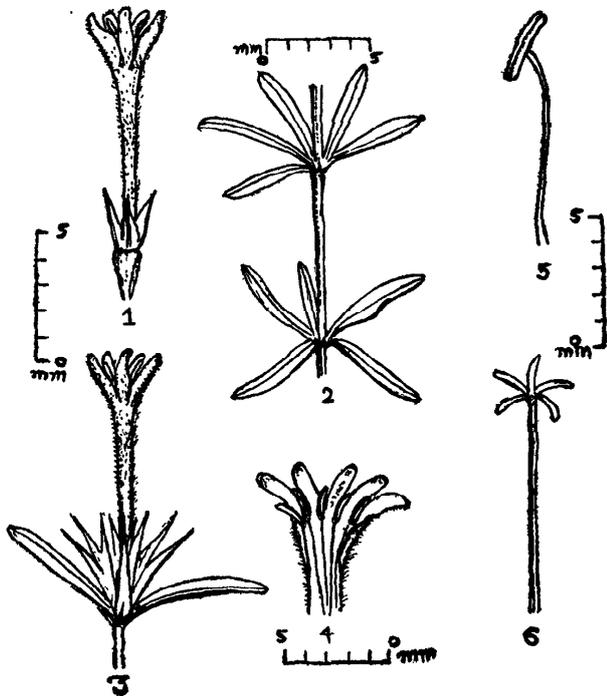


Occasional on dry rocky exposed slopes. North China.



Leptodermis virgata Edgew.

Figs. 1-6 : 1. A complete flower. 2. Part of branch showing fascicled leaves. 3. A flower. 4. Flower split open. 5. Stamen. 6. Style and lobed stigma.

Specimens examined : Kulu, Brandis 33729 (CAL); Clarke 31416 (CAL) 1876; Reporter on Economic Products to Govt. of India, 13446 (CAL) 1894; Hazara, Duthie 7491 (DD) 1888; Kashmir, Inyat 19634 (DD) 1896; Lambart 43016-43020 (DD) 1926; Swajan Pulga, Kirat Ram 13750 (DD); Aut 1400 m, Mandi (H. P.), Murti & Prasad, 62122 (BSD) 1977.

ACKNOWLEDGEMENTS

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Botanical Survey of India, Dehra Dun

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LISTERA TENUIS LINDL.—A RARE AND INTERESTING ORCHID FROM THE NORTH WESTERN HIMALAYA

The terrestrial orchid genus *Listera* R. Br. is poorly known from the North Western Himalaya. Whatever is known is rather exiguous which may be attributed to the inconspicuous flowers they possess and the habitat, undisturbed temperate and sub-alpine forest floor, they occupy. While exploring the Nandadevi National Park recently, the senior author collected a few *Listera* spp. Two populations of them were found to grow on moss-covered rocks in *Abies*, *Pinus*, *Rhododendron* and *Betula* forest. On critical study in the herbarium they were found to belong to two different species. The characters of specimens of one collec-

tion tally with those of *Listera tenuis* Lindl. in general, so far known from the Sikkim Himalaya, Nepal and the Chumbi valley in Tibet. The present finding shows its distribution in the North Western Himalaya as well. Its occurrence in the intervening areas may not be ruled out and intensive searches by future explorers might lead to its discovery. Another pertaining point needing mention here is that *L. tenuis* appears to be a highly variable species. Examination of the specimens from Nandadevi as well as the old collections of Pantling from Sikkim housed in the herbarium of the Forest Research Institute, Dehra Dun, revealed

some of these variable characters. Hence a description of the species is given, followed by observations based on our studies. Diagrams from J. D. Hooker (Ic. Pl. t. 2169. 1893), King & Pantling (Orch. Sikkim t. 337. 1898) as well as from the Nandadevi specimens are presented to emphasise our observations, given on a comparative basis. Notes on phenology, ecology and other pertaining points are also provided.

Listera tenuis Lindl. in Journ. Linn. Soc. 1 : 176. 1857 ; Hook. f., Fl. Brit. India 6 : 104. 1890 et Ic. Pl. t. 2169. 1893 ; King & Pantling, Orch. Sikkim 255. t. 337. 1898 ; Ohashi, Fl. East. Himal. 3rd Report 160. 1975.

Terrestrial, erect, slender herbs, 12-15 cm high. Stem 8.5-9.0 cm below leaves, glabrous, with a sheath. Leaves two, sessile, opposite, orbicular to ovate-elliptic, 1.5-2.0 cm long, 1.5-2.0 cm broad, membranous, glabrous, distinctly 3-nerved. Peduncle 1.5-2.0 cm long, glandular-puberulous. Raceme 1.0-2.5 cm long, glandular-puberulous, 2-5-flowered. Pedicel ca 3 mm long. Flowers 5-8 mm long, green. Floral bracts ovate-acute, ca 2 mm long. Sepals subequal, dorsal sepal ovate-lanceolate, acute, 4 mm long, 1 mm broad, 1-nerved ; lateral sepals subfalcate, acute, 3.5 mm long, 1 mm broad. Petals ovate-lanceolate, 3 mm long, 1 mm broad. Lip cuneately obcordate, 5-6 mm long, 3 mm broad at apex, 3-nerved, lobes rounded, sinus blunt almost obscure with a deltoid ridge. Column 3 mm long. Rostellum blunt. Anther papillose ; pollinia two. Ovary 3 mm long.

