

Spionidae (Annelida, Polychaeta) from Japan  
VII. The Genus *Spiophanes*

By

**Minoru IMAJIMA**

Department of Zoology, National Science Museum, Tokyo

**Abstract** Four species of the genus *Spiophanes* are described from Japanese waters. These four include two new species, herein named *Spiophanes japonicum* and *S. urceolata*. *Spiophanes kroeyeri* GRUBE is newly recorded from Japan, whereas *S. bombyx* (CLAPARÈDE) was reported previously.

During the course of a study on Japanese spionids, four species including two new species of the genus *Spiophanes* were recorded. Of these species, *Spiophanes bombyx* (CLAPARÈDE, 1870) was previously reported from Japanese waters, but *S. kroeyeri* GRUBE, 1860 is newly reported. Two new species of *Spiophanes* are described.

The collection localities mentioned in the text are shown in Fig. 1. The bulk of the collection, including type specimens, is deposited in the National Science Museum, Tokyo.

The author wishes to thank Dr. Nancy J. MACIOLEK, Massachusetts, U. S. A. for reading the manuscript and providing many helpful suggestions.

**Genus *Spiophanes* GRUBE, 1860**

Prostomium anteriorly broad, rounded or bell-shaped, with or without frontal horns; occipital tentacle and eyes present or absent. Branchiae entirely absent. Setigers 1–4 with well developed noto- and neuropodial lamellae; middle setigers with ventral, highly glandular interramal region. Notopodial setae all capillaries. Neuropodia of setiger 1 with 1–2 large, curved crook setae in addition to capillaries; neuropodial hooks first present from setiger 14–16; hooks bi-, tri-, or quadridentate, with or without reduced hood. Bacillary setae present or absent in glandular region of setigers 5–14. Ventral sabre setae present. Pygidium with anal cirri.

**Key to Japanese Species of *Spiophanes***

1. Prostomium with occipital tentacle; lateral pouches present or absent.....2
- 1'. Prostomium without occipital tentacle; lateral pouches absent.....3
2. Prostomium subtriangular to bell-shaped; neuropodial lamellae of setiger 1 much larger than notopodial lamellae; lateral pouches present from setiger 14–16;

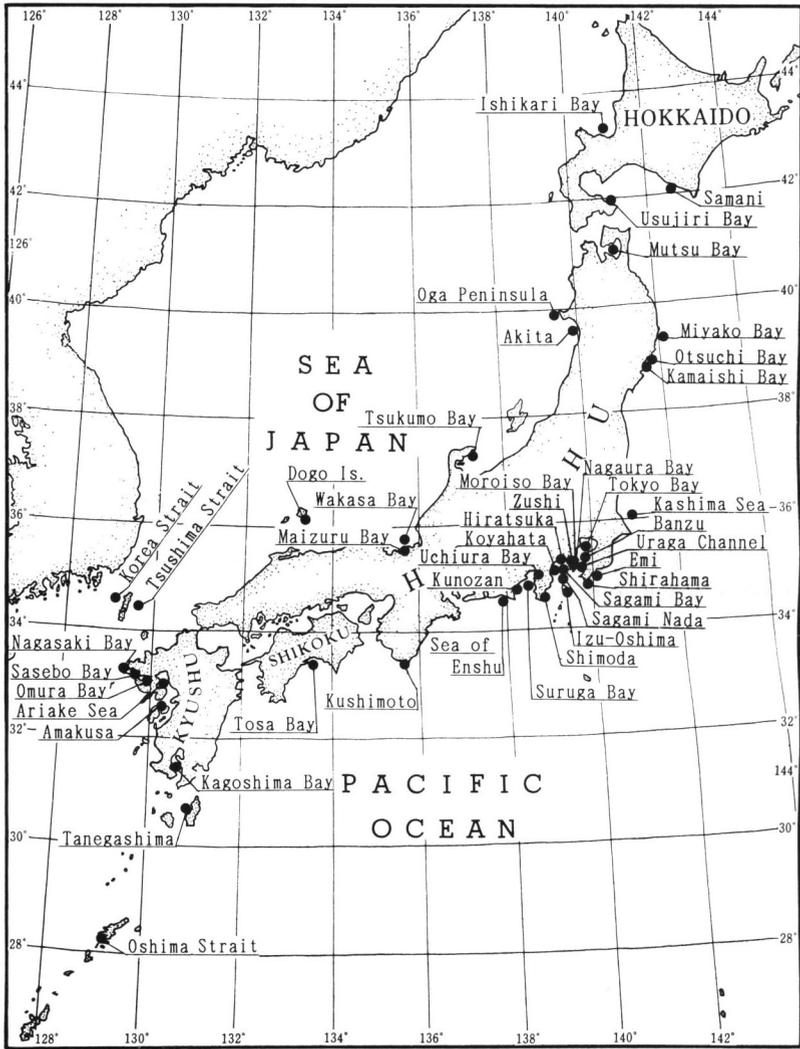


Fig. 1. Map of Japan, showing localities mentioned in the text.

- posterior notopodia with geniculated curved setae. . . *Spiophanes kroeyeri* GRUBE
- 2'. Prostomium T-shaped; neuropodial lamellae of setiger 1 as large as notopodial lamellae; lateral pouches absent; curved setae of posterior notopodia not geniculated. . . . . *S. japonicum* sp. nov.
  3. Prostomium T-shaped, with prominent lateral projections; nuchal organs to setiger 2; neuropodial hooks tridentate; ventral sabre setae present from setiger 10. . . . . *S. bombyx* (CLAPARÈDE)

- 3'. Prostomium triangular to bell-shaped; nuchal organs to setiger 4; neuropodial hook quadridentate; ventral sabre setae present from setiger 4.....  
 .....*S. urceolata* sp. nov.

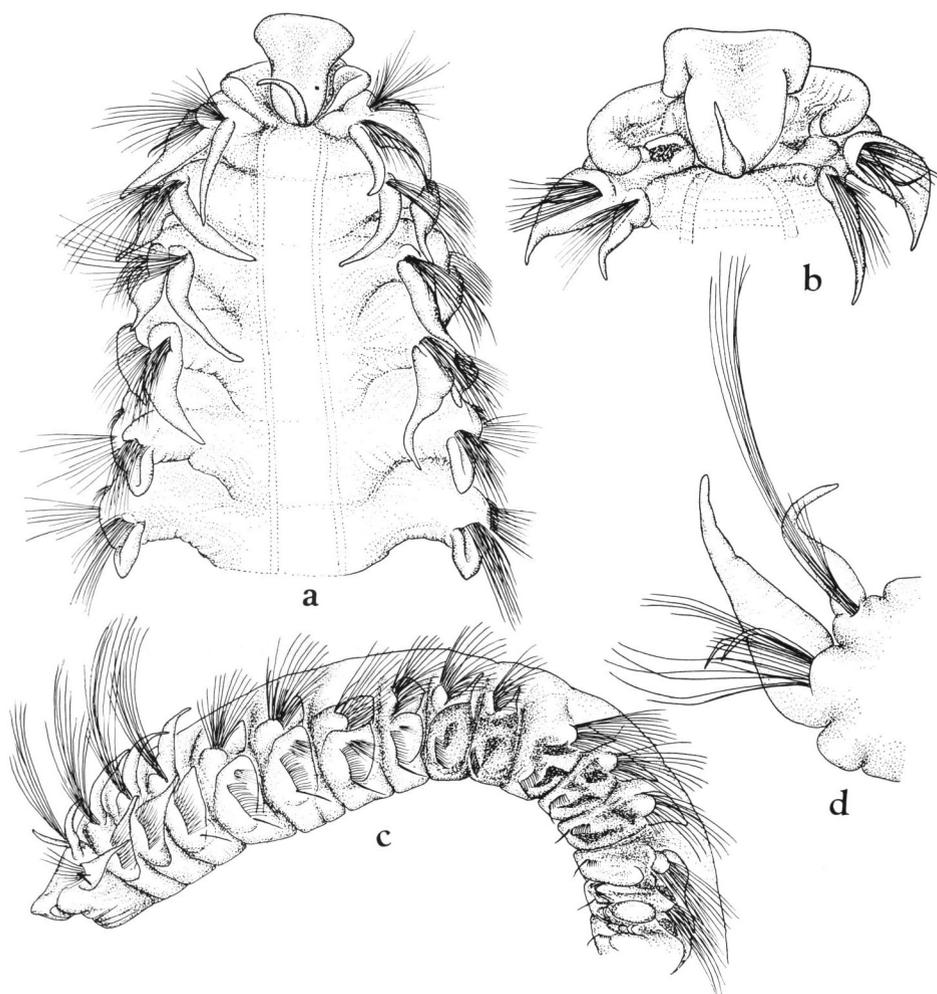


Fig. 2. *Spiophanes kroeyeri* GRUBE.—a, Anterior end, dorsal view,  $\times 18$ ; b, prostomium and setiger 1 from other large individual, dorsal view,  $\times 18$ ; c, anterior end, lateral view,  $\times 15$ ; d, right parapodium from setiger 1, anterior view,  $\times 32$ .

*Spiophanes kroeyeri* GRUBE, 1860

(Figs. 2a-d, 3a-h, 4a-o)

*Spiophanes kroeyeri* GRUBE, 1860, p. 88.*Spiophanes kroeyeri*: FAUCHALD, 1972, p. 99, fig. 4c-d; LIGHT, 1977, pp. 79-80, fig. 5d; 1978, p. 59; BLAKE, 1983, pp. 232-233.

