs in the form of inverted tubes that evert for attachment to the substrate. The lobed apertures, (usually) a posterior abdomen containing the gonads, and replication by strobilation of the abdomen (rather than by generation of clones in the vascular stolon) distinguish the family from Pycnoclavellidae. Longitudinal muscle bands from the thorax converge to a band along each side of the abdomen and the posterior abdomen as in most aplousobranch families.

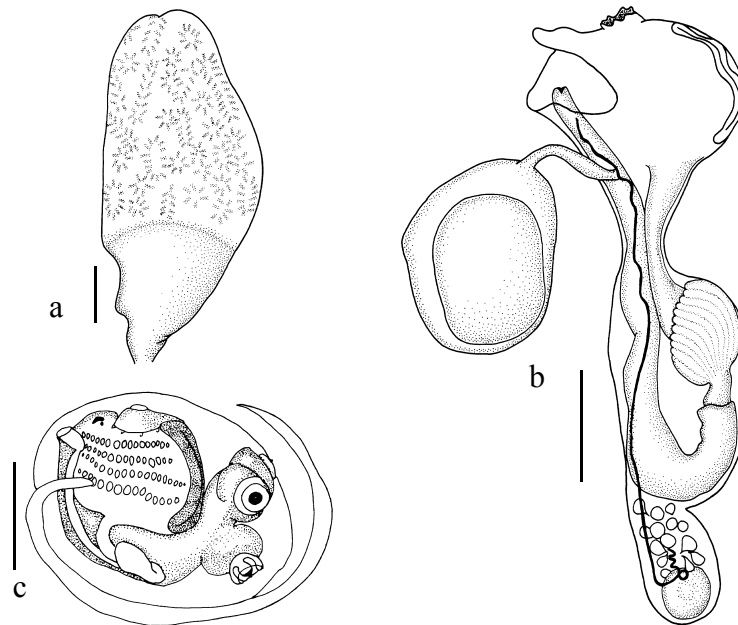
Euherdmaniinae was originally established as a subfamily in the Polychinidae for aplousobranch genera with separately opening, 6-lobed atrial apertures. Kott (1992) elevated it to family status, basing the amended definition on the type species of *Euherdmania*, *Euherdmania claviformis* (Ritter, 1903). *Euherdmania* is the only known genus in the family. It contains about 10 known species worldwide, three occurring in Australian waters. They are seldom recorded, and the known geographic ranges of most species are limited.



## References

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- Ritter, W.E. (1903). The structure and affinities of *Herdmania claviformis*, the type of a new genus and family of ascidians from the coast of California. pp. 237–261, pls xviii, xix. in, *Mark Anniversary Volume*. New York : Henry Holt & Co.
- Ritter, W.E. (1904). *Euherdmania* vs. *Herdmania* preoccupied. *Zool. Anz.* **27**: 650–651
- Euherdmania* Ritter, 1904**
- Euherdmania*** Ritter, W.E. (1904). *Euherdmania* vs. *Herdmania* preoccupied. *Zool. Anz.* **27**: 650–651 [650].  
Type species: *Herdmania claviformis* Ritter, 1903 by original designation.
- Extralimital distribution: pantropical. See: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [415].
- Euherdmania dentatosiphonis* (Millar, 1975)**
- Clavelina dentatosiphonis*** Millar, R.H. (1975). Ascidians from the Indo-West Pacific region in the Zoological Museum, Copenhagen (Tunicata, Ascidiacea). *Steenstrupia* **3**(20): 205–336 [211].  
Type data: holotype ZMUC 11.xi.1951\*.  
Type locality: 100 m, Tasman Sea [30°00'S 154°34'E].
- Distribution: NSW (SE oceanic); known only from type locality.  
Ecology: benthic, marine; 100 m on coral.
- Euherdmania digitata* Millar, 1963**
- Euherdmania digitata*** Millar, R.H. (1963). Australian ascidians in the British Museum (Natural History). *Proc. Zool. Soc. Lond.* **141**(4): 689–746 [698].  
Type data: holotype BMNH 30.10.8.10a.  
Type locality: Cape Boileau, north WA.
- Distribution: Palau, New Caledonia, French Polynesia, QLD (Great Barrier Reef), SA (S Gulfs coast), WA (NW coast); also Ponape.  
Ecology: benthic, marine.  
Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [417].
- Euherdmania translucida* Kott, 1992**
- Euherdmania translucida*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [420].  
Type data: holotype SAMA E2092, paratype(s) SAMA E2056, E2093.  
Type locality: offshore, North Point, Marum Is., Sir Joseph Banks Group, 8 m, SA.
- Distribution: SA (S Gulfs coast).  
Ecology: benthic, marine; sand and in root mats of *Posidonia* [Posidoniaceae].

## HOLOZOIDAE



**Fig. 6.** *Distaplia stylifera* (Kowalevsky, 1874): **a**, colony; **b**, zooid; **c**, larva. (Scale bars: a = 10.0 mm; b, c, = 0.5 mm). [from Kott 1990]

Holozoidae Berrill, 1950 have zooids embedded in soft fleshy test (without sand or other inclusions). Colonies are either sessile cushions or sheets, or they have relatively thick fleshy stalks with rounded to long or fan-shaped heads containing the zooids. Branchial openings are 6-lobed. In certain genera, atrial openings are on 6-lobed siphons either to the exterior (*Polydistoma* Kott, 1990 and *Sigillina* Savigny, 1816), or into a cloacal cavity (*Hypodistoma* Tokioka, 1967). In other genera, the atrial openings are sessile and wide, with an anterior lip, and they expose a great part of the branchial sac directly to a common cloacal cavity. In this family, the gut loop is relatively short and the stomach is about half to two-thirds of the distance down the descending limb. The gonads are in the loop of the gut or project behind it into the top of the vascular stolon, or in a sac separated from the abdomen by a narrow constriction. They are smaller and more contained than those of Clavelinidae, testis follicles being fewer in number and often arranged in a circle, and the ovary small and sac-like. Fertilisation occurs in a brood pouch (formed by a loop of the oviduct) that projects out from the posterior end of the thorax. Body musculature is mostly longitudinal, the fine bands on the thorax continuing along each side of the abdomen and often onto a posterior abdominal vascular stolon (in *Sigillina*, *Hypodistoma*, *Polydistoma* and *Hypsistozoa* Brewin, 1953). Muscles are confined to the thorax in *Neodistoma* Kott, 1990, *Distaplia* Della Vale, 1881 and *Sycozoa* Lesson, 1832. Occasionally some fine circular bands are also in the thorax (in a few species of *Sigillina*). Often a large gastric vesicle is halfway along the gastric duct that extends between stomach and intestine.

#### HOLOZOIDAE

Replication in *Sycozoa* and *Distaplia* is known to occur by strobilation of an isolated vegetative stolon (which contains vestiges of the left epicardial sac). In the other genera it may occur by strobilation of the posterior abdominal stolon (which also contains the epicardial sacs), although this has not been investigated specifically. The vegetative and vascular stolons are in the stalk or the base of the colony, where rows of developing vegetative zooids often are found.

Although diverse, this family is thought to be monophyletic because of the thoracic brood pouches, long vascular stolons, replication by division of a posterior abdominal stolon, relatively small zooids with short abdomina, and a limited number of rows of stigmata. The highly organised cloacal systems of *Distaplia*, *Sycozoa* and *Neodistoma*, and their zooids with musculature confined to the thorax, are different from the other genera in the family. There are, however, intermediate forms, such as *Hypsistozoa* which do have muscles on a vascular stolon like those of *Sigillina* although their zooids and larvae otherwise resemble those of *Distaplia*; and *Polydistoma* and *Hypodistoma* which have cloacal systems and short almost horizontal gut loops like *Distaplia*, but 6-lobed apertures and muscles on the vascular stolon like *Sigillina*. Further diversity in the zooids is displayed in *Distaplia* which has gonads either projecting posterior to the gut loop in a stalked pouch or enclosed in the gut loop.

Larvae are relatively large in all genera and display generic differences. Larvae of *Sigillina* and *Hypodistoma* are some of the largest known in the Ascidiacea with trunks up to 4.0 mm long and particularly large median adhesive organs. In *Hypsistozoa*, *Distaplia* and *Sycozoa* larvae are smaller, with triradially arranged adhesive organs and sometimes blastozooids developing from a stolon of the oozooid.

The family is well represented in Australian waters. *Sigillina*, *Sycozoa* and *Distaplia* in particular are well represented. *Sigillina* is a genus of the tropical to temperate Australian and African waters; *Sycozoa* is not known north of Japan but is common in the Antarctic and Subantarctic; *Hypsistozoa* is known only from temperate Australia and New Zealand; *Hypodistoma* is known only from South Africa and temperate and tropical Australian waters; and *Polydistoma* and *Neodistoma* are known only from southern Australia. *Distaplia* is the only genus with a cosmopolitan distribution.

The family was proposed first as a subfamily, Holozoinae, of the family Clavelinidae Forbes & Hanley, 1848. It was revised and elevated to family status by Kott (1990).

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Savigny, J.C. (1816). Recherches anatomiques sur les ascidies composées et sur les ascidies simples—Système de la classe des Ascidies pp. 1–239. In *Mémoires sur les Animaux sans Vertèbres*, Pt 2. Paris : G. Dufour.

Tokioka, T. (1967). Pacific Tunicata of the United States National Museum. *Bull. U.S. Natl Mus.* **251**: 1–242

### *Distaplia* Della Valle, 1881

**Holozoa** Lesson, R.P. (1832). Zoologie. pp. 256–279, 433–440 in Lesson, R.P. *Voyage autour du Monde sur la Corvette La Coquille pendant 1822–1825*. Paris : P. Pourret Freres Vol. 2(1) [439] [senior synonym, suppressed in favour of *Distaplia* Della Valle, 1881, see Hartmeyer, R. (1915). *Ascidium nomina conservanda*. pp. 247–258 in Apstein, C. *Nomina Conservanda. Sber. Ges. Naturf. Freunde Berl.* **1915b**: 247–258].

Type species: *Holozoa cylindrica* Lesson, 1832 by monotypy.

***Distaplia*** Della Valle, A. (1881). Nuove contribuzioni alla storia naturale delle ascidie composte del Golfo di Napoli. *Atti Accad. nag. Lincei Series 3, Memoir* **10**: 431–498 [455]. Type species: *Distaplia magnilarva* Della Valle, 1881 by original designation.

***Julinia*** Calman, W.T. (1894). On *Julinia*, a new genus of compound ascidians from the Antarctic Ocean. *Q. J. Microsc. Sci.* (2)**37**: 1–17 [1].

Type species: *Julinia australis* Calman, 1894 by monotypy.

***Leptobotrylloides*** Oka, A. (1927). Zur kenntnis der japanischen Botryllidae. *Proc. Imp. Acad. Japan* **3**(9): 607–609 [607].

Type species: *Leptobotrylloides dubium* Oka, 1927 by monotypy.

Taxonomic decision for synonymy: Hartmeyer, R. (1909). Ascidien (continuation of work by Seeliger). pp. 1281–1488 in Bronn, H.G. *Klassen und Ordnungen des Tier-Reichs*. Leipzig : C.F. Winter Vol. 3, suppl. pts 81–87 [1437]; Tokioka, T. (1953). *Ascidians of Sagami Bay*. Tokyo : Iwanami Shoten 313 pp. 79 pls [206].

Extralimital distribution: worldwide. See: Hartmeyer, R. (1924). Ascidacea, part II. Zugleich eine Übersicht über die Arktische und boreale Ascidienfauna auf tiergeographischer Grundlage. *Ingolf-Exped.* **2**(7): 1–275; Harant, H. (1929). Ascidies provenant des croisières du Prince Albert I<sup>er</sup> de Monaco. *Résultats de Campagnes Scientifique accomplies (Monaco)* **75**: 1–110; Van Name, W.G. (1945). The North and South American ascidians. *Bull. Am. Mus. Nat. Hist.* **84**: 1–476; Berrill, N.J. (1950). The Tunicata. *Ray Soc. Publs* **133**: 1–354; Kott, P. (1962). The ascidians of Australia III. Aplousobranchiata Lahille: Didemnidae Giard. *Aust. J. Mar. Freshwat. Res.* **13**(3): 265–334; Millar, R.H. (1962). Further descriptions of South African ascidians. *Ann. S. Afr. Mus.* **56**(7): 113–221; Kott, P. (1969). Antarctic Ascidacea. A monographic account of the known species based on specimens collected under U.S. Government auspices 1947 to 1963.

*Antarct. Res. Ser.* **13**: i–xv 1–239; Millar, R.H. (1982). The marine fauna of New Zealand. *Mem. N.Z. Oceanogr. Inst.* **85**: 1–117; Kott, P. (1990). The Australian Ascidacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266; Nishikawa, T. (1990). The ascidians of the Japan Sea 1. *Publ. Seto Mar. Biol. Lab.* **34**(4–6): 73–148.

### *Distaplia australiensis* Brewin, 1953

***Distaplia australiensis*** Brewin, B.I. (1953). Australian ascidians of the sub-family Holozoinae and a review of the sub-family. *Trans. R. Soc. N.Z.* **81**(1): 53–64 [61].

Type data: holotype AM U3842.

Type locality: south of Tasmania, 43 m, TAS.

Distribution: SA (S Gulfs coast), TAS (Bass Strait, Tas. coast), VIC (Bass Strait).

Ecology: benthic, marine.

References: Kott, P. (1990). The Australian Ascidacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [113]; Kott, P. (2004). Ascidacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [46].

### *Distaplia cuscina* Kott, 1990

***Distaplia cuscina*** Kott, P. (1990). The Australian Ascidacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [115].

Type data: holotype QM GH4381, paratype(s) QM GH4124.

Type locality: Wistari Reef, Capricorn Group, QLD.

Distribution: QLD (Great Barrier Reef).

Ecology: benthic, marine; rubble fauna, lowtide.

### *Distaplia dubia* (Oka, 1927)

***Leptobotrylloides dubium*** Oka, A. (1927). Zur kenntnis der japanischen Botryllidae. *Proc. Imp. Acad. Japan* **3**(9): 607–609 [607].

Type data: type status unknown UTZM (depository uncertain, not found).

Type locality: Japan.

***Distaplia japonica*** Tokioka, T. (1951). Contributions to Japanese ascidian fauna. IV. Notes on some ascidians collected in Osaka Bay I. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **1**(4): 169–182 [169].

Type data: syntypes SMBL 90\*.

Type locality: Osaka Bay.

***Distaplia yezoensis*** Tokioka, T. (1951). The fauna of Akkeshi Bay XVIII. Ascidacea. *Publications from the Akkeshi Marine Biological Station* **1**: 1–24 [4].

Type data: type status unknown.

Type locality: Akkeshi Bay, Japan.

***Distaplia imaii*** Hirai, E. (1952). On a new species of compound ascidian, *Distaplia imaii* n.sp. from Japan. *Sci. Rep. Tôhoku Univ.* (4)19(3): 211–214 [211].  
Type data: type status unknown.  
Type locality: Otaru, Hokkaido, Japan.

Taxonomic decision for synonymy: Tokioka, T. (1953). *Ascidians of Sagami Bay*. Tokyo : Iwanami Shoten 313 pp. 79 pls [206]; Tokioka, T. (1963). Contributions to the Japanese ascidian fauna XX. The outline of Japanese ascidian fauna as compared with that of the Pacific coasts of North America. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* 11(1): 131–156 [135].

Distribution: Japan, Lord Howe Island, NSW (SE oceanic).  
Ecology: benthic, marine.  
Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* 29(1): 1–266 [116].

***Distaplia florida*** Kott, 1990

***Distaplia florida*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* 29(1): 1–266 [118].  
Type data: holotype QM GH4103.  
Type locality: reef, Julian Rocks, Byron Bay, 10 m, NSW.

Distribution: NSW (Central E coast), SA (Great Australian Bight), TAS (Bass Strait).  
Ecology: benthic, marine.

***Distaplia mikropnoa*** Sluiter, 1909

***Distaplia mikropnoa*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* 56B: 1–112 [94].  
Type data: holotype ZMA TU 830.  
Type locality: 16–32 m, with *Lithothamnion*, anchorage off North-Ubian [6°7.5'S 120°26'E].

Distribution: Indonesia, Palau, NT (N coast), WA (N coast); west Pacific Ocean.  
Ecology: benthic, marine.  
Reference: Kott, P. (2002). Ascidiacea (Tunicata) from Darwin, Northern Territory, Australia. *Beagle, Rec. Mus. Art Galleries NT* 18: 19–55 [24].

***Distaplia muriella*** Kott, 1990

***Distaplia muriella*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* 29(1): 1–266 [119].  
Type data: holotype WAM 135.75, paratype(s) WAM 32.75.  
Type locality: Blackwall Reach, Swan River estuary, 20 m, WA.

Distribution: WA (Lower W coast); known only from the Swan River estuary.  
Ecology: benthic; brackish water.

***Distaplia pallida*** Kott, 1990

***Distaplia pallida*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* 29(1): 1–266 [121].  
Type data: holotype QM GH4102, paratype(s) QM G11923.  
Type locality: on jetty pile, Portsea, 4 m, VIC.

Distribution: SA (Great Australian Bight, S Gulfs coast), TAS (Bass Strait, Tas. coast), VIC (Bass Strait).  
Ecology: benthic, marine; growing on rubble.

***Distaplia prolifera*** Kott, 1990

***Distaplia prolifera*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* 29(1): 1–266 [122].  
Type data: holotype WAM 812.83 (QM GH2103).  
Type locality: 11 nautical miles NW Port Hedland, 14 m, WA [20°12'S 118°25'E].

Distribution: WA (NW coast); known only from type locality.  
Ecology: benthic, marine.

***Distaplia racemosa*** Kott, 1990

***Distaplia racemosa*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* 29(1): 1–266 [124].  
Type data: holotype NTM E9 (QM GH4366).  
Type locality: Cootamundra Shoals, 36 m, Arafura Sea, NT [10°49'49"S 129°12'54"E].

***Distaplia cuspidis*** Kott, P. (2002). Ascidiacea (Tunicata) from Darwin, Northern Territory, Australia. *Beagle, Rec. Mus. Art Galleries NT* 18: 19–55 [23].  
Type data: holotype NTM E171, paratype(s) NTM E198.  
Type locality: Darwin, Plater Rock, 8–10 m, NT.  
Taxonomic decision for synonymy: Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* 20: 37–81 [44].

Distribution: Palau, NT (N coast).  
Ecology: benthic, marine.

***Distaplia regina*** Kott, 1990

***Distaplia regina*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* 29(1): 1–266 [125].  
Type data: holotype QM GH4201, paratype(s) QM GH4202.  
Type locality: Capricorn Group, Heron Is., QLD.

Distribution: QLD (Great Barrier Reef); known only from type locality.  
Ecology: benthic, marine.  
Reference: Kott, P. (2002). Ascidiacea (Tunicata) from Darwin, Northern Territory, Australia. *Beagle, Rec. Mus. Art Galleries NT* 18: 19–55 [20] (in which this species is said to have been recorded from Darwin in error).

***Distaplia retinaculata* Kott, 1990**

***Distaplia retinaculata*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [125].

Type data: holotype MV F53267 (QM GH4127), paratype(s) MV F53268.

Type locality: reef, Ninety Mile Beach, 1.5 km off McGauran's Beach, 15 m, VIC.

Distribution: VIC (Bass Strait); known only from type locality.

Ecology: benthic, marine.

***Distaplia stylifera* (Kowalevsky, 1874)**

***Didemnum styliferum*** Kowalevsky, A. (1874). Ueber die Knospung der Ascidien. *Arch. Mikrosk. Anat. Entwicklungsmech.* **10**: 441–470 [443].

Type data: holotype (probable) ZMUC (depository uncertain, not found).

Type locality: Red Sea.

Distribution: QLD (NE coast), SA (Great Australian Bight), WA (Central W coast, Lower W coast, NW coast); west Pacific Ocean and Indian Ocean.

Ecology: benthic, marine.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [127].

***Distaplia tokiokai* Kott, 1990**

***Distaplia tokioka*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [129].

Type data: holotype SAMA E2081, paratype(s) QM GH4179.

Type locality: Avoid Bay, Price Is., Great Australian Bight, 15–20 m, SA.

Distribution: SA (Great Australian Bight); known only from type locality.

Ecology: benthic, marine.

***Distaplia turboensis* Kott, 2004**

***Distaplia turboensis*** Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [45].

Type data: holotype NTM E321, paratype(s) QM G308748.

Type locality: Dawson Rock, Bynoe Harbour, 5–8 m, NT.

Distribution: NT (N coast), QLD (Central E coast, NE coast).

Ecology: benthic, marine.

***Distaplia violetta* Kott, 1990**

***Distaplia violetta*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [130].

Type data: holotype QM GH1358, paratype(s) QM GH4130.

Type locality: Wistari Reef, Capricorn Group, QLD.

Distribution: QLD (Great Barrier Reef, NE coast); west Pacific Ocean.

Ecology: benthic, marine; rubble fauna.

***Distaplia viridis* Kott, 1957**

***Distaplia viridis*** Kott, P. (1957). Ascidiacea of Australia II. Aplousobranchiata Lahille; Clavelinidae Forbes and Hanley and Polyclinidae Verrill. *Aust. J. Mar. Freshwat. Res.* **8**(1): 64–110 [96].

Type data: syntypes AM Y1182, Y2070, Y2069.

Type locality: Victor Harbour, Gulf St Vincent, SA.

Distribution: QLD (NE coast), SA (Great Australian Bight, S Gulfs coast), VIC (Bass Strait).

Ecology: benthic, marine; to 8 m.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [132].

***Hypodistoma* Tokioka, 1967**

***Hypodistoma*** Tokioka, T. (1967). Pacific Tunicata of the United States National Museum. *Bull. U.S. Natl. Mus.* **251**: 1–242 [124].

Type species: *Distoma deerrata* Sluiter, 1895 by original designation.

Extralimital distribution: west Pacific Ocean. See: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

***Hypodistoma deerratum* (Sluiter, 1895)**

***Distoma deerrata*** Sluiter, C.P. (1895). Tunicaten. In, Semon, R. Zoologische Forschungsreisen in Australien und den Malayischen Archipel. *Denkschr. Med.-Naturw. Ges. Jena* **8**: 163–186; Nachtrag zu den tunicaten: 325–326. [167].

Type data: holotype ZMA TU38.

Type locality: Thursday Is., Torres Strait.

***Polycitor coalitus*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [23].

Type data: holotype ZMA TU19.

Type locality: 32 m, Indonesia [1°42'30"S 130°47'30"E].

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [106].

Distribution: NT (Gulf of Carpentaria), QLD (NE coast), WA (Central W coast, Lower W coast, NW coast).

Ecology: benthic, marine; sea floor habitats to 80 m.

***Hypodistoma mirabile* (Kott, 1972)**

***Atapozoa mirabilis*** Kott, P. (1972). The ascidians of South Australia II. Eastern Sector of the Great Australian Bight and Investigator Strait. *Trans. R. Soc. S. Aust.* **96**(4): 165–196 [169].

Type data: holotype SAMA E899, paratype(s) SAMA E896.

Type locality: floor of cave, Elliston Bay, 6 m, SA.

Distribution: SA (Great Australian Bight), VIC (Bass Strait).

