

Calyconectid Siphonophorae III
by
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The bracketed [..] and emboldened comments are Totton's marginalia.

II Family Prayidae K lliker, 1853 (Diphyidae)
(= Pragomorphae Chun, 1888 = Oppositae Chun, 1892)

There are two (occasionally 3-4) identical nectophores facing each other. In most instances, these undergo regeneration. Bracts are found on the cormidia, which, for the most part, do not break loose but remain attached to the stem.

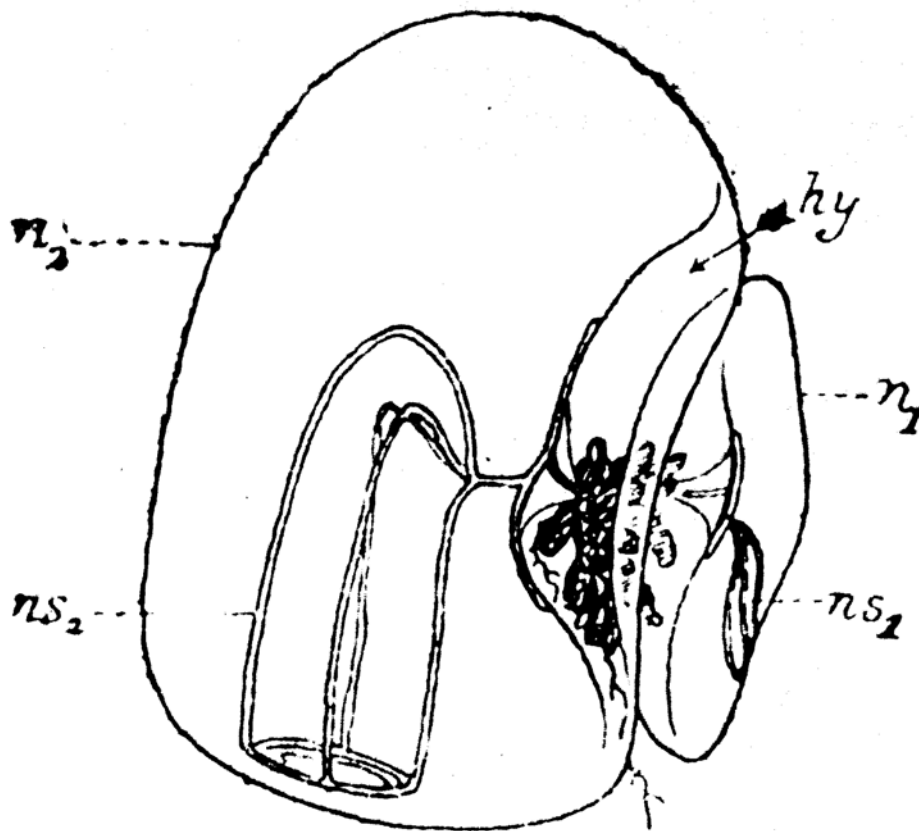
I Sub-family Amphicaryoninae Chun, 1888

the two nectophores of siphonophores in this sub-family are dissimilar because the older one becomes a shield-like bract. Regeneration does not occur in the nectophores. "Free swimming" eudoxids are budded off.

The last two characteristics are only true for this sub-family and indicate a close relationship between this sub-family and the previous family. This group, however, has only one genus, as follows:

Amphicaryon Chun, 1888

Only one species from the Canary Islands, *Amphicaryon acaule* is known (fig. 7). *Mitrophyes peltifera* which was reported by Haeckel in the past is believed to be this species [NO].



II Sub-family Prayinae Haeckel, 1888

The two nectophores present are almost identical in size and are replaced by nectophores that bud out from behind. The cormidia appear to remain on the top of the stem permanently. Three genera of this sub-family, *Rosacea*, *Lilyopsis*, and *Praya* were described many years ago. Numerous species of these genera are now on record but these are rather confused. In recent years many scientists have combined *Lilyopsis* with *Rosacea*. Bigelow has added the genus *Nectodroma*. Both *Desmalia* and *Desmophyes* are old genera created by Haeckel.

Praya Blainville, 1834

No special nectophore on the cormidia.

Only one [2] species is recognised at present.

Praya cymbiformis (delle Chiaje) Leuckart [**not a *Praya***]

Praya dubia Blainville, 1834, p. 137, Pl. Vi, fig. 4 [Not]

Diphyes prayensis Quoy and Gaimard, 1834, p. 106, Pl. III, figs. 37-38 [**Not**]

Physalia cymbiformis delle Chiaje, 1842, tab. 33, fig. 1

Praya diphyes Lesson, 1843, p. 144

Praya cymbiformis Leuckart, 1853, p. 2, tab. 1, fig. 4; 1854, p. 286, Pl. XI, figs. 18-24; Huxley, 1859, p. 30; Keferstein and Ehlers, 1861, p. 20, Pl. I, fig. 28; Haeckel, 1888b, p. 146; Chun, 1897b, p. 66, fig. 8; 1897b, p. 102; Bigelow, 1911, p. 200, Pl. II, figs. 1-6.

Praya maxima Gegenbaur, 1854, p. 19, Pl. XVII, figs. 1-6; Haeckel, 1888b, p. 146; Lens and van Riemsdijk, 1908, p. 17.

Praya galea Haeckel, 1888a, p. 35; 1888b, p. 146, Pl. XXXI, XXXII.

Praya (Huxleya) californica Gravier, 1899, p. 87, figs. 1-4.

Two identical nectophores face each other ventrally. Between them hangs the stem with many cormidia. However, there is a slight difference in shape between the two if observed critically. The larger (and younger) one with its lateral wing-like processes embraces the corresponding part of the smaller one which, on the other hand, encases the basal part of the stem. The large groove passing vertically between these “wings” is comparable to the hydroecium of other Calycophorae. The triangular lamella longitudinally attached to the median line of the hydroecium is the part by which the nectophore attached itself to the stem. Both dorsal and lateral sides are smooth. The overall shape of a nectophore is a column whose longitudinal axis curves inward, that is, it is kidney-shaped.

The nectosac is an extremely small cone occupying the lower 1/3 of the nectophore. Its opening is round, slanting obliquely toward the lower dorsal side. The velum is wide.

The short stalk canal enters the gelatinous part (of the nectophore) from the stem, through the muscular lamella and extends in a straight line toward the apex of the nectosac. Branch canals [**upper and lower pallial canals**] bud out above and below. The branches turn upward and downwards following the median line of the hydroecial groove and terminate in blind ends near the upper and lower ends of the nectophore. The four radial canals may be grouped into two pairs. The dorsal and ventral canals are simple and run directly toward the nectosac opening while the lateral canals are extremely long and form very complicated sinuous curves along the nectosac wall.