*Material examined.* Off Wakinosawa, Mutsu Bay, in 4 m (6 specimens), X-1971. Mutsu Bay, in 50 m, VIII-1971. Miyako Bay, 39°39.2'N, 141°59.8'E, in 49 m (2), VII-1967. Kamaishi Bay, in 34 m (1), XI-1973; in 50 m (1), XI-1974. Otsuchi Bay, 39°20.8'N, 141°56.1'E-39°20.9'N, 141°56.2'E, in 15-25 m (1), 39°20.2'N, 141°58.0'E-39°20.3'N, 141°58.1'E, in 18 m (1), VIII-1976; 39°20.5'N, 141°57.2'E-39°20.6'N, 141°57.4'E, in 43-45 m (5), 39°22.3'N, 141°59.8'E-39°22.5'N, 142°01.0'E, in 89-99 m (2), 39°22.9'N, 141°59.8'E-39°23.1'N, 141°59.9'E, in 83-85 m (4), 39°21.8'N, 142°00.1'E-39°21.9'N, 141°59.8'E, in 75-85 m (7), 39°21.7'N, 141°59.8'E-39°21.5'N, 141°59.6'E, in 79-74 m (2), VIII-1979; 39°21.3'N, 139°59.0'E-39°21.4'N, 139°59.1'E, in 66-68 m (1), 39°20.8'N, 139°58.5'E-39°21.0'N, 139°58.6'E, in 55-58 m (1), V-1984; 39°20.6'N, 141°56.6'E, in 30 m (1), VII-1985. Off Otsuchi, 39°19.3'N, 142°04.0'E-39°19.3'N, 142°04.3'E, in 149 m (154), VIII-1985, KT-85-11. Kashima Sea, 36°34.9'N, 140°55.6'E-36°35.6'N, 140°56.2'E, in 120-122 m (1); 36°09.3'N, 140°56.6'E-36°10.0'N, 140°56.1'E, in 280-295 m (2), VIII-1979, KT-79-13. Off Boso Peninsula, 35°00.1'N, 140°06.8'E-35°00.5'N, 140°07.5'E, in 145-150 m (4), 35°01.0'N, 140°04.6'E-35°01.3'N, 140°05.1'E, in 77-83 m (2), 34°53.8'N, 140°00.5'E-34°53.3'N, 139°59.9'E, in 180-160 m (1), IX-1976, KT-76-16. Tokyo Bay, 35°22.6'N, 139°45.4'E, in 20 m (5), VIII-1971, KT-71-12; 35°23.0'N, 139°45.0'E, in 20 m (9), XI-1971, KT-71-19; 35°23.0'N, 139°45.0'E, in 20 m (9), VI-1973, KT-73-6; 35°17.0'N, 139°43.3'E, in 53 m (1), XII-1978; 35°19.0'N, 139°42.0'E, in 47 m (1), VIII-1981; 35°30.0'N, 140.00.0'E, in 16 m (2), IX-1981; 35°24.0'N, 139°46.0'E, in 18 m (2), 35°23.0'N, 139°44.0'E, in 19 m (2), 35°22.0'N, 139°40.0'E, in 10 m (1), 35°21.0'N, 139°40.0'E, in 13 m (21), 35°20.0'N, 139°46.0'E, in 14 m (2), X-1981; 35°25.0'N, 139°44.0'E, in 35 m (1), V-1982; 35°22.0'N, 139°44.0'E, in 20 m (3), 35°22.0'N, 139°48.0'E, in 14 m (4), 35°20.0'N, 139°40.0'E, in 20 m (1), 35°20.0'N, 139°46.0'E, in 14 m (8), 35°19.0'N, 139°42.0'E, in 47 m (1), 35°16.2'N, 139°42.5'E, in 34 m (2), VIII-1982; 35°22.0'N, 139°48.0'E, in 14 m (4), 35°22.0'N, 139°44.0'E, in 20 m (4), 35°19.0'N, 139°42.0'E, in 47 m (3), 35°16.2'N, 139°42.5'E, in 49 m (2), XI-1982; 35°36.0'N, 139°51.0'E, in 8 m (1), 35°22.0'N, 139°40.0'E, in 10 m (1), 35°22.0'N, 139°44.0'E, in 20 m (5), 35°22.0'N, 139°48.0'E, in 14 m (5), 35°20.0'N, 139°46.0'E, in 14 m (1), 35°19.0'N, 139°42.0'E, in 47 m (3), III-1983. Banzu, Tokyo Bay, in 4 m (1), VI-1974. Nagaura Bay, 35°19.2'N, 139°40.1'E, in 9 m (2), 35°19.2'N, 139°41.4'E, in 34 m (1), 35°18.8'N, 139°39.7'E, in 14 m (3), X-1977. Uruga Channel, 35°09.0'N, 139°48.3'E, in 33 m (1), XII-1978. Off Koyahata, Sagami Bay, 35°16.3'N, 139°13.3'E, in 24 m (2), 35°16.4'N, 139°13.0'E, in 12 m (2), 35°16.2'N, 139°13.0'E, in 97 m (1), V-1966. Off Mito beach, Sagami Bay, 35°10.3'N, 139°36.4'E, in 32 m (1), VII-1967. Off

Zushi, Sagami Bay, 35°16.2'N, 139°33.0'E, in 28 m (2), VII-1969. Off Moroiso Bay, Sagami Bay, in 30 m (4), III-1979. Off Hiratsuka, Sagami Bay, 35°15.5'N, 139°24.8'E, in 116 m (2), 35°17.4'N, 139°21.5'E, in 95 m (1), VI-1982. Sagami Bay, 35°12.2'N, 139°12.6'E-35°12.0'N, 139°12.9'E, in 825 m (7), 35°11.4'N, 139°28.7'E-35°14.9'N, 139°27.4'E, in 110-140 m (3), V-1970, KT-70-4; 35°09.1'N, 139°23.3'E-35°09.1'N, 139°23.9'E, in 478-490 m (31), III-1976, KT-76-3; 35°04.2'N, 139°40.2'E, in 450 m (1), 35°07.4'N, 139°36.0'E, in 50 m (1), 35°07.1'N, 139°34.4'E, in 99 m (1), VIII-1978; 35°07.4'N, 139°36.0'E, in 52 m (1), 35°09.4'N, 139°32.0'E, in 330 m (2), 35°07.4'N, 139°32.0'E, in 310 m (1), 35°15.4'N, 139°28.0'E, in 84 m (1), 35°11.4'N, 139°28.0'E, in 720 m (4), 35°17.4'N, 139°27.0'E, in 20 m (1), VII-1979; 35°11.4'N, 139°24.0'E, in 860 m (1), VIII-1979; 35°08.2'N, 139°35.5'E-35°08.4'N, 139°35.4'E, in 54 m (3), 35°08.3'N, 139°34.5'E-35°08.6'N, 139°34.5'E, in 83 m (1), 35°13.2'N, 139°34.1'E-35°13.4'N, 139°34.2'E, in 67 m (11), 35°14.0'N, 139°32.5'E-35°14.3'N, 139°32.5'E, in 84 m (2), 35°07.4'N, 139°36.3'E-35°07.2'N, 139°36.1'E, in 46 m (1), 35°09.4'N, 139°24.0'E, in 570 m (4), IX-1979; 35°13.4'N, 139°23.0'E, in 590 m (1), 35°13.4'N, 139°22.0'E, in 730 m (2), 35°17.4'N, 139°22.0'E, in 62 m (1), V-1980; 35°09.4'N, 139°20.0'E, in 1,020 m (2), VI-1980; 35°14.4'N, 139°14.0'E, in 600 m (1), 35°15.4'N, 139°14.4'E, in 460 m (2), 35°15.4'N, 139°12.0'E, in 21 m (1), 35°08.0'N, 139°07.1'E, in 18 m (1), VIII-1980; 35°11.4'N, 139°18.0'E, in 920 m (5), 35°16.4'N, 139°18.0'E, in 78 m (1), 35°16.4'N, 139°16.0'E, in 88 m (2), 35°11.4'N, 139°16.0'E, in 1,070 m (1), 35°07.4'N, 139°16.0'E, in 1,200 m (1), 35°09.4'N, 139°14.0'E, in 930 m (1), 35°13.4'N, 139°14.0'E, in 750 m (1), IX-1980; 35°16.2'N, 139°33.4'E, in 15 m (3), 35°16.5'N, 139°33.4'E, in 12 m (1), 35°16.4'N, 139°32.0'E, in 20 m (1), 35°17.2'N, 139°32.2'E, in 13 m (1), 35°16.5'N, 139°30.2'E, in 28 m (5), X-1985. Sagami Bank, 35°11.7'N, 139°20.2'E, in 1,025 m (4), 35°09.5'N, 139°23.7'E, in 465 m (1), 35°10.5'N, 139°20.0'E, in 1,070 m (27), 35°07.5'N, 139°25.8'E, in 1,150 m (2), X-1966, KT-66-23. Sagami Nada, 34°56.2'N, 139°15.0'E, in 1,350 m (5), 35°02.4'N, 139°14.6'E, in 1,340 m (17), 35°04.3'N, 139°23.9'E, in 1,220 m (3), XII-1965, KT-65-34. Off Shimoda, 34°45.0'N, 139°02.1'E-34°45.1'N, 139°02.1'E, in 80-51 m (8), 34°38.1'N, 138°56.1'E-34°38.6'N, 138°56.3'E, in 44-43 m (1), 34°39.7'N, 138°57.0'E-34°39.6'N, 138°56.9'E, in 17-28 m (7), 34°44.9'N, 139°02.2'E-34°45.0'N, 139°01.9'E, in 85-57 m (11), X-1981; 34°41.1'N, 139°00.0'E-34°40.9'N, 138°59.8'E, in 59-50 m (2), XI-1981. Suruga Bay, 35°04.4'N, 138°35.5'E, in 430 m (4), 34°55.8'N, 138°32.9'E, in 450 m (1), 34°40.8'N, 138°24.1'E, in 450 m (2), I-1968, KT-68-2; 34°52.7'N, 138°37.6'E-34°53.3'N, 138°37.5'E, in 1,500-1,480 m (5), VI-1973, KT-73-6; 35°01.6'N, 138°51.1'E-35°02.5'N, 138°50.6'E, in 88-99 m (1), 35°03.1'N, 138°50.6'E-35°02.2'N, 138°50.8'E, in 100-99 m (2), 34°46.0'N, 138°42.3'E-34°46.4'N, 138°42.4'E, in 314 m (1), 34°55.0'N, 138°44.0'E-34°54.2'N, 138°44.1'E, in 313-304 m (2), X-1973, KT-73-15; 34°55.8'N, 138°43.8'E-34°56.4'N, 138°43.8'E, in 365-380 m (1), II-1976, KT-76-3; 34°54.4'N, 138°27.7'E-34°54.4'N, 138°28.0'E, in 56-64 m (65), 35°02.3'N, 138°51.0'E-35°02.7'N, 138°51.1'E, in 78-101 m (1), II-1978, KT-78-2. Off Kushimoto, 33°27.8'N, 135°47.7'E, in 35 m (1), 33°29.1'N, 135°51.0'E, in 34 m (1), VII-1978. Ishi-

