

CONTRIBUTIONS TO JAPANESE ASCIDIAN FAUNA

IX. RE-DESCRIPTIONS OF OKA'S SPECIES FOUND IN "FIGURARO DE JAPANAJ BESTOJ"¹⁾

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With Plate IV and one Text-figure

A. OKA (1927) gave brief descriptions of a number of ascidian species in "Figuraro de Japanaj Bestoj" under new names, each with an explanatory note "(仮)" at the end. This note indicates that the name is given provisionally without full description nor sufficient consideration on the identification. Some of these species were redescribed or some names were replaced with known ones by OKA himself, but eight species remain still untouched in the revised edition of the "Illustrated Encyclopedia of the Fauna of Japan" (1947); they are each marked with (MS) at the end of the name. I had chances to re-examine some type specimens or specimens identified by OKA himself and by this date I could give redescriptions of three species and found out that two are synonyms of the species already known to us. Here, the last three provisional species are redescribed each on the type specimen kept in the Zoological Institute of the Tokyo University of Education.

1. *Synoicum clavatum* (OKA), 1927

(Pl. IV, Figs. E and F)

Polyclinum clavatum (仮) OKA, A. (1927): Ascidiacea in "Figuraro de Japanaj Bestoj," p. 501, Fig. 965.

cit.: TOKIOKA, T. (1953): Ascidians of Sagami Bay, pp. 184-185.

Original description: Colony consists of several club-shaped cormidia united one another at the basal end, by which the animal attached to the substratum. Corona 27 mm in length and 19 mm in diameter, peduncle reaches as long as 37 mm. Surface of colony smooth; test soft, colourless and transparent; zooids can be seen through. Zooid slender, consists of thorax, abdomen and postabdomen; many zooids arranged parallel to the axis of the cormidium. Thin vascular canal issued from the posterior end of the postabdomen and reaches deep into the peduncle. Branchial

1) Contributions from the Seto Marine Biological Laboratory, No. 240.

aperture 6-lobed, a slender languet at the atrial aperture. Thorax and abdomen nearly equal in length. From 10 to 12 rows of stigmata on the thorax. Dist.—From the shallows along the Pacific coast of Honsyû.

Test is gelatinous, soft but sticky in consistency and slightly milky white in colour. System indistinct. The anterior part of the peduncle contains postabdomens of zooids, while the posterior part contains solely vascular prolongations of zooids.

Zooid: About a dozen thin longitudinal muscles on each side of the thorax. Several short transverse muscles behind the atrial aperture. Rows of stigmata 15-17. Tentacles ca. 15. Anus opens on the level from 10 to 12th transverse vessel, bilobed.

Abdomen: Stomach near the middle of the abdomen, roundish in outline and surfaced smoothly, though irregularly wrinkled in strongly contracted specimens. Mid-intestine distinct. Rectum begins near the posterior end of the intestinal loop and has no coecum at the proximal end.

Postabdomen: Very slender, 10-15 mm in length. Ovary situated just behind the intestinal loop. Testicular follicles arranged in 2 rows in the thicker anterior half, while in a single row in the thinner posterior half. The posterior portion contains no follicle but the heart at the rear end.

2. *Leptoclinides tigrinum* (OKA), 1927

(Fig. 1)

Didemnoides tigrinum (坂) OKA, A. (1927): Ascidiacea in "Figuraro de Japanaj Bestoj," p. 498, Fig. 960.

cit.: TOKIOKA, T. (1953): Ascidiaceans of Sagami Bay, p. 15.

TOKIOKA, T. (1953a): Publ. Seto Mar. Biol. Lab., vol. III, No. 1, p. 2.

Original description: Colony irregular in shape, encrusting stems of sea weeds such as *Sargassum* and less than 2 mm in thickness. The surface of the colony nearly smooth and coloured yellow and black as in the fur of the tiger. Test soft and contains numerous stellate calcareous spicules. Zooids short, consists each of thorax and abdomen and situated perpendicularly. They are arranged in simple but irregular systems. Common cloacal apertures roundish in outline and scattered here and there. Four rows of stigmata which are short and straight. Dist.—From the shallows along the coast of Honsyû.