A thin but long stem carries countless cormidia. Each cormidium consists of one bract, one siphon, one tentacle, and one or more gonophores. Many buds surrounding the base of the stem give the appearance of beautiful cobalt beads.

The bract is a thick, muscular kidney-shape. Its dorsal and lateral sides are smooth. A deep depression on the ventral side forms a bracteal cavity which covers the other parts of the cormidium. The “cavity” canal running parallel to the axis of the stem [**? in fig. 5, i.e. c.br + dorsal canal**] becomes connected to an arrow-like canal. The canal toward the front ends blindly while towards the back it not only forms a dorsal canal which curves slightly, but it also branches out for half its length [**divides into two (half its length)**] into lateral canals [**commonly called longitudinal (paired)**] to the wing-like parts on both sides of the bracteal cavity. All four canals are inflated slightly at their blind ends and give the appearance of a club. Furthermore, the lateral [**longitudinal**] canals each have a short, symmetrical branch that turns upwards. In some specimens only the terminal part of the dorsal canal appears to reach the surface. This, however, is a case of abnormal growth (Pl. VII, fig. 5)

Once Haeckel considered the short branch budding from the right lateral canal comparable to the somatocyst [**phyllocyst**] seen in the bracts of other genera. But since he overlooked identical growth on the left lateral canal this so-called “somatocyst” is comparable to the dorsal canal. This is quite obvious when compared with the following genus *Rosacea*. [**He is referring to *Desmophyes* (see pl. VII, figs. 6-8)**] The older bract is slightly bent toward the stem, its [**latero-**]lateral axis parallels the stem when attached.

The siphon is connected to the stem by an extremely short stalk from which the tentacle grows. There are eight clear red hepatic ridges on its spindle-shaped stomach. The bright yellow nematocyst clusters [**cnidosacs**] have a readily contractible terminal filament.

All seven specimens were caught at Misaki during the spring and summer. The smaller nectophores were 13 to 30 mm in length and 8 to 20 mm in width while the larger ones were generally 1.25 times greater in length and width. The bracts were, in the largest measures, 5 to 8 mm in length and 3.5 to 6 mm in width. On [**polygastric stage**] taken in perfect condition had the stem reaching approximately 3.03 dm. It expanded and contracted vigorously. When alive it was exceptionally beautiful but being extremely delicate it separated easily.

As far as the distribution of this species in the Pacific is concerned it had already been found in the Indian Ocean, Torres Strait, Malayan waters, Lower California and the Eastern Tropical Pacific. Recently, it has also been seen in the waters of our coasts. Therefore, it evidently occurs widely in the tropical and temperate zones.

Genus *Rosacea* Quoy and Gaimard, 1827
(= *Lilyopsis* Chun, 18850

[***Desmophyes* sp. judging by his figures**]

A special nectophore is found on the cormidia. Many animals of this genus were finally classified in the following two species as *Rosacea plicata* Quoy and Gaimard or *Rosacea medusa* (Metschnikoff). In this report, however, only the former species will be discussed. The latter, *Rosacea medusa* is nearly three angle [**triangular**] drill-like [**i.e. conical?**], and its nectosome is comparatively large. On the nectophores and special nectophores there is a [**are many**] rudimentary tentacle at the base of the velum, which is characteristic of this species [**R. medusa**].

Rosacea plicata Quoy and Gaimard

Pl. VII, figs. 6-8

Rosacea plicata Quoy and Gaimard, 1827, p. 177, pl. IVB, fig. 4; Schneider, 1898, p. 78; Bigelow, 1911, p. 201, Pl. II, figs. 7-9 [**This is another species (i.e. not**

***Desmophyes* sp.) now known as “*Rosacea plicata* sensu Bigelow”]**

Rosacea ceutensis Blainville, 1834, p. 140, Pl. VI [**? ctenophore**]

Praya diphyes Kölliker, 1853, p. 38, taf. IX; Vogt, 1854, p. 99, Pl. XVI, XVII; Bedot, 1882, p. 122.

Diphyes bragae Vogt, 1851, p. 140

Diphyes filiformis Keferstein and Ehlers, 1861, p. 20, taf. V, figs. 8-11

Lilyopsis diphyes Chun, 1885, p. 280; 1897b, p. 102; Lens and van Riemsdijk, 1908, p. 17, Pl. II, fig. 16

This species [***Desmophyes* sp. - not all above synonymy**] is [**somewhat**] similar in shape and structure to *Praya cymbiformis* discussed previously. Only it is smaller (in size) and shows slight structural differences in the nectophores, bracts, etc. First the stalk [**pallial**] canal of the nectophore, on entering the gelatinous part, buds out an upper [**no mention of descending branch**] branch which runs upward only a short distance and whose end becomes a slightly conspicuous egg-shaped inflated part, curving a little toward the dorsal side. The four [**straight**] radial canals are of equal length and run along the nectosac wall directly to the circular canal. At this point four dark red ocellar spots are found. The round nectosac opening is on the lower dorsal surface and has a velum.

The bract is kidney-shaped and has a smooth dorsal surface. On the ventral surface running like an arrow [**? Y-shaped**] toward the lower back side, forming the bracteal cavity. The stem enters the gelatinous part at the apex of the bracteal cavity, turns at once toward the dorsal surface, and expands into a rather large oval somatocyst [**vesicle**] in the centre of the bract. This is not the dorsal canal of the previous genus. {NO. It is not found in *R. cymbiformis*, but K does not describe any other ‘dorsal’ canal] The somatocyst divides at its base into three canals [**c⁴ and pair of longitudinal**] of equal length - the median frontal canal [**? c⁴**] extends toward the front while the pair of the back [**longitudinal**] canals turn backward towards [**along**] the processes [flaps] forming the bracteal cavity. However, each of these again turns toward the front and have short lateral branches. These canals all end in club-like expansions. The cormidia have a special conical nectophore [**special swimming bell**] in front of the siphon within the bracteal cavity. The nectosac, too, is a comparatively large cone. The straight stalk [**pedicular**] canal reaches the apex of the nectosac entering from the point of attachment with the bract and branches into four radial [**? not 2 and 2 (see Moser 1917)**] canals. Like other nectophores [**polygastric**] it has a velum and ocellar spots.

The structure and colours of the siphons, tentacles, and the gonophore are the same as in *Praya cymbiformis* (delle Chiaje) Leuckart.

