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On the Two Species of *Avrainvillea* from Southern Japan

Takesi TANAKA and Hiroshi ITONO*

Abstract

Hitherto, four species of *Avrainvillea* including two forma, *A. erecta* (BERKL.) A. et E. S. GEPP (Tanaka 1956: 18), *A. lacerata* J. AG. f. *typica* GEPP (Yamada and Tanaka 1938: 62; Tanaka 1960: 6), *A. lacerata* J. AG. f. *robustior* A. & E. S. GEPP (Okamura 1936: 110), *A. nigricans* DECAISNE (Tanaka 1963: 77) and *A. riukiuensis* YAMADA (Yamada 1932: 267-268; 1934: 73), have been reported from Japanese waters. In 1967, the present authors had the chance of collecting additional two species of *Avrainvillea* from southern Japan. These two species are new to Japanese waters, and of these two one is the species already reported by the senior writer from Camiguin Island, Philippines.

Avrainvillea obscura (AG.) J. AGARDH

Fig. I, Fig. II 1-3

“Till Algernes Systematic VIII” (1887) p. 53; Taylor, Plants of Bikini (1950) pp. 67-69 pl. 34 Fig. I; Gepp, A. and E. S., Codiaceae of the Siboga Expedition (1911) pl. X Fig. 90 a, b Fig. 91; De Toni, Sylloge algarum I (1889) p. 515.

Plants solitary, to 14 cm. tall, yellowish green becoming dull green in drying, arising from a massive subterranean basal mass of rhizoids and sand grains, subterranean basal mass become 16 mm. in diameter and 2 cm. long; flabellum cuneate to round at the base, round, obovate or slightly lacerate above, very thin when dried, texture spongy but firm, the margins of the flabellum spongy and compact to somewhat hairy, flabellum to about 10 cm. broad and to about 10 cm. long, stipitate; stipe to 2 cm. long and 0.4-0.9 cm. broad, slightly compressed; filaments smooth, cylindrical or rarely tortuous, filaments of actively growing margins and proliferous areas measure 33-56 μ in diameter, surface filaments in the upper center of the blades 24-33 μ in diameter, inner filaments colorless to brown and 30-36 μ in diameter, the surface filaments of the thickened base of the blade reach 45 μ in diameter and that of the stipe measure 27-42 μ in diameter; filaments dichotomously branched, constrictions above the forks, constrictions usually even; zonation on the surface of the flabellum not seen; chromatophores small spindle shaped or cymbeloid containing one or rarely two pyrenoids, 12-15 μ long and 4.5-6 μ broad.

Syn.: *Anadyomene obscura* AG., Spec. Alg. (1821) p. 401.

Japanese name: Maruba hauchiwa (nom. nov.)

Habitat: Growing on the sandy bottom at the depth of about 30 m..

Nishinoomote, Tanegashima southern part of Japan (June 1967,
no. 19691).

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Geographical distribution: Bikini Atoll, Rongerik Atoll, Guam, etc.

The present species shows some likeness to *Avrainvillea riukiensis* and *A. nigricans* in the external appearance. However, it is quite different from those two species on its structural filaments of the frond. As to the structural filaments of the frond the present species is thicker than that of *A. riukiensis*, and usually it does not have the clear moniliform filaments

