clasping the stem up to about one third of its circumference. Older leaves are removed when they become yellow while drying, leaving about twelve in number forming the crown.

According to the literature on the subject, the plants bear male and female flowers on different trees after 14-30 years of growth. But the tree in Indian Botanic Garden is yet to bear flowers though it is about 86 years old.

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TAXONOMIC NOTES ON *LYCOPODIUM ANNOTINUM* L. AND *L. VEITCHII* CHRIST

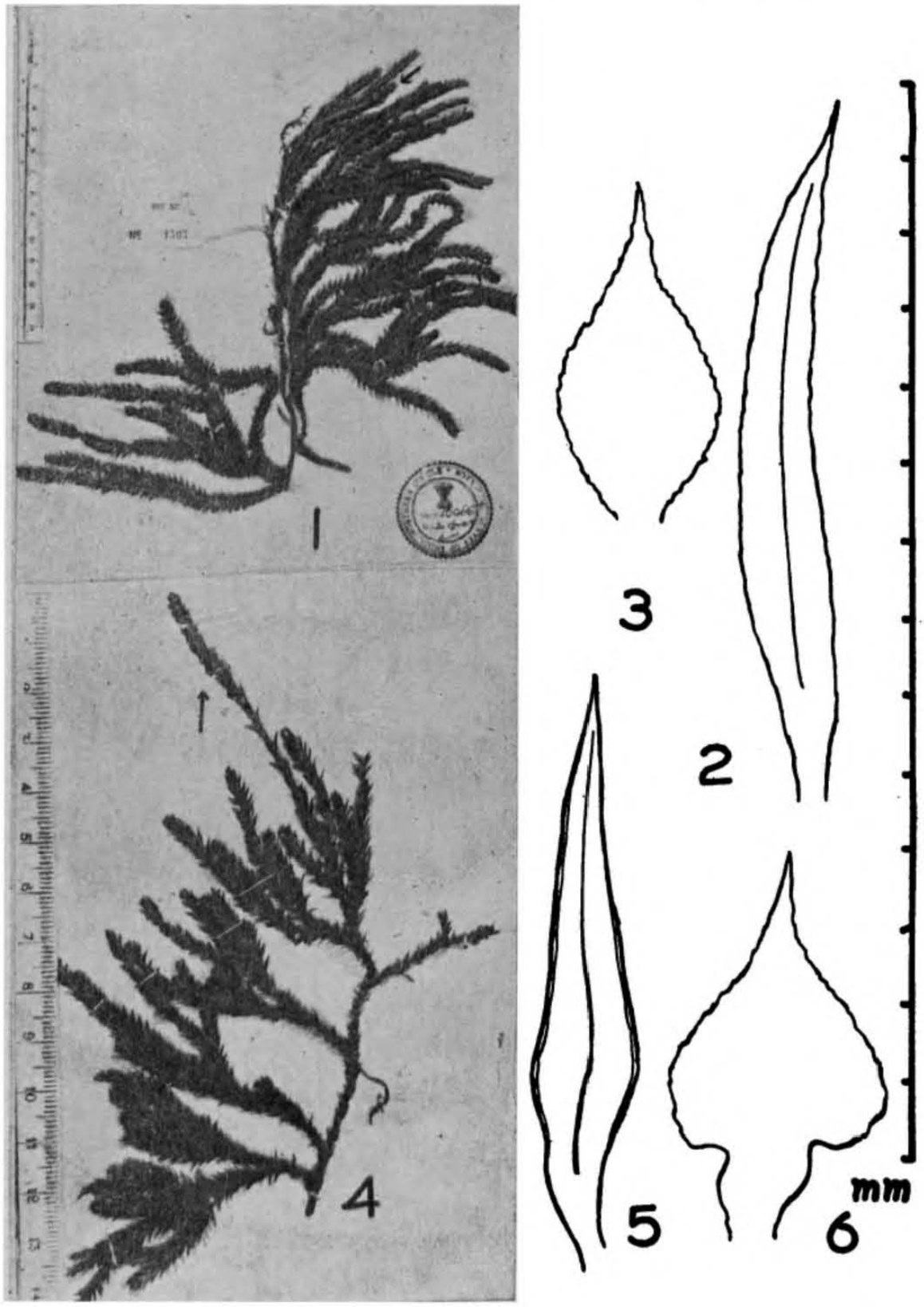
Linnaeus (1753) characterised his *Lycopodium annotinum* as having leaves sparse, 5-whorled, wavy to subserrate, strobili solitary and sessile. In India Clarke (1880) was the first to describe *L. annotinum* L. However, the material that he described was not homogeneous as discovered by later studies. Clarke himself had noticed that his material differed from the Linnaean material in the strobili being distinctly peduncled but he did not realise the significance. Tagawa (1971) and Iwatsuki (1975) who collected the plants with peduncled strobili from Nepal and Bhutan Himalayas identified their material as *L. veitchii* Christ and cited in synonymy *L. annotinum sensu* Clarke. However, Clarke's material was partly *L. annotinum* and partly *L. veitchii.* Material of the several herbaria were studied and *L. annotinum* or *L. veitchii* were identified. The two species can be differentiated as follows:

