J. Orchid Soc. India, 25(1-2): 13-18, 2011 ISSN 0971-5371

FLORAL DIVERSITY IN *ODISHA CLEISTANTHA* S.MISRA: A MONOTYPIC AND ENDEMIC TERRESTRIAL ORCHID FROM INDIA

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Abstract

Odisha cleistantha S.Misra is a monotypic terrestrial orchid described from Odisha. Interesting variations observed in the structure of the flowers, especially in the plants collected from Koraput district of the state, has been discussed. The revised morphological description for this species along with the drawings for the biotypes from different regions of Odisha has been provided.

Introduction

THE ORCHID flora of Odisha included (Misra 2004:125) three genera *Habenaria* (17), *Peristylus* (5) and *Pecteilis* (2) under the subfamily Orchidoideae (figure in parenthesis indicate number of species). One plant, collected first from the Gajapati district, and subsequently from the districts of Kandhamala, Kendujhara and Mayurbhanj, that looked like a species of *Habenaria*, did not match with any other known species under Orchidoideae. It was therefore not included in the earlier report of Orchidaceae from the state. Subsequently, however it was included (Misra, 2004:231) as *Habenaria pelorioides* Par. & Rchb.f.

In this enigmatic species the perianths of the flower never open; the three-lobed lip has a deeply saccate to shortly spurred base. Inside of the flower shows a strange form of rostellum that is erect and somewhat petaloid, three-lobed on its upper part; the lobes are free. Rostellum in many other members under Orchidoideae is massive, with a dome-shaped midlobe and arm-like lateral lobes ending in a minute sac (the bursicula). The pollinia in our species was not distinct as observed earlier (Misra, 2004:234). The flowers were perhaps examined before the pollinia developed completely. As the flowers never opened, it was rather difficult to know when the pollinia mature. Subsequent studies, however, showed that there is a distinct and interesting pollinia in this species. The anther locules are blunt, without antherophores; these are longitudinally two-chambered, containing in each two sectile oblong pollinia with a minute caudicle, but without a viscidium. A distinct anther structure and a peculiar rostellum as above, is not known in members of Orchidoideae. It was therefore determined (Misra 2007:252) as a new species *Odisha cleistantha* S.Misra and accommodated under a new genus and a new subtribe *Odisha* S.Misra and Odishinae S.Misra respectively. Consultation of herbaria showed that species resembling this plant of ours have been collected in India earlier from the states of Chhattisgarh, Jharkhand, Odisha, Manipur, Nagaland and Andhra Pradesh and labelled as *Habenaria malintana* (Blanco) Merrill. Seidenfaden (1977:126) too has treated the Indian plants under *Habenaria malintana*; he has not studied these, but relied on Mukerjee (1953) and Deb (1961) for his purpose.

Habenaria malintana is an East-Asiatic plant. The lip of its flower is lanceolate with no sidelobes and without a spur. Based on this character of the lip, Seidenfaden (*l.c.:* 101) has separated *H.malintana* from its close allies, where the lip is both lobed and spurred with variations in their size. He has provided good drawings for this plant collected from Thailand showing details of the lip, anther, stigma and rostellum. I have seen the Indian plants in the herbaria and found that the perianth of the flowers are not opened; the lip is distinctly three lobed and is deeply saccate at base. I have not dissected these flowers to know more details. In any case these cannot certainly be identified with *Habenaria malintana*.

Seidenfaden included *Habenaria peloriodes* Par. & Rchb. from Myanmar under the synonyms of *H. malintana*, having seen its type (Herb. Reichenbach 1817: Parish 327), which according to him, "consists of only some loose flowers". I have seen at Kew, the type specimen (holotype ?) of this species (Burma, Amherst, sea side). It is a flowering plant with leaves (leaves from base upwards, with margins, turning above to foliar sheaths). The lip is oblong-lanceolate, acute, entire, narrowed and abruptly bent at base making the lamina erect. The anther, stigma, rostellum in this are not well developed. Parish's drawings provided in the protologue, however, depict the anther locules ± orbicular, with long and slender anther-tubes. Nothing has been said here about the pollinia or the rostellum.

In any case our plants from Odisha, determined as *Odisha cleistantha*, is not like *Habenaria pelorioides*, whether or not it is considered as a synonym of

Accepted: May 10, 2011

H.malintana. I have a feeling that the plants from other states studied from herbaria are not *H.malintana* and could belong only to *Odisha cleistantha*.

