

Calyconectid Siphonophores (II)
by
Tamiji Kawamura
Dobutz, Z. Tokyo, 27, 191-198, 1915
Translated by Rodney Notomi

The bracketed [..] and emboldened comments are Totton's marginalia.

Although the number of siphonophore specimens collected by the author is negligible, if we take into account the distribution of these animals, based on reports made by many investigators in the past, we strongly believe we may yet find in the waters off our coasts at some future time, not only those species occurring in the southern Pacific and the Indian Ocean but also the species said to be exclusively endemic in the Atlantic. The author, therefore, will attempt to give a systematic view of the siphonophores with some supplementary notes on the characteristics of the major sub-families and genera in addition to the discussion on the specimens studied by him. Several specimens collected at Misaki, and studied by the author, are in the specimen room of the Department of Zoology, College of Science, Tokyo Imperial University. Each anatomical part of many of these specimens was purposely removed from the stem. Some specimens have, therefore, lost the usual appearance of the animal as a whole but each part was carefully preserved in individual bottles for further detailed studies.

Sub-order (or Order) Calycophorae

Calycophora Leuckart, 1854 (Calyconectae Haeckel, 1885)

The order (or sub-order) has neither a pneumatophore nor palpons. One or many nectophores are found on the upper end of a very thin, long stem and are capable of withdrawing the stem. The cormidia which are evenly arranged on the top of the stem are provided with a siphon, a tentacle, gonophores and, in some cases, with a bract. Some cormidia break loose and become eudoxids.

I Family Sphaeronectidae Huxley, 1859

(Monophyidae Claus, 1874, Sphaeronectinae Chun, 1892)

This family has a single nectophore that does not undergo regeneration. Its cormidia have bracts and become eudoxids.

I Sub-family Sphaeronectinae Haeckel, 1888

(Sphaeronectidae Chun, 1892)

The smooth nectophore undoubtedly is the primary nectophore. Originally this sub-family had two genera, *Sphaeronectes* and *Monophyes*. Although the shape of the hydroecium and the somatocyst differ, Schneider claimed that the difference in shape of the nectophore only indicates the extent of its growth and that other characteristic differences serve to identify the species. The familiar genus *Monophyes* eventually went out of existence rather than being united into the former genus.

(Tamakura Zoku) Genus *Sphaeronectes* Huxley, 1859

This genus includes 3 definitely recognised species at present. These are *Sphaeronectes truncata* (Will) Schneider (Figure 1); *S. irregularis* Claus; *S. princeps* Haeckel. Each species has a number of synonyms. The second species differs from the first by the greater size of its nectophore and the curved lateral radial canal. The third is distinguishable by its hydroecium being ditch-like instead of a conical depression. None of these species, however, have been found as yet in our waters.

The eudoxid of this genus was previously called *Diplophysa* (figure 2).

II Sub-family Mugiinae Bigelow, 1911
(Cymbonectae Haeckel, 1888)

As the smooth primary nectophore breaks loose, it is permanently replaced by 4 or 5 pentagonal drill-like secondary nectophores. This sub-family has 3 genera, *Muggiaea*, *Doromasia*, and *Cuboides*. *Cymbonectes* and *Halopyramis* known in the past are considered at present as belonging to the first and third genera respectively.

Genus *Muggiaea* Busch, 1851

The nectophores are pentagonal and drill-like in shape. A special nectophore is not present in the cormidia. There are at present 4 species in the genus *Muggiaea* *atlantica* Cunningham; *M. kochi* (Will) Chun; *M. pyramidalis* Haeckel; *M. (Cymbonectes) huxleyi* Haeckel. The author has been able to collect only the first species. The second species with a short somatocyst barely extending half way up the height of the nectosac and the third with a tall hydroecium extending half the height of the nectosac, both differ from the first. The characteristic structures of the last species are not quite clear and there are today many scientists who doubt the validity of the species.

The eudoxid of this genus was mostly separated in the genera *Cucubalus* and *Ersaea*.

Muggiaea atlantica Cunningham

Muggiaea pyramidalis Haeckel, 1888, p. 139

Cucubalus pyramidalis Haeckel, 1888, p. 109 (eudoxid)

Muggiaea atlantica Römer, 1902, p. 172; Vanhöffen, 1906, p. 13, figs. 8-9; Bigelow, 1911, p. 187, pl. VII, fig. 7, Pl. IX, figs. 7-8.

The nectophore is drill-like with an inflated middle and five unbranched ridges that begin at the apex. Of these, one on the inner dorsal side and one pair on the dorso-lateral side are approximately the same length. They end in extremely inconspicuous teeth which encircle the dorsal side of the nectosac opening. The remaining pair of the ventral side are slightly longer and end in a weak tooth on the ventral side of the nectosac. Near the dorsal of this tooth, and midway to the ventro-lateral tooth each side is an additional tooth which is far stronger than the other five teeth and extends further downward at the lateral side of the hydroecium opening. The five ridges of the nectophore and the circular margin of its lower end are smooth but have extremely weak saw-teeth.

The nectosac is conical with an inflated middle. Around its lower opening is a wide velum and circular canal. The length of the four radial canals is not equal; the ventral canal is exceedingly short, while the dorsal canal is very long. It loops about the apex of the nectosac, runs nearly the entire length of the median line extending from the dorsal to the ventral side. A pair of lateral radial canals are located on the side wall of the nectosac are parallel to the dorsal canal. Thus, the point at which the 4 radial canals converge is somewhere on the ventral side of the nectosac, very near the lower side. This point and the apex of the hydroecium are connected by a short stalk canal.

The hydroecium is bell-like and extends about 1/3 the length of the nectosac. Half of it lies above the nectosac opening. The lower part of the dorsal wall of the hydroecium, that is, the part forming the partition between the hydroecium and the nectosac opening is slit in the median line; consequently, the dorsal wall is equally divided to left and right in the form of petals.

The somatocyst is a long column; its dorsal side and lateral wall are composed of large polygonal cells. Its lower end is somewhat small and attached directly to the hydroecium. The apex of the somatocyst is at the same height as that of the nectosac or a little higher in smaller specimens. At the apex is an oleocyst. The stem and the cormidia are a light yellowish brown. The bract, siphon, tentacle, and gonophores are attached to the stem. However, the specimens examined by the author all had a short stem, and no mature cormidia were seen. No one has yet been able to see clearly the cormidia of this species. The cormidia themselves are known to break loose, but whether they occur as eudoxids or not is uncertain. Vanhöffen has called it *Ersaea eschscholtzi* (*Eudoxia eschscholtzi*) but this identification is questionable - Haeckel's *Cucubalus pyramidalis* too is only found in synonymy.