Colony usually less than 3 mm in thickness, although it reaches as thick as 5 mm where it encrusting both surfaces of leaves of *Sargassum*. Pale grayish brown in colour in preserved specimens. No pattern nor system found on the surface. All spicules are dissolved and leave whitish vestigial spots scattered in the test. They are found sparsely in the layer containing zooids, but none in the superficial layer

where some traces of pigments are found and let us surmise the existence of the deep pigmentation in a fresh state. Judging from the size of the vestigial spots, the spicules are considered to be considerably large.

Zooid: Average distance between zooids 760μ . Thorax 680μ and abdomen 900μ in length in an examined zooid.

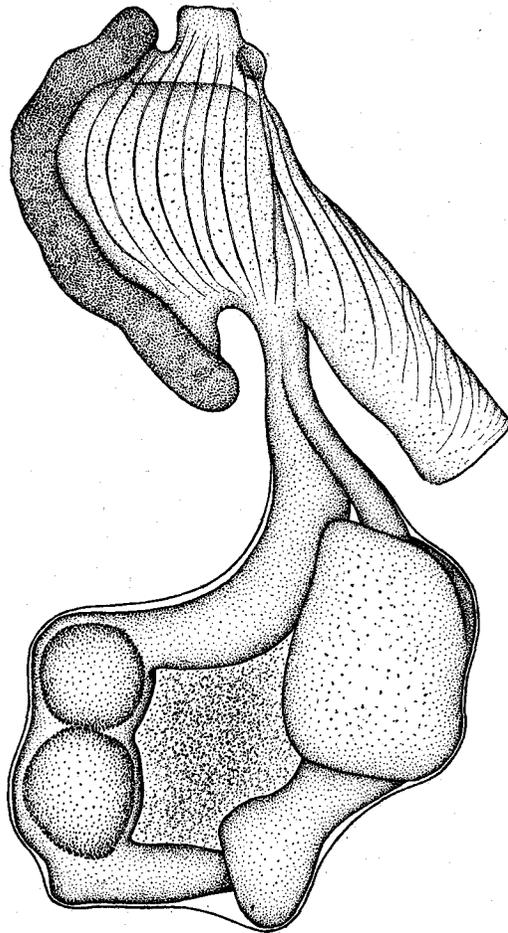


Fig. 1. *Leptoclinides tigrinum* (OKA). Zooid from left side, $\times 75$.

Thorax: Atrial siphon situated at the dorso-posterior corner of the thorax, rather long and stretched posteriorly. About 10 longitudinal muscles on each side of the thorax. Tentacles ca. 8. Less than 8 stigmata in each of 4 rows.

Abdomen: Alimentary canal as in general species of Didemnidae. Testicular

follicles 4-12, most frequently 5-8; vas deferens coils 6 times at the proximal portion.

Remarks: *Leptoclinides komaii* TOKIOKA has much more, 20-24 testicular follicles and vas deferens coiling only once at the proximal end. *Leptoclinides ocellatus* (SLUITER) has usually 4, ranging from 4 to 7, testicular follicles and shows the characteristic pigmentation consisting of many small roundish pigment patches. *Leptoclinides madara* TOKIOKA bears regularly 4 testicular follicles and shows the pigment pattern very like the present species, although the pigmentation is in quite different hue. Thus, it is most possible that *Lept. madara* is synonymous with the present species if the difference in the colouration is proved to be of no specific importance. Even then, how it is regrettable that all the spicules of the type specimen are quite dissolved.

3. *Eudistoma parvum* (OKA), 1927

(Pl. IV, Figs. G-J)

Distoma parvum (假)—OKA, A. (1927): Ascidiacea in "Figuraro de Japanaj Bestoj," p. 497, Fig. 958.

cit.: TOKIOKA, T. (1953): Ascidians of Sagami Bay, p. 15.