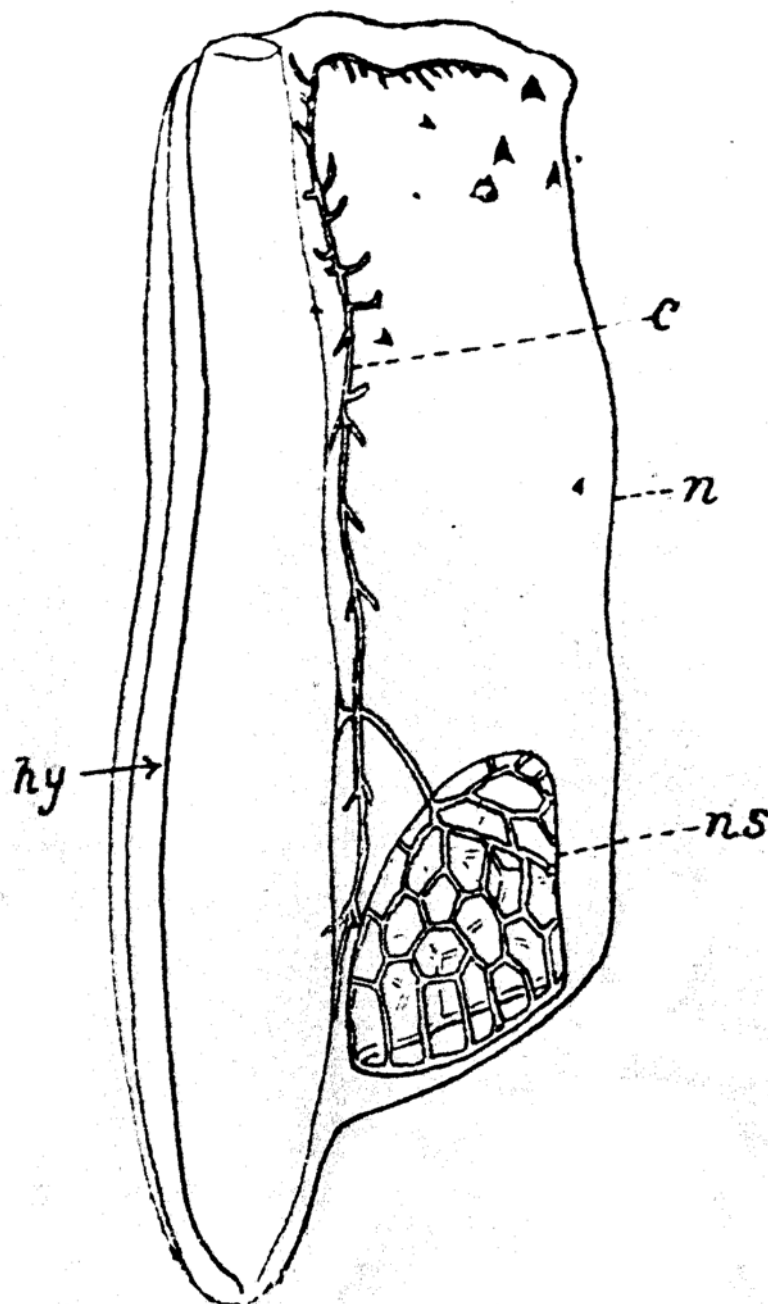
Of the two specimens studied by the author, one was obtained by Prof. Iijima in January 1907 at Misaki and the other was caught at the same locality on December 26 of that year. Specimen “A” was preserved in formalin. The primary nectophores measured 22 mm in length and 16 mm in width, the secondary nectophore, 25 mm in length, 18 mm in width, and the largest bract 5 mm in length, 4 mm in width. Specimen “B” (when alive) was about 1/3 the size of specimen “A”.

This species, too, is apparently common [**?! Described only 4 times. Confusion of 2 or more spp.**] all over the world. However, in some specimens of the Atlantic form [**different species**], the dorsal bracteal canal often ends blindly and

lacks the ovoid expansion. [? not homology of dorsal bracteal canal, but of 'central organ' in *Nectopyramis thetis*]

Genus *Nectodroma* Bigelow, 1911

The canal comparable to the somatocyst branches out. There are more than four radial canals on the nectosac which all become connected to form a network. The two species *Nectodroma dubia* (Quoy and Gaimard), *Nectodroma reticulata* Bigelow (fig. 8) are known. Both are tropical Pacific forms. The latter has a more intricate net-like radial canal than the former.



Genus *Desmalia* Haeckel, 1888

Has a total of four nectophores in two rows but no special nectophore on the cormidia. The description of this genus is insufficient.

Genus *Desmophyes* Haeckel, 1888

Has six nectophores arranged in two rows. A special nectophore is present on the cormidia. There is one species *Desmophyes annectens* Haeckel. However, the structure of the nectophores and the cormidia, as in the previous genus, *Desmalia*, resemble those of *Praya* and *Rosacea*. Therefore, many scientists doubt this genus to be distinct from these.

III Sub-family (Stephanophyinae)

There are numerous nectophores arranged in a ring. The part comparable to the somatocyst is a branched canal system. The cormidia do not break loose.

Single genus and species

Genus *Stephanophyes*

Stephanophyes superba Chun

Stephanophyes superba Chun, 1891

Stephanophyes superba Chun, 1888, p. 1164; 1891, p. 3, Pls. I-VII; 1897b, p. 102

Rosacea dubia Schneider, 1898, p. 76 (partim)

The two specimens studied by the author were in rather bad state of preservation as each part was either broken off or separated. It was, therefore, not possible to describe them as they appeared when alive. However, Chun's original report of this animal was given in great detail and accompanied by drawings. The structure of the nectophores, bracts, special nectophores and tentacles of the author's specimens agreed well with these drawings and description. From this, the author assumes that the general shape and position of the parts differed but little. Inasmuch as the author included the entire animal [**fig. 9**] as well as the cormidia [**fig. 10**] on the plate [**VII**] for the reader's convenience, he wishes to state that there is some discrepancy between the drawings of these, unlike those [**most of sketches of other spp. in life**] for other species, because these drawings [**? cormidium - fig. 10**] were not sketched from life. Further the discussion [**? description**] of the structure [**of gonophores and tentaculat nematocysts**] has been supplemented [**taken from**] with Chun's description as far as the detailed comparison of the overall shape of the structure of the male and female gonophores (the gonophores on the stem are not yet fully developed) and the tentacular nematocysts are concerned.

