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XLVI.—Observations on a new Group, Genus and Subgenus, of Freshwater Confervæ, with descriptions of Species mostly new

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Like that species, the sporidia have a gelatinous coat, but surrounding only one side, like an arillus. This is sometimes contracted at the sides, so that a portion of it projects at either end of the sporidium, forming a little transparent appendage. It is probable that in an earlier stage of growth the coat entirely surrounded the sporidium.

PLATE XII. fig. 18. *Sphæria thyrsus*, nat. size; *a*, ostiola and perithecia; *b*, ascus with its sporidia; *c*, sporidium with its gelatinous appendage. All more or less magnified.

47. *Sphæria ianthino-velutina*, Mont.

Clavaria fusca, Swartz! Prod., is referable to this or some closely allied species. The specimens are very imperfect, and without fruit.

48. *Sphæria escharoidea*, n. s. Suberosa simplex clavula cylindrica apiculata ex ostioliis conicis prominulis scabra, pallida; stipite elongato, cylindrico, radicato. "*Clavaria pistillaris?* membrana escharoidea tecta. Fl. Zeyl." König in Herb. Mus. Brit.

Ceylon, Dr. König. Herb. Mus. Brit.

Whole plant about 3 inches high, rooting deeply; root nearly equal, flexuous, uneven, nodulose, about $\frac{3}{4}$ of a line thick; stem 1 inch high, cylindrical, equal, slightly thickened at the base, about $\frac{1}{3}$ rd of a line thick, black, washed with a dull white coat, minutely striate or wrinkled, quite smooth; head cylindrical, equal, nearly an inch high, obtuse at either end, tipped with a sharp apiculus, pallid, rough, with the conical prominent ostiola of the small perithecia. Sporidia not yet developed.

A very distinct species, which can scarcely be confounded with any described by authors. The head resembles the spike of a *Peperomia*.

PLATE XII. fig. 19. *Sphæria escharoidea*, nat. size.

49. *Sph. ædipus*, Mont. Jamaica. Herb. Mus. Brit.

XLVI.—*Observations on a new Group, Genus and Subgenus, of Freshwater Conservee, with descriptions of Species mostly new.* By ARTHUR HILL HASSALL, Esq., M.R.C.S.L. Corresponding Member of the Dublin Natural History Society.

[Concluded from p. 341.]

It now becomes necessary that I should make a few brief remarks upon the classifications of the younger Agardh and M. J. Decaisne, but only in so far as these have reference to the group *Vesiculaspermae*.

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M. Agardh divides the Algæ into two classes, of one only of which we have at present to speak, viz. the Zoospores, which are made by Agardh to embrace the following orders: *Nostochinæ*, *Oscillatoria*, *Confervæ*, *Conjugatæ*, *Ectocarpæ*, *Ulvaceæ*, and *Siphonaceæ*. It is thus characterized:

“Materia granulosa interna uniuscujusque loculi (cellulæ articuli vel tubi) frondem constituentis tandem in fructificationem abeunte; sporidiis maturitate motu præditis et singulis loculis per porum unicum egredientibus, demum, per extensionem evolutis. Viridescentes incolæ præcipue aquæ dulcis marisque minus salsi, in scrobiculis sinubusque, rarissime in aperto vel profundiori mari.”

From this most extensive class as constituted by Agardh, in which the most diverse productions are evidently embraced, M. J. Decaisne, as already noticed, has removed the *Conjugatæ* of Vaucher, and raised them into a distinct group under the name of Synspores, doubtless on very sufficient grounds; and I have contented myself with subtracting the true freshwater *Confervæ*, concerning the reproduction of which such erroneous notions are entertained both by Agardh and M. J. Decaisne; the opinion of the latter differing only from that of the former in the disbelief of the motion of the zoospores, I feel at the same time assured that it ought to be reduced within still narrower limits. Although I am not disposed to go the length of questioning the existence of the motion of zoospores in all *Confervæ*, I yet feel confidence in doing so in reference to all freshwater *Confervæ* with simple filaments, whether belonging to the group of *Synsporeæ*, the *Vesiculasperma*, or the *Sphæropleæ*, excluding only *C. mucosa* and *C. punctata*.

