13.9.1965, *Togashi* 9936 (CAL). EUROPE: Berlin 10.9.1958, *Motel* 473 (CAL); Braemar, Aug. 1855, *Croall* 359 (CAL); Schweizerischen, 7.5.1899. *Hepo* s.n. Acc. no. 29816 (CAL); Austria, *Dorfler* 1902 (CAL); Norway, July 1852, *Anderson* s.n. Acc. no. 29828 (CAL). AMERICA: New York, *Buckley* s.n. Acc. no. 30020 (CAL).

Photograph examined: North-West America, 1849. *Sammon* 1762 (K) BSI Negative 1946 (CAL).

Distribution: INDIA: Uttar Pradesh, Sikkim, Meghalaya, ARCTIC zones and mountains of north temperate zones in both hemispheres.

L. veitchii Christ in Bull. Geor. Bor. Mans. 106. 1906; Tagawa, Journ. Jap. Bot. 30(9): 279. 1955 & in Univ. Mus. Univ. Tokyo Bull. no. 2. 200. 1971; Iwatsuki in Univ. Mus. Univ. Tokyo Bull. no. 8. 167. 1975. *L. annotinum sensu* Clarke in Trans. Linn. Soc. Lond. II Bot. 1: 592. 1880 (*pro parte*). *L. stichense* Rupr. var. *veitchii* (Christ) Takada, Bot. Mag. Tokyo 29: 288. 1955. *L. alpinum* var. *transmorrisonense* Hayata, Icon. Pl. Formosanum 4: 130. f. 69. 1914.

Stems terete, long creeping, 1.0-1.5 mm in diameter, branched; branches many, stipitate, ascending, copiously forked. Leaves shortly stalked, spirally arranged, adpressed to spreading, ascending, deltoid-lanceolate, 2.5-4.0 × 1.0-1.5 mm, broad at base, coriaceous, margins wavy and slightly involute; midrib distinct on the lower surface, obscure on the upper surface. Strobili solitary at the apex of branchlets, cylindrical, 2.0-2.5 cm × 3-4 mm, distinctly stalked; stalks 2.0-3.5 cm, bearing subremote, spirally arranged linear-lanceolate leaves, 3-5 × 0.8-1.0 mm. Sporophylls firm, dense, imbricate, spirally arranged, broadly ovate, slightly auriculate at base, acute-caudate at apex, 3-4 × 2.0-2.5 mm; margins irregular to rarely denticulate. Spores 35-40 μ m, reticulate (Figs. 4-6).

Specimens examined: ARUNACHAL PRADESH: Kameng: Zong to Senge Dzong, 3000-3200 m, 1.6.1957, *R. S. Rao* 7983, Acc. nos. 9035, 28791 (ASSAM).

Distribution: INDIA: Sikkim, Arunachal Pradesh, CHINA, JAPAN.

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CHRISTENSENIA AESCULIFOLIA (BLUME) MAXON—FIRST REPORT OF A POORLY KNOWN FERN FROM SUBANSIRI DISTRICT, ARUNACHAL PRADESH, INDIA

During detailed botanical collections in and around Itanagar, the new capital of Arunachal Pradesh, in Subansiri district, a rare and hitherto poorly known lithophytic fern was collected, along a stream in cool shaded areas amidst dense low herbs in a hilly secondary forest. Although Beddome (1883) and Dixit et Panigrahi (1969/1972) described and illustrated the species, the whole plant with special reference to its

rhizome has not yet been illustrated, nor, the peculiar rhizome and the stipe characters have adequately been described earlier. It is also noted that previously only one gathering *viz. G. K. Deka* s.n. from Lakhimpur (Assam) was made in December 1948 (ASSAM) to-date. The first report of its presence in Arunachal Pradesh, extends its range further north. Considering its rarity and incomplete description a detailed description with illustrations based on living materials is presented. The specimens are in the herbarium of the Botanical Survey of India, Arunachal Field Station, Itanagar.

Christensenia aesculifolia (Blume) Maxon in Proc. Biol. Soc. Washington 18: 240. 1905; Dixit and Panigrahi in Bull. Bot. Surv. India 11: 370. f. 14-16, 1972. *Aspidium aesculifolium* Blume, Enum. Pl. Jav. 2: 143. 1828. *Kaulfussia aesculifolia* (Blume) Blume, Enum. Pl. Jav. 2: 260. 1828; Bedd. Handb. Ferns Brit. Ind. 462. t. 287. 1883. *K. assamica* Griffith Asiat. Res. 19: 108.. t. 18. 1836.

