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XXIX.—Excerpta Botanica, or abridged Extracts translated from the Foreign Journals, illustrative of, or connected with, the Botany of Great Britain.

W. A. Leighton Esq., B.A., F.B.S.E.

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Two specimens of this beautiful insect were brought from Monte Video by Mr. Darwin.

Baripus rivalis (*Molops rivalis*, Germar), Dejean. Species Gen. des Col., vol. iii. p. 25.

Two specimens of this species from Monte Video, and one specimen from Maldonado La Plata, occur in the collection.

XXIX.—*Excerpta Botanica, or abridged Extracts translated from the Foreign Journals, illustrative of, or connected with, the Botany of Great Britain.* By W. A. LEIGHTON, Esq., B.A., F.B.S.E., &c.

No. 3. *On the Structure of the Hairs on the Pericarp of certain Plants.* By M. DECAISNE. (Ann. des Sc. Nat. n. s. xii. p. 251.)

ONE of the characters of the genus *Ruckeria* is, that of having the pericarp covered with papillæ. These papillæ, when attentively examined in a dry state, are found to be of a club-shaped form, of a pearly appearance, and with a longitudinal line dividing them into two equal portions. Their base is dilated or curved, in the different species, so as to rest upon one of the cellules of the epidermis, in the organisation of which there is nothing unusual. On placing some of these papillæ or hairs in a drop of water, we immediately see them separate at the apex into two lips, and thence emit two tubes (*boyaux*) of a mucilaginous substance, which issues forth like wires spirally unrolling themselves, twisting about on themselves many times, and finally greatly exceeding in length the hairs into which they were apparently thrust.

These tubes are apparently formed by a very considerable number of filaments, united and placed one upon the other, in the manner of a skein of thread, of which the pieces adhered together by means of some gummy substance. When these hairs are moistened, we distinguish through their parietes in each of the two lateral moieties, two bodies more opaque, attenuated at both ends, and exhibiting striæ arranged in a regular series, but changing their direction at certain intervals.

If the hair, instead of adhering to the pericarp, as in the preceding example, is broken off at the base, the emission of the tubes takes place at that extremity, and the two are then seen to descend slowly, and to proceed parallel to each other for a short time in unrolling themselves, but afterwards to curve and twist one around the other in an irregular manner.

Sometimes when the hair is not broken off, the tube issues forth from the side, and almost constantly about the middle,
Ann. & Mag. Nat. Hist. Dec. 1840. s

the internal substance presses against some point of the wall, rends it, and issues forth bent and folded upon itself. In this case, the emission of one of the tubes is frequently independent of that of the other.

The same phenomenon may be observed in *Trichocline*, *Euryops lateriflorus*, and *Mesogramma*. In this latter plant, the central line of each division of the corolla (considered as a nervure by DeCandolle), is formed by a series of utricles enclosing a red resinous substance, which is also found in the leaflets of the involucre.

In *Doria chytiaefolia* the pericarp is covered with extremely fine, subulate, silvery-white hairs, which, when examined under the microscope, exactly resemble a thread of silk from the cocoon, viz. two tubes united to each other and curved upon themselves by desiccation. When moistened, they project outwards, as in the preceding case, two very fine tubes, which exhibit similar characters to those mentioned above. As these hairs are of considerable length, it is not difficult to cut them into pieces, and thus see the internal substance escape at the two extremities in opposite directions. These hairs are formed by two navicular valves applied together by their edges like those of a shell, and are destitute of a partition, as is ascertained by the examination of the transverse section, or by observing the hairs of *Oligothrix gracilis*, D.C. or those of *Mesogramma*, which occupy the angles of the fruit, and are of the form of small clubs. When moistened, they instantaneously open, not only at their upper extremity, but by separating throughout their whole length into two transparent colourless valves which continue united at the base, and eject two oblong, free, mucilaginous, striated bodies, which subsequently elongate, and sometimes present in the course of their spiral certain irregular, linear, yellowish transparent fragments, which however do not turn blue on the application of iodine, as has been likewise remarked of similar ones which escape from the utricles of the pericarp of *Dra-coccephalum Moldavica*.

In order to ascertain the structure of these hairs, it is expedient to examine them when the fruit is almost perfectly matured.

These hairs, in certain species, occupy a determinate situation, and those of the pappus to which they approximate do not participate in their characters, nor do the cellules of the epidermis itself, contiguous to those which produce these hairs, offer anything analogous in their organisation.