This species is very common at Misaki - particularly in winter. The length of the nectophore is from 3.5 to 4 mm and the maximum width of the dorsal and ventral sides is 1.3 to 2 mm. However, according to other reports on the Pacific form of this species, there were some specimens whose nectophore attained a length of 8 mm.

Genus *Doromasia* Chun, 1888

The nectophore is pentagonal and drill-shaped. A special nectophore is found on the cormidia. Chun described *Doromasia bojani* and *D. picta*, but recently the former was found to have an inferior nectophore, at present only the latter remains in this genus. **[both same species]**

Doromasia picta (Pl. VII, fig. 2) *Diphyes dispar*

Doromasia picta Chun, 1888, p. 14; 1892, p. 115, Pl. VII, figs. 3-5, Pl. IX, fogs. 5-10, Pl. X, figs. 1-9; 1897, p. 1; Günther, 1903, p. 428.

Ersaea picta Chun, 1892, p. 122, Pl. VII, figs. 4-5, Pl. IX, fig. 10; 1897, p. 1 eudoxid

Muggiaea bojani Schneider, 1888, p. 98 (partim)

Diphyopsis picta Mayer, 1900, p. 75.

Ersaea hispaniana Mayer, 1903, p. 77, Pl. XXIX, fig. 100 (Eudoxid)

The nectophore is pentagonal drill-shaped with five unbranched ridges which diverge from its apex. These ridges are convex in the lower half of the organism while at the upper they become concave and near the apex they again curve outwardly. This elongated shape is as if the upper half of a drill had been pulled out. The upper 1/3 of these ridges are extremely sharp, appearing like wings. Consequently, the degree of concavity of the surface is very great on this part of the organisms. Along the lower 1/3 slightly noticeable serrations are found. All five ridges end in five tooth-like processes at the lower end. Of these, the one on the dorsal side is like a four sided drill and the pair of slightly weaker three sided drill-like processes on the dorso-lateral sides, together surround the nectosac dorsally and laterally. The remaining ventro-lateral pair have a three sided drill-like shape and are situated at the ventral side of the opening of the hydroecium. Their pointed ends are slightly below the level of those on the dorsal side. In addition to the five tooth-like processes, a pair of extremely strong three sided (drill-like) teeth are found laterally on the lower side of the nectophore, the nectosac and the hydroecium openings. Therefore, the pair of pentagonal "drill" surfaces on the ventro-lateral sides are trapezoidal while the other three surfaces are all equilaterally triangular.

The nectosac is a long column whose upper 1/3 is like a small canal. Near the apex of the nectophore, the nectosac ends blindly. This canal is, however, increasingly larger in diameter toward the lower part, forming a cone, by which it becomes connected to the columnar part. (Chun stated this transitional part often bends slightly toward the ventral side.) A weak constriction occurs dorsally near the

nectosac opening. This opening is round with a well developed velum. The four radial canals are quite uneven in length, because the stalk canal reaches almost to the lower end of the nectosac. The ventral canal is extremely short and runs in a straight line only for a short distance while the dorsal canal runs upward almost the full length of the ventral median line and passing over the apex turns downward along the dorsal median line. The pair of lateral canals run up and down parallel to the dorsal canal but since they do not enter the canal part of the upper half of the nectosac their length is much shorter than the dorsal canal. There are seven bright yellow spots on the nectosac wall - one each on the apex, slightly above the centre on the ventral side, and on the centre of the dorsal side; one pair ventro-laterally at 1/4 distance below the apex; lateral pair near the nectosac opening. (According to Chun, the Pacific species have three spots - one at the apical ventral side; another in the lower part of the dorsal side and the third in the lower part of the ventral side respectively.)

The hydroecium is bell shaped, occupying the lower 1/3 of the nectophore on the ventral side. The lower opening is trapezoidal and ends in four strong pointed teeth as previously described. Of the four sides of this trapezoid, the lateral ones are almost straight and the dorsal bilateral pair are in a conspicuous arc, curving upward.

The somatocyst is columnar, slightly smaller at the lower side, and the dorso-lateral wall has large bubble-like cells. It occupies the centre 1/3 of the nectophore on the ventral side and its apex which stores the oleocyst is situated at about the height of the lower end of the canal-like part of the nectosac.

The stem is short and ordinarily has either 2 or 3 well developed cormidia. (the author's specimen had one cormidium and thus follows Chun's description.) The upper end, that is, the cormidium budding zone is slightly inflated with numerous small buds. From the ventral side where the stem is connected with the somatocyst, a stalk canal comes out and runs downward paralleling the ventral wall of the nectosac along the dorsal wall of the hydroecium. Slightly above the opening of the nectosac it becomes connected with the four radial canals.

In this case, the stalk does not immediately branch out into the four radial canals but first develops into a simple net-like canal system (according to Chun this may be an exceedingly complex system), between which come the radial canals, a characteristic of this species. Each cormidium is composed of one bract, siphon, tentacle, special nectophores and many buds of numerous gonophores. On the bract are three sharp teeth - one on the median line and the other two laterally. The bract itself is attached to the stem at a point somewhere within the upper concavity and covers other parts of the cormidium like an officer's cape. Adjacent to the point of contact, the bract has a small kidney-shaped sac within the bracteal gelatinous material, and appears to encircle the ventral side of the stem on its concave side. About the time the cormidium becomes an eudoxid it should have an oil drop within. The siphon is columnar and consists of an extremely short, thin stalk, a short, thick walled basal part, an inflated stomach with a thin wall, and a well developed muscular proboscis. The tentacle grows from the upper side of the siphon stalk and has countless branches, that is, tentilla. The stem and cormidia are light yellowish brown while the tentilla are a very beautiful yellow. With the author's specimen, it was not possible to see a reasonably well developed special nectophore and gonophores but as described by Chun, they are not different from the corresponding parts of an eudoxid *Ersaea bojani*.

