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XXIV.—*On the Genus Alicia (Cladactis), with an Anatomical Description of A. costæ, Panc.* By J. E. DUERDEN, A.R.C.Sc. (Lond.), Curator of the Museum of the Institute of Jamaica.

[Plate IX.]

WHILE investigating, in conjunction with Prof. Haddon, the anatomy and relationships of a collection of sea-anemones from Port Phillip, Australia, it became necessary, in order to determine the systematic position of one of them—*Cystiactis tuberculosa*, Quoy & Gaim.,—that a study of the genus *Alicia* should be made. No specimen in this genus, so far as we are aware, has ever been submitted to microscopic examination, a condition which is now absolutely necessary before the relationship of any form of sea-anemone can be determined.

The genus *Alicia* was founded by J. Y. Johnson (1861) for a new form of sea-anemone—*Alicia mirabilis*—from Madeira. Andres (1884), disregarding Johnson's priority, places this species under the genus *Cladactis*, founded by Panceri in 1868 for a Mediterranean Actinarian, *Cladactis costæ*. Verrill (1869), quite independently, founded a genus of the same name for a new Panaman species, *Cladactis grandis*. Prof. Haddon and Miss Shackleton (1893) restore Johnson's *Alicia* in place of *Cladactis*, and add a new species, *Alicia rhadina*, which they regard as undoubtedly allied to *Actinia pretiosa*, Dana, from Fiji. They therefore show the genus *Alicia* to include the following:—*A. mirabilis*, Johns.

(the type species); *A. costæ*, Panc.; *A. grandis*, Verr.; *A. pretiosa*, Dana; *A. rhadina*, Hadd. & Shackl. Unfortunately only the second species, *A. costæ*, is available for microscopic investigation; but until this is done the generic relationship of the others, founded entirely upon external characters, must be assumed.

Johnson thus defines his genus *Alicia*:—"Base adherent at pleasure; greatly exceeding column. Tentacles simple. Margin of disk simple, without spherules. *Column beset with stalked appendages.*"

His figures and description of *A. mirabilis* appear sufficiently clear to enable one to recognize the species, while the character of the genus—"Column beset with stalked appendages"—is sufficient as an external feature to separate it from all other previously described genera, and would certainly include Panceri's and Verrill's species.

Verrill, however, has evidently mistaken the relationship of the disk and column in the genus. He speaks of the disk as "broad, with a naked area or 'fosse' between the tentacles and the margin," and the marginal tubercles as "elongated, pedunculated, the end divided into two to six rounded lobes." In *A. costæ* this naked area or "fosse" is certainly the distal portion of the column, as is well shown in Andres's figure, and from the fact that the sphincter muscle occurs in this place.

The genus has generally been placed under the family Bunodidæ, from the fact that the column possessed what were regarded as tubercles mainly disposed in vertical series. The characters of the family Bunodidæ are now defined by McMurrich (1889) as the following:—"Actiniæ adhering to foreign bodies by a flat contractile base. Column occasionally smooth, but usually provided with tubercles, either simple or compound. No cinclides. Sphincter muscle is strong and circumscribed. Perfect mesenteries usually numerous, those of the first cycle, with the exception of the directives, being gonophoric. No acontia. Tentacles smooth, cylindrical, and entacmæous." Hertwig (1888) considers "the endodermal sphincter [circumscribed] must occupy the first place in the diagnosis." The *Cystiactis* we had under consideration from Australia has, from Quoy and Gaimard's figure, always been taken to be one of the Bunodidæ, on account of possessing what appeared to be tubercles disposed in a vertical series. Histologically, however, we found it to differ from that family in the salient character of having a well-developed diffuse endodermal sphincter in place of a circumscribed one, and also in the fact that the so-called tubercles are really hollow

vesicles. Hence arose the necessity of examining if the various species of *Alicia*, to which *Cystiactis* bears some external resemblance, agreed with it or the typical *Bunodidæ*. The sphincter of *A. costæ* is shown on Pl. IX. fig. 1, from which it will be seen that it is a somewhat weakly developed, but greatly elongated, diffuse endodermal muscle. A section through a vesicle is shown in fig. 2, exhibiting a hollow structure. Since our Australian form and *A. costæ* agree in such an important essential as the sphincter, and also in the nature of the outgrowths on the column, it becomes necessary that a new family should be established for their reception and others closely allied to them, as they are obviously different from any of those at present described. I propose the family name *Aliciidæ*, after the genus *Alicia*, with the following characters:—

Fam. *Aliciidæ*.

