Sindora stipitata (Detarioideae, Leguminosae), a new species from Thailand

Wilawan Promprom¹, Wannachai Chatan¹, Peerapol Saisaard²

¹ Department of Biology, Faculty of Science, Mahasarakham University, Kantharawichai District, Maha Sarakham Province, 44150, Thailand ² Number 57, Village No. 3, Thung Kula Subdistrict, Tha Tum district, Surin Province, Thailand

Corresponding author: Wannachai Chatan (wannachaichatan@gmail.com)

Academic editor: C. Morden | Received 16 April 2018 | Accepted 24 May 2018 | Published 21 June 2018

Citation: Promprom W, Chatan W, Saisaard P (2018) Sindora stipitata (Detarioideae, Leguminosae), a new species from Thailand. PhytoKeys 100: 149–156. https://doi.org/10.3897/phytokeys.100.25870

Abstract

Sindora stipitata, a new species in the subfamily Detarioideae (Leguminosae), collected from Nakhon Phanom Province, Thailand, is described and illustrated. The new species is morphologically similar to S. leiocarpa but differs in its smaller stature (3–5 m high), 6-foliolate paripinnate leaves, falcate persistent stipules, presence of a petal auricle, absence of a petal claw, stipitate ovary and capitate stigma. A key to the Thailand and Malesia species of Sindora is provided.

Keywords

Sindora, Fabaceae, Nakhon Phanom Province, plant diversity, Thailand, taxonomy

Introduction

Sindora Miq. is a genus in the tribe Detarieae (Detarioideae: Leguminosae) (McKinder 2005). It consists of 18–20 species distributed in Southeast Asia, one in Africa (Larsen et al. 1984, Lock and Heald 1994, McKinder 2005), two species in the South Asia (Kumar and Sane 2003) and two species in China (Chen et al. 2010). Three species have been identified in Thailand. Of these, S. siamensis Teysmann ex Miq. is a very common species of dry deciduous dipterocarp forests and beach forests, especially the type variety (Larsen et al. 1984).
During floristic surveys in the years 2009 to 2016 in the northeast of Thailand, a specimen of *Sindora* was collected from the Phulangka National Park in Nakhon Phanom Province which, on further investigation, was found to be clearly different from the previously reported species. It closely resembled *S. leiocarpa* Backer ex de Wit from Malesia. This was confirmed after comparing it against the type and description of *S. leiocarpa* and is here described as a new species.

**Materials and methods**

Morphological characters were studied based on living plants observed during a field trip in the northeast of Thailand in the years 2009 to 2016 and from dried herbarium specimens housed in BKF and K. The studies consulted all relevant taxonomic literature in Thailand and neighbouring countries. Measurements were made using a vernier caliper and were examined under a stereo dissecting microscope. The conservation status of the new species was evaluated based on the guidelines of the International Union for Conservation of Nature (IUCN 2017).

**Taxonomy**

*Sindora stipitata* Chatan & Promprom, sp. nov.  
urn:lsid:ipni.org:names:60476588-2  
Figs 1, 2

**Diagnosis.** *Sindora stipitata* is very similar to *S. leiocarpa* from Malesia, but it is easily distinguished by the following characters: a smaller stature (3–5 m high), 6-foliolate paripinnate leaves, falcate persistent stipules, presence of a petal auricle, absence of a petal claw, stipitate ovary and capitate stigma.

**Type.** THAILAND. Nakhon Phanom Province: Phu Langka National Park, elevation 250–350 m, 17°59'18.7"N 104°07'50.1"E (Fig. 3), 20 April 2012, W. Chatan 1231 (Holotype: BKF!; Isotype: K!).

