

Abridged Threatened Species Nomination Form

For nominations/assessments under the Common Assessment Method (CAM) where supporting information is available, but not in a format suitable for demonstrating compliance with the CAM, and assessment against the IUCN Red List threat status.

Cover Page *(Office use only for Assessment)*

Species name (scientific and common name):	<i>Stylidium amabile</i>
Nomination for (addition, deletion, change):	Addition
Nominated conservation category and criteria:	CR: B1ab(v)+B2ab(v); C2a(ii)

Scientific committee assessment of eligibility against the criteria:		
This assessment is consistent with the standards set out in Schedule 1, item 2.7 (h) and 2.8 of the Common Assessment Method Memorandum of Understanding.		Yes <input type="checkbox"/> No <input type="checkbox"/>
A.	Population size reduction	•
B.	Geographic range	•
C.	Small population size and decline	•
D.	Very small or restricted population	•
E.	Quantitative analysis	•

Outcome:			
<i>Scientific committee Meeting date:</i>			
<i>Scientific committee comments:</i>			
<i>Recommendation:</i>			
<i>Ministerial approval:</i>		<i>Date of Gazettal/ Legislative effect:</i>	

Nomination/Proposal summary *(to be completed by nominator)*

Current conservation status				
Scientific name:	<i>Stylidium amabile</i>			
Common name:	None			
Family name:	Stylidiaceae	Fauna <input type="checkbox"/>	Flora <input checked="" type="checkbox"/>	
Nomination for:	Listing <input checked="" type="checkbox"/>	Change of status/criteria <input type="checkbox"/>	Delisting <input type="checkbox"/>	
1. Is the species currently on any conservation list, either in a State or Territory, Australia or Internationally? 2. Is it present in an Australian jurisdiction, but not listed?		Provide details of the occurrence and listing status for each jurisdiction in the following table		
Jurisdiction	State / Territory in which the species occurs	Date listed or assessed (or N/A)	Listing category i.e. critically endangered or 'none'	Listing criteria i.e. B1ab(iii)+2ab(iii)
International (IUCN Red List)				
National (EPBC Act)				
State / Territory	1. WA	2006	Critically Endangered	C2a(i)
		2017 (proposed)	Critically Endangered	B1ab(v)+B2ab(v); C2a(ii)
	2.			
Consistent with Schedule 1, item 2.7 (h) and 2.8 of the Common Assessment Method Memorandum of Understanding, it is confirmed that:				
<ul style="list-style-type: none"> this assessment meets the standard of evidence required by the Common Assessment Method to document the eligibility of the species under the IUCN criteria; 			Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Comments:				
<ul style="list-style-type: none"> surveys of the species were adequate to inform the assessment; 			Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Comments:	Further survey occurred in 2003, 2006, 2007, 2009, 2010, 2011, 2013, 2014 and 2015. The total number of mature individuals declined from 94 in 1989 to 26 in 2007. Following a trial burn numbers increased to 198 in 2015.			
<ul style="list-style-type: none"> the conclusion of the assessment remains current and that any further information that may have become available since the assessment was completed supports or is consistent with the conclusion of the assessment. 			Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Comments:	Criteria C2a(i) no longer applies as there are >50 mature individuals known from Subpopulation 2. Both subpopulations showed a significant decline in the number of mature individuals prior to undertaking regeneration burns. Subpopulation 1 declined overall from 25 mature individuals in 1989 to 8 in 2015. Subpopulation 2 declined from 69 in 1989 to 25 in 1990, but overall has seen an increase in numbers following a trial burn, but has declined since the burn and further decline expected. Therefore criteria B1ab(v)+B2ab(v) now applies. 198 (96%) of plants occur in			