Hexactinæ with a large flat contractile base. Tentacles simple, cylindrical, and entacmæous. Column with simple or complex hollow processes or vesicles over the greater part of its surface, arranged mostly in vertical rows. No cinclides. Sphincter muscle endodermal and diffuse, variable in amount of development. Perfect mesenteries few or numerous. No acontia.

The family, as thus defined, includes the genera *Alicia* and *Cystiactis*, and possibly others, such as *Bunodeopsis*, &c.

The relationships of the Actiniaria are still in a very unsatisfactory condition, and will be so until a greater number have been examined anatomically. It is therefore somewhat premature to discuss the position of the *Aliciidæ*. External characters alone would place them near the *Bunodidæ*; but they are now shown to be separated by such an important character as that of the sphincter muscle.

The genus *Cystiactis* will be more fully discussed in a paper shortly to be published by the Royal Dublin Society.

Genus ALICIA.

Tissues very delicate. Tentacles elongated, more or less retractile. Column with the distal vesicles pedunculated and much divided, the proximal vesicles simpler and more or less sessile. Sphincter muscle feebly developed. Mesenteries not very numerous; two pairs of directive mesenteries.

Should *A. mirabilis*, Johns., when histologically examined, be found to differ fundamentally from the foregoing definition,

then, as it is the type of its genus, it will retain the name *Alicia*, and *A. costæ*, Panc., will be referred to its original genus *Cladactis*, with the definition given above.

Alicia costæ, Panc.

The description of the external characters is sufficiently well given by Andres, who also devotes a beautiful plate to the species. The following details refer only to the histological features.

Column.—The column is thin and delicate, somewhat thicker in the region of the sphincter muscle, but very thin in the vesicular region. The ectoderm is regular and covered on the outside with a delicate cuticle. The sphincter region of the ectoderm is crowded with elongated nematocysts, showing very distinctly the internal spiral thread; somewhat above and below this region the nematocysts are arranged in groups, as in the tentacles. In the vesicular region the ectoderm is much thinner and nematocysts are rare.

The mesogloea varies in thickness, as does the ectoderm. It is homogeneous in structure, except for the presence of a few minute cells.

The endoderm is very thin throughout and shows a weak endodermal muscle.

Vesicles (Pl. IX. fig. 2).—The stem or peduncle of the vesicle shows a regular ectoderm with a thin cuticle, but without any nematocysts; the mesogloea is thicker than that of the enlarged portions, and the endoderm forms a weak basal muscle. The distal portions of the vesicles possess a thicker ectoderm, with a few nematocysts. The ectoderm seems largely made up of elongated unicellular glands, which stain deeply. It is probable that the vesicles are partly glandular in function. They are not batteries of nematocysts. The mesogloea is very thin, and the endoderm contains markedly the pigment granules which give the bright coloration to the vesicles in the living animal.

Tentacles (Pl. IX. fig. 3).—The walls of the tentacles are very thin, with small batteries of nematocysts arranged at intervals all over the surface. The nematocysts are large, elongated, and show the spiral thread distinctly. Accompanying them are deeply staining unicellular glands. The mesogloea appears only linear in section. The endoderm is about half the thickness of the ectoderm and evenly arranged. A very weak ectodermal muscle can be distinguished in transverse sections and an endodermal one in longitudinal sections.

Disk.—In the disk the ectoderm is very thick and shows

few or no nematocysts. The mesogloea is very thin and the endodermal muscle very weak, except towards the periphery of the disk. Here, close to the tentacles, the disk in spirit-specimens has a deep fold; the mesogloea is plaited somewhat as at the sphincter muscle, and the endodermal muscle is clearly seen. Nematocysts occur in the fold.

