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Sarcopyramis napalensis var. *bodinieri* (Melastomataceae): a new addition to the Indian flora and typification of two names

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Abstract: *Sarcopyramis napalensis* Wall. var. *bodinieri* (H.Lév.) H.Lév. is collected for the first time in India from the state of Arunachal Pradesh, eastern Himalaya. The present communication provides the taxonomy, nomenclature and typification of the names *S. bodinieri* H.Lév. and *S. napalensis* Wall.

Keywords: India, Lectotype, Nomenclature, *Sarcopyramis bodinieri*.

Introduction

The genus *Sarcopyramis* Wall., a member of the tribe Sonerileae, was described by Wallich in 1824. The genus is distributed in South and Southeast Asian countries (Hansen, 1979; Basumatary & Baruah, 2021) with an enigmatic number of taxa due to much taxonomic ambiguities. Hansen (1979), in his revision of the genus, concluded that the genus was monotypic with a single taxon, *Sarcopyramis napalensis* Wall., and merged all other taxa described under this genus. Although Chen and Renner (2007) accepted two species, namely *S. napalensis* and *S. bodinieri* H.Lév., for the *Flora of China*, they mentioned further studies were needed to clarify the identity of these taxa. Léveillé (1914–1915) treated *S. bodinieri* as a variety of *S. napalensis*, although its taxonomic status was ambiguous. Chen and Renner (2007) treated *S. crenata* H.L.Li, *S. delicata* C.B.Robinson and *S. parvifolia* Merr. ex H.L.Li as synonyms of *S. bodinieri*. However, we found that more studies are required to elucidate the taxonomic as well as nomenclatural problems and ambiguities in this group. In the present communication, *S. bodinieri* is treated as a variety following Léveillé (1914–1915). A comparison of diagnostic characters between *S. napalensis* var. *napalensis* and var. *bodinieri* is given in Table 1.

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Sarcopyramis is represented by two species in India, *viz. S. napalensis* and *S. subramanii* Nayar (Nayar, 1967; Tiwari *et al*., 2016; Basumatary & Baruah, 2021). Recently, an interesting specimen of this genus was collected between Chhang La and Tungri, West Kameng district of Arunachal Pradesh, India. A scrutiny of the literature confirmed their identity as *S. napalensis* var. *bodinieri* (H.Lév.) H.Lév hitherto not reported from India. Additionally, it was noticed that no type had been designated for the names *S. napalensis* and *S. bodinieri* until now.

Materials and Methods

The specimens were collected from West Kameng district of Arunachal Pradesh in 2021. Herbarium specimens were prepared following standard protocols (Jain & Rao, 1977) and deposited in the herbarium of the Botanical Survey of India, Arunachal Pradesh Regional Centre, Itanagar (ARUN). Live plants were studied in the field, as well as from dried herbarium specimens using a SMZ1500 stereo-zoom microscope (Nikon, Tokyo, Japan). Flowers were dissected, studied, and illustrated. The identity of the specimens was confirmed with the relevant literature (Wallich, 1824; Clarke, 1879; Léveillé, 1906; Hansen, 1979; Chen & Renner, 2007), and by consulting specimens in ARUN, ASSAM, BSHC and CAL, and viewing digital images of specimens from A, BM, C, E, G, GH, K, M, and P (acronyms of herbaria follow Thiers, 2022, updated continuously).

Taxonomic Treatment

Sarcopyramis napalensis Wall., Tent. Fl. Napal. 1: 32, t. 23. 1824. *Lectotype* (designated here): NEPAL, **Sheopore**, 1821, *Wallich* 4088a ("4088" on label) (K [K001038110, upper right corner plant, digital image!]); residual syntypes: NEPAL, 1821, *Wallich* 4088a (K [K001038110 except upper right corner "Sheopore" individual, K000867700, K000867739, digital images!], E [E00288105, digital image!], G [G00319893, G00353928, mislabelled as *Wall*. 4086a, digital images!], M [M0165821, digital image!]). **Fig. 1a**