Subpopulation 2, therefore criteria C2a(ii) now applies.		
Nominated national conservation status: category and criteria		
Presumed extinct (EX) <input type="checkbox"/> Critically endangered (CR) <input checked="" type="checkbox"/> Endangered (EN) <input type="checkbox"/> Vulnerable (VU) <input type="checkbox"/>		
None (least concern) <input type="checkbox"/> Data Deficient <input type="checkbox"/> Conservation Dependent <input type="checkbox"/>		
What are the IUCN Red List criteria that support the recommended conservation status category?	B1ab(v)+B2ab(v); C2a(ii)	
Eligibility against the IUCN Red List criteria (A, B, C, D and E)		
<i>Provide justification for the nominated conservation status; is the species eligible or ineligible for listing against the five criteria. For delisting, provide details for why the species no longer meets the requirements of the current conservation status.</i>		
A.	Population size reduction (evidence of decline)	<ul style="list-style-type: none"> Insufficient information is available to reliably show rate of decline. Changes in plant numbers partially attributed to the species being a relatively short-lived disturbance opportunist.
B.	Geographic range (EOO and AOO, number of locations and evidence of decline)	<ul style="list-style-type: none"> (B1) The Extent of Occurance is 4km², this figure is equivalent to the AOO as the EOO cannot be smaller than the AOO. Using Minimum Convex Polygon (MCP), an EOO of approximately 0.04 km² was calculated by drawing a polygon around the plants. (B2) Area of Occupancy is an estimated 4 km² using the 2km x 2km grid method (<10 km²) – area occupied is 0.018 km² or 1.8 hectares. (a) Only known from a single location in the Maya area, northeast of Perth. (b) Continuing decline observed and projected: (v) Both subpopulations showed a significant decline in the number of mature individuals prior to undertaking regeneration burns. Subpopulation 1 has declined overall from 25 mature individuals in 1989 to 8 in 2015. Subpopulation 2 declined from 69 in 1989 to 25 in 1990, but overall has seen an increase in numbers following a trial burn, but has declined since the burn and further decline expected. A continuing decline in the number of mature individuals is expected without ongoing management. Meets criteria for Critically Endangered B1ab(v)+B2ab(v)
C.	Small population size and decline (population size, distribution and evidence of decline)	<ul style="list-style-type: none"> (C2) Known from 206 mature individuals in total. (a) Continuing decline in the number of mature individuals is expected following disturbance event, and will decline further without ongoing management. (ii) 198 (96%) of plants in one subpopulation. Meets criteria for Critically Endangered C2a(ii)
D.	Very small or restricted population (population size)	<ul style="list-style-type: none"> (D) There are approximately 206 mature individuals in total. Meets Endangered D

E.	Quantitative analysis (statistical probability of extinction)	<ul style="list-style-type: none"> No information to assess. 			
Summary of assessment information					
EOO	0.04 km ² (MCP), calculated to 4 km ² so as not less than the estimated AOO.	AOO	4 km ² (2 km x 2 km grid), but mapped area of subpopulations is 0.018 km ² .	Generation length	Unknown
No. locations	1	Severely fragmented	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/>		
No. subpopulations	2	No. mature individuals	206		
Percentage global population within Australia			100		
Percentage population decline over 10 years or 3 generations			Unknown		
Threats (detail how the species is being impacted)					
Threat <i>(describe the threat and how it impacts on the species. Specify if the threat is past, current or potential)</i>		Extent <i>(give details of impact on whole species or specific subpopulations)</i>		Impact <i>(what is the level of threat to the conservation of the species)</i>	
Poor recruitment <ul style="list-style-type: none"> The species appears to require a disturbance to recruit, but if disturbance is too frequent, occurs at the wrong time of the year or is followed by a drought, then the populations are likely to be severely impacted. Past, present, future		Whole population		Severe	
Road and rail maintenance <ul style="list-style-type: none"> Threats include grading, chemical spraying, construction of drainage channels, slashing of road and rail vegetation and burning of old railway sleepers. Past, current and future		Whole population		Severe	
Rabbits <ul style="list-style-type: none"> Grazing impacts on the establishment of seedlings and thereby limiting natural recruitment. Disturbance to plants and roots from rabbit diggings. Past, current and future		Whole population		Severe	
Altered fire regimes <ul style="list-style-type: none"> The species appears to require fire to stimulate germination. However frequent fire would deplete the soil seed store. Fire is likely to facilitate weed invasion and appropriate weed 		Whole population		Severe	