This species [*D. picta*] was classified by Chun (1888) from his catch at the Canary Islands and differs from our specimen [*D. dispar*] on the position of the

yellow spots found on the nectosac wall - such a characteristic, however, does not fully warrant further reclassification.

Chun, at the same time classified *Doromasia bojani* from the Pacific species collected by the “Vettor Pisani” and claimed that this and the previous species are the Atlantic and Pacific forms respectively [**of one species**]. However, at present, *Doromasia bojani* is placed in the family Diphyidae. Furthermore since *Doromasia picta* [***D. dispar***] was caught at Misaki, presumably the occurrence of the latter is not limited to the Atlantic Ocean. Thus, it definitely points out an error in Chun’s theory on this question. [**Kawamura’s error in identification of his species**]

Our specimen was found in plankton off Misaki on December 29, 1907 - length and width of the nectosac were 9.5 and 3 mm respectively.

Supplement

Ersaea bojani (Eschscholtz) Chun

Eudoxia bojani Eschscholtz, 1825, p. 743, taf. 5, fig. 15; 1929, p. 125, taf. 12, fig. 1

Eudoxia bojani Huxley, 1859, p. 59, Pl. II, fig. 7

Cucullus gracilis Haeckel, 1888b, p. 100

Ersaea dispar Haeckel, 188b, p. 361

Ersaea bojani Chun, 188, p. 1154; 1892, p. 108, fig. 7

Ersaea picta Chun, 1892, p. 98, p. 101, fig. 6, pl. XI, fig. 8

Ersaea bojani Lens and van Riemsdijk, 1908, p. 6, figs. 1-6; Bigelow, 1911, p. 264, pl. XI, figs. 7-8.

This organism is not clearly a member of this genus and its scientific name was originally given to a monogastric generation (an eudoxid) whose parent had not been definitely identified. However, since the species has been once identified as the eudoxid of *Doromasia picta* by Chun, it is included here for convenience. Chun defined two monogastric species *Ersaea picta* and *Ersaea bojani* in preference to placing them in the genus *Doromasia*. Their structural characteristics are nearly the same. The only positive difference between them is the shape of the somatocyst. Actually, the only difference between them was that the somatocyst of *Ersaea bojani* is wide, protruding upward in a blind sac in the right upper corner while that of *Ersaea picta* is almost oval. In 1908, A.D. Lens and Th. van Riemsdijk reported as a result of studying various specimens caught of the “Siboga” expedition that between the somatocysts of the species discussed above there are many transitional forms which in reality link these two forms together. Thus any differentiation between them is impossible. Simultaneously, these investigators reclassified one of the parents, *Doromasia bojani*, under a different family group in the genus *Diphyes*.

Consequently, this eudoxid became a lost child between the families Monophyidae and Diphyidae. However, in this case, had either one of the relations been *Doromasia bojani* and *Ersaea bojani* or *Doromasia picta* and *Ersaea picta* been defined before, this eudoxid would have probably been classified in the right genus. Unfortunately, such was not the case. Chun, himself, who should have been in a position to find the missing link, based his classification of these species on various analogous characteristics of bracts, tentacles, etc. and not on certain indisputable facts.

Consequently, today, it can only be called a eudoxid whose parent is unknown.

Ordinarily, as has been mentioned in several reports, the genera *Doromasia* and *Diphyes* or *Diphyopsis* are quite similar in a number of respects and even the parents are exceedingly difficult to distinguish. Therefore, it is not at all strange that their eudoxids resemble each other so closely. Even among the specimens of *Ersaea bojani* mentioned above it is not known whether “a” is an offspring of the genus *Doromasia*

and “b” of the genus *Diphyes* or some other genus. So at present we can only accept the specimens for what they are.

The bract of this species has the shape of a dagger without a hilt and appears to be egg-shaped when seen from the dorsal side. Its length is about twice its width with the thicker upper half gradually tapering toward the lower end. It finally terminates in a thin, leaf-like form. The dorsal surface is convex and its upper margin is a smooth arc while its lower margin has three teeth, one situated on the median line while the other two are lateral. The tooth on the right side is not conspicuous but there are several serrate teeth between it and the centre process. The ventral side is wide, shallow and slightly concave. Especially, in the lower half, this concavity appears to coincide with the depression on the upper surface of the special nectophore which faces it. This provides a space for expansions and contractions of the siphon and the tentacle. The wide oval somatocyst is situated in the centre of the bract. At its right end there is a slight protrusion that bends upward. The oleocyst is commonly found either at or near its blind end. The inner wall of the somatocyst is made of many bubble-like cells. The lower part has an ordinary outer covering layer and the upper part is thicker. The somatocyst itself becomes connected to a short, thick stem at its under side. Around this is a ring of thick cortical cells. Each cell contains numerous granules. This is the first characteristic Chun observed and is very interesting histologically. The siphon is short and columnar. Its large stalk is connected to the stem without distinction, the basal part is thick, the stomach is a yellowish-green with a pyloric constriction at the base, and a well developed muscle is found on the proboscis. The tentacle grows from the dorsal side of the stalk. Its structure is of the usual type. The stem and cormidia are a light yellow.

The special nectophore is on the lateral side of the bract and the siphon. Because it is firm and shaped to these parts, the general shape of the eudoxid does not vary too greatly on expansion or contraction. Its shape is roughly square drill-like with four sharp ridges. When it is well developed, it resembles a square pillar whose upper end appears to have been cut diagonally. On its surface is found a slight four cornered drill-like process in the centre. In an older specimen the lateral symmetry is more or less lacking. This may easily be ascertained from the fact that the paired ventral ridges are sharper than the dorsal ones. At the lower end they end in strong teeth. All four ridges are serrated on the lower half. Of four borders which enclose the lower surface of the special nectophore the ventral one is almost straight, but the other three prominently curve upward. In all case the strong serrate teeth are present. The nectosac of the special nectophore is columnar and its length is approximately three times greater than its width. Its opening is round, with a well developed velum. The stalk canal leaves the stem at the left lower part of the somatocyst and enters the gelatinous part of the nectophore on the middle of the upper surface. After running in a short straight line to the upper ventral side of the nectosac, this canal branches into the dorsal and ventral radial canals. Of these, the dorsal shortly branches again into lateral canals to the right and left. Thus, these four radial canals finally become connected with a ring canal at the opening of the nectosac. However, these radials canals, especially the dorsal canal, run counter-clockwise, spiralling downward.

