

Some Ascidians Collected in the Vicinity of Shimoda, Izu Peninsula, Middle Japan*

By

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西川輝昭**: 下田市周辺で採集されたホヤ類

As a small part of the survey programme "Natural History of Fuji-Hakone-Izu Area" in progress by the National Science Museum, Tokyo, the study of ascidians collected in the vicinity of Shimoda on the southeastern coast of the Izu Peninsula was planned and fortunately the author was asked for to take the responsibility for this study.

Material

The material for the study consists of the following collections:

- (A) Specimens dredged by the research vessel "Tsukuba" of the Shimoda Marine Research Center of the University of Tsukuba on Oct. 19, 1981 at stations 6, 7 and 9, off Inatori near Shimoda, the site and depth of respective stations are as follows:
St. 6 —34°44.8'N and 139°02.0'E to 34°44.9'N and 139°02.1'E, 87 to 81 m deep,
St. 7 —34°44.4'N and 139°02.0'E to 34°44.5'N and 139°01.8'E, 100 to 92 m deep,
St. 9 —34°44.3'N and 139°00.9'E to 34°44.2'N and 139°00.7'E, 30 to 25 m deep.
- (B) Specimens found by the author himself in the dredge samples by shrimp net fishery operated on Oct. 19 and 20, 1981 near the Center.
- (C) Specimens found similarly in the shrimp net sample dredged on Oct. 20, 1981 off Susaki, east of Shimoda.
- (D) Specimens offered to the author by the courtesy of Messrs. Tetsu HIRATA and Koichiro HASHIMOTO of the center, who collected those attached to the glass plates or the cement blocks set in the indoor seawater tank for rearing experiments in the center on Oct. 21, 1981.

Throughout the specimens mentioned above, the following 21 species inclusive of a single new species were identified, and the four species marked with an asterisk are found rather commonly in the warm water region of Japan but here recorded from Sagami Bay for the first time.

* Contributions to the Japanese ascidian fauna XXXVII

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Species	Habitat
1. <i>Amaroucium multiplicatum</i> (SLUITER)	Collection D, cement block
*2. <i>Synoicum</i> sp.	Collection C
3. <i>Sidneioides japonense</i> REDIKORZEV	Collection D, glass plate
4. <i>Didemnum</i> (D.) <i>moseleyi</i> (HERDMAN)	Collection D, cement block
5. <i>Trididemnum savignii</i> (HERDMAN)	Collection D, cement block
*6. <i>Leptoclinides echinatus</i> TOKIOKA (?)	Collection D, cement block
7. <i>Diplosoma mitsukurii</i> OKA	Collection D, cement block
8. <i>Eudistoma amploides</i> TOKIOKA (?)	Collection C
9. <i>Ascidia sydneyensis samea</i> OKA	Collection D, cement block and glass plate
10. <i>A. zara</i> OKA	Collection D, cement block
*11. <i>A. alpha</i> TOKIOKA	Collection D, glass plate
12. <i>Polyandrocarpa</i> (?) sp. (Definite identification impossible owing to the complete lack of gonads)	Collection B
13. <i>Symplegma</i> sp.	Collection D, glass plate
14. <i>Polycarpa cryptocarpa</i> var. <i>kuroboja</i> (OKA)	Collections B and C
15. <i>Cnemidocarpa areolata</i> (HELLER)	Collection B; Collection D, cement block
16. <i>C. fertilis molguloidea</i> TOKIOKA	Collection A, St. 7, fine sand
*17. <i>Pyura lignosa</i> MICHAELSEN	Collection B
18. <i>Microcosmus hartmeyeri</i> OKA	Collections B and C
19. <i>Hartmeyeria orientalis</i> OKA	Collection A, St. 9, fine sand
20. <i>Molgula interrupta</i> TOKIOKA	Collection A, St. 7, fine sand
21. <i>M. shimodensis</i> n. sp.	Collection A, St. 6, fine sand

Of these, *Synoicum* sp., *Sidneioides japonense*, *Leptoclinides echinatus*(?), *Eudistoma amploides* (?), *Symplegma* sp. and *Hartmeyeria orientalis* are described, together with the new species, repeatedly to enrich the knowledge about their morphological features for future crucial taxonomical studies.

