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XXXIII.—On the genera Spirulina and Coleochæte

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costa; the outer margin is ochraceous brown, bordered internally with black, externally with a bright silvery line, and marked towards the apex between the nervules with three or more silvery vittæ. Posterior wings ochraceous brown, margined externally by a silvery line; a vitta in the cell, commencing above it at the base of the subcostal nervure, a very slight one above the first subcostal nervule, a long slender one below it, followed by four very distinct ones in the interstices between the nervules, a longer one extending to the base between the median and radial nervures, and a similar one between the latter and the abdominal margin bright silvery white, all except the two first-mentioned connected with the marginal line. Cilia of the anterior wings rufescent, darkest towards the anal angle; of the posterior ochraceous brown.

Head brown; antennæ brown above, white below; palpi light brown.

Thorax clothed with long brown hair; legs very pale brown.

Abdomen black above, very pale brown below.

The female is smaller, much paler in colour; the outer margin of all the wings above, and of the anterior below, very pale brown; the apex of the anterior marked above with two silvery vittæ, their discoidal cell on both sides and that of the posterior above with a fulvous vitta.

In the collection of the British Museum, Mr. W. W. Saunders, &c.

The only specimens of this insect which I have seen were obtained by P. Earl, Esq., who discovered them on a plain in the southern island of New Zealand. The specific name was suggested to me by Dr. Boisduval, who agreed with me in the opinion that it was one of the most, if not the most, interesting species of the family yet known. At present it is the only one from New Zealand.

XXXIII.—On the Genera *Spirulina* and *Coleochæte*. By JOHN RALFS, Esq., M.R.C.S., Penzance*.

[With a Plate.]

SPIRULINA, Turpin (*Kütz.*).

Filaments collected into a mucous film-like stratum, simple, spiral, oscillating, "inarticulate."—*Kütz. Phycologia Generalis*, p. 182.

Spirulina has its filaments interwoven into a thin stratum of

* Read before the Botanical Society of Edinburgh, Dec. 12th, 1844, and Jan. 9th, 1845.

no determinate form, and by the naked eye cannot be distinguished from *Oscillatoria*, to which indeed it is nearly allied, as its filaments are in like manner simple, oscillating and radiating. Kützing describes them as inarticulate, and I have failed to detect any joints or striæ; but as I have also been unable to perceive any granular matter, the apparent absence of striæ may probably depend upon the extreme fineness of the filaments.

The close and regular spires formed by the filament are very remarkable, and constitute, I believe, the only certain distinctive mark between *Spirulina* and *Oscillatoria*.

1. *S. tenuissima*, Kütz. "Stratum very lubricous, æruginose, sub-radiant; filaments densely spiral, very slender, parallel, flexuose." Kütz. Alg. xiv. no. 131!; Phycol. Gener. p. 183.

On decaying algæ in a brackish pool near the Menai Bridge, Anglesea. On sticks in brackish pools at Penman Pool near Dolgelly.

It forms at first a thin pellicle of a rich green colour, but in an advanced state becomes somewhat skin-like and tinged with brown; filaments shortly radiate.

Under the microscope the filaments are extremely slender, of a pale bluish green colour, elongated, straight when free, equal, not attenuated at the extremities, vividly oscillating. Spires very close, like the volutions of some shells, broader than long. There is no appearance of granular matter, and the filaments are so fine that I cannot ascertain whether they are jointed.

The oscillations of this plant are more vivid than those of any species of *Oscillatoria* I have examined.

When I first gathered this plant in 1841, I suspected, notwithstanding its different colour, that it might be the *Oscillatoria spiralis* of Capt. Carmichael; but having communicated a specimen to the Rev. M. J. Berkeley, he informed me of its real name, and sent me a specimen of Carmichael's plant, which is a true *Oscillatoria*, and cannot belong to this genus, as the filaments, in the dried state at least, though somewhat distorted, are not regularly spiral.

Through the kindness of Mr. Borrer I have been able to compare our plant with the specimen in Kützing's 'Alg. Aq. Dul.,' and am satisfied of their identity, although his specimens were gathered in fresh water, and I have always found mine in brackish pools.

PLATE X. fig. 1. *Spirulina tenuissima*.

COLEOCHÆTE, Bréb.

Fronds minute, parasitic, green, disciform, appressed, composed

of series of cells radiating from a centre and connected together by a hyaline substance; spores imbedded in the frond*.

1. *C. scutata*, Bréb. Cells having on their upper surface a cylindrical truncate sheath, from which a bristle at length protrudes. Bréb. Ann. d. Sc. Nat. série 3. vol. i. p. 29. tab. 2.