control should be applied post-fire. Past, current and future		
Drought <ul style="list-style-type: none"> • Equivalent to a major disturbance. • May delay surveys for additional subpopulations given that plants are unlikely to flower and be more difficult to detect. • Climate change modelling for the south west region predicts a decline in rainfall, and some seasonal shift to summer rainfall events, which is likely to increase the potential impact of drought on the species. Past, present, future	Whole population	Severe
Management and Recovery		
Is there a Recovery Plan (RP) or Conservation Management Plan operational for the species?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
<p><i>List all relevant recovery or management plans (including draft, in-preparation, out-of-date, national and State/Territory recovery plans, recovery plans for other species or ecological communities, or other management plans that may benefit or be relevant to the nominated species).</i></p> <ul style="list-style-type: none"> • Department of Environment and Conservation (2010) <i>Stylidium amabile</i> Interim Recovery Plan 2010–2015. Interim Recovery Plan No. 295. Department of Environment and Conservation, Western Australia. 		
<p><i>List current management or research actions, if any, that are being undertaken that benefit the conservation of the species.</i></p> <ul style="list-style-type: none"> • Monitoring and surveys have been carried out to determine plant numbers and impact of threats; • Protecting the sites from fire unless required for ecological reasons, and implemented early intervention in any wildfires which may threaten the site; • Surveying for additional subpopulations; • Installation of markers; • Trial burns at both subpopulations to attempt to stimulate recruitment; • Fencing of both subpopulations to protect from grazing by rabbits; • Collecting approximately 20,000 seed for storage at Parks and Wildlife's Threatened Flora Seed Centre. 		
<p><i>List further recommended management or research actions, if any, that would benefit the conservation of the species. Please ensure that this section addresses all identified threats.</i></p> <p>Management</p> <ul style="list-style-type: none"> • Monitoring the populations for evidence of rabbit or weed impacts, or changes in plant or site health; • Ongoing liaison with Main Roads Western Australia and Brookfield Rail to ensure that subpopulations of the species are not accidentally damaged or destroyed, and the habitat is maintained in a suitable condition for the conservation of the species; • Upgrade fencing at both subpopulations to protect from rabbits; • Control rabbits through scatter baiting; • Develop and implement a fire management strategy, including associated weed control measures and the need for and method of the construction and maintenance of firebreak; • Develop a translocation proposal and select a disease free translocation site; 		

- Map habitat critical to the survival of the species to facilitate its protection and appropriate management;
- Promote awareness of the species with general public.

Research

- Research biology and ecology of the species, with a focus on pollination effectiveness, seed viability, conditions required for natural germination, response to threats and disturbances and reproductive biology.
- Improve understanding of species responses to fire frequency, season and severity to inform the development of a fire management strategy.

Nomination prepared by:

Contact details:

Date submitted:

20/9/2016

If the nomination has been refereed or reviewed by experts, please provide their names and contact details:

Summary of subpopulation information (detailed information to be provided in the relevant sections of the form)						
Location (include coordinates)	Land tenure	Survey information: Date of survey and No. mature individuals	AOO	Site / habitat Condition	Threats (note if past, present or future)	Specific management actions
Subpopulation 1: NW of Maya	Main Roads road reserve; rail reserve	1989: 25 2000: 9 2001: 6 2003: 4 2007: 2 2008: 1 2013: 0 2014: **7 juveniles 2015: 8	~0.8 ha	Habitat excellent. Threatened by ongoing road and rail maintenance.	Road and rail maintenance (past, present, future) Poor recruitment (past, present, future) Grazing (rabbits) (past, present, future) Inappropriate fire regimes (future) Climate change (future)	Install markers Upgrade fencing Develop a fire management plan Undertake baiting for rabbits Collect seed and test viability, conduct regeneration trials Baiting program to be completed Establish new populations through translocation
Subpopulation 2: NW of Maya	Main Roads road reserve; rail reserve	1989: 69 1990: *25 1992: 132 2000: 47 2001: 48 2007: 24 2009: **425 2013: 198 *a number of plants destroyed by grading **recruitment trials conducted	~1 ha	Habitat excellent. Threatened by ongoing road maintenance.	Road and rail maintenance (past, present, future) Poor recruitment (past, present, future) Grazing (rabbits) (past, present, future) Inappropriate fire regimes (future) Climate change (future)	Install markers Upgrade fencing Develop a fire management plan Undertake baiting for rabbits Collect seed and test viability, conduct regeneration trials Baiting program to be completed Establish new populations through translocation



FLORA NOMINATION FORM
TO BE CONSIDERED AT THE 2005 TSSC MEETING
(Updated 2016)

Proposed addition, deletion or other change to the schedule of Declared Rare Flora pursuant to the *Wildlife Conservation Act 1950* and/or amendments to CALM's Priority Flora List.