Before going further, the author would like to express his hearty thanks to the authorities of the National Science Museum, Tokyo, for the present precious chance to study the ascidians in the vicinity of Shimoda, to Dr. Hiroshi WATANABE and other members of the Shimoda Marine Research Center of the University of Tsukuba for every facility during his works at the Center, especially to Messers. Tetsu Hirata and Koichiro HASHIMOTO for the interesting specimens, and to Dr. Yukio IWAOKAWA of Nagoya University for his kind help in the examination by scanning electron microscopy. Dr. Takashi TOKIOKA kindly read the manuscript in detail and gave important suggestions to the author, whose cordial gratitude is expressed here to Dr. TOKIOKA.

Descriptions of Prominent Species

Synoicum sp.

Description. A single, probably a fragment, of colony in the collection C; roughly cylindrical in shape, 30 mm tall, 15 mm and 8.5 mm in thickness. Test itself is transparent and colourless, but wholly and densely impregnated with sand grains, shell fragments of molluscs and foraminiferans. Numerous zooids, much deteriorated, are found embedded, but systems indistinct. In this state of zooids, thorax ca. 0.5 mm, abdomen up to 1 mm and postabdomen

to 2 mm or more in length. Branchial aperture 6-lobed; the atrial smoothly margined, situated at the level of the middle of thorax and furnished with a simple atrial languet issuing from just anterior to the anterior margin of the aperture. Tentacles about a dozen(?). About 15 longitudinal muscles on each side of thorax; about 8 stigmata in each half of about 13 stigmatal rows. Stomach surface seemingly quite smooth; no rectal coecum. Gonad emptied.

Remarks. The test appearance densely impregnated with foreign matters, the structure of atrial aperture and the number of stigmatal rows in the present specimen may be reminiscent of *Amaroucium nadaense* NISHIKAWA from the Kii Peninsula, Japan (NISHIKAWA, 1980, pp. 104–5), though the latter is provided with 5–6 distinct plications on the stomach. As the smooth surface of the stomach in the present specimen seems to be a natural feature, the specimen may well be assigned to the genus *Synoicum*. Then, in the number of stigmatal rows, the present specimen is similar to *S. tukusii* TOKIOKA (14: TOKIOKA, 1960, p. 208) from Ariake Sea and *S. sabuliferum* REDIKORZEV (12: REDIKORZEV, 1937, p. 125) from Kamtschatka, but the former differs from the latter two in the test appearance and the structure of the atrial aperture. The position of the atrial aperture in the present specimen, far posterior from the branchial aperture, seems unique, but this might be caused by some unbalanced contraction of the thorax as seen in the state of deterioration. As more detailed structures of the colony and zooids cannot be cleared in the present specimen, further discussion as to its affiliation may better be ceased here.

Sidneioides japonense REDIKORZEV, 1913

(Fig. 1, A–B)

Sidneioides japonense REDIKORZEV, 1913, pp. 210–212, fig. 5; TOKIOKA, 1953, pp. 176–177, pl. 8, figs. 1–4; MILLAR, 1975, pp. 253–255, fig. 38.

Description. A single colony in the collection D and presented by Mr. HASHIMOTO. Colony as an oval cushion, 8.8 mm × 13.5 mm in extent and 8.7 mm in height (Fig. 1, A); the surface smooth and sparsely coated throughout, though never impregnated, with sand grains except the side of attachment; test itself rather tough, gelatinous, pale brown and nearly transparent. Single common cloacal aperture opening at the tip of a low but distinct siphon located at the slightly depressed centre of the distal surface of colony, and encircled with about 50 zooids roughly arranged in a single ring, but partially in double concentric rows. Branchial apertures are distributed rather in the peripheral zone of the upper surface of colony, and of the 6 lobes of each aperture the ventral 3 situated on the peripheral side of the colony are often elongated and projecting out from the colony surface more conspicuously than the rest (Fig. 1, B). Thorax up to 3.8 mm, abdomen to 1.5 mm and postabdomen ca. 0.8 mm in length. Atrial aperture smoothly margined and with a conical projection of mantle wall just behind it. A simple long atrial languet issuing from the middle of the distance between both siphons. Six to 8 fine longitudinal muscles are converged on each side of thorax to the branchial siphon and running down to the abdomen, while only one or two very fine ones are converging to the atrial. Tentacles 20–24, arranged usually as—132313231—; in addition a few minute papillae are discernible. Ciliated groove as a round orifice an