Ecology: benthic, marine; often in caves with strong water movement, to 16 m.

**Hypsistozoa** Brewin, 1953

**Hypsistozoa** Brewin, B.I. (1953). Australian ascidians of the sub-family Holozoinae and a review of the sub-family. *Trans. R. Soc. N.Z.* **81**(1): 53–64 [56].

Type species: *Distaplia fasmeriana* Michaelsen, 1924 by original designation.

Extralimital distribution: Peru-Chile Trench. See: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

**Hypsistozoa distomoides** (Herdman, 1899)

**Amaroucium distomoides** Herdman, W.A. (1898). Note on the Tunicata fauna of Australian seas. *Ann. Mag. Nat. Hist.* **7**(1): 443–450 [448] [*nom. nud.*].

**Amaroucium distomoides** Herdman, W.A. (1899). Descriptive catalogue of the Tunicata in the Australian Museum. *Australian Museum, Sydney, Catalogue* **17**: 1–139 [72].

Type data: holotype AM G2106.

Type locality: Port Jackson, NSW.

Taxonomic decision for new combination: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [134] (as *Hypsistozoa distomoides*).

Distribution: NSW (Lower E coast), SA (Great Australian Bight, S Gulfs coast), TAS (Tas. coast).

Ecology: benthic, marine; to 20 m.

**Neodistoma** Kott, 1990

**Neodistoma** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [135].

Type species: *Neodistoma mammillatum* Kott, 1990 by original designation.

**Neodistoma mammillatum** Kott, 1990

**Neodistoma mammillatum** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [135].

Type data: holotype SAMA E1984 (QM GH4104), paratype(s) QM GH2424.

Type locality: reef, Seacliff, Gulf St Vincent, 12 m, SA.

Distribution: SA (S Gulfs coast); known only from type locality.

Ecology: benthic, marine; low limestone reef, on top of rocks, also in caves and under rocks.

**Polydistoma** Kott, 1990

**Polydistoma** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [101].

Type species: *Polydistoma fungiforme* Kott, 1990 by original designation.

**Polydistoma fungiforme** Kott, 1990

**Polydistoma fungiforme** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [102].

Type data: holotype WAM 881.83, paratype(s) WAM 880.83 (QM GH2111).

Type locality: about 27 km W of Cliff Head, Dongara, 44 m, WA [29°30'S 114°41'18"E–29°31'42"S 114°42'E].

Distribution: WA (Lower W coast); known only from type locality.

Ecology: benthic, marine.

**Polydistoma longitube** (Kott, 1957)

**Polycitor longitubis** Kott, P. (1957). Ascidians of Australia II. Aplousobranchiata Lahille; Clavelinidae Forbes and Hanley and Polyclinidae Verrill. *Aust. J. Mar. Freshwat. Res.* **8**(1): 64–110 [80].

Type data: holotype AM Y802.

Type locality: SW Australia.

Taxonomic decision for new combination: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [104] (as *Polydistoma longitube*).

Distribution: WA (Lower W coast); known only from type locality, from unspecified locality.

Ecology: benthic, marine.

**Protoholozoa** Kott, 1969

**Protoholozoa** Kott, P. (1969). Antarctic Ascidiacea. A monographic account of the known species based on specimens collected under U.S. Government auspices 1947 to 1963. *Antarct. Res. Ser.* **13**: i–xv 1–239 [35].

Type species: *Protoholozoa pedunculata* Kott, 1969 by monotypy.

Extralimital distribution: Antarctic Region; west Pacific Ocean, The Azores. See: Kott, P. (1992). The Australian Ascidiacea, supplement 2. *Mem. Queensl. Mus.* **32**(2): 621–655.

**Protoholozoa australiensis** Kott, 1992

**Protoholozoa australiensis** Kott, P. (1992). The Australian Ascidiacea, supplement 2. *Mem. Queensl. Mus.* **32**(2): 621–655 [628].

Type data: holotype SAMA E2423, paratype(s) SAMA E2422.

Type locality: 1 km NE Margaret Brock Reef off Cape Jaffa, 7–15 m, SA.

Distribution: SA (S Gulfs coast); known only from type locality.

Ecology: benthic, marine; in overhangs and caverns.

**Sigillina** Savigny, 1816

**Sigillina** Savigny, J.C. (1816). Recherches anatomiques sur les ascidies composées et sur les ascidies simples—Système de la classe des Ascidies pp. 1–239. In *Mémoires sur les Animaux sans Vertèbres*, Pt 2. Paris: G. Dufour. [40].

Type species: *Sigillina australis* Savigny, 1816 by monotypy.

**Hyperiodistoma** Michaelsen, W. (1930). Ascidiae Krikobranchiae. *Fauna Südwest-Aust.* **5**(7): 463–558 [490]. Type species: *Colella moebiusi* Hartmeyer, 1905 by original designation.

*Atapozoa* Brewin, B.I. (1956). *Atapozoa marshi*, a compound ascidian from Western Australia. *J. Proc. R. Soc. West. Aust.* **40**(1): 31–32 [3].

Type species: *Atapozoa marshii* Brewin, 1956 by monotypy.

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [86].

Extralimital distribution: west Indian Ocean, west Pacific Ocean. See: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [86].

***Sigillina australis* Savigny, 1816**

*Sigillina australis* Savigny, J.C. (1816). Recherches anatomiques sur les ascidies composées et sur les ascidies simples—Système de la classe des Ascidies pp. 1–239. In *Mémoires sur les Animaux sans Vertèbres*, Pt 2. Paris : G. Dufour. [179].

Type data: holotype MNHP A3 SIG.1\*.

Type locality: southwest coast of Australia (as New Holland), 40 m, WA.

*Atapozoa marshi* Brewin, B.I. (1956). *Atapozoa marshi*, a compound ascidian from Western Australia. *J. Proc. R. Soc. West. Aust.* **40**(1): 31–32 [31].

Type data: holotype AM U3843.

Type locality: Triggs Is., WA.

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [87].

Distribution: New Zealand, NSW (Lower E coast), SA (Great Australian Bight, S Gulfs coast), WA (Central W coast, Lower W coast, NW coast).

Ecology: benthic, marine; roofs of caverns, under reefs.

***Sigillina cyanea* (Herdman, 1899)**

*Colella cyanea* Herdman, W.A. (1898). Note on the Tunicata fauna of Australian seas. *Ann. Mag. Nat. Hist.* **7**(1): 443–450 [447] [*nom. nud.*].

*Colella cyanea* Herdman, W.A. (1899). Descriptive catalogue of the Tunicata in the Australian Museum. *Australian Museum, Sydney, Catalogue* **17**: 1–139 [70].

Type data: syntypes AM U153, U346.

Type locality: Port Jackson, NSW.

*Sigillina caerulea* Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [31].

Type data: type status unknown ZMA (depository uncertain, not found).

Type locality: Pulu Jedan, east coast of Aru Is., 13 m, Indonesia.

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [89].

Distribution: NSW (Central E coast, Lower E coast), QLD (Central E coast, Great Barrier Reef), WA (Central W coast, Lower W coast, NW coast, SW coast).

Ecology: benthic, marine; to 150 m.

***Sigillina fantasiana* (Kott, 1957)**

*Eudistoma fantasiana* Kott, P. (1957). Ascidians of Australia II. Aplousobranchiata Lahille; Clavelinidae Forbes and Hanley and Polyclinidae Verrill. *Aust. J. Mar. Freshwat. Res.* **8**(1): 64–110 [76].

Type data: holotype AM Y1276.

Type locality: Reevesby Is., SA.

Distribution: SA (Great Australian Bight, S Gulfs coast), TAS (Bass Strait, Tas. coast), VIC (Bass Strait), WA (Lower W coast).

Ecology: benthic, marine; colonies often around stems of seaweed (*Hormosira*) [Phaeophyta].

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [92].

***Sigillina grandissima* Kott, 1990**

*Sigillina grandissima* Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [93].

Type data: holotype WAM 846.83 (QM GH2114), paratypes WAM 782.83, QM GH1305 (SAMA E1983).

Type locality: Dampier Archipelago, NW of Rosemary Is., 70–72 m, WA.

Distribution: SA (Great Australian Bight), WA (Central W coast, Lower W coast, NW coast).

Ecology: benthic, marine.

***Sigillina mjobergi* Hartmeyer, 1919**

*Sigillina mjobergi* Hartmeyer, R. (1919). Ascidien. In, Results of Dr E. Mjöberg's Swedish scientific expeditions to Australia 1910–1913. *K. Svenska Vetensk.-Akad. Handl.* **60**(4): 1–150. [117] [as *Sigillina mjobergi*].

Type data: holotype NHRM 1487\*.

Type locality: 48 miles WSW of Cape Jaubert, 280 m, WA.

Distribution: WA (Central W coast, Lower W coast, NW coast).

Ecology: benthic, marine; epibionts including barnacles, bryozoans on horny stalk, from 30–140 m.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [96].

***Sigillina nigra* (Herdman, 1899)**

*Polyclinum nigrum* Herdman, W.A. (1898). Note on the Tunicata fauna of Australian seas. *Ann. Mag. Nat. Hist.* **7**(1): 443–450 [448] [*nom. nud.*].

*Polyclinum nigrum* Herdman, W.A. (1899). Descriptive catalogue of the Tunicata in the Australian Museum. *Australian Museum, Sydney, Catalogue* **17**: 1–139 [84].

Type data: holotype AM U354.

Type locality: Vaucluse, Port Jackson, NSW.

Taxonomic decision for new combination: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [98] (as *Sigillina nigra*).

Distribution: NSW (Lower E coast).

Ecology: benthic, marine.



***Sigillina pulvinus* Kott, 2003**

***Sigillina pulvinus*** Kott, P. (2003). New syntheses and new species in the Australian Ascidiacea. *J. Nat. Hist.* **37**: 1611–1653 [1618].

Type data: holotype SAMA E2845.

Type locality: Waterfall Bay outside Cathedral Cave, Tasman Peninsula, 10–13 m, TAS.

Distribution: TAS (Tas. coast).

Ecology: benthic, marine.

***Sigillina signifera* (Sluiter, 1909)**

***Polycitor signiferus*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [5].

Type data: syntypes ZMA TU808.1, TU808.2.

Type locality: 5700 miles, 279°E from Southpoint of S Lucipara Is., 894 m, and Banda Is., 9–45 m, Indonesia.

***Sycozoa sedens*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [34].

Type data: syntypes ZMA TU1071-7.

Type locality: Sulu Is., Karkaralong Group, Karbaena Is., Lucipara Group, Postillon Is., Savu Is., Saleh Bay, Indonesia; reef habitats to 36 m.

***Eudistoma viridis*** Tokioka, T. (1955). Ascidians from the Palao Islands II. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **5**(1): 43–57 [49].

Type data: syntypes SMBL 74\*.

Type locality: Geruherugaeru, canal, Palau Is., west Pacific Ocean.

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [100].

Distribution: Philippines, Indonesia, Palau, QLD (NE coast), WA (NW coast); west Pacific Ocean.

Ecology: benthic, marine; forms extensive mats on coral debris, sides of reefs and surge channels.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

***Sycozoa* Lesson, 1832**

***Sycozoa*** Lesson, R.P. (1832). Zoologie. pp. 256–279, 433–440 in Lesson, R.P. *Voyage autour du Monde sur la Corvette La Coquille pendant 1822–1825*. Paris : P. Pourret Freres Vol. 2(1) [436].

Type species: *Sycozoa sigillinoides* Lesson, 1832 by monotypy.

***Colella*** Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiae compositae. *Zool. Chall. Exped.* **14**(38): 1–425 [115].

Type species: *Aplidie pedunculatum* Quoy & Gaimard, 1834 by original designation.

***Cyathocormus*** Oka, A. (1912). On *Cyathocormus mirabilis* n.gen., n.sp., the type of a new family of compound ascidians from Japan. *J. Coll. Sci. Imp. Univ. Tokyo* **32**(12): 1–30 [17].

Type species: *Cyathocormus mirabilis* Oka, 1912 by monotypy.

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [137].

Extralimital distribution: Antarctic Region; tropical west Pacific Ocean. See: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

***Sycozoa brevicauda* Kott, 1990**

***Sycozoa brevicauda*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [140].

Type data: holotype WAM 139.75, paratype(s) WAM 801.83, 1046.83.

Type locality: Cockburn Sound, WA.

Distribution: SA (S Gulfs coast), WA (Central W coast, Lower W coast, NW coast).

Ecology: benthic, marine; on floors of caves.

***Sycozoa cavernosa* Kott, 1990**

***Sycozoa cavernosa*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [142].

Type data: holotype WAM 795.83 (QM GH2106), paratype(s) WAM 879.83, 199.75.

Type locality: reef, off Whitford Beach, Cockburn Sound, 5 m, WA.

Distribution: WA (Lower W coast, NW coast).

Ecology: benthic, marine.

***Sycozoa cerebriformis* (Quoy & Gaimard, 1834)**

***Aplidie cerebriforme*** Quoy, J.R.C. & Gaimard, J.P. (1834). Zoologie, Mollusques pp. 559–626. in, *Voyages de découvertes de l'Astrolabe 1826–1829*, Vol. 3. Paris : Pilet Ainé. [625].

Type data: holotype MNHP A3 SCY.A29\*.

Type locality: Westernport, VIC.

***Colella plicata*** Herdman, W.A. (1891). A revised classification of the Tunicata, with definitions of the orders, sub-orders, families, sub-families and genera, and analytical keys to the species. *J. Linn. Soc. Lond. Zool.* **23**: 558–652 [611].

Type data: syntypes AM U152, U299–U317.

Type locality: Port Jackson, NSW.

***Colella incerta*** Caullery, M. (1909). Recherches sur la famille des Distomidae. *Bull. Scient. Fr. Belg.* **42**: 1–59 [10].

Type data: holotype MNHP A3 SYC.A18\*.

Type locality: Australian (as New Holland).

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [143].

Distribution: NSW (Central E coast, Lower E coast), QLD (Central E coast), SA (Great Australian Bight, S Gulfs coast), TAS (Bass Strait, Tas. coast), VIC (Bass Strait), WA (Central W coast, Lower W coast).

Ecology: benthic, marine; in caves, crevices, and on the sea floor to 50 m.

***Sycozoa murrayi*** (Herdman, 1886)

***Collela murrayi*** Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiæ compositæ. *Zool. Chall. Exped.* **14**(38): 1–425 [115].  
Type data: syntypes BMNH 1887.2.4.255, 1887.2.4.256.  
Type locality: 240 m, NSW [33°57'18"S 151°39'06"E].

***Sycozoa tasmanoides*** Kott, P. (1954). Tunicata, Ascidiæ. *Rep. B.A.N.Z. Antarct. Res. Exped.* **1**(4): 121–182 [157].  
Type data: syntypes AM Y1231.  
Type locality: off Maria Is., 174–155 m, TAS.

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [146].

Distribution: NSW (Lower E coast), SA (Great Australian Bight, S Gulfs coast), TAS (Bass Strait, Tas. coast), VIC (Bass Strait).  
Ecology: benthic, marine.

***Sycozoa pedunculata*** (Quoy & Gaimard, 1834)

***Aplidie pedunculatum*** Quoy, J.R.C. & Gaimard, J.P. (1834). Zoologie, Mollusques pp. 559–626. in: *Voyages de découvertes de l'Astrolabe 1826–1829*, Vol. 3. Paris: Pilet Ainé. [626].  
Type data: holotype MNHP A3 SCY.A25\*.  
Type locality: King George Sound, WA.

Taxonomic decision for new combination: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [147] (as *Sycozoa pedunculata*).

Distribution: TAS (Bass Strait, Tas. coast), VIC (Bass Strait), WA (SW coast).  
Ecology: benthic, marine; hard substrates.

***Sycozoa pulchra*** (Herdman, 1886)

***Colella pulchra*** Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiæ compositæ. *Zool. Chall. Exped.* **14**(38): 1–425 [106].  
Type data: type status unknown BMNH (depository uncertain, not found).  
Type locality: 10°36'S 141°55'E, 12 m, Torres Strait.

***Colella tenuicaulis*** Herdman, W.A. (1891). A revised classification of the Tunicata, with definitions of the orders, sub-orders, families, sub-families and genera, and analytical keys to the species. *J. Linn. Soc. Lond. Zool.* **23**: 558–652 [611].  
Type data: syntypes AM U326–U330, U383.  
Type locality: Port Stephens and Port Jackson, NSW.

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [149].

Distribution: Indonesia, NSW (Central E coast, Lower E coast), QLD (Central E coast, NE coast), SA (S Gulfs coast), TAS (Bass Strait, Tas. coast), VIC (Bass Strait), WA (Lower W coast).  
Ecology: benthic, marine.

***Sycozoa seiziwadae*** Tokioka, 1952

***Sycozoa seiziwadae*** Tokioka, T. (1952). Ascidiæ collected by Messrs Renzi Wada and Seizi Wada from the Pearl Oyster bed in the Arafura Sea in 1940. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **2**(2): 91–142 [99].  
Type data: syntypes SMBL 106\*.  
Type locality: off Melville Is., Arafura Sea.

Distribution: Philippines, NT (N coast), QLD (NE coast), WA (N coast, NW coast); isolated record from Cronulla, NSW.

Ecology: benthic, marine; subtidal–40 m.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [152].

***Sycozoa sigillinoides*** Lesson, 1832

***Sycozoa sigillinoides*** Lesson, R.P. (1832). Zoologie. pp. 256–279, 433–440 in Lesson, R.P. *Voyage autour du Monde sur la Corvette La Coquille pendant 1822–1825*. Paris: P. Pourret Freres Vol. 2(1) [436].  
Type data: type status unknown MNHP (depository uncertain, not found).  
Type locality: 53°S, south of Staaten Is., Magellanic region, Tierra de Fuego.

***Colella ramulosa*** Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiæ compositæ. *Zool. Chall. Exped.* **14**(38): 1–425 [120].  
Type data: type status unknown BMNH (depository uncertain, not found).  
Type locality: west of Straits of Magellan at the south entrance of Smyth Channel, Patagonia [52°45'30"S 73°64'W].

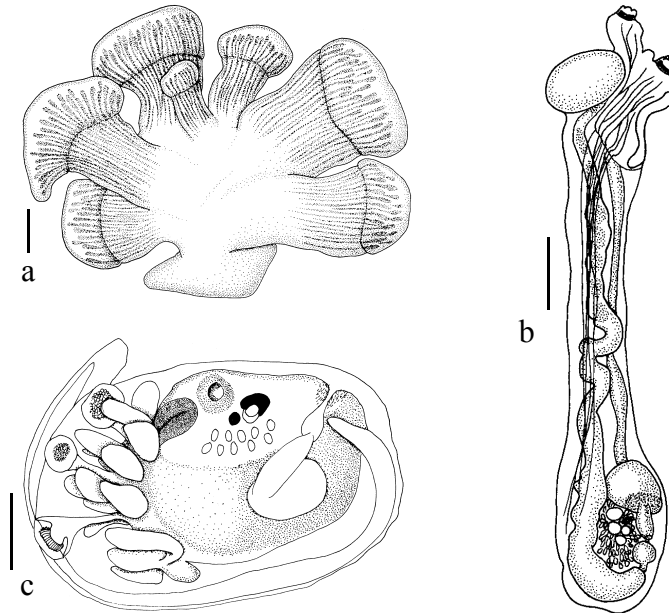
***Colella umbellata*** Michaelsen, W. (1898). Vorläufige Mitteilung über einige Tunicaten aus dem Magalhaenischen Gebiet sowie von Süd-Georgien. *Zool. Anz.* **21**: 363–371 [371].  
Type data: syntypes (probable) ZMH\*.  
Type locality: Grettan Bay, west of Port Pantalan, Tierra del Fuego.

***Colella perrieri*** Caullery, M. (1909). Recherches sur la famille des Distomidae. *Bull. Scient. Fr. Belg.* **42**: 1–59 [33].  
Type data: syntypes (probable) MNHN A3 SYC.A10\*, MNHN A3 SYC.A11\*.  
Type locality: Santa Cruz, Patagonia and 53°13'S 68°31'W.

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [153].

Distribution: New Zealand, SA (S Gulfs coast), TAS (Tas. coast); circumpolar Antarctic and Subantarctic to Magellanic area.  
Ecology: benthic, marine; heads of colonies found floating in tropical plankton.

## POLYCITORIDAE



**Fig. 7.** *Eudistoma* sp.: **a**, colony; **b**, zooid; **c**, larva. (Scale bars: a = 2.0 mm; b = 1.0 mm; c = 0.1 mm).  
[from Kott 1990]

The family Polycitoridae Michaelsen, 1904 contains colonial species in which zooids usually are embedded in relatively firm test which often contains embedded sand and other foreign particles. Partially embedded zooids occur only in *Archidistoma* Garstang, 1891, a genus not recorded from Australia. With the exception of *Brevicollus tuberosus* Kott, 1990 (an unusual indigenous species), the zooids are long and narrow, the abdomen being many times the length of the relatively short thorax.

In many species of *Eudistoma* Caullery, 1909, *Polycitor* Renier, 1804, *Eucoelium* Savigny, 1816 (= *Polycitorella* Michaelsen, 1924, a junior synonym) and *Cystodytes* Drasche, 1884, the zooids, arranged in circles with the separately opening 6-lobed atrial apertures in the centre of the circle, form rudimentary cloacal systems. True cloacal systems are developed only in the monotypic genus *Salix* nom. nov. (for *Exostoma* Kott, 1990). In the genera *Cystodytes* and *Eucoelium* the zooids synthesise calcareous spicules—either unique plate-like ones or stellate spicules resembling those of Didemnidae.

Throughout the family, zooids are muscular with an internal layer of circular fibres and external longitudinal fibres on the thorax, the longitudinal ones continuing in a wide band along each side of the abdomen. When disturbed, the zooids contract and withdraw deep into the base or centre of the colony, unlike zooids of Holozoidae and Clavelinidae which appear to draw the abdomen up behind the thorax when disturbed. Kott (1990) has suggested that this reflects the importance of protecting the site of replication from predators—in Polycitoridae replication is from horizontal division of the long, narrow abdomen, while in Clavelinidae and Holozoidae the buds develop from the isolated terminal ampullae or the posterior stolon, both in the stalk or base of the colony.

#### POLYCITORIDAE

Fertilisation may occur in the upper part of the oviduct, or in the atrial cavity where embryos are found at various stages of development. Larvae of Polycitoridae are of various sizes, but usually differ from Holozoidae and Clavelinidae in the arrangement of adhesive organs in a median vertical row at the anterior end of the trunk, generally having lost the triradial arrangement which is thought to be more primitive.

Although both have a long abdominal gut loop, Polycitoridae differ from Pycnoclavellidae in having lobed (rather than smooth-rimmed) apertures and larval adhesive organs with an axillary cone in an epidermal cup (rather than the inverted tubes of Pycnoclavellidae). The eggs do not appear to be fertilised at the base of the oviduct as they are in Pycnoclavellidae.

The family is well represented in Australian waters, especially by species of the genus *Eudistoma*. The monotypic *Salix*, the only genus with true cloacal systems, is common in tropical waters off the northern coast of the continent. *Brevicollus* Kott, 1990, an unusual indigenous genus with an equally unusual larva, is assigned to this family on the basis of its two 6-lobed, separately opening apertures, by its larval form and the presence of embryos at different stages of development in the atrial cavity.