See CALM Policy Statement No. 9 for criteria and definitions. Please complete all sections. Attach additional information, if space is insufficient.

1. TAXON: *Stylidium amabile* Author Wege & Coates (2007) Hybrid ☐

2. CURRENT LIST/SCHEDULE: Declared Rare: previously considered as part of DRF *Stylidium coroniforme*
[WA:CR] Priority ☐ None ☐

3. PROPOSED LIST/SCHEDULE: Threatened [EPBC Act as CR: B1ab(v)+B2ab(v); C2a(ii)] Presumed
Extinct ☐ Priority ☐ None ☐

4. PROPOSED IUCN THREAT CATEGORY (see page 4): Extinct (EX) ☐ Extinct in the Wild (EW) ☐
Critically Endangered (CR) ☒ Endangered (EN) ☐ Vulnerable (VU) ☐ Lower Risk (LR) ☐
IUCN ranking: CR: C2a(i) (2006)
CR: B1ab(v)+B2ab(v); C2a(ii) (2016)

5. SUMMARY REASON FOR CHANGE:

Addition: Believed to be rare, but needs further survey ☐ Confirmed to be rare ☒
Populations not adequately reserved ☒ Subject to threatening processes ☒
Deletion: More common than previously thought ☐ Populations adequately reserved ☐
Taxonomic uncertainty ☐ Does not comply with guidelines for hybrids ☐
Change: Name Change ☐ Now presumed extinct ☐ Presumed extinct to extant ☐
Date found / /
Other ☐

6. TAXONOMIC HISTORY/AFFINITY:

Stylidium amabile, known from only two populations near Maya, was previously thought to represent a disjunct population of the rare Wongan Hills trigger plant *Stylidium coroniforme* F.L. Erickson & J.H. Willis.

Both DNA sequence data (Coates 1992) and recent morphological studies suggest that the Maya populations are taxonomically distinct. *Stylidium amabile* is in the process of being described. A draft taxonomic description is attached. Taxonomic description published in 2007 by Wege and Coates.

Morphological characters that support its taxonomic distinction, including differences in overall habit, stigma morphology, and the pattern of corolla markings.

Location and collection number of voucher specimens:

PERTH 06016480 - S. Patrick 2881

PERTH 06941737 - J.A. Wege & C. Wilkins JAW 902

PERTH 06941710 - D.J. Coates 3389

PERTH 07290969 - A. Crawford ADC 787

7. RECENT SURVEY EFFORT (refer to the CALM guidelines for survey requirements):

- Two populations of this species were discovered in spring 1989 near Maya, one comprising 25 mature plants, the other 69. In autumn 1990 a grader driver inadvertently destroyed plants in both populations, reducing numbers to about 17 and 25 respectively (Stace & Coates 1995). Subsequent surveys in the Maya vicinity and south towards Wongan Hills have failed to locate any additional populations.

8. THREATS:

The main threats are associated with lack of recruitment, road and rail maintenance, rabbits, altered fire regimes and drought:

- Appears to require fire to stimulate germination, also killed by drought;
- Seedling mortality and recruitment impacted by grazing;
- Plants impacted by road and rail maintenance. Previous evidence of burn old railway sleepers;
- Drought a potential threat. May delay surveys for new subpopulations as plants are unlikely to flower making detection difficult.

9. RESEARCH KNOWLEDGE/NEEDS:

- Stylidium amabile* was previously thought to be a disjunct population of the rare Wongan Hills trigger plant;
- This species ranking is well supported by DNA sequence data, which shows this taxon to be highly divergent from *S. coroniforme* (Coates 1992);
- Knowledge and understanding applicable to *S. coroniforme* needs to be confirmed as being applicable to *S. amabile*;
- Appears to be a disturbance opportunist, recruiting after physical grading and fire. Further research required on pollination effectiveness, seed viability, conditions required for natural germination, response to threats and disturbances and reproductive biology.

