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Cephalozia kodaikanalensis sp. nov. (Cephaloziaceae) from Palni Hills, Tamil Nadu, India

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ABSTRACT

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During exploration of bryophytes from Kodaikanal (Palni Hills), Tamil Nadu, South India, some interesting plants of *Cephalozia* have been observed, which are quite distinct from the known species of the genus in one or the other characters. After a critical evaluation they have been assigned the status of a new species: *C. kodaikanalensis* sp. nov., which has been described and illustrated here. The species is mainly characterized by small, light green-hyaline plants having dorsiventrally flattened axis with 6-7 (large) cortical and 5-6 medullary cells, distantly arranged bilobed leaves with broad sinus and the lobing of the leaf up to 1/5-1/4 of the leaf length.

Key-words: *Cephalozia kodaikanalensis* sp. nov., Cephaloziaceae, Tamil Nadu, India.

INTRODUCTION

The genus *Cephalozia* (Dumort.) Dumort., a small leafy liverwort belonging to the family Cephaloziaceae, is represented by 8 species in India: *C. gollanii* Steph., *C. kashyapii* Udar (Syn. *C. laxifolia* Udar & Kumar), *C. indica* Udar & Kumar, *C. pandei* Udar & Kumar from Senchal Lake, Darjeeling in eastern Himalaya, *C. darjeelingensis* Udar & Kumar from Lebong road, Darjeeling in eastern Himalaya, *C. udarii* Kumar from Valley of Flowers, Garhwal Hills, Uttarakhand in western Himalaya, *C. schusteri* Singh & Singh from Great Himalayan National Park, Kullu, Himachal Pradesh in western Himalaya and *C. hamatiloba* Steph. (Syn. *C. siamensis* Kitagawa) from Bandishola – Coonoor: Nilgiri Hills, Tamil Nadu in south India (Udar & Nath 1973, Udar & Kumar 1976, Udar 1978, Kumar 1987, Singh & Singh 2007).

During the investigation of the recent collection of bryophytes from Palni Hills, Tamil Nadu, South India, some interesting plants of *Cephalozia* (Dumort.) Dumort. were observed growing on moist and shady places on the roadside in Coaker's Walk area in Kodaikanal. In the plants, small, reduced, bilobed underleaves have been occasionally observed which is a rare feature of the genus. The underleaves are wanting in the genus however, sometimes small, ephemeral slime papilla like underleaves in *Cephalozia lacinulata* (Jack) Spr. and 2-4 cells long and 1-2 cells wide underleaves are reported in *Cephalozia bicuspidata* subsp. *ambigua* (Massal.) Schust. (Schuster 1974). Besides, the gemmae are quite commonly present in the genus but they are not observed in these plants. A careful investigation reveals that the plants are quite distinct and has been described here as new to science.

TAXONOMIC DESCRIPTION

Genus: *Cephalozia* (Dumort.) Dumort.

***Cephalozia kodaikanalensis* sp. nov.**

Plate 1, figures 1-6, Text-figures 1-21

Type: India - Tamil Nadu, Palni Hills: Kodaikanal

(Coaker's walk), altitude ca. 2133 m, Lat. 10°13.7372' N and Long. 77°29.5722' E, G. Asthana & Party, 14.02.2011, 21190/11 (LWU) holotype.

Description: Plants small, delicate, light green to hyaline, up to 6.5 mm long, 0.47 - 0.71 mm wide with leaves; stem dorsiventrally flattened, 0.10 x 0.05 mm, cross-section of the stem with (6)7 cortical cells and 5-6 medullary cells, cortical cells thin walled, larger than medullary cells, dorsal cortical cells larger than the ventral cortical cells, 14-45 x 8-31 µm, medullary cells 5-6, small, thin walled, 3-18 x 3-12 µm; rhizoids present on ventral surface in tufts, at regular intervals, colourless, sometimes swollen at tips or even branched at tips. Leaves small, simple, variable in size, 0.15-0.31 mm long, 0.11-0.26 mm wide, bilobed, distant, alternate to subalternate, succubously arranged, slightly oblique-horizontally inserted on the axis with wide attachment, basal leaves highly reduced, small, bilobed, sometimes linear, unlobed, uniseriate, leaf-lobes small, 2-3 cells high and 1-2 cells wide at base, sinus broad, lobing 1/5-1/4 of the leaf length; leaf cells polygonal, thin walled, trigones absent; apical cells (lobe cells) 11-26 x 7-11 µm, marginal cells 37-75 x 18-26 µm, median cells 26-75 x 30-45 µm, basal cells 33-71 x 26-38 µm; underleaves occasionally present along with tufts of rhizoids, small, reduced, bilobed, lobes uniseriate, up to 3 cells high; gemmae absent. Plants sterile.