Michaelsen (1930) proposed *Archidistoma*, *Eudistoma*, *Paessleria* Michaelsen, 1907 and *Hyperiodistoma* Michaelsen, 1930 as subgenera of the genus *Sigillina* Savigny, 1816. The family was revised by Kott (1990) who recognised *Eudistoma*, *Archidistoma* and *Polycitor* as genera of the Polycitoridae, while *Sigillina* was shown to have closer affinities with Holozoidae. The name *Eudistoma* has been given precedence over *Paessleria* (Kott 1995; ICZN Opinion 1865, 1997). *Hyperiodistoma* is a junior synonym of *Sigillina* (Holozoidae).

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Savigny, J.C. (1816). Recherches anatomiques sur les ascidies composées et sur les ascidies simples—Système de la classe des Ascidies pp. 1–239. In, *Mémoires sur les Animaux sans Vertèbres*, Pt 2. Paris : G. Dufour.

***Brevicollus* Kott, 1990**

***Brevicollus* Kott, P. (1990).** The Australian Asciacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [236] [monotypic].

Type species: *Brevicollus tuberatus* Kott, 1990 by original designation.

***Brevicollus tuberatus* Kott, 1990**

***Brevicollus tuberatus* Kott, P. (1990).** The Australian Asciacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [237].

Type data: holotype SAMA E2059 (QM GH4188), paratype(s) NMV F45284 (QM GH4952).

Type locality: The Gap, 15–20 m, SA.

Distribution: NSW (Lower E coast), SA (Great Australian Bight), VIC (Bass Strait).

Ecology: benthic, marine.

Reference: Kott, P. (2003). New syntheses and new species in the Australian Asciacea. *J. Nat. Hist.* **37**: 1611–1653 [1625].

***Cystodytes* Drasche, 1884**

***Cystodytes* Drasche, R. von (1884).** Ueber einige neue und weniger gekannte aussereuropäische einfache Ascidien. *Denkschr. Akad. Wiss. Wien* **48**: 369–387 [9].

Type species: *Distoma dellachiajei* Della Valle, 1877 by monotypy.

Extralimital distribution: Pacific Ocean, Atlantic Ocean and Indian Ocean in tropical and temperate latitudes, Mediterranean Sea. See: Van Name, W.G. (1945). The North and South American ascidians. *Bull. Am. Mus. Nat. Hist.* **84**: 1–476; Kott, P. (1990). The Australian Asciacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

Generic reference: López-Legentil, S. & Turon, X. (2005). How do morphotypes and chemotypes relate to genotypes? The colonial ascidian *Cystodytes* (Polycitoridae). *Zool. Scr.* **34**: 3–14.

***Cystodytes dellachiajei* (Della Valle, 1877)**

***Distoma dellachiajei* Della Valle, A. (1877).** Contribuzioni alla storia naturale delle ascidie composte del Golfo di Napoli con la descrizione di alcune specie e varietà nuove di altre poco note. Napoli : Tip. Communi [40].

Type data: type status and whereabouts unknown.

Type locality: Gulf of Naples, Mediterranean Sea.

***Cystodites cretaceus* Drasche, R. von (1883).** Die Synascidien der Bucht von Rovigno (Istrien). In, *Ein Beitrag zur Fauna der Adria* Wien : Carl Gerolds Sohn. 41 pp. [18].

Type data: type status unknown NHMW (depository uncertain, not found).

Type locality: Bay of Rovinj, Istra, Gulf of Venice, Adriatic Sea.

***Cystodites durus* Drasche, R. von (1883).** Die Synascidien der Bucht von Rovigno (Istrien). In, *Ein Beitrag zur Fauna der Adria* Wien : Carl Gerolds Sohn. 41 pp. [13].

Type data: type status unknown NHMW (depository uncertain, not found).

Type locality: Bay of Rovinj, Istra, Gulf of Venice, Adriatic Sea.

***Cystodytes draschii* Herdman, W.A. (1886).** Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiae compositae. *Zool. Chall. Exped.* **14**(38): 1–425 [137].

Type data: holotype BMNH 1887.2.4.284\*.

Type locality: off Barra Grande, 800 m, Brazil.

***Cystodytes aucklandicus* Nott, J.T. (1892).** On the composite ascidians of the North Shore Reef. *Trans. N.Z. Inst.* **24**: 305–334 [323].

Type data: type status unknown.

Type locality: North Shore Reef, Rangitoto Channel, Auckland, New Zealand.

***Cystodytes perspicuus* Nott, J.T. (1892).** On the composite ascidians of the North Shore Reef. *Trans. N.Z. Inst.* **24**: 305–334 [326].

Type data: type status and whereabouts unknown.

Type locality: North Shore Reef, Rangitoto Channel, Auckland, New Zealand.

***Cystodytes violaceus* Van Name, W.G. (1902).** The ascidians of the Bermuda Islands. *Trans. Conn. Acad. Arts Sci.* **11**: 325–412 [348].

Type data: syntypes AMNH 1389\*, 1219\*, 1220\*.

Type locality: on underside of rubble, Castle Harbour, Waterloo, Bermuda.

***Cystodytes ceylonensis* Herdman, W.A. (1906).** Report on the Tunicata. *Ceylon Pearl Oyster Fisheries Suppl. Rept.* **39**: 295–348 [334].

Type data: holotype BMNH 1907.8.30.31\*.

Type locality: Talaivillu Paar, 16m Sri Lanka.

Taxonomic decision for synonymy: Michaelsen, W. (1930). Ascidiae Krikobranthiae. *Fauna Südwest-Aust.* **5**(7): 463–558 [501]; Kott, P. (1990). The Australian Asciacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [179]; Kott, P. (2003). New syntheses and new species in the Australian Asciacea. *J. Nat. Hist.* **37**: 1611–1653 [1619].

Distribution: NSW, NT, QLD, SA, TAS, VIC, WA; temperate and tropical zones of Indo-west Pacific Ocean, Atlantic Ocean, Mediterranean.

Ecology: benthic, marine; intertidal–736 m.

***Cystodytes philippinensis* Herdman, 1886**

***Cystodytes philippinensis*** Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiaceae compositae. *Zool. Chall. Exped.* **14**(38): 1–425 [140].  
Type data: syntypes BMNH 1887.2.4.285\*, 1887.2.4.286\*, 1887.2.4.287\*.  
Type locality: Samboanga, 20 m, Philippines.

***Cystodytes hapu*** Monniot, C. & Monniot, F. (1987). Les ascidies de Polynésie française. *Mém. Mus. Natl. Hist. Nat. Paris* **136**: 1–155 [64].  
Type data: holotype MNHP A3 CYS 39\*.  
Type locality: Tuheia Pass, Tikehau Atoll, French Polynesia.

Taxonomic decision for synonymy: Kott, P. (2003). New syntheses and new species in the Australian Ascidiaceae. *J. Nat. Hist.* **37**: 1611–1653 [1619].

Distribution: NT (N coast), QLD (Great Barrier Reef); also West Pacific Ocean.

Ecology: benthic, marine.

Reference: Kott, P. (2002). Ascidiaceae (Tunicata) from Darwin, Northern Territory, Australia. *Beagle, Rec. Mus. Art Galleries NT* **18**: 19–55 [27].

***Cystodytes ramosus* Kott, 1992**

***Cystodytes ramosus*** Kott, P. (1992). The Australian Ascidiaceae, supplement 2. *Mem. Queensl. Mus.* **32**(2): 621–655 [629].  
Type data: holotype QM GH5374.  
Type locality: in bay, Haslewood Is., central section Great Barrier Reef, 20 m, QLD.

Distribution: QLD (NE coast); known only from type locality.

Ecology: benthic, marine.

Reference: Kott, P. (2003). New syntheses and new species in the Australian Ascidiaceae. *J. Nat. Hist.* **37**: 1611–1653 [1621].

***Eucoelium* Savigny, 1816**

***Eucoelium*** Savigny, J.C. (1816). Recherches anatomiques sur les ascidies composées et sur les ascidies simples—Système de la classe des Ascidies pp. 1–239. In: *Mémoires sur les Animaux sans Vertèbres*, Pt 2. Paris : G. Dufour. [195].  
Type species: *Eucoelium hospitolum* Savigny, 1816 by monotypy.

***Polycitorella*** Michaelsen, W. (1924). Ascidiaceae Krikobbranchiae von Neuseeland, den Chatham und den Auckland Inseln. *Vidensk. Meddr. Dansk Naturh. Foren.* **77**: 263–434 [278].  
Type species: *Polycitorella mariae* Michaelsen, 1924 by monotypy.

Taxonomic decision for synonymy: Huus, J. (1937). Ascidiaceae. pp. 545–692 in Kükenenthal, W. & Krumbach, T. (eds) *Handbuch der Zoologie*. Berlin : Walter de Gruyter Vol. 5(2)6 [668] (used the name *Polycitorella*); Kott, P. (1998). Tunicata. pp. 51–259 in Wells, A. & Houston, W.W.K. (eds) *Zoological Catalogue of Australia*.

Hemichordata, Tunicata, Cephalochordata. Melbourne : CSIRO Publishing, Australia Vol. 34 298 pp. (priority of *Eucoelium* Savigny, 1816 recognised).

Extralimital distribution: Red Sea, west Indian Ocean. See: Kott, P. (1990). The Australian Ascidiaceae Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

***Eucoelium coronarium* (Monniot, 1988)**

***Polycitorella coronaria*** Monniot, F. (1988). Ascidies de Nouvelle-Calédonie V. Polycitoridae du Lagon. *Bull. Mus. Natl. Hist. Nat. Paris* (4)**10A**(2): 197–235 [228].  
Type data: holotype MNHP A3-PolB-1.  
Type locality: 19 m, Great Australian Bight, SA [33°14'30"S 126°20'E].

Distribution: SA (Great Australian Bight), WA (Central W coast, Lower W coast, NW coast).

Ecology: benthic, marine; 3–190 m.

***Eucoelium orientalis* (Kott, 1990)**

***Polycitorella orientalis*** Kott, P. (1990). The Australian Ascidiaceae Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [187].  
Type data: holotype QM GH9477, paratype(s) QM GH4420.  
Type locality: Swain Reefs, 8 m, QLD.

Distribution: QLD (Great Barrier Reef), WA (Lower W coast); Coral Sea.

Ecology: benthic, marine.

Reference: Kott, P. (1998). Tunicata. pp. 51–259 in Wells, A. & Houston, W.W.K. (eds) *Zoological Catalogue of Australia*. Hemichordata, Tunicata, Cephalochordata. Melbourne : CSIRO Publishing, Australia Vol. 34 298 pp. [107] (as *Eucoelium orientalis*).

***Eudistoma* Caullery, 1909**

***Distoma*** Savigny, J.C. (1816). Recherches anatomiques sur les ascidies composées et sur les ascidies simples—Système de la classe des Ascidies pp. 1–239. In: *Mémoires sur les Animaux sans Vertèbres*, Pt 2. Paris : G. Dufour. [178] [junior homonym of *Distoma* Retzius, 1786 (Trematoda)].  
Type species: *Distoma rubrum* Savigny, 1816 by monotypy.

***Paessleria*** Michaelsen, W. (1907). Tunicaten pp. 1–84 in, *Ergebnisse der Hamburger Magalhaensischen Sammelreise*. Hamburg : L. Friederichsen & Co. Vol. 8(5). [68] [suppressed in favour of the name *Eudistoma* Caullery, 1909, see ICZN Opinion 1865. (1997). *Eudistoma* Caullery, 1909 (Tunicata): given precedence over *Paessleria* Michaelsen, 1907. *Bull. Zool. Nomencl.* **54**(1): 70–71].  
Type species: *Paessleria magalhaensis* Michaelsen, 1907 by monotypy.

***Eudistoma*** Caullery, M. (1909). Recherches sur la famille des Distomidae. *Bull. Scient. Fr. Belg.* **42**: 1–59 [44] [first introduced as a subgenus of *Distoma* Savigny, 1816; the name *Eudistoma* Caullery, 1909 given preference over *Paessleria* Michaelsen, 1907, see ICZN Opinion 1865. (1997). *Eudistoma* Caullery, 1909 (Tunicata): given precedence over *Paessleria* Michaelsen, 1907. *Bull. Zool. Nomencl.* **54**(1): 70–71].

Type species: *Distoma rubrum* Savigny, 1816 by subsequent designation, see Michaelsen, W. (1930). Ascidiace Krikobanchiae. *Fauna Südwest-Aust.* **5**(7): 463–558 [489].

Taxonomic decision for synonymy: Michaelsen, W. (1930). Ascidiace Krikobanchiae. *Fauna Südwest-Aust.* **5**(7): 463–558 [492].

Extralimital distribution: Afrotropical Region; tropical and temperate Pacific Ocean, Atlantic Ocean, Indian Ocean. See: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

***Eudistoma amplum*** (Sluiter, 1909)

***Polycitor amplus*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [21].

Type data: syntypes ZMA TU781, TU770.

Type locality: reef, Sailu Ketil and reef, Banda Is., Indonesia.

***Polycitor discolor*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [17].

Type data: syntypes ZMA TU785.1, TU785.2, TU785.3.

Type locality: reef, Savu Is., 16–23 m, Jedan Is., 13 m, Indonesia [6°07'30"N 120°26'E].

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [194].

Distribution: Philippines, Papua New Guinea, Palau, Federated States of Micronesia, QLD (Great Barrier Reef); Micronesia, Indonesia, Palau Is., Papua New Guinea, Philippines.

Ecology: benthic, marine.

Reference: Kott, P. (2003). New syntheses and new species in the Australian Ascidiacea. *J. Nat. Hist.* **37**: 1611–1653 [1624].

***Eudistoma anaematum*** Kott, 1990

***Eudistoma anaematum*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [196].

Type data: holotype QM GH4611, paratype(s) QM GH4610, GH4612–3.

Type locality: Wistari Reef, Capricorn Group, QLD.

Distribution: QLD (Great Barrier Reef).

Ecology: benthic, marine; rubble fauna.

***Eudistoma angolanum*** (Michaelsen, 1914)

***Polycitor (Eudistoma) paesslerioides angolanum*** Michaelsen, W. (1914). Ueber einige westÄafrikanische Ascidien. *Zool. Anz.* **43**: 423–432 [430] [proposed with subspecific rank in *Polycitor paesslerioides* Michaelsen, 1914].

Type data: holotype (probable) ZMH\*.

Type locality: Angola, Ambrizete, West Africa.

***Eudistoma snakabri*** Tokioka, T. & Nishikawa, T. (1976). Contributions to the Japanese ascidian fauna XXX. Further notes on Japanese clavelinids. *Publ. Seto Mar. Biol. Lab.*

*Kyoto Univ.* **23**(3–5): 341–350 [251].

Type data: syntypes SMBL 134\*.

Type locality: Ose, Takarazima, Tokara Is., Japan.

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [197].

Distribution: QLD (Great Barrier Reef), WA (Lower W coast, NW coast); Tokara Is., W Africa.

Ecology: benthic, marine.

***Eudistoma aureum*** Kott, 1990

***Eudistoma aureum*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [199].

Type data: holotype SAMA E2084, paratype(s) SAMA E2085.

Type locality: off West Beach, Gulf St Vincent, 12–20 m, SA.

Distribution: SA (S Gulfs coast).

Ecology: benthic, marine; *Posidonia* [Posidoniaceae] beds.

***Eudistoma bulbatum*** Kott, 1990

***Eudistoma bulbatum*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [200].

Type data: holotype AM Y2204, paratype(s) AM Y835, Y842, Y1120.

Type locality: off Cronulla, 140 m, NSW.

Distribution: NSW (Lower E coast); known only from type locality.

Ecology: benthic, marine.

***Eudistoma carnosum*** Kott, 1990

***Eudistoma carnosum*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [201].

Type data: holotype AM Y1289, paratype(s) AM Y1290, Y1291.

Type locality: Fish Hook Bay, Cape Vlamingh, Rottneest Is., WA.

Distribution: NT (N coast), WA (Lower W coast).

Ecology: benthic, marine; under undercut of limestone reefs.

Reference: Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [42].

***Eudistoma constrictum*** Kott, 1990

***Eudistoma constrictum*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [203].

Type data: holotype SAMA E2083, paratype(s) QM GH2291, GH4186.

Type locality: on headland near Chinaman's Hat Is., York Peninsula, Great Australian Bight, SA.

Distribution: SA (Great Australian Bight, S Gulfs coast).  
Ecology: benthic, marine.

***Eudistoma eboreum* Kott, 1990**

***Eudistoma eboreum*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [205].  
Type data: holotype QM GH336.  
Type locality: MacGillivray's Reef, near Lizard Is., 14 m, QLD.

Distribution: QLD (Great Barrier Reef); known only from type locality.  
Ecology: benthic, marine.  
Reference: Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [39 and Fig. 22a].

***Eudistoma elongatum* (Herdman, 1886)**

***Colella elongata*** Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiæ compositæ. *Zool. Chall. Exped.* **14**(38): 1–425 [110].  
Type data: type status unknown BMNH (depository uncertain, not found).  
Type locality: Port Jackson, 60 m, NSW.

Distribution: NSW (Central E coast, Lower E coast), QLD (Central E coast).  
Ecology: benthic, marine; muddy habitats and wharf piles in protected waters.  
Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [205].

***Eudistoma gilboviride* (Sluiter, 1909)**

***Polycitor gilboviridis*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [6].  
Type data: lectotype ZMA TU1269, paralectotype(s) ZMA TU788.  
Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [186].  
Type locality: reef, Kabaena Is., Indonesia.

Distribution: Indonesia, Papua New Guinea, Palau, QLD (Great Barrier Reef).  
Ecology: benthic, marine.  
References: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [206]; Monniot, F. & Monniot, C. (1996). New collections of ascidians from the western Pacific and Southeastern Asia. *Micronesica* **29**(2): 133–279 [189].

***Eudistoma glaucum* (Sluiter, 1909)**

***Polycitor glaucus*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [12].  
Type data: holotype ZMA TU790.  
Type locality: 274 m, Indonesia [8°19'S 117°41'E].

***Eudistoma rigida*** Tokioka, T. (1955). Ascidians from the Palao Islands II. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **5**(1): 43–57 [50].  
Type data: syntypes SMBL 98\*.  
Type locality: reef, off Gadaraku, Palau Is.

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [208].

Distribution: Indonesia, QLD (Great Barrier Reef); west Pacific Ocean.  
Ecology: benthic, marine.

***Eudistoma globosum* Kott, 1957**

***Eudistoma globosum*** Kott, P. (1957). Ascidians of Australia II. Aplousobranchiata Lahille; Clavelinidae Forbes and Hanley and Polyclinidae Verrill. *Aust. J. Mar. Freshwat. Res.* **8**(1): 64–110 [72].  
Type data: syntypes AM Y1275 (whereabouts of other syntype(s) unknown).  
Type locality: Little Geordie Bay, Rottneest Is., WA.

Distribution: QLD (Great Barrier Reef), WA (Lower W coast).  
Ecology: benthic, marine.  
Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [210].

***Eudistoma gracilum* Kott, 1990**

***Eudistoma gracilum*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [211].  
Type data: holotype QM GH4531, paratype(s) QM GH4532.  
Type locality: north reef, Heron Is., QLD.

Distribution: QLD (Great Barrier Reef); known only from type locality.  
Ecology: benthic, marine.

***Eudistoma incubitum* Kott, 1990**

***Eudistoma incubitum*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [212].  
Type data: holotype QM GH4537, paratype(s) QM GH4538.  
Type locality: NW Wistari Reef, Capricorn Group, QLD.

Distribution: QLD (Great Barrier Reef); known only from type locality.  
Ecology: benthic, marine.

***Eudistoma laysani* (Sluiter, 1900)**

***Distoma laysani*** Sluiter, C.P. (1900). Tunicaten aus dem Stillen Ocean. *Zool. Jahrb. Syst.* **13**: 1–35 [9].  
Type data: syntypes ZMA TU795\*.  
Type locality: Laysan.



***Distoma parva*** Sluiter, C.P. (1900). Tunicaten aus dem Stillen Ocean. *Zool. Jahrb. Syst.* **13**: 1–35 [6].

Type data: lectotype ZMA TU1301\*, paralectotype(s) ZMA TU508, TU803\*.

Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [176].

Type locality: Laysan, Indonesia.

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [214].

Distribution: Philippines, Indonesia, Palau, Hawaii, Lord Howe Island, NSW (Central E coast, Lower E coast, SE oceanic), QLD (Central E coast, Great Barrier Reef, NE coast); west Pacific Ocean.

Ecology: benthic, marine; from high intertidal region.

***Eudistoma maculosum*** Kott, 1990

***Eudistoma maculosum*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [216].

Type data: holotype QM GH1304, paratype(s) QM GH1278, GH2391.

Type locality: Ward Is., 20–25 m, SA.

Distribution: NSW (Lower E coast), SA (Great Australian Bight, S Gulfs coast), VIC (Bass Strait), WA (Lower W coast).

Ecology: benthic, marine.

***Eudistoma malum*** Kott, 1990

***Eudistoma malum*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [217].

Type data: holotype QM G11939, paratype(s) QM G11940.

Type locality: Heron Is., Capricorn Group, 10 m, QLD.

Distribution: QLD (Great Barrier Reef).

Ecology: benthic, marine.

***Eudistoma microlarvum*** Kott, 1990

***Eudistoma microlarvum*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [218].

Type data: holotype QM GH4520, paratype(s) QM GH4521.

Type locality: Point Lookout, North Stradbroke Is., QLD.

Distribution: QLD (Central E coast).

Ecology: benthic, marine; sandy habitats.

***Eudistoma ovatum*** (Herdman, 1886)

***Psammaphidium ovatum*** Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiacea compositae. *Zool. Chall. Exped.* **14**(38): 1–425 [246].

Type data: holotype BMNH BM 30.9.23.19\*.

Type locality: Torres Strait, Cape Boileau, 6–22 m, northern Australia.

Distribution: NT (N coast); west Pacific Ocean.

Ecology: benthic, marine.

Reference: Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [42].

***Eudistoma pratulum*** Kott, 1990

***Eudistoma pratulum*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [224].

Type data: holotype QM GH4606, paratype(s) QM GH4607.

Type locality: Heron Is., QLD.

Distribution: QLD (NE coast); known only from type locality.

Ecology: benthic, marine; low water mark.

***Eudistoma purpureum*** Kott, 1990

***Eudistoma purpureum*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [225].

Type data: holotype QM GH4466, paratype(s) QM GH4467, GH4455.

Type locality: near reef edge, Wistari Reef, QLD.

Distribution: QLD (Great Barrier Reef).

Ecology: benthic, marine.

***Eudistoma pyriforme*** (Herdman, 1886)

***Psammaphidium pyriforme*** Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiacea compositae. *Zool. Chall. Exped.* **14**(38): 1–425 [419].

Type data: holotype BMNH 1887.2.4.482.

Type locality: Flinders Passage, 16 m, Torres Strait [10°30'S 142°18'E].

***Polycitor arenaceus*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [13].

Type data: holotype ZMA TU782.

Type locality: reef, Sawan, Sian Is., Indonesia.