10. MANAGEMENT NEEDS & IMPLICATIONS (including susceptibility to disease, and presence of other threats):

- While markers and fencing is in place, rail maintenance and roadside grading pose a threat to individuals that may occur outside the fenced area. Ongoing liaison with Main Roads Western Australia and Brookfield Rail is required to ensure that subpopulations of the species are not accidentally damaged or destroyed, and the habitat is maintained in a suitable condition for the conservation of the species;
- Like the allied rare species *S. coroniforme*, *S. amabile* is probably a disturbance opportunist and is likely to respond well to fire, however, fires in consecutive years would threaten this species survival. A fire management strategy should be developed and implemented, including associated weed control measures and the need for and method of the construction and maintenance of firebreak. It is not known whether *S. amabile* is susceptible to disease;
- Monitoring the populations for evidence of rabbit or weed impacts, or changes in plant or site health;
- Upgrade fencing at both subpopulations to protect from rabbits;
- Control rabbits through scatter baiting;
- Develop a translocation proposal to establish new subpopulations.

11. DISTRIBUTION BY CALM REGION:

Kimberley []	Pilbara []	Midwest [X]	Goldfields []	Wheatbelt []
Swan []	Central Forest []		Southern Forest []	South Coast []

12. KNOWN POPULATIONS AND RANGE (attach WAHERB and/or population database printout):

CALM Region	Location	Land Status	Population size/area	Date of most Recent Survey	Condition of Population
A. Conservation Reserves (National Parks, Nature Reserves, State Forests)					
B. Other Crown Lands					

C. Private/Leasehold Lands

The two populations are known from the NW of Maya. They are growing between the road and a railway line. Both sites carry remnant scrub on sandy lateritic gravel.

Popn 1	NW of Maya	6 plants (2001)
		8 plants (2015)
Popn 2	NW of Maya	48 plants (2001)
		198 plants (2013)

D. Unconfirmed Locations

13. TRENDS IN POPULATION SIZE & RANGE:

A. Previous

- When this species was discovered in 1989 there were 25 mature plants in one population and 69 in the other; however in autumn 1990 a grader driver inadvertently destroyed plants in both populations, reducing numbers to about 17 and 25 respectively Stace & Coates (1995).
- Sue Patrick noticed that there were no herbarium specimens from either population lodged at the WA Herbarium, and therefore made a collection in November 1996. She observed only 2 mature plants; however, the population was not fully surveyed as the plants were in fruit and not very easy to find.

B. Current

Geraldton District Conservation Officer Alana Chant has been monitoring these populations.

Subpopn 1	2000: 9
	2001: 6
	2014: 7 juveniles (trial burn undertaken)
	2015: 8
Subpopn 2	2000: 47
	2001: 48
	2009: 425 (trial burn undertaken)
	2013: 198

14. SUMMARY STATUS ASSESSMENT:

Stylidium amabile has a highly restricted distribution (2 populations some 1.7km apart) and less than 60 individuals (206 in 2015) are currently known. It is therefore recommended that this species be placed on the Declared Rare Flora schedule at the level of Critically Endangered.

Both subpopulations showed a significant decline in the number of mature individuals prior to undertaking regeneration burns. A continuing decline in the number of mature individuals is expected without ongoing management.

Threats include road and rail maintenance, inappropriate fire regimes, grazing and drought.

14. PROPOSED BY:

Updated 14/9/2016 by Species and Communities Branch, Department of Parks and Wildlife

References

Coates, D.J. (1992). Genetic consequences of a bottleneck and spatial genetic structure in the triggerplant *Stylidium coroniforme* (Stylidiaceae). *Heredity* 69: 512-520.

Stace, H.M. & Coates, D.J. (1995). Wongan Hills Triggerplant (*Stylidium coroniforme*) Recovery Plan. Department of Conservation and Land Management. Perth.

Wege, J. and Coates, D. (2007) Observations on the rare triggerplant *Stylidium coroniforme* (Stylidiaceae) and the description of two allied taxa of conservation concern. *Nuytsia* 17(1): 433-434.

Western Australian Herbarium (1998–) *FloraBase – The Western Australian Flora*. Department of Environment and Conservation. <http://florabase.calm.wa.gov.au/>.