Œsophagus.—The ectoderm of the œsophagus possesses numerous large elongated nematocysts, which do not stain; the mesogloea has increased considerably in thickness and the endoderm has what seem to be glandular cells. A weak endodermal muscle is present. There is no indication of a groove opposite the directives.

Sphincter Muscle (Pl. IX. fig. 1).—The sphincter muscle is weak, endodermal, and diffuse in character. It is very elongated, extending from just below the tentacles to where the vesicles commence. The mesogloea is thrown into delicate plaits to support it.

Mesenteries (Pl. IX. fig. 4).—The mesenteries are few and regular in arrangement. There are six pairs of perfect mesenteries, two pairs of these being directives. Alternating with the perfect mesenteries are six pairs of secondary mesenteries, and with these again twelve pairs of tertiaries. In structure they are very thin and delicate, except where the retractor muscle is developed. Here the mesogloea is thickened and becomes plaited in a more or less delicately dendriform manner to support the weak muscle-fibres. There is also a weak muscle on the side opposite the retractor, and in the lower part of the column the muscle and plaitings of the mesogloea are about equally developed on each side. The endoderm is feebly developed and has small deeply staining cells.

Gonads.—In the specimens examined there were no gonads present.

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EXPLANATION OF PLATE IX.

*Reference letters.**ect.* = ectoderm.*end.* = endoderm.*end. mus.* = endodermal muscle.*gld. c.* = gland-cell.*mes.* = mesogloea.*nem.* = nematocyst.*sph. m.* = sphincter muscle.*rec. m.* = retractor muscle.

Fig. 1. Longitudinal section of the portion of the column of *Alicia costæ*, Panc., between the tentacles and the commencement of the vesicles, showing the diffuse endodermal sphincter muscle, considerably folded. Magnified 33 times.

Fig. 2. Section through one of the large vesicles. Slightly magnified.

Fig. 3. Transverse section through a flattened portion of an extended tentacle, showing the arrangement of the nematocysts in limited areas. Magnified 33 times.

Fig. 4. Transverse section of a middle portion of a mesentery in the region of the œsophagus. Magnified 33 times.

XXV.—*On some new Species of Coleoptera in the Museum of the Hon. Walter Rothschild.* By Dr. K. JORDAN.

1. *Trichius ornatus*, sp. n.

♂ ♀. *Tr.* obscure viridis, infra æneo-nitens. Caput sæpe parum purpurascens; clypeo latitudine parum longiore, præcipue in ♀, grosse punctato; fronte et vertice in ♂ minute sat sparsim, in ♀ dense subreticulato-punctatis, duabus maculis frontis, duabusque lateralibus elongatis verticis luteis. Antennæ pallide rufis, articulo primo apice viridescente, clava maris ea feminae parum longiore. Palpi rufi.

Prothorax longitudine parum latior, apice rectus, basi rotundatus, lateribus pone angulos anticos prominentes, in ♂ minus quam in ♀ rotundatus, leviter sinuatus, retrorsum gradatim (♂) vel rotundatim (♀) parum ampliatus, angulis posticis rotundatis; sulco mediano longitudinali, sulcis transversis uno apicali, altero basali, limbo laterali medio angustiore, utrinque macula disci obliqua postmediana, altera minore subapicali, tertia laterali mediana cum limbo ac sæpe cum macula prima connexa, luteis, his maculis impressis; disperse, (♂) minute, (♀) crasse punctatus.

Scutellum triangulare, longitudine latius, marginibus exclusis luteum.

Elytra latitudine sexta parte longiora, leviter striato-punctata, interspatiis tertio cæteris multo latiore et primo parum elevatis; vitta mediana longitudinali longitudine ac latitudine variante, in humeris sæpe dilatata, rufa; linea longitudinali interspatium secundum occupante, guttis septem in utroque elytro luteis—1^a basali mediana, 2^a basali marginali, 3^a dorsali antemediana in



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