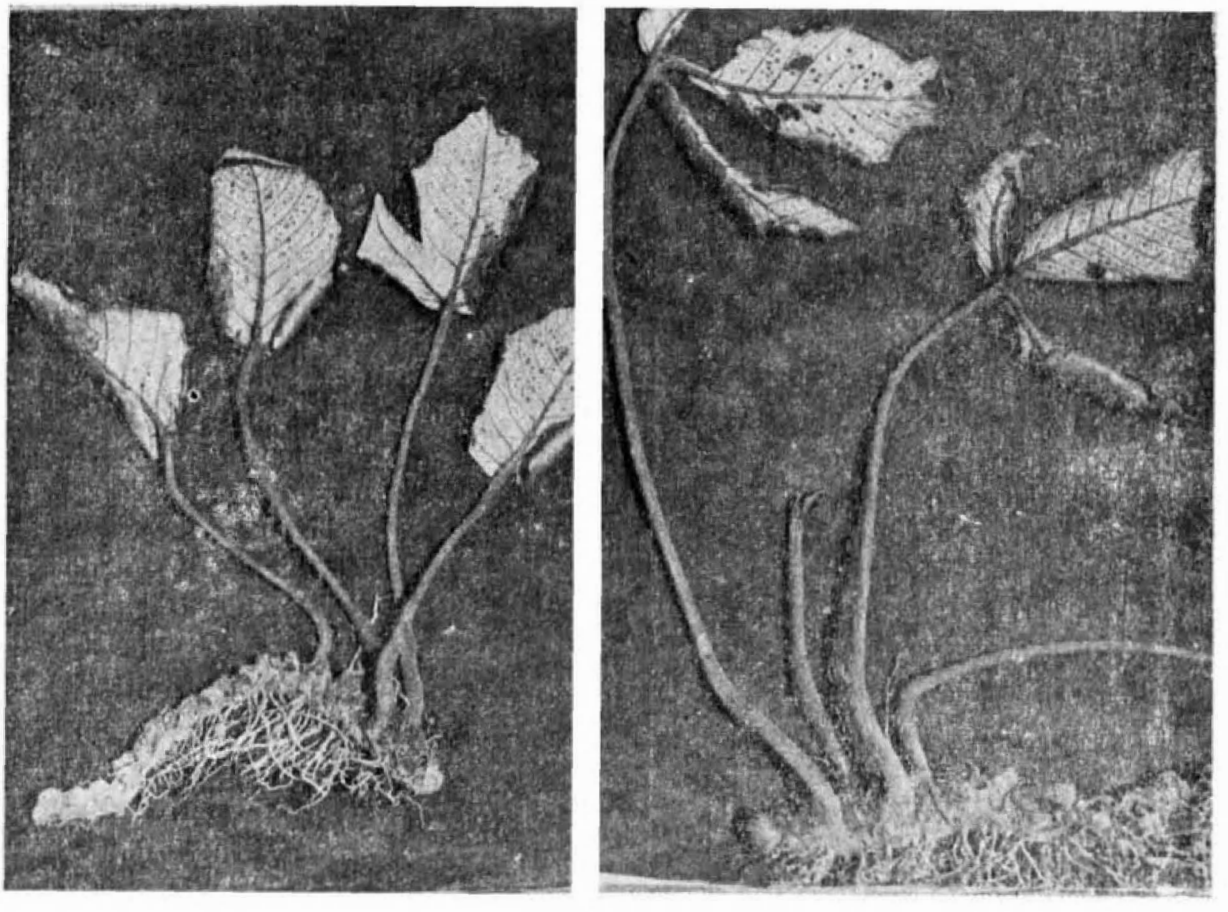
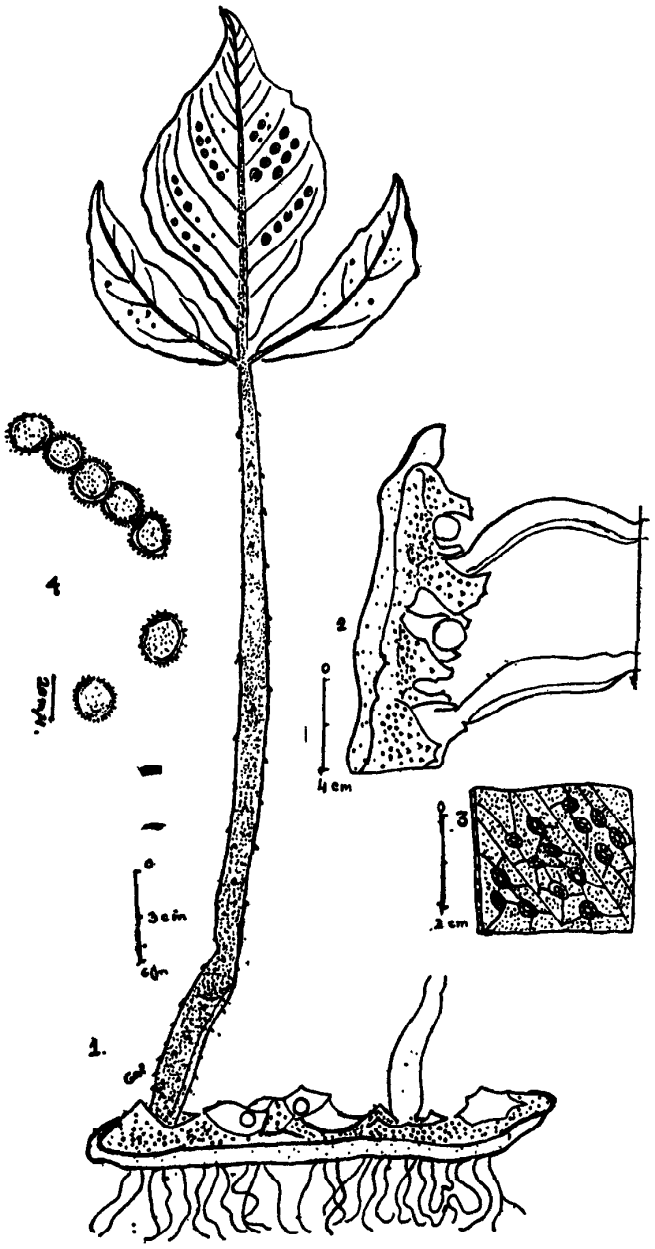