Leaves lanceolate; strobili sessile; sporophylls ovate ..	*L. annotinum*
Leaves deltoid-lanceolate; strobili peduncled; sporophylls ovate-auriculate ..	*L. veitchii*

L. annotinum L. Sp. Pl. 2: 1103. 1753; Spring in Mem. Acad. Sci. Belg. 15(1): 78. 1843 & 24(2): 36. 1850; Clarke in Trans. Linn. Soc. Lond. II. Bot. 1: 592. 1880 (*pro parte*).

Main stem wide trailing, branched; branches ascending, upper simple, lower copiously compound, constricted at intervals simulating nodes where growth has been suspended (may be an indication of yearly growth). Leaves 5-whorled, close, spreading to reflexed, glaucous, pale-brownish-green when dry, lanceolate, 3-5 × 1-2 mm, acute to mucronate, margins wavy to subserrate thick in texture, midrib distinct. Strobili solitary, sessile at the end of leafy branchlets, cylindrical, 2.5 - 4.0 cm × 4 - 6 mm. Sporophylls broadly ovate, short cuspidate, ascending brownish-green, imbricate, wavy to irregularly denticulate in margins. Spores trilete, 35 - 40 μ m, yellow, reticulate. (Figs. 1-3).

Specimens examined: UTTAR PRADESH: Kumaon: Furkia, 3500-5000 m, 23.9.1957, *T A. Rao* 4505 (BSD); Pindari Noriaine, 3500-5000 m, 24.9.1957, *T A. Rao* 4505 Acc. no. 10260 (BSD); Bogdwar bugyar, 3200-4500 m, 21.6.1958, *T. A. Rao* 7123 (BSD). SIKKIM: 3500-4000 m, Aug. 1836, Herb. *Hook. f. & Thomson*, s. n. Acc. no. 29499 (CAL). MEGHALAYA: Khasia, 2000 m, Herb. *Hook. f. & Thomson*, s. n. Acc. no. 29570, Plant numbered 6 (CAL). NEPAL: Western part, 4000-4500 m, 25.7.1886, *Duthie* 6308. CHINA: Hupeh, 1899, *Henry* 6986, two sheets (CAL). JAPAN: Tokyo, Mawrike, 1500 m,



Lycopodium annotinum L.

Figs. 1-3. : 1. Habit, *T. A. Rao* 4505 (BSD), Arrow showing strobilus. 2. Leaf. 3. Sporophyll.
Figs. 4-6. *L. veitchii* Christ. 4. Habit, *R. S. Rao* 7985 (ASSAM), Arrow showing peduncled strobilus. 5. Leaf. 6. Sporophyll.

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