Many other objections besides those already urged in the course of these remarks might be raised to Agardh's definition of the zoospores; but for the present I pass these by, reserving one or two observations, until we come to speak of the zoospores as limited by M. Decaisne.

M. Decaisne thus defines the zoospores, which he makes to embrace only the *Nostochinæ*, the true *Confervæ*, and the *Ulvaceæ*: “Ont la spore formée aux dépens de la matière verte qui s'organize à l'intérieur de chacun des articles ou utricules qui composent toute la plante; chacun de ces organes peut contenir une seule ou plusieurs spores.”

And again, M. Decaisne, in another part of his memoir, thus more particularly defines the true *Confervæ*, or *Vesiculasperma*: “Les Conferves proprement dites, dont les filaments n'offrent jamais le curieux phénomène de la conjugation, et chez lesquelles les spores sortent des tubes sous la forme de

vésicules extrêmement petites, ordinairement munies, au centre, d'un globule plus transparent, qui se colore soit en lilac, soit en brun, par l'action de l'iode."

From what has been said of the true *Confervæ*, it is evident that both of the above definitions are full of error, in so far as they have reference to the *Confervæ* proper. Thus I have shown that more than one spore is never contained in the same cell; that this spore is not formed, as described in the first definition, at the expense of the green matter, "qui s'organise à l'intérieur de CHACUN des articles ou utricules qui composent toute la plante," but from the concentration of the matter in two contiguous cells of the same filament: nor, as stated in the second, are they "extrêmement petites vésicules," but large elliptical spheroidal or ovate bodies of the same dimensions and structure as the similar bodies of the *Conjugatæ*.

I have shown, too, that the majority of the *Confervæ* with simple unbranched filaments are perpetuated by means of true spores and not zoospores, and that these spores are in all these cases formed in the same manner by the union and concentration of the contents of two cells, placed either, as in some but not all *Conjugatæ*, in two distinct filaments, or in the same filament, as in the *Vesiculaspermæ* and *Sphæropleæ*, a statement now for the first time promulgated, and upon the important conclusion from which, with reference to the animality of the *Confervæ* and *Spirogyræ* in particular, I have already dwelt.

The passage of the contents of one cell into the interior of a contiguous one has not hitherto, I believe, been witnessed by any observer. I was lately so fortunate as to notice the manner of this transference in one of the species of the genus *Vesiculifera*. It would appear not to be a momentary operation, but a continued action, being the result of a sustained attraction existing between the contents of the two cells, but most powerfully in that in which the seed is to be formed. This attraction occasions the separation, at intervals of some minutes, of three or four of the bright spherules, which, with a thick colourless fluid, compose the contents of the cells, which, when separated, immediately start into the seed-bearing cell, and unite with the material already there.

The tapering of the filaments alluded to in the definition of the genus requires a careful examination for its detection, and accounts satisfactorily for the variable size of the filaments in the same species; indeed, the more closely we study these productions the more satisfactory will be the investigation of them, and the fewer the number of the supposed anomalies.

The cause of the variation in the length of the joints has been explained by the discovery of the law which governs the development of the *Confervæ* generally; and here, again, observation affords a reason for the difference of diameter observable among the filaments of the species of this genus. The more simple the structure of any plant, the more simple and isolated will be the laws which preside over its æconomy, and the fewer consequently should be the abnormal conditions to which it is subject.

New Species.

Vesiculifera princeps. Filaments of considerable diameter; cells usually rather longer than broad; spores circular, lying in cells, which in the thickest part of the filaments are scarcely inflated, but are more so near their terminations.

The above species is to be referred without doubt to the *Prolifera composita* of Vaucher, which the elder Agardh considered merely to be a variety of his *Conferva capillaris*. It would appear, however, to be specifically distinct from the *Conferva* which I regard as the *C. capillaris* of Agardh.