Plate I: *Christensenia aesculifolia* (Blume) Maxon
A poorly known fern showing rhizome, petiole and leaves. Please see the simple and trifoliate leaves.

Rhizome creeping horizontally, fleshy, 2.5 cm thick; upper surface with successive sockets of fleshy auricles, within which the stipe arises, bristly, green; lower surface purplish, bearing rows of numerous rhizoides; rhizoides whitish, rarely green; auricles ovate, undulate or dentate, rarely entire, stout, fleshy, bristly, green, the older auricles with stipe-scar within; stipe 14.0-50.0 cm long, 0.3-1.3 cm thick, fleshy,

olive green; stipe base 0.5 - 1.3 cm thick, curved and flattened up to 4-7 cm and with distinct notch at about that point; scales prickly, minute, green, many at the base but few distally, rusty waxy throughout except the flattened part of stipe; frond simple or partially lobed when young, the old frond palmately compound consisting of 3 leaflets, rarely 5, subsessile to shortly stalked; stalk 1-10 mm, the middle leaflets largest, 13 - 21 × 7 - 11 cm, obovate-oblong to elliptic, cuneate at the base, subacuminate to acuminate at the apex, entire to subrepand or broadly crenate or dentate, flexible, thick leathery, dark green above and whitish green beneath, glabrous; mid-vein prominent, scabrulous, brownish with 9-10 pairs of transverse veins; lateral leaflets smaller, 11-15 × 4-6 cm, obliquely oblong or elliptic, main lateral vein curved; venation reticulate with free veinlets, included in aerioles; sorus at vein junctions in two rows, between the transverse veins, *ca* 4 mm across, and each consisting of 10-20 laterally jointed sporangia forming raised circular cup-shaped, rarely oblong, groups with central depressions; spores globose, rarely oblong, exine spinescent, entire, smooth, white, 16-20 mμ diam. (Figs. 1-4, Plate 1).



Christensenia aesculifolia (Blume) Maxon

Figs. 1-4 : 1. An adult plant. 2. Profile view of rhizomes showing auricles and stipe-scare. 3. Venation and sori enlarged. 4. Spore.

Fertile: Dec.-March.

Rare, at one spot; Arunachal Pradesh, Subansiri, Itanagar, 22.12.78, *G. D. Pal* 70347.

Distribution: INDIA (Assam, Lakhimpur, Jaypur, Cachar). BANGLA DESH (Chittagong hills). MALAY ISLANDS and THE PHILIPPINES.

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