Extension of known range and variations noticed in the new species

Odisha cleistantha in the mean while, has been collected from Odisha from a few more localities in Kandhamala and Koraput districts. The Koraput plants showed some interesting variations in the flower structure, like: the *lip* is flabelliform, its lateral lobes are large and broad with crispate margins. The lip is also distinctly spurred; the spur, lying close to the pedicel of the ovary is 6-7 mm long, 1.4-1.5 mm wide. This adds to the known variations in the overall shape of the lip, shape of the lateral lobes and midlobe of the lip. The base of the lip in a few species has been observed to be deeply saccate; at others it is found with a minute blunt spur. Variations have been noticed in the shape of the stigma lobes and lobes of the rostellum too. The incurved midlobe of the rostellum is narrowly triangular (SM 1378 and SM 890) or ovate acute (SM 2434 and SM 2515). Minor variations in the shape of the sepals and petals too have been observed.

The fact that in *Odisha cleistantha* the flower has very distinct characters in its anther and the rostellum; it is observed with morphological variations; and it is growing over a reasonably large geographical area of India, both in the Peninsular and the Himalayan region, indicates that it is a good species and not mere any mutant or variant of any known species. The morphological description of this species is rewritten here to accommodate the observed variations.

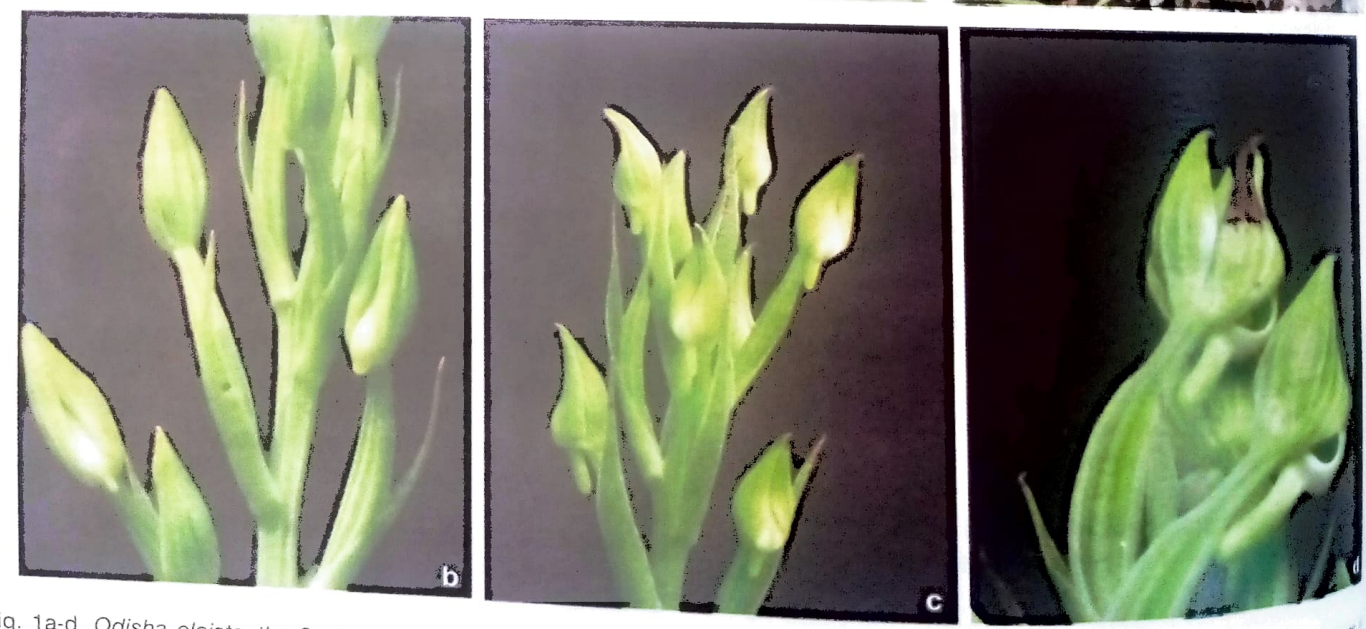

Fig. 1a-d. *Odisha cleistantha* S. Misra: a, A young plant; b, Cleistogamous flowers with reduced spurs; c, Cleistogamous flowers pronounced spurs; d, Closeup view of flowers with long spurs.