PLEASE FORWARD COMPLETED FORM TO:

**DEPARTMENT OF CONSERVATION AND LAND
MANAGEMENT**

ADMINISTRATIVE OFFICER (FLORA)

CALM WILDLIFE BRANCH

LOCKED BAG 104

BENTLEY DELIVERY CENTRE WA 6983

or Email address:

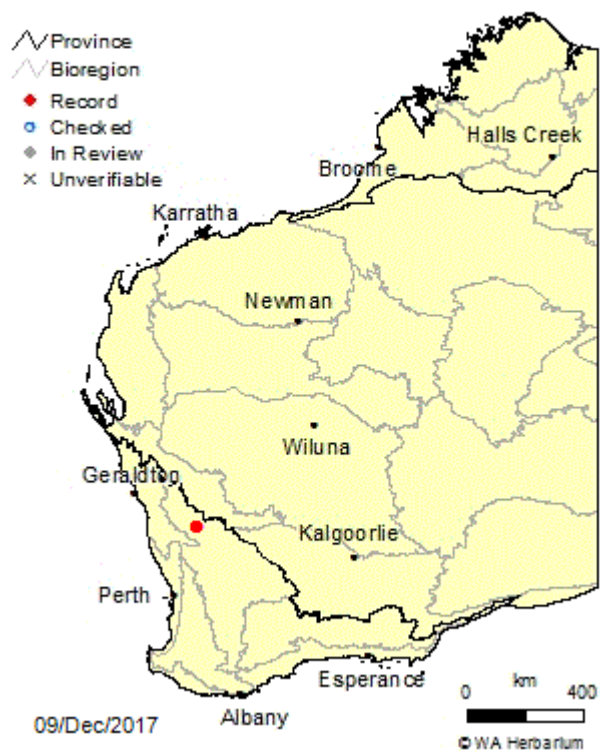
johnri@calm.wa.gov.au

or Fax Address:

(08) 9334 0278 (Phone enquiries: 9334 0422)

****PLEASE ENSURE THAT YOU COMPLETE THE ATTACHED RANKING FORM (Nomination may not be accepted unless this is completed and returned)****

Stylidium amabile



Map from Western Australian Herbarium (1998–).

***Stylidium amabile* Wege & Coates sp. nov.**

Caespitose perennial herb, 6-23 cm high. *Glandular trichomes* 0.15-0.3 mm long; stalks translucent, multicellular, biseriate; heads red to red-black, ellipsoidal, multicellular. *Stems* partly buried or slightly elevated above the soil, thickened, branched or unbranched, bearing persistent leaf bases. *Leaves* arranged in compact rosette, oblanceolate, 1.2-6 cm long, 1.8-4 mm wide, glabrous; apex mucronate, mucro 1-2.5 mm long; margin white, conspicuous, often serrulate; abaxial midrib prominent, white. *Scape* 4-28 cm high, 0.8-2 mm wide, glabrous at base, glandular on inflorescence axis; sterile bracts absent. *Inflorescence* 9-55-flowered, paniculate; units 2-3.5 cm long, 1-5 -flowered. Bracts 3-7 mm long, 1-3 mm wide, glandular, apex mucronate. Bracteoles 3-5.5 mm long; glandular. Pedicels to 1mm long. *Hypanthium* cylindrical, 8-23 mm long, 0.9-2.2 mm wide, markedly compressed in T.S., glandular; one cell of ovary infertile. *Calyx lobes* free, 2.5-3.7 mm long, 0.5-1.2 mm wide, surface glandular, margin entire, apex subacute. *Corolla* pale pink to whitish with 2 sets of pink throat markings and a white throat; abaxial surface glandular; tube 2-3.5 mm long; lobes laterally-paired, each pair typically slightly spread; anterior lobes elliptic, anterior margin strongly arcuate, 3.5-5.5 mm long, 2-3 mm wide; posterior lobes elliptic, often slightly falcate, 3.5-5.8 mm long, 2-3.2 mm wide. *Labellum* boss cream to yellow, orbicular to ovate, 0.8-1.2 mm long, 0.8-1.2 mm wide, glabrous; margin papillose, red; lateral appendages red, 1.3-2.5 mm long, papillose. *Throat appendages* 2, linear, white with pink tips, 0.9-2.2 mm long. *Column* white at base, pink-red above, 11-14 mm long; anther locules red, oblique or at 90 degrees relative to column, subtending hairs translucent; pollen yellow; stigma entire, shortly stalked, elliptic (0.7-1 mm long, 0.5-0.6 mm wide). *Capsule* cylindrical. *Seeds* brown, ellipsoid, 0.8-1.1 mm long, 0.4-0.6 mm wide, subterete to terete in T.S., papillose.

Distribution and habitat. Geographically restricted to the Maya area where it is known to grow high in the landscape, on sandy lateritic gravel in remnant *Allocasuarina* and *Acacia* scrub.