***Eudistoma vulgare*** Monniot, F. (1988). Ascidiées de Nouvelle-Calédonie V. Polycitoridae du Lagon. *Bull. Mus. Natl. Hist. Nat. Paris (4)* **10A**(2): 197–235 [213].

Type data: holotype MNHP A3 Eud 57.

Type locality: New Caledonia.

Taxonomic decision for synonymy: Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [42].

Distribution: Indonesia, QLD (Great Barrier Reef, NE coast), WA (NW coast).

Ecology: benthic, marine.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [226].

***Eudistoma reginum*** Kott, 1990

***Eudistoma reginum*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [228].

Type data: holotype QM G11948, paratype(s) QM G11949, G11950, G11951.

Type locality: reef edge, Heron Is., QLD.

Distribution: Indonesia, Palau, QLD (Great Barrier Reef).

Ecology: benthic, marine; underside of rubble behind reef edge.

***Eudistoma sabulosum* Kott, 1990**

*Eudistoma sabulosum* Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [229].

Type data: holotype QM GH937, paratype(s) QM GH4591.  
Type locality: Topgallant Is., 5 m, SA.

Distribution: SA (S Gulfs coast), VIC (Bass Strait).

Ecology: benthic, marine.

***Eudistoma sluiteri* Hartmeyer, 1909**

*Eudistoma sluiteri* Hartmeyer, R. (1909). Ascidién (continuation of work by Seeliger). pp. 1281–1488 in Bronn, H.G. *Klassen und Ordnungen des Tier-Reichs*. Leipzig: C.F. Winter Vol. 3, suppl. pts 81–87 [1488] [*nom. nov.* for *Polycitor mollis* Sluiter, 1909].

*Polycitor mollis* Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidién. *Siboga Exped.* **56B**: 1–112 [11] [junior homonym of *Eudistoma molle* (Ritter, 1900)].

Type data: holotype ZMA TU801.

Type locality: Kamboragi Bay, Tanal Djampeah, Indonesia.

*Eudistoma muscosum* Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [220] [unnecessary *nom. nov.* for *Polycitor mollis* Sluiter, 1909].

Distribution: Indonesia, NT (N coast), QLD (Great Barrier Reef).

Ecology: benthic, marine.

Reference: Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [43].

***Eudistoma superlatum* Kott, 1990**

*Eudistoma superlatum* Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [229].

Type data: holotype WAM 822.83 (QM GH2136), paratype(s) WAM 189.75.

Type locality: near South Passage, Shark Bay, 10–15 m, WA.

Distribution: NT (N coast), WA (Central W coast, Lower W coast, NW coast).

Ecology: benthic, marine.

Reference: Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [27].

***Eudistoma tigrum* Kott, 1990**

*Eudistoma tigrum* Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [231].

Type data: holotype QM G11941, paratype(s) QM G11942–4, GH1362.

Type locality: Heron Is., Great Barrier Reef, QLD.

Distribution: Fiji, QLD (Great Barrier Reef), WA (Lower W coast).

Ecology: benthic, marine; lower water mark, rubble zone.

***Eudistoma tumidum* Kott, 1990**

*Eudistoma tumidum* Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [232].

Type data: holotype AM Y1068.

Type locality: Gulf of Carpentaria, NT [16°52'42"S 140°56'12"E].

Distribution: QLD (Gulf of Carpentaria); known only from type locality.

Ecology: benthic, marine.

***Polycitor* Renier, 1804**

*Polycitor* Renier, S.A. (1804). Prospetto della classe dei Vermi pp. XV–XXVII. Padua (see Porro, C. 1840, 'Nota per una Bibliografia Malacologie, Series III Geografica no. 1–4, pp. I–III and numbered columns 27–130). [XVII] [validated under plenary powers, see Hemming, F. & Noakes, D. (eds) (1958). *Official List of Generic Names in Zoology*. First instalment. London: International Trust for Zoological Nomenclature 200 pp.].

Type species: *Polycitor crystallinus* Renier, 1804 by monotypy.

*Paradistoma* Caullery, M. (1909). Recherches sur la famille des Distomidae. *Bull. Scient. Fr. Belg.* **42**: 1–59 [44] [first introduced as a subgenus of *Distoma* Savigny, 1816; junior objective synonym of *Polycitor* Renier, 1804].

Type species: *Polycitor crystallinus* Renier, 1804 by subsequent designation, see Harant, H. (1929). Ascidiées provenant des croisières du Prince Albert 1<sup>er</sup> de Monaco. *Résultats de Campagnes Scientifique accomplies (Monaco)* **75**: 1–110 [40].

*Tetrazona* Michaelsen, W. (1930). Ascidiæ Krikobranthiæ. *Fauna Südwest-Aust.* **5**(7): 463–558 [481].

Type species: *Distoma glareosa* Sluiter, 1906 by original designation.

Taxonomic decision for synonymy: Hartmeyer, R. (1912). Die Ascidién der Deutschen Tiefsee Expedition. *Wiss. Ergebn. dt. Tiefsee-Exped. 'Valdivia'* **16**(3): 223–392 [298]; Van Name, W.G. (1945). The North and South American ascidians. *Bull. Am. Mus. Nat. Hist.* **84**: 1–476 [132].

Generic reference: Caullery, M. (1909). Recherches sur la famille des Distomidae. *Bull. Scient. Fr. Belg.* **42**: 1–59 [43].

***Polycitor annulus* Kott, 1990**

*Polycitor annulus* Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [165].

Type data: holotype QM GH4350, paratype(s) QM GH4348, GH4351, GH4346.

Type locality: near reef edge, Heron Is., Capricorn Group, QLD.

Distribution: QLD (Great Barrier Reef).  
Ecology: benthic, marine.

***Polycitor calamus* Kott, 1990**

***Polycitor calamus*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [167].  
Type data: holotype SAMA E2058, paratypes SAMA E2051, E2057, QM GH4187–8, GH4308.  
Type locality: Archipelago Cove, 40 m, SA.

Distribution: NSW (Lower E coast), SA (Great Australian Bight, S Gulfs coast).

Ecology: benthic, marine; common in *Posidonia* [Posidoniaceae] beds.

***Polycitor cerasus* Kott, 1990**

***Polycitor cerasus*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [168].  
Type data: holotype SAMA E2080, paratype(s) QM GH4365.  
Type locality: Breaking Reef, Franklin Is., Nuyts Archipelago, 15 m, SA.

Distribution: SA (Great Australian Bight); known only from type locality.

Ecology: benthic, marine; 15 m, amongst algae.

***Polycitor circes* Michaelsen, 1930**

***Polycitor circes*** Michaelsen, W. (1930). Ascidiace Krikobranchiae. *Fauna Südwest-Aust.* **5**(7): 463–558 [495].  
Type data: syntypes (probable) ZMB 3897\* (whereabouts of other syntype(s) unknown).  
Type locality: Shark Bay, off Dirk Hartog Is., 2.5–4.5 m, WA.

***Polycitor gelatinosa*** Kott, P. (1957). Ascidiaceans of Australia II. Aplousobranchiata Lahille; Clavelinidae Forbes and Hanley and Polyclinidae Verrill. *Aust. J. Mar. Freshwat. Res.* **8**(1): 64–110 [83].

Type data: syntypes AM Y1310.

Type locality: Mary Cove, Rottnest Is., WA.

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [169].

Distribution: QLD (NE coast), WA (Central W coast, Lower W coast, NW coast); west Pacific Ocean.

Ecology: benthic, marine.

References: Kott, P. (2002). Ascidiacea (Tunicata) from Darwin, Northern Territory, Australia. *Beagle, Rec. Mus. Art Galleries NT* **18**: 19–55 [26]; Kott, P. (2003). New syntheses and new species in the Australian Ascidiacea. *J. Nat. Hist.* **37**: 1611–1653 [1623].

***Polycitor columna* Kott, 1954**

***Polycitor columna*** Kott, P. (1954). Tunicata, Ascidiaceans. *Rep. B.A.N.Z. Antarct. Res. Exped.* **1**(4): 121–182 [153].  
Type data: syntypes AM Y1297.  
Type locality: Maria Is., TAS.

Distribution: TAS (Tas. coast).  
Ecology: benthic, marine.

***Polycitor emergens* Kott, 1990**

***Polycitor emergens*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [170].  
Type data: holotype AM Y1124, paratype(s) AM Y837.  
Type locality: off Cronulla, 60 m, NSW.

Distribution: NSW (Lower E coast), TAS (Tas. coast).  
Ecology: benthic, marine.

***Polycitor giganteus* (Herdman, 1899)**

***Polycitor giganteum*** Herdman, W.A. (1898). Note on the Tunicata fauna of Australian seas. *Ann. Mag. Nat. Hist.* **7**(1): 443–450 [448] [*nom. nud.*].

***Polyclinum giganteum*** Herdman, W.A. (1899). Descriptive catalogue of the Tunicata in the Australian Museum. *Australian Museum, Sydney, Catalogue* **17**: 1–139 [79].  
Type data: syntypes AM U163 (G2099).  
Type locality: Port Jackson, NSW.

***Polyclinum globosum*** Herdman, W.A. (1899). Descriptive catalogue of the Tunicata in the Australian Museum. *Australian Museum, Sydney, Catalogue* **17**: 1–139 [80].  
Type data: syntypes AM U157 (G2100), AM G12253.  
Type locality: Port Jackson, NSW.

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [171].

Distribution: NSW (Central E coast, Lower E coast), QLD (Central E coast), SA (Great Australian Bight, S Gulfs coast), TAS (Bass Strait, Tas. coast), VIC (Bass Strait), WA (Central W coast).

Ecology: benthic, marine; shallow subtidal waters–24 m.

***Polycitor nubilus* Kott, 1990**

***Polycitor nubilus*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [174].  
Type data: holotype SAM E2079.  
Type locality: Lighthouse Point, Flinders Is., Investigator Group, 8 m, SA.

Distribution: SA (S Gulfs coast).  
Ecology: benthic, marine; 8 m in caves and overhangs.

***Polycitor obeliscus* Kott, 1972**

***Polycitor obeliscum*** Kott, P. (1972). The ascidiaceans of South Australia II. Eastern Sector of the Great Australian Bight and Investigator Strait. *Trans. R. Soc. S. Aust.* **96**(4): 165–196 [171].  
Type data: holotype NMV H167.  
Type locality: reef, Investigator Strait, 30 m, SA.

Distribution: SA (S Gulfs coast); known only from type locality.  
Ecology: benthic, marine.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [175].

***Polycitor protectans*** (Herdman, 1899)

*Amaroucium protectans* Herdman, W.A. (1899). Descriptive catalogue of the Tunicata in the Australian Museum. *Australian Museum, Sydney, Catalogue* **17**: 1–139 [73].

Type data: holotype AM U160 (G2105).

Type locality: Port Jackson, New South Wales.

Distribution: NSW (Lower E coast); known only from type locality.

Ecology: benthic, marine.

Reference: Monniot, F. & Monniot, C. (1996). New collections of ascidians from the western Pacific and Southeastern Asia. *Micronesica* **29**(2): 133–279 [139].

***Polycitor subarborensis*** Kott, 1957

*Polycitor subarborensis* Kott, P. (1957). Ascidians of Australia II. Aplousobranchiata Lahille; Clavelinidae Forbes and Hanley and Polyclinidae Verrill. *Aust. J. Mar. Freshwat. Res.* **8**(1): 64–110 [81].

Type data: holotype AM Y1298.

Type locality: Brush Is., off Ulladulla, 90 m, NSW.

Distribution: NSW (Lower E coast); known only from type locality.

Ecology: benthic, marine.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

***Polycitor translucidus*** Kott, 1957

*Polycitor translucida* Kott, P. (1957). Ascidians of Australia II. Aplousobranchiata Lahille; Clavelinidae Forbes and Hanley and Polyclinidae Verrill. *Aust. J. Mar. Freshwat. Res.* **8**(1): 64–110 [81].

Type data: syntypes AM Y1301.

Type locality: reef, west of Point John, Point Peron, WA.

Distribution: Philippines, New Caledonia, French Polynesia, QLD (Great Barrier Reef), VIC (Bass Strait), WA (Lower W coast, NW coast).

Ecology: benthic, marine.

Reference: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

***Salix*** Kott, nom. nov.

*Exostoma* Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [233].

Type species: *Polycitor ianthinus* Sluiter, 1909 by original designation.

*Salix* nom. nov. [for *Exostoma* Kott, 1990].

Extralimital distribution: tropical west Pacific Ocean. See: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

***Salix ianthina*** (Sluiter, 1909)

*Polycitor ianthinus* Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [20].

Type data: lectotype ZMA TU791, paralectotype(s) ZMA TU792.

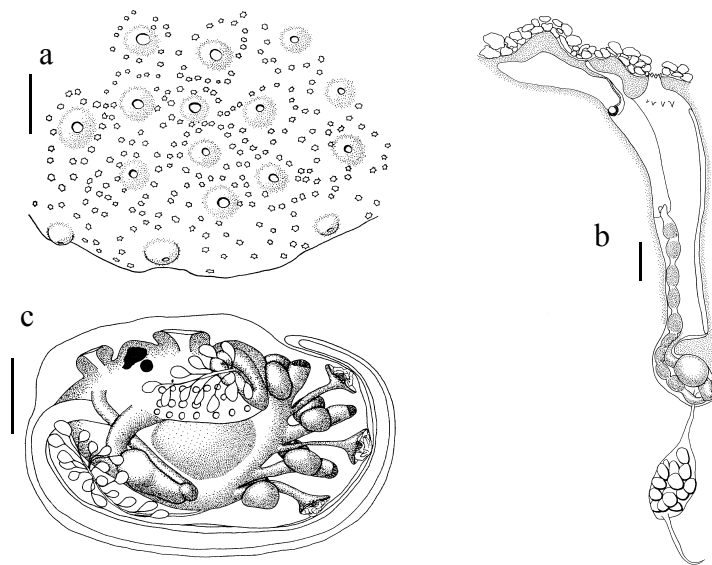
Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [186].

Type locality: reef, Nusa Laut Is., Indonesia.

Distribution: Indonesia, New Guinea, QLD (Great Barrier Reef); west Pacific Ocean.

Ecology: benthic, marine; sea grass beds.

## POLYCLINIDAE



**Fig. 8.** *Polyclinum* spp.: **a**, colony surface showing common cloacal apertures, each surrounded by a circle of branchial apertures; **b**, zooid in test (sand on surface) showing atrial tongue above cloacal cavity; **c**, larva. (Scale bars: a = 2.0 mm; b, 0.5 mm; c, 0.1 mm). [from Kott 1992]

Polyclinidae Milne-Edwards, 1841 is one of the most diverse families of the Aplousobranchia. Six genera are represented in Australian waters. All have embedded zooids with 6-lobed or (occasionally) 8-lobed branchial apertures and smooth-rimmed atrial apertures, usually with a tongue from the upper rim of the opening or from the body wall anterior to the opening. Zooids may be arranged with their atrial openings into sometimes extensive branching cloacal canals or in circular systems around simple cloacal cavities. Colonies vary from small cushions to large irregular and sometimes lobed masses, or stalked heads, and many species have sand or other particles embedded in the test. Gonads are in a thread- or sac-like posterior abdomen with the testis follicles respectively serially arranged or bunched. The ovary is small and is anterior to the testis follicles. Fertilisation appears to occur in the atrial cavity or the distal end of the oviduct, where embryos are found at different stages of development. The gut loop is relatively short and the stomach is about halfway down the descending limb.

The stomach wall has parallel longitudinal folds in *Aplidium* Savigny, 1816 and is either smooth or has mulberry-like pockets in its wall in *Polyclinum* Savigny, 1816, *Aplidiopsis* Lahille, 1890, *Synoicum* Phipps, 1774, *Morchellium* Giard, 1872 and *Sidneioides* Kesteven, 1909. *Aplidium* often has long, thread-like posterior abdomina. The posterior abdomina of *Synoicum* and *Morchellium* are seldom so long. In *Polyclinum*, *Aplidiopsis* and *Sidneioides* the abdomen is separated from a more or less sac-like posterior abdomen by a constriction. The last three genera have larvae with vesicles separating from posteriorly projecting bilateral strands of larval ectoderm, one strand each side of the dorsal midline, and one each side of the postero-ventral corner of the larvae trunk, as well as anterior epidermal ampullae and adhesive organs. *Aplidium* usually has epidermal vesicles separating from the epidermis at the anterior end of the larval trunk around and amongst the adhesive organs. *Synoicum* has

## POLYCLINIDAE

a stomach wall and larval epidermal vesicles like *Polyclinum*, *Aplidiopsis* and *Sidneioides*. The phylogenetic position of *Morchellium* is uncertain. It may be allied to *Aplidium*, the stomach being more barrel-shaped than the dorsally shortened stomach of *Polyclinum*. Larvae are not known for the Australian species of *Morchellium*, but the English Channel species, *M. argus* (see Berrill 1950), has anterior vesicles similar to those of *Aplidium*.

*Polyclinum* has branchial papillae, possible vestiges of the inner longitudinal branchial vessels found also in Protopolyclinidae, suggesting a protopolyclinid ancestry for *Polyclinum* and its related genera *Aplidiopsis*, *Sidneioides* and probably *Synoicum*. However, the folded stomach wall, and thread-like posterior abdomina of Ritterellidae suggest a direct relationship with *Aplidium*. Polyclinidae may therefore be polyphyletic, for although most of the genera are related to one another and appear to have an ancestor in the Protopolyclinidae, *Aplidium* and possibly *Morchellium* may have evolved from Ritterellidae after its isolation from the Protopolyclinidae.

*Aplidium* is one of the most speciose of the genera in tropical, temperate and polar waters in most parts of the world including Australia where 47 species are recorded. *Synoicum* (22 species) and *Polyclinum* (12 species) are also well represented. Two species each of *Aplidiopsis* and *Morchellium* are known from Australia, as well as one of the two known species of *Sidneioides* (see Kott 1992). As in other families, tropical species appear to have a wider range than temperate ones.

## References

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### *Aplidiopsis* Lahille, 1890

*Aplidiopsis* Lahille, F. (1890). *Recherches sur les tuniciers des côtes de France*. Toulouse : Lagarde et Sebillé 330 pp. [206].

Type species: *Aplidium vitreum* Lahille, 1887 by monotypy.

Extralimital distribution: tropical Atlantic, Mediterranean Sea, north Atlantic Ocean, temperate west Pacific Ocean. See: Kott, P. (1990). The Australian Ascidacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

### *Aplidiopsis confluenta* Kott, 1992

*Aplidiopsis confluenta* Kott, P. (1992). The Australian Ascidacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [468].

Type data: holotype QM GH5514.

Type locality: Ninepin Point, 5 m, TAS.

Distribution: TAS (Tas. coast); known only from type locality.

Ecology: benthic, marine.

***Aplidiopsis mammillata* Kott, 1992**

*Aplidiopsis mammillata* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [469].

Type data: holotype QM GH4168.

Type locality: Cathedral Rock, near Thistle Is., Spencer Gulf, SA.

Distribution: SA (S Gulfs coast); known only from type locality.

Ecology: benthic, marine.

***Aplidiopsis sabulosa* Kott, 1992**

*Aplidiopsis sabulosa* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [470].

Type data: holotype QM GH4153.

Type locality: Avoid Bay, Price Is., 15–20 m, SA.

Distribution: SA (Great Australian Bight); known only from type locality.

Ecology: benthic, marine; 15–20 m.

***Aplidium* Savigny, 1816**

*Aplidium* Savigny, J.C. (1816). Recherches anatomiques sur les ascidies composées et sur les ascidies simples—Système de la classe des Ascidies pp. 1–239. In *Mémoires sur les Animaux sans Vertèbres*, Pt 2. Paris : G. Dufour. [182].

Type species: *Aplidium lobatum* Savigny, 1816 by subsequent designation, see Hartmeyer, R. (1924). Ascidiacea, part II. Zugleich eine Übersicht über die Arktische und boreale Ascidienfauna auf tiergeographischer Grundlage. *Ingolf-Exped.* **2**(7): 1–275.

*Sidnyum* Savigny, J.C. (1816). Recherches anatomiques sur les ascidies composées et sur les ascidies simples—Système de la classe des Ascidies pp. 1–239. In *Mémoires sur les Animaux sans Vertèbres*, Pt 2. Paris : G. Dufour. [238].

Type species: *Sidnyum turbinatum* Savigny, 1816 by subsequent designation, see Hartmeyer, R. (1924). Ascidiacea, part II. Zugleich eine Übersicht über die Arktische und boreale Ascidienfauna auf tiergeographischer Grundlage. *Ingolf-Exped.* **2**(7): 1–275.

*Amaroucium* Milne-Edwards, H. (1841). Observations sur les ascidies composées des côtes de la Manche. *Mem. Acad. Sci. Inst. Fr.* **18**: 217–326 [283].

Type species: *Amaroucium proliferum* Milne-Edwards, 1841 by original designation.

*Parascidia* Milne-Edwards, H. (1841). Observations sur les ascidies composées des côtes de la Manche. *Mem. Acad. Sci. Inst. Fr.* **18**: 217–326 [291].

Type species: *Parascidia flavum* Milne-Edwards, 1841 by monotypy.

*Circinalium* Giard, A.M. (1872). Recherches sur les ascidies composées ou synascidies. *Arch. Zool. Exp. Gén.* **1**: 613–662 [639].

Type species: *Circinalium conrescens* Giard, 1872 by monotypy.

*Fragarium* Giard, A.M. (1872). Recherches sur les ascidies composées ou synascidies. *Arch. Zool. Exp. Gén.* **1**: 613–662 [638].

Type species: *Fragarium elegans* Giard, 1872 by monotypy.

*Psammaplidium* Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiaceae compositae. *Zool. Chall. Exped.* **14**(38): 1–425 [237].

Type species: *Psammaplidium spongiforme* Herdman, 1886 by original designation.

*Heterotrema* Fiedler, K. (1889). *Heterotrema sarasinorum*, eine neue Synascidiengattung aus der familie der Distomidae. *Zool. Jahrb. Jena* **4**: 859–878 [877].

Type species: *Heterotrema sarasinorum* Fiedler, 1889 by monotypy.

*Macreteron* Redikorzev, V. (1927). Zehn neue Ascidien aus dem fernen Osten. *Zool. Jahrb. Jena* **53**: 373–404 [378].

Type species: *Macreteron ritteri* Redikorzev, 1927 by original designation.

Taxonomic decision for synonymy: Harant, H. (1929). Ascidies provenant des croisières du Prince Albert 1er de Monaco. *Résultats de Campagnes Scientifique accomplies (Monaco)* **75**: 1–110 [19, 20]; Huus, J. (1937). Ascidiaceae. pp. 545–692 in Kükenthal, W. & Krumbach, T. (eds) *Handbuch der Zoologie*. Berlin : Walter de Gruyter Vol. 5(2)6 [666]; Millar, R.H. (1962). Further descriptions of South African ascidians. *Ann. S. Afr. Mus.* **56**(7): 113–221 [128]; Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [509].

Extralimital distribution: worldwide. See: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620.

***Aplidium acroporum* Kott, 1992**

*Aplidium acroporum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [513].

Type data: holotype SAMA E2554 (QM GH4169), paratype(s) QM GH5443, GH5431.

Type locality: The Gap, near Thistle Is., Spencer Gulf, SA.

Distribution: SA (S Gulfs coast).