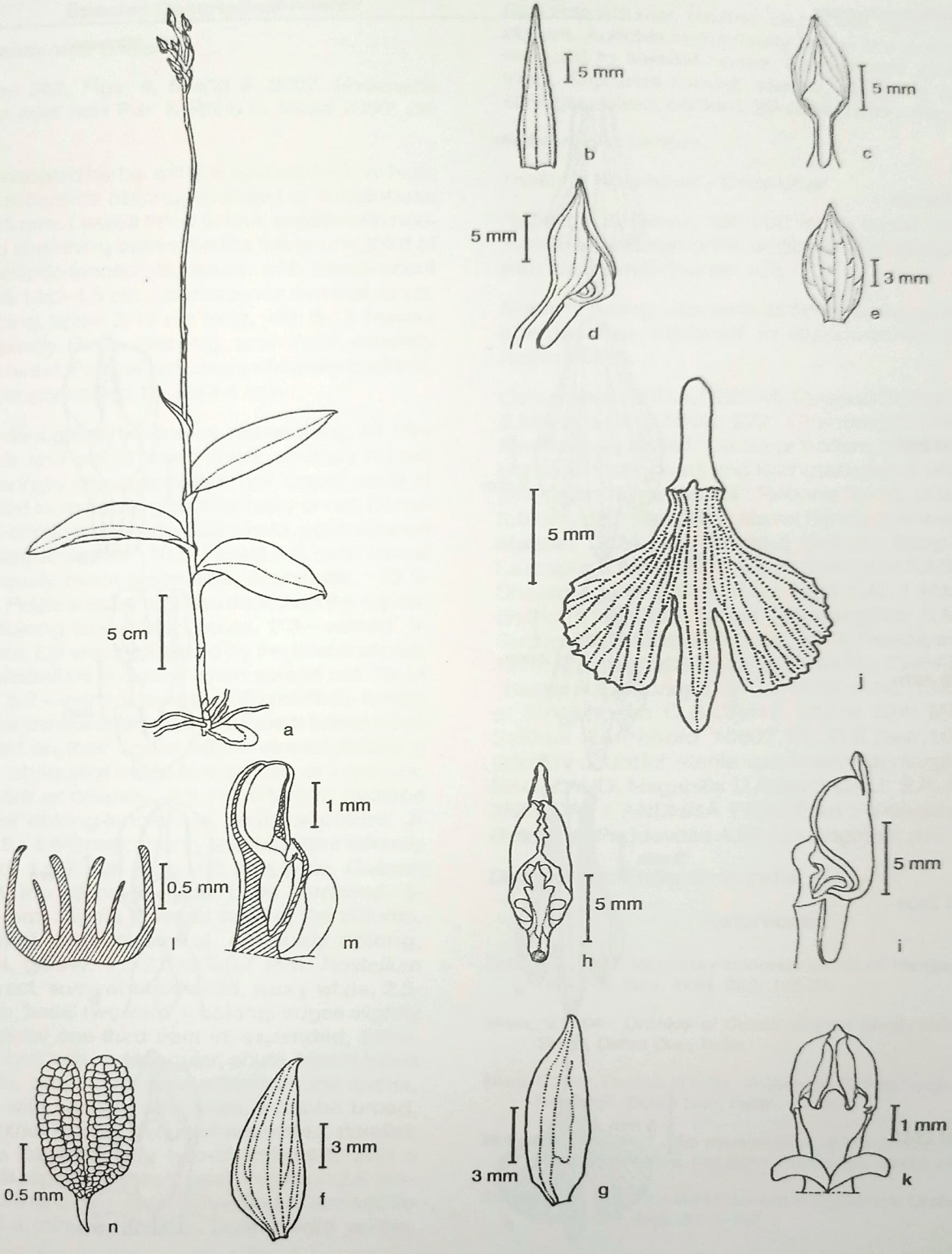

Fig. 2a-n. *Odisha cleistantha* S.Misra : a, Plant; b, Bract; c-d, Flower, front and side views; e, Dorsal sepal; f, Lateral sepal; g, Petal; h – i, Column with lip in position, front and side views; j, Lip spread out; k & m, Column, front view and long section showing anther, stigma lobes and rostellum; l, Section of anther showing bipartite locules (pollinia removed); n, pollinarium (a. after SM 890; b-l. after SM 2510; m-n. after SM 2434. (drawn by S. Misra)

