

# NEW FORMS OF LITHOTHAMNIA

BY

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Lithothamnion erubescens Fosl.

New or crit. calc. Alg. p. 9.

f. *madagascarensis* Fosl. msr.

Branches less regular and the cells frequently shorter than in the typical form (f. *americana*).

Judging from a solitary specimen received for examination from Museum d'histoire naturelle in Paris (Mr. P. Hariot) the present form, collected on the coast of Madagascar, seems to be referrible to the above species. I should be inclined to consider it a separate species, but as in several respects closely related to the said one, which appears to be somewhat varying both in habit and structure, I for the present refer it to this.

The plant has been fastened to some hard object, forming a somewhat irregular mass approaching a subhemispheric shape, about 5 cm. long, 3.5 cm. broad and 1.5 cm. thick in the thickest part. The branches are densely crowded, fastigate, but less regularly divided than in f. *americana*, and slightly thicker. The conceptacles of sporangia almost fully resemble those in the said form, 300–350 or up to 400  $\mu$  in diameter seen from above.

A longitudinal section of a branch does not show so regularly cup-shaped layers of tissue as in f. *americana*. The cells in f. *haingsisiana* are sometimes a little longer than in f. *americana*, while in f. *madagascarensis* they are frequently shorter than in the latter, in this respect however approaching a specimen from Bermuda mentioned in New. Melob. p. 3. They are 10–20  $\mu$  long, frequently 12–15, and often with thicker walls than in f. *americana* as well as f. *haingsisiana*.

It seems as if this form also occurs on the coast of Japan. Some fragments from Hinga, collected by Mr. K. Yendo (no. 785)



are very nearly related to *f. madagascarensis*. They are however young and small, only about 1 cm. in diameter, with simple or scantily divided branches. The conceptacles are of about the same size as in the latter, though not distinctly marked. With reference to structure the cells are more irregular than in any of the other forms, often smaller, and the conceptacles more frequently become overgrown by new formed tissue, while in the other forms and especially *f. americana* and *f. haingsisiana* the whole roof often falls away and the conceptacles not so regularly become overgrown. Therefore, it cannot be decided with certainty whether identic before older and well developed specimens are known.

*Lithothamnion nitidum* Fosl. msr.

Thallus forming irregular crusts loosely clinging to the substratum, 3—5 cm. in diameter and 300—700  $\mu$  thick, with irregular and somewhat knotty surface. Conceptacles of sporangia immersed or subimmersed, convex or subhemispheric, 800—1000  $\mu$  in diameter seen from above, deeply depressed in the central part and here traversed by 40—50 muciferous canals. Conceptacles of cystocarps very low conical, 700—900  $\mu$  in diameter.

The plant clings loosely to the root of other algæ, here and there attached, or surrounding small parts of the substratum, with the margin most often free and bent more or less downwards. According to the solitary specimen seen, the crust does not become much extended, probably however depending on the substratum, with a thickness of up to about 700  $\mu$ . The surface is rather irregular, wavy and knotty, here and there furnished with wartlike or small branchlike excrescences. It is somewhat shining, and in the lower part occasionally zonate.

In structure the species stands near to *Lithothamnion Muelleri*, the perithallic layer however apparently more vigorously developed. The cells of the said layer partly are almost square or rounded, about 4—5  $\mu$  in diameter, partly and more frequently vertically elongated, 7—12  $\mu$  long and 4—7  $\mu$  broad.

The conceptacles of sporangia are frequently rather crowded in some parts of the frond, immersed or subimmersed, seen from

the surface convex or subhemispherical, 800—1000  $\mu$  in diameter, sometimes and especially before fully developed scarcely raised above the surface of the frond. They are partly distinctly marked partly not, and deeply depressed in the central part. This depression always being distinctly marked has a diameter of 150—200  $\mu$ . The bottom of the latter forms a part of the roof and is intersected with about 40—50 rather coarse muciferous canals. The depression arises thereby, that the corresponding part of the conceptacle gets dissolved. Therefore, before the said part being dissolved the conceptacle rather resemble that of cystocarps in *Lithothamnion Muelleri*. The sporangia are four-parted, 140—180  $\mu$  long and 60—90  $\mu$  broad, frequently with enduring interwalls.

The conceptacles of cystocarps are to be found in the same individual as those of sporangia, but in far less number. They are subimmersed or immersed, very low conical and 700—900  $\mu$  in diameter seen from above. In a median vertical section they are oblong-lanceolate.

The species stands near to certain forms of *Lithothamnion Muelleri*, and especially that form of the latter which sticks to the root of other algæ. However, it distinguishes itself from that species especially with reference to the reproductive organs. The said organs are more superficial in any form of *Lithothamnion Muelleri*. In the latter the conceptacles of sporangia sometimes are depressed in the central part and then somewhat approaching those in the present species, though in that case always more superficial and more distinctly marked in *L. Muelleri*. Besides the conceptacles of cystocarps differ much from those in the said species.

This species is only known from Japan, found at Misaki on the Pacific coast and provided with reproductive organs in August. K. Yendo, no. 784.

*Lithophyllum tumidulum* Fosl. mscr.

Thallus forming 300—800  $\mu$  thick crusts, surrounding the branches of *Gelidium* and often angulate. Perithallic cells frequently elongated. Conceptacles of sporangia immersed.

The plant surrounds especially the upper part of the branches



of the host, and forms partly smooth partly a little uneven crusts which often are angulate. It attains a thickness of up to about 800  $\mu$ . The basal cells are vertically elongated, straight or somewhat oblique, 18—30  $\mu$  long and about 9  $\mu$  broad. The upper ones partly are square or almost square, about 10  $\mu$  in diameter partly and most frequently vertically elongated, 15—30 or up to about 40  $\mu$  long and 7—12  $\mu$  broad.

The conceptacles of sporangia are immersed. A part of the roof is at first slightly raised above the surface of the frond but afterwards it becomes decorticated. In a median vertical section the conceptacles are about 200—250  $\mu$  in diameter by a height of about 125  $\mu$ . They at length become overgrown in rather great numbers.

At first I considered this species to be a form of *Lithophyllum amplexifrons*, supposing that the structure of the latter would show to be rather varying such as in several other crustlike species, especially since parts of the thallus sometimes show almost exactly the same structure in both species. However, after having examined the structure of the type specimen it appears, that they must be considered specifically distinct from one another. Thus in *L. amplexifrons* the basal cells are shorter and almost horizontally creeping over the substratum, two or three layers forming a hypothallus which sends forth perithallic rows. The cells of the latter partly are square or rounded, 7—13  $\mu$  in diameter, partly up to about 20  $\mu$  long, or  $1\frac{1}{2}$ —2, occasionally  $2\frac{1}{2}$  times longer than broad. The type specimen also was growing on *Gelidium* and has been taken on the coast of Port Natal. Cp. Harvey, Ner. Austr. p. 111. However, the species is rather widely dispersed and sticks to divers other algæ. A specimen from Tasmania shows even a little smaller cells than in the type.

*L. tumidulum* also somewhat approaches quite young specimens of *L. Carpophylli*.

The species is hitherto only known from the Pacific coast of middle Japan, Shimoda (Prov. of Izu), where it has been found by Mr. K. Yendo.