**Description.** Small tree, 3–5 m high. Stem diameter 3–5 cm. Stipules falcate, 23–25 × 1.0–1.3 mm, coriaceous, glabrous on both surfaces, persistent, venation distinctly reticulate. Leaves 6-foliolate, paripinnate, leaflets opposite; petioles 3.0–5.5 cm long, with sparse minute hairs or glabrescent; rachis 7–11 cm long, with sparse minute hairs or glabrescent. Leaflets rigidly coriaceous, elliptic or ovate or obovate or oblong, 7.5–11.5 × 3.5–5.3 cm; apex obtuse or sometime shallowly emarginate; base obtuse or cuneate, slightly asymmetric, glabrous on both surfaces, sometimes with a few minute hairs on the blade margin; abaxial side dull. Petiolules 3–6 mm long; glabrescent or with sparse minute hairs. Inflorescences paniculate, lax, up to 20 cm long, lateral branches up to 6 cm long, both rachises and lateral branches densely pubescent; bracts and bracteoles ca. 4.5 × 1.5 mm, puberulous; pedicels 11–12 mm long, densely puberulous. Buds
ca. 15 × 10 mm, elliptic. Pedicel 10–11 mm long, densely puberulous. Hypanthium asymmetrically short and funnel-like, 0.5–1.0 mm long, brownish-yellow. Calyx lobes 4, thick, brownish-yellow, without any spiny outgrowth on the outer surface, densely puberulous outside, appressed hairs inside; the posterior lobe boat-shaped and obovate, 14–20 × 10–11 mm, apices acuminate; the other three lobes narrower, 15–20 × 4–6 mm, narrowly oblong or elliptic, apices narrowly acute. Corolla comprised of a solitary boat-shaped petal, lanceolate or narrowly obovate, thick, 15–17 × 5–6 mm, apices acute or acuminate, bases auriculate, puberulous outside, glabrous inside. Stamens 10, dorsifixed; upper stamen free, staminodal, 10–11 mm long, lower 2/3 of filament length densely puberulous, upper 1/3 of filament length sparsely hairy and glabrous near apex; remaining nine stamens, fertile, joined at the base into a sheath; sheath ca. 8–9 × 4.0–4.5 mm, densely puberulous on both surfaces; the two largest stamens are fertile, free parts of filament ca. 22–25 mm, lower half of the free parts of filament sparsely hairy and the upper half glabrous; anthers 5.5–6.0 × 1.5–1.6 mm, glabrous; other fertile stamens seven, free parts of filament 7–8 mm, lower 1/3 of the free parts densely puberulous, upper 2/3 of the free parts sparsely hairy and glabrous near apex; anthers, 2.5–3.0 × 1.0–1.2 mm, glabrous. Pistils with 5–6 mm stipe length; stipes densely puberulous; ovary asymmetrically elliptic; 7–8 × 4.5–5.0 mm, densely
Figure 2. Line drawing of *Sindora stipitata* Chatan & Promprom, sp. nov. A a branch with leaves and inflorescence B floral bud C floret D posterior sepal (abaxial side) E posterior sepal (adaxial side) F one of the remaining narrower sepal (abaxial side) G one of the remaining narrower sepal (adaxial side) H petal (adaxial side) I free staminode J fused stamen K pistil. Illustration by W. Chatan (based on type specimen).

Puberulous, no spiny outgrowth; style 9–11 mm long, densely puberulous on lower parts and sparsely hairy on the anterior side of upper parts; stigma capitate, glabrous. Pods circular or ellipsoid to obovate, 3.3–9.0 × 3.5–5.5 cm diameter, flattened, slightly smooth, unarmed, obscurely veined, with 1.5–5.0 mm long beaks, sparsely hairy on both surfaces, densely appressed hairs on the margin; seeds 1–4.
Sindora stipitata (Detarioideae, Leguminosae), a new species from Thailand

Other specimen examined. THAILAND. Nakhon Phanom Province: Phu Langka National Park, 29 June 2013, fruiting, P. Saisaard 55 (BKF).

Flowering and fruiting. Flowering in March–May and fruiting April–June.

Distribution. The new species is a Thai endemic and is known from only the type locality in the Phulangka National Park, Ban Pheang District, Nakhon Phanom Province, North-eastern Thailand.

Ecology. This new species grows in open areas of dry deciduous forest at an elevation of 250–350 m.

Vernacular name. Ma Kha Tae Nakhon Phanom, Mak Tae.

Etymology. The specific epithet refers to its distinctly long ovary stipe. This character is one of many morphological characters that distinguishes the new species from its closely related species.

Preliminary conservation status. Sindora stipitata is known only from the type locality and its estimated extent of occurrence is less than 100 km². The number of mature individuals was less than 1,000 and the occupied area is continuing to decline slightly. Therefore, it should be considered as “Critically Endangered” according to the IUCN criteria B1 (IUCN 2017).

Discussion. Sindora stipitata is closely related to S. leiocarpa, a plant that grows in Sumatra (Jimbi, Palembang and Riau) and Borneo (Sarawak, Brunei, Sabah and Kalimantan) (Hou 2000), but is easily distinguished from the latter by several morphological characters. Details of the differences between S. stipitata and S. leiocarpa are presented in Table 1.

The new species is also related to S. coriacea (Baker) Prain. Both have unarmed sepals, but S. stipitata is clearly different from S. coriacea by its stature of a small tree (3–5 m high) (vs. a large tree up to 50 m high), its abaxial leaflet surface dull brown
(vs. shining), the two largest stamen 22–25 mm long (vs. ca. 10 mm long) and anthers 5.5–6 mm long (vs. 2–3 mm long). The new species also clearly differs from *S. laotica* Gagnep., a species that is distributed near the border of Thailand (in Vientiane, Phou Khao Khouay National Biodiversity Conservation Area, Lao) and Vietnam (Larsen, Larsen and Vidal 1980); the two species are different in that there is no spiny outgrowth on the outer surface of the calyx of the new species (vs. calyx spinescent). The following identification key for *Sindora* in Thailand and Malesia is constructed by modification of the key from the Flora Malesiana (Hou 2000).