The structure of this species can be said, probably, to be the most beautiful of all Calycophorae despite its small size. On the upper end of the body, there are four nectophores arranged with the dorsal side outwards. Consequently, the stem, which connects these nectophores is suspended from the centre. At the upper end of the stem many cormidia are scattered at equal distances. Because its special nectophore is pressed slow closely from above and below (by the cormidia), the stem does not freely expand and contract as in the case of other Calycophorae. Its appearance closely resembles *Agalma*. There are many cormidia and the length of each cormidium [**? total stem**] reaches many tens of times greater than that of the nectophore. A cormidium spotted with red, yellow and orange is very beautiful.

The nectophore is hood-shaped and, in its natural position, its outer surface corresponds to its dorsal side and the lower surface. This is because the apex of the nectosac extends towards the ventral side. Hence, the lower surface of the nectophore, that is, the opening of the nectosac, changed its position to the dorsal side. Therefore, the shape of the nectosac, viewed from the outside, appears to be rectangular, twice as high as it is wide, or, when viewed from the side, as a parallelogram with rounded corners. When seen from the dorsal side the nectosac is comparatively smaller and is egg-shaped with its long axis placed horizontally. But if seen from the side it is columnar with its axis arched slightly from the inner side toward the outer side.

Precisely, the opening with the velum is slanting almost perpendicular instead of being horizontal. The stalk canal which is nearly horizontal as it enters the gelatinous part through the muscular lamella (attaching the nectophore to the stem) reaches the nectosac at its upper ventral median line. There the canal branches into four radial [**subumbra**l] canals. Of these, both the ventral and dorsal canals simply run along the median line while the lateral canals form an S on the nectosac wall. They enter the circular canal near the ventral canal. The velum is slightly wider on the dorsal side.

The part corresponding to the somatocyst is a canal system which branches repeatedly. When the stalk [**pallia**l] canal enters the gelatinous part, two branches run upward and downward. The lower branch ends in a sac a short distance below the wall of the hydroecium and the upper branch has several forked branches. These branched canals extend (spread) into the gelatinous upper and the lateral sides of the nectosac. The end of each branch is slightly inflated and is a clear red.

The hydroecium is found on the ventral surface of the nectophore, that is, it is represented by an extremely weak groove situated on the lower half of the natural inner lower surface. The stem is attached slightly above the upper side instead of by the bottom of the groove [**hydroecium**].

Each cormidium consists of a bract, a siphon, a tentacle, special nectophores and gonophores. In addition, there is a different shaped siphon and another kind of tentacle attached at the internodal part. At the upper end of the stem a young nectophore bud is seen.

The smooth bract is attached on the dorsal side of the stem and has a complicated shape. Roughly, it has the form of a saddle which straddles the stem, the right and left sides expanding around toward the ventral side, like a pair of thin wings. However, these “wings” are not symmetrical, the right wing is wide and flat wrapping the special nectophore like a sleeve, while the left wing is rather long, thick and muscular [?], having a groove inside which is a passage for the extension and contraction of the siphon and of the tentacle. In the gelatinous part of the bract there are six rather long canals that enter from the stem. They are situated in the following manner [**This translation of the Japanese account of the bracteal canals does not help one to understand the pattern (common to *Rosacea*, etc), but when “the pattern” is understood one can understand K’s account, which is poor.**] - two on each wing [see Chun taf. III, fig. 4], one facing upward [**one of latitudinals, Chun’s ‘4’**] and one [**“c³” also Chun’s ‘3’**], and one toward the dorsal side. [**This obscures the significance of the arrangement (1 & 2 on one side, 4 & 6 on the other)**] Each canal ends blindly with a slight expansion filled with small oil droplets. Some of them are clear red. The longest canals of the six are two [**the two longitudinals 5 & 6**] on the left wing [**side**] and the shortest is one on the dorsal side [**“c³”**]. The latter canal does not develop directly from the stem but branches out from the one [**Chun’s 4, a lateral**] which turns upward along the median line.

The structure of the siphon does not differ from that of other calycophorid siphonophores. However, the distinctiveness of divisions of its four parts are quite different from others. Particularly in the characteristics of a long and narrow stalk. The tentacle is attached to the upper surface of the basal part of the siphon.

The special nectophore is situated slightly above the gonophore, close to the lower left side of the siphon. Slightly large in size and protruding from the stem towards the ventral side, it is in alignment with the cormidia above and below it. Its gelatinous part is well developed on the side near the stem. The nectosac occupies half of the ventral side of the cormidium as a whole. The stalk canal runs a very short distance through the muscular lamellae and, bending at a right angle, becomes

connected to [22] branches running upward and downward. Then, midway, the lower canal gives off a branch which goes directly to the nectosac apex. The two lateral canals (of the four radial canals) curve conspicuously before joining the circular canal.

According to Chun, this species grows both male and female gonophores at the base of the siphon. (Chun has observed two each of male and female gonophores when examining the cormidia from one side). The male gonophore develops a long, narrow, spindle-shaped manubrium with sex cells. The velum too is definitely present. The female gonophore has a manubrium which is a bit shorter than the male form. Its umbrella is like a shallow saucer but its manubrium is inflated. In this there are stored several large egg cells. The direction of growth of the radial canals is similar to those of the male gonophore.

In conclusion there are two component parts which must be discussed and which are not common with other calycophorid siphonophores, namely, the polyp attached to the node of the stem and a primitive tentacle which grows from the base of the stem [?]. The polyp is a small-spindle shaped growth whose tip is closed and whose function is unknown. This occurs on practically all siphonophores and has been considered as a palpon. However, there are some inactive types which are hardly thought to have any function of their own. Haeckel, on the other hand, on finding an individual with an opening at the end, considered that such an opening has an excretory function. Yet a true palpon as seen in the Physophorae is accompanied by a narrow palpacle which develops at the base without lateral branches. If the type seen on *Physalia physalis* with tentacles is considered, this too, can be given a similar interpretation [?].

The small tentacles which bud out from the polyp [**attached to the node - ? larval tentacle for each polyp**] are one to three in number (according to Chun), with acorn-like nematocysts. These abnormal tentacles are supposedly primitive like the temporary tentacles found in the embryonic stages of *Agalma* and other genera. Following this, however, a kidney-shaped nematocyst common to the Calycophorae appears to replace this earlier growth. This has already been explained by Haeckel (in 1869). In short, in *Stephanophyes* a more primitive tentacle from the embryological standpoint, develops at the same time as the normal tentacles generally found in Calycophorae.