Fls. & Frts. : July-August.

Distribution : Sub-alpine Himalayas (Nepal, Sikkim and Tibet). In the Nandadevi National Park in the Western Himalayas it occurs in *Abies*, *Pinus*, *Rhododendron* and *Betula* forest. Rare.

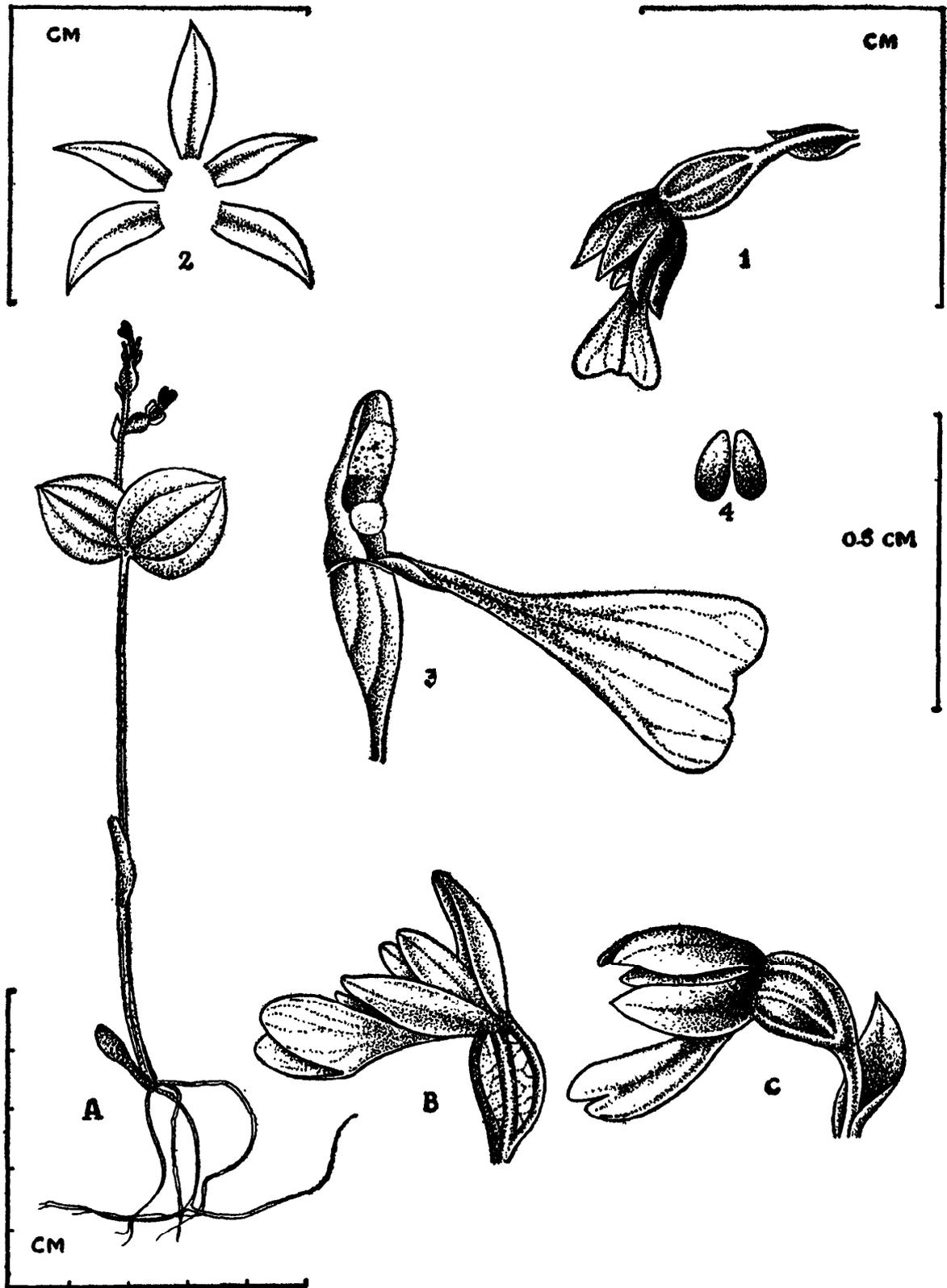
Notes : Though King & Pantling (Orch. Sikkim 255. t. 337. 1898) mention in the