Original description: Colony consists usually of several small mushroom-shaped cormidia which consist each of a roughly hemispherical corona and a cylindrical peduncle. Cormidia are united one another at the basal end. Length of cormidium 10 mm, diameter of corona ca. 8 mm. Corona translucent, grayish in colour and contains zooids, while peduncle rather opaque, whitish and contains only vascular canals. Zooids comparatively large and composed of thorax and abdomen, the two parts are constricted from each other. Both apertures open directly to the outside on the surface of the corona and 6-lobed. Dist.—From the shallows along the coast of Honsyû.

The surface of the corona smooth; test soft, gelatinous, translucent and milky white in colour.

Zooid: Large one may reach as much as 5 mm in length in a contracted state. Abdomen 3 times as long as the thorax or more in perfectly preserved zooids.

Thorax: Large thorax 1.4 mm in length in a slightly contracted state. From 12 to 15 longitudinal and ca. 30 transverse muscles on each side. Eight to ten stigmata in each of 3 rows. Tentacles ca. 20, dorsal languets of moderate size and displaced slightly to the left side. Anus situated on the level of the second transverse vessel and with two thickened lips. Up to 2 embryos found in some zooids.

Abdomen: Stomach in the posterior part of the abdomen, globular in shape and smoothly surfaced. Mid-intestine distinct and occupies the posterior end of the

intestinal loop. No coecum at the proximal end of the rectum. Vas deferens fully packed with sperms. Gonads degenerated, except for a few testicular follicles in rare cases.

Larva: Trunk ellipsoidal, 550–560 μ in length, 1.6–1.76 times as long as wide. Three cup-shaped attachment processes arranged linearly. Two pigment flecks of the sensory organ arranged antero-posteriorly; the posterior one is much larger than the anterior one, elongate in outline and brownish in colour, while the latter roundish in shape and pure black in colour.

Remarks: *Eudistoma rubra* TOKIOKA and *E. tokarae* TOKIOKA resemble closely the present species in the shape of the colony. In the first species, however, zooids are devoid of transverse muscles on the thorax. The second species conforms with the last one also in the arrangement of thoracic muscles. Differences are shown merely in the following three points: (1) *E. tokarae* is pigmented conspicuously on the thorax of the zooid, (2) in *E. tokarae* transverse muscles are united into several bundles along the dorsal side of the thorax, and (3) zooids of *E. tokarae* are small, less than 2.5 mm in length; this size is about a half of that of perfectly preserved zooids of *E. parvum*. Thus, it is not impossible that *E. tokarae* represents a younger colony of the present species.

Colonies of the type specimen contain only a small number of perfectly preserved zooids; most zooids are found in the state shown in Pl. IV fig. I, in which the abdomen is cut off in front of the stomach. The posterior part of the abdomen degenerates completely, while the anterior part, usually as long as the contracted thorax, remains unchanged. These zooids are completely devoid of gonad, but they seem to be functional as males, because the vas deferens is exceptionlessly filled with sperms and plays the rôle of the seminal vesicle. As some zooids contain well developed embryos in the incubatory chamber, the present species can be considered to be protogynous. It is quite unknown why zooids cast the posterior halves of their abdomens away, although the following two ideas, for instance, may be easily suggested: (1) Organs in the abdomen may be regenerated and the abdomen grows forwards after a pause for a little while; thus the prolongation of the peduncle is brought about; (2) this condition shows nothing but merely the state in which zooids serve as males; zooids may die after the ejection of sperms.

EXPLANATION OF PLATE IV

Figs. E-F. *Synoicum clavatum* (OKA)

E...Colony (from OKA, 1927).

F...Zooid, magnified.