Distribution and ecology: The plants were collected from Coaker's walk area in Kodaikanal (Palni Hills) on moist soil in shady place. The plants were found growing in association with *Phaeoceros laevis* (Linn.) Prosk., *Calypogeia* sp. and mosses.

DISCUSSION

Cephalozia kodaikanalensis sp. nov. shows close resemblance with *C. indica* Udar & Kumar in overall appearance of the plant, leaf morphology, lobing of the leaves up to 1/5 - 1/4 of the leaf length and absence of gemmae but it distinctly differs in the stem anatomy having (6)7 cortical and 5-6 medullary cells in new species while 5 cortical and 1 or (2) medullary cells in *C. indica*. Besides, the underleaves are absent in *C. indica* while they are observed in *C. kodaikanalensis*. In fact, the underleaves are not reported in any of the Indian species of *Cephalozia* so far (Udar & Kumar 1976, Udar & Nath 1973, Singh & Singh 2007).

Cephalozia pandei shows close similarity with *C. kodaikanalensis* in having dorsiventrally flattened stem with more or less similar stem anatomy but differs in pigmentation and in the number of cortical and medullary cells. *C. pandei* has 8 cortical cells and about 8 pigmented medullary cells, while *C. kodaikanalensis* has 6-7 cortical and 5-6 not pigmented medullary cells. The lobing in the leaves (bilobed leaves) is extended up to half of the leaf length in *C. pandei* which clearly differentiates it from *C. kodaikanalensis* with the lobing up to 1/5 - 1/4 of the leaf length. Besides, the presence of gemmae and absence of underleaf in *C. pandei* is a major difference between the two (Udar & Kumar 1976).

Cephalozia gollanii resembles with *C. kodaikanalensis* in having less deeply lobed leaves up to 1/5–1/4 of the leaf length, absence of gemmae and dorsiventrally flattened stem but differs in stem anatomy having 12 cortical and numerous medullary cells, while *C. kodaikanalensis* has 6-7 cortical and 5-6 medullary cells. Besides the lobes are convergent in the former and divergent in the latter (Udar & Kumar 1976).

Cephalozia udarii share a common feature of dorsiventrally flattened stem with *C. kodaikanalensis* but distinctly differs in having 12 cortical and numerous medullary cells in contrast to 6-7 cortical and 5-6 medullary cells in *C. kodaikanalensis*. Besides the leaves are deeply bilobed up to 1/2- 2/3 of the leaf length and the lobes are broad 6-10 cells high and 4-8 cells wide at base in *C. udarii* while leaves are not deeply lobed and the lobes are small 2-3 cells high and 1-2 cells wide at base in *C. kodaikanalensis* (Kumar 1987).

Cephalozia schusteri also shares a common feature of dorsiventrally flattened stem and absence of gemmae with *C. kodaikanalensis* but distinctly differs in having 11-12 cortical and numerous medullary cells in contrast to 6-7 cortical and 5-6 medullary cells in *C. kodaikanalensis*. Besides the leaves are bilobed up to 1/3- 1/2 of the leaf length and the lobes are 3-6