oval opening. About two dozens of stigmata in each half of 11–14 rows. In an examined thorax with 14 rows, each stigma in the ventral half of the anterior-most row is subdivided anteroposteriorly by a very thin transverse vessels, that is accompanied with a corresponding smaller additional dorsal languet anteriorly to the first regular languet, thus this thorax is furnished partially with 15 stigmatal rows. Transverse vessels without any papillae. Row of dorsal languets on the left side along the mid-dorsal line. Anus bi-lobed, opening at the level between 5th and 6th, or 6th and 7th stigmatal rows when counted from posterior. Ovary situated along the ventral side of rectum nearly at the level of 2nd to 3rd stigmatal rows on the right side of thorax. Eight to ten embryos of various stages, up to 500μ in long diameter, in the peribranchial cavity. Stomach occupying nearly the middle one-third of abdomen, with smooth surface. Postabdomen and larvae just as described by TOKIOKA (1953), except that the trunk of larvae is a little smaller, $450\text{--}500\mu$ long, in the present colony.

Remarks. The present specimen is seemingly unique among the species of the genus *Sidneioides* in its simple structure of colony and rather less stigmatal rows. But the first feature may probably be regarded as a very young phase of colonial development, and the last feature, the number of stigmatal rows (11–14, or partly 15), may be continuous to those of *S. japonense* (15 in the colony from Nagasaki given by REDIKORZEV, 1913; 14–16 in the colonies from Sagami Bay by TOKIOKA, 1953; 14 in the colony from the Banda Sea by MILLAR, 1975). The present colony from Shimoda may, therefore, be included safely in *S. japonense*.

? *Leptoclinides echinatus* TOKIOKA, 1954

Description. A single colony, $60\text{ mm}\times 45\text{ mm}$ in extent and 2 mm in thickness, found in the collection D, presented by Mr. HIRATA. Test surface coloured orange yellow; this is because of the distribution of many irregular reddish orange patterns that are paler, almost to white, centrally and thinly margined with black pigments. There are scattered many conical or stout protuberances, up to 1.5 mm in length, on the colony surface, some of which may contain spicules within them. Superficial spiculeless layer distinct. Spicules evenly but rather sparsely distributed throughout the colony; $12\text{--}30\mu$ (or rarely 40μ) in diameter and 8–10 conical rays on the equatorial plane. Hypozooidal lacunae present. Thorax ca. 750μ and abdomen 650μ long. About 10 longitudinal muscles on each side of thorax; a small lateral thoracic organ near the posterior end of thorax on each side. Tentacles 8, larger and smaller ones alternating regularly; usually a single minute papillae discernible in each interval. About a dozen of stigmata in each half of 4 rows. Gonad and larva not observed.

Remarks. In the echinate appearance of the colony surface and the shape and size of spicules, the present specimen might be identified with *L. echinatus* from Osaka Bay (TOKIOKA, 1954, pp. 80–82). However, the final decided identification is kept here pending as the structure of gonads is unknown in the present specimen.

? *Eudistoma amploides* TOKIOKA, 1962

Description. A single flat colony, $40\text{ mm}\times 20\text{ mm}$ in extent and up to 7.5 mm thick,