Ecology: benthic, marine; in algae covering rocks merging to sand and sea grass, 12 m.

***Aplidium altarium* (Sluiter, 1909)**

*Amaroucium altarium* Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [105].

Type data: holotype ZMA TU176.

Type locality: Nalahia Bay, Nusa Laut Is., 46 m, Indonesia, see Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200.

Distribution: Indonesia, NT (N coast), QLD (Great Barrier Reef, NE coast), WA (Central W coast, Lower W coast, N coast, NW coast).

Ecology: benthic, marine.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [519].

***Aplidium amorphatum* Kott, 1963**

*Aplidium amorphatum* Kott, P. (1963). The ascidians of Australia IV. Aplousobranchiata Lahille; Polyclinidae Verrill (continued). *Aust. J. Mar. Freshwat. Res.* **14**(1): 70–118 [101].

Type data: holotype AM U3918.

Type locality: Bass Strait, 36 m, VIC [28°51'S 146°55'E].

*Aplidium pseudobesum* Kott, P. (1963). The ascidians of Australia IV. Aplousobranchiata Lahille; Polyclinidae Verrill (continued). *Aust. J. Mar. Freshwat. Res.* **14**(1): 70–118 [101].

Type data: holotype AM Y1292, paratype(s) AM U3924, U3922.

Type locality: Tathra, near Green Cape, NSW.

Taxonomic decision for synonymy: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [522].

Distribution: NSW (Lower E coast), SA (Great Australian Bight), VIC (Bass Strait).

Ecology: benthic, marine.

***Aplidium australiense* Kott, 1963**

*Aplidium australiense* Kott, P. (1963). The ascidians of Australia IV. Aplousobranchiata Lahille; Polyclinidae Verrill (continued). *Aust. J. Mar. Freshwat. Res.* **14**(1): 70–118 [111].

Type data: holotype AM Y1398, paratype(s) AM U3914.

Type locality: Shoreham, VIC.

Distribution: SA (Great Australian Bight, S Gulfs coast), VIC (Bass Strait), WA (Great Australian Bight, SW coast).

Ecology: benthic, marine.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [523].

***Aplidium bacculum* Kott, 1992**

*Aplidium bacculum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [526].

Type data: holotype QM GH5434.

Type locality: Edithburgh, Yorke Peninsula, 12 m, SA [35°97'S 137°47'24"E].

Distribution: SA (Great Australian Bight, S Gulfs coast).

Ecology: benthic, marine.

***Aplidium brevilarvacium* Kott, 1963**

*Aplidium brevilarvacium* Kott, P. (1963). The ascidians of Australia IV. Aplousobranchiata Lahille; Polyclinidae Verrill (continued). *Aust. J. Mar. Freshwat. Res.* **14**(1): 70–118 [113].

Type data: holotype AM U3926.

Type locality: Sugarloaf Rock, Cape Naturaliste, S WA.

*Aplidium digitatum* Kott, P. (1975). The ascidians of South Australia III. Northern sector of the Great Australian Bight and additional records. *Trans. R. Soc. S. Aust.* **99**(1): 1–20 [7].

Type data: holotype SAMA E1030, paratypes QM G7508, AM Y1982.

Type locality: northern Great Australian Bight, 49 m, SA [32°24'S 133°30'E].

Taxonomic decision for synonymy: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [527].

Distribution: SA (Great Australian Bight, S Gulfs coast), WA (Lower W coast); isolated record from Heron Is., QLD.

Ecology: benthic, marine.

***Aplidium caelestis* Monniot, 1987**

*Aplidium caelestis* Monniot, F. (1987). Ascidies de Nouvelle-Calédonie III. Polyclinidae du lagon. *Bull. Mus. Natl. Hist. Nat. Paris* (4) **9A**(3): 499–535 [517].

Type data: syntypes MNHP A1-Apl B-221\*.

Type locality: Woodin Canal, 20–27 m, New Caledonia.

Distribution: New Caledonia, Norfolk Island, QLD (Great Barrier Reef), SA (S Gulfs coast), VIC (Bass Strait, SE oceanic), WA (Central W coast, Lower W coast); Marianas.

Ecology: benthic, marine.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [528].

***Aplidium clivosum* Kott, 1992**

*Aplidium clivosum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [530].

Type data: holotype SAMA E2561, paratype(s) QM G1197.

Type locality: on jetty piles, SE Beachport, 6–7 m, SA.

Distribution: NSW (Lower E coast), NT (N coast), QLD (Great Barrier Reef), SA (Great Australian Bight, S Gulfs coast), WA (Central W coast, Lower W coast, NW coast).

Ecology: benthic, marine.

***Aplidium congregatum* Kott, 1992**

*Aplidium congregatum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [533].

Type data: holotype QM GH5584.

Type locality: Point Lookout, N Stradbroke Is., QLD.

Distribution: QLD (Central E coast); known only from type locality.

Ecology: benthic, marine; tucked into narrow rocky crevices.

***Aplidium coniferum* Kott, 1963**

*Aplidium coniferum* Kott, P. (1963). The ascidians of Australia IV. Aplousobranchiata Lahille; Polyclinidae Verrill (continued). *Aust. J. Mar. Freshwat. Res.* **14**(1): 70–118 [102].

Type data: holotype AM U3921.

Type locality: near Twofold Bay, 57–65 m, NSW.



Distribution: NSW (Lower E coast), SA (Great Australian Bight), TAS (Bass Strait), VIC (Bass Strait).

Ecology: benthic, marine; to 400 m.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [535].

***Aplidium crateriferum*** (Sluiter, 1909)

*Amaroucium crateriferum* Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Asciden. *Siboga Exped.* **56B**: 1–112 [103].

Type data: lectotype ZMA TU1278, paralectotype(s) ZMA TU179.

Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [159].

Type locality: Sulu harbour, Sulu Is., 14 m, Indonesia.

Distribution: Philippines, QLD (Great Barrier Reef), WA (NW coast).

Ecology: benthic, marine.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [536].

***Aplidium depressum*** Sluiter, 1909

*Aplidium depressum* Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Asciden. *Siboga Exped.* **56B**: 1–112 [102].

Type data: holotype ZMA TU201.

Type locality: 521 m, Indonesia [7°35'24"S 117°28'36"E].

Distribution: Indonesia, Hong Kong, QLD (Great Barrier Reef, NE coast).

Ecology: benthic, marine; often on carapace of crabs.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620.

***Aplidium directum*** Kott, 1972

*Aplidium directum* Kott, P. (1972). Notes on some ascidians from Port Jackson, Botany Bay and Port Hacking NSW. *Proc. Linn. Soc. N.S.W.* **97**(4): 241–257 [246].

Type data: holotype AM Y1110, paratype(s) AM Y111.

Type locality: off Cronulla, 90 m, NSW.

Distribution: NSW (Central E coast, Lower E coast), QLD (Central E coast).

Ecology: benthic, marine; 6–140 m on sea floor.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [539].

***Aplidium distaplium*** Kott, 1992

*Aplidium distaplium* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [540].

Type data: holotype QM G12728, paratype(s) QM G12729.

Type locality: 560 m off shore, 10 km SW Seaspray, off Ninety Mile Beach, Bass Strait, VIC.

Distribution: SA (S Gulfs coast), VIC (Bass Strait).

Ecology: benthic, marine; 12 m, fast current on calcarenite reef.

***Aplidium elatum*** Kott, 1972

*Aplidium elatum* Kott, P. (1972). The ascidians of South Australia II. Eastern Sector of the Great Australian Bight and Investigator Strait. *Trans. R. Soc. S. Aust.* **96**(4): 165–196 [177].

Type data: holotype SAMA E906, paratype(s) SAMA E905.

Type locality: Elliston Bay, 17 m, SA.

Distribution: SA (Great Australian Bight); known only from type locality.

Ecology: benthic, marine.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [541].

***Aplidium filiforme*** Kott, 1992

*Aplidium filiforme* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [542].

Type data: holotype QM GH5527, paratype(s) QM GH5528.

Type locality: Blue Pools, Heron Is., QLD.

Distribution: QLD (Great Barrier Reef), WA (Lower W coast).

Ecology: benthic, marine.

***Aplidium fluoescum*** Kott, 1992

*Aplidium fluoescum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [544].

Type data: holotype QM GH5243, paratype(s) QM GH5244, GH5245, GH5246, GH5247.

Type locality: NE Point, Heron Is., QLD.

Distribution: QLD (Great Barrier Reef, NE coast).

Ecology: benthic, marine; reef, rubble fauna.

***Aplidium gastrolineatum*** Kott, 1992

*Aplidium gastrolineatum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [546].

Type data: holotype SAMA E2584.

Type locality: Anxious Bay, 1 km NW of Waldegrave Is., 23 m, SA [33°33'S 134°46'E].

Distribution: SA (Great Australian Bight).

Ecology: benthic, marine; rocky bottom, slow current.

***Aplidium gelasinum*** Kott, 1992

*Aplidium gelasinum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [547].

Type data: holotype QM GH5333.

Type locality: Tydeman Reef, far northern Great Barrier Reef, QLD.

Distribution: QLD (Great Barrier Reef); known only from type locality.

Ecology: benthic, marine.

***Aplidium geminatum* Kott, 1992**

*Aplidium geminatum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [548].

Type data: holotype QM GH4175, paratype(s) QM GH4229.  
Type locality: Avoid Bay, Price Is., SA.

Distribution: SA (Great Australian Bight, S Gulfs coast), TAS (Bass Strait), VIC (Bass Strait).

Ecology: benthic, marine.

***Aplidium grisiatum* Kott, 1998**

*Aplidium griseum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [551] [junior primary homonym of *Aplidium griseum* Lahille, 1890].

Type data: holotype QM GH5212, paratype(s) QM GH5214, GH5215.

Type locality: near reef edge, Heron Is., QLD.

*Aplidium grisiatum* Kott, P. (1998). Tunicata. pp. 51–259 in Wells, A. & Houston, W.W.K. (eds) *Zoological Catalogue of Australia*. Hemichordata, Tunicata, Cephalochordata. Melbourne: CSIRO Publishing, Australia Vol. 34 298 pp. [119] [*nom. nov.* for *Aplidium griseum* Kott, 1992].

Distribution: Palau, NT (N coast), QLD (Great Barrier Reef).

Ecology: benthic, marine; under rubble near reef edge.

***Aplidium incubatum* Kott, 1992**

*Aplidium incubatum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [551].

Type data: holotype QM GH5309, paratype(s) QM GH5310.  
Type locality: Point Lookout, N Stradbroke Is., QLD.

Distribution: QLD (Central E coast).

Ecology: benthic, marine; rocky substrates, 0–10 m.

***Aplidium inflorescens* Kott, 1992**

*Aplidium inflorescens* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [553].

Type data: holotype SAMA E2588.

Type locality: NNE Cape Catastrophe, SW Point, Grindal Is., 18 m, SA.

Distribution: SA (Great Australian Bight), VIC (Bass Strait).

Ecology: benthic, marine.

***Aplidium jacksoni* Kott, 1963**

*Aplidium jacksoni* Kott, P. (1963). The ascidians of Australia IV. Aplousobranchiata Lahille; Polyclinidae Verrill (continued). *Aust. J. Mar. Freshwat. Res.* **14**(1): 70–118 [110].

Type data: holotype AM U3917.

Type locality: Port Jackson, NSW.

Distribution: NSW (Lower E coast).

Ecology: benthic, marine.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [554].

***Aplidium lenticulum* Kott, 1992**

*Aplidium lenticulum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [555].

Type data: holotype QM GH5060, paratype(s) QM GH5061.  
Type locality: Heron Is., 3 m, QLD.

Distribution: QLD (Great Barrier Reef), SA (Great Australian Bight), WA (Lower W coast).

Ecology: benthic, marine.

***Aplidium lodix* Kott, 1992**

*Aplidium lodix* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [557].

Type data: holotype QM G12712.

Type locality: Crawfish Rock, Western Port, VIC.

Distribution: SA (Great Australian Bight), VIC (Bass Strait).

Ecology: benthic, marine.

***Aplidium longithorax* Monniot, 1987**

*Aplidium longithorax* Monniot, F. (1987). Ascidiées de Nouvelle-Calédonie III. Polyclinidae du lagon. *Bull. Mus. Natl. Hist. Nat. Paris* (4)**9A**(3): 499–535 [525].

Type data: holotype MNHP Al-Apl B-210\*.

Type locality: lagoon, Woodin Canal, New Caledonia.

Distribution: Palau, New Caledonia, NSW (Lower E coast), QLD (Great Barrier Reef).

Ecology: benthic, marine; 0–100 m.

Reference: Monniot, F. & Monniot, C. (1996). New collections of ascidians from the western Pacific and Southeastern Asia. *Micronesica* **29**(2): 133–279 [139].

***Aplidium lunacratum* Kott, 1992**

*Psammaplidium ordinatum* Herdman, W. & Riddell, W. (1913). The Tunicata of the 'Thetis' Expedition. In, Scientific results of the Trawl Expedition Thetis, Part 17. *Mem. Aust. Mus.* **4**: 873–889 [884] [junior primary homonym of *Psammaplidium ordinatum* Sluiter, 1906].

Type data: holotype AM G12216.

Type locality: Manning River, NSW.

*Aplidium lunacratum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [558] [*nom. nov.* for *Psammaplidium ordinatum* Herdman & Riddell, 1913].

Distribution: NSW (Lower E coast), SA (Great Australian Bight, S Gulfs coast), VIC (Bass Strait), WA (Lower W coast).

Ecology: benthic, marine.

***Aplidium macrolobatum* Kott, 1992**

*Aplidium macrolobatum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [561].

Type data: holotype QM GH5169, paratype(s) QM GH5170.  
Type locality: outer edge of reef, NE Heron Is., QLD.

Distribution: QLD (Great Barrier Reef, NE coast).

Ecology: benthic, marine; on under-surface of rubble, outer edge of reef, sometimes on crabs.

***Aplidium magnilarvum* Kott, 1992**

*Aplidium magnilarvum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [563].

Type data: holotype SAMA E2582, paratype(s) SAMA E2583.

Type locality: 115 nautical miles SW of Eucla, 180 m, WA [38°17'S 129°37'E].

Distribution: WA (Great Australian Bight).

Ecology: benthic, marine; 180–190 m.

***Aplidium minisculum* Kott, 1992**

*Aplidium minisculum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [564].

Type data: holotype QM G11920.

Type locality: Portsea Pier, 2 m, VIC.

Distribution: VIC (Bass Strait).

Ecology: benthic, marine.

***Aplidium multilineatum* Kott, 1992**

*Aplidium multilineatum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [566].

Type data: holotype AM U3954.

Type locality: Salmon Bay, Rottnest Is., WA.

Distribution: TAS (Bass Strait), WA (Lower W coast).

Ecology: benthic, marine.

***Aplidium multiplicatum* Sluiter, 1909**

*Aplidium multiplicatum* Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [56].

Type data: lectotype ZMA TU 205, paralectotype(s) ZMA TU 203.

Subsequent designation: Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200 [160].

Type locality: Tual anchorage, Kei Is., 22 m, Indonesia.

*Aplidium controversum* Monniot, F. & Monniot, C. (1996). New collections of ascidians from the western Pacific and Southeastern Asia. *Micronesica* **29**(2): 133–279 [135].

Type data: holotype MNHP A1 Apl B312\*.

Type locality: Marine Lake, Koror State, Palau.

Taxonomic decision for synonymy: Kott, P. (2003). New syntheses and new species in the Australian Ascidiacea. *J. Nat. Hist.* **37**: 1611–1653 [1629].

Distribution: Philippines, Hong Kong, Palau, Kiribati, NSW (Lower E coast), NT (N coast), QLD (Great Barrier Reef, NE coast), SA (S Gulfs coast), WA (Central W coast, Lower W coast, NW coast); also Majura Atoll, Truk, Ponape.

Ecology: benthic, marine.

***Aplidium opacum* Kott, 1963**

*Aplidium opacum* Kott, P. (1963). The ascidians of Australia IV. Aplousobranchiata Lahille; Polyclinidae Verrill (continued). *Aust. J. Mar. Freshwat. Res.* **14**(1): 70–118 [108].

Type data: holotype AM U3929.

Type locality: Balnarring Beach, VIC.

*Aplidium foliorum* Kott, P. (1975). The ascidians of South Australia III. Northern sector of the Great Australian Bight and additional records. *Trans. R. Soc. S. Aust.* **99**(1): 1–20 [5].

Type data: holotype SAM E1036.

Type locality: northern Great Australian Bight, SA.

Taxonomic decision for synonymy: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [570].

Distribution: NSW (Lower E coast), SA (Great Australian Bight, S Gulfs coast), TAS (Bass Strait, Tas. coast), VIC (Bass Strait), WA (Lower W coast).

Ecology: benthic, marine.

***Aplidium ornatum* Kott, 1992**

*Aplidium ornatum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [572].

Type data: holotype QM GH5157.

Type locality: NW corner, Wistari Reef, QLD.

Distribution: QLD (Central E coast, Great Barrier Reef).

Ecology: benthic, marine; lower tide, under rubble near reef edge.

***Aplidium paralineatum* Kott, 1992**

*Aplidium paralineatum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [574].

Type data: holotype SAMA E10648.

Type locality: 45 nautical miles N of Sister Is., 92 m, TAS [39°00'S 148°25'E].

Distribution: TAS (Bass Strait); known only from type locality.

Ecology: benthic, marine; 92 m.

***Aplidium parastigmaticum* Kott, 1992**

*Aplidium parastigmaticum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [575].

Type data: holotype QM GH5603.

Type locality: reef slope, Heron Is., 10 m, QLD.

Distribution: QLD (Great Barrier Reef).

Ecology: benthic, marine; 10 m, reef slope.

***Aplidium parvum* Kott, 1963**

*Aplidium parvum* Kott, P. (1963). The ascidians of Australia IV. Aplousobranchiata Lahille; Polyclinidae Verrill (continued). *Aust. J. Mar. Freshwat. Res.* **14**(1): 70–118 [112].

Type data: syntypes AM Y1832.

Type locality: San Remo, VIC.

Distribution: VIC (Bass Strait), WA (SW coast).

Ecology: benthic, marine.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [577].

***Aplidium petrosum* Kott, 1992**

*Aplidium petrosum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [577].

Type data: holotype QM GH5454.

Type locality: Margaret Brock Lighthouse, Cape Jaffa, SA.

Distribution: SA (Great Australian Bight, S Gulfs coast).

Ecology: benthic, marine.

***Aplidium pronum* Kott, 1975**

*Aplidium pronum* Kott, P. (1975). The ascidians of South Australia III. Northern sector of the Great Australian Bight and additional records. *Trans. R. Soc. S. Aust.* **99**(1): 1–20 [6].

Type data: holotype NMV H287.

Type locality: Investigator Strait, 19 m, SA.

Distribution: SA (S Gulfs coast); known only from type locality.

Ecology: benthic, marine.

***Aplidium ritteri* (Sluiter, 1895)**

*Amaroucium ritteri* Sluiter, C.P. (1895). Tunicaten. In, Semon, R. Zoologische Forschungsreisen in Australien und den Malayischen Archipel. *Denkschr. Med.- Naturw. Ges. Jena* **8**: 163–186; Nachtrag zu den tunicaten: 325–326. [170].

Type data: holotype ZMA TU189.

Type locality: Thursday Is., Torres Strait, north Australia.

Distribution: Palau, New Caledonia, French Polynesia, QLD (Great Barrier Reef, NE coast); also Truk, Ponape.

Ecology: benthic, marine.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [581].

***Aplidium robustum* Kott, 1992**

*Aplidium robustum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [582].

Type data: holotype QM GH5467, paratype(s) QM GH5506.

Type locality: south of Mt Martin, King George Sound, Albany, 2 m, WA [35°00'48"S 117°57'E].

Distribution: SA (Great Australian Bight), TAS (Tas. coast), WA (SW coast).

Ecology: benthic, marine; in small crevices in flat base rock.

***Aplidium rosarium* Kott, 1992**

*Aplidium rosarium* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [583].

Type data: holotype QM GH5224.

Type locality: Blue pools, Heron Is., QLD.

Distribution: QLD (NE coast); known only from type locality.

Ecology: benthic, marine; rubble fauna.

***Aplidium rubricollum* Kott, 1963**

*Aplidium rubricollum* Kott, P. (1963). The ascidians of Australia IV. Aplousobranchiata Lahille; Polyclinidae Verrill (continued). *Aust. J. Mar. Freshwat. Res.* **14**(1): 70–118 [103].

Type data: holotype AM Y1417, paratype(s) AM Y1403, Y1415.

Type locality: Reevesby Is., SA.

Distribution: SA (Great Australian Bight, S Gulfs coast).

Ecology: benthic, marine.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [584].

***Aplidium solidum* (Herdman, 1891)**

*Psammaplidium solidum* Herdman, W.A. (1891). A revised classification of the Tunicata, with definitions of the orders, sub-orders, families, sub-families and genera, and analytical keys to the species. *J. Linn. Soc. Lond. Zool.* **23**: 558–652 [620] [*Amaroucium solidum* Ritter & Forsyth, 1917 is a junior secondary homonym].

Type data: holotype AM U165 (G2108).

Type locality: Port Jackson, NSW.

*Psammaplidium fragile* Herdman, W.A. (1891). A revised classification of the Tunicata, with definitions of the orders, sub-orders, families, sub-families and genera, and analytical keys to the species. *J. Linn. Soc. Lond. Zool.* **23**: 558–652 [620].

Type data: holotype AM U166 (G2110).

Type locality: Port Jackson, NSW.

*Psammaplidium incrustans* Herdman, W.A. (1891). A revised classification of the Tunicata, with definitions of the orders, sub-orders, families, sub-families and genera, and analytical keys to the species. *J. Linn. Soc. Lond. Zool.* **23**: 558–652 [620].

Type data: holotype AM U167 (G2111).

Type locality: Port Stephens, NSW.

*Psammaplidium lobatum* Herdman, W.A. (1891). A revised classification of the Tunicata, with definitions of the orders, sub-orders, families, sub-families and genera, and analytical keys to the species. *J. Linn. Soc. Lond. Zool.* **23**: 558–652 [620] [junior primary homonym of *Aplidium lobatum* Savigny, 1816].

Type data: holotype QM U164 (G2109).

Type locality: Port Jackson, NSW.

***Aplidium arboratum*** Kott, P. (1963). The ascidians of Australia IV. Aplousobranchiata Lahille; Polyclinidae Verrill (continued). *Aust. J. Mar. Freshwat. Res.* **14**(1): 70–118 [96] [unnecessary *nom. nov.* for *Psammaplidium lobatum* Herdman, 1899].

***Synoicum investum*** Kott, P. (1963). The ascidians of Australia IV. Aplousobranchiata Lahille; Polyclinidae Verrill (continued). *Aust. J. Mar. Freshwat. Res.* **14**(1): 70–118 [90].

Type data: holotype AM U3928.

Type locality: Bargara, Hervey Bay, QLD.

Taxonomic decision for synonymy: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [586].

Distribution: NSW (Central E coast, Lower E coast), QLD (Central E coast, NE coast), WA (NW coast).

Ecology: benthic, marine.

***Aplidium tabascum*** Kott, 1992

***Aplidium tabascum*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [589].

Type data: holotype QM GH5208, paratype(s) QM GH5542, G9727.