kari Bay, 43°13.0'N, 141°10.0'E, in 23 m (1), 43°23.9'N, 140°55.8'E, in 84 m (1), V-1987. Off Oga Peninsula, 40°05.2'N, 139°46.4'E-40°04.8'N, 139°46.6'E, in 62-59 m (3), 39°52.5'N, 139°44.0'E-39°52.5'N, 139°43.8'E, in 49-62 m (2), 39°53.6'N, 139°42.5'E-39°53.7'N, 139°43.2'E, in 75-68 m (3), 39°53.6'N, 139°41.5'E-39°53.5'N, 139°42.3'E, in 101-93 m (4), 39°50.4'N, 139°45.0'E-39°50.8'N, 139°44.7'E, in 90-89 m (1), 39°49.8'N, 139°47.2'E-39°49.9'N, 139°47.5'E, in 70-65 m (2), 39°48.5'N, 139°45.4'E-39°48.8'N, 139°45.4'E, in 92-91 m (1), 39°49.9'N, 139°53.3'E-39°49.6'N, 139°53.5'E, in 31-33 m (5), 39°49.3'N, 139°52.8'E-39°49.2'N, 139°52.3'E, in 39-42 m (4), 39°48.5'N, 139°50.5'E-39°48.3'N, 139°50.1'E, in 57-62 m (3), 39°45.9'N, 139°49.9'E-39°45.8'N, 139°49.8'E, in 70-72 m (1), VI-1983. Off Akita, 39°47.0'N, 139°51.5'E, in 60 m (2), 39°47.0'N, 139°58.0'E, in 30 m (1), IV-1982; 39°47.0'N, 139°53.2'E, in 50 m (2), 39°47.0'N, 139°51.5'E, in 60 m (1), VI-1982; 39°47.0'N, 139°54.7'E, in 40 m (2), VIII-1982. Off Tsukumo Bay, in 26 m (4), V-1973. Maizuru Bay, in 10 m (1), in 27 m (1), in 18 m (2), in 13-16 m (8), VIII-1975. Off Maizuru Bay, Wakasa Bay, in 30 m (19), VIII-1975. Wakasa Bay, in 60 m (1), V-1976, coll. I. HAYASHI. Korea Strait, 34°35.4'N, 129°06.0'E, in 140 m (1), 34°56.4'N, 129°32.9'E, in 145 m (2), VIII-1968. Tsushima Strait, 34°40.1'N, 129°34.4'E, in 75 m (1), 34°37.5'N, 129°50.7'E, in 110 m (3), 34°27.6'N, 129°43.8'E, in 100 m (4), VIII-1968. Sasebo Bay, 33°06.6'N, 128°40.4'E, in 20 m (1), 33°04.1'N, 128°43.2'E, in 18 m (1), VIII-1972; 33°06.0'N, 128°40.7'E, in 35 m (1), II-1973. Omura Bay, 33°01.5'N, 128°46.0'E, in 30 m (1), II-1973. Nagasaki Bay, in 54 m (1), III-1971. Tomioka, Amakusa, in 12 m (1), VII-1961. Ariake Sea, in 10 m (1), XII-1957; in 15 m (1), in 21 m (3), IX-1958. Kagoshima Bay, 31°20.6'N, 130°34.6'E, in 53 m (1), I-1974. Tosa Bay, 33°24.8'N, 133°36.3'E, in 65 m (1), IV-1970. Off Usa, Tosa Bay, in 90 m (1), X-1985. Oshima Strait, 28°10.6'N, 129°13.6'E, in 68 m (1), 28°10.6'N, 129°12.9'E, in 55 m (1), IV-1970, KT-70-2.

*Description.* Largest complete specimen with 89 setigers, measuring 32 mm in length and about 2 mm in width including parapodia; largest anterior fragment measuring 4.2 mm in width at setiger 10, body filled with oocytes.

Prostomium bell-shaped (Fig. 2a) to subtriangular (Fig. 2b), bluntly rounded posteriorly, median part of prostomium slightly depressed; with digitiform occipital tentacle; eyes variable, with one pair to several distinct ocelli, but not appearing in fleshed prostomium of largest individual (Fig. 2b). Peristomium well-developed, not enclosing prostomium. Nuchal organ extending to setiger 16 along dorsum.

Notopodial lamellae of setiger 1 more slender than those of subsequent three setigers in anterior region (Fig. 2c, d); notopodial lamellae of setigers 2-4 becoming gradually larger, finely tapered, cirriform with broad base (Figs. 2a, 3a). Notopodial lamellae of setigers 5-8 reduced, semicircular to subtriangular (Figs. 2a, 3b); subsequent notopodial lamellae with wide obcordate base and digitiform tip (Fig. 3c-e). Median and posterior notopodial lamellae with small triangular base (Fig. 3f) or conical base (Fig. 3g), bearing slender digitiform tip. Setigers 9-14 with glandular material sometimes darkly pigmented (Figs. 2c, 3c). Neuropodial lamellae largest on setigers 1-4,

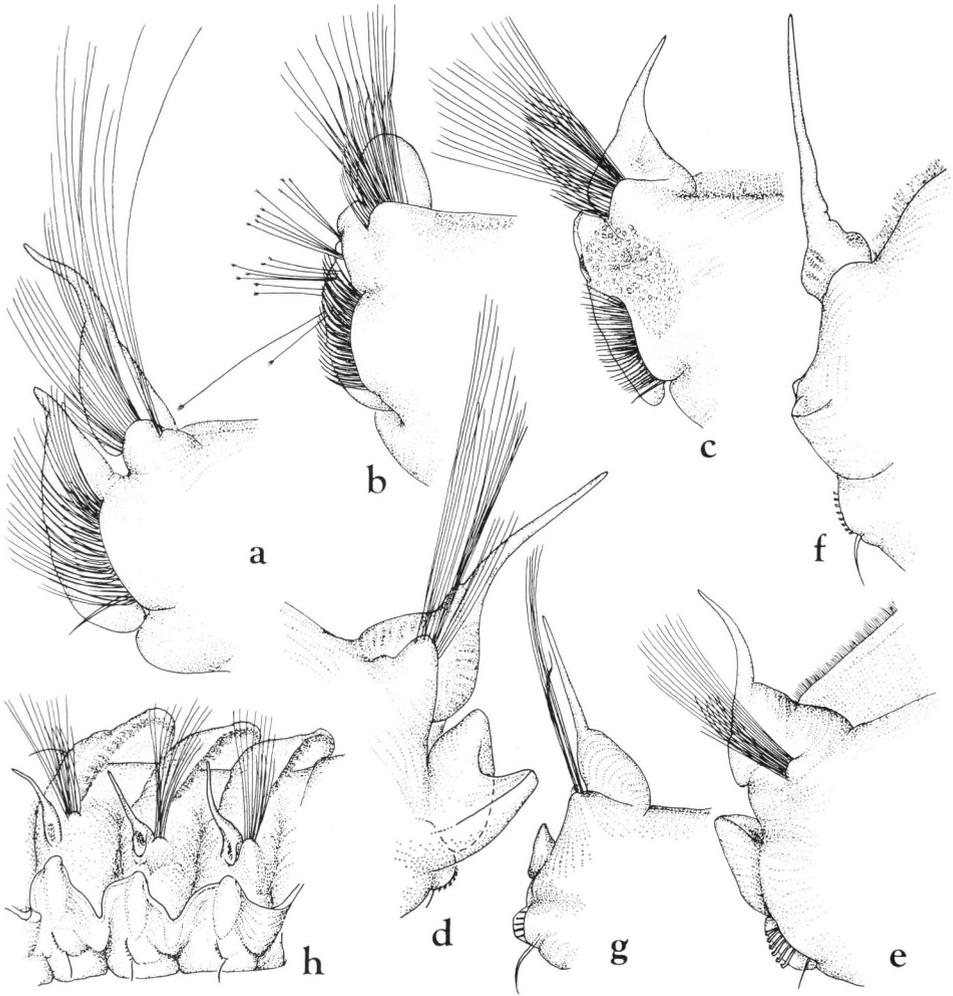


Fig. 3. *Spiophanes kroeyeri* GRUBE.—a, Right parapodium from setiger 4, anterior view,  $\times 30$ ; b, right parapodium from setiger 5, anterior view,  $\times 30$ ; c, right parapodium from setiger 9, anterior view,  $\times 30$ ; d, left parapodium from setiger 19 of large individual, anterior view,  $\times 32$ ; e, right parapodium from setiger 23, anterior view,  $\times 30$ ; f, left parapodium from setiger 54 of large individual, posterior view, notopodial setae omitted,  $\times 32$ ; g, right parapodium from posterior setiger, anterior view,  $\times 40$ ; h, setigers 27 to 29, right lateral view, showing dorsal crests and lateral pouches,  $\times 16$ .

especially well-developed on setiger 1 (Fig. 2d), those of subsequent setigers triangular (Fig. 3a), becoming low, rounded thereafter (Fig. 3b–g). Lateral pouches present from between setigers 14 and 15, continuing for posterior setigers (Fig. 3d, e, h); small individuals also having lateral pouches; dorsal crests with cilia from setiger 17–19, well-developed in median setigers (Fig. 3h), crests decreasing from about setiger 60.