Of the two specimens studied by the author, one is an old specimen belonging to the Misaki Marine Experiment Station and was not in good condition. The time of catch and the name of the collector was not recorded. The other was a live specimen caught by the author near the station. However, before a close examination could be made, nearly all parts became separated and the stem contracted irregularly. At any rate, the largest nectophore measured 8.5 mm in length and 5 mm in width. The larger special nectophore measured 10 mm in length (in the natural horizontal position) and 3 to 4.5 mm in width (in the natural vertical position).

Figure 10. Cormidium of above, left lateral view x8.

br. bract; c.br. bracteal canal system; c.ol. somatocyst; col.br. bracteal somatocyst; go. gonophore; hy. hydroecium; n1. nectophore; n2 nectophore; n3 nectophore; ns. nectosac; p. siphon; p!. siphon without opening; stl.br. bracteal stalk lamella; stl.n. nectophore stalk lamella; t. tentacle; tr. stem; t.pr. primitive tentacle.

III Family Hippopodiidae K  lliker, 1853 (Polyphyidae Chun, 1882)

When the smooth primary nectophore drops off numerous secondary nectophore identical in shape takes its place, and are aligned in two rows. No bract is present on the cormidia which remains permanently attached to the stem.

At present, two genera *Hippopodius* and *Vogtia* are known

Genus *Hippopodius* Quoy and Gaimard, 1827

The nectophore is smooth and horse-shoe shaped.

Those that are thought to belong to this genus are *Gleba*, *Protomedia*, *Elaphantopes*, *Polyphyes* etc. The old “family” name was derived from the last generic name listed here. In the past various species such as *Hippopodius lutes*; *H. mediterraneus*, *H. neapolitanus*, *H. gleba* etc have been described but at present they are all thought to belong to the same species, Thus, *Hippopodius hippopus* (Forsk  l) Schneider will be used in this paper. However, the specimen caught by the author at Misaki last year and subsequently reported in Col. 22, No. 264 of this publication is a different species and identified of *Hippopodius unguatus* (Haeckel). The best characteristic for distinguishing this species (from *Hippopodius hippopus*) is by the six tooth-like protrusions around the nectosac opening of the nectophore. This difference, however, Schneider (1898) has insisted, does not justify the separation of the two species. Bigelow (1911) recently that inasmuch as the former (i.e. *Hippopodius hippopus*) shows some sign of developing a similar growth, it is still better to refrain from identifying it (*Hippopodius unguatus*) positively. Therefore, it is reasonable to consider these two as different species.

に次で顯はれ、以て是に代るものなることは、夙に(一八六九年)ヘッケルが闡明したる所なり。之を要するに、ハナワクラゲには、一般鐘泳類に見る通常觸手の外に、發生學上より見て、更に原始的なる他の一型の觸手をも併有するものとす。

余が檢し得たる標品二個。甲は古くより三崎實驗所標本として保存せられありし不完全のもの(採集時及採集者不明)、乙は一九一〇年一月、余が同所に得たる生ける標品なりしも、詳密なる觀察を行はざるに先ち。器中にて各部解離し、幹は不規則に收縮したり、乙に於て、泳鐘の最大なるもの、長さ八・五耗、左右幅五耗を測り、特別泳鐘の大なるもの、長さ(自然の位置にて水平の)一〇耗、幅(自然の位置にて垂直の)三乃至四・五耗を測りたりき。

第三科 バティクラゲ科

Hippopodiidae KÖLLIKER, 1853.
(=Polypodiidae Chun, 1882.)

圓滑なる一次泳鐘脱落し、多數の同形なる二次泳鐘是に代りて、二列に並列す。幹群に保護葉なく、永久に幹に附着して停まる。

現今二屬ありて、*Hippopodius*, *Vogtia* とす。

屬 バティクラゲ屬

Hippopodius QUOY et

GAIMARD, 1827.

泳鐘馬蹄形、圓滑にして稜角なし。

本屬と同一ならんと疑はるゝものは、*Gleba*, *Protonevris*, *Elaphantopus*, *Polyphyes* 等なり。舊科名は此最後の屬に基きたりしなり。古來 *H. fulvus*, *H. mediterraneus*, *H. neapolitanus*, *H. gleba* 其他種々の種を作られしが、現時是等を、總て同種と認むる者多く、是に *H. hippocampus* (FORSK.) SCHNEIDER の名用ゐらる。然れども余が前年三崎に獲て、本誌第二十二卷第二百六十四號に報告せしものは、是と別種にして、*H. unguiculatus* (HECKEL) といふ。其區別の最も見易きものは、後者には、泳鐘の泳囊口の周圍に、六個の齒狀突起あるに、前者にこれなき事なり。例のシコナイダー(一八九八年)のみは、此差異を以て、種の區別と認むるに足らずと主張し、最近ビゲロー(一九一一年)は、前者に多少突起を生ぜんとする傾向ありといへるも、未だ何れとも斷定するを憚れるを以て、即ち別種と認むるを至當とすべし。

内側に凹溝あり、營養體及觸手伸縮の通路とす。保護業寒天質中には、六本の稍長き管ありて、幹より發す。其位置は左右翼に入るもの各二、上方に向ひて一、背方に向ひて一なり。孰れも盲狀に終り、末端少しく膨れ、茲に小油滴を藏し、或ものは鮮紅色を帶ぶ。六本中最長きは左翼に入れる二本にして、最短きは背方に向へる一、こは正中線を上方に向へる他の一本より岐出し、直接幹より發せず。

營養體の構造は、他の鐘泳管水母類と異らざるも、その四部分の限界の甚明瞭なることは異例とすべし。特に其柄部が長く細く延びたる點に於て然り。營養體の基面上面に接して觸手附着す。

特別泳鐘は、營養體の左下方に接し、生殖體の少しく上方に位置す。形稍大にして、幹より腹方に向ひて突出し、上下相隣接して整列す。而して其寒天質は、幹に近き側に於てよく發育し、泳囊は腹側(幹群全體としての)半部を占む。柄管は極短距離を直線に柄瓣中を走り、直角に曲りて上下に走れる上下枝に接續し、更に、下枝の中途より折れて、泳囊の頂に直走する一管を岐出す。四放射管中、兩横側管は、頗る彎曲して環管に達す。

クーンによるに、此動物は雌雄兩生殖體を營養體の基部に生ず。(クーンは幹群を一方より數へて二つ宛にて雌雄相交互せるを見たり。)雄生殖體は、細長き軸柄と、生殖素を發育せしむる、頗る長き紡錘形の柄部(mantidium)

とを具ふ。緣膜も亦明瞭に存在し、四放射管は往々不規則なる曲走をなせり。雌生殖體の軸柄は、右に比し稍短く、その傘も淺くして皿の如くなれども、柄部は球狀に膨大し、茲に數個の大なる卵細胞を藏す。放射管の走向は前者に同じ。