I have conferred the name of *princeps* upon this species, less from the size of its filaments than from its great abundance, both in this country and on the continent. The generic and specific names of Vaucher are altogether inapplicable to the species, both conveying false impressions with respect to its reproduction; thus the specific term *composita* is derived from a branched parasite which Vaucher observed growing upon it, and which he erred in supposing to be the prolific offspring. The fact of the parent filament being *simple* and that of the parasite *branched*, ought to have saved Vaucher from this error.

There is a specimen of this species in the herbarium of Dr. Greville, from Caen, put up by M. Chauvin under the name of *C. capillaris*—var. *β. alternata*, Ag.

Vesiculifera condensata. Filaments of more considerable diameter than those of the preceding species; cells not so long as they are broad.

This species I conceive to be the *Conferva capillaris* of Agardh, whose name for it I have been obliged to change, inasmuch as it is very distinct from that which is probably the true *C. capillaris* of Linnaeus.

It is evidently a very rare species, for I have only met with one small specimen, procured I believe from the lake in the pleasure gardens at Kew.

Vesiculifera capillaris, Linnæus? Filaments of considerable diameter; cells varying in length from nearly twice to almost four times their diameter; spores large, circular, contained in distinct inflations of the cells of an evidently ovate form.

I am unable to quote a single synonym for this species with certainty; I am inclined, however, to refer to it the *Conferva tumidula* of 'English Botany*.'

Very abundant in ponds in the brick-fields near Notting Hill; it also occurs occasionally in the vicinity of Cheshunt.

Vesiculifera crassa. Filaments of very considerable diameter; cells usually about five times as long as broad; spores oval, generally solitary, but sometimes binary, contained in cells of a slightly oval form, the length of which exceeds the diameter about twice.

The only species near to which this approaches is *Vesiculifera Landsboroughi*, than which the filaments are thicker, and the inflated cells shorter and less marked.

In a fish-pond at Wood Green near Bury Green, vicinity of Cheshunt.

Vesiculifera Landsboroughi. Filaments of considerable diameter, but scarcely so large as those of the preceding species; cells at the period of fructification about five or six times as long as broad; spores oval, contained in inflated cells of an elongated but not regularly oval form; these occur usually single at intervals of three or four cells, but sometimes two are juxtaposed.

I have much pleasure in dedicating this one of the finest species of the genus to the Rev. David Landsborough, by whom the merit of its discovery is shared equally with myself, as an expression of my warm admiration of the devotion displayed by that gentleman to the cause of natural science.

I have met with this species but sparingly myself, but have received excellent specimens of it in a state of reproduction from Mr. Landsborough, who aptly compares the form of the spore-bearing cells to that of the "soldering of lead pipes."

Vicinity of Cheshunt; very rare.—A. H. H. In an old coal-pit near Stevenston, Ayrshire; abundant.—Rev. D. Landsborough†.

* I am led to suspect, from observations made subsequent to the writing of the above description, that *Vesiculifera princeps* is merely this species in a young condition; however, I am by no means certain of this.

† Under the name of *Conferva tumidula* a fine specimen of this species was sent me by Mr. Ralfs a few days since; but that *Conferva*, as already mentioned, I conceive ought to be referred to *Vesiculifera capillaris*, described above.

Vesiculifera prolongata. Filaments more slender than those of the preceding species; cells usually seven times as long as broad; spores oval, contained in inflated cells of an ovate form.

This species is known from *Vesiculifera Landsboroughi* by its finer filaments, longer cells, and ovate form of the spore-bearing inflated cells. I have twice met with it, once in a pond near Louton, and again near Enfield.

Vesiculifera lacustris. Filaments nearly equal in diameter to those of *Vesiculifera prolongata*; cells from three to five times as long as broad; spores oval, sometimes almost quadrangular, solitary, occasioning no very considerable enlargement of the cell in which it lies; empty cell next the spore also inflated.