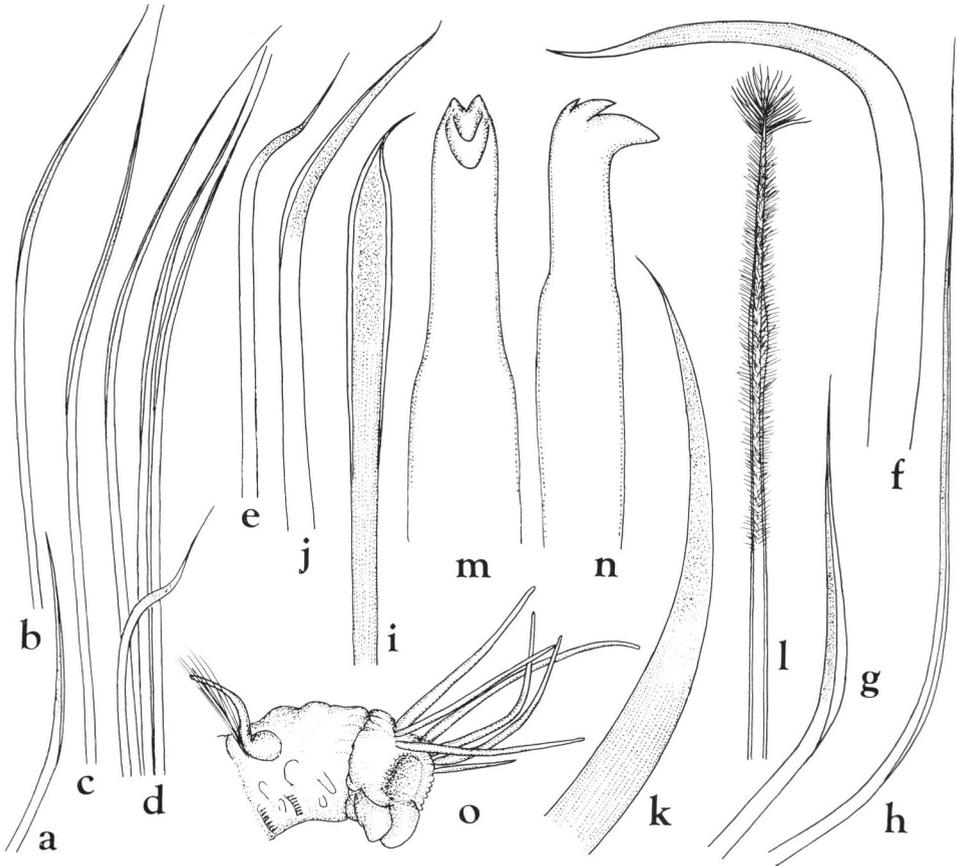


Fig. 4. *Spiophanes kroeyeri* GRUBE.—a–c, Notopodial setae of setiger 5,  $\times 130$ ; d, setal fascicle of posterior notopodium,  $\times 192$ ; e, curved seta of posterior setiger,  $\times 192$ ; f, neuropodial curved seta from setiger 1,  $\times 192$ ; g, h, neuropodial setae from setiger 4,  $\times 192$ ; i, neuropodial seta from setiger 10,  $\times 376$ ; j, ventral sabre seta from setiger 10,  $\times 192$ ; k, same from setiger 23,  $\times 352$ ; l, bacillary seta,  $\times 376$ ; m, n, neuropodial hooded hooks, frontal (m) and lateral (n) views,  $\times 615$ ; o, posterior end, post-lateral view,  $\times 42$ .

Notopodial capillary setae of first 4 setigers much longer than those of subsequent setigers (Fig. 2c); notopodial setae of setiger 1 nongranulated, without sheaths; notopodial setal fascicles of setigers 2–4 each with superior bundle of nongranulated capillaries without sheaths, and inferior bundle of short and long nongranulated capillaries with narrow sheaths; notopodial setae of setiger 5 arranged in three rows, shorter to longer, setae with light granulations and narrow sheaths (Fig. 4a–c); following setal fascicle also with three rows of capillaries, setae with narrow sheaths and granulations. Notopodial setal fascicle of posterior setigers with 1 short, geniculated curved seta with granulations among normal sheathed capillaries (Figs. 3g, 4d, e). Neuropodial

setae of setiger 1 include 1–2 stout, curved, nongranulated setae (Figs. 2d, 4f) in addition to short and long limbate granulated capillaries (Fig. 2d). Capillary neurosetae of setigers 2–4 arranged in two rows, setae in anterior row shorter, with wide sheaths and granulations (Fig. 4g), setae in posterior row longer, with narrow sheaths and light granulations (Fig. 4h). Neuropodial setae of setiger 5 arranged in one row; setae short, broad, bilimbate, distally pointed, with granulated shafts (Fig. 4i). Ventral sabre setae from setiger 4, each heavily granulated near tip (Fig. 4j), those of posterior setigers becoming stouter basally (Fig. 4k). Bacillary setae present on setigers 5–8, emerging from glandular interramal region; each seta bristled for about 2/3 length, with brushlike tip (Figs. 3b, 4l). Neuropodial hooks from setiger 15, numbering 6–7 per neuropodium; hooks quadridentate with main fang surmounted by single unpaired tooth and pair of smaller teeth (Fig. 4m), appearing tridentate in lateral view (Fig. 4n), hoods lacking. Pygidium with 7–8 digitiform anal cirri and 2 ventral papillae, anus terminal (Fig. 4o).

*Remarks.* Usually bacillary setae emerge from just above and behind the upper neurosetae on parapodia of setigers 5–14 with thread glands. However, the specimens examined have bacillary setae only from setiger 5 to setigers 7 or 8.

The species is new to the Japanese fauna.

*Distribution.* Greenland; western Norway; Australia; Falkland Islands; Ross Sea; Japan; subtidal to 1,272 m.

***Spiophanes japonicum* sp. nov.**

(Figs. 5a–h, 6a–h, 7a–n)

*Material examined.* Ishikari Bay, 43°15.6'N, 141°08.3'E, in 28 m (6), V–1987. Kamaishi Bay, in 53 m (4), XI–1973. Southeast off Otsuchi, 38°42.0'N, 143°01.6'E–38°40.6'N, 143°00.2'E, in 1642–1659 m (1), VIII–1985, KT–85–11. Off Emi, Boso Peninsula, 35°00.1'N, 140°06.8'E–35°00.5'N, 140°07.5'E, in 145–150 m (1), IX–1976, KT–76–16. Tokyo Bay, 35°28.0'N, 139°46.0'E, in 23 m (1), V–1982. Off Hiratsuka, Sagami Bay, 35°18.8'N, 139°25.7'E, in 11 m (2), 35°18.2'N, 139°24.0'E, in 11 m (6), 35°17.5'N, 139°18.5'E, in 14 m (8), 35°17.9'N, 139°19.5'E, in 20 m (1), VI–1982. Sagami Bay, 35°10.5'N, 139°34.3'E–35°11.1'N, 139°34.4'E, in 92 m (1), 35°11.3'N, 139°34.9'E–35°11.4'N, 139°33.5'E, in 60 m (1), 35°14.0'N, 139°32.5'E–35°14.3'N, 139°32.5'E, in 84 m (17), 35°09.6'N, 139°34.5'E–35°10.2'N, 139°34.5'E, in 84 m (24), 35°08.4'N, 139°34.5'E–35°08.6'N, 139°34.5'E, in 83 m (29), 35°12.3'N, 139°33.2'E–35°13.0'N, 139°33.0'E, in 73 m (holotype and 5 paratypes), 35°08.0'N, 139°35.3'E–35°07.4'N, 139°35.4'E, in 73 m (1), IX–1979; 35°18.1'N, 139°23.0'E, in 13 m (1), V–1980; 35°16.4'N, 139°18.0'E, in 78 m (1), VIII–1980. Off Enoshima, Sagami Bay, 35°11.4'N, 139°28.7'E–35°14.9'N, 139°27.4'E, in 110–140 m (2), V–1970, KT–70–4. Off Shimoda, 34°45.0'N, 139°02.1'E–34°45.1'N, 139°02.1'E, in 80–51 m (1), X–1981. Off Izu-Oshima, 34°41.3'N, 139°27.5'E–34°41.6'N, 139°27.7'E, in 45–80 m (1), VII–1977. Okinose, Suruga Bay, 34°37.9'N, 138°27.0'E–34°37.7'N, 138°26.7'E, in 95–