### Key to *Sindora* Species in Thailand and Malesia

1. Leaflets minutely puberulous or pubescent on both surfaces ...... **S. siamensis**
   – Leaflets glabrous on both surfaces or minutely puberulous or pubescent on the lower surface or rarely sparsely puberulous above .............................................. 2
2. Leaflets glabrous on both surfaces ......................................................... 3
   – Leaflets only minutely puberulous or pubescent on the lower surface or rarely sparsely puberulous above ........................................................................ 8
3. Apex of leaflet obtuse, rounded, retuse or emarginate ......................... 4
   – Apex of leaflets acute to acuminate ................................................. 6
4. Calyx lobes densely spinescent .............................................................. **S. supa**
   – Calyx lobes smooth, unarmed.......................................................... 5
5. Petal auricle present, petal claw absent, ovary stipe 5-6 mm long, ...... **S. stipitata**
   – Petal auricle absent, petal claw present, ovary subsessile or shortly stipitate ...

### Table 1. Distinguishing features between *S. stipitata* Chatan & Promprom and *S. leiocarpa* de Wit.

| Character                          | *S. stipitata* sp. nov. | *S. leiocarpa* |
|-----------------------------------|-------------------------|---------------|
| 1. Habit                          | Small tree 3–5 m high, 3–5 cm diam. | Large tree, 25–45 m high, 45–80 cm diam. |
| 2. Stipule                        | Falcate, 23–25 mm long | Lanceolate, 3–5 mm long, caducous |
| 3. Leaflet size                   | 7.5–11.5 × 3.5-5.3 cm | 2.5–9.5 × 2–5 cm |
| 4. Pedicel length                 | 10–11 mm                | 1–1.5 mm      |
| 5. Sepal size                     | 14–20 × 4-11 mm        | 2–6 × 2–3.5 mm |
| 6. Petal length                   | 15–17 mm                | 5–6 mm        |
| 7. Petal claw                     | Absent                  | Present at about the lower half |
| 8. Petal auricle                  | Present                 | Absent        |
| 9. Staminial sheath               | 8–9 mm (high)           | 2–3 mm (high) |
| 10. Free filament part length     | 7–25 mm                 | ca. 7 mm      |
| of united stamens                 |                         |               |
| 11. Anther length of two largest stamens | 22–25 mm             | 2–2.5 mm      |
| 12. Anther length of seven smallest fertile stamens | 7–8 mm                | Up to 0.75 mm |
| 13. Ovary stipe length            | 5–6 mm                  | Subsessile or shortly stipitate (ca. 1 mm) |
| 14. Ovary length                  | 7–8 mm                  | ca. 4.5 mm    |
| 15. Stigma                        | Capitate                | Obscure       |

**Table 1**. Distinguishing features between *S. stipitata* Chatan & Promprom and *S. leiocarpa* de Wit.
Sindora stipitata (Detarioideae, Leguminosae), a new species from Thailand

Acknowledgements

The authors are indebted to the curators and officers of L for providing information on the type specimens investigated in this study. We would like to thank Mr. Teerawut Namsawang, Mr. Nopphanun Kanithaisong and the officers in Phulangka National Park while collecting plant specimens during field trips. Thanks for linguistic advice from Dr. Jolyon Dodgson, Faculty of Science, Mahasarakham University. This research was financially supported by Mahasarakham University.

References

Chen D, Zhang D, Hou D (2010) Sindora. In: Wu ZY, Raven PH, Hong DY (Eds) Flora of China. Vol. 10 (Fabaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis, 25–26.

Hou D (2000) Leguminosae-Caesalpinioideae. In: Soepadmo F, Saw LG (Eds) Tree Flora of Sabah and Sarawak. Forest research institute Malesia, Kuala Lumpur, 119–180. [Electronic version]

IUCN (2017) Standards and Petitions Subcommittee Guidelines for Using the IUCN Red List Categories and Criteria. Version 13. Prepared by the Standards and Petitions Subcommittee. http://www.iucnredlist.org/documents/RedListGuidelines.pdf [accessed: 15 August 2017]
Kumar S, Sane PV (2003) Legumes of South Asia, A check-List. Royal Botanic Gardens, Kew, 536 pp.
Larsen K, Larsen SS, Vidal JE (1980) Leguminosae-Caesalpinioideae. In: Aubreville A, Leroy J-F (Eds) Flore du Cambodge du Laos et du Viet-Nam 18. Muséum National d’Histoire Naturelle, Paris, 5–221.
Larsen K, Larsen SS, Vidal JE (1984) Leguminosae-Caesalpinioideae. In: Smitinand T, Larsen K (Eds) Flora of Thailand 4(1). Auspices of Danida at the TISTR Press, Bangkok, 1–129.
Hou D (1996) Sindora. In: Kalkman C, Kirkup DW, Nootboom HP, Stevens PF, de Wilde WJJ O (Eds) Flora Malesiana ser. 1, 12(2). Rijksherbarium/Hortus Botanicus, Leiden, 691–709.
Lock JM, Heald J (1994) Legume of Indo-China, A Check list. Whitstable Litho Ltd., Great Britain, 164 pp.
McKinder B (2005) Detarieae. In: Lewis G, Schrire B, Mackinder B, Lock M (Eds) Legumes of the world. The Board of Trustees of the Royal Botanical Gardens, Kew, 1–577.