The two tribes of *Compositæ* in which these hairs have been hitherto observed are the *Labiatifloræ* and the *Senecionideæ*.

Note.—With a view of connecting the above with British Botany, it may be proper to remark, that I have observed a phenomenon similar to that described above as existing in the genus *Ruckeria*, in the hairs which clothe the achenia of the common Groundsel (*Senecio vulgaris*, Linn.)*. The achenia should be collected on a dry day, when fully matured, and before they have been wetted either by dew or rain. On placing them under the microscope, the silky hairs will be found to be very much adpressed and scarcely conspicuous. Immediately, however, on the application of a drop of water, the hairs become prominent and erecto-patulous, and will be perceived to be in form linear, emarginate or notched at the apex, having a darker longitudinal line communicating with the notched apex, and thus as it were dividing the hair into two cylindrical but attached tubes. On the continued application of the water for a short time, a spiral coil encircling a mucilaginous substance issues from each of the segments of the apex, and after twisting upon itself several times, becomes at length quiescent, extended in a nearly straight direction, and considerably longer than the hair from which it proceeded.—W. A. L.

Shrewsbury, Oct. 16, 1810.

No. 4. *Conspectus of the Genera and Species of the Lemnaceæ*. By M. J. SCHLEIDEN. (Linnæa, 1839, iv. p. 385.)

SCHLEIDEN purposes to publish a Monograph of the *Lemnaceæ*, founded on the results of a continued study of the plants during five years, aided by the experience of his uncle Horkel, a very skilful investigator of the tribe. In the mean time he presents the following as a Prodrômus of his intended work.

According to his observations these plants do not flower seldomer than other proliferous Phanerogama; the rarity of their detection in that state is consequently owing to our researches being conducted unadvisedly or at an unseasonable period. He has frequently examined in a complete state *Lemna minor*, *trisulca*, and *gibba* through all the stages of the development of their flowers, fruits, and germination.

In the arrangement of the genera, he has generally followed the principles so successfully applied by Schott, and later by

* [The structure and property of the hairs on the achenia of this plant have been previously observed by Mr. Brown.—Ed.]

Blume, to the inflorescence of the *Aroideæ*, of which the *Lemnaceæ* are a tribe.

If it be at all proper to establish a genus on characters derived from the vegetation, he feels himself justified in the adoption of his genus *Spirodela*. For, if the whole of the *Lemnaceæ* be carefully examined, they will be found to constitute the lowest group of the *Aroideæ*, and a very slight sagacity will detect in them a series of well-defined developments proceeding from *Wolffia* (which is probably the simplest phanerogamic plant) up to *Spirodela*, which presents the highest state of organization, and is evidently the connecting link with *Pistia*. The sudden appearance of two stipular leaves which must be regarded as typical of the stipular sheath of *Pistia*, the surprising development of spiral vessels, without any visible change in the exterior form of the plant and of the axis which is easily distinguishable as a node with many roots, furnish in these simple plants characters sufficiently important to justify the establishment of a particular genus; and probably a more attentive examination of the female organs and of the fruit may elucidate other characters confirmatory of this genus on the above grounds, however arbitrary its adoption may at present appear.

AROIDEÆ.

Trib. LEMNACEÆ, DC.

Herbulæ liberæ, natantes vel submersæ, arrhizæ, vel 1-poly-rhizæ, radicibus calyptra* terminatis. Vasa spiralia rudimentaria transitoria (in pistillo) vel conspicua (in tota planta). Axis ad punctum reductus, cum foliis in frondem confluentis. *Frons*: singula planta completa, ex rima una basilari, vel duabus lateralibus prolifera, prole nuda, vel stipulis duabus membranaceis aucta. *Hibernaculum*: bulbillus† autumnò fundum aquæ, vere superficiem petens. *Inflorescentia*: spadix ob axim suppressum ferè nullus; spatha urceolata, membranacea: staminum evolutione irregulariter fissa. *Flores* monoici. *Masc.* 1—2, mon-

* The calyptra is not a loose portion of the epidermis, nor a distorted form of the radical spongiolæ, but is a proper and peculiar organ, which surrounds the apex of the root even whilst it lies concealed in the plant, although perfectly free and distinct both from that and from the parenchyma.