The eudoxid is either male or female. The first gonophore and those that develop subsequently are always the same sex. The gonophore grow attached to the ventral side of the stem. Generally, they are situated on the right side of the special nectophore. As far as their sizes are concerned, even a fully mature gonophore is far smaller than the special nectophore. The form and structure of the gonophores are, as a whole, similar to those in the Calycophorae.

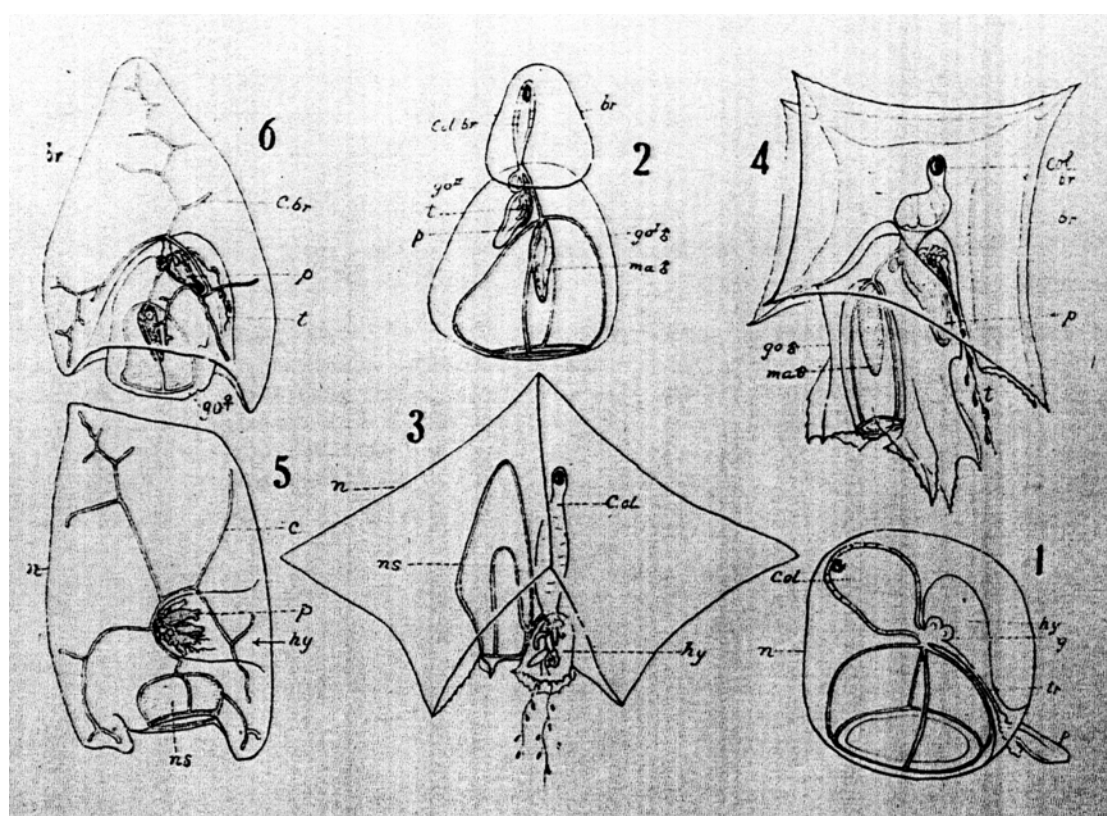
The author was able to collect many specimens of this species in the spring of 1908 to add to the plankton collections of the Misaki Marine Experiment Station. Many of them, however, were so-called species "*picta*" type or had a somatocyst similar to this species. One has a species "*bojani*"-type somatocyst.

The overall length of the colony was between 4.5 and 8 mm and a maximum width of approximately 2.5 to 4 mm.

Genus *Cuboides* Quoy and Gaimard, 1827

This generic name was commonly given to the monogastric generation and *Halopyramis* was given to the polygastric generation. Heretofore, a tremendous number of species have been reported in this group but, at present, all of them are recognised as one species, that is, *Cuboides vitreus* Quoy and Gaimard (drawings - fig. 3 and 4) and *Cymba cuboides* Eschscholtz, *Abyla vogtii* Huxley, *Halopyramis adamantina* Chun, *Cuboides crystallus* Haeckel, *Enneagonum hyalinum* Schneider etc, are all synonyms. Until recently it has been called by the generic name *Halopyramis*. Bigelow, however, claimed that, in the strict taxonomic sense, the name of any part even of a eudoxid, may have priority and hence adopted the name *Cuboides*.

Although this species has not yet been caught by use, it probably does occur in our local waters since it has already been reported as occurring in the Indies, Malayan waters and the Eastern Tropical Pacific.



Legends

Vol. XXVII, Plate 7, Figures 1-6.

Figure 1. *Sphaeronectes truncata* Chun

Figure 2. eudoxid.

Figure 3 *Cuboides vitreus* Chun

Figure 4. eudoxid.

Figure 5. *Nectopyramis diomedae* Bigelow

Figure 6. eudoxid

br. bracts; c.br. bracteal canal system; col. somatocyst; col.br. bracteal somatocyst;
go. gonophore; hy. hydroecium; mas. gonophore manubrium; n. nectophore; ns.
nectosac; p. siphon.

III. Sub-family Nectopyramidinae Bigelow, 1911

In this sub-family the branched canal system within the smooth nectophore corresponds to the somatocyst. There is only one genus which was described from a specimen caught on the "Research" cruise of 1900.

Genus *Nectopyramis* Bigelow, 1911

This genus has only two species, *Nectopyramis thetis* Bigelow, and *Nectopyramis diomedae* Bigelow (figs. 5 and 6). The former occurs in the Bay of Biscay and the latter in the Southern Pacific. However, it is not yet known in Japanese waters.