Vesiculifera lacustris differs principally from *V. crassa* in the less diameter of its filaments, and in the presence of the inflated empty cell placed next to the spore.

In the New River Reservoir near Cheshunt, sparingly, and other places in the vicinity.

Vesiculifera paludina. Filaments of less considerable diameter than those of *Vesiculifera capillaris*; cells two and a half or three times as long as broad; spores at first circular, but subsequently becoming ovate, contained in distinctly inflated cells of an ovate form.

This species bears some resemblance to *Vesiculifera capillaris*, from which it is to be distinguished principally by its smaller size, and the form of the perfect spores.

It is very abundant, and is now (August) to be met with plentifully in fructification, in ponds in brick-fields near Notting Hill.

Vesiculifera pulchella. Filaments nearly equal in diameter to those of the preceding species; cells usually two and a half or three times as long as broad, but sometimes twice, and rarely four times as long as broad; spores circular, contained in much inflated cells, which are at first oval, then circular, and lastly somewhat hexagonal.

This is a very fine species, seeking usually rather pure water; it is of an intense and beautiful green colour. I have met with it several times both in the neighbourhoods of Cheshunt and Notting Hill.

Var. a. Filaments more slender than those of the preceding species; cells four times as long as broad; spores circular, contained in cells which are nearly of a spherical form.

I am inclined to regard this as a distinct species ; however, it is perhaps safer to consider it for the present, until it has again been met with in other localities, as a variety.

I received a fine specimen of it in fructification from that excellent observer Mr. Ralfs, by whom it was found near Penzance.

Vesiculifera cardiaca. Filaments about equal in diameter to those of the preceding species ; cells five or six times as long as broad ; spores circular, contained in much inflated cells, which may be compared to a heart in form.

I have only met with this very distinct species once, in a pond near Notting Hill. There is no other Conferva known to me wherewith it could be confounded.

Vesiculifera ovalis. Filaments more slender than in the preceding species ; cells five or six times as long as broad ; spores oval, contained in cells of a regularly oval form, and not filling the entire cavity of the cells.

The above species approaches more nearly than any of the others described in this paper to the figure of *Conferva tumidula* in 'English Botany;' the cells are, however, twice as long as they are said to be in that species. From *Vesiculifera prolongata* it is distinguished by the greater fineness of its filaments, and the more regularly oval form of the spore-bearing cells.

Vicinity of Cheshunt ; very rare.

Vesiculifera virescens. Filaments equalling in diameter those of *Vesiculifera dissiliens* ; cells once and a half or twice as long as broad, fasciated ; spores spheroidal, contained in much inflated cells of the same form.

This at the period of reproduction is a peculiarly elegant species, the elegance of its appearance arising from the grace of form and regularity of disposition of the spore-bearing inflated cells.

I have found it in two localities in the vicinity of Notting Hill, near London.

Vesiculifera dissiliens, Lyngb. et Ag.? Cells scarcely so long as broad ; spores circular, contained in inflated cells of the same form, which are usually solitary.

The above is a very beautiful species under the microscope ; it is to be distinguished from all others by the shortness of its cells. I have preserved several fine specimens of it in seed. In the herbarium of Dr. Greville I find a specimen of this species, not indeed in a state of reproduction, put up by M. Chauvin, and marked with doubt as *Conferva dissiliens*, Lyngb.

It is certainly not the *Conferva dissiliens* either of Dillwyn's work or of 'English Botany'; that of the latter work being probably identical with *Desmidium mucosum*.

Vesiculifera ovata. Filaments of less diameter than those of *V. paludina*; cells three or four times as long as broad; spores at first ovate, but subsequently becoming circular, contained in inflated cells of an ovate form.

I do not see that this species can be confounded with any of the others. I have met with it but in one locality, viz. in a small pond near the New River Reservoir, which is entirely filled by it.