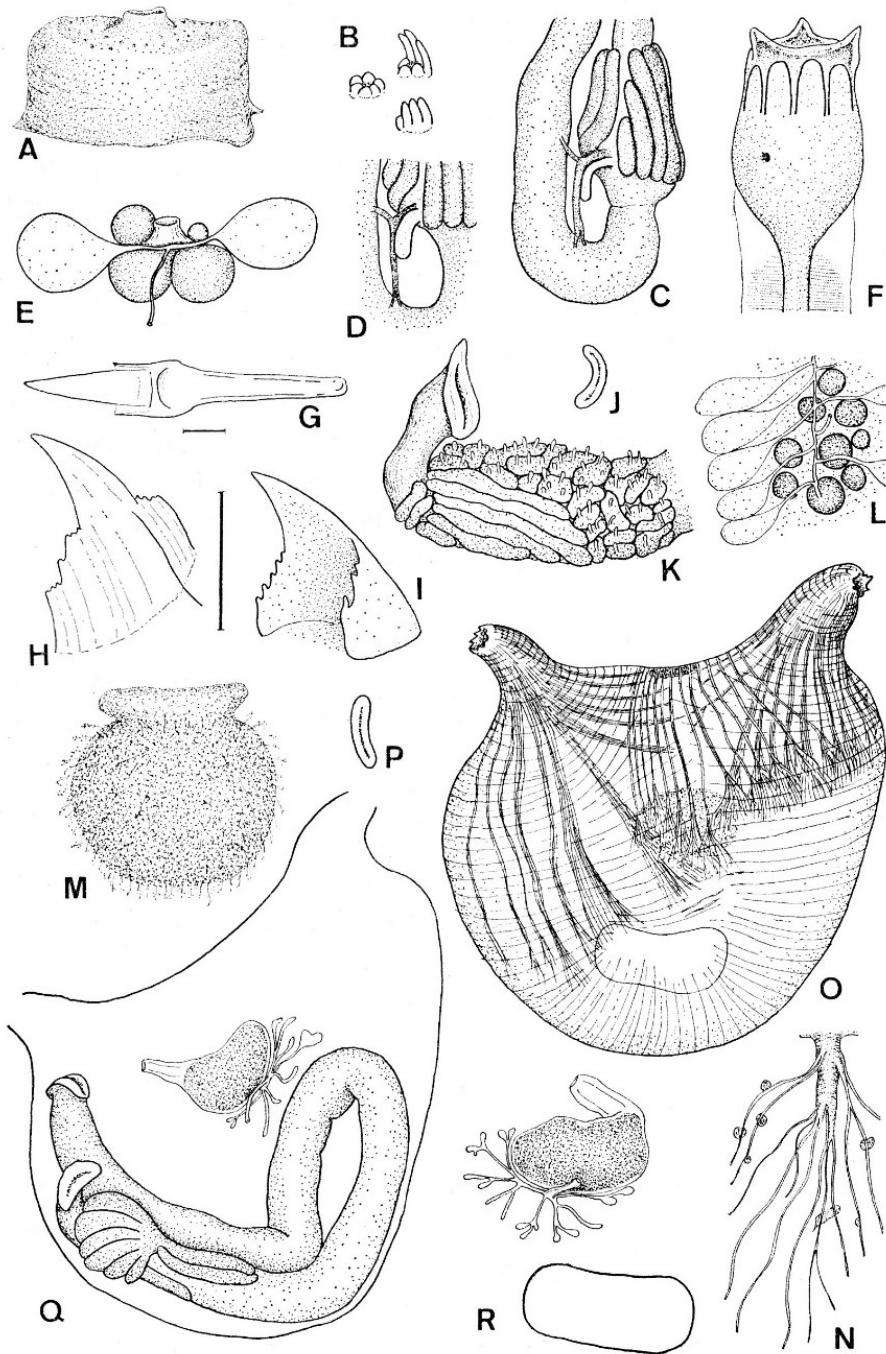


Fig. 1. A-B: *Sidneioides japonense* REDIKORZEV. C-F: *Symplegma* sp. G-L: *Hartmeyeria orientalis* OKA. M-R: *Molgula shimodensis* n. sp. A: Whole colony. B: Three branchial apertures on colony surface. C: Loop of alimentary canal and moderately curved pyloric coecum. D: Nearly straight pyloric coecum. E: Gonad. F: Larva. G-I: Siphonal spinules, under light microscope (G) and under scanning electron microscope (H, I). J and P: Ciliated groove. K: Stomach or gastric region. L: Part of gonad. M: Whole body. N: A test process carrying sand grains. O: Mantle body, right side. Q: Left half of mantle body, inner side. R: Right gonad and renal sac. Scales for G-I indicate 5 μ .