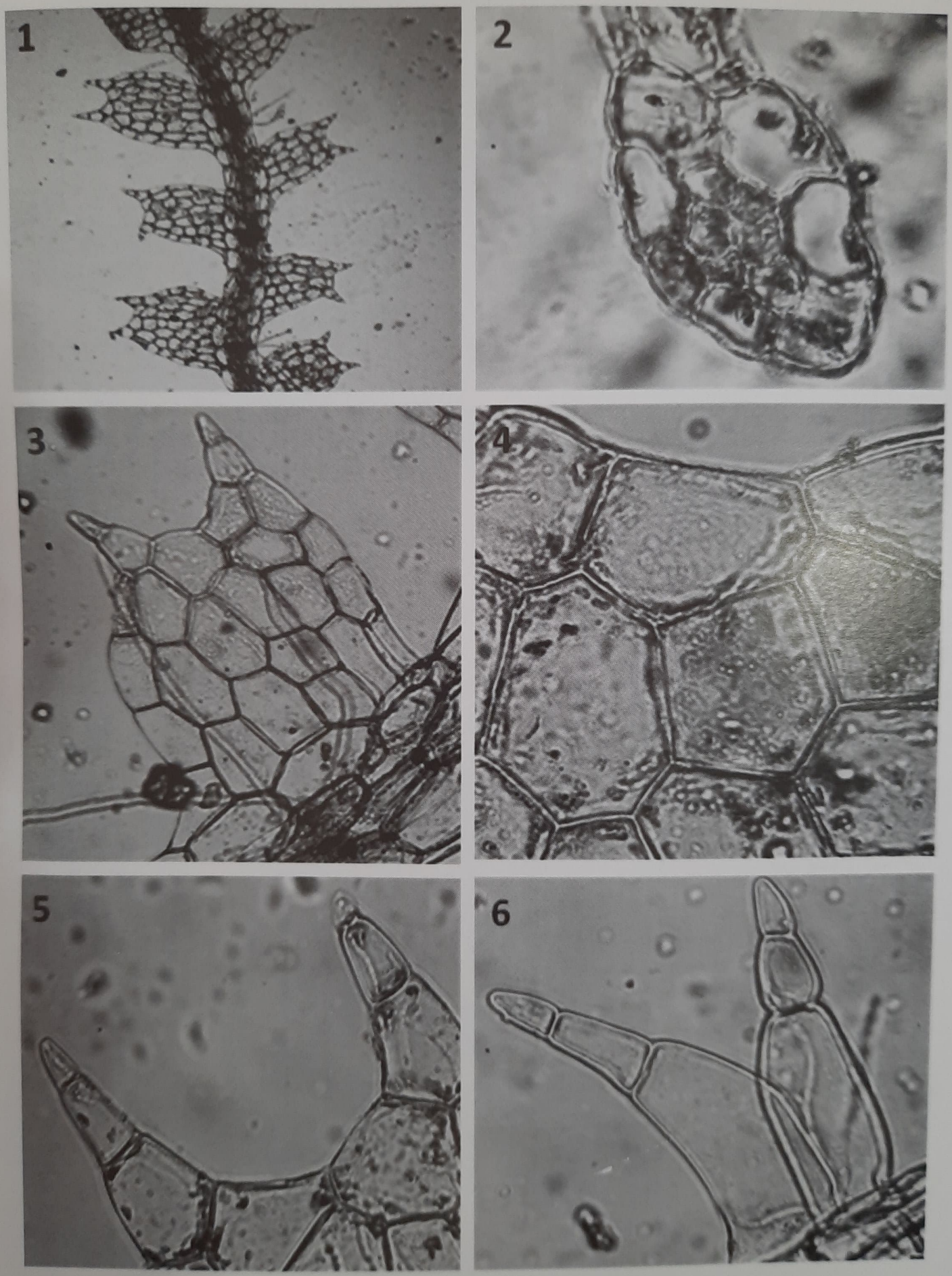
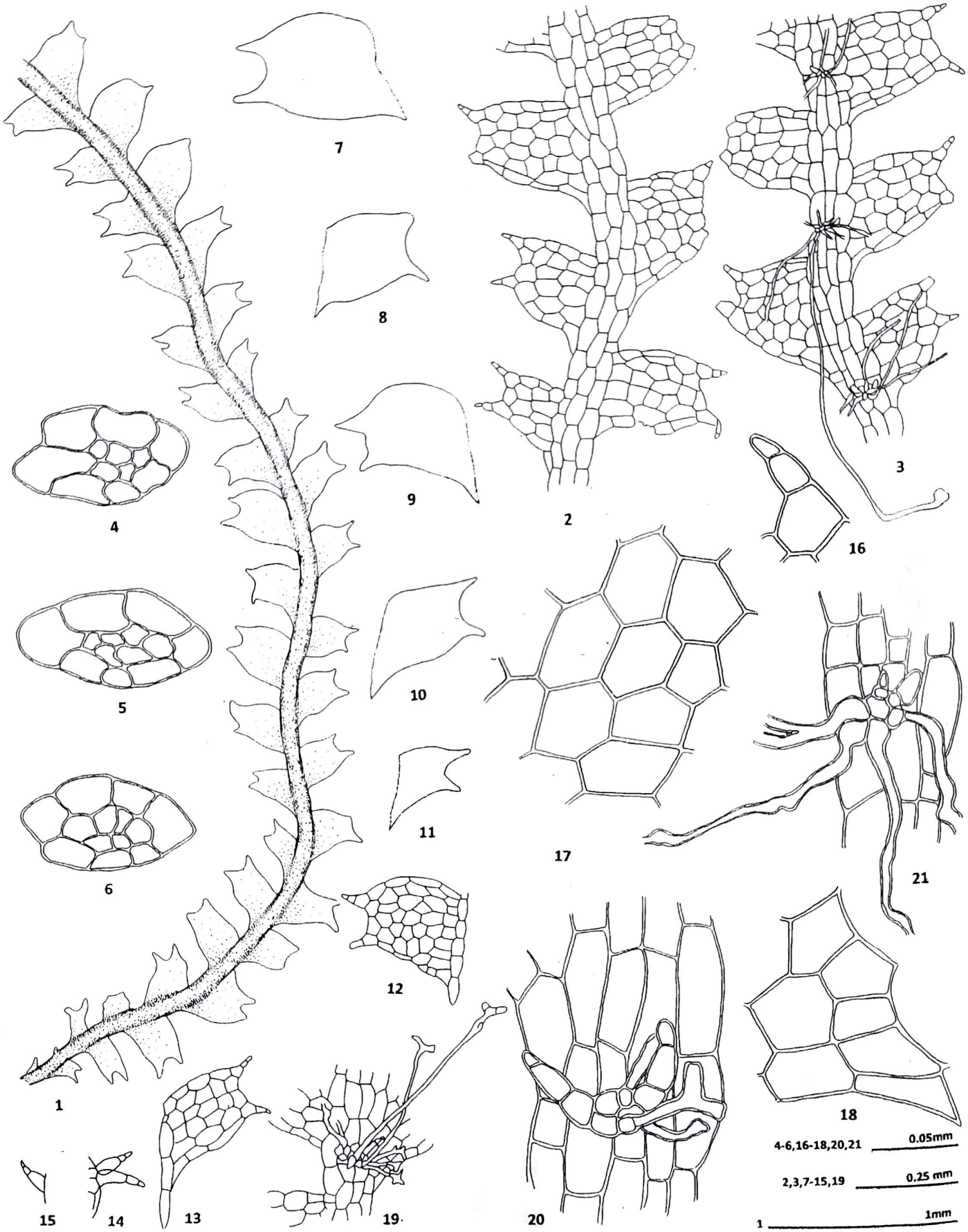