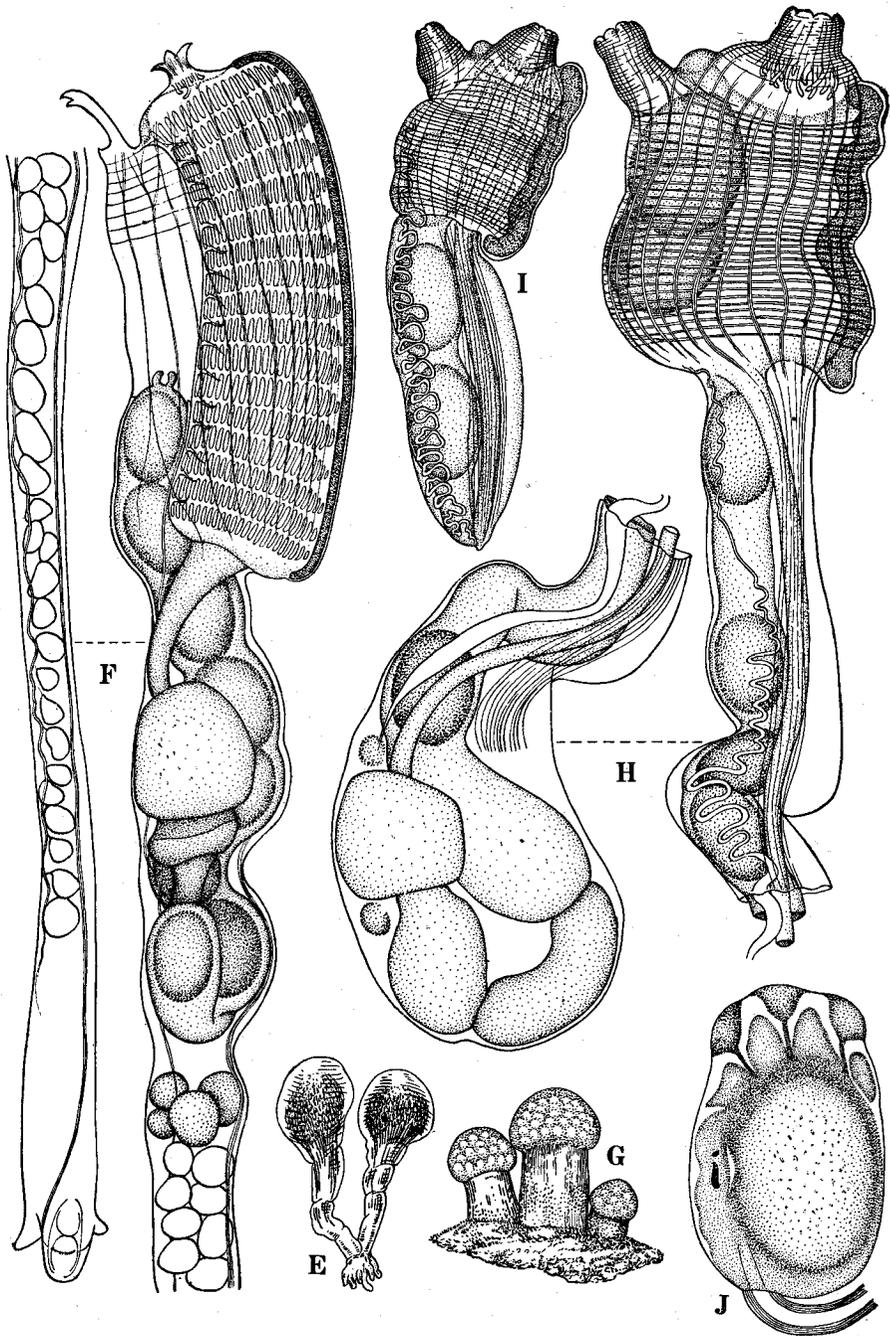
Figs. G-J. *Eudistoma parvum* (OKA)

G...Colony (from OKA, 1927).

H...Zooid, magnified.

I...Zooid casted the posterior half of the abdomen away,
magnified.

J...Larva, from right side, $\times 75$.



T. TOKIOKA: CONTRIBUTIONS TO JAPANESE ASCIDIAN FAUNA, IX.