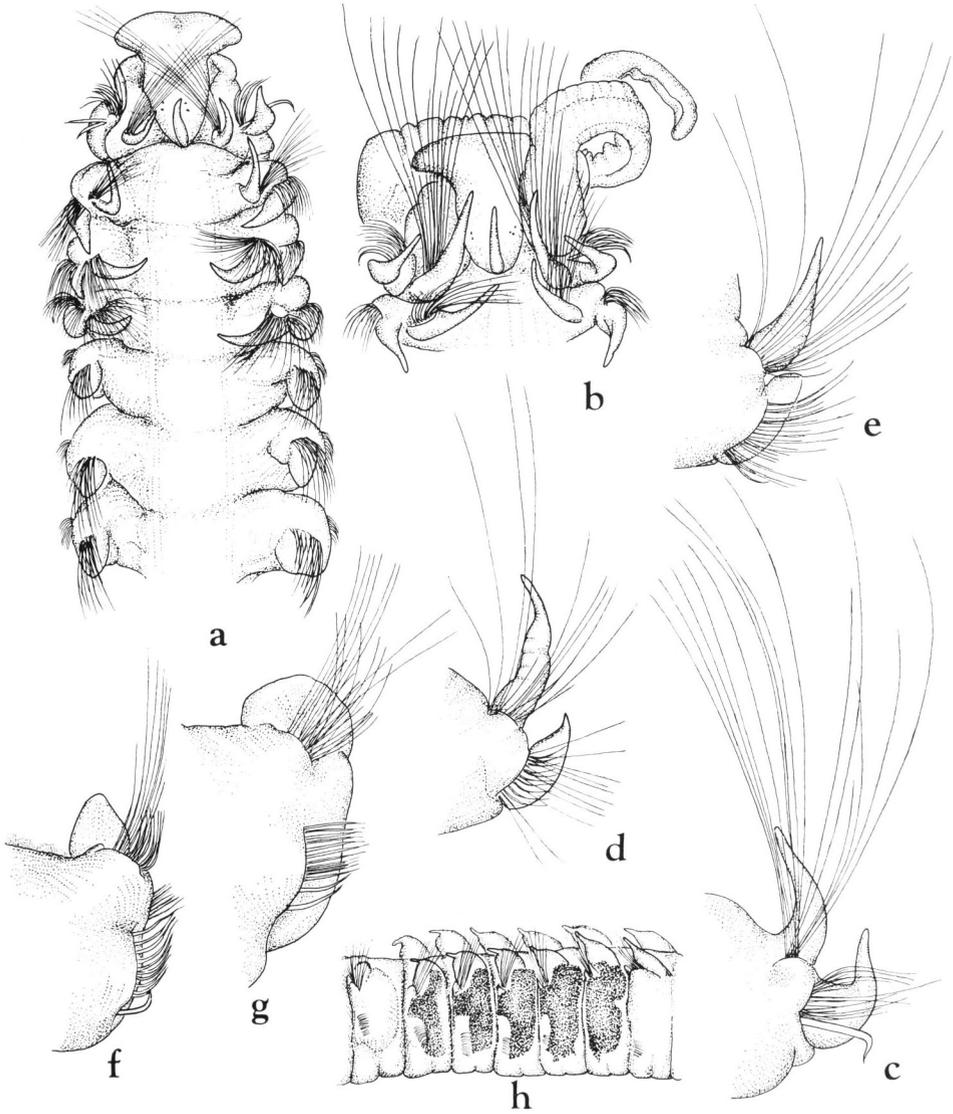


Fig. 5. *Spiophanes japonicum* sp. nov. — a, Anterior end, dorsal view,  $\times 40$ ; b, anterior end with right palp, dorsal view,  $\times 40$ ; c, left parapodium of setiger 1, anterior view,  $\times 58$ ; d, left parapodium of setiger 3, anterior view,  $\times 58$ ; e, left parapodium of setiger 4, anterior view,  $\times 58$ ; f, left parapodium of setiger 5, anterior view,  $\times 88$ ; g, left parapodium of setiger 8, anterior view,  $\times 88$ ; h, setigers 8 to 14, left lateral view, showing glandular region with dark glands,  $\times 32$ .

100 m (1), 34°54.4'N, 138°27.7'E–34°54.4'N, 138°28.0'E, in 56–64 m (48), II–1978, KT-78-2. Off Kunozan, Suruga Bay, 35°54.4'N, 138°28.4'E, in 60 m (7), VII–1967. Uchiura Bay, Suruga Bay, 35°01.6'N, 138°51.1'E–35°02.5'N, 138°50.6'E, in 88–99 m (4), 34°45.9'N, 138°42.3'E–34°46.4'N, 138°42.4'E, in 314 m (1), X–1973, KT-73-15. Sea of Enshu, 35°35.6'N, 138°01.9'E, in 80 m (15), V–1967. Off Oga Peninsula, 39°49.3'N, 139°46.3'E–39°49.5'N, 139°46.8'E, in 82–75 m (2), 39°48.5'N, 139°45.4'E–39°48.8'N, 139°45.4'E, in 92–91 m (6), 39°48.5'N, 139°44.5'E–39°48.2'N, 139°44.6'E, in 104–102 m (4), 39°47.2'N, 139°47.5'E–39°47.3'N, 139°47.9'E, in 82–78 m (2), 39°48.6'N, 139°50.6'E–39°48.3'N, 139°50.1'E, in 57–62 m (2), 39°47.7'N, 139°48.7'E–39°47.9'N, 139°49.0'E, in 72–69 m (1), 39°45.3'N, 139°48.8'E–39°45.0'N, 139°48.3'E, in 80–83 m (3), 40°06.1'N, 139°45.8'E–40°06.3'N, 139°45.5'E, in 68 m (1), VI–1983. Off Tsukumo Bay, in 37 m (3), in 25 m (3), V–1973. Tango-Kai, Wakasa Bay, in 95 m (1), VII–1976, coll. I. HAYASHI. Off Kamo, Dogo, in 55 m (5), VIII–1980. Tsushima Strait, 34°37.5'N, 129°50.7'E, in 110 m (1), 34°27.6'N, 129°43.8'E, in 100 m (2), VIII–1968. Kagoshima Bay, 31°20.6'N, 130°34.6'E, in 53 m (1), 31°12.4'N, 130°42.6'E, in 110 m (6), 31°35.8'N, 130°35.5'E, in 44 m (2), 31°16.5'N, 130°42.3'E, in 100 m (44), 31°31.2'N, 130°33.2'E, in 29 m (1), 31°27.0'N, 130°42.0'E, in 100 m (5), I–1974. Oshima Strait, Amami-Oshima, in 50–58 m (11), VII–1989.

*Description.* Holotype largest complete individual with 102 setigers, measuring 29 mm in length and about 1 mm in width at anterior region including parapodia. Body slender, subcylindrical.

Prostomium T-shaped, broad on anterior margin, with slight median incision, with laterally directed processes (Fig. 5a, b); prostomium bluntly rounded posteriorly, ending on setiger 1; 2 pairs of eyes present on holotype; digitiform occipital tentacle arising from posterior end of prostomium. Peristomium moderately developed as 2 lateral bulges. Nuchal organ extending to setiger 10 along dorsum (Fig. 5a).

Setigers 1–4 with long cirriform notopodial lamellae, all lamellae subequal in length (Fig. 5a, c–e). Subsequent notopodial lamellae of setigers 5–8 reduced, subtriangular (Fig. 5f) to semicircular (Fig. 5g), those increasing gradually in size. Conspicuous dark glands present between noto- and neuropodia on setigers 9–13 (Fig. 5h), notopodial lamellae on this region with wide obcordate base and digitiform tip (Fig. 6a, b); subsequent notopodial lamellae becoming fingerlike lobes with small triangular base (Fig. 6c–g). Neuropodial lamellae slightly tapered on setiger 1, wider, triangular on setigers 2–4 (Fig. 5c–e), thereafter lower, rounded, glandular. Lateral pouches lacking. Dorsal crests with cilia from setiger 15, these forming deep pockets over dorsum in posterior portion of each setiger (Fig. 6h).

Notopodial capillary setae of first 4 setigers much longer than those of subsequent setigers (Fig. 5c–e), setae of setiger 1 especially long, extending past anterior end (Fig. 5a, b); notopodial setae of setiger 1 nongranulated, lacking sheaths, notopodial setae of setigers 2–4 arranged in 2 rows, setae of both rows with light granulations and narrow sheaths, setae in setigers subsequent to setiger 5 arranged in 3 rows, shorter to longer, with light granulations and narrow sheaths (Fig. 7a, b). Noto-