の泳囊は、圓柱形にして、長さ凡そ幅に三倍す。その開口は圓形にして、よく發達したる縁膜を備ふ。柄管は、體囊の左下方に於て幹より起り、特別泳鐘上面の中央に於て寒天質中に入り、短距離を直線に走りて、泳囊腹側上方に達し、此所にて背腹の二放射管に分岐す。此内背側管は、間もなく右側に向ひて横側管を岐出し、次で又左側に岐出し、かくて四條となれる放射管は、泳囊口に於て、環狀管によりて相連結せらる。而して放射管、特に背側管は、上方より下方に行く間に横に移りて左旋形を取れり。

「ユードキシッド」は雌性なるか、若くは雄性にして、一個の生殖體と、是に次で芽出する生殖體とは、常に性を同うす。生殖體は幹の腹側に附着して生じ、通常は、特別泳鐘の右側に位置するものなり。充分生長せし生殖體と雖、形遙に特別泳鐘よりも小なり。生殖體の形及構造は、一般鐘泳類の場合と異らず。

余は、明治四十一年春、此種の多くの標品を三崎實驗所プラントン中にて得たり。其内の多くは、所謂 *pecta* 型、又は是に近き體囊を有したりしが、一個は *boiani* 型の體囊を有したりき。群體は全體として長さ四・五乃至八耗、左右幅(保護葉の最大幅)二・五乃至四耗ありたり。

屬

Cuboides QUoy and GAIMARD, 1827.

本屬名は、元來單營養世代に附せられたる名にして、多營養世代には、別に *Hyalopyramis* の名ありて、從來是に入るべきものとして報告せられたる種甚だ多かり

しも、現時は總て同一種と認めらる。即ち *Cuboides viridis* QUoy and GAIMARD (挿圖第三及第四) について *Gymba cuboides* ISCHSCHOLTZ, *Abgyle voglii* HUXLEY, *Halopyramis adamantina* CHUN, *Cuboides crystallus* HAECKEL, *Emneagomum hyalinum* SCHNEIDER 等はその異名なり。而して近頃迄、*Halopyramis* を屬名とせしが、ビゲローは、命名規約を嚴守すれば、たとへ「ユードキシッド」に附せられたるにもせよ、優先權を有すべしとして、*Cuboides* を屬名として採用せり。

未だ採集せしことなきも、既に、印度太平洋、馬來近傍、東熱帶太平洋にて報告せられれば、我近海にも産するなるべし。

第三亞科 アミスチクラゲ亞科

Nectopyramidinae BIGELOW, 1911.

圓滑なる泳鐘、體囊に相當するものは、分岐せる細管系統なり。

一九〇〇年『リサーチ』號の採りたる標品によりて作られたる一屬あるのみ。

屬 アミスチクラゲ屬

Nectopyramis BIGELOW, 1911.

二種あり、即ち *N. thetis* BIGELOW, *N. diomedea* BIGELOW (挿圖第五及第六) の二種にして、前者はビスケー灣、後者は南太平洋産なり。日本には未だ知られず。

の少許の類似を基として推測したるものたるに止まり、決して證左の動かす可からざるものありしにあらす、従つて今日に於ては、單に、母體不明の「ユードキシッド」と稱する外なし。元來、既に緒論に於ても述べ置きたるが如く、*Dorastasia* 屬と *Diphyes* 又は *Diphypsids* 屬とは、諸々の點に於て酷似し、母體に於ても區別すること甚だ困難なる位なれば、其「ユードキシッド」が酷似せるは毫も怪むに足らず。即ち茲に掲ぐる *Ersacca bojani* の標品中にて、甲は *Dorastasia* 屬の子にして、乙は *Diphyes* 屬の子なるや、或は又其他の屬より來れるものなるやも知れざれど、今日に在りては、そは唯標品自ら知る丈に止まるなり。

保護葉は、其形、柄を去りたるヒ音の如く、背側より見れば卵圓形にして、其長さ幅に二倍す。厚さは上半に於て大に、下半に至れば減じて薄葉となる。背面は凸にして圓滑、その上縁は滑なる弧線なれど、下縁には三個の齒あり、一は正中線に、他の二はその兩側にあり。右側の齒は少しく不著明にして、これと中央の齒との間には鋸齒あるを見る。腹下面は廣く、淺く、凹。特に下半に於ては、是に對立する特別泳鐘上面の凹陷と相呼應して、營養體及觸手の伸縮する通路を構成す。體囊は保護葉の中心にありて、形横に長き橢圓、往々その右端にて稍細く、且つ上方に向ひ曲りて突出することあり。油滴囊は此盲端、若くは是に近く位置するを常とす。體囊の

内壁は、下方は通常の上覆層なるも、上に於ては厚くして、多くの大なる胞狀細胞より成る。體囊は腹下面に於て太く短き幹に移行す。此部を取圍みて、輪狀をなせる表皮細胞の増厚部ありて、各細胞内に多くの顆粒を有することを見る。こはクーンが初めて注意したることにして、組織學上に興味ある所とす。營養體は短き圓柱狀。その太き柄部は幹と區別なく引續き、基部は厚く、胃部は是と境するに、黃綠色の縊れたる部 (pyloric constriction) を以てし、吻部にはよく發達せる筋を見る。觸手は柄部の背面より起り、構造常の如し。幹幹群は、總て淡黃褐色を帶び、觸手の刺胞叢は美麗なる黃色なり。

特別泳鐘は、保護葉及營養體の腹側にあり、是等と堅く適合せるを以て「ユードキシッド」の全形は、著しく伸縮變更する事なし。特別泳鐘の概形は、四個の鋭き稜を有する四角錐形なるが、よく發達したるものにては、恰も上端を斜に切り去りたる一個の四角柱が、其斜なる上面の中央に一個の些細なる四角錐突起を載せたるものと考ふれば可なり。又老成したるものにては、多少左右不相稱形あるも、元來は左右相稱形なり。此事は一對の腹側の稜が、他の一對の背側の稜よりも鋭くして、下端に於ても、より強き齒に終れることによりて了解し得べし。四稜は皆その下半に於て強き鋸齒を有す。特別泳鐘の下面を繞れる四邊は、腹側に於ては殆んど直線、他の三邊は著しく上方に弧形に曲る。共に強き鋸齒を有す。特別泳鐘

クーンによるに、其構造は次に述ぶる「ユードキシッド」*Eysaea bojani* のものと異らずといふ。

本種はクーン(一八八八)がカナリ島にて得たる標品により作れるものにして、我標品とは泳囊壁に存する黄斑の位置を異にするも、これは種を別にする程の性質に非るべし。クーンは同時に“Vettor Pisani”號の採りたる太平洋産標品より、*Doramasia bojani* を作り、之を比較詳論して、兩者は、夫々太西洋及太平洋種として相對立せしむ可きものなりとなせしが、近頃 *D. bojani* はフタツクラゲ科に入り、今又三崎に於て *D. picta* を得たるを以て、後者の決して太西洋に限られたるものにあらざることを知るべく、クーンの説の誤れること明かなり。

標品一個。明治四十年十二月二十九日、三崎沖プランクトン中より得たり。泳鐘の長さ九五耗、背腹の幅三耗。

附 *Eysaea bojani* (ESCHSCHOLTZ) CHUN. (第七版第三圖)

Eudorcia bojani ESCHSCHOLTZ, 1825, p. 743, Taf. 5, fig. 15; 1829 p. 125; Taf. 12, fig. 1.