Typification: Wallich (1824) while describing *Sarcopyramis napalensis,* cited "Napaliae majoris Sheopore, Chandaghiry, aliisque ad loca umbrosa, humida, saxosa. Floret Julio–Septembre. Fructus maturescunt Octobre et Novembre". It is evident that Wallich studied multiple specimens collected throughout the flowering and fruiting season from many areas of Nepal ("Napaliae majories") and mentioned two of such localities "Sheopore" and "Chandaghiry". Upon searching, one specimen found in K (barcode K001038110) was named "*Sarcopyramis succulenta* Wall.", with collection number "4088", collected from Sheopore (in Nepal) in "Julio 1821". We failed to trace any "Chandaghiry" specimens in any herbaria. According to Wallich's Catalogue, "4088" is a heterogenous collection of which specimens numbered with "4088a" are collected from Nepal and represented *S. napalensis.* On the other hand, "4088b" was collected from "Mont. Sillet" [Sylhet, Bangaladesh], initially kept under the name *S. napalensis,* but on page 215 of his catalogue Wallich adds "deleatur (est nempe dist. spec. N. 6290)", meaning to "delete (this is certainly a different species, numbered 6290)". The sheet in Kew barcoded with K001038110, is considered to be comprised of heterogenous gatherings, as it bears two labels; one with number "4088a" and locality "Nepalea" without any precise locality, which could be anywhere in Nepal, dated

Fig. 1. a. Lectotype of *Sarcopyramis napalensis* var. *napalensis* Wall. [K001038110 (within red boundary) © Royal Botanic Gardens, Kew]; **b.** Lectotype of *S. bodinieri* H.Lév. [E00285940 © Royal Botanic Garden Edinburgh].

"1821" without any specific month of collection and other named as *S. succulenta*, with number "4088", locality "Sheopore" and dated "Juleo 1821". Two individuals in the K001038110 sheet were observed with fruiting structures which can not be collected in the month of July, proves its heterogeneity. However, the name *S. succulenta* Wall. is an unpublished name, and the individual from "Sheopore" (K001038110) matches exactly the description given in the protologue of *S. napalensis*. The duplicates of "4088a" collected from Nepal in 1821 without any precise locality are found in different herbaria (E, K, G & M), along with the specimen from "Sheopore" labelled as *S. succulenta,* and an illustration (t. 23) given in *Tentamen Florae Napalensis* (1824), constitute the original materials and all the specimens found in E, K, G and M can be considered as syntypes (Art. 9.6, *Shenzhen Code*, Turland *et al*., 2018). Subsequently, Hansen (1979) misapplied the terms 'holotype' and "isotype" which can be treated as an inadvertent typification (Turland *et al*., 2018 *vide* Art. 7.11 and 9.10.) Hence, the specimen deposited at K (K001038110), which is the best one preserved amongst the other original material, and best match with the protologue, is selected here as the lectotype for the name *S. napalensis* Wall.

Sarcopyramis napalensis Wall. var. **bodinieri** (H.Lév.) H.Lév., Fl. Kouy-Tchéou 278. 1914–1915. *Sarcopyramis bodinieri* H.Lév., Mém. Soc. Sci. Nat. Math. Cherbourg 35: 397. 1906. *Lectotype* (first-step by Hansen, 1979, second-step designated here): CHINA, **Kouy-Tchéou**, "environs de Kuoy-Yang, bois de Kien-Lin-Chan" 07.07.1898, *E. Bodinier* 2393 (E [E00285940 digital image!); residual syntype: CHINA, Kouy-Tchéou, "environs de Kuoy-Yang, bois de Kien-Lin-Chan" 07.07.1898, *E. Bodinier* 2393 (A [A00073201 *n.v.*]) **Figs. 1b & 2**

Herbs up to 7(–10) cm tall, slender, erect or rarely creeping. Stem angular, narrowly ridged, red, glabrous, sometimes rooting at nodes. Leaves decussate, unequal; petioles 0.3–1 cm long, narrowly winged, glabrous; laminae ovate to elliptic, 1–7 × 0.5–6 cm, base rounded–sub-cuneate, mostly oblique, margins serrate, teeth sharp pointed, apex obtuse to acute, adaxially green or purplish green, strigose hairy, abaxially purplish red or green, glabrous or sparsely strigose. Inflorescence terminal, rarely on upper axils, 1–5-flowered cyme; peduncles slender, terete–4–6-angled, glabrous, up to 3 cm long; bracts 2, sub-sessile, foliaceous, obovate. Pedicels 1–2 mm long, 4-angular, green, glabrous or sparsely pubescent. Hypanthia cupular, 3–6 mm long, quadrangular, winged on angles; calyx lobes 4, rectangular or triangular, apex sometimes 2-fid, not fimbriate, with triangular wings, green, glabrous, abaxially setose or glabrous. Petals 4, broadly ovate, 3–6 mm long, apex acute with an apiculate tip, pink, glabrous. Stamens 8, equal, 1–1.5 mm long; anthers ovate, 0.4–0.5 mm long, 2-celled, yellow; connective decurrent, with a spur *c.* half-length of anther; filaments *c.* twice–thrice longer than anther. Ovary inferior, urceolate, 4-chambered with axile placentation, with a membranous crown at apex; crown slightly exserted from hypanthium; style apical, glabrous, white; stigma 2-cleft. Capsules cupular, 4-angular, light green. Seeds numerous, obovate, densely tuberculate.