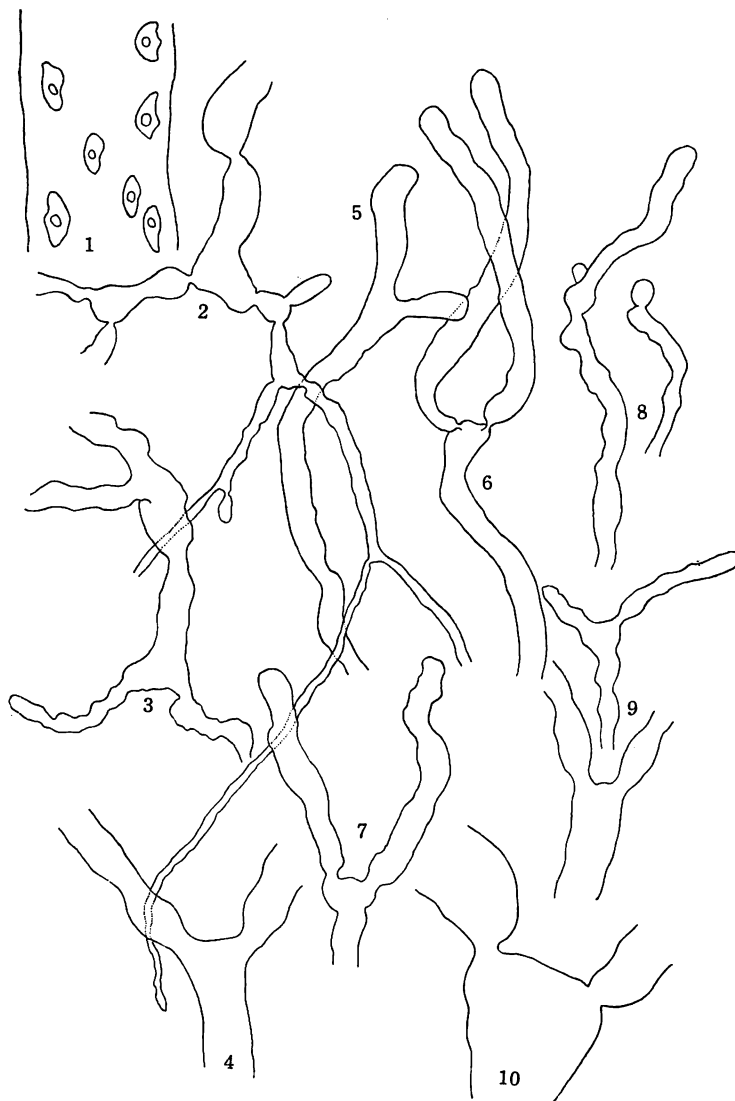


Fig. I. *Avrainvillea obscura* (AG.) J. AGARDH

1. chromatophores. $\times 720$.

2-4. filaments of the lower part of the flabellum. $\times 192$.

5-7. filaments of the upper part of the flabellum. $\times 192$.

8-10. filaments of the middle part of the flabellum. $\times 192$.

as it does in case of *A. nigricans*.

According to the descriptions of Taylor (1950: 68) on the specimens from the Bikini and northern Marshall Islands, the filaments of the frond of this species often reach $100\ \mu$ in diameter, whereas in our Japanese materials at hand the filaments never exceed $56\ \mu$ in diameter.