In ponds, parasitic on aquatic plants, especially on the under surface of the leaves of *Potamogeton natans* and *Nymphaea alba* when verging to decay. Victoria Park, Manchester, and in Windermere, Mr. Sidebotham; Aberdeen, Dr. Dickie; Henfield and near Tunbridge Wells, Sussex, Mr. Jenner; near Fleetwood, Mr. J. S. Ashworth; near Bristol, Mr. Thwaites; ponds at Singleton and Sketty near Swansea, Mr. Moggridge; also abundant in Cromlyn Bogs near the same town. In several stations near Penzance and Dolgelly.

This parasite, I suspect, is not uncommon, but from its minuteness it is difficult to detect, especially when growing on leaves which still remain slightly green. It was first gathered in this country by Mr. Sidebotham, who kindly sent me specimens exceedingly well-mounted.

The very minute fronds, which to the naked eye seem mere specks, are under the microscope found to consist of many series of cells radiating from a centre and connected together by a colourless substance, which is best seen at the margin. Each series of cells is repeatedly dichotomous; the cells are longer than broad and truncate, the four or five central ones somewhat irregular, the others of equal length, forming concentric circles. These circles vary from five to twenty in number. Endochrome green, and usually contracted into a central spot in each cell.

After some time a cylindrical, colourless process appears on the upper surface of each cell; it is directed outwards and is truncate at the extremity; within it a bristle becomes visible, gradually protrudes, and finally becomes much elongated. The bristle sometimes contains pale granular matter, when it may be traced even before it issues from the tube. Before the protrusion of the bristle the sheath is always truncate, as if open at the end, but afterwards it is sometimes conical, as if a membrane was pushed out and then perforated.

Although the fronds are closely appressed, if care be used they may generally be separated by a penknife from the leaf on which they grow. The margin of the frond is well-defined; in young plants it is usually circular, but in the larger specimens often slightly lobed.

The spores, which are imbedded in the frond, are suborbicular

* "Frons disciformis, adpressa filamentis e centro radiantibus sæpius coadunatis; formata filamenta articulata dichotomo-ramosa e dorso articulo-rum vaginas cylindricas, truncatas longe setigeras passim prodeunt. Endochromas viride."—Bréb. Ann. d. Sc. Nat. série 3. vol. i. p. 29.

and at first green, but finally brown; they are large compared with the size of the plant, and are arranged in a circle near the margin.

I am indebted to Dr. Dickie for determining the name of this plant, which I had supposed was one hitherto undescribed, and also for a specimen gathered at Falaise which he had received from M. Lenormand.

Having sent a British specimen to Professor Kützing, he informed me, that as far as he could determine from the dried specimen, it is his *Phylactidium pulchellum*; but although he considers it distinct from *Coleochaete scutata*, which he has also gathered in Prussia, I believe that he has only described its young state as *Phylactidium pulchellum*, for his figure well represents our plant before the appearance of bristles; and as it is undoubtedly Brébisson's plant, I have retained the present name*.

PLATE X. fig. 2. *Coleochaete scutata*: b, portion of a frond in fructification; c, portion magnified to show the processes.

XXXIV.—*Notice of a new genus and several new species of Nudibranchiate Mollusca*. By JOSHUA ALDER and ALBANY HANCOCK, Esqrs.

Genus EUMENIS.

BODY elongated, quadrilateral; head subinferior, with corneous jaws; veil very small or none. Tentacles two, dorsal, clavate and laminated, with sheaths. Branchiæ papillose, set on a waved pallial expansion down the sides of the back. Foot linear. Orifices of the generative organs and of the anus? on the right side.

Eumenis marmorata. Body nearly linear, tapering to an obtuse point behind; olive-brown, streaked and spotted with dark chocolate-brown and white. Head with a few tubercular processes in front. Tentacles clavate, broadly laminated on the upper part and truncated at the apex; lower part plain, inclosed in small and rather tight sheaths. The sides of the body are produced into a pallial expansion, which undulates into three or four lobes, the margin set with irregular papillose branchiæ of a fawn-colour with pale edges. Interrupted dark brown markings run down the centre of the back, streaked and spotted on each side with brown and white. The sides of the body below the margin of the cloak are also streaked with interrupted lines of dark brown

* "*Phylactidium*, Kütz. *Phylloma minutum*, monostromaticum, orbiculare, s. flabellatum conjuncta constituentibus compositum. Spermatia ignota." —Kütz. *Phycologia Generalis*, p. 294.

"1. *P. pulchellum*, Kütz. Orbiculare, amœne viride; cellulis cælogonimicis, demum transverse zonatis, centro globulo gonimico majori notatis." —Kütz. *l. c.* p. 295. t. 16. f. 11.