Vesiculifera concatenata. Filaments about the thickness of those of *Vesiculifera ovalis*; cells six times as long as broad; spores oval, contained in much enlarged cells of a beaded form, from three to six of which occur contiguously to each other.

The inflated cells in this species appear very large compared with the size of the filaments, and are never, so far as I have observed, solitary, three being generally placed together, but not unfrequently as many as six.

Cheshunt Common, and in a pond near Highgate.

Vesiculifera aurea. Filaments of nearly the same diameter as those of *Vesiculifera ovalis*; cells from four to seven times as long as broad; spores oval, frequently of a golden colour, usually solitary, but sometimes binary. When there is but one spore an inflated empty cell is always placed next to it; and when there are two, these lie in adjacent cells, with an enlarged cell not containing a spore next to one or other of them; not unfrequently six or seven contiguous cells are inflated, which gradually taper from the first to the last.

This species has occurred abundantly to me in a pond at Wood Green near Bury Green, vicinity of Cheshunt; it appears to be very distinct from any of the others. In the condition in which I met with it, viz. in seed, the filaments were of a bright russet colour and the seeds golden.

Vesiculifera fasciata. Filaments of less diameter than those of *Vesiculifera virescens*; cells about three times as long as broad; spores circular, contained in cells of the same form.

This species approaches more closely than any of the others to *Vesiculifera virescens*, from which it differs principally in being altogether smaller. I do not know whether the cells are fasciated in all stages of their growth, but I should imagine not.

In a pond on Nazing Common, Essex.

Vesiculifera compressa. Filaments slender; cells twice or thrice as long as broad; spores contained in inflated cells of a compressed ellipsoidal form.

The filaments are a shade finer than those of the following species, which I have named *Vesiculifera spherica*; and the form of the inflations is also different, being in *V. compressa* not unlike the knobs upon dumb-bells.

In Mr. York's brick-field near Cheshunt.

Vesiculifera spherica. Filaments slender; cells about once and a half or twice as long as broad; spores spherical, contained in enlarged cells of the same form.

Vicinity of Cheshunt.

Vesiculifera fugacissima. Filaments of less diameter than those of *Vesiculifera spherica*, mucous, and of a light green colour; cells usually as long as broad, but sometimes much longer than broad, at others their breadth exceeds their length.

Although I have not seen this species in a state of reproduction, I have but little hesitation in referring it to the genus *Vesiculifera*, the joints being strongly marked, and when dried somewhat contracted, as is usual with the species of that genus. The filaments, notwithstanding their mucosity, do not exhibit any gloss when in a dried condition, in this also resembling other *Vesiculiferæ*.

Cheshunt Common and High Beach.

Vesiculifera elegans. Filaments slender, but of greater diameter than those of *Vesiculifera tenuis*; cells about six times as long as broad; spores oval, contained in greatly enlarged cells of the same form.

There is not a more distinct or prettier species in the genus, differing from *Vesiculifera tenuis* in the greater diameter of the filaments.

I have twice met with it, once near Cheshunt Common and again in ponds on Hertford Heath.

Vesiculifera tenuis. Filaments very slender; cells many times as long as broad; spores oval, contained in cells of a much elongated but regularly oval form.

A distinct, graceful, and very rare species.

Vicinity of Cheshunt.

Vesiculifera Mülleri. Filaments very slender; cells fully four times as long as broad; spores spherical, contained in inflated cells of a regularly globular form.

This species comes very close to the following.

In the New River Reservoir, and other places in the vicinity of Cheshunt.

Vesiculifera bombycina. Filaments more slender than those of the preceding species; cells fully four times as long as broad; spores spherical, contained in inflated cells, which have their sides somewhat compressed. Three or four inflated cells sometimes occur in juxtaposition.

Common, Cheshunt.

Vesiculifera angusta. Filaments scarcely equal in diameter to those of *Vesiculifera bombycina*, somewhat mucous; cells usually about three times, but sometimes nearly four times as long as broad.