Flowering & fruiting: Flowering from August to September; fruiting from late September to November.

Habitat: Terrestrial herbs, found on ground, rock crevices and shaded damp areas in temperate conifer-*Rhododendron* mixed forests, between 1500–2700 m.

Distribution: China, India and Taiwan.

Specimen examined: INDIA, **Arunachal Pradesh**, West Kameng district, Chhang La to Tungri, 28.09.2021. *M.R. Debta* 44136 (ARUN).

Conservation status: Based on field observations, evaluation of available literature, and persistent taxonomic confusion, this taxon should be temporarily kept under the Data Deficient category as per IUCN guidelines (IUCN, 2022).

Typification: Upon searching for the type specimen of *S. bodinieri*, we could locate two specimens that completely matched the protologue: one in A (A00073201 metadata!, digital image *n.v.*) and another in E (E00285940 digital image!); however, both specimens were marked as holotypes. Léveillé (1906), did not specify any institution where the type specimen was deposited. Hence, as the duplicates of the same cited specimen is found in different herbaria, none of the two specimens comply with the ICN rules (*vide* Art. 9.1, Turland *et al*., 2018) to be the holotype. Hansen (1979) cited both specimens

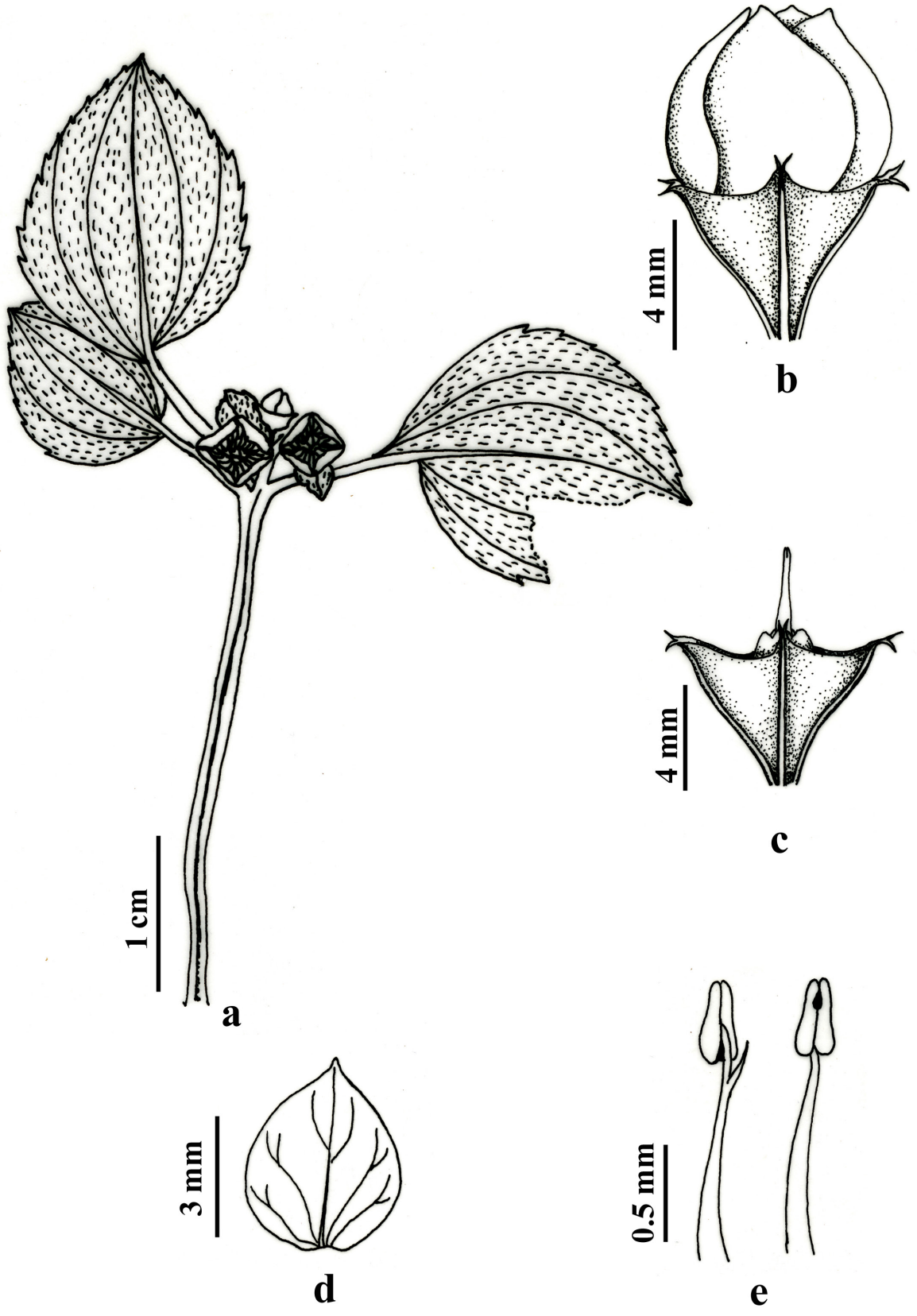

Fig. 2. *Sarcopyramis napalensis* var. *bodinieri* (H.Lév.) H.Lév: **a.** Habit; **b.** Flower in bud; **c.** Hypanthium with gynoecium; **d.** Petal; **e.** Stamens (left, back view showing spur and right front view) [drawn by Rohan Maity; from *Debta* 44136].

deposited in A and E as type specimens, but did not designate the lectotype or specified a particular specimen which could be assigned as lectotype. Therefore, the specimen in E (E00285940), which fully matches the protologue and is well preserved, is selected here as the second-step lectotype for the name *S. bodinieri*.

Notes: Léveillé (1906), initially, had differentiated *S. bodinieri* from *S. napalensis* based on leaf colour. However, after recognizing the striking similarities between these taxa, he reduced it as a variety of *S. napalensis* (Léveillé, 1914–1915). Since then, the short description provided by Léveillé confused many workers and led to merge these taxa for a long period. Chen and Renner (2007) differentiated them