in the collection C. Test surface nearly smooth and even, though somewhat elevated irregularly along the periphery, almost free from any foreign matters; test itself rather tough, gelatinous, translucent and pale brownish. Spherical bodies are sparsely distributed in only the surface layer of colony; they include purplish hollow ones, up to 1 mm (or exceptionally 2.5 mm) in diameter, and yellow green ones densely packed with greenish granules, 200 to 500 μ in diameter; in addition, a few faecal pellets are also found embedded among the spherical bodies. System indistinct. Zooids are pale brown in colour but shrunk and deteriorated so much. Thorax ca. 750 μ and abdomen up to 2 mm long in such a state. About a dozen of longitudinal muscles on each side of thorax. Seemingly about 30(?) very fine transverse muscles are observed on each side of the thorax, but it is uncertain whether this is the number of real muscle bands or of total muscular fibres of much less muscle bands that are torn to fibres by deterioration. Tentacles 16(?); larger and smaller ones alternating regularly. About 20 stigmata in each half of 3 rows. Ovarian eggs 750 μ in diameter.

Remarks. The existence of greenish spherical bodies in the test in the present specimen may be reminiscent of *E. amploides* from Sagami Bay (TOKIOKA, 1962, pp. 274-276), though the present colony includes additionally larger, purplish and hollow bodies that are not noticed in *E. amploides*. The transverse muscles on the thorax are seemingly very fine and much more in the present specimen than in *E. amploides* which is provided with only 8 strong ones. These differences, especially the last one, may be of some taxonomic significance, if they are natural and constant throughout a considerable number of specimens. However, the state of the present specimens is far from perfect, and it is not impossible that the above-mentioned differences might be brought about by deterioration or by some physiological state of colony. On the other hand, the existence of spherical bodies in the test seems to be very unique at least among the Japanese species of *Eudistoma*. For these reasons, the present specimen is here tentatively identified as *E. amploides*.

Symplegma sp.

(Fig. 1, C-F)

Description. Two incrusting colonies, 42 mm \times 15 mm and 85 mm \times 14 mm in extent respectively and up to 1.5 mm thick, in the collection D and presented to the author by Mr. Hashimoto. Many zooids are densely embedded in the sheet of common test, though the test surface is slightly elevated above each zooid. Test thin, tough, translucent and white; the surface smooth and shining. Zooids oval, up to 2.5 mm long and flattened dorsoventrally. Branchial aperture subterminal and the atrial nearly in the middle of body; both opening each on a low siphon. Fine atrial tentacles present.

Branchial tentacles 12, larger and smaller ones alternating regularly. Ciliated groove oval, elongated anteroposteriorly. Inner longitudinal vessels 4 on each side; dorsal two vessels on the left side never reaching the rear end of branchial sac, but always ending to the dorsal lamina at the level between 4th and 5th rows (dorsal-most vessel) or 7th and 8th rows (second vessel). Ten stigmatal rows on each side; the posterior-most one sometimes rather rudimentary; in some zooids only 9 rows on the left side; second row never reaching the dorsal lamina.

Stigmata arranged as D 6-4-5-5-6 V in an examined zooid. The anterior margin of intestinal loop usually reaching the level between 5th and 6th stigmatal rows. Anus bi-lobed and situated nearly at the same level as the anterior margin of the loop. Stomach globular and provided with 10-11 longitudinal plications, of which 1 to 2 (or rarely 3) plications on the left side of typhlosole never reaching anteriorly the cardiac margin of stomach (Fig. 1, C). Pyloric coecum of moderate size, not so stout nor so strongly curved. A thick vessel running along the outer margin of coecum issues from near the proximal end of coecum and a single short branch toward the rectum and distally bridges between the distal end of coecum and bottom of intestinal loop, ending on the intestinal wall unclearly bifurcated (Fig. 1, C-D). The vessel and its branch mentioned above are seemingly opaque owing to minute granules contained therein. Gonads fully matured; several eggs, up to 350μ in diameter, in an ovary; testicular lobes simple in outline and common sperm duct slender (Fig. 1, E). Both embryos and tailed larvae often found in peribranchial cavity; their total number generally 5 in a zooid. Larva about 525μ long and 325μ wide, with 1.25 mm long tail; provided with 3 attachment processes, 8 ampullae discriminated though rather rarely; pigment fleck of sensory organ near the middle of trunk (Fig. 1, F).