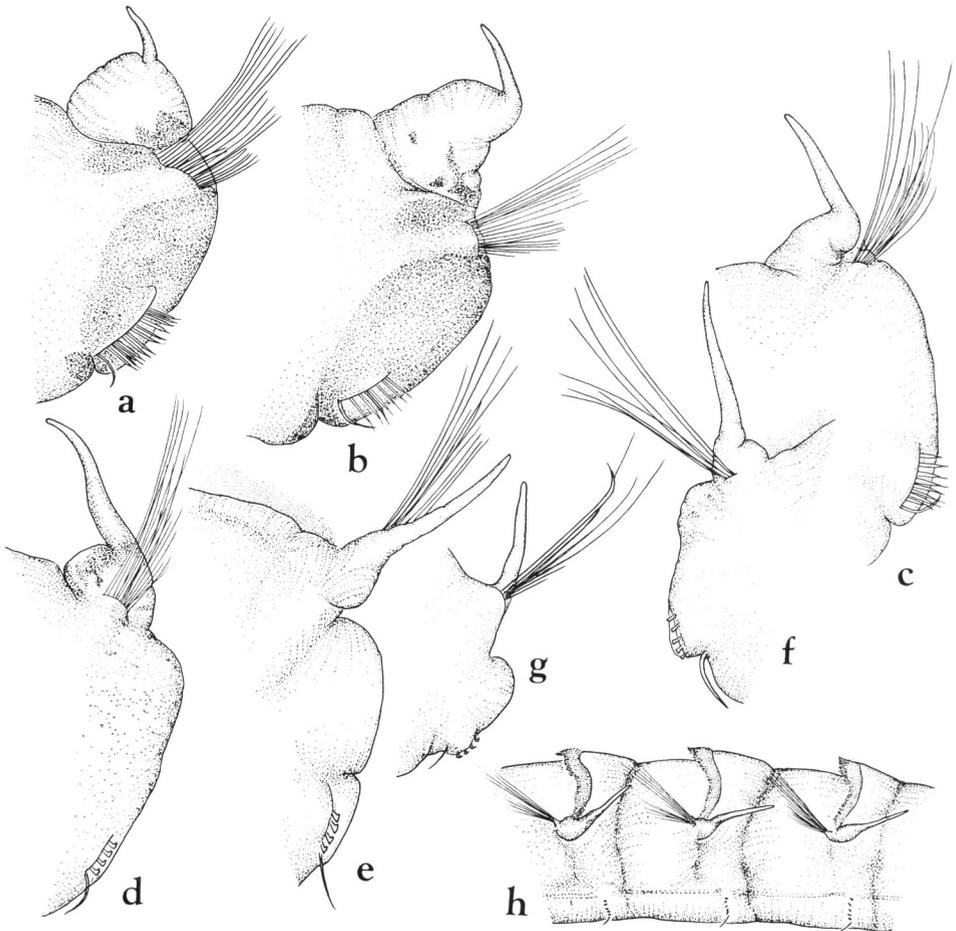


Fig. 6. *Spiophanes japonicum* sp. nov.—a, Left parapodium of setiger 9, anterior view,  $\times 88$ ; b, left parapodium of setiger 13, anterior view,  $\times 88$ ; c, left parapodium of setiger 14, anterior view,  $\times 88$ ; d, left parapodium of setiger 15, anterior view,  $\times 88$ ; e, right parapodium of setiger 20, posterior view,  $\times 88$ ; f, right parapodium of setiger 50, anterior view,  $\times 88$ ; g, left parapodium of posterior setiger, anterior view,  $\times 88$ ; h, setigers 47 to 49, left lateral view,  $\times 40$ .

podial setal fascicles of posterior setigers each with 1–2 distally right-angled, curved setae with granulations and narrow limbation at distal part (Fig. 7c); curved setae accompanied by sheathed capillaries of various lengths. Neuropodial setae of setiger 1 include 1–2 stout, curved, nongranulated setae (Fig. 7d), in addition to short and long capillaries with light granulations and narrow sheaths (Fig. 7e, f). Capillary neurosetae of setigers 2–4 arranged in 2 rows (Fig. 5d, e). Neuropodial setae of setiger 5 arranged in one row, setae broad, bilimbate, distally pointed (Fig. 7g, h), those of

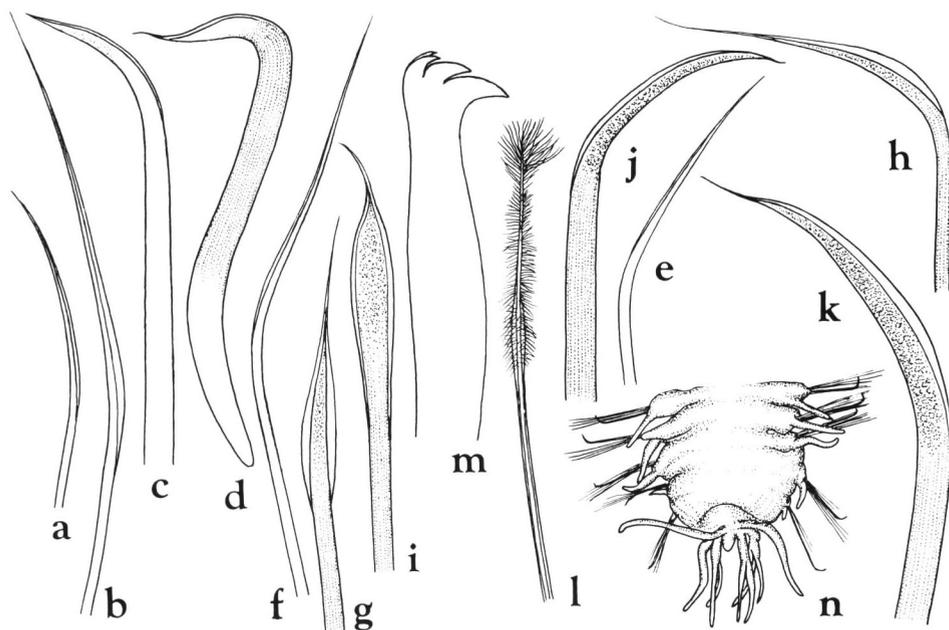


Fig. 7. *Spiophanes japonicum* sp. nov.—a, b, Short and long notopodial setae of setiger 10,  $\times 255$ ; c, curved seta of posterior setiger,  $\times 375$ ; d, neuropodial curved seta of setiger 1,  $\times 255$ ; e, f, short and long neuropodial capillary setae of setiger 1,  $\times 255$ ; g, h, neuropodial setae of setiger 11,  $\times 680$ ; i, neuropodial seta of setiger 11,  $\times 680$ ; j, ventral sabre seta from setiger 5,  $\times 375$ ; k, ventral sabre seta from setiger 11,  $\times 680$ ; l, bacillary seta from setiger 5,  $\times 680$ ; m, neuropodial hook,  $\times 960$ ; n, posterior end, dorsal view,  $\times 47$ .

more posterior setigers with broad, granulated shafts and filiform tips (Fig. 7i). Ventral sabre setae from setiger 4, each heavily granulated near tip (Fig. 7j), those of posterior setigers becoming stouter basally (Fig. 7k). Bacillary setae appearing on setiger 5, emerging from glandular interrampal region; each seta bristled for only 1/2 length, with brushlike tip (Fig. 7l). Neuropodial hooks from setiger 15, numbering 5–7 per neuropodium; hooks quadridentate with main fang surmounted by single unpaired tooth and pair of smaller teeth, appearing tridentate in lateral view, hoods lacking (Fig. 7m). Pygidium with 3 pairs of digitiform anal cirri, some cirri dichotomously branched (Fig. 7n).

*Remarks.* *Spiophanes japonicum* is similar to *S. berkeleyorum* PETTIBONE, 1962 from the east coast of Vancouver Island, British Columbia, in that the prostomium is widest anteriorly, a prominent occipital tentacle is present, the neuropodial hooks are quadridentate and lack hoods, and lateral pouches are absent. However, *S. japonicum* can be distinguished from *S. berkeleyorum* in that (1) the notopodial lamellae of setigers 5–8 are reduced and are subtriangular to semicircular, rather than being

low and rounded on setigers 5–9 (PETTIBONE, 1962, fig. 1a), (2) the notopodial lamellae in the posterior region (beginning on setiger 15 and continuing through the end of the body) are fingerlike lobes with small triangular bases, rather than large, cordiform lamellae (PETTIBONE, 1962, fig. 4a), and (3) the notosetae of setiger 1 are extremely long, rather than short.

*S. japonicum* is clearly related to *S. kroeyeri* GRUBE, but is separable from that species in that the prostomium is T-shaped, rather than subtriangular to bell-shaped, and lateral pouches are absent throughout body, rather than present from setiger 14–16. *S. japonicum* is also distinguished from *S. longicirris* CAULLERY, 1944 in the shape of the prostomium and in the features of the notopodial lamellae of first 4 setigers.

*Type-series.* Holotype, NSMT–Pol. H 332; 5 paratypes, NSMT–Pol. P 333.

*Distribution.* Japan; 29–314 m.

### *Spiophanes bombyx* (CLAPARÈDE, 1870)

(Figs. 8a–h, 9a–n)

*Spiophanes bombyx* CLAPARÈDE, 1870, pp. 485–487, pl. 12, fig. 2.

*Spiophanes bombyx*: MESNIL, 1896, pp. 249–257, pl. 15; FAUVEL, 1927, p. 41, fig. 14, a–i; OKUDA, 1937, pp. 222–223, figs. 3, 4; BERKELEY & BERKELEY, 1952, pp. 22–24, figs. 40–43; PETTIBONE, 1962, p. 85; IMAJIMA & HARTMAN, 1964, pp. 289–290; HARTMAN, 1966, p. 22, pl. 5, figs. 14–16; DAY, 1967, p. 474, fig. 18.5. a–e; 1973, p. 69; FOSTER, 1971, pp. 40–43, figs. 66–75; BLAKE & KUDENOV, 1978, p. 224; BLAKE, 1983, p. 230.

*Material examined.* Off Samani, Hokkaido, 42°05.7'N, 142°53.7'E, in 40 m (2), VII–1971. Usujiri Bay, Hokkaido, in 12 m (1), in 15 m (3), in 17 m (4), in 20 m (1), in 21 m (1), VI–1985, coll. K. YOKOUCHI. Ishikari Bay, 43°16.8'N, 140°48.2'E–43°15.5'N, 140°48.0'E, in 64–62 m (1), 43°17.5'N, 141°15.7'E–43°17.0'N, 141°14.8'E, in 26–26 m (2), 43°18.7'N, 141°10.3'E–43°19.4'N, 141°10.8'E, in 37–37 m (1), 43°13.0'N, 141°10.0'E, in 23 m (17), 43°15.6'N, 141°08.2'E, in 28 m (27), 43°24.6'N, 141°03.5'E, in 66 m (14), 43°21.5'N, 140°51.8'E–43°21.0'N, 140°51.4'E, in 83–83 m (2), 43°17.3'N, 140°41.3'E, in 64 m (5), 43°12.8'N, 140°48.3'E, in 23 m (26), 43°12.4'N, 140°49.7'E, in 16 m (5), V–1987. Miyako Bay, 39°39.2'N, 141°59.8'E, in 49 m (7), VII–1967. Otsuchi Bay, 39°20.8'N, 141°57.8'E–39°20.9'N, 141°57.9'E, in 48–50 m (5), 39°21.5'N, 141°58.7'E–39°21.8'N, 141°59.0'E, in 65–70 m (7), 39°20.5'N, 141°57.2'E–39°20.6'N, 141°57.4'E, in 43–45 m (14), 39°21.7'N, 141°59.8'E–39°21.5'N, 141°59.6'E, in 79–74 m (5), VIII–1979; 39°21.3'N, 141°59.0'E–39°21.4'N, 141°59.1'E, in 66–68 m (2), 39°20.8'N, 141°58.5'E–39°21.0'N, 141°58.6'E, in 55–58 m (3), 39°21.0'N, 141°58.9'E–39°21.2'N, 141°58.9'E, in 62 m (5), 39°20.8'N, 141°58.2'E–39°20.8'N, 141°58.4'E, in 40–44 m (40), V–1984; 39°20.9'N, 141°58.1'E, in 46 m (17), 39°20.4'N, 141°55.8'E, in 10 m (1), VII–1985. Kamaishi Bay, in 22 m (8), XI–1973; in 22 m (5), in 24 m (2), in 29 m (4), XI–1974. Off Shirahama, Boso Peninsula, 34°51.5'N, 139°55.8'E, in 93 m (3), IX–1976, KT–76–16. Banzu, in 6 m (2), VI–1974. Uraga Strait, 35°13.5'N,

