The Japanese Seaweed, Tosaka Nori

Author(s): A. D. Cotton

Source: *Bulletin of Miscellaneous Information (Royal Botanic Gardens, Kew)*, Vol. 1914, No. 6 (1914), pp. 219-222

Published by: Springer on behalf of Royal Botanic Gardens, Kew

Stable URL: <http://www.jstor.org/stable/4119505>

Accessed: 27-06-2016 10:01 UTC

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at
<http://about.jstor.org/terms>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.

Royal Botanic Gardens, Kew, Springer are collaborating with JSTOR to digitize, preserve and extend access to *Bulletin of Miscellaneous Information (Royal Botanic Gardens, Kew)*

The earlier of these specimens were originally named *Tabebuia pentaphylla*, Hemsl., but the identity of the wood had been regarded as doubtful for some years past.

Wiesner* gives a description of the structure of a West Indian Boxwood, which appears to be the same as the one described here, and therefore the wood of a species of *Casearia*. He, however, gives the botanical name of the tree yielding the wood as *Aspidosperma Vargasii*, DC. on the authority of A. Ernst,† who mentions that the wood is called “Amarilla yema de huevo”‡ in Venezuela. Ernst also refers to the export of the wood from Puerto Cabello to Hamburg, and gives figures showing that the export was considerable in 1878. Wiesner mentions that the wood is used for making shuttles, combs, sticks and measures, but states that it is less suitable for wood-engraving.

Useful wood is yielded by other species of *Casearia*, and in the case of *C. tomentosa*, Roxb. the wood is employed for making combs.§ A specimen in the museum at Kew shows that the grain of this wood is not so close as in West Indian Boxwood, but it is quite possible that there may be two or more species of *Casearia* in America yielding woods that are practically indistinguishable. For the present, however, it may be assumed that the different specimens of West Indian or Venezuelan Boxwood referred to above belong to the same species.

XXXIX.—THE JAPANESE SEAWEED, TOSAKA NORI.

A. D. COTTON.

Some years ago Mr. E. M. Holmes presented to the Herbarium some specimens of an edible Japanese alga which he had received from the late Mr. E. C. C. Stanford. The plant is much esteemed in Japan where it is known as *Tosaka nori* (= Cock's-comb seaweed). The structure of the thallus and cystocarp was plainly that of *Eucheuma*, though the outline of the frond agreed with none of the described species of that genus. Being apparently common in Japan, it was improbable that it had never been named, hence, pending further inquiry, the plant was laid in the Herbarium as *Eucheuma* sp. Mr. Holmes also had been unable to place it under any described species.

Identification and Description.—On the occasion of Professor Yendo's visit to England last winter, the opportunity was taken to ask his opinion. Dr. Yendo's knowledge of the algae of the East is unrivalled, not only from the fact that he has for many years made an exceptionally careful study of the algal vegetation of Japan, but also from the circumstance that he had just com-

* Wiesner, *Die Rohstoffe des Pflanzenreiches*, vol. 2, p. 999.

† A. Ernst, *Bot. Centralblatt*, 1 Jahrg. (1880), p. 59.

‡ The name refers to the colour of the wood, which is supposed to resemble that of the yolk of an egg.

§ Watt, *Dict. Econom. Prod. of India*.

pleted a two years' tour of the principal herbaria of Europe in order to examine the specimens on which the Japanese species had been founded or recorded. "Tosaka" was familiar enough to Prof. Yendo, who stated that its scientific identity had never been effected in Japan, but that in his "Text Book of Marine Botany" he had provisionally and doubtfully referred the plant to *Meristotheca papulosa*, though it differed materially from the description of that species. During his stay in Europe he had found specimens of the plant in question in many herbaria, and under various names. The examination, however, of the co-types at Dublin and Lund did much to remove the doubt expressed in his text-book, and on returning to the Continent in February, Dr. Yendo wrote that he had clinched the point by an examination of Montagne's original specimen in the Paris Museum. As this is now established, and as it is unlikely that any earlier specific name for the plant will be discovered, the new combination *Eucheuma papulosa* may be formed, the formal description of which is as follows:—