Remarks. The present specimens conform superficially well to *Symplegma reptans* (OKA). Especially the vessel arrangement around the pyloric coecum in these reminds the author of that shown in the specimens from Sagami Bay (TOKIOKA, 1953, fig. 3 in plate 46). However, the stigmatal rows are a little more in the present specimens than in *reptans*, in which they are 7-8 or rarely 9. The pyloric coecum in *reptans* is described as rather short, though stout, and no reference is given in *reptans* about such a vessel branch as issued from about the proximal end of the pyloric coecum in the present specimens. Further, the larvae in *reptans* are significantly smaller (470μ) than in the present specimens and quite devoid of any ampullae. The appearance of ampullae might be possibly due to the advanced phase of larvae in the present specimens, but a remarkable increase of the body size is not usual in released larvae. The difference in the number of stigmatal rows is seemingly rather slight, and it is not impossible that this is merely an intraspecific variation. However, if this slight difference occurs rather constantly, especially in combination with some difference in any other features, it should be of a taxonomic significance. Actually, the number of stigmatal rows seems to have been treated together with the vessel arrangement around the pyloric coecum. Here, however, the size of coecum may possibly differ somewhat according to the physiological state of zooids, but nothing has been given about this. Further, it is quite unknown at present whether or not the vessel arrangement around coecum can be a stable feature. The vessel arrangement given in *reptans* from Sagami Bay, mentioned above, shows clearly the existence of two kinds of vessels. Therefore, it is requested in future studies to distinguish the blood and lacteal vessels from each other. Thus, seemingly there are too many examinations to be done before the decisive identification of the present specimens can be made.

Hartmeyeria orientalis OKA, 1929

(Fig. 1, G-L)

Hartmeyeria orientalis TOKIOKA, 1967, pp. 224-225, fig. 102 (synonymy).

Description. A single specimen in the collection A. Body $4.5\text{ mm} \times 3.8\text{ mm}$, with 6.8 mm long rooty process; the surface wholly and densely coated with sand grains and shell fragments. Siphonal spinules are densely distributed near the aperture and simply pointed. Their free part is 10 to $15\text{ }\mu$ long, and according to SEM images, is almost always furnished with a slight irregular serration along the proximal half of the lateral margin (Fig. 1, G-I). Mantle musculature conforms well to that described by TOKIOKA (1953, pl. 78, fig. 7). A projection from the inner surface of the test opposite the base of the rooty process, is expanded distally to fit a siphon-like prominence on the mantle, which is furnished with inner circular and outer longitudinal muscles. Both vela less developed. About 10 very fine and simple atrial tentacles on the inner base of the velum. No endocarps discernible. Tentacles 8, larger and smaller ones alternating almost regularly; branched in one order; several minute papillae also found in some intervals. In addition to these, there are 8(?) very fine and simple filaments, very similar to the atrial tentacles and much thinner than the papillae on the tentacular ring, issuing from the inner base of the velum just anterior to the tentacular ring. Ciliated groove as a simple longitudinal slit (Fig. 1, J). The branchial formula is:

L. D. 0 (8) 0 (1) 0 (9) 0 (7) 0 (6) 0 (3) 0 V.

R. D. 0 (9) 0 (1) 0 (8) 0 (7) 0 (6) 0 (4) 0 V.

One to three parastigmatic vessels in each mesh, which is containing up to 8 nearly straight stigmata in the interspace. About 6 infundibula under each fold; each summit usually divided into two apices. Dorsal lamina tall and smoothly margined. The free surface of the stomach is wholly covered with hepatic lobules; these are somewhat elongate and smooth on the surface in the posteroventral part of the gastric region, while they are oval to elliptical and densely papillated as a whole in the other part (Fig. 1, K). Anus bi-lobed. Gonad fully matured; ovarian eggs ca. $170\text{ }\mu$ in diameter. Openings of vas deferens are found on the mesial surface of the ovary, 2(+) on the left gonad and 4(?) on the right (Fig. 1, L).