最後に説く可き幹群の二成分は、他の鐘泳管水母に見ざるものなり。即ち幹の節間に附着せる一個の水螅形と、その基部より起れる原始型觸手となり。水螅形は先端閉ぢたる小さき紡錘形の突起にして、其作用不明なり。凡そ諸管水母を通じて見らるゝ口なき水螅形は、昔は總て感觸體と認められたるものなるが、中には運動不活潑にして、到底其作用を爲すと信じ難きもありて、

ヘッケルは先端に小孔あるものを見出し、是排泄作用を行ふ構造なりと説明したることあり。而して眞の感觸體には、バレンクラグに見る如く、その基部に發する、細くして側枝なき感觸絲を伴へるものにして、カツヲノエボシに見る如く、觸手を伴へるものに至りては、寧ろ營養體の口を失ひたるものと見るを至當とすれば、此場合に於ても亦、同様なる見解を下す可きものならむ。次に此水螅體より發する細き觸手は、其數一本乃至三本(クーンによる)にして、其上に櫛實形の刺胞叢配列せり。此異常型觸手は、所謂原始的觸手にして、ヤウラクラグ其他の種屬が、發生の初期に有する一時的觸手の型式に外ならず。而して鐘泳類に見る如き腎臟形の刺胞叢は、是

載に於ても亦、全形及び雌雄生殖體構造（生殖體は幹の上方にては發育未だしき故）と、觸手刺胞叢の詳密なる比較とは、クーンの記載によりて補綴したるものなりとす。

本種は其構造に於て頗特有なる點ある外、其形こそ小なれ、恐らく全鐘泳類中最華麗なるものと稱して可なる可し。體の上端には、背側を外にして並立する四個の泳鐘あり、從て此等を連ぬる幹は、是等の中央にありて、長く下垂す。幹の上には、等距離に配列せる多數の幹群ありて、其特別泳鐘上下相壓して密接せるが爲に、他の泳鐘類に見る如く、幹が隨意に引き縮めらるゝことなし。其狀宛も胞泳類のヤウラクケ等に見るが如し。而して此幹群は甚だ多くして、長さ泳鐘の高さの數十倍に達し、構造形態の複雑なると、所々に點在せる紅黃・橙黃色と相俟ちて、實に美觀を呈す。

泳鐘の全形は頭巾形、自然の位置に於る外側はその背側と下面とに當る。是、泳囊の頂が著しく腹側に向ひて突出すると同時に、泳鐘の下面、即ち泳囊の開口が、背側に轉位したる結果なり。是によりて、泳囊の形は、外より見れば、高さが幅に二倍する長方形、横より見れば、角の圓くなりたる平行四邊形なり。

泳囊は比較的頗小にして、背側よりより見れば倒卵形、横側より見れば、稍弧形なる中軸を、内上方より外下方に向けたる圓柱形なり。即ち縁膜を有する開口は、水平

に位置せずして、却て垂直面に近き位斜なり。泳鐘の幹に附着する柄瓣中を走りて、寒天質中に入る柄管は、殆ど水平に走りて、泳囊腹側正中線上方に於て是に達し、茲に於て四放射管に分岐す。就中腹側管と背側管とは、單に正中線に沿ひて走れども、一對の横側管は、S字形をなして永く泳囊壁を迂曲彷徨し、終に腹側管に甚だ近き所にて環狀管に入る。縁膜は背側に於て僅に廣し。

體囊に相當するものは、盛に分岐する管系統にして、柄管が幹より寒天質に入りたる時、上下に分てる兩枝の中、下枝は、幹室の天井に沿ひて、短距離を走りて盲狀に終れども、上枝は、數回二岐式に分れて、樹枝狀を呈しつゝ、泳囊の上方及側方寒天質中に擴がり、各枝の末梢は、鮮紅色を帶ぶる小さき膨大部に終れり。

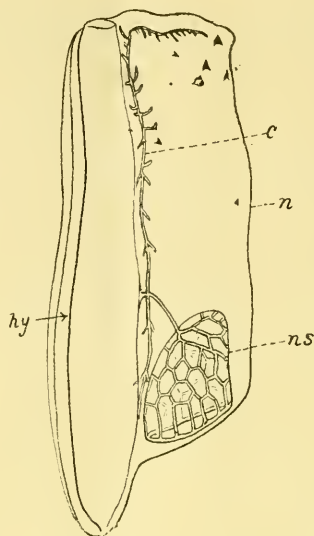
幹室は泳鐘腹側面、即ち自然の内下面下半にある、甚だ弱き溝狀の凹入によりて代表せられ、幹の附着せる所は、凹入の底に當らずして、少しく上方なり。

各幹群は保護葉・營養體・觸手・特別泳鐘及生殖體よる成る。別に節間部に附着せる異形の營養體及別種の觸手あり。尙幹の上端には泳鐘の幼芽を見る。

保護葉は幹の背側に附着し、外形圓滑なるも、複雑なる形を有す。概して言へば鞍狀にして、幹に跨りて左右より腹方に延び、薄き翼狀の部分となる。但し兩翼は不相稱にして、右翼の、廣く扁平にして、特別泳鐘を袖の如くに被包するに對し、左翼寧ろ長く、肉亦稍厚くして

屬 *Nectopoma* BIGELOW, 1911.

體囊に相當する管は分岐す。泳囊放射管四條よりも多くして、網の如く相聯絡す。二種あり、*N. dubia* (Quoy et GAIMARD), *N. reticulata* BIGELOW (種圖第八)共に熱帶太平洋産。後者は前者よりも放射管の網となれること細密なり。



第八圖
Nectopoma reticulata
(ビグロウより)
c. 體囊。
n. 泳囊。
ns. 泳囊。

屬 *Desmalia* HAECKEL, 1888.

合計四個の泳鐘ありて、二列に並ぶ。幹群には特別泳鐘なし。

不充分に報告せられたるものなり。

屬 *Desmophyes* HAECKEL, 1888.

六個の泳鐘あり、二列に並ぶ。幹群に特別泳鐘あり。一種 *D. annectens* HAECKEL あるも、泳鐘及幹群の構造、前屬と共に、餘りに *Praya* と *Rosacea* に似たる故、別屬たることを疑ふ者あり。

第三亞科 ハナワクラゲ亞科

多數の泳鐘環狀に並立す。體囊に相當するものは分岐せる管系統なり。幹群分離せずして停まる。

單屬單種 *Stephanophyes superba* CHUN あり。

屬 ハナワクラゲ屬

Stephanophyes CHUN 1891.

