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XXXVIII.—*On a new Physophore, Plæophysa, and its Relationships to other Siphonophores.* By J. WALTER FEWKES\*.

[Plate XVII.]

ONE of the most interesting Siphonophores collected by the United-States Fish-Commission steamer 'Albatross' in the Gulf-stream is a new genus, *Plæophysa*, which has most interesting morphological affinities with known genera of these animals. This Medusa, notwithstanding its very interesting relationships, has never been described. The structure of the genus is so exceptional and its anatomy throws so much light on the morphology of other little-known Physophores that a description of it seems worthy of special publication.

*Plæophysa* was picked out of a bottle of "surface skimmings" obtained by the 'Albatross' during her cruise of 1886 †. Two fine specimens were found, both of which exhibit the characteristic features here described and figured.

\* Communicated by the Author, by permission of G. Brown Goode, U.S. Fish Commissioner.

† The bottle in which *Plæophysa* was found had not been examined when my Reports on the Medusæ collected by the 'Albatross' were written.



The most exceptional peculiarity in the genus is the structure of an organ called the hood, elsewhere unknown among Physophores in this form, although represented by organs which have already been described in other little-known genera. This homology of these structures, however, is here pointed out for the first time. A diagnosis of the genus *Plæophysa*, of which only the single species *P. Agassizii* is known, is given in the following pages. The account closes with a discussion of its affinities and its relationships to certain other Physophores.

I. *Description of Plæophysa Agassizii, gen. et sp. nov.*

PLÆOPHYSA, gen. nov.

Float large, conspicuous, partially covered by a hood-shaped body, which is (or appears to be) bound by muscular bands to a globular enlargement of the polyp-stem.

No nectocalyces, no hydrophyllia. Polyp-stem globular, bearing numerous, long, flexible tasters, without (?) filaments. Polypites situated below the crown of tasters. Polygastric. Tentacles with tentacular knobs formed of a sacculus, two terminal filaments, and a terminal vesicle. Rudimentary involucre at the base of the sacculus. Sexual clusters in botryoidal bunches at the base of the tasters. Monœcious.

Diameter of the float in a horizontal direction 5 millim. Whole diameter with contracted tasters (hydrocysts) 12–15 millim. Colourless\* in alcohol, with the exception of the pigment-zone about the apex of the float.

*Plæophysa Agassizii*, sp. nov. (Pl. XVII.)

*Float*.—The float (*f*) is large and hemispherical, with a pigment-zone at the apex, as in *Athorybia*. The lower hemisphere of the float is inflated and passes directly into a globular enlargement of the polyp-stem known as the polyp-sac. Size 2 millim. in horizontal diameter.

*Hood*.—On one side of the float there rises a structure called the hood (*h*). This organ arches over the float in alcoholic specimens and appears to be a continuation of the polyp-sac. Its outer walls are papillose, and the whole structure appears to be glandular. It is connected with the polyp-

\* A universal characteristic of all specimens of Physophores which have been in alcohol for a length of time.



sac by thin bands (*m*), which embrace the lower part of the float. It is not possible for me to say that the arching of the hood over the float, figured in my drawings, is not due to contraction \*. The hood may thus be more prominent in live specimens than in alcoholic.

*Nectocalyces* and *Nectostem* †.—There are no nectocalyces in the two specimens studied. It is possible that the hood (*h*) may be a homologue of the nectostem and the minute papillæ rudimentary nectocalyces. The structure of *Pleurophysa* would seem to indicate this interpretation.

*Polyp-sac*.—The enlargement below the float is known as the polyp-sac. It is an inflated or globular structure, and bears on its sides many highly flexible organs (*ts*), forming a mass of filamentous bodies with members projecting at all angles. Looking at the float from one side it will be seen that on the same side of the float as the hood (left hand) there is a cluster of sexual bodies (*s*) larger than the others. The position of these bodies is important morphologically.

*Tasters*.—The whole side of the polyp-sac below the float is concealed by the tasters (*ts*). No filaments were observed on them; but in one or two instances bodies which may be the filaments of the tasters were observed coiled at their bases. It is possible that no filaments exist and that these tasters are like the nectotasters of *Apolemia*.