Type locality: reef, Heron Is., 15 m, QLD.

Distribution: Papua New Guinea, QLD (Great Barrier Reef).

Ecology: benthic, marine.

***Aplidium triggsense*** Kott, 1963

***Aplidium triggsensis*** Kott, P. (1963). The ascidians of Australia IV. Aplousobranchiata Lahille; Polyclinidae Verrill (continued). *Aust. J. Mar. Freshwat. Res.* **14**(1): 70–118 [104].

Type data: holotype QM V3923, paratypes AM Y1405, AM Y1408, AM Y1421, AM Y1427, AM Y1428.

Type locality: Trigg's Is., near Fremantle, WA.

Distribution: New Caledonia, QLD (Great Barrier Reef), SA (Great Australian Bight), VIC (Bass Strait), WA (Lower W coast).

Ecology: benthic, marine; often subjected to surf, turbulence and strong currents.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [590].

***Aplidium uteute*** Monniot & Monniot, 1987

***Aplidium uteute*** Monniot, C. & Monniot, F. (1987). Les ascidies de Polynésie française. *Mém. Mus. Natl. Hist. Nat. Paris* **136**: 1–155 [79].

Type data: holotype MNHP A APL B194\*.

Type locality: Moorea, French Polynesia.

***Aplidium latusexitus*** Monniot, F. (1987). Ascidies de Nouvelle-Calédonie III. Polyclinidae du lagon. *Bull. Mus. Natl. Hist. Nat. Paris* (4) **9A**(3): 499–535 [523].

Type data: holotype MNHP Al-Apl B-213\*.

Type locality: New Caledonia, 35 m along Woodwin Canal.

Taxonomic decision for synonymy: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [592].

Distribution: New Caledonia, French Polynesia, QLD (Great Barrier Reef).

Ecology: benthic, marine.

***Morchellium*** Giard, 1872

***Morchellium*** Giard, A.M. (1872). Recherches sur les ascidies composées ou synascidies. *Arch. Zool. Exp. Gén.* **1**: 613–662 [641].

Type species: *Amaroucium argus* Milne-Edwards, 1841 by monotypy.

Extralimital distribution: Palaearctic Region; western Europe, west Pacific Ocean. See: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620.

***Morchellium albidum*** Kott, 1992

***Morchellium albidum*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [505].

Type data: holotype QM GH5582.

Type locality: Wedge Is., West Bay, southern Spencer Gulf, SA.

Distribution: SA (S Gulfs coast); known only from type locality.

Ecology: benthic, marine.

***Morchellium pannosum*** Kott, 1992

***Morchellium pannosum*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [506].

Type data: holotype QM G12722.

Type locality: Port Phillip Heads, 18 m, VIC.

Distribution: VIC (Bass Strait); known only from type locality.

Ecology: benthic, marine.

***Polyclinum*** Savigny, 1816

***Polyclinum*** Savigny, J.C. (1816). Recherches anatomiques sur les ascidies composées et sur les ascidies simples—Système de la classe des Ascidies pp. 1–239. In *Mémoires sur les Animaux sans Vertèbres*, Pt 2. Paris : G. Dufour. [189].

Type species: *Polyclinum saturnium* Savigny, 1816 by subsequent designation, see Hartmeyer, R. (1915). Ascidiarum nomina conservanda. pp. 247–258 in Apstein, C. Nomina Conservanda. *Sber. Ges. Naturf. Freunde Berl.* **1915b**: 247–258 [257].

***Glossophorum*** Lahille, F. (1887). Système musculaire du *Glossophorum sabulosum* (G.) (*Polyclinum sabulosum*, Giard). *Bull. Soc. Toulouse* **19**: 107–116 [107].

Type species: *Polyclinum sabulosum* Giard, 1872 by original designation.

Taxonomic decision for synonymy: Hartmeyer, R. (1916). Ueber einige Ascidien aus dem Golf von Suez. *Sber. Ges. Naturf. Freunde Berl.* **1915**: 397–430 [428].

Extralimital distribution: temperate and tropical seas to the Faroe IIs. See: Van Name, W.G. (1945). The North and South American ascidians. *Bull. Am. Mus. Nat. Hist.* **84**: 1–476; Berrill, N.J. (1950). The Tunicata. *Ray Soc. Publs* **133**: 1–354; Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620.

***Polyclinum fungosum* Herdman, 1886**

***Polyclinum fungosum*** Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiae compositae. *Zool. Chall. Exped.* **14**(38): 1–425 [190].  
Type data: holotype BMNH 1887.2.4.323\*.  
Type locality: Port Jackson, 12–30 m, NSW.

Distribution: NSW (Lower E coast), VIC (Bass Strait).  
Ecology: benthic, marine.  
Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [447].

***Polyclinum glabrum* Sluiter, 1895**

***Polyclinum glabrum*** Sluiter, C.P. (1895). Tunicaten. In: Semon, R. Zoologische Forschungsreisen in Australien und den Malayischen Archipel. *Denkschr. Med.-Naturw. Ges. Jena* **8**: 163–186; Nachtrag zu den tunicaten: 325–326. [168].  
Type data: holotype ZMA TU824\*.  
Type locality: Ambon, Indonesia.

Distribution: Indonesia, NT (N coast), QLD (Great Barrier Reef, NE coast), WA (NW coast).  
Ecology: benthic, marine.  
Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620.

***Polyclinum incrustatum* Michaelsen, 1930**

***Polyclinum neptunium incrustatum*** Michaelsen, W. (1930). Ascidiae Krikobranthiae. *Fauna Südwest-Aust.* **5**(7): 463–558 [542] [proposed with subspecific rank in *Polyclinum neptunium* Hartmeyer, 1912].  
Type data: holotype (probable) ZMB 3892\*.  
Type locality: Koombana Bay, Geographe Bay, 14.5–18 m, WA.

Taxonomic decision for new combination: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [450] (as *Polyclinum incrustatum*).

Distribution: SA (Great Australian Bight, S Gulfs coast), WA (Great Australian Bight, SW coast).  
Ecology: benthic, marine.

***Polyclinum marsupiale* Kott, 1963**

***Polyclinum marsupiale*** Kott, P. (1963). The ascidians of Australia IV. Aplousobranchiata Lahille; Polyclinidae Verrill (continued). *Aust. J. Mar. Freshwat. Res.* **14**(1): 70–118 [83].  
Type data: holotype AM U3915, paratype(s) AM U3916.  
Type locality: Hunter Is., Bass Strait, TAS.

Distribution: SA (S Gulfs coast), TAS (Bass Strait), VIC (Bass Strait), WA (SW coast).

Ecology: benthic, marine.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620.

***Polyclinum nudum* Kott, 1992**

***Polyclinum nudum*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [454].  
Type data: holotype QM GH5391, paratype(s) QM GH5387.  
Type locality: old jetty piles, Coffs Harbour, 0.5 m, NSW.

Distribution: NSW (Lower E coast).  
Ecology: benthic, marine.

***Polyclinum orbitum* Kott, 1992**

***Polyclinum orbitum*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [455].  
Type data: holotype QM G12730, paratype(s) QM G12731.  
Type locality: 560 m offshore, 10 km SW of Seaspray, Ninety Mile Beach, 12 m, VIC.

Distribution: VIC (Bass Strait).  
Ecology: benthic, marine; 12 m, fast currents, calcarenite reef.

***Polyclinum psammiferum* Hartmeyer, 1909**

***Polyclinum psammiferum*** Hartmeyer, R. (1909). Ascidiien (continuation of work by Seeliger). pp. 1281–1488 in Bronn, H.G. *Klassen und Ordnungen des Tier-Reichs*. Leipzig : C.F. Winter Vol. 3, suppl. pts 81–87 [1461] [*nom. nov.* for *Polyclinum sabulosum* Sluiter, 1909].

***Polyclinum sabulosum*** Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidiien. *Siboga Exped.* **56B**: 1–112 [96] [junior homonym of *Polyclinum sabulosum* Giard, 1872 (= *Polyclinum aurantium* Milne-Edwards, 1841)].  
Type data: holotype ZMA TU832.  
Type locality: Labuan Badjo, Flores, Indonesia.

***Polyclinum solum*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [458] [unnecessary *nom. nov.* for *Polyclinum sabulosum* Sluiter, 1909].

Distribution: Indonesia, NT (N coast), QLD (Great Barrier Reef, NE coast).  
Ecology: benthic, marine.  
Reference: Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [46].

***Polyclinum saturnium* Savigny, 1816**

***Polyclinum saturnium*** Savigny, J.C. (1816). Recherches anatomiques sur les ascidies composées et sur les ascidies simples—Système de la classe des Ascidies pp. 1–239. In *Mémoires sur les Animaux sans Vertèbres*, Pt 2. Paris : G. Dufour. [190].

Type data: type status unknown MNHP (depository uncertain, not found).

Type locality: Suez, Red Sea.

Distribution: Philippines, QLD (NE coast), WA (Lower W coast); Suez, Red Sea.

Ecology: benthic, marine.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [455].

***Polyclinum tenuatum* Kott, 1992**

*Polyclinum tenuatum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [461].

Type data: holotype AM Y2261, paratype(s) AM Y1356.

Type locality: Shelly Beach, Nornalup, WA.

Distribution: SA (S Gulfs coast), WA (SW coast).

Ecology: benthic, marine.

***Polyclinum terranum* Kott, 1992**

*Polyclinum terranum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [461].

Type data: holotype QM GH5460.

Type locality: Rockingham, 15 m, WA [32°15'42"S 115°37'06"E].

Distribution: WA (SW coast); known only from type locality.

Ecology: benthic, marine.

***Polyclinum tsutsuii* Tokioka, 1954**

*Polyclinum tsutsuii* Tokioka, T. (1954). Contributions to Japanese ascidian fauna VII. Invertebrate fauna of the intertidal zone of the Tokara Islands. VII Ascidiaceans. *Publ. Seto Mar. Biol. Lab. Kyoto Univ.* **3**(3): 239–264 [240].

Type data: holotype SMBL 127\*.

Type locality: Maégomori, Takarazima, Tokara Is., Japan.

*Polyclinum pute* Monniot, C. & Monniot, F. (1987). Les ascidies de Polynésie française. *Mém. Mus. Natl. Hist. Nat. Paris* **136**: 1–155 [84].

Type data: holotype MNHP A1 POL B33\*.

Type locality: Tikehau, French Polynesia.

*Polyclinum corbis* Kott, P. (2003). New syntheses and new species in the Australian Ascidiacea. *J. Nat. Hist.* **37**: 1611–1653 [1626].

Type data: holotype WAM 476.91, paratype(s) WAM 475.91.

Type locality: W of Cervantes, WA.

Taxonomic decision for synonymy: Kott, P. (2004). Ascidiacea (Tunicata) in Australian waters of the Timor and Arafura Seas. *Beagle, Rec. Mus. Art Galleries NT* **20**: 37–81 [47].

Distribution: Philippines, Kiribati, French Polynesia, QLD (Great Barrier Reef), WA (Lower W coast, N coast); also Marianas Islands, Tokara Is., West Pacific.

Ecology: benthic, marine.

***Polyclinum vasculosum* Pizon, 1908**

*Polyclinum vasculosum* Pizon, A. (1908). Ascidies d'Amboine. *Rev. Suisse Zool.* **16**: 195–248 [223].

Type data: holotype GMNH T1/91\*.

Type locality: Ambon (as Amboine), Indonesia.

*Polyclinum macrophyllum* Michaelsen, W. (1919). Die Krikobranchen Ascidien des westlichen Indischen Ozeans: Claveliniden und Synoiciden. *Jahrb. Hamb. Wiss. Anst.* **36**: 71–102 [82].

Type data: holotype ZMH\*.

Type locality: Bay of Tuléar, southwest Malagasy.

Taxonomic decision for synonymy: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [464].

Distribution: Philippines, Hawaii, QLD (Central E coast, Great Barrier Reef, NE coast), WA (Central W coast, NW coast); W Indian Ocean.

Ecology: benthic, marine.

***Sidneioides* Kesteven, 1909**

*Sidneioides* Kesteven, H.L. (1909). Studies on Tunicata no. 1. *Proc. Linn. Soc. N.S.W.* **34**: 276–295 [277].

Type species: *Sidneioides tamaramae* Kesteven, 1909 by original designation.

Extralimital distribution: See: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620.

***Sidneioides tamaramae* Kesteven, 1909**

*Sidneioides tamaramae* Kesteven, H.L. (1909). Studies on Tunicata no. 1. *Proc. Linn. Soc. N.S.W.* **34**: 276–295 [277].

Type data: holotype AM U564.

Type locality: Tamaramae Bay, NSW.

Distribution: NSW (Lower E coast), QLD (NE coast), VIC (Bass Strait).

Ecology: benthic, marine.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [472].

***Synoicum* Phipps, 1774**

*Synoicum* Phipps, C.J. (1774). pp. 194, 195, 199–200, pl. 13 fig. 3 in, *A Voyage towards the North Pole undertaken by His Majesty's Command, 1773*. London. [199].

Type species: *Synoicum turgens* Phipps, 1774 by subsequent designation, see Hartmeyer, R. (1924). Ascidiacea, part II. Zugleich eine Übersicht über die Arktische und boreale Ascidiaceenfauna auf tiergeographischer Grundlage. *Ingolf-Exped.* **2**(7): 1–275.

*Macroclinum* Verrill, A.E. (1871). Descriptions of some imperfectly known and new ascidians from New England. *Amer. J. Sci.* (3) **1**: 54–58, 93–100, 211–212, 288–294, 443–446 [292].

Type species: *Macroclinum crater* Verrill, 1871 (= *Synoicum pulmonaria*, Ellis & Solander, 1786) by original designation.

**Atopogaster** Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiacea compositae. *Zool. Chall. Exped.* **14**(38): 1–425 [163].

Type species: *Atopogaster gigantea* Herdman, 1886 by original designation.

**Lissamaroucium** Sluiter, C.P. (1906). *Tuniciers de l'Expédition antarctique Française (1903–1905)*. Paris : Masson pp. 1–48 5 pls [19].

Type species: *Lissamaroucium magnum* Sluiter, 1906 by original designation.

Taxonomic decision for synonymy: Hartmeyer, R. (1921). Die Gattung *Atopogaster* Herdman (Ascidiacea). *Zool. Anz.* **53**: 273–281 [273].

Extralimital distribution: Antarctic Region; north Pacific Ocean, Bering Sea, tropical west Pacific Ocean, Atlantic Ocean to New Zealand and Antarctica. See: Van Name, W.G. (1945). The North and South American ascidians. *Bull. Am. Mus. Nat. Hist.* **84**: 1–476; Kott, P. (1969). Antarctic Ascidiacea. A monographic account of the known species based on specimens collected under U.S. Government auspices 1947 to 1963. *Antarct. Res. Ser.* **13**: i–xv 1–239; Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620.

#### ***Synoicum angustum* Kott, 1992**

***Synoicum angustum*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [477].

Type data: holotype SAMA E2570, paratype(s) SAMA E2572, E2573.

Type locality: 45 nautical miles NNE of East Sister Is., 92 m, TAS [39°00'S 148°25'E].

Distribution: TAS (Bass Strait); known only from type locality.

Ecology: sand bottom.

#### ***Synoicum arenaceum* (Michaelsen, 1924)**

***Macroclinum arenaceum*** Michaelsen, W. (1924). Ascidiacea Krikobanchiae von Neuseeland, den Chatham und den Auckland Inseln. *Vidensk. Meddr. Dansk Naturh. Foren.* **77**: 263–434 [406].

Type data: holotype ZMUC\*.

Type locality: 2 miles from North Cape, North Island, 110 m, New Zealand.

Taxonomic decision for new combination: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [478] (as *Synoicum arenaceum* (Michaelsen, 1924)).

Distribution: New Zealand, VIC (Bass Strait).

Ecology: benthic, marine; to 274 m.

#### ***Synoicum atopogaster* Kott, 1963**

***Synoicum atopogaster*** Kott, P. (1963). The ascidians of Australia IV. Aplousobranchiata Lahille; Polyclinidae Verrill (continued). *Aust. J. Mar. Freshwat. Res.* **14**(1): 70–118 [89].

Type data: holotype AM U3927.

Type locality: west of Houtman Abrolhos, 36 m, WA [28°33'30"S 113°E].

Distribution: WA (Lower W coast); known only from type locality.

Ecology: benthic, marine.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [478].

#### ***Synoicum bowerbanki* Millar, 1963**

***Synoicum bowerbanki*** Millar, R.H. (1963). Australian ascidians in the British Museum (Natural History). *Proc. Zool. Soc. Lond.* **141**(4): 689–746 [696].

Type data: holotype BMNH 61.9.20.7\*.

Type locality: Fremantle, WA.

Distribution: VIC (Bass Strait), WA (Lower W coast).

Ecology: benthic, marine.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [480].

#### ***Synoicum buccinum* Kott, 1992**

***Synoicum buccinum*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [481].

Type data: holotype QM GH5045, paratype(s) QM GH5046, GH5047, GH5048.

Type locality: cave, Marion Reef, 8 m, Coral Sea.

Distribution: QLD (Great Barrier Reef, NE oceanic).

Ecology: benthic, marine; rubble zone, sandy substrate.

#### ***Synoicum castellatum* Kott, 1992**

***Synoicum castellatum*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [483].

Type data: holotype QM GH5160, paratype(s) QM GH5163.

Type locality: North Point, Heron Is., 5 m, QLD.

Distribution: NT (Gulf of Carpentaria), QLD (Great Barrier Reef, Gulf of Carpentaria), WA (NW coast).

Ecology: benthic, marine.

#### ***Synoicum chrysanthemum* Kott, 1992**

***Synoicum chrysanthemum*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [485].

Type data: holotype WAM 1031.83, paratype(s) WAM 1032.83, 850.83 (QM GH2115).

Type locality: NW Bluff Point, 130 m, WA [27°40'S 113°03'E].

Distribution: WA (Lower W coast).

Ecology: benthic, marine.

#### ***Synoicum citrum* Kott, 1992**

***Synoicum citrum*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [486].



Type data: holotype QM GH5104, paratype(s) NMV F59369.  
Type locality: vertical face, Wilson's Promontory, Waterloo Bay, 25 m, VIC.

Distribution: SA (S Gulfs coast), TAS (Bass Strait, Tas. coast), VIC (Bass Strait).

Ecology: benthic, marine.

***Synoicum concavatum* Kott, 1992**

*Synoicum concavatum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [487].

Type data: holotype QM GH5465.

Type locality: reef, Eclipse Is., SW entrance to King George Sound, WA.

Distribution: WA (SW coast); known only from type locality.

Ecology: benthic, marine; rocky granite reef.

***Synoicum erectum* Kott, 1992**

*Synoicum erectum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [489].

Type data: holotype NMV F59367.

Type locality: from Sharklines, south of Warrnambool, 350–350 m, VIC.

Distribution: SA (Great Australian Bight), VIC (Bass Strait).

Ecology: benthic, marine.

***Synoicum galei* (Michaelsen, 1930)**

*Macroclinum hypurion galei* Michaelsen, W. (1930). Ascidiæ Krikobranthiæ. *Fauna Südwest-Aust.* **5**(7): 463–558 [535].

Type data: holotype ZMB\*.

Type locality: Fremantle, WA.

Taxonomic decision for new combination: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [490] (as *Synoicum galei*).

Distribution: WA (Lower W coast); known only from type locality.

Ecology: benthic, marine.

***Synoicum intercedens* (Sluiter, 1909)**

*Morchellium intercedens* Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Asciden. *Siboga Exped.* **56B**: 1–112 [108].

Type data: syntypes ZMA TU694.

Type locality: southeast side of Pearl bank, Sulu Archipelago, 15 m, Indonesia, see Spoel, S. van der (1969). Catalogue of the type specimens of Tunicata in the Zoological Museum in Amsterdam. *Bull. Zool. Mus. Amsterdam* **1**(13): 157–200.

Distribution: Indonesia, QLD (NE coast); Tahiti.

Ecology: benthic, marine.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620.

***Synoicum longistriatum* Kott, 1992**

*Synoicum longistriatum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [493].

Type data: holotype QM GH5583.

Type locality: 110 m, WA [32°S 155°08'E].

Distribution: WA (Lower W coast); known only from type locality.

Ecology: benthic, marine.

***Synoicum macroglossum* (Hartmeyer, 1919)**

*Macroclinum macroglossum* Hartmeyer, R. (1919). Asciden. In, Results of Dr E. Mjöberg's Swedish scientific expeditions to Australia 1910–1913. *K. Svenska Vetensk.-Akad. Handl.* **60**(4): 1–150. [126].

Type data: syntypes NHRM 1096\*.

Type locality: 45 miles WSW Cape Jaubert, WA.

Taxonomic decision for new combination: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [494] (as *Synoicum macroglossum*).

Distribution: NT (N coast), QLD (Central E coast, Great Barrier Reef, NE coast), WA (NW coast).

Ecology: benthic, marine.

***Synoicum obscurum* Kott, 1992**

*Synoicum obscurum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [496].

Type data: holotype QM G12726, paratype(s) QM G12727.

Type locality: 90 km SW of Lakes Entrance, reef off Ninety Mile Beach, Bass Strait, VIC.

Distribution: NSW (Lower E coast), VIC (Bass Strait).

Ecology: benthic, marine.

***Synoicum papilliferum* (Michaelsen, 1930)**

*Macroclinum papilliferum* Michaelsen, W. (1930). Ascidiæ Krikobranthiæ. *Fauna Südwest-Aust.* **5**(7): 463–558 [530].

Type data: syntypes (probable) ZMB\*.

Type locality: Koombana Bay, near Bunbury, 14.5–18 m, WA.

Distribution: VIC (Bass Strait), WA (SW coast).

Ecology: benthic, marine.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [497].

***Synoicum prunum* (Herdman, 1899)**

*Polyclinum prunum* Herdman, W.A. (1898). Note on the Tunicata fauna of Australian seas. *Ann. Mag. Nat. Hist.* **7**(1): 443–450 [448] [*nom. nud.*].

*Polyclinum prunum* Herdman, W.A. (1899). Descriptive catalogue of the Tunicata in the Australian Museum. *Australian Museum, Sydney, Catalogue* **17**: 1–139 [83].

Type data: holotype AM U159 (G2102).

Type locality: Port Jackson, NSW.

Taxonomic decision for new combination: Kott, P. (1963). The ascidians of Australia IV. Aplousobranchiata Lahille; Polyclinidae Verrill (continued). *Aust. J. Mar. Freshwat. Res.* **14**(1): 70–118 [87] (as *Synoicum prunum*).

Distribution: NSW (Central E coast, Lower E coast), QLD (Central E coast, NE coast).

Ecology: benthic, marine.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [498].

***Synoicum sacculum* Kott, 1992**

*Synoicum sacculum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [499].

Type data: holotype SAMA E2556, paratype(s) QM GH5044, GH10163.

Type locality: in caves, Waldegrave Is., SA.

Distribution: SA (S Gulfs coast), TAS (Bass Strait, Tas. coast), VIC (Bass Strait).

Ecology: benthic, marine; in caves with 2 m waves, from jetty piles, and to 425 m (TAS).