ハナワクラゲ (第七圖版)

Stephanophyes superba CHUN, 1888.

Stephanophyes superba CHUN, 1888, p. 1164, 1891, p. 3, Pl. I—VII, 1897b, p. 102.

Posacea dubia SCHNEIDER, 1893, p. 79 (partim).

余が檢し得たる二個の標品は、既に各部分支離滅裂の狀態にありしを以て、生時に於る全形及各部配列の實際に至りては、之を決定するに由なかりしが、クーンによりて與へられたる原記載には、頗る詳密且つ精巧なる圖版を附せられてありて、余の標品を之に比較するに、泳鐘保護葉・特別泳鐘及觸手の構狀形態が、甚だよく是に一致することより推すときは、其全形並に各部の配置も亦恐らく大差なかりしなる可し。余は本誌讀者の便を思ひて、圖版中に、全形及幹群の圖を入れ置きしが、事情右の如くなりしを以て、此二圖のみは他の諸種の場合と異り、生時に於て親らなしたる寫生圖に非ることを、茲に豫め一言し置かざる可からず。而して次に列記する記

(論 說) ○鐘泳管水母類 (川村)

二二

Posea pincta QUoy and GAIMARD, 1827, p. 177, Pl. IVB, fig. 4; SCHNEIDER, 1898, p. 78; BIGelow, 1911, p. 201, Pl. II, figs. 7-9.

Posaea centensis BLAINVILLE, 1834, p. 140, Pl. VI.

Tringa diploes KÖLLIKER, 1853, p. 38, Taf. IX; VoGT, 1854, p. 90, Pl. XVI, XVII; BEDOT, 1882, p. 122.

Diphyes brugie VoGT, 1851, p. 140.

Diphyes filiformis KEFFERSTEIN and EHRENS, 1861, p. 20, Taf. V, figs. 8-11.

Trigopsis diphyes CHUN, 1885, p. 280, 97b, p. 102; LENS and VAN RIEMSDIJK, 1908, p. 17, Pl. II, fig. 16.

本種は全體の形及構造酷だ前のアヒオヒクラゲに似、唯是よりも小く、又泳鐘・保護葉等の構造に少許の差あり。先づ泳鐘の柄管は、寒天質中に入る時、上下兩枝を分たずして、上枝のみ出で、短距離を上向し、末端は稍背側に向つて曲りつゝ、稍著しき卵形の膨大部となれり。四放射管は長さ相等しく、簡單に泳囊壁の彎曲に沿ひ、直走して環管に達す。此點に四個の暗紅色なる眼點(ocellar spot)存在す。泳囊口は、圓形にして背下方に向ひ、廣き縁膜を備ふ。

保護葉は腎臟形、背面は圓滑、腹面には後下方に矢狀に走れる凹溝ありて、保護葉腔を示す。幹の中軸は、保護葉腔の項に於て寒天質中に入り、直に背面に向ひ、保

護葉の中心に位する稍大なる橢圓形の體囊に達す。是即ち前屬に於る背側管に相當するものとす。體囊の基端よりは又殆ど同長なる三管を岐出し、其中一本の前側管は正中面を前方に向ひ、他の一對の後側管は、保護葉腔の兩翼を後方に向ふ。而して後者の各は、又其中途より一短枝を出して前横側に向はしむ。是等各管の末端は棍棒狀に終る。

幹群に特別泳鐘あり、保護葉腔内にありて營養體の前方に位置し、形圓錐形なり。その泳囊も亦圓錐形にして比較的大なり。直線なる柄管は、保護葉の尖頂より入りて泳囊の頂に達し、四放射管に分る。縁膜及眼點の存すること泳鐘に同じ。

營養體・觸手及生殖體の構造・色彩は全くアヒオヒクラゲに一致す。

余の驗せし標品二。甲は明治四十年一月、飯島先生が三崎に得給ひしもの、乙は同年十二月二十六日、同所に捕へたるものなり。甲にてはフォルマリン液中に保存せられて、泳鐘、長さ二二耗、幅一六耗、第二泳鐘は長さ二五耗、幅一八耗、最大なる保護葉、長さ五耗、幅四耗を測れり。乙は(生時)頗る小にして、其大さ總て甲の約三分の一なりき。

本種も世界各地に普通なるものと如し。但し太平洋產標品中には、保護葉背側管が卵形に膨大せずして、普通の盲狀に終れるもの往々之ありと云ふ。

の色美麗なるコバルト色を呈す。

保護葉は肉厚くして腎臓形をなす。背側及横側はすべて圓滑にして稜なく、腹側には深き凹陷部ありて保護葉腔 (bracteal cavity) を形くり、以て幹群の他の部分を被包せり。幹の中軸を走れる腔管は、保護葉に入りて一條の矢狀管に續き、管は前方に向つては末端盲狀に終れる一管に過ぎざるも、後方に向ひては少しく螺旋形に曲りて、保護葉の背側管を作るのみならず、中途に於て左右兩側に管を岐出して、保護葉腔の兩側に立てる翼狀部に入らしむ。四管ともにその盲端に於て少しく膨れ、棍棒狀を呈す。更に左右兩側管には、各一條の短枝ありて上方に向ひ、左右相對して相稱をなす。或標品にては背側管の末端のみは殆ど表面に達せることを見たりしが、こは寧ろ異常のことなるべし(第七版第五圖)。尙ヘッケルは曾て、右側管の岐出する一短枝を以て、他屬の保護葉に見る體囊に相當するものとなせしが、これ左側管に於て同様なる一短枝の存することを見落したるが爲にして、體囊に相當するものは却つて背側管なること、次の *Rosacea* 屬の場合を比較すれば明かなり。尙老成せる保護葉は、其形の關係上、幹に對し亦少しく捩れ、其横軸を幹に平行ならしめて附着す。

營養體は甚だ短き柄部にて幹に連接す。その紡錘形なる胃部には、鮮赤色なる八條の肝隆起 (hepatic ridge) あり。觸手は柄部より起り、刺胞叢は輝ける黃色、末端に

一條の縮み易き細き終絲を垂る。

標品總て七個、春季及夏季に三崎にて得たるもの、小泳鐘長さ一三乃至三〇耗、幅八乃至二〇耗、大泳鐘は長さ幅共に小泳鐘の約四分の五なるを常とせり。保護葉は最大なるものにて長徑五乃至八耗、幅三・五乃至六耗を測れり。最も完全に掬ひ取られしものは、幹の長さ一尺に餘り、活潑に伸縮するを以て、生時は頗る華麗なるものなるが、又甚だ纖弱にして、容易に解離するものなりとす。

太平洋中の分布に就ては、既に印度洋・トールス海峡・馬來地方下カリフォルニア、及東熱帶太平洋に得られ、今我近海に見たることによりて、廣く溫暖なる部分に棲息するものなることを知るなり。

屬 コアヒオヒクラゲ屬

Rosacea Quoy and Gaimard 1827.