Plate 1

1-6. *Cephalozia kodaikanalensis* sp. nov. 1. A portion of plant, x80. 2. Cross-section of the stem, x590. 3. Leaf, x200. 4. Leaf-cells, x720. 5. Apical portion of leaf showing lobes, x625. 6. Reduced leaf, x530. All photographs taken from 21190/11, (LWU).



Text-figure 1-21. *Cephalozia kodaikanalensis* sp. nov. 1. A plant in dorsal view. 2. A portion of plant in dorsal view. 3. A portion of plant in ventral view. 4-6. Cross-sections of the stem. 7-15. Leaves. 16. Apical (leaf-lobe) cells. 17. Median leaf-cells. 18. Basal leaf-cells. 19. A portion of stem showing rhizoidal tuft. 20, 21. Portions of stem with underleaves and rhizoids. All Text-figures drawn from 21190/11, (LWU).

cells long and 2-4 cells wide at the base in *C. schusteri* in contrast to smaller lobes in *C. kodaikanalensis* (Singh & Singh 2007).

Cephalozia hamatiloba differs from *C. kodaikanalensis* in having 8-9 cortical and 9-11 medullary cells in contrast to 6-7 cortical and 5-6 medullary cells in *C. kodaikanalensis*. The stem is not dorsiventrally flattened but more or less circular in outline in section in *C. hamatiloba* while in *C. kodaikanalensis* stem is dorsiventrally flattened. The lobing in the leaves is extended up to half of the leaf length in *C. hamatiloba* while it is up to 1/5 - 1/4 of the leaf length in *C. kodaikanalensis*. Besides, unicelled gemmae are reported in the former which are absent in the new species (Udar & Nath 1973).

Cephalozia kashyapii distinctly differs from *C. kodaikanalensis* in having circular stem, in the lobing up to 1/2- 2/3 of the leaf length with the lobes 4 cells high and 3-4 cells wide at the base (Udar & Kumar 1976, Udar 1978).

Cephalozia darjeelingensis differs from *C. kodaikanalensis* in having circular stem with 12 cortical and numerous medullary cells, deeply lobed leaves with lobing up to 1/3 - 1/2 of the leaf length with the lobes 4 cells high and 3-4 cells wide at the base. Besides, one celled gemmae are reported in *Cephalozia darjeelingensis* while the same are not observed in *C. kodaikanalensis* (Udar & Kumar 1976).

Besides all these differences, the underleaves are not reported so far in any Indian species except in this new species: *C. kodaikanalensis*. With the present contribution, the genus *Cephalozia* is now represented by nine species in India. Among these five (maximum number) species are reported from eastern Himalaya and two species each from western Himalaya and South India.

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REFERENCES

Kumar D. 1987. A new *Cephalozia* Dum. from the Valley of Flowers. J. Indian Bot. Soc. 66: 170-172.

Schuster R. M. 1974. The Hepaticae and Anthocerotae of North America, east of the Hundredth Meridian. Vol. III. Columbia University Press.

Singh S. K. & Singh D. K. 2007. *Cephalozia schusteri* (Cephaloziaceae, Hepaticae) - a new species from India, with note on the Indian species of the genus. Lindbergia 32: 1-4.

Udar R. 1978 *Cephalozia kashyapii* Udar nom. nov. from eastern Himalayas. Geophytology 8: 133.

Udar R. & Kumar D. 1976 Genus *Cephalozia* in Eastern Himalayas. Geophytology 6: 35-45.

Udar R. & Nath V. 1973 Studies in South Indian Hepaticae, 3. *Cephalozia siamensis* Kitagawa; a new record from India. Bull. Bot. Surv. India 15: 143-151.