

Sinske HATTORI*: *Frullania caduca* from Amami Island服部新佐*: 奄美大島産 *Frullania caduca* について

Between December 27-30 in 1981 Dr. Z. Iwatsuki and Mr. T. Suzuki made an extensive collection of bryophytes on Amami-oshima Island, southern Japan. I am much indebted to them in kindly placing the *Frullania* specimens of the collection at my disposal. Among them I found Formosan *Frullania caduca* Hatt. which has been known only from the type collection made by Dr. H. Inoue in Urai, Prov. Taipei. In appearance the Amami plants are remarkably different from the Formosan type, and are described as follows:

Frullania (Trachycolea) **caduca** Hatt., Bull. Natn. Sci. Mus. Tokyo, Ser. B, 6(1): 33, f. 1 (1980).

Plants medium-sized to small, deep green and \pm glossy when fresh, in dense patches on bark of pine trees; stem ca 2 cm, 0.13-0.14 mm in diam. and dark green above, 0.1-0.12 mm and brownish below, with leaves ca 1.2 mm wide, irregularly bipinnately branched, primary branches obliquely spreading, usually less than 5 mm long. Lobes of stem-leaves imbricate but often caducous (particularly lower leaf-lobes), widely spreading, dorsally extending 1/2 (or a little more) the stem-width beyond the farther edge of stem, nearly flat, widely ovate with round apices and arched but non-appendiculate bases, 0.55-0.6 mm long and wide, occasionally with marginal propagules; cavities of cells containing 10 or more chloroplasts and 5-10 oil-bodies per cell, oil-bodies oblong, \pm fusiform, or nearly orbicular, grayish with minute globules, cavities of marginal cells 20-22 \times 18-20 μ m, of median cells 22-25 \times 20-22 μ m, of basal cells 25-35 \times 22 μ m, walls subhyaline, thin, with small to medium-sized, subtriangular trigones and often with \pm nodulose intermediate thickenings; leaf-lobules frequently caducous, mostly explanate and lanceolate, ca 0.3 mm long and 0.1 mm wide, often \pm canaliculate with recurved adaxial margins, acute or rarely obtuse at apices, when saccate symmetrical-galeate, ca 0.18 mm long and 0.2-0.22 mm wide; styli minute, of a row of 3-4 uniseriate cells. Stem-underleaves (non-caducous) contiguous, flat, widely (wider than long) obtuse, ca 0.4 mm

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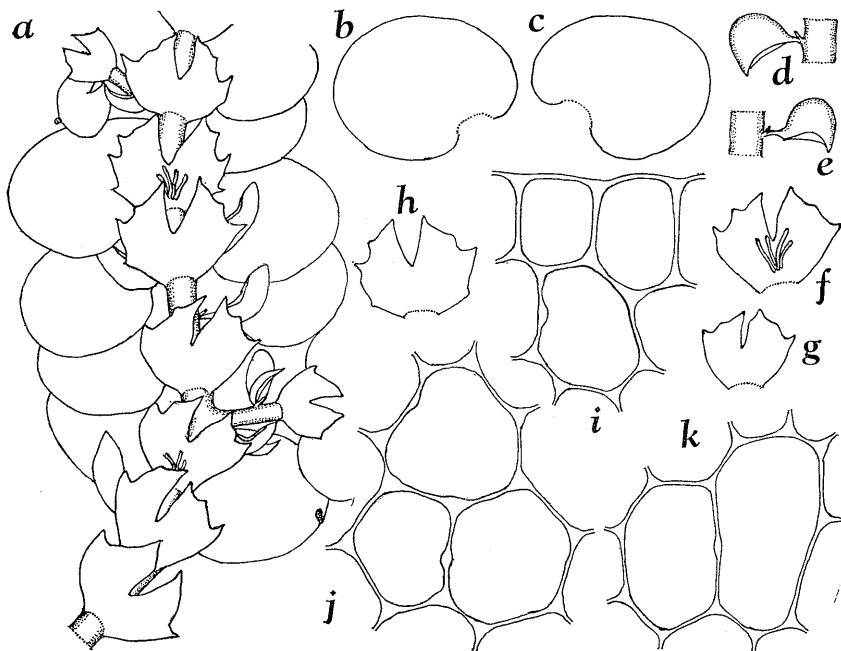


Fig. 1. *Frullania caduca* Hatt. a. Portion of stem, ventral view, $\times 35$. b-c. Lobes of stem-leaves, $\times 35$. d-e. Lobules and styli of stem-leaves, $\times 35$. f-h. Stem-underleaves, $\times 35$. i-k. Cells of lobe of stem-leaf. i: from margin; j: from middle; k: from base, all $\times 695$. Drawn from specim. from Amami-oshima, Z. Iwatsuki 10823.

long and 0.4-0.5 mm wide, with 1 or more frequently 2 marginal teeth at and above each shoulder (teeth often subacute to obtuse at tips, upper tooth smaller, rarely barely angular), rarely with 1 or 2 minute marginal teeth below the middle, ca 4/7-bifid, sinus acute, lobes subtriangular, usually acute or \pm apiculate at apices, insertions \pm sinuose; rhizoid-initial area near the base, not or slightly convex, rhizoids often seen, purplish-brown, 4-6 per area, short, \pm fasciculate.