(= *Liphyopsis* Chun, 1885).

幹群に特別泳鐘あり。

多くの既知種同定せられたる結果、*R. plicata* Quoy and Gaimard, *R. melusa* (METCHNIKOFF) の二種となれり。茲に報告するは前者のみにして、後者は泳鐘三角錐形に近く、泳囊割合に大、泳鐘及特別泳鐘には、縁膜の基に、痕跡的觸手あるを以て前者と區別せらる。

コアヒオヒクラゲ(第七版第六一八圖)

Rosacea plicata Quoy and Gaimard.

アヒオヒクラゲ (第七版)
(第四—五圖)*Praya cymbiformis* (DELLÉ CHIAJE)

LEUCKART.

Praya adia BLAINVILLE, 1834, p. 137, Pl. VI,

fig. 4.

Diphyes prapensis QUOY and GAIMARD, 1834, p.

106, Pl. 3, figs. 37, 38.

Physalia cymbiformis DELLÉ CHIAJE, 1842, tab.

33, fig. 1.

Praya diples LESSON, 1843, p. 144.*Praya cymbiformis* LEUCKART, 1853, p. 2, Taf. 1,

fig. 4; 1854, p. 286, Pl. XI, fig. 18—24; HUXLEY,

1859, p. 30; KIEFERSTEIN and EICHERS, 1861, p. 20,

Pl. I, fig. 28; HAECKEL, 1888b, p. 146; CHUN,

1897b, p. 66, fig. 8; 1897b, p. 102; BIGELOW, 1911,

p. 200, Pl. II, fig. 1—6.

Praya murina GEGENBAUER, 1854, p. 19, Pl.

XVII, fig. 1—6; HAECKEL, 1888b, p. 146; LENS

and REMSDIKE, 1908, p. 17.

Praya galea HAECKEL, 1888a, p. 35; 1888b, p. 146,

Pl. XXXI, XXXII.

Eudarella galea HAECKEL, 1888b, p. 108, Pl.

XXXII.

Praya (Hurdia) californica GRAYNER, 1899, p.

87, fig. 1—4.

二個の同形なる泳鐘は其腹側を以て相對し、多數の幹群を有する幹は其中間より下垂す。而して兩泳鐘は少し

く形を異にし、大なる方(發生より云へば後より生じたる方)は、その腹側にある左右の翼狀部を以て、小なる方の同様なる部分を抱き、後者は又幹の基部を完全に抱擁す。此翼狀部の間に存する上下に通せる大なる凹溝は、他の鐘泳類に於る幹室に相當する部分にして、凹溝の中央正中線に沿うて縦に附着せる三角形の柄辨は即ち、泳鐘が幹の頂點に附着するための構造なり。泳鐘の背側及横側は、共に圓滑にして、稜を有せず。泳鐘の全形は縱軸が内方に彎曲せる圓柱形、即ち寧ろ腎臟形に近し。

泳囊は圓錐形にして、割合に甚だ小く、泳鐘の下方三分の一に占居す。其圓き口は、斜に背下方に向ひ、廣き縁膜を有す。短き柄管は、幹より柄辨を通じて寒天質中に入るや、上下の枝管を分出し、直線に進みて泳囊の頂に達す。兩枝は幹室溝の正中線に沿ひて上と下とに向ひ、殆ど泳鐘の上下端に達せんとして盲狀に終る。四條の放射管は之を二對に分ち得べく、背側管と腹側管とは共に簡單にして、直線に射囊口に向へども、左右の横側管は甚だ長くして、泳囊壁に沿ひて壁に頗複雑なる特有の迂曲をなせり。

長く細き幹はその上に無數の幹群を運べり。各群部は一個の保護葉、一個の營養體、一本の觸手、及一個若くは多數の生殖體より成る。幹の基部にある無數の芽は、螺旋狀に密集して、全體として恰も一個の球の如く、そ

●鐘 泳 管 水 母 類 (三)

第二科 アヒオヒクラゲ科 (二鐘科)

Prayidae KÖLLIKER, 1853.

(= Prayomorpha Chun, 1888

= Oppositae Chun, 1892.)

相對立せる二個(時として三—四個)の泳鐘は、何れも全く同一の構造を有す。多くは泳鐘の新陳代謝あり。幹群に保護葉あり。多くは幹群游離せずして、幹に附着して停まる。

第一亞科 カタワクラゲ亞科

Amphicaryoninae Chun, 1888.

二個の泳鐘形不同。そは古き方退化變形して盾狀、保護葉の如きものとなる故なり。泳鐘の新陳代謝なく、自由游泳性「ユードキシッド」を作る。

此後の二性質は本科中本亞科のみに見られ、本亞科が前科に近縁ある事を示す。次の一屬あるのみ。

屬 カタワクラゲ屬

Amphicaryon Chun, 1888.

カナリー島産一種 *A. acule* (挿圖第七)あるのみ。昔ハッケルの報告せし一種 *Nitophyes pettifera* も同種なるべしと

(論 說) ○鐘泳管水母類 (川村)

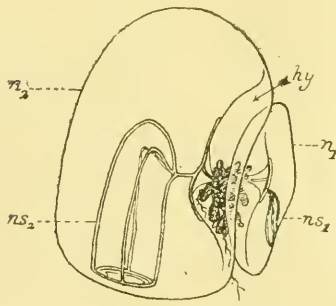
疑はる。

理 學 士 川 村 多 實 二

第二亞科 アヒオヒクラゲ亞科

Prayinae HAECKEL, 1888.

二個の泳鐘殆ど同大、後より生ずる泳鐘によりて置換せらる。幹群は永久に幹の上に停まるものゝ如し。最古く知られたる三屬 *Rosacea*, *Liliopsis*, *Praya*



ありて、各多數の種記載せられあるも相混亂せり。近頃 *Liliopsis* を *Rosacea* に合併する者多し。其他 *Netotromus* はビケローの附加せし新屬 *Desmalia* と *Desmophyes* とは共にハッケルの作りし舊屬なり。

屬 アヒオヒクラゲ屬

Praya BLAINVILLE, 1834.

幹群に特別泳鐘なし。現時認めらるゝもの唯一種。