† Definition of a *bulbillus*: an axillary bud, the parts of which are more fleshy than usual, and connate, and which separates spontaneously from the parent plant for the purpose of propagating the species. A more fleshy frond, therefore, without roots, engendered in the autumn by plants of the *Lemnaceæ*, and on the death of the parent plant separating from it and seeking the bottom of the pit, the parent plant remaining on the surface of the water (as in *Lemna polyrrhiza*); or becoming buried in the bottom of the water with its dead parent plant, and rising again in spring (as in the rest of the *Lemnaceæ*);—is truly denominated a *Bulbillus*.

andri. *Filamenta* filiformia. *Antheræ* biloculares, loculis subglobois, apice contiguis, basi remotissimis, bilocellatis, rima longitudinali laterali dehiscentibus. *Pollen* globosum, muricatum, rima unica (?) donatum. *Fem.* 1. *Ovarium* uniloculare, uni-multi- (septem- in *L. gibba*) ovulatum. *Ovulum* anatropum vel hemianatropum vel atropum, in tegumentis binis. *Stylus* continuus; stigma expanso-infundibuliforme. *Fructus*: utriculus mono-polyspermus, indehiscens vel capsula circumscissa. *Semen* in tegumentis binis, externo coriaceo-carnoso, interno membranaceo; endostomio indurato (operculo) in germinatione embryostega. *Embryo* in axi albuminis carnosus rectus, monocotyledoneus, gemmula seorsim (radiculam) spectans in rima laterali, radícula supera, infera vel vaga*.

† *Vasa spiralia* transitoria, vel nulla. *Plantæ novellæ* nudæ.

A. *Frondes* rima una basilari hiantes. *Flores* in pagina frondis superiore erumpentes.

I. WOLFFIA, Horkel MSS. (*Horkelia*, Reich. non Schlechtend.)

Flos masculus unicus. *Filamentum* breve, crassiusculum. *Flos* *fæmi-neus* unicus. *Ovarium* uniloculare, uniovulatum, ovulo uno recto, anatropo; *stylus* brevis; *fructus* utriculus monospermus; *semen* erectum; *embryo* turbinatus; *radícula* supera.

1. *W. Delilii*. *Frondes* ovales, tenuissimæ, geminatim oppositæ, arrhizæ; labium inferius rimæ basilaris productum, appensum, hyalinum. *Lemna hyalina*, *Del. Lemna* e Rosetta, *Herb. Willd.* no. 17144. *L. arhiza*, *Herb. Willd.* 17141.

The author is indebted to Dr. Ehrenberg for specimens of *Wolffia* in flower brought from Egypt; and he detected in Willdenow's herbarium specimens of the same plant in fruit, under the name of *Lemna*, from Rosetta.

B. *Frondes* rimis binis basilaribus hiantes. *Flores* e rima lateraliter prodeuntes.

II. LEMNA.

Flores masculi, altero in evolutione præcociori. *Filamenta* filiformia, recurva; *ovarium* uniloculare, uniovulatum, ovulo erecto, horizontali, hemianatropo; *stylus* elongatus, recurvus; *fructus* utriculus monospermus indehiscens; *semen* in fundo affixum, horizontale; *embryo* conicus; *radícula* vaga.

1. *L. minor*, Linn. *Frondes* obovato-subrotundæ, crassiusculæ, ternatim quaternatimque, rarius plures cohærentes, monorrhizæ; stipite frondis novellæ discreto fragili. *L. cyclostasa*, *Ell.* *L. minuta*, *Kunth.* *L. minima*, *Chev.* *L. conjugata*, *Willd. Herb.* 17143.

* Brongniart's description of the embryo in 'Archives de Botanique' is very far from being accordant with nature, nor can I possibly imagine what could lead him to the supposition of a canal pervading the upper portion of the embryo and nourishing a cordate plumule at its base.

I first collected *L. minor* in flower and fruit at Berlin in 1835, and since that time I have each year detected it again in the same state whenever I searched with care.

2. *L. trisulca*, Linn. Frondes lanceolatæ, apice repando-dentatæ, tenues, in stipitem elongatum persistentem attenuatæ, ideoque multifariam aggregatæ, exclusis floriferis submersæ. *Staurogeton*, Reich. *L. intermedia*, Ruthe. *L. cruciata*, Roxb.

In 1836 I found *L. trisulca* in flower, and have since regularly detected the flowers wherever I encountered this species. The reason why this species has been so rarely found in flower, is that the search has been made at too late a period, as it generally flowers abundantly in April and the beginning of May. The flowers will be seen on those plants which are submerged near the surface; after flowering they multiply themselves laterally and are then submerged.