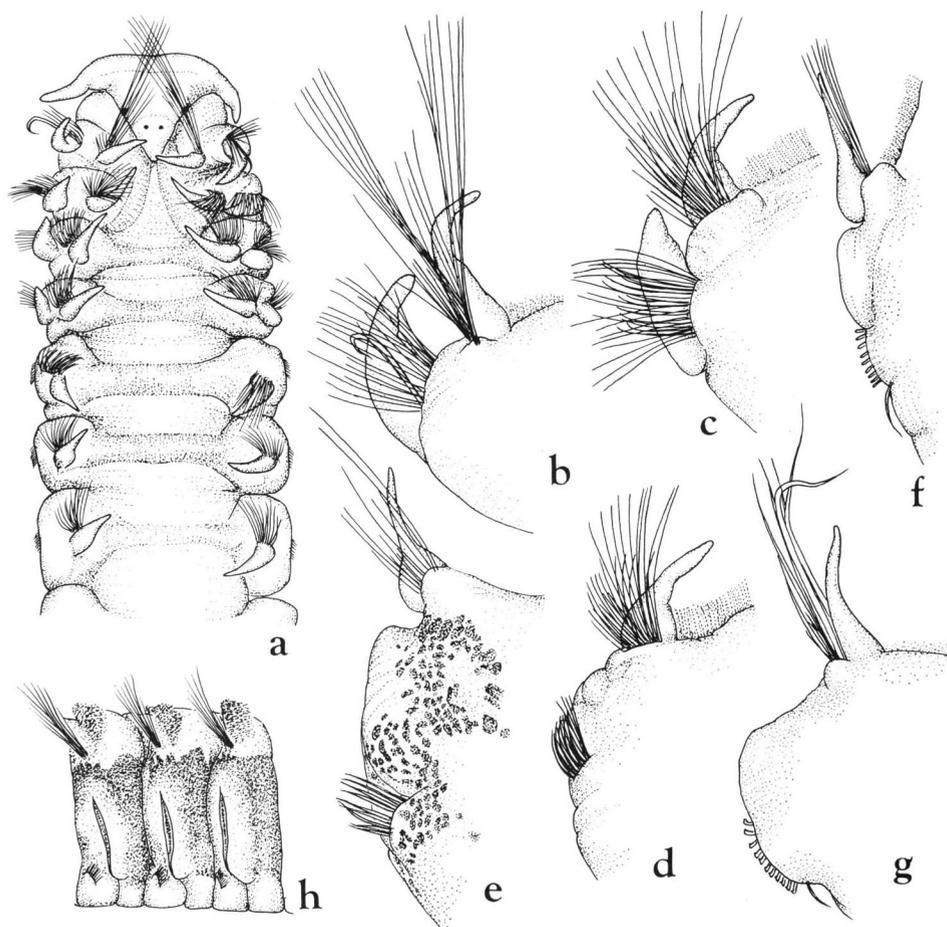


Fig. 8. *Spiophanes bombyx* (CLAPARÈDE). — a, Anterior end, dorsal view,  $\times 34$ ; b, right parapodium from setiger 1, anterior view,  $\times 62$ ; c, right parapodium from setiger 4, anterior view,  $\times 62$ ; d, right parapodium from setiger 5, anterior view,  $\times 62$ ; e, right parapodium from setiger 12, anterior view,  $\times 62$ ; f, right parapodium from setiger 60, anterior view,  $\times 62$ ; g, right parapodium from posterior setiger, anterior view,  $\times 62$ ; h, setigers 11 to 13, left lateral view, showing longitudinal interramal opening in glandular region,  $\times 34$ .

139°50.0'E, in 10 m (37), XII-1978; 35°11.5'N, 139°41.1'E, in 11 m (1), II-1979. Tokyo Bay, 35°23.0'N, 139°45.0'E, in 20 m (2), VI-1973, KT-73-6; 35°21.0'N, 139°40.0'E, in 13 m (3), VIII-1981; 35°30.0'N, 140°00.0'E, in 16 m (1), IX-1981; 35°20.0'N, 139°46.0'E, in 14 m, X-1981 (2), V-1982 (15), VIII-1982 (13), III-1983 (3); 35°22.0'N, 139°48.0'E, in 14 m (1), 35°22.0'N, 139°44.0'E, in 20 m (2), IX-1982. Off Zushi, Sagami Bay, 35°16.7'N, 139°33.7'E, in 12 m (1), VII-1969. Off Moroiso Bay, Sagami Bay, in 30 m (23), III-1979. Off Mito beach, Sagami Bay, 35°10.3'N, 139°36.8'E,

in 17 m (3), 35°10.3'N, 139°36.6'E, in 20 m (7), 35°10.3'N, 139°36.4'E, in 32 m (20), 35°10.4'N, 139°36.3'E, in 36 m (2), 35°10.4'N, 139°36.1'E, in 42 m (1), 35°10.3'N, 139°36.1'E, in 45 m (1), VII-1967. Off Hiratsuka, Sagami Bay, 35°18.8'N, 139°25.7'E, in 11 m (21), 35°18.2'N, 139°24.0'E, in 11 m (13), 35°18.5'N, 139°21.0'E, in 10 m (4), 35°17.9'N, 139°20.2'E, in 25 m (6), 35°17.5'N, 139°18.5'E, in 14 m (52), VI-1982. Off Koyahata, Sagami Bay, 35°16.1'N, 139°12.9'E, in 94 m (1), 35°16.0'N, 139°12.5'E, in 22 m (1), 35°16.6'N, 139°13.4'E, in 10 m (1), V-1966; 35°15.7'N, 139°12.2'E, in 16 m (3), 35°15.3'N, 139°12.1'E, in 68 m (3), 35°15.9'N, 139°12.4'E, in 20 m (29), VI-1966; 35°15.0'N, 139°10.9'E, in 23 m (2), VII-1966. Sagami Bay, 35°09.4'N, 139°37.0'E, in 11 m (6), 35°17.2'N, 139°32.2'E, in 15 m (5), 35°16.4'N, 139°27.0'E, in 57 m (3), 35°17.4'N, 139°27.0'E, in 20 m (1), VII-1979; 35°07.4'N, 139°24.0'E, in 850 m (2), XI-1979; 35°18.1'N, 139°23.0'E, in 13 m (1), 35°16.4'N, 139°20.0'E, in 360 m (1), 35°15.4'N, 139°12.0'E, in 21 m (1), VIII-1980; 35°17.9'N, 139°19.5'E, in 20 m (37), VI-1982; 35°16.2'N, 139°33.4'E, in 15 m (3), 35°16.5'N, 139°33.4'E, in 12 m (39), 35°17.4'N, 139°32.3'E, in 9 m (6), 35°17.1'N, 139°34.1'E, in 6 m (7), 35°17.2'N, 139°32.2'E, in 13 m (1), 35°15.2'N, 139°33.6'E, in 22 m (2), 35°16.4'N, 139°32.0'E, in 20 m (1), 35°17.6'N, 139°32.4'E, in 5 m (1), 35°17.5'N, 139°30.2'E, in 7 m (1), X-1985; 35°17.3'N, 139°17.5'E, in 14 m (19), 35°17.0'N, 139°16.0'E, in 20 m (1), 35°18.0'N, 139°20.0'E, in 12 m (6), VII-1989. Off Shimoda, 34°39.7'N, 138°57.0'E-34°39.6'N, 138°56.9'E, in 17-28 m (1), X-1981. Sea of Enshu, 35°31.9'N, 137°12.4'E, in 30 m (5), 35°36.4'N, 137°22.9'E, in 30 m (5), 35°39.2'N, 137°37.2'E, in 20 m (30), 35°38.7'N, 137°36.6'E, in 60 m (44), 35°37.2'N, 138°02.7'E, in 40 m (16), 35°35.6'N, 138°01.9'E, in 80 m (2), 35°37.8'N, 138°03.0'E, in 20 m (4), V-1967. Off Kunozan, Suruga Bay, 35°55.0'N, 138°28.1'E, in 30 m (1), VII-1967. Off Oga Peninsula, 39°48.5'N, 139°50.5'E-39°48.3'N, 139°50.0'E, in 57-62 m (1), 40°01.1'N, 139°49.7'E-40°00.7'N, 139°50.0'E, in 32-29 m (7), 40°05.1'N, 139°46.4'E-40°04.8'N, 139°46.5'E, in 62-59 m (1), VI-1983. Off Akita, 39°47.0'N, 140°00.8'E, in 20 m (2), IV-1982; 39°47.0'N, 140°01.8'E, in 10 m (2), 39°47.0'N, 139°54.7'E, in 40 m (2), VIII-1982; 39°47.0'N, 139°53.2'E, in 50 m (1), IV-1983. Off Tsukumo Bay, in 37 m (2), in 25 m (5), V-1973. Tsukumo Bay, in 21 m (1), V-1973. Off Yuragawa, Wakasa Bay, in 10 m (9), V-1976, coll. I. HAYASHI. Tsushima Strait, 33°49.9'N, 129°29.0'E, in 100 m (3), 33°48.6'N, 130°02.7'E, in 45 m (31), 33°57.7'N, 129°11.6'E, in 105 m (10), 34°17.6'N, 129°48.6'E, in 110 m (1), 34°25.1'N, 129°59.3'E, in 115 m (4), 34°01.2'N, 130°24.0'E, in 60 m (1), VIII-1968. Tosa Bay, 33°28.3'N, 133°33.7'E, in 23 m (3), 33°26.6'N, 133°34.8'E, in 45 m (1), IV-1970. Sasebo Bay, 33°05.2'N, 128°40.0'E, in 30 m, V-1972 (2), VIII-1972 (1), II-1973 (2); 33°06.6'N, 128°40.4'E, in 20 m (1), V-1972; 33°04.0'N, 128°44.0'E, in 20 m (1), XI-1972; 33°06.0'N, 128°40.7'E, in 35 m (10), II-1973. Tomioka, Amakusa, in 10 m (2), X-1963. Ariake Sea, in 20 m (1), XII-1957; in 10 m (1), IX-1958. Kagoshima Bay, 31°12.2'N, 130°40.1'E, in 12 m (2), 31°12.4'N, 130°44.8'E, in 60 m (2), I-1974. Off Tanegashima, 30°36.5'N, 130°54.0'E, in 41 m (3), VI-1975.