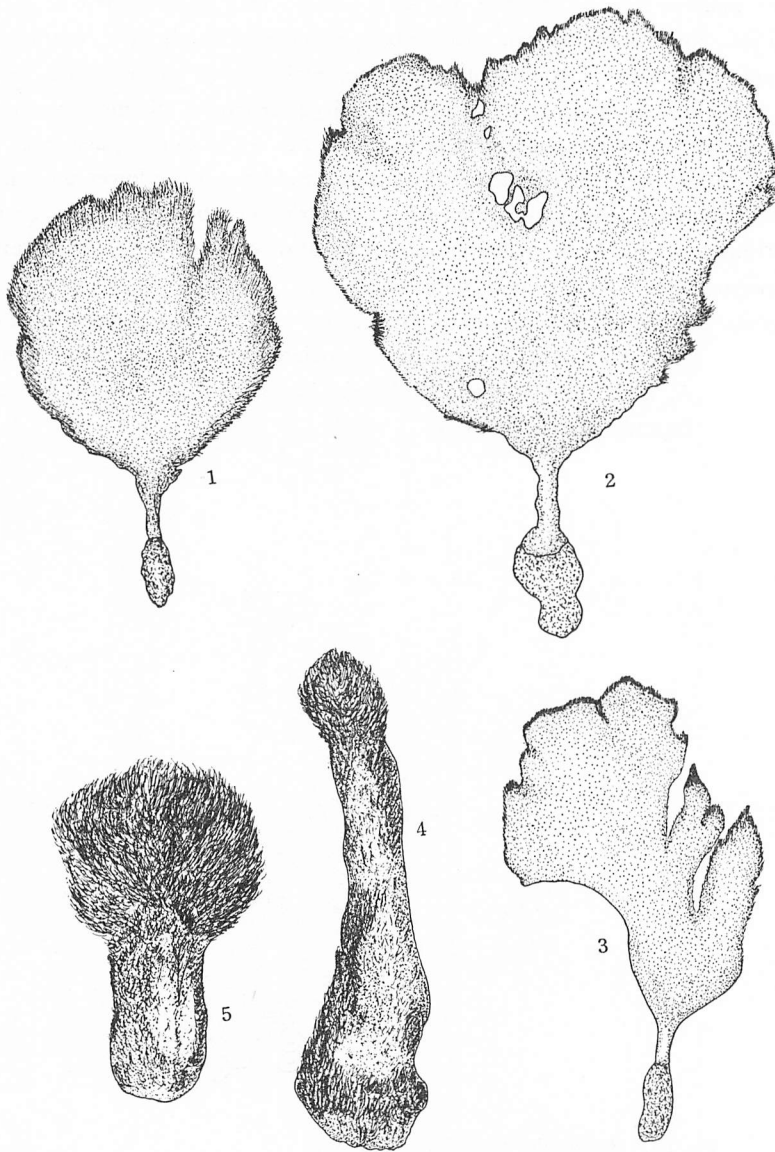


Fig. II. Plant habits. $\times 3/5$.

1-3. *Avrainvillea obscura* (AG.) J. AGARDH

4-5. *Avrainvillea capituliformis* TANAKA

Avrainvillea capituliformis TANAKA

Fig. II 4-5, Fig. III

Some Marine Algae from Batan and Camiguin Islands-I (1967) pp. 14-16, Figs. 2-3, Pl. I-B.

Plants solitary, to 11 cm. tall, dull green becoming pale green in drying, arising from a subterranean massive base of rhizoids and sand grains which may become to 3 cm. broad and to 9.5 cm. long; subterranean massive base cylindrical or slightly compressed, solid, compact; apical portion of the plant capitulate, globular or semispherical, to 4.5 cm. broad and to 4 cm. long, usually foliar portion hairy; structural filaments very smooth or rarely tortuous, slightly clavate and not tapering, the walls thin, upper-most structural filaments 75-100 μ in diameter, those belonging to middle and the lower-most portion are 33-88 μ in diameter, dichotomously branched, constrictions above the forks, strongly constricted; chromatophores with one pyrenoid, spherical or oblong, 6-(9) μ in diameter.

Japanese name: Umi kinoko (nom. nov.)

Habitat: Yoron Island, Southern Japan. Growing on muddy bottom at the depth of about 1.5 m. in the lagoon associated with *Avrainvillea erecta* (BERKL.) A. et E. S. GEPP and *Halimeda incrassata* LAMOUROUX f. *lamourouxii* BARTON. (Aug. 1967, no. 19692).

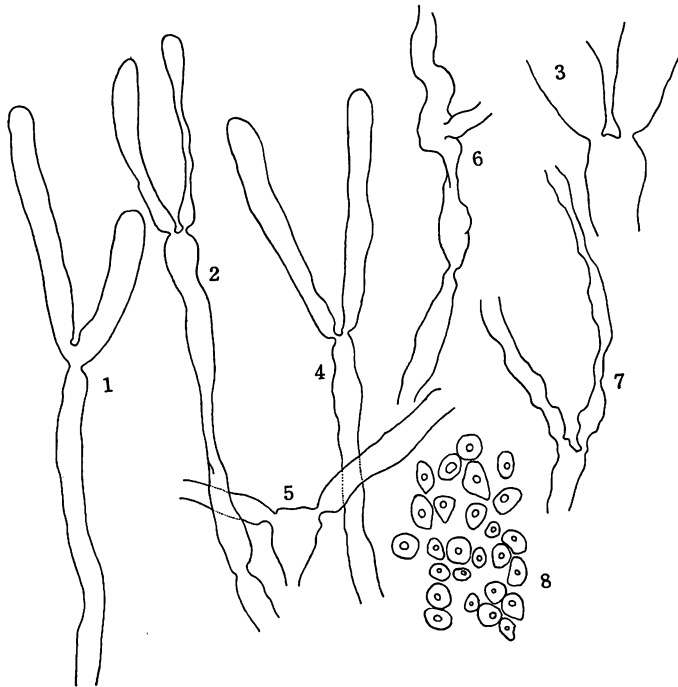


Fig. III. *Avrainvillea capituliformis* TANAKA

- 1-3. filaments of the upper part of the flabellum. $\times 192$.
 4-5. filaments of the middle part of the flabellum. $\times 192$.
 6-7. filaments of the lower part of the flabellum. $\times 192$.
 8. chromatophores. $\times 720$.