Remarks. The present specimen is well consistent with the previous descriptions of *Hartmeyeria orientalis* OKA from South Sakhalin(?) and from the waters around Japanese main islands. However, the present species is closely related to, or might be conspecific with, as was already suggested by VAN NAME (1945, p. 359), *H. triangularis* RITTER from the Aleutian Islands, 9–12 fathoms deep (RITTER, 1913, pp. 461–463; VAN NAME, 1945, pp. 358–359) and from the Mamiya (=Tatarskii) Strait, 22 m deep (REDIKORZEV, 1941, pp. 181–182), especially in the mantle musculature, existence of simple fine filaments anterior to the tentacular ring (cf. RITTER, fig. 11), and in the structure of vas deferens (cf. REDIKORZEV, pl. 2, figs. 8–9). More crucial examinations on the specimens from much more different localities are desirable in the future.

Molgula shimodensis n. sp.

(Fig. 1, M–R)

Description. A single specimen in the collection A, St. 6 (fine sand). Body roudish in outline, $6\text{ mm} \times 6\text{ mm}$, and flattened laterally. Branchial aperture subterminal and directed

forward, while the atrial nearly in the middle of body and directed backward; each siphon short but prominent (Fig. 1, M). The test surface is wholly and densely coated, though not impregnated, with sand grains; in addition the whole body except the dorsal siphonal area is furnished with slender processes, simple or branched, up to 2 mm long and carrying sand grains (Fig. 1, N). Test itself very thin as paper but tough, transparent and colourless. On the mantle body, the branchial siphon subterminal and the atrial situated with its anterior base around the middle of the body. Mantle musculature consists of fine muscle fibres densely distributed nearly all over the mantle body, about 20 muscle bundles radiating from each siphon and about a dozen of transverse ones passing over the intersiphonal area including the neural complex; all these muscle bundles are extending ventrally to the middle on each lateral side (Fig. 1, O). Each aperture 10(?)-lobed. Both vela are developed very well; especially the branchial velum forms a funnel-like structure extending towards the aperture as seen in *Molgula hozawai* OKA (see NISHIKAWA, 1981). No atrial tentacles. Branchial tentacles of various sizes, 10 in number, and branched in two orders; besides several minute papillae. Ciliated groove as a longitudinal slit (Fig. 1, P). Seven branchial folds on each side; the formula is:

L. D. 0 (3) 0 (3) 0 (3) 0 (3) 0 (3) 0 (3) 0 (3) 0 V.

R. D. 0 (3) 0 (3) 0 (3) 0 (3) 0 (3) 0 (3) 0 (3) 0 (3) 0 V.

Six infundibula under each fold except the ventral-most one that is holding 9 or 10 infundibula beneath it. Each infundibulum not so well developed, sometimes nearly flat, consisting nearly always of double spiral stigmata often interrupted and bridged with parastigmatic vessels, with simple summit. Dorsal lamina tall and smoothly edged. First intestinal loop deep and narrow, while the second loop rather deep but wide; anus bi-lobed. Liver yellowish brown in colour, consisting of rather elongate lobes and with quite smooth surface. Gonads quite emptied. The left gonad is situated along the dorsal side of the proximal branch of the second loop, while the right is dorsal to the renal sac. Ovary oval, slightly elongated anteroposteriorly, and containing only the white mass in the emptied state; oviduct issuing from the posterodorsal corner and directed toward the atrial aperture on the left gonad, but bent anteriorly on the right gonad. Testis is located along the ventral side of ovary, but seemingly completely separated from it, and consists of 7 or 8 thin tubular follicles roughly converging to a single and moderately long sperm duct projecting out from near the posteroventral edge of ovary, but not from the mesial surface of ovary (Fig. 1, Q-R). Thin tubular follicles in the emptied testis may have been swollen to elongate lobules before sperm shedding, and these might have assumed a stellate arrangement as a whole. Then, this feature might remind one of the state of gonad in *Gamaster*.