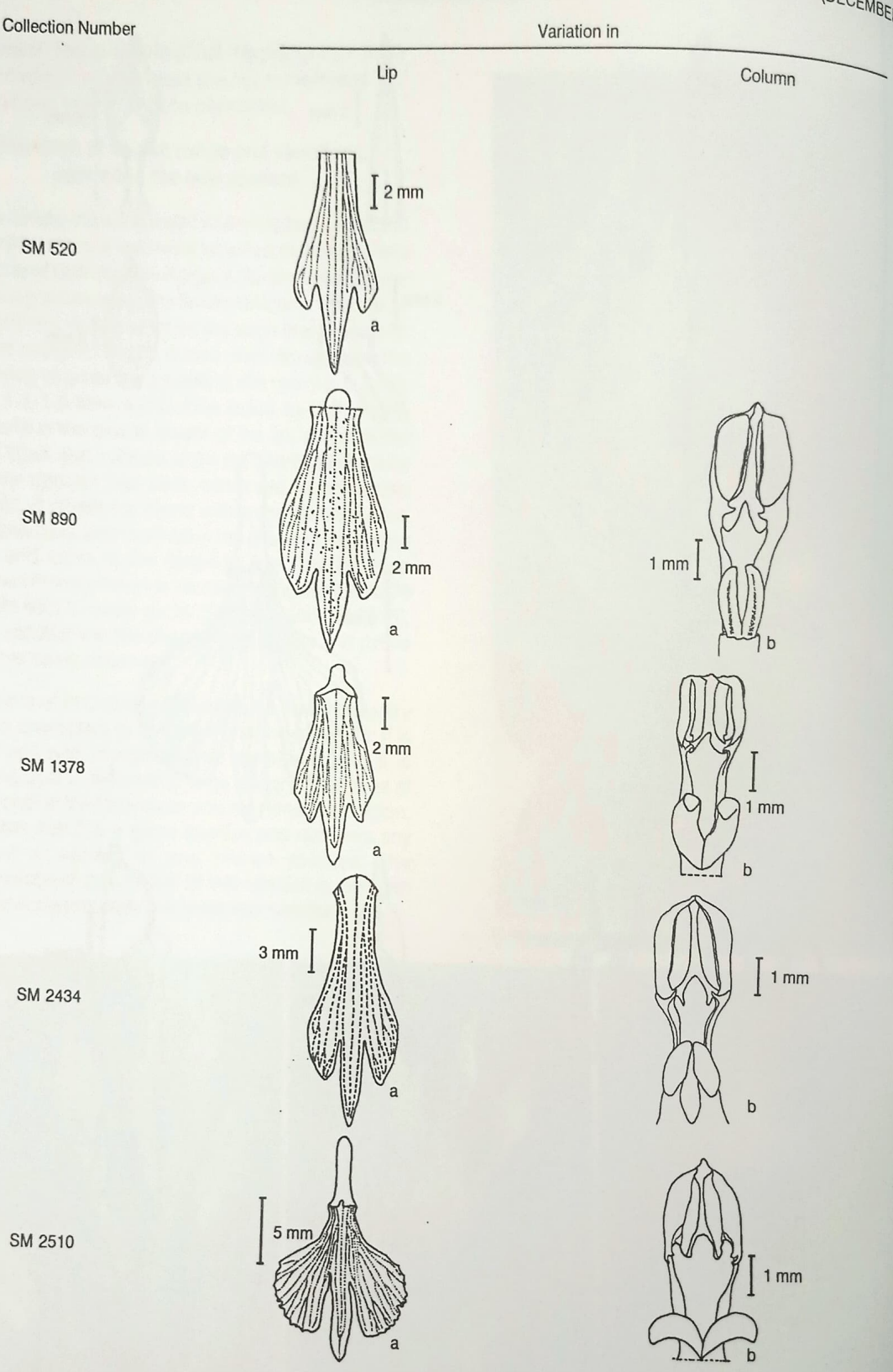

Fig. 3a-b. *Odisha cleistantha* S.Misra. Morphological variations in lip and column and different biotypes from Odisha : a, Lip; b, column (drawn by S. Misra).

Species Description

Odisha cleistantha S.Misra

Orch. India: 252, Figs. 4, 5 and 6. 2007. *Habenaria pelorioides* auct non Par. & Rchb.f.; Misra 2000: 26; 2004:231.

Terrestrial scattered herbs, with the scape 30-70 cm high. *Root-stem tuberoids* oblong, rounded or subglobose 25-52x10-15 mm. *Leaves* three to four, sessile with non-articulating sheathing bases, on the lower one-third of the plant, elliptic-lanceolate, acute, with transluscent margins, 8.5-13x3-4.5 cm. *Inflorescence* terminal, erect, 20-30 cm long, spike 5-19 cm long, with 5-13 flowers arranged spirally. *Bracts* clasping, acuminate, minutely ciliolate, 3-veined. *Pedicel* with ovary obliquely fusiform, beaked, strongly ribbed 15-25x3-4 mm.