Japan. Ryukyu Islands: Amami-oshima Island, Yamato-son, Kaigyō Shrine, 10 m (supra mare), Dec. 31, 1981, Z. Iwatsuki 10823 (NICH H-185347).

Distr.: Formosa (Urai) and southern Japan (Amami-oshima).

In the Formosan material the plants are pale olive-green but this color was observed on the herbarium specimen more than ten years after collection, so I suspect that it was green when fresh, as was the Amami-oshima material.

The Formosan material is somewhat smaller (stems are 1.5-2 cm long and 0.1 mm in diam.), with smaller, somewhat densely imbricate leaf-lobes (ca 0.5 mm long and wide on the stem), almost always galeate leaf-lobules somewhat smaller (0.2 mm long and 0.15 mm wide on the stem), and smaller underleaves (0.2-0.3 mm long and wide on the stem).

Such slightly smaller sizes of the plants, leaf-lobes and -lobules, and underleaves, slightly denser arrangements of leaves, and not explanate lobules of the Formosan material can be interpreted as caused by its somewhat dried habitat conditions. It is possible that the Amami-oshirna material might have occurred under slightly moister habitat conditions than are normal for this species. Thus, the leaf-lobules are mostly explanate and the leaf-lobes are not so imbricate as, and somewhat larger than, those of the Formosan material. The above variations are considered to be environmental modifications of a single taxon.

Frullania caduca seems to be closely related to, or possibly conspecific with, *F. amamiensis* Kamim. (J. Kochi-Gakuen Coll. 1: 51-53, f. 1, 1968), though I do not see the type specimen of the latter. According to Kamimura's protologue, the leaf-lobes are not caducous and have strongly thick-walled cells in *F. amamiensis*. These differences appear to be beyond those caused by environmental conditions. So further discussions will not be given until sufficient, adequate material can be obtained from Amami-oshima Island and the adjacent areas.

Frullania pedicellata Steph. (distributed in Honshu, Shikoku, and Kyushu, including Yakushima Island to the north of Amami-oshima) seems to be most closely related to the present species. But the present species is distinguished by the more than 1/2-bifid underleaves that are slightly wider than long, the caducous leaf-lobes that are neither auriculate nor appendiculate at the dorsal bases and occasionally with marginal propagules, the strongly caducous, often explanate leaf-lobules, and the deeply green plant. In *F. pedicellata*, in contrast, the underleaves are usually 1/3-bifid and narrower (slightly longer than wide) and have smaller lateral teeth, the leaf-lobes hardly are caducous, with auriculate-appendiculate dorsal bases, and without marginal propagules, the leaf-lobules are usually saccate and never caducous, the plant is usually reddish-brown, and the cell-walls of leaf-lobes are thicker and \pm flexuose with larger trigones and intermediate thickenings. One might consider the present species

to be an environmental modification of *F. pedicellata*, but the deep sinus of the underleaves, the caducous leaves (particularly their lobules), and the non-auriculate bases of leaf-lobes are features that cannot be considered as modified by any habitat condition.

Other species of *Frullania* identified in the collection are: *Frullania aoshimensis* Horik. Uken-son, Mt. Yuwan, summit area, on tree-trunk (10515a); Mt. Yuwan, 450 m, on tree-trunk (10563c), with *Cololejeunea horikawana*. *F. kagoshimensis* Steph. Mt. Yuwan, summit area, on branches (10505b, 10506b, 10507h). *F. ramuligera* (Nees) Mont. Mt. Yuwan, summit area, on branches (10507g). *F. gaudichaudii* (Nees & Mont.) N. & M. Sumiyo-son, Kamiya, 200-350 m, on tree-trunk (10742). *F. tamarisci* subsp. *obscura* (Verd.) Hatt. Mt. Yuwan, 500-640 m, on rock (10470).

The above-cited specimens are all kept in NICH.

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台湾から記載した *Frullania caduca* が奄美大島で岩月・鈴木両氏によって採集されたが、奄美大島産の植物は台湾産の植物とくらべてすべてがより大形で、色調も少し異なる。しかしこれらの差は生育環境の差によっておこされたものと考えられる。この種は *F. pedicellata* に近縁であるが、腹葉の形、葉の上片及び下片がいちじるしくもろいこと、その他によって区別出来る。奄美大島で岩月・鈴木両氏が採集した *Frullania* 属の苔類の他の5種とともに記録した。