Remarks. The present specimen is superficially related most closely to *Molgula ellistoni* KOTT from Elliston Bay, South Australia (KOTT, 1972, p. 190, fig. 59) especially in structures of the branchial sac (3 longitudinal vessels on each of 7 folds on each side and 6 transverse rows of infundibula) and gonads (testicular follicles radially arranged along the proximal border of roundish ovary and joining into a single sperm duct). In the Australian species, however, the summit of each infundibulum is divided into two apices, the left gonad is located in the

middle part of the second loop, and the sperm duct is very short and opening on the mesial surface of the ovary. Moreover, this species inhabits "in caves outside bar, subject to strong swell". This is a remarkable contrast to that the present specimen was obtained from the sea floor of about 85 m deep. These differences are enough to separate the present specimen as a new species from *M. ellistoni*. Reference made to *Gamaster* in mentioning the structure of the testis may better be put aside, till the specimens with fully matured gonad are actually examined in future. Thus, it is proposed here to name the present new species *Molgula shimodensis* after its locality. The holotype is deposited in the Seto Marine Biological Laboratory, Kyoto University (SMBL Type No. 332).

要

約

1981年10月に静岡県下田市周辺で21種(同定不確定種を含む)のホヤ類が採集された。これらのうち、*Molgula shimodensis* は新種であり、南オーストラリアの *M. ellistoni* に類似する。また、*Synicum* sp., *Leptoclinides echinatus*?, *Ascidia alpha*, *Pyura lignosa* の4種は相模湾新記録であった。この新種のほか、*Sidneioides japonense* や *Hartmeyeria orientalis* など6種を選んでここに記載した。

References

- KOTT, P., 1972. The ascidians of South Australia II: Investigator Strait, and the eastern end of the Great Australian Bight. *Trans. Roy. Soc. South Australia*, 96: 165-196.
- MILLAR, R.H., 1975. Ascidians from the Indo-West-Pacific region in the Zoological Museum, Copenhagen. *Steenstrupia*, 3: 205-336.
- NISHIKAWA, T., 1980. Ascidians from the coast of Kii Peninsula, Middle Japan, with descriptions of two new species. *Mem. Natn. Sci. Mus., Tokyo*, (13): 97-111.
- NISHIKAWA, T., 1981. Contributions to the Japanese ascidian fauna XXXV. *Molgula hozawai* OKA, 1932 and *M. verrucifera* RITTER and FORSYTH, 1917, with special reference to the funnel-like structure within the siphon. *Publ. Seto mar. biol. Lab.*, 26: 337-345.
- REDIKORZEV, V., 1913. Neue Ascidien. *Zool. Anz.*, 43: 204-213.
- REDIKORZEV, V., 1937. Neue Ascidien aus den Fernen Osten. *Fest. Prof. Embrik STRAND*, 3: 122-127, 2 pls.
- РЕДИКОРЦЕВ, В., 1941. Асцидии дальневосточных морей СССР. *Иссл. Дальневост. Морей СССР*, 1: 164-212, 3 pls.
- RITTER, W.E., 1913. The simple ascidians from the northeastern Pacific in the collection of the United States National Museum. *Proc. U. S. Natn. Mus.*, 45: 427-505, 4 pls.
- トキョカ, T., 1953. Ascidians of Sagami Bay. 315 pp., 80 pls. Tokyo, Iwanami-shoten. (In Japanese.)
- トキョカ, T., 1954. Contributions to the Japanese ascidian fauna X. Notes on some ascidians collected in Osaka Bay (2). *Publ. Seto mar. biol. Lab.*, 4: 75-98, 4 pls.
- トキョカ, T., 1960. Ditto, XVII. Ascidians found in the benthic samples dredged in the Ariake Sea 1957-58. *Ibid.*, 8: 205-221, 5 pls.
- トキョカ, T., 1962. Ditto, XIX. Additions to Japanese ascidian fauna, with notes on two already known species. *Ibid.*, 10: 259-282.
- トキョカ, T., 1967. Pacific Tunicata of the United States National Museum. *Bull. U. S. Natn. Mus.*, 251: 1-247.
- VAN NAME, W., 1945. The North and South American ascidians. *Bull. Amer. Mus. nat. Hist.*, 84: 1-476, 31 pls.