Eucheuma papulosa, Cotton et Yendo, comb. nov., *Callymenia papulosa*, Mont. Pugillus Alg. Yemens No. 21 (Ann. Sci. Nat. ser. 3. t. xiii, 1850, p. 246); J. Ag. Sp. ii. p. 293. *Euhymenia papulosa*, Kütz. Tab. Phyc. xvii. Tab. 73, fig. 2. *Meristotheca papulosa*, J. Ag., Bidrag Fl. Syst. p. 36, partim, excl. syn.; Yendo, Text-book of Marine Botany pp. 622-630, figs. 177 and 178.

Fronds springing from a discoid base, with a short stem soon expanding and dividing into many segments. Total height, 15-20 cm., very irregular in general outline but cordate or reniform when fully developed. Colour when fresh deep rosy brick red. Segments plane, thick and fleshy, 5-8 cm. long, 2-5 cm. wide, irregularly dichotomous: margins at first entire, later giving rise in a pectinate manner to copious proliferating branchlets. Antheridial and cystocarpic plants usually rugulose on the surface. Cystocarps sessile, globose, intermixed with short subulate processes, marginal, or in irregular clusters on surface. Antheridia similar in shape and in position to cystocarps but destitute of subulate outgrowths. Tetraspores scattered all over the frond, imbedded in the epidermal layer, zonately divided, small, $18-20 \times 9-10 \mu$.

Distribution.—Red Sea, Somaliland, Formosa, Japan, Guadeloupe (?), Sandwich Islands.

The external appearance of the plant is extremely variable according to the age and mode of branching. In the simpler forms the frond is flat, dividing into broad linear segments with wide axils; in the more complicated, the general aspect resembles that of *Halymenia formosa*. The surface of the principal segments of sexual plants is usually rugulose and the margin verrucose and irregular owing to the presence of reproductive bodies. The tetrasporic form has a smooth surface and is generally more copiously branched. In some specimens the frond is spotted with deep crimson flecks and in others it is homogeneously crimson red. The subulate processes amongst the cystocarps are characteristic of the species, though they occur also in a doubtful ally *E. Schrammii*, J. Ag.

History and Taxonomy.—The original specimen of *Callymenia papulosa* is represented in Montagne's Herbarium at Paris by a tetrasporic plant, but there are co-types at Dublin and Lund which possess cystocarps. It is fortunate that both forms of fruit are available, as it was only by means of these that the true position of the plant could be located. Dr. Yendo found that the structure of the frond and cystocarp of the Dublin specimen was clearly that of a *Eucheuma*. A difficulty, however, existed as to the tetraspores. In *Eucheuma* these are zonate. J. Agardh in 1872 removed *C. papulosa* to his genus *Meristotheca*, a genus which he expressly separates from other members of the *Solierieae* on the ground of cruciate tetraspores. He gave as a synonym *Halymenia ceylanica*, Harv. and *Callymenia exasperata*, Zan. J. Agardh's material at Lund was examined by Yendo, who reports that he had no doubt that the statement as to the tetraspores was not based on an authentic specimen, but on some other species. Nine specimens so named exist in the Agardhian Herbarium, and they comprise at least three species. In any case, the possession of cruciate tetraspores is negated by the fact that in the type specimen at Paris the sporangia are zonate. Montagne's species is thus shown to be a typical *Eucheuma*, and from wide experience of the Japanese Tosaka, both in the field and in herbarium, Yendo has no hesitation in referring it to that species. It may be added that specimens from Japan sent by Tanaka to Grunow (now in the herbarium of the Botanical Museum at Berlin) were identified by the latter as *Meristotheca papulosa*, but this fact was never communicated to Japanese algologists.