III. THELMATOPHACE.

Spadix brevissimus, sed discernendus. *Flores* masculi duo. *Filamenta* recurva, medio dilatata; *ovarium* uniloculare, bi-multi-ovulatum, ovulis erectis anatropis; *stylus* elongatus, recurvus; *fructus*: capsula membranacea, dehiscentia circumscissa, dipolysperma; *semina* erecta; *albumen* paucissimum; *embryo* ovatus; *plumula* maxima; *radicula* infera.

1. *T. gibba*. Frondes obovatæ vel suborbiculatæ, adultæ inferne vesiculoso-convexæ; stipite frondis novellæ discreto, fragillimo, ideoque frondibus adultis subsolitariis. *Lemna gibba*, Linn.

β. *trichorhiza*, fronde superne rubente, radice longissima. *Lemna trichorhiza*, Thuill.

In 1837 I first observed *T. gibba* in flower, and since frequently. It is the rarest species at Berlin.

†† *Vasis spiralibus in tota planta conspicuis; fronde novella stipulis binis (inferiori et superiori) membranaceis aucta, polyrhiza.*

IV. SPIRODELA.

Flores masculi duo; *filamentis* inferne angustatis. *Flores* feminei. *Ovarium* biovulatum, ovulis erectis anatropis; *stylus*.; *stigma*.; *fructus*.

1. *S. polyrhiza*. Frons planiuscula, nervis palmatis, polymorpha, orbiculari-ovata; apice obtuso vel acuto. *Lemna polyrhiza*, Linn. *L. bannatica*, Kit. *L. orbicularis*, Kit. *L. thermalis*, P. Beauv. *L. orbiculata*, Roxb.

Notwithstanding the most careful search I did not detect *S. polyrhiza* in flower until 1839, when I found at Werningerode the male flowers, or those in which the pistil is imperfectly developed. The only previous notice of the flowers of this species is in Wiggers *Prim. Fl. Holsat.*

APPENDIX.

Lemna arhiza, Mich. according to the observations of Hoffmann is a good species, but, as the flowers and fruit are still wanting,

is doubtful to what genus it should be referred; most probably to my genus *Thelmatophace*.

In Steudel's *Nomenclat. Bot.* there is a plant *Lemna punctata*, Meyer, of which I am ignorant.

Lemna obcordata, P. Beauv. and Vahl. as well as *Lemna dimidiata*, Rafn., are erroneously enumerated amongst the *Lemnaceæ*, since an inspection of authentic specimens from the authors themselves proves them to be species of *Riccia*.

XXX.—Contributions to the History of the Development of the Decapod Crustacea. By HEINRICH RATHKE*.

ONE of the objects which I had proposed to myself for my tour through Scandinavia and Denmark, was an investigation of the Crustacea as regarded their development. Of Decapods which might serve as subjects for this investigation, several, it is true, fell in my way; fewer, however, by far than I had expected: these were *Astacus marinus*, *Pagurus Bernhardus*, *Galathea rugosa*, and a crab, which I consider to be *Hyas Araneus*. The details respecting these I design to make known, together with the results of the examination of various other animals, in a separate work; as, however, some time may elapse before its publication, I will here communicate the most essential particulars of what I have learned respecting the development of the above-mentioned Crustacea, in order, as soon as possible, to record a testimony to the correctness of Thompson's discovery, that even the Decapods, after they have already quitted the egg, undergo a very considerable metamorphosis.

1. *Astacus marinus*.—Embryos just on the point of hatching, possess already five pairs of feet, and these are similar in form to those of the full-grown specimens. But to the coxæ of each is attached a part representing a narrow and long appendage of the leg, proceeding down it on its outer side, little inferior to it in length, and composed of two larger members, of which the inferior one again consists of ten smaller articulations, and carries a number of long bristles. The same also is the case with the foot-jaws (Kieferfussen) of the second and third pair, of which, moreover, the hindmost is even at this period the largest of all, and it is evident from this that the above appendix represents the subsequent *palpus flagelliformis*. The four posterior foot-jaws and the ambulatory legs have also in general a resemblance to the legs of the Schizopoda, especially to those of *Mysis*. But this similarity afterwards

* From Wiegmann's Archiv. (Part III. 1840.)—Translated and communicated by Mr. W. Francis.