description that the sheath is about half way, the plate shows it much below, almost at one third which the Nandadevi specimens invariably show. The number of flowers is 4-8 [King & Pantling (*loc. cit.*)] and 6-10 (J. D. Hooker Ic. Pl. t. 2169. 1893) ; however, our specimens have 2-5 flowers only. The sepals and petals are oblong according to King & Pantling (*loc. cit.*) and J. D. Hooker (*loc. cit.*) while in our specimens they are ovate-lanceolate. In our specimens the petal is 3 mm long and the lip 5-6 mm long while J. D. Hooker (*loc. cit.*) mentions that it is twice as long as the petals. Though in the description King & Pantling (*loc. cit.*) give that the sinus in the lip is somewhat blunt, which is the case with our specimens, their plate as well as that of J. D. Hooker (*loc. cit.*) shows the lip with an acute sinus. This character appears to be a much overlapping one. For in *R. Pantling* 378 (with 8 specimens mounted on it) we have examined, one of them has the lip like that of the ones from Nandadevi. One might feel that these variations presented above, albeit minor, might warrant a distinct varietal if not a specific rank. However, considering the observations of Ohashi (*loc. cit.*), we are disinclined to recognize it as a distinct entity at present.

Specimens examined : Deodi to Ramani Camp Nandadevi National Park in Chamoli Dist., Uttar Pradesh, ca 3500 m, 25.8.1981, P. K. Hajra, 73294 (BSD) ; Lachen & Chumbi valley, Sikkim, July 1895, *R. Pantling*, 378 (DD).

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A, 1-4 *Listera tenuis* from P. K. Hajra 73294.
 A. Habit. 1. Flower. 2. Perigone. 3. Column with lip. 4. Pollinia.
 B. After J. D. Hooker (1893). C. After King & Pantling (1898).

Forest Research Institute, Dehra Dun, for allowing us to study the specimens in DD. We are beholden to Dr. H. J. Chowdhery for his invaluable help. The senior author is thankful to the authorities of the

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OBSERVATIONS ON TWO THREATENED ARECOID PALMS OF NICOBAR ISLANDS CULTIVATED AT THE INDIAN BOTANIC GARDEN, HOWRAH

INTRODUCTION

During one and half century many exotic and indigenous palms were introduced at the Indian Botanic Garden, Howrah (Long. $88^{\circ}21'$ east/Lat. $22^{\circ}35'$ North, Temp. 21°C - 31°C , Rainfall 1536 mm, Alt. 4.57 m), among them were two rare arecoid palms *Rhopaloblaste augusta* (Kurz) H. E. Moore and *Bentinckia nicobarica* (Kurz) Beccari both natives of Nicobar Islands and seldom seen in cultivation. In a recent report these two arecoid palms were declared as threatened at their natural habitat. It is heartening that they were introduced and cultivated at the Garden, long before the campaign for conservation of threatened plants was felt necessary. Plenty of live materials are now available in the Garden, which provided the author a very good opportunity to study both the palms in detail, particularly their performance after introduction. A brief description of each species and an account on their culture may help in identification and serve as a prerequisite for their further introduction and conservation.

Rhopaloblaste augusta (Kurz) H. E. Moore in Principes 14 : 79. 1970. *Areca augusta* Kurz in Jour. Bot. 4 : 331. pl. 170. figs. 1-10. 1875. Type : Nicobar Islands : Kamorta : Kurz s.n. Feb. 1875 (CAL !). Pl. I, figs. 1-3.

Stem solitary, columnar, annulate. Leaves pinnate, deep green, 3-4 m long ; leaflets

pendulous, linear, opposite to sub-opposite, each 1 m \times 3-4 cm. Inflorescence decom-pound, ca 1 m long. Outer spathe broadly oblong, semi-woody, bicarinate with hard beak-like apex. Flower clusters in protandrous triads with a middle female flower and two lateral male flowers. Each triad is subtended by a lip-like bract. Male flowers symmetric with 3-distinct imbricate sepals and 3-valvate petals. Stamens 6 ; filaments adnate to corolla at base. In female flowers staminodes united into six membranous 6-lobed ring. Ovary 3-loculed. Fruit ovoid to ellipsoid, 1-2 seeded, rarely 3-seeded. Seed ovoid, planoconvex, 1.2-1.4 cm \times 9-11 mm ; endosperm deeply ruminant.

Phenology and cultural notes : In the Indian Botanic Garden, Howrah, a tree in average produces 3 inflorescences during the period from June to August. The first inflorescence after emerging from the leaf-sheath and spathes takes about 2 months to complete anthesis in the staminate flowers followed by the pistillates. In the first inflorescence fruits start maturing from January. Fruiting is less pronounced in the second and third inflorescences. Freshly harvested seeds take about 24 days to germinate in a compost medium. The first sheath of the seedling is nonchlorophyllous. Eophyll is paripinnate, each 7-11 cm long ; pinnae of the eophyll are opposite to sub-opposite. Seedlings are slow growing, each taking about 3 years to attain a height of