The joints of this species are somewhat inconspicuous from the fineness of the filaments, as well as from the circumstance of the endochrome filling the entire cavity of the cells. Although I have not seen any of the cells inflated, I yet regard it as a *Vesiculifera*, on account of the contraction of the joints in drying, and the absence of gloss on the filaments. This species is by no means uncommon, and has probably been confounded with *V. bombycina*.

Cheshunt and other places; Ilfracombe, Mr. Ralfs.

Vesiculifera pygmaea. Filaments about equal to those of *V. bombycina*; cells rather longer than broad, joints strongly marked.

This species resembles greatly *Sphaeroplea vermicularis*, but has longer cells and more strongly marked joints. It often adheres to the roots of trees which grow in the water.

Cheshunt; Penzance, Mr. Ralfs.

SUBGENUS.

CHAR. Filaments attenuated, brittle; joints strongly marked, when dry somewhat contracted; filaments lustreless; spores placed in inflated cells, two of which enter equally into the formation of each inflation.

Vesiculifera composita. Filaments somewhat slender, very fragile, of a dark chocolate colour; cells rather longer than broad; spores circular, placed in inflated cells of the same form.

So remarkably does this species differ from other *Vesiculasperms*, that I should have hesitated to have associated it with that group, had I not discovered the vesicles upon the species, of which a definition is given above. It agrees with other *Vesiculiferae* in having attenuated filaments and strongly marked joints, but, on the other hand, it is remarkably distin-

guished from them by its exceeding fragility as well as by the circumstance of the inflations being formed by two cells instead of one, as is the case with all other *Vesiculasperms*.

This is by no means an uncommon species, although it is rare to find it with inflated cells. It appears to prefer pure water, for it is usually met with in ditches in which the water glides slowly along.

Cheshunt marshes; Stevenston, Ayrshire, Rev. D. Landsborough.

Accurate figures, many of them coloured, have been preserved of the whole of the species above described.

PROCEEDINGS OF LEARNED SOCIETIES.

ZOOLOGICAL SOCIETY.

Jan. 11, 1842.—William Yarrell, Esq., Vice-President, in the Chair.

A letter from the Society's corresponding member, H. J. Ross, Esq., was read, in which he states that the Common Green Woodpecker of Europe (*Picus viridis*, Auct.) is to be found in great numbers at Trebizond, and that he has shot them as high as Gumushkhaugh, which is between Erzeroum and Trebizond.

M. P. Gervais exhibited a drawing representing the details of a new genus of Marsupial animals, and communicated to the Meeting, in his own name and that of M. Jules Verreaux, the description of this new Mammal, which formed part of a collection brought from Swan River, and, in the opinion of the authors of the paper, will constitute among the *Marsupialia* the type of a distinct family, for which these naturalists propose the name *Tarsipedidae*, and for the species the name of *Tarsipes rostratus*.

In general appearance, observe the authors, the *Tarsipes rostratus* bears some resemblance to a Shrew (*Sorex*); but the head is longer, and the muzzle is much elongated. The head and body together measure $4\frac{1}{2}$ French inches, and the tail $3\frac{1}{2}$ inches. The fur is tolerably dense, and composed of shortish silky adpressed hairs, which are of a slate-grey colour next the skin, and yellowish externally. The back is of a brownish yellow colour, and a dorsal black stripe extends from the shoulders to the base of the tail, and on each side of this stripe the fur assumes a paler hue: the upper part of the head and muzzle are of the same brownish colour as the back; the under side of the body as well as the inner side of the limbs are yellowish; the hairs of the moustaches are brown, and tolerably long, some about one inch in length. The muzzle is terminated by a little *muflle*; the nostrils are laterally pierced and virguliform; the inter-nasal furrow is nearly equal in length to the nostrils. The tail is furnished at the base with fur like that of the body, but the greater portion is covered with short hairs, as in the rat tribe: its extremity is naked beneath, but the naked portion is but a few lines in length. The ears are tolerably short, somewhat rounded, and may be compared to those of the Shrews.