*Polypites*.—The polypites (*pt*) are contracted to globular bodies and lie on the underside (opposite the float) of the polyp-sac. Ordinarily in contraction in alcohol they bear at their distal end a small button-shaped structure, formed by the reflexed lips of the mouth. There are several polypites, while each of these structures has longitudinal rows of "liver-cells" on its inner walls.

*Tentacles and Tentacular Knobs*.—The tentacles (*ta*) arise from the bases of the polypites. The tentacular knobs were easily seen in the alcoholic specimens and consist of a sacculus, a rudimentary involucre, two terminal filaments, and a terminal vesicle.

The terminal filaments are short, stumpy (in alcohol), and

\* The description which Hæckel gives of the aurophore of his *Auronectæ* is so short—his paper is a preliminary one ("System der Siphonophoren")—that I am unable to say whether my "hood" of *Plæophysa* is not an aurophore. *Plæophysa*, however, does not belong to the *Auronectæ*, Hæckel, as no nectocalyces are developed in my genus. There are other structural differences between *Plæophysa* and the *Auronectæ*, Hæckel.

† The stem on which the nectocalyces are carried may be called the nectostem; that which bears the polyp is called the polyp-stem. Tasters which arise from the nectostem as in *Apolemia* may be called nectotasters.



resemble those of *Athorybia* \* *rosacea*, Köll. The sacculus is uncoiled, curved, and armed with powerful nematocysts. The involucre is rudimentary.

*Gonophores*.—Clusters of male and female gonophores are found at the base of the hydrocysts. Monœcious. An exceptionally large cluster of female gonophores is found at the point *s*.

### *Summary of Exceptional Features in Plœophysa.*

1. Existence of the hood (*h*).
2. Portion of the stem (axis) which ordinarily bears polypites (polyp-stem) is reduced to a globular sac. The nectostem, or the part of the stem which generally bears nectocalyces, is modified into a hood (*h*).
3. Nectocalyces and hydrophyllia are wanting.

### II. *Conclusions in regard to the Affinities of Plœophysa.*

1. It is the type of a new family, for which the name Plœophysidæ is suggested.

The affinities of *Plœophysa* are somewhat difficult to make out. As in the families to which *Physalia*, *Velella*, and *Rhizophysa* respectively belong, nectocalyces and hydrophyllia are wanting. The tentacular knobs are unlike those of any of these families. There is, however, a remote likeness of the tentacular knobs of *Plœophysa* to those of *Rhizophysa gracilis*, Fewkes †; but in this genus the stem is elongated and not globular, as in *Plœophysa*. While the tentacular knobs somewhat resemble those of *Athorybia rosacea*, unlike any of the Anthophysidæ the Plœophysidæ are destitute of hydrophyllia or covering-scales.

The absence of nectocalyces separates *Plœophysa* from the order Auronectæ of Hæckel ‡, although it is not impossible that the hood is homologous with the aurophore of the last-mentioned writer.

With the Angelidæ, a family which includes *Angela* and *Angelopsis*, *Plœophysa* has close resemblances, but differs from it in the character of the hood.

\* The *Athorybia* with two kinds of tentacular knobs described by me as *Athorybia formosa* is referred by Hæckel to *Anthophysa*, Mert. I accept his suggestion that it is not an *Athorybia*, but find it different from *Anthophysa*. It is probably a new genus, *Diplorybia*, Fewkes.

† Bull. Mus. Comp. Zool. vol. ix. no. 7, p. 270, pl. vi. fig. 5.

‡ Of the three genera of this order *Stephalia* is without tentacular knobs; while *Auralia* and *Rhodalia*, according to Hæckel, have knobs like *Forskalia*.