The subsequent history in the literature of Montagne's plant may be briefly stated. Heydrich, in his paper on New Guinea Algae (Ber. Deut. Bot. Ges. x. p. 477, 1892), takes up Harvey's *Halymenia ceylanica* (Kütz. Tab. Phyc. xvi. Tab. 97) and formed the combination *Sebdenia ceylanica*, Heydr. Under this he places *Meristotheca papulosa* (Mont.) J. Ag., as a synonym, a position in which it unfortunately finds itself in De Toni's *Sylloge Algarum*. Without re-investigation, which in so vast a work was impossible, it was only natural for De Toni to leave the plant where Heydrich placed it, but it is needless to say that as a *Eucheuma* it has been practically buried. Harvey's *Halymenia ceylanica* is itself a problem, and is probably a composite gathering, but there is no evidence that it is allied to *Eucheuma*.

The following extracts compiled from Prof. Yendo's note-book are worth recording:—

"During my stay in Europe I found the plant treated in a puzzling way and under many diverse names. In addition to finding specimens named *Meristotheca papulosa*, I discovered specimens under:—

<i>Sarcodia Klenzeana</i> (Kütz.) Kjellm.	Hb. St. Petersburg.
det. Kjellman.
<i>Callymenia dentata</i> , Kütz.	Hb. Imp. Mus. Tokyo.
det. Grunow.
<i>Acanthymenia Harveyana</i> , J. Ag.	Hb. Bot. Mus. Lund.
Sandwich specimen only.
det. J. Agardh.

Eucheuma Schrammii, J. Ag.

Hb. Bot. Mus. Lund.

Guadeloupe specimen
only. det. J. Agardh.

“The following other more or less doubtful references to the plant occur in the literature or herbaria. A name *Tosakanoria japonica* is mentioned in a list of Japanese plants compiled by K. Saida (1910) without description, but with little doubt proposed for this same plant. Being a *nomen nudum*, however, it is not valid. The alga distributed by Collins, Setchell and Holdens in Phyc. Bor. Amer. No. 745 under *Eucheuma echinocarpum*, Aresch. has some resemblance to Tosaka, but it differs in several particulars. It should be further noted that in the copies of Phyc. Bor. Amer., which I have seen, the Florida plant is distinct from the original *E. echinocarpum* of Areschoug. The alga hinted at as gen.? sp.? in Okamura's Nippon Sorui Mei-i (Enumeration of the Algae of Japan, 1902) certainly refers to our Tosaka. The nearest ally is *Eucheuma Schrammii*, J. Ag., which was originally distributed by Mazé as *Mychodea Schrammii*, Orn. I have examined specimens at Kew, Dublin and Lund, all of which are fragmentary, and though they agree in possessing horned cystocarps it is impossible to say from the specimens whether or not they are identical with *E. papulosa*. The colour and texture do not support such a view.”

Habitat and Economic Importance.—The following notes have also been supplied by Prof. Yendo. Tosaka is often collected by divers in a depth of 10–12 fathoms in open coasts in the middle and southern part of the country. Large quantities of the plant are, however, obtained by picking up the floating fronds with scoop-nets after rough weather in early spring. It is found on the Pacific side of Japan up to about 36° N., and is supposed to grow in much deeper water than the above-mentioned depth.

The collected weed is dried in the sun and sold in the markets, where several varieties, according to the colour, substance and shape, are distinguished by dealers. It is prepared into isinglass and is used as food. A certain amount is also exported annually to China where the plant is known as Hong-tsay (crimson-weed).

XL.—THE RINGING OF TREES.

L. A. BOODLE.

The injuries sometimes inflicted on trees by squirrels were described a few years ago in the case of young trees of *Thuja* and *Cupressus*, specimens of which had been sent to Kew by Mr. R. B. Rogers, of Hexworthy, Launceston, Cornwall.* The immediate injury is to the bark,† which is stripped off the trunk in places, sometimes on one side, sometimes all round. That is, in the latter case the stem is completely ringed, and an experiment

* A. W. Hill, Conifers damaged by squirrels. New Phytologist, vol. 10, pp. 340–342, Pl. 7.

† The word “bark” is used here for convenience in the vernacular sense to include all the tissues outside the wood (or outside the cambium).