Geographical distribution: Only known from San Pio Quinto, Camiguin Island, Philippines.

In the external feature, our southern Japanese specimens agree quite well with the specimens from Camiguin Island. But between these two specimens from the Japan and the Philippines a slight difference can be seen on some vegetative characteristics. In the Philippine materials of *A. capituliformis*, the structural filaments of the upper portion are usually much more constricted, the color of the plants being brownish yellow. While the structural filaments of the Japanese specimens are usually smooth and rarely constricted at the internode of the upper portion, and the diameter of the structural filaments of the present specimens are a little broader than that of the Philippine materials, measuring about 88–100 μ in diameter, while in Philippine specimens it measure about 70–80 μ in diameter (Tanaka 1967: 14). The color of the present southern Japanese specimens are yellowish-green, the body of the plant being a little stouter.

The appearance of the present plants which are terminated in a capitular tuft of free dichotomously branched filaments generally constricted above the forks, reminds us of the species of genus *Penicillus*, but the fact that the present species is entirely uncalcified immediately makes us regard the present species as belonging to the genus *Avrainvillea*.

The structural filaments of the present species are similar to those of *Avrainvillea erecta*, but it differs from the latter by having rather broader filaments. In *A. erecta* the structural filaments measure about 30–60 μ in diameter (Okamura 1936: 110).

Among the genus *Avrainvillea*, three species, *A. rawsonii* HOWE, *A. ridleyi* A. & E. S. GEPP and *A. amadelpa* A. & E. S. GEPP, have been reported to be gregarious having no flabelliform frond.

The present plants are characterized by its having the capitulate and mashroom like external features and solitary growing habit.

The analytical key to the six species of *Avrainvillea* including two forma from the Japanese Islands and its adjacent waters is as in the following:

1. Frond apex terminating in a capitular tuft *A. capituliformis*
1. Frond apex terminating in a compressed flabellate plane blade 2
2. Filaments of flabellum distinctly moniliform *A. nigricans*
2. Filaments of flabellum cylindric 3
3. Filaments of flabellum grow gradually thicker toward the apex *A. riukiensis*
3. Filaments of flabellum tapering *A. lacerata*
 plants stiped, digitate *f. typica*
 plants almost sessile, not digitate *f. robustior*
3. Filaments of flabellum not growing thicker nor tapering toward the apex 4
4. Plants with long stipe *A. obscura*
4. Plants with short stipe or sessile *A. erecta*

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— 摘 要 —

日本南海産ハウチワ属2種について

田 中 剛 ・ 糸 野 洋

現在までに日本産ハウチワ属には6種が報告されておる。筆者等は近年南西諸島に於ける海藻フロラの調査、採集を行ってきたが、これら採集標本の中にハウチワ属に所属する2種の植物を見出す事が出来た。これら2種の植物はマルバハウチワ(新称) *Avrainvillea obscura*, ウミキノコ(新称) *Avrainvillea capituliformis* でいずれも日本新産種である。

本稿ではこれら2種の植物について報告すると共に、日本産ハウチワ属の種の検索表を附記した。

マルバハウチワ: 本種は種子島西表港沖合水深30mの砂地に生育していたもので、外見はテングノハウチワ、クロハウチワに酷似するが体糸の形状、太さ等によって簡単に区別できる。本種は太平洋ではビキニ環礁、グアム島等から報告されている。

ウミキノコ: 本種は筆者の1人によってすでにフィリピン、カミグイン島より新種として報告されたものである。本種は外見上キノコ状を呈する特異な形状の植物で、一見 *Penicillus* 属のある種を思わせるが、体糸が石灰を全く被らない事によって *Penicillus* 属とは区別できる。

ハウチワ属のうち現在までに3種の植物が扇状葉状部を持たないものとして報告されているが、本種はキノコ状の外部形態を呈している事によってこれら3種の植物とは区別できる。採集地は与論島茶花湾奥部の水深1.5m附近の砂泥地で、コテングノハウチワ、ミツデサボテングサと共に生育していた。