***Synoicum saxeum* Kott, 1998**

*Synoicum durum* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [488] [junior primary homonym of *Synoicum durum* Sluiter, 1915].

Type data: holotype AM U3990.

Type locality: Heron Is., QLD.

*Synoicum saxeum* Kott, P. (1998). Tunicata. pp. 51–259 in Wells, A. & Houston, W.W.K. (eds) *Zoological Catalogue of Australia. Hemichordata, Tunicata, Cephalochordata*. Melbourne : CSIRO Publishing, Australia Vol. 34 298 pp. [127] [*nom. nov.* for *Synoicum durum* Kott, 1992].

Distribution: QLD (Great Barrier Reef); known only from type locality.

Ecology: benthic, marine.

***Synoicum suarenium* Kott, 1992**

*Synoicum suarenium* Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [501].

Type data: holotype QM GH5080, paratype(s) QM GH5070.

Type locality: Wilson Reef, Capricorn Group, QLD.

Distribution: Indonesia, QLD (Great Barrier Reef, NE coast).

Ecology: benthic, marine.

***Synoicum tropicum* (Sluiter, 1909)**

*Atopogaster tropicum* Sluiter, C.P. (1909). Die Tunicaten der Siboga Expedition. Pt II. Die merosomen Ascidien. *Siboga Exped.* **56B**: 1–112 [107].

Type data: holotype ZMA TU291\*.

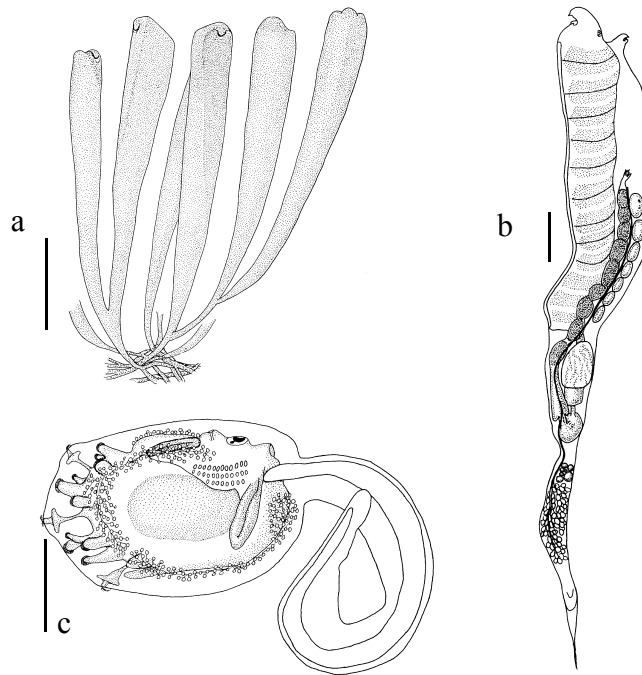
Type locality: off Kapul Is., Sulu Archipelago, 13 m, Philippines.

Taxonomic decision for new combination: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [503] (as *Synoicum tropicum*).

Distribution: Indonesia, WA (NW coast).

Ecology: benthic, marine.

## PROTOPOLYCLINIDAE



**Fig. 9.** *Monniotus australis* (Kott, 1957): **a**, part of a colony; **b**, mature zooid with developmental series of embryos in distal end of oviduct; **c**, larva. (Scale bars: a = 10 mm; b = 2.00 mm; c = 0.4 mm).  
[from Kott 1992]

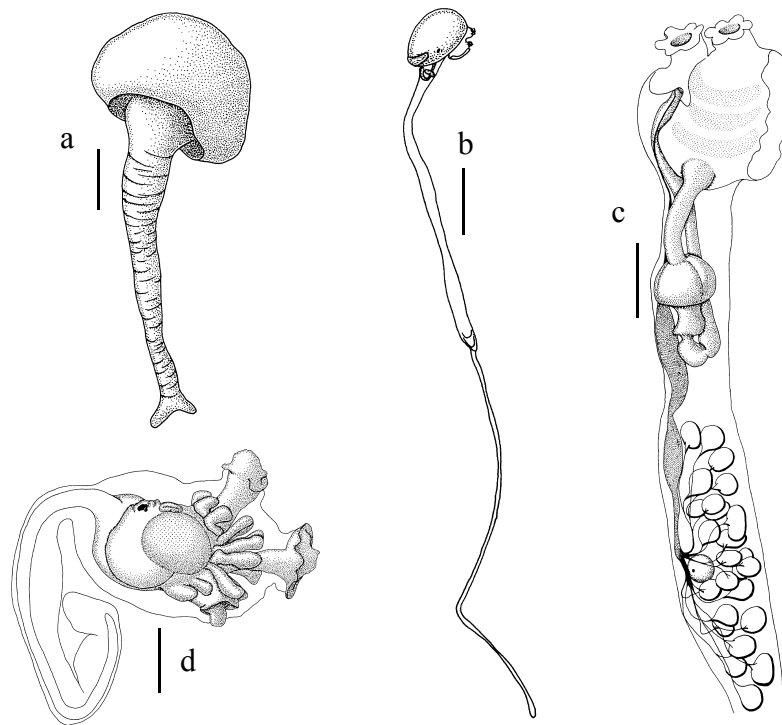
Zooids of the family Protopolyclinidae Kott, 1992 are divided into thorax, abdomen and posterior abdomen. The gonads are in the posterior abdomen. Both branchial and atrial openings are 6-lobed. The family contains species with either embedded zooids or zooids joined to one another only at the base. When embedded, the zooids are arranged in an orderly way, usually in systems but these are never cloacal systems. Atrial apertures are directed away from the branchial apertures but they never open into internal cloacal chambers. The abdomen is relatively short, the stomach wall sometimes is folded, the gonads are bunched in the posterior abdomen and the anus opens about halfway up the large thorax. As in *Polyclinum*, internal branchial papillae-possibly vestiges of the internal longitudinal branchial vessels of Cionidae and Diazonidae-usually are present in the branchial sac, suggesting a direct relationship with the Diazonidae. However, larvae have diverged considerably from the small oviparous diazonid larvae. Eggs are fertilised in the distal end of the oviduct which appears to extend alongside the rectum in the posterior half of the branchial sac. The larvae resemble those of Polyclinidae with median stalked adhesive organs, median and lateral epidermal amullae, and lateral epidermal vesicles.

Three genera are known in the family. They are recorded infrequently, and only from the Southern Hemisphere. One of the three genera is indigenous to Australian waters, one is known also from the West Indian Ocean, and the third, *Protopolyclinum* Millar, 1960 is known from a single record from New Zealand.

## References

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- Millar, R.H. (1960). Ascidiacea. *Discovery Rep.* **30**: 1–160
- Condominium*** Kott, 1992
- Condominium*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [396].  
Type species: *Placentela areolata* Kott, 1963 by original designation.
- Extralimital distribution: See: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620.
- Condominium areolatum*** (Kott, 1963)
- Placentela areolata*** Kott, P. (1963). The ascidians of Australia IV. Aplousobranchiata Lahille; Polyclinidae Verrill (continued). *Aust. J. Mar. Freshwat. Res.* **14**(1): 70–118 [74].  
Type data: holotype AM U3925, paratype(s) AM Y1316.  
Type locality: 10 m, Mackay, QLD.
- Placentela ellistoni*** Kott, P. (1972). The ascidians of South Australia II. Eastern Sector of the Great Australian Bight and Investigator Strait. *Trans. R. Soc. S. Aust.* **96**(4): 165–196 [173].  
Type data: holotype SAMA E901, paratype(s) SAMA E900.  
Type locality: inside caves, Elliston Bay, SA.
- Homoeodistoma omasum*** Monniot, F. (1987). Ascides de Nouvelle-Calédonie III. Polyclinidae du lagon. *Bull. Mus. Natl. Hist. Nat. Paris* (4) **9A**(3): 499–535 [503].  
Type data: holotype MNHP AI-Hom-1\*.  
Type locality: Woodin Canal, lagoon of New Caledonia.
- Taxonomic decision for synonymy: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [397].
- Distribution: New Caledonia, Lord Howe Island, NSW (SE oceanic), QLD (Great Barrier Reef), SA (Great Australian Bight), WA (Lower W coast).  
Ecology: benthic, marine, sand bottom.
- Monniotus*** Millar, 1988
- Monniotus*** Millar, R.H. (1988). Ascidians collected during the International Indian Ocean Expedition. *J. Nat. Hist.* **22**: 823–848 [826].  
Type species: *Monniotus ramosus* Millar, 1988 by monotypy.
- Extralimital distribution: west Indian Ocean. See: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [393].
- Monniotus australis*** (Kott, 1957)
- Euherdmania australis*** Kott, P. (1957). Ascidians of Australia II. Aplousobranchiata Lahille; Clavelinidae Forbes and Hanley and Polyclinidae Verrill. *Aust. J. Mar. Freshwat. Res.* **8**(1): 64–110 [103].  
Type data: syntypes AM Y1165, Y1317.  
Type locality: Port Phillip Heads, VIC.
- Taxonomic decision for new combination: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [394] (as *Monniotus australis*).
- Distribution: SA (Great Australian Bight, S Gulfs coast), VIC (Bass Strait), WA (Lower W coast).  
Ecology: benthic, marine.
- Monniotus radiatus*** Kott, 1992
- Monniotus radiatus*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [396].  
Type data: holotype AM G10012 (MV F58435).  
Type locality: Nambucca Heads, 13 m, NSW.
- Distribution: NSW (Lower E coast), VIC (Bass Strait).  
Ecology: benthic, marine.

## PSEUDODISTOMIDAE



**Fig. 10.** *Pseudodistoma candens* Kott, 1992: **a**, colony; **b**, whole zooid with huge embryo at top of abdomen; **c**, zooid thorax and abdomen; **d**, larva. (Scale bars: **a** = 10.0 mm; **b** = 2.0 mm; **c** = 0.5 mm; **d** = 0.4 mm). [from Kott 1992]

The family Pseudodistomidae Harant, 1931 has, like Pycnoclavellidae and Euherdmaniidae, 6-lobed apertures opening separately to the exterior, gonads in a long, narrow posterior abdomen, and a moderately long vascular appendix. Like *Sigillina* Savigny, 1816 (Holozoidae), the family consistently has three rows of stigmata, and a gut loop of moderate length with the stomach (divided into four chambers) half to three-quarters of the distance down the descending limb. Fertilisation occurs at the base of the oviduct and embryos develop as they pass up the oviduct into a brood pouch projecting, and sometimes constricted off, from the zooid at the top of the abdomen (rather than in the thorax). Zooids are completely embedded, and the colonies are often (but not always) stalked. The test frequently is hardened with embedded sand.

Genera of this family are distinguished from *Sigillina* by the very long posterior abdomina containing the gonads. As in other families of Aplousobranchia, longitudinal thoracic muscles extend posteriorly in a band along each side of the abdomen and posterior abdomen, but usually not onto the vascular appendix as they do in *Sigillina*. The larvae are large, the trunk from 0.6 to more than 1.0 mm long. Unlike *Sigillina*, the large antero-median adhesive organs have unusual hollow eversible papillary cones (scyphate with an axial vesicle: Cloney 1990) and large lateral epidermal ampullae.

When Kott (1992) defined the family Pseudodistomidae, she overlooked the subfamily Pseudodistominae Harant, 1931. Although Kott's definition excludes other genera (*Ritterella* and *Placentela*) which Harant included, both family level taxa are based on the same nominal genus, and Harant is the author of the family, albeit redefined by Kott (1992).

The family contains two genera, the diverse *Pseudodistoma* and the monotypic *Anadistoma* Kott, 1992. The latter genus, known only from one Australian record, is distinguished by its inner coat of transverse muscles on the thorax, which suggests an affinity with *Eudistoma* Caullery, 1909 (Polycitoridae) rather than with *Sigillina* (Holozoidae). It is possible, therefore, that the family, as presently constituted, is polyphyletic.

The genus *Pseudodistoma* is well represented in Australian waters, especially in temperate waters, although two species are known from the tropics.

## References

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- Kott, P. (1992). The Australian Asciacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620
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### *Anadistoma* Kott, 1992

*Anadistoma* Kott, P. (1992). The Australian Asciacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [440].  
Type species: *Anadistoma attenuatum* Kott, 1992 by original designation.

#### *Anadistoma attenuatum* Kott, 1992

*Anadistoma attenuatum* Kott, P. (1992). The Australian Asciacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [440].  
Type data: holotype AM Y1315, paratype(s) AM Y2212.  
Type locality: Montague South, near Eden, 94 m, NSW.

Distribution: NSW (Lower E coast).

Ecology: benthic, marine.

### *Pseudodistoma* Michaelsen, 1924

*Pseudodistoma* Michaelsen, W. (1924). Ascidiae Krikobanchiae von Neuseeland, den Chatham und den Auckland Inseln. *Vidensk. Meddr. Dansk Naturh. Foren.* **77**: 263–434 [364].  
Type species: *Pseudodistoma cereum* Michaelsen, 1924 by original designation.

Extralimital distribution: Mediterranean Sea, Japanese southern temperate waters, tropical West Pacific Ocean, east Atlantic Ocean. See: Kott, P. (1992). The Australian Asciacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620.

### *Pseudodistoma acutum* Kott, 1992

*Pseudodistoma acutum* Kott, P. (1992). The Australian Asciacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [425].  
Type data: holotype SAMA E2120 (QM GH923), paratype(s) QM GH2323.  
Type locality: Ward Is., 20–25 m, SA.

Distribution: SA (Great Australian Bight).

Ecology: benthic, marine; 8–25 m, on undercuts and ledges.

### *Pseudodistoma aureum* (Brewin, 1957)

*Sigillinaria aurea* Brewin, B.I. (1957). Ascidians of New Zealand, Part 10. Ascidians from North Auckland. *Trans. R. Soc. N.Z.* **84**(3): 577–580 [580].

Type data: holotype OMNZ\*.

Type locality: coastal rocks, Omapere, Hokianga Harbour, north Auckland, New Zealand.

***Pseudodistoma coronatum*** Monniot, F. & Monniot, C. (1996). New collections of ascidians from the western Pacific and Southeastern Asia. *Micronesica* **29**(2): 133–279 [145].

Type data: holotype MNHP A1 Pse 31.

Type locality: Makada Is., Duke of York Is., Papua New Guinea, 15 m.

Taxonomic decision for synonymy: Kott, P. (1998). Tunicata. pp. 51–259 in Wells, A. & Houston, W.W.K. (eds) *Zoological Catalogue of Australia*. Hemichordata, Tunicata, Cephalochordata. Melbourne : CSIRO Publishing, Australia Vol. 34 298 pp. [132]; taxonomic decision for new combination: Kott, P. (1981). The ascidians of the reef flats of Fiji. *Proc. Linn. Soc. N.S.W.* **105**(3): 147–212 [157] (as *Pseudodistoma aurea*).

Distribution: New Zealand, French Polynesia, Fiji, Papua New Guinea, QLD (Great Barrier Reef); Majuro Atoll.

Ecology: benthic, marine.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620.

***Pseudodistoma australe*** Kott, 1957

***Pseudodistoma australe*** Kott, P. (1957). Ascidians of Australia II. Aplousobranchiata Lahille; Clavelinidae Forbes and Hanley and Polyclinidae Verrill. *Aust. J. Mar. Freshwat. Res.* **8**(1): 64–110 [101].

Type data: holotype AM Y919.

Type locality: Parrakeet Bay, Rottneet Is., WA.

Distribution: SA (Great Australian Bight), VIC (Bass Strait), WA (Central W coast, Lower W coast).

Ecology: benthic, marine.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620.

***Pseudodistoma candens*** Kott, 1992

***Pseudodistoma candens*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [430].

Type data: holotype QM GH977, paratype(s) SAMA E2118.

Type locality: Pearson Is., SA.

Distribution: SA (Great Australian Bight, S Gulfs coast), VIC (Bass Strait), WA (Lower W coast).

Ecology: benthic, marine.

***Pseudodistoma gracilum*** Kott, 1992

***Pseudodistoma gracilum*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [433].

Type data: holotype SAMA E2413 (QM GH971), paratype(s) QM GH4167.

Type locality: Top Gallant Is., 10 m, SA.

Distribution: NSW (Lower E coast), QLD (Great Barrier Reef), SA (Great Australian Bight, S Gulfs coast), VIC (Bass Strait).

Ecology: benthic, marine.

***Pseudodistoma inflatum*** Kott, 1992

***Pseudodistoma inflatum*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [435].

Type data: holotype QM G10157, paratype(s) QM G9472.

Type locality: South Solitary Is., 10 m, NSW.

Distribution: NSW (Central E coast, Lower E coast), QLD (Central E coast).

Ecology: benthic, marine; 15 m, reef.

***Pseudodistoma oriens*** Kott, 1992

***Pseudodistoma oriens*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [436].

Type data: holotype NMV H306, paratype(s) QM GH4953.

Type locality: Port Phillip Heads Channel, 20 m, VIC.

Distribution: SA (S Gulfs coast), TAS (Bass Strait), WA (Lower W coast).

Ecology: benthic, marine.

***Pseudodistoma pilatum*** Kott, 1992

***Pseudodistoma pilatum*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [439].

Type data: holotype SAMA E2114 (QM GH921), paratypes QM GH922, GH1296, GH4140, SAMA E2409.

Type locality: Ward Is., 20–25 m, SA.

Distribution: SA (Great Australian Bight).

Ecology: benthic, marine.

***Pseudodistoma pulvinum*** Kott, 1992

***Pseudodistoma pulvinum*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [439].

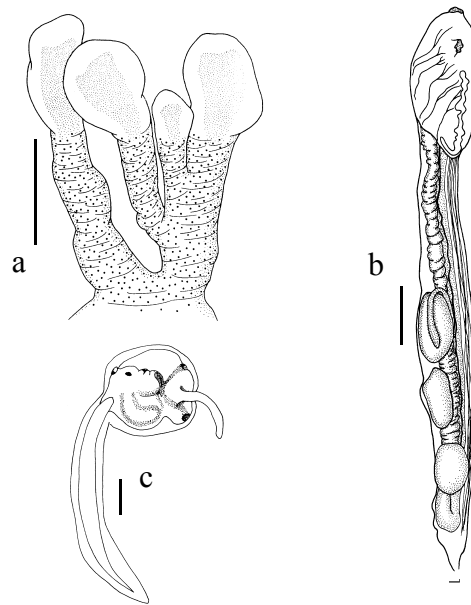
Type data: holotype SAMA E2411 (QM GH2396), paratype(s) QM GH2397.

Type locality: Ward Is., in caves, 8 m, SA.

Distribution: SA (Great Australian Bight).

Ecology: benthic, marine.

## PYCNOCLOVELLIDAE



**Fig. 11.** *Pycnoclavella* sp.: **a**, colony; **b**, zooid with embryos developing in abdomen; **c**, larva with one adhesive organ everted. (Scale bars: a = 5.0 mm; b = 1.0 mm; c = 0.5 mm). [from Kott 1990]

The family Pycnoclavellidae Kott, 1990 has characters that to some extent resemble those of Clavelinidae, having smooth apertures and usually only partially embedded zooids. Pycnoclavellid zooids have small thoraces and a relatively long narrow stalk, containing an invariably long gut loop with the stomach at its posterior end. A vascular stolon extends from the posterior end of the zooid. The compact gonads are in the distal end of the gut loop. Larvae are relatively large, and have two or three tubular adhesive organs invaginated into the larval haemocoel from the anterior end of the larval trunk. To effect settlement, these evert as long cylindrical, anterior projections with terminal adhesive cells. The eggs, fertilised at the base of the oviduct, form a developmental series as they move up towards the atrial cavity.

Pycnoclavellid species were formerly included in the family Clavelinidae owing to the smooth-rimmed apertures and the presence of a vascular stolon. Family status was proposed by Kott (1990) on the basis of its differences from Clavelinidae, namely, its very long gut loop, distinctive larval adhesive organs, relatively small gonads, and replication by horizontal division of the abdomen involving the epicardium (Trason 1963). *Euherdmania* (Euherdmaniidae) has similar adhesive organs and fertilisation at the base of the oviduct and a long gut loop. However, its gonads usually are behind the gut loop, and it has lobed apertures. In defining this family, Kott (1990) included fertilisation at the base of the oviduct as a character distinguishing it from Clavelinidae. However, species in the *Detorta* group of the genus *Pycnoclavella* are an exception, fertilisation occurring in the atrial cavity at the top of the thorax (see Kott 2005).

Two genera are known. The monotypic *Euclavella* Kott, 1990 has a temperate range from New Zealand to eastern Australia, and *Pycnoclavella* Garstang, 1891 is well represented in Australian waters by two tropical and four temperate species, all brightly coloured and forming large clusters of partially embedded zooids with characteristic small, inflated thoraces and long, narrow gut loops.



## References

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- Trason, W.B. (1963). The life cycle and affinities of the colonial ascidian *Pycnoclavella stanleyi*. *Univ. Calif. Publ. Zool.* **65**(4): 283–326
- Euclavella* Kott, 1990**
- Euclavella*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [79].  
Type species: *Colella claviformis* Herdman, 1891 by original designation.
- Extralimital distribution: See: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [79].
- Euclavella claviformis* (Herdman, 1891)**
- Colella claviformis*** Herdman, W.A. (1891). A revised classification of the Tunicata, with definitions of the orders, sub-orders, families, sub-families and genera, and analytical keys to the species. *J. Linn. Soc. Lond. Zool.* **23**: 558–652 [611].  
Type data: syntypes AM U151, U241, G12248.  
Type locality: Port Jackson, NSW.
- Amaroucium anomalum*** Herdman, W.A. (1899). Descriptive catalogue of the Tunicata in the Australian Museum. *Australian Museum, Sydney, Catalogue* **17**: 1–139 [76].  
Type data: holotype AM U353 (G2107).  
Type locality: Port Jackson, NSW.
- Clavelina sigillaria*** Michaelsen, W. (1924). Ascidae Krikobanchiae von Neuseeland, den Chatham und den Auckland Inseln. *Vidensk. Meddr. Dansk Naturh. Foren.* **77**: 263–434 [269].  
Type data: holotype ZMUC, paratype(s) ZMH K1287.  
Type locality: 10 miles northwest of Cape Maria van Diemen, 10 m North Island, New Zealand.
- Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [79].
- Distribution: New Zealand, NSW (Central E coast, Lower E coast).  
Ecology: benthic, marine; 15–60 m.
- Pycnoclavella* Garstang, 1891**
- Pycnoclavella*** Garstang, W. (1891). Report on the Tunicata of Plymouth. Part I. Clavelinidae, Perophoridae, Diazonidae. *J. Mar. Biol. Ass. U.K. (ns)* **2**: 47–67 [65].  
Type species: *Pycnoclavella aurilucens* Garstang, 1891 by monotypy.
- Archiascidia*** Jülin, C. (1904). Recherches sur la phylogénèse des tuniciers *Archiascidia neapolitana* nov. gen. *Mitt. Zool. Stat. Neapel* **16**: 489–552 [548].  
Type species: *Archiascidia neapolitana* Jülin, 1904 by monotypy.
- Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [67].
- Extralimital distribution: Palaearctic Region; western Europe, tropical west Pacific Ocean. See: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.
- Pycnoclavella arenosa* (Kott, 1972)**
- Oxycorynia arenosa*** Kott, P. (1972). The ascidians of South Australia II. Eastern Sector of the Great Australian Bight and Investigator Strait. *Trans. R. Soc. S. Aust.* **96**(4): 165–196 [167].  
Type data: holotype NMV H168, paratype(s) NMV H169.  
Type locality: Investigator Strait, 30 m, SA.
- Taxonomic decision for new combination: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [69] (as *Pycnoclavella arenosa*).
- Distribution: SA (S Gulfs coast), VIC (Bass Strait).  
Ecology: benthic, marine.
- Pycnoclavella aurantia* Kott, 1990**
- Pycnoclavella aurantia*** Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [71].  
Type data: holotype QM GH2295.  
Type locality: reef, Nuyts Archipelago, Franklin Is., 15 m, SA.
- Distribution: SA (Great Australian Bight).  
Ecology: benthic, marine; 15 m breaking reef.  
Reference: Kott, P. (1992). The Australian Ascidiacea, supplement 2. *Mem. Queensl. Mus.* **32**(2): 621–655.
- Pycnoclavella detorta* (Sluiter, 1904)**
- Podoclavella detorta*** Sluiter, C.P. (1904). Die Tunicaten der Siboga-Expedition. Pt. I, Die socialen und holosomen Ascidien. *Siboga Exped.* **56A**: 1–126 [6].  
Type data: syntypes ZMA TU761.1.  
Type locality: 15 m, Indonesia [7°55'30"S 114°26'E].
- Taxonomic decision for new combination: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [71] (as *Pycnoclavella detorta*).
- Distribution: Indonesia, QLD (NE coast), WA (Lower W coast); west Pacific Ocean.  
Ecology: benthic, marine; to 40 m.