III. *Homology of the Hood of Plœophysa*.

The homologue of the hood is to be found among other Physophores in the nectostem of which it is an outgrowth. It assumes in certain genera a variety of shapes. In *Rhizophysa gracilis*, Fewkes, in which, as in all Rhizophysidæ, the polyp-stem is very long, the hood appears as a small transparent hernia-like bud with air-bubbles at the base of the float, as figured in my paper on the jellyfishes of Tortugas \*. In *Pleurophysa* the nectostem does not bear nectocalyces; but instead of bells it carries small buds or tubercles on one side. In this genus the hood has been elongated into a nectostem, but does not yet bear nectocalyces. In *Haliphyta* we have the same condition as in *Pleurophysa* as far as the modified hood is concerned †. It can readily be seen that in these two genera the hood has assumed the shape of a nectostem, which, in genera like *Agalma*, bears nectocalyces ‡. It seems, then, that we have in the so-called nectostem of *Pleurophysa* and *Haliphyta* an indication of the homology of the hood of *Plœophysa*.

In the Rhizophysidæ, as before recorded, the nectostem is ordinarily reduced to nothing or wanting. The hood, however, may be represented in the structure at the base of the float of *R. gracilis*. In *Pterophysa*, a giant genus over twenty feet in length, a differentiation of the nectostem from the polyp-stem has begun to take place, and in the allied *Bathypphysa abyssorum* (Studer) Hæckel, both nectostem and polyp-stem are well differentiated.

In *Pterophysa* § we find at the base of the float, in about the same position as the bud already mentioned on the float of *Rhizophysa gracilis*, a cluster of taster-like bodies homologous with the so-called tasters (*ts*) of *Plœophysa*. These bodies indicate the position of the nectostem and are homologous with similar bodies, called nectotasters, found on the

\* *Loc. cit.*

† The great difference between these two genera is the absence of hydrophyllia in *Pleurophysa* and the character of the polypites.

‡ I was at first led to suppose that nectocalyces once existed on the nectostem of *Haliphyta* and that the small knobs indicated their former attachment. That opinion is now abandoned, and I now think they were never there. I am confident of this so far as *Pleurophysa* is concerned.

§ My figure of *Pterophysa*, drawn from a beautiful specimen over twenty feet long, shows no nectocalyces or hydrophyllia. In none of the specimens which I have studied are there any signs of nectocalyces or covering-scales, nor of the attachment of these structures. Moreover, a long nectostem does not exist. I cannot therefore follow Hæckel when he refers my *Pterophysa* to the Forskalidæ.



nectostem of *Apolemia uvaria*. The filiform bodies (*ts*) of *Plæophysa* are thought to be homologous with nectotasters in *Apolemia* and *Pterophysa*.

Cambridge, Mass., U.S.A.,  
February 1888.

#### EXPLANATION OF PLATE XVII.

- f.* Float.
- h.* Hood.
- m.* Connexion of the hood with the polyp-sac.
- pt.* Polypite (artificially extended; in nature probably even more extended).
- pt'*. Polypite as it appears in alcoholic specimens.
- s.* Gonophores. A large cluster of male and female bells.
- ta.* Tentacle (artificially extended as in nature; in alcohol all the tentacles are retracted to the body of the polypite).
- ts.* Taster or hydrocyst.

[The figures are drawn from an alcoholic specimen.]

*Fig. 1.* *Plæophysa Agassizii* (lateral view).

*Fig. 2.* The same (viewed from above).

XXXIX.—*Contribution to the Knowledge of Snakes of Tropical Africa.* By Dr. A. GÜNTHER, F.R.S., Keeper of the Zoological Department, British Museum.

[Plates XVIII. & XIX.]

#### I. *Descriptive Notes.*

RHINOCALAMUS, g. n. (Calamariid).

Body elongate, cylindrical, of uniform thickness throughout; head small, not distinct from neck, narrow and tapering; tail rather short, obtuse; eye very small; cleft of mouth narrow, with feeble jaws; scales smooth, in seventeen rows; subcaudals paired. Rostral shield wedge-shaped; two pairs of frontals, the posterior replacing a loreal and anteocular; nasal single, but with a groove below the narrow nostril. Maxillary armed with a few comparatively strong teeth, the two hindmost of which are enlarged and grooved.

*Rhinocalamus dimidiatus*, sp. n. (Pl. XIX. fig. C.)

The scutellation of the head of this singular snake consists



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