Flowers verdant green, inodorsus, not opening, 10-15m long. *Sepals* and *petals* erect, thick, strongly ridged behind, sparingly gland-dotted or not, upper parts of margins rolled in, minutely glandular hairy or not. Dorsal sepal ovate-elliptic-lanceolate, acuminate, apex clasped by tips of lateral sepals, 10.5-13.5x3.5-6 mm; lateral sepals obliquely ovate-lanceolate, acuminate, 13.5-14.5x5 mm. *Petals* smaller and less thick than the sepals, obliquely oblong-lanceolate, acute, 2-3—veined, 9-13x2.75-4mm. *Lip* erect, enclosed by the lateral sepals, obovate-obflabellate in outline when spread out, 12-14 x 6-13 mm, 5-7—veined, lamina of lip medially fleshy, with a slender central channel, three lobed; lateral lobes erect, arched on their upper edges almost touching one other, obliquely ovate-lanceolate or obovate, margins entire or crispate, 2.5-7x1.5-5 mm; midlobe lanceolate or oblong-lanceolate, acute or obtuse, 3-veined, 4-7.5 x 1.6-2 mm; shortly spurred, *spur* laterally compressed, 1.6-7 mm long, 1.5 mm wide. *Column* short, erect, top slightly bent in, base narrowed 5-5.8x1.9-2.5 mm. *Stigma* lobes at base of the column, basally joined, parallel or not, obliquely oblong, transluscent, glossy, 1.5-2.5x0.5-0.7 mm. *Rostellum* elongate, erect, somewhat petaloid, waxy white, 2.5-3x1.25-2 mm; basal two third ± oblong, edges slightly curved in; distal one-third bent in, expanded, three-lobed; the lobes free, ± triangular, acute, lateral lobes short, falcate, simple, not connected with the anther, apices, not with sac-like structures; midlobe broad, incurved. *Anther* locules two, well separated, parallel; each locule longitudinally two-chambered, with a membranous septum, without basal projection 2.6-3x1-1.25 mm. *Pollinaria* two, each consisting of two sectile pollinia and a minute caudicle; pollinia light yellow, *Caudicle* acicular, hyaline, ca.0.5 mm long; viscidium absent. Auricles immediately below the anther base, reduced to slender hooks, transluscent, ca.0.4 mm long. *Capsules* robust, sessile, obliquely fusiform, strongly ribbed, beaked, 20-25x4-5 mm. (Figs.1-3)

Flowering : October

Fruiting : November – December

Habitat : Between 360-900 m, in moist deciduous forests, as undergrowths, under partly shaded situations, with loamy well-drained soil.

Notes : Fruiting, almost in all flowers, suggest that this species has adopted to cleistogamic mode of reproduction.

Occurrence : INDIA.ODISHA. Gajapati District : Mohana *S.Misra*, 119, *S.Misra*; 272 Chandragiri *S.Misra* 126. Kandhamala district : Gadapur *S.Misra* 135; Dangamala, between Daringbadi and Brahmanigam *S.Misra* 2515-2517. Kendujhar district : Rebana forest, at Badajhara *S.Misra*, 520; Bhatodihi, above Kandadhar waterfall *H.F. Mooney* 2824 DD!. Koraput district : Barigam, near Laxmipur *S.Misra* 2510; Govindpali ghat *S.Misra* 2511; Dharamagada *D.C.S. Raju* 1323 CAL ! Mayurbhanj district : Similipal forest (Bamanghati *S.Misra* 70; Gudugudia *S.Misra* 890, 1592, 2434; Barehipani *S.Misra* 1378; Kabataghai S.Misra 2435, 2436). CHHATISGARH : Bastar *H.F.Mooney* 875 K! JHARKHAND: Chotnagpur, at Singbhoom *C.B.Clarke* 34216 BM! MANIPUR: Saithus *A.Meebold* 10807 K!; *D.B.Deb* 1078 CAL! (Identity doubtful; sterile specimen with margined leaf). NAGALAND; Nagahills *D.Prain* 3 CAL!; *S.K. Mukerjee* 3523 CAL ! ANDHRA PRADESH : Vishakhapatnam district, at Peddavolia *A.W. Lushington s.n.*K!

Distribution : Endemic to India.

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