***Pycnoclavella diminuta*** (Kott, 1957)

*Clavelina diminuta* Kott, P. (1957). Ascidiens of Australia II. Aplousobranchiata Lohille; Clavelinidae Forbes and Hanley and Polyclinidae Verrill. *Aust. J. Mar. Freshwat. Res.* **8**(1): 64–110 [89].

Type data: syntypes AM Y1160.

Type locality: Rottnest Is., WA.

*Clavelina nodula* Kott, P. (1972). The ascidiens of South Australia II. Eastern Sector of the Great Australian Bight and Investigator Strait. *Trans. R. Soc. S. Aust.* **96**(4): 165–196 [166].

Type data: holotype SAMA E898, paratype(s) SAMA E908.

Type locality: off Waldegrave Is., SA.

*Archidistoma richeri* Monniot, F. (1988). Ascidiens de Nouvelle-Calédonie V. Polycitoridae du Lagon. *Bull. Mus. Natl. Hist. Nat. Paris* (4)**10A**(2): 197–235 [199].

Type data: holotype MNHP A3-ARC-4\*.

Type locality: lagoon, New Caledonia.

*Archidistoma rubripunctum* Monniot, F. (1988). Ascidiens de Nouvelle-Calédonie V. Polycitoridae du Lagon. *Bull. Mus. Natl. Hist. Nat. Paris* (4)**10A**(2): 197–235 [200].

Type data: holotype MNHP A3-ARC-6\*.

Type locality: outside barrier reef, lagoon, 20–25 m, New Caledonia.

Taxonomic decision for synonymy: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [73].

Distribution: Philippines, New Caledonia, Lord Howe Island, NT (N coast), QLD (Great Barrier Reef, SE oceanic), SA (Great Australian Bight, S Gulfs

coast), WA (Central W coast, Lower W coast, N coast).

Ecology: benthic, marine; 5–20 m in caves and under ledges.

***Pycnoclavella elongata*** Kott, 1990

*Pycnoclavella elongata* Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [76].

Type data: holotype SAMA E1980, paratypes QM GH4082, SAMA E1981.

Type locality: just offshore N of West Is., Nuyts Archipelago, Franklin Is., 8–10 m, SA.

Distribution: SA (Great Australian Bight).

Ecology: benthic, marine; on rock amongst breaking reef, rock and sand patches, 8–15 m.

Reference: Kott, P. (1992). The Australian Ascidiacea, supplement 2. *Mem. Queensl. Mus.* **32**(2): 621–655.

***Pycnoclavella tabella*** Kott, 1990

*Pycnoclavella tabella* Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [77].

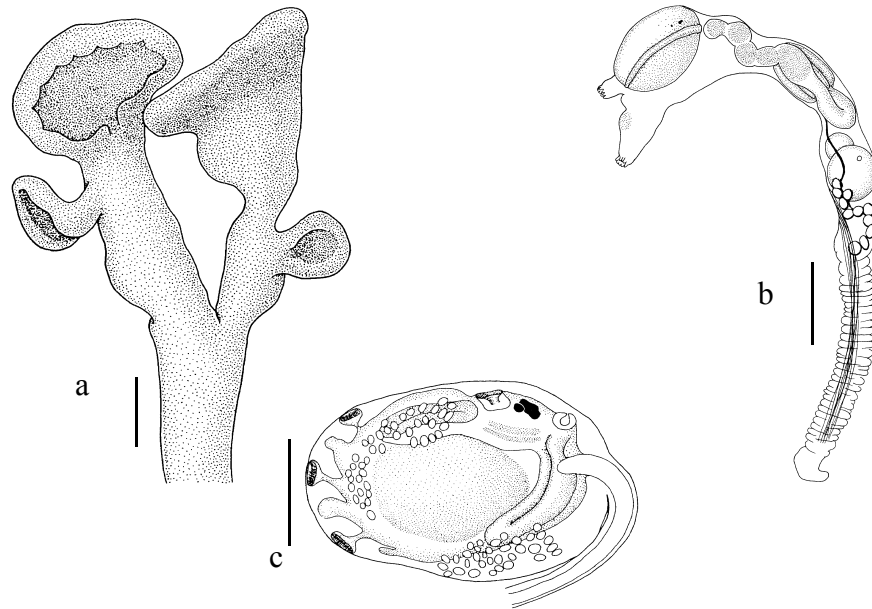
Type data: holotype QM G10161, paratypes QM G9257, SAMA E1982.

Type locality: on reef, Portsea, 1.8 m, VIC.

Distribution: SA (S Gulfs coast), VIC (Bass Strait).

Ecology: benthic, marine; reef, 1.8–11 m.

## RITTERELLIDAE



**Fig. 12.** *Ritterella pedunculata* (Herdman, 1899): **a**, part of colony; **b**, zooid; **c**, larva. (Scale bars: a = 2.0 mm; b = 0.5 mm; c = 0.2 mm). [from Kott 1992]

Genera in the family Ritterellidae Kott, 1992 have 6-lobed, separately opening apertures, a short abdomen, a stomach with a longitudinally folded wall halfway down the descending limb of the gut loop and a long narrow posterior abdomen containing serially arranged gonads. Parastigmatic vessels sometimes cross each row of stigmata and sometimes papillae (possible vestiges of internal longitudinal vessels as in Protopolyclinidae) are on the transverse branchial vessels. Sand often is crowded in the test making it hard and brittle. Zooids always are embedded, often in long, narrow sandy branches in which each terminal branch has zooids arranged in a system with the atrial apertures on one side and branchial apertures in an arc on the other side. These are not true cloacal systems, although in some species zooids are arranged in circles in rudimentary cloacal systems (as in some Polycitoridae). Larvae are incubated in the atrial cavity, where the eggs may be fertilised. Most larvae resemble those of *Polyclinum* Savigny, 1816, with paired dorsal and postero-ventral strands of epidermal vesicles. Only *Ritterella dispar* Kott, 1957 has vesicles between the adhesive organs as in *Aplidium* Savigny, 1816.

Zooids are distinguished from those of Protopolyclinidae and Euherdmaniidae by their long posterior abdomen with serially arranged gonads. Pseudodistomidae have wider thoraces with only three rows of stigmata. The zooids are similar to those of *Aplidium* species, with the gut loop short, stomach folded, and posterior abdomen very long. They possibly share a common ancestor with *Aplidium* and may have evolved from Protopolyclinidae in parallel with *Polyclinum* and other genera of the Polyclinidae. The two known genera, *Ritterella* Harant, 1931 and *Dumus* Brewin, 1952 formerly were included in the Euherdmaniinae Ritter, 1903, a subfamily of the Polyclinidae, together with other genera characterised by their separately opening atrial apertures.

# RITTERELLIDAE

A few tropical species are known, but Ritterellidae are mainly temperate, in the western Pacific both north and south of the tropics, and in the eastern Pacific north of the equator. In the Atlantic Ocean only one specimen of a newly described species (*R. glareosa* Monniot, 1974) is reported from an isolated sea-mount off the Azores. The type species of the monotypic genus *Dumus* is one of the few known trans-Tasman species. *Ritterella* is well represented in southern Australian waters.

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## *Dumus* Brewin, 1952

***Dumus*** Brewin, B.I. (1952). Ascidians of New Zealand, Part 7 Ascidians from Otago coastal waters, Part 2. *Trans. R. Soc. N.Z.* **79**(3/4): 452–458 [453].

Type species: *Dumus areniferus* Brewin, 1952 by original designation.

Extralimital distribution: See: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620.

### *Dumus areniferus* Brewin, 1952

***Dumus areniferus*** Brewin, B.I. (1952). Ascidians of New Zealand, Part 7 Ascidians from Otago coastal waters, Part 2. *Trans. R. Soc. N.Z.* **79**(3/4): 452–458 [453].

Type data: holotype OMNZ\*.

Type locality: on rocks, intertidal, Victory Beach, Otago, coastal waters, South Island, New Zealand.

Distribution: New Zealand, NSW (Central E coast, Lower E coast), QLD (Central E coast), SA (Great Australian Bight), VIC (Bass Strait), WA (Lower W coast).

Ecology: benthic, marine.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620.

## *Ritterella* Harant, 1931

***Ritterella*** Harant, H. (1931). Contributions à l'histoire naturelle des ascidies et de leurs parasites. *Ann. Inst. Océanogr. Monaco* **8**(4): 229–389 [246].

Type species: *Amaroucium aequalisiphonalis* Ritter & Forsyth, 1917 by monotypy.

Extralimital distribution: tropical west Pacific Ocean, north Pacific Ocean. See: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620.

### *Ritterella asymmetrica* Millar, 1966

***Ritterella asymmetrica*** Millar, R.H. (1966). Ascidiacea, Port Phillip Survey. *Mem. Natl. Mus. Vic.* **27**: 357–375 [361].

Type data: syntypes NMV H39.

Type locality: Port Phillip Bay, VIC.

Distribution: SA (Great Australian Bight, S Gulfs coast), VIC (Bass Strait).

Ecology: benthic, marine; sand-adapted species with colonies consolidated by sand and stabilising sandy substrates in association with similar colonies in other taxa.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [384].

***Ritterella compacta* Kott, 1992**

***Ritterella compacta*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [403].

Type data: holotype QM GH2399 (SAMA E2094), paratypes QM GH4172 (SAMA E2095), QM GH4177 (SAMA E2096). Type locality: in caves, Flinders Is., Investigator Group, SA.

Distribution: SA (Great Australian Bight, S Gulfs coast).

Ecology: benthic, marine; 10–15 m.

***Ritterella cornuta* Kott, 1992**

***Ritterella cornuta*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [405].

Type data: holotype QM GH4176 (SAMA E2098).

Type locality: Price Is., SA.

Distribution: SA (Great Australian Bight); known only from type locality.

Ecology: benthic, marine.

***Ritterella dispar* Kott, 1957**

***Ritterella dispar*** Kott, P. (1957). Ascidiaceans of Australia II. Aplousobranchiata Lahille; Clavelinidae Forbes and Hanley and Polyclinidae Verrill. *Aust. J. Mar. Freshwat. Res.* **8**(1): 64–110 [102].

Type data: holotype AM U3897.

Type locality: Caloundra, QLD.

Distribution: Lord Howe Island, NSW (Central E coast, Lower E coast, SE oceanic), QLD (Central E coast, NE coast, SE oceanic); W Indian Ocean.

Ecology: benthic, marine; favours cryptic habitats high in intertidal.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620.

***Ritterella multistigmata* Kott, 1992**

***Ritterella multistigmata*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [408].

Type data: holotype QM GH5463.

Type locality: near Rockingham, Warnbro Sound, Murray Reef, Sisters Reef, WA [46°21'21"S 115°41'18"E].

Distribution: WA (Lower W coast); known only from type locality.

Ecology: benthic, marine.

***Ritterella papillata* Kott, 1992**

***Ritterella papillata*** Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620 [409].

Type data: holotype QM GH4148 (SAMA E2097), paratype(s) QM GH4217.

Type locality: Price Is., SA.

Distribution: SA (Great Australian Bight); known only from type locality.

Ecology: benthic, marine.

***Ritterella pedunculata* (Herdman, 1891)**

***Psammaplidium pedunculatum*** Herdman, W.A. (1891). A revised classification of the Tunicata, with definitions of the orders, sub-orders, families, sub-families and genera, and analytical keys to the species. *J. Linn. Soc. Lond. Zool.* **23**: 558–652 [620].

Type data: syntypes AM U281 (G2112).

Type locality: Port Jackson, NSW.

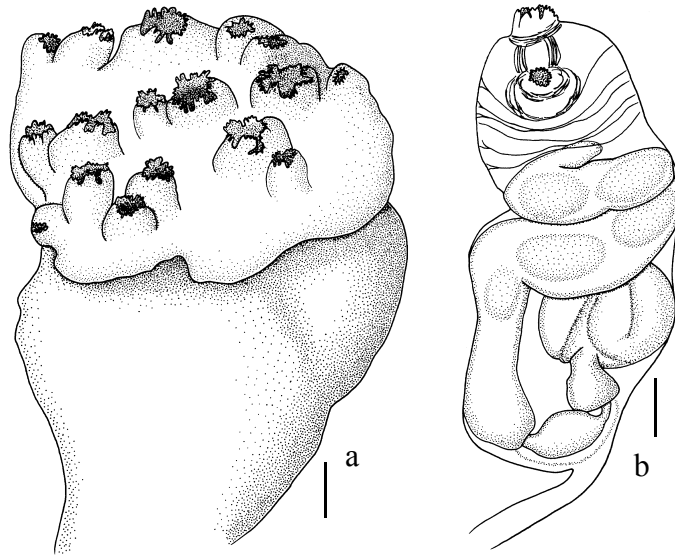
***Ritterella herdmania*** Kott, P. (1957). Ascidiaceans of Australia II. Aplousobranchiata Lahille; Clavelinidae Forbes and Hanley and Polyclinidae Verrill. *Aust. J. Mar. Freshwat. Res.* **8**(1): 64–110 [102] [*nom. nov.* proposed erroneously for *Psammaplidium pedunculatum* Herdman, 1891, the senior rather than junior homonym of *Ritterella pedunculata* Tokioka, 1953].

Distribution: NSW (Lower E coast), SA (Great Australian Bight, S Gulfs coast), TAS (Bass Strait, Tas. coast), VIC (Bass Strait).

Ecology: benthic, marine; to 12 m, often fast flowing currents, colonies often consolidated by, and stabilising, sand.

Reference: Kott, P. (1992). The Australian Ascidiacea Pt 3, Aplousobranchia (2). *Mem. Queensl. Mus.* **32**(2): 377–620.

## STOMOZOIDAE



**Fig. 13.** *Stomozoa australiensis* Kott, 1990: **a**, single lobe of a colony with zooid openings distended; **b**, zooid, much contracted. (Scale bars: a = 2.0 mm; b = 0.5 mm). [from Kott 1990].

The family Stomozoidae Kott, 1990 is small, containing only three known species, two in Australia and one with a cosmopolitan distribution (Kott 1990). The family is distinguished by the fringed lobes that surround each separately opening aperture. These lobes alternate with conspicuous pigment spots, similar to those known in other aplousobranch and phlebobranch ascidians. A siphonal velum projects forwards inside the lobes to form the actual branchial opening. Small gonads with only a one- or two-egg ovary are in the moderately long gut loop. Vascular stolons of moderate length, sometimes branching, project down into the basal test from the embedded zooids, but they do not appear to have terminal ampullae as in Clavelinidae (which is further distinguished by its smooth-rimmed apertures). Longitudinal muscles extend along each side of the thorax and abdomen but not onto the vascular stolon as in *Sigillina* Savigny, 1816 (Holozoidae). The larvae have large triradially arranged adhesive organs (as in Clavelinidae). Nevertheless, the family appears to be most closely related to Polycitoridae (see Kott 1990).

Although they are not inconspicuous, forming fleshy cushion-like colonies, species of this genus are seldom recorded, and possibly their preferred habitat has not yet been located.

# References

Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266

Savigny, J.C. (1816). Recherches anatomiques sur les ascidies composées et sur les ascidies simples—Système de la classe des Ascidies pp. 1–239. In *Mémoires sur les Animaux sans Vertèbres*, Pt 2. Paris : G. Dufour.

## *Stomozoa* Kott, 1957

*Stomozoa* Kott, P. (1957). The sessile Tunicata. *Scient. Rep. John Murray Exped.* **10**(4): 129–149 [131].

Type species: *Stomozoa murrayi* Kott, 1957 by monotypy.

Extralimital distribution: Afrotropical Region, Neotropical Region; Brazilian and Guyana Shelves, Red Sea. See: Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266.

## *Stomozoa australiensis* Kott, 1990

*Stomozoa australiensis* Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [157].

Type data: holotype QM GH974, paratype(s) QM GH946, GH2392.

Type locality: Topgallant Is., Great Australian Bight, 5 m, SA.

Distribution: SA (Great Australian Bight).

Ecology: benthic, marine; cliffs and caves.

## *Stomozoa bellissima* Kott, 1990

*Stomozoa bellissima* Kott, P. (1990). The Australian Ascidiacea Pt 2, Aplousobranchia (1). *Mem. Queensl. Mus.* **29**(1): 1–266 [159].

Type data: holotype QM G9267, paratype(s) QM GH4918.

Type locality: Bundegi Reef, Exmouth, WA.

Distribution: QLD (Great Barrier Reef), WA (NW coast).

Ecology: benthic, marine.

# UNPLACED SPECIES

The following names cannot be placed with certainty, for reasons given below, and are listed here as *Species Inquirendae*.

## *Species Inquirenda*

***Atopogaster aurantiaca*** Herdman, W.A. (1886). Report on the Tunicata collected during the voyage of H.M.S. *Challenger* during the years 1873–1876. Pt II, Ascidiaceae compositae. *Zool. Chall. Exped.* **14**(38): 1–425 [168] [may be a *Polycitor* species, although on the basis of the original description, the zooids with many rows of stigmata and gonads spilling over from the abdomen to a posterior abdomen, cannot be assigned to any known genus or species; the holotype has not been re-examined].

Type data: holotype BMNH\*.

Type locality: Bass Strait, VIC.

***Leptoclinum fimbriatum*** Herdman, W.A. (1898). Note on the Tunicata fauna of Australian seas. *Ann. Mag. Nat. Hist.* **7**(1): 443–450 [448] [also in Herdman, W.A. (1899). Descriptive catalogue of the Tunicata in the Australian Museum. *Australian Museum, Sydney, Catalogue* **17**: 1–139 (91)].

Type data: type status and whereabouts unknown\*.

Type locality: Port Jackson, NSW.

***Amaroucium rotundatum*** Herdman, W.A. (1899). Descriptive catalogue of the Tunicata in the Australian Museum. *Australian Museum, Sydney, Catalogue* **17**: 1–139 [71] [name first listed by Herdman, W.A. (1898). Note on the Tunicata fauna of Australian seas. *Ann. Mag. Nat. Hist.* **7**(1): 443–450 (448), *nom. nud.*; probably a colony of *Polycitor giganteum* (Herdman, 1899), its zooids having a long abdomen with gonads in the gut loop; the holotype has not been re-examined].

Type data: holotype AM U112, G2104\*.

Type locality: Port Jackson, NSW.

***Polyclinum clava*** Herdman, W.A. (1899). Descriptive catalogue of the Tunicata in the Australian Museum. *Australian Museum, Sydney, Catalogue* **17**: 1–139 [77] [name first listed by Herdman, W.A. (1898). Note on the Tunicata fauna of Australian seas. *Ann. Mag. Nat. Hist.* **7**(1): 443–450 (448), *nom. nud.*; probably a colony of *Polycitor giganteum* (Herdman, 1899)].

Type data: holotype AM U154.

Type locality: Port Jackson, NSW.

***Polyclinum complanatum*** Herdman, W.A. (1899). Descriptive catalogue of the Tunicata in the Australian Museum. *Australian Museum, Sydney, Catalogue* **17**: 1–139 [81] [name first listed by Herdman, W.A. (1898). Note on the Tunicata fauna of Australian seas. *Ann. Mag. Nat. Hist.* **7**(1):

443–450 (448), *nom. nud.*; has as its junior synonym, *Polyclinum depressum* Herdman, 1899 (*loc. cit.*, figs Pl. 1, 9–12), and may be a specimen of a *Pseudodistoma* species].

Type data: holotype whereabouts unknown.

Type locality: Port Jackson, NSW.

***Polyclinum fuscum*** Herdman, W.A. (1899). Descriptive catalogue of the Tunicata in the Australian Museum. *Australian Museum, Sydney, Catalogue* **17**: 1–139 [82] [name first listed by Herdman, W.A. (1898). Note on the Tunicata fauna of Australian seas. *Ann. Mag. Nat. Hist.* **7**(1): 443–450 (448), *nom. nud.*; appears to be a specimen of *Polycitor giganteum* (Herdman, 1899); holotype has not been re-examined].

Type data: holotype AM U156, G2101.

Type locality: Port Jackson, NSW.

***Didemnum rotnesti*** Kott, P. (1962). The ascidians of Australia III. Aplousobranchiata Lahille: Didemnidae Giard. *Aust. J. Mar. Freshwat. Res.* **13**(3): 265–334 [322] [species description unsatisfactory and requires revision; holotype and paratype from Rottnest Is. (WA) and Maria Is. (Tasmania) suggest anomalies but the specimens have not been reexamined].

Type data: holotype AM Y1515, paratype(s) AM Y1523.

Type locality: Mary Cove, Rottnest Is., WA.

***Trididemnum spiculatum*** Kott, P. (1962). The ascidians of Australia III. Aplousobranchiata Lahille: Didemnidae Giard. *Aust. J. Mar. Freshwat. Res.* **13**(3): 265–334 [322] [although the holotype and the paratypes AM Y1628, Y 1630-2 are from Rottnest Is. (WA), other paratypes (AM Y1619 and Y1624) are from Tasmania; another paratype (AM Y1627) from Heron Is. has been found to be conspecific with *Trididemnum paracyclops* Kott (1980); the species is ill-defined and requires revision].

Type data: holotype AM Y1626, paratype(s) AM Y1619, Y1624, Y1628, Y1630-2.

Type locality: Thompson's Bay, Rottnest Is., WA.

***Polysyncrator victoriense*** Kott, P. (1976). Ascidian fauna of Western Port Bay, Victoria and a comparison with that of Port Phillip Bay. *Mem. Natl. Mus. Vic.* **37**: 53–96 [73] [the species is inadequately described and requires revision; the holotype has not been reexamined].

Type data: holotype NMV H171.

Type locality: on *Ecklonia* holdfasts, 8 m, Crawfish Rock, Westernport, VIC.