Eudorcia bojani HUXLEY, 1859, p. 59, Pl. III, fig. 7.

Cucullus gracilis HAECKEL, 1888b, p. 110.

Eysaea dispar HAECKEL, 1888b, p. 361.

Eysaea bojani CHUN, 1888, p. 1154; 1892, p. 108, fig. 7.

Eysaea picta CHUN, 1892, p. 98, 101, fig. 6, Pl. XI, fig. 8.

Eysaea bojani TESS and RIEMSDIJK, 1908, p. 6, fig. 1-6; BIGELOW, 1911, p. 264, Pl. XI, figs. 7, 8.

本動物は、明かに此屬に入れらるべき種にはあらずして、此學名は、元來、母體の不明なる一個の單營養世代、即ち一の「ユードキシッド」に與へられたる名稱なるが、曾てクーンによりて、上記ヤリクラゲの「ユードキシッド」と同定せられし事ある因縁よりして、便宜上茲に挿入し置くのみなり。前に述べたる二種の *Doramasia* に對して、クーンは、夫々 *Eysaea picta*, *Eysaea bojani* なる二種の單營養世代管水母を選定せしが、兩者は殆んど其構造を同うし、その間の明確なる區別としては、唯體囊の形あるのみなりき。即ち *E. bojani* の體囊は、横に長く、右上方の一隅、上方に向ひて盲囊狀に突出せるに、*E. picta* には之なくして、圓滿なる橢圓に近き形を取るといふ事のみなりき。然るに其後、一九〇八年に至り、レンス及ファン・リームスデークの二女史が、『ジボガ』號の採りたる多數の標品を検して、右の體囊の形には、其間に多くの移行型ありて完全に連結せらるゝことを見、兩者の間の區別を否定したると同時に、母體の一なる *D. bojani* を拉して他科なる *Diphyes* 屬に轉入せしめたる結果、此「ユードキシッド」は、單鐘と二鐘の兩科の間に、迷兒となる事となりたるなり。蓋し此際若し、曩の *D. bojani* 對 *E. bojani* の關係、若くは *D. picta* 對 *E. picta* の關係の何れか、確實なりしならんには、此「ユードキシッド」はその何れが確實なる方に隸屬すべき筈なれども、不幸にして此關係たる、クーンが、保護葉、觸手等

柱形の部分に移行す。(クーンによれば、此移行部に於て、少しく腹方に屈折すること多しといふ。) 泳囊壁背側に於て、泳囊口に近き所に、廣く弱き縊れを見る。泳囊口は圓形にしてよく發育したる縁膜を有す。四個の放射管は、長さ甚だ不等なるが、柄管は泳囊の腹側下端に近く是に達するを以てなり。腹側管は極めて短く、簡單に、直線に、小距離を走れど、背側管は腹側正中線の殆んど全線を上りて、頂點を超へ、背側正中線を下る。他の一對の横側管は、背側管に平行して上下に走れど、泳囊上半の管狀部に入らざるを以て、背側管よりは遙に短し。泳囊壁には七個の輝ける黄色の斑點あり、一は頂端に、一は腹側の中央より少しく上に、一は背側の中央に、一對は腹横側下方四分の一の處に、一對は泳囊口の横側にある。(クーンによるに、太平洋種にては斑點三ありて、頂端腹側に一、背側下方に一、腹側下方に一なりといふ。) 幹室は鐘狀にして、泳鐘腹側の下方三分の一を占む。下端開口は梯形にして、既に述べたる四個の強き齒を其角頂とす。梯形の四邊の内、横側の一對は殆んど直線、背腹兩側のものは共に著しく弧形をなして上方に曲れり。體囊は圓柱形、下方に於て少しく細く、其背横側壁は大なる胞狀の細胞より成る。泳鐘腹側の中央三分の一を占む。油囊を藏する其頂端は、泳囊の管狀部下端の高さに位置す。

幹は短くして通常二個又は三個のよく發育したる幹群

を具ふ。(予の標本は唯一個なりし故クーンによる。) 幹の上端、即ち幹群芽出帶は、少しく膨れ、無數の小なる芽の並立するを見る。幹の體囊に接續する點の背側より一體の柄管出で、幹室の背壁に沿ひ、泳囊腹側壁に平行して下降し、泳囊口の少しく上方に達し、四放射管に接續す。但し、柄管が直ちに四條に分岐するに非ずして、簡單なる(クーンが見たるものにては頗る複雑なる)網目狀の管系統を作り、放射管は此間より分出することは本種の特性的の一なり。各の幹群は一個の保護葉・一個の營養體・一本の觸手及一個の特別泳鐘と、多數の生殖體とに對する澤山の芽より成る。保護葉には三個の鋭き齒ありて、一は正中線に、他の二はその左右側にあり。保護葉は其上内方の一點に於て幹に附着し、恰も將校用外套の如くに、幹群の他の諸部分を被包す。此附着點に接し、保護葉寒天質肉中に、一個の小なる腎臟形小囊あり、其凹弧側を以て幹の背側を少しく圍繞する如き位置を取れり。こは泳鐘の體囊に相當する器管にして、幹群游離して「ユードキシッド」となる頃には、其中に一個の油滴球を藏するものとす。營養體は圓柱形にして、極めて短く細き柄部、短くして壁厚き基部、壁薄くして膨らみ得る胃部、及筋のよく發育せる吻部とより成る。觸手は營養體柄部上側より起り、無數の枝、即ち刺胞叢を有す。幹及幹群は淡き黃褐色、刺胞叢は美麗なる黄色を呈す。充分發育したる特別泳鐘及生殖體は、余の標品にては見能はざりしも