based on leaf shape and size, which are also highly variable characters, not sufficient for species delimitation. However, they neglected floral characters such as the length of the pedicel, the structure of the calyx lobe apex, and petal characters. *S. napalensis* var. *bodinieri* is very similar to var. *napalensis* in overall appearance by having a 4-angled stem; mostly ovate, 5-veined leaves, small clusters of flowers in inflorescences and presence of sub-sessile bracts. It can be easily differentiated from *S. napalensis* var. *napalensis* by its much smaller habit (up to 7(–10) cm tall *vs*. 10–30 cm tall), by having the calyx lobe apex 2-fid or not fimbriate (*vs*. fimbriate) and broadly ovate petals, 3–6 mm long (*vs*. obovate petals, 5–8 mm long). Both the varieties of *S. napalensis* can easily be distinguished from *S. subramanii*, which exhibits a 5–6-angular stem, narrowly ovate to lanceolate leaves, stalked bracts and elliptic petals (Basumatary & Baruah, 2021).

Key to the taxa of *Sarcopyramis* in India

1. Stem 5–6-angular; bracts stalked; petals elliptic ..... *S. subramanii*
1. Stem 4-angular; bracts sub-sessile; petals ovate or obovate 2
2. Plants 10–30 cm tall; calyx lobe fimbriate at apex; petals obovate ..... *S. napalensis* var. *napalensis*
2. Plants up to 7(–10) cm tall; calyx lobe not fimbriate at apex; petals broadly ovate ..... *S. napalensis* var. *bodinieri*

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Table 1. Comparison between *Sarcopyramis napalensis* var. *napalensis* and *S. napalensis* var. *bodinieri*

Characters	*S. napalensis* Wall. var. *napalensis*	*S. napalensis* Wall. var. *bodinieri* (H.Lév.) H.Lév.
Habit	Herbs, 10–30 cm tall	Herbs, up to 7(–10) cm tall
Leaves	Lamina broadly ovate or ovate to sub-lanceolate, 2–10 × 1–4.5 cm, apex acute–acuminate, margins serrulate, base cuneate to sub-round and slightly decurrent, abaxially puberulous or glabrescent	Lamina ovate to elliptic, 1–7 × 0.5–6 cm, apex obtuse to acute, margins serrate, base rounded–sub-cuneate, abaxially glabrous or sparsely strigose
Petioles	8–28 mm long	3–10 mm long
Pedicels	2–6 mm long	1–2 mm long
Calyx lobes	Fimbriate at apex	Not fimbriate, sometimes 2-fid
Petals	Obovate, 5–8 mm long	Broadly ovate, 3–6 mm long

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