(論 說) ○鐘泳管水母類 (川村)

りも高く(小さき標品にて、茲に油囊(oleocyst)を藏す。幹及幹群は少しく黄褐色を帯び、保護葉營養體・觸手及生殖體附着する筈なれども、余の得たる標本は、總て幹短く切斷せられありて、生成せる幹群を見ざりき。(從來此種の幹群を完全に見たる人なし。) 幹群も分離する筈なるも、此「ユードキシッド」は不明、ファンヘッフェンは *Ersaed eschscholtzi* (≡ *Eudoridia eschscholtzi*) が是なりと云ひしも疑はし。ヘッケルの *Cucubalus pyramidalis* は名稱のみなり。

本種は三崎に最普通にして、冬季に多し。泳鐘の長さは三五乃至四耗、背腹の最大幅は一・三乃至二耗。太平洋産の他の報告にては、長さ八耗に達せしものもありたり。

屬 ヤリクラゲ屬

Boromusia CHUN, 1888.

泳鐘五角錐形、幹群に特別泳鐘あり。

クーンは *D. bojani*, *D. picta* の二種を作りしが、前者は近頃、下泳鐘發見せられて、フタツクラゲ科に轉籍し、今は唯後者のみとなれり。

ヤリクラゲ (第七版 第二圖)

Boromusia picta CHUN.

Boromusia picta CHUN, 1888, p. 14; 1892, p. 115, pl. VIII, figs. 3-5. Pl. IX, figs. 5-10, pl. X, figs. 1-9; 1897, p. 1; GÜNTHER, 1903, p. 428.

Ersaed picta CHUN, 1892, p. 122, Pl. VIII, figs. 4-5, Pl. IX, fig. 10; 1897, p. 1, (Endoxid).

Thyphlocyba bojani SCHNEIDER, 1898, p. 88 (partim).

Thyphlops picta MAYER, 1900, p. 75.

Ersaed hispaniana MAYER, 1903, p. 77, Pl. XXIX, fig. 100, (Endoxid).

泳鐘は五角錐形、頂點より起りて分岐することなき五稜は、泳鐘の下半部に於て外に凸、上半部に於て凹、而して頂點に近く再び凸なるを以て、恰も角錐形の上半部を引き伸ばして、細長くせる形となれり。稜は上三分の一に於て甚だ鋭くして、翼狀をなし、従つて錐面の凹度は此邊に於て最も強し。稜の下方三分の一には稍著明なる鋸齒あり。五稜は下端五個の齒狀突起に終る。此内背面にありて四錐面を有する一と、是より少しく弱き背横側面と横側面とを圍めり。腹横側にある他の一對の齒は、三錐面を有し、幹室口の腹側にありて、其尖端は背面のものよりも少しく下の水平に位す。右の五齒の外、別にはよりも遙に強き一對の三錐面を有する齒ありて、泳鐘の下面兩横側、泳囊口と幹室口との間に存す。是が爲に泳鐘の五錐面の内、腹横側の一對は不等邊四角形をなし、他の三面は熟れも三等邊三角形をなせり。

泳囊は長き圓柱形、其上方三分の一は細き管の如き形をなし、泳鐘の頂端に近く盲囊狀に終る。此管は下方に至れば徐々に其徑を増して圓錐形をなし、次で大なる圓

三屬 *Muggiaca*, *Doramasia*, *Cuboides* あり。昔ありし *Cymbonectes* は第一に *Halopyramis* は第三に同定せらる。

屬 ヒトツクラゲ

Muggiaca BUSCH, 1851.

泳鐘五角錐形、幹群に特別泳鐘なし。

現今四種あり。即ち *M. atlantica* CUNNINGHAM, *M. kochii* (WILL.) CHUN, *M. pyramidalis* HAECKEL, *M. (Cymbonectes) hual yu* HAECKEL の四なりとす。余は其第一のみを得たり。第二は體囊短くして、漸く泳囊の高さの半に達せることに於て、第三は幹室高くして、頂點泳囊の半に達せることに於て是と異なる。第四の特徴は明確ならず、近時疑を挟む者多し。

此屬の「ユードキシッド」は、多くは *Cucubalus* 屬として、又は *Ersaea* 屬として報告せられたるものなり。

ヒトツクラゲ (第七版 第一圖)

Muggiaca atlantica CUNNINGHAM.

Muggiaca pyramidalis HAECKEL, 1858, p. 137.

Cucubalus pyramidalis HAECKEL, 1858, p. 109.

(Endosol.)

Muggiaca atlantica RÖMER, 1902, p. 172; VAN

HÖFFEN, 1906, p. 13, figs. 8-9; BIGELOW, 1911, p.

187, Pl. VII, figs. 1, Pl. IX, figs. 7, 8

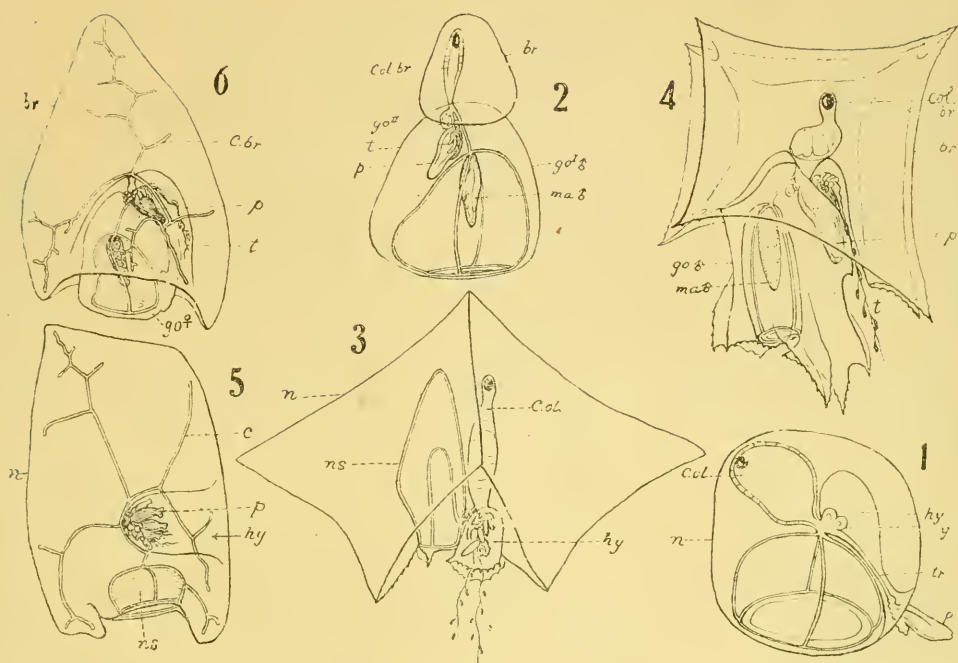
泳鐘は中央の膨らみたる角錐形、頂點より起れる五稜

は分歧することなくして終る。其内背側の一及背横側の一對は殆んど同長にして、下端は泳囊口の背側を圍みて立てる、甚だ不著明なる齒(突起)に終る。腹側にある他の一對は是等よりも少しく長く、泳囊口の腹側に位する弱き齒に終る。此齒の背側に當りて、是より背横側の齒に至る半途に、各側一個の齒ありて、他の五齒に比し頗る強く、泳囊口の腹側に遙に下方に突出す。此一對は同時に幹室口の背側を限りて立てり。泳鐘の五稜及下端の周縁は、總て滑なるか、若しくは極めて弱き鋸齒を有す。

泳囊は中央の膨れたる圓錐形にして、下方開口の周圍に、幅廣き縁膜と環狀管とを具ふ。四放射管は長さ不同、腹側管甚だ短きに反し、背側管最も長くして、泳囊の頂點を迂迴して、背側より腹側に亘る正中線の殆んど全周を走る。一對の横放射管は、稍後者に平行して、泳囊の側壁にあり。即ち四放射管の集合點は、泳囊の腹側に於て、甚だ下方に近く存す。簡單なる一條の短き柄管ありて、此點と幹室頂點との間を連接す。

幹室は鐘狀、長さ凡そ泳囊の三分の一、長さの半分が少しく泳囊口を上を超ゆ。幹室背壁の下部、即ち泳囊口との間に隔壁を劃する部分には、正中線に裂目ありて、爲に壁は瓣狀の左右兩半に分る。

體囊は頗る長き圓柱形にして、背側及横側壁は多角形の大なる細胞より成る。下端少しく細くなりて、幹室の直上に接する。其頂點は泳囊の頂點と同高、又は少しく是よ



第一圖。タマクラゲ *Spherozetes impectu*. (クーンより。)

第二圖。同右。「ユードキシッド」。(同右。)

第三圖。*Cubolites vitreus*. (同右。)

第四圖。同右。「ユードキシッド」。(同右。)

第五圖。アミスデクラゲ *Actopterygus diomedea*. (ビクローより。)

第六圖。同右。「ユードキシッド」。(同右。)

br. 保護葉。 ma. + o. 生殖體柄部。

c. br. 保護葉管系統。 n. 泳鐘。

col. 體囊。 ns. 泳囊。

col. br. 保護葉體囊。 p. 營養體。

co. + o. 生殖體。 tr. 幹。

hy. 幹室。

principis HAECKEL 是れにして、各多數の異名を有す。第二は泳囊の大なること、横側放射管の迂曲せることに第一と異り、第三は幹室か圓錐形の凹入にあらずして溝となれるにて區別せらる。但し是等は日本にては未だ得られず。

此屬の「ユードキシッド」は、元、屬名を *Diphyphysa* と呼びたりき (挿圖。第二)。

第二亞科 ヒトツクラゲ亞科

Mugginae BIGLOW, 1911.

(= *Cymbonectae* HAECKEL, 1888.)

圓滑なる一次泳鐘脫離して、四又は五稜を有する角錐形泳鐘に代り永存す。

●鐘 泳 管 水 母 類 (二)

(第二十七卷
第七版附)

理 學 士 川 村 多 實 二

(四) 記 載

鐘泳管水母類中、余が獲たる屬種は未だ僅少なれども、從來諸家の報告に徴して此動物の分布を考ふるときは、南太平洋・印度洋は勿論、太西洋産として報告せられたる諸屬と雖、他日之を我近海に發見すること無きを保せず。依て茲には、余の檢し得たる種の記載の外、主なる亞科又は屬の特徴を附記して、系統的記載を試みんとす。因に余の檢したる諸種の三崎産標品は、總て東京理科大學動物學教室標本室に現存す。其多くは、必要上、各部分を幹より引き離したる爲、支離滅裂全形を止めざるものあるも、其等の各部は注意して同一罐中に納めあり。

亞目(又は) 鐘 泳 類

Calycophora LUTCKART, 1854.

(= *Calyconectes* HAECKEL, 1888.)

氣胞體無く、感觸體無し。一個或は多數の泳鐘は細長き莖の上端にありて、莖をその一部中に引き納め得。莖の上に等距離に配列せられたる幹群は、營養體觸手生殖體及多くは保護葉を備ふ。幹群脫離して自由游泳性

「ユードキシッド」を作るものあり。

第一科 タマクラゲ科(單鐘科)

Sphaeronectidae HUNLEY, 1859.

(= *Monophyidae* CLATS, 1874

= *Sphaeronectinae* HAECKEL, 1888.)

單一の泳鐘あり。泳鐘の新陳代謝なし。幹群保護葉あり。脫離して「ユードキシッド」となる。

第一亞科 タマクラゲ亞科

Sphaeronectinae HAECKEL, 1888.

(= *Sphaeronectidae* CHUX, 1892.)

圓滑なる泳鐘、そは恐らく一次的泳鐘に當るものならん。元來二屬ありて、*Sphaeronectes*, *Monophyes* と云ひ、泳鐘の外形・幹室及體囊の形狀を異にせしが、シナイダーが、泳鐘の外形は發育程度の差にして、其他の性質は唯種の區別に値すとて、前者に併合せしめたるより、人口に喰炙したる *Monophyes* 屬滅びたり。

屬 タマクラゲ屬

Sphaeronectes HUNLEY, 1859.

現在確實に認めらるゝもの三種あり。即ち *S. truncata* (WILL.) SCHNEIDER (挿圖 第十一) *S. irregularis* CLATS, *S.*