*Description.* Complete specimen with 98 setigers, measuring 25 mm in length

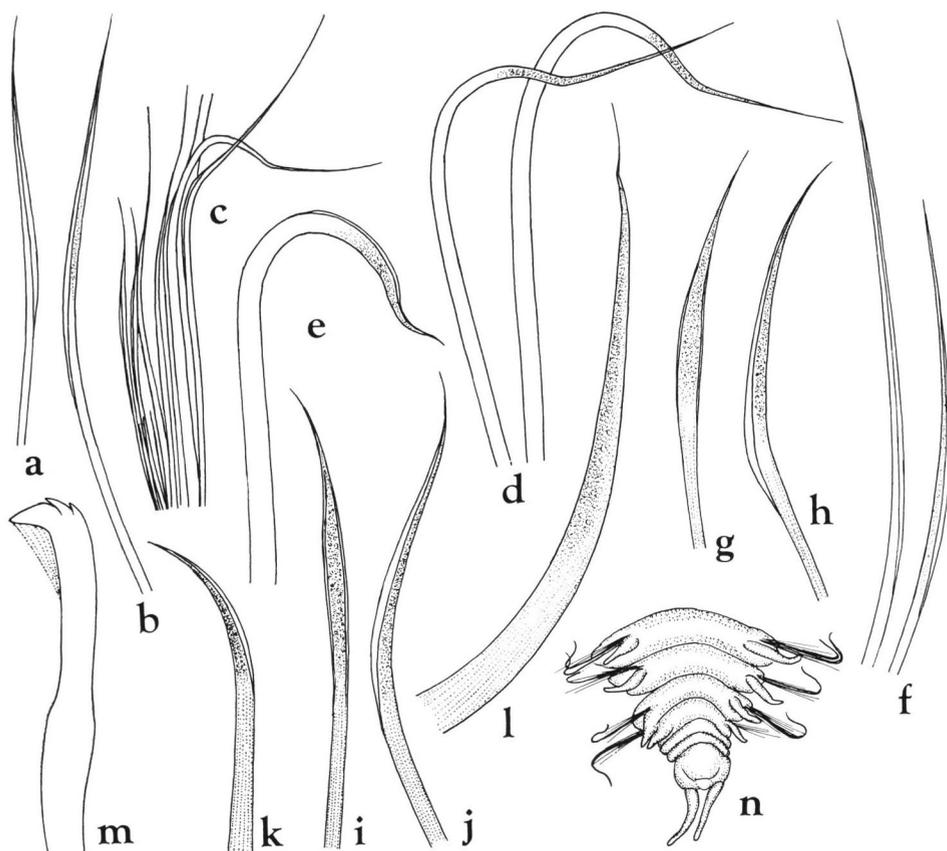


Fig. 9. *Spiophanes bombyx* (CLAPARÈDE).—a, Short notopodial seta of setiger 12,  $\times 255$ ; b, long notopodial seta of same setiger,  $\times 255$ ; c, notopodial fascicle of posterior setiger,  $\times 130$ ; d, enlarged curved setae of posterior setiger,  $\times 190$ ; e, neuropodial curved seta from setiger 1,  $\times 255$ ; f, neuropodial setae from setiger 1,  $\times 375$ ; g, h, neuropodial setae from setiger 5,  $\times 375$ ; i, j, neuropodial setae from setiger 12,  $\times 375$ ; k, ventral sabre seta from setiger 12,  $\times 375$ ; l, same from setiger 60,  $\times 680$ ; m, neuropodial hooded hook,  $\times 960$ ; n, posterior end, dorsal view,  $\times 34$ .

and about 1 mm in width including parapodia. Body slender, subcylindrical.

Prostomium anteriorly T-shaped, with prominent, elongate frontal horns; tapered posteriorly, ending on setiger 1; occipital tentacle absent; two pairs of small eyes present, anterior pair farther apart, usually detectable. Peristomium fused to setiger 1. Dorsal nuchal organs extending from posterior margin of prostomium to base of setiger 2 (Fig. 8a).

Notopodial lamellae on setigers 1–4 shifted dorsally; lamellae of setiger 1 digitiform, subequal to neuropodial lamellae in size (Fig. 8b); following lamellae slightly

shorter but with wider base (Fig. 8c-f); lamellae in posterior setigers slender, digitiform (Fig. 8g). Neuropodial lamellae triangular, tapered in anterior setigers (Fig. 8b, c), then becoming reduced, cushionlike (Fig. 8d, e); prominently glandular interramal region present on setigers 9-16 with longitudinal, interramal opening (Fig. 8h). Lateral pouches lacking. Transverse ciliated ridges from setiger 3 and more prominent after setiger 15.

Notopodial setae all capillaries; setae of superior bundle on setiger 1 very long, thin, lacking granulations and sheaths, inferior setae short, with sheaths but lacking granulations. Anterior setae arranged in 2-3 rows, setae of anterior row shorter, nongranulated with sheaths (Fig. 9a), those of posterior row longer, lightly granulated with sheaths (Fig. 9b). Last 7-9 posterior notopodia with fascicles of short and long sheathed capillaries and 1-2 enlarged curved setae with granulated tips (Fig. 9c, d, n). Neurosetae of setiger 1 include 1-2 stout, curved, distally granular crooklike setae (Fig. 9e), and additional short, lightly granulated and long, nongranulated, limbate capillaries (Fig. 9f); capillary neurosetae of setigers 2-4 similar to those of setiger 1; following capillary neurosetae short, distally granulated, with broad sheath (Fig. 9g-j). Ventral sabre setae present from setiger 10-12, moderately granulated (Fig. 9k), those of posterior setigers stout, with short filament at tip (Fig. 9l). Neuropodial hooded hooks tridentate, beginning on setiger 15, reduced hood present (Fig. 9m). Pygidium with 2 short anal cirri (Fig. 9n).

*Distribution.* North and South Atlantic; Mediterranean; South Africa; Gulf of Mexico; southeastern Australia; Falkland Island; W. Canada to S. California; Bering Sea; Japan; low intertidal to 1,336 m.

*Spiophanes urceolata* sp. nov.

(Figs. 10a-c, 11a-g, 12a-1)

*Material examined.* Kashima Sea, 36°34.9'N, 140°55.6'E-36°35.6'N, 140°56.2'E, in 120-122 m (9), VIII-1979, KT-79-13. Off Boso Peninsula, 34°57.2'N, 140°02.4'E-34°57.6'N, 140°02.7'E, in 115 m (4), 34°51.2'N, 139°55.6'E-34°51.1'N, 139°55.2'E, in 100 m (7), 35°00.1'N, 140°06.8'E-35°00.5'N, 140°07.5'E, in 145-150 m (6), 34°53.8'N, 140°00.5'E-34°53.3'N, 139°59.9'E, in 180-160 m (9), IX-1976, KT-76-16. Off Mito beach, Sagami Bay, 35°10.1'N, 139°34.8'E, in 85 m (1), VII-1967. Off Hiratsuka, Sagami Bay, 35°15.5'N, 139°24.8'E, in 116 m (2), VI-1982. Sagami Bay, 35°11.4'N, 139°28.7'E-35°14.9'N, 139°27.4'E, in 110-140 m (4), V-1970, KT-70-6; 35°05.3'N, 139°40.1'E, in 100 m (1), VIII-1978; 35°07.4'N, 139°34.0'E, in 98 m (1), VII-1979; 35°11.4'N, 139°32.0'E, in 350 m (1), 35°15.4'N, 139°28.0'E, in 84 m (1), VIII-1979; 35°08.3'N, 139°34.5'E-35°08.6'N, 139°34.5'E, in 83 m (1), 35°10.5'N, 139°34.3'E-35°11.0'N, 139°34.4'E, in 92 m (holotype and 1 paratype), IX-1979; 35°08.5'N, 139°34.7'E-35°07.9'N, 139°34.6'E, in 88-92 m (1), X-1979; 35°15.4'N, 139°16.0'E, in 110 m (2), VIII-1980; 35°08.1'N, 139°32.9'E, in 150 m (45), 35°08.1'N, 139°34.6'E, in 95 m (18), 35°08.1'N, 139°35.6'E, in 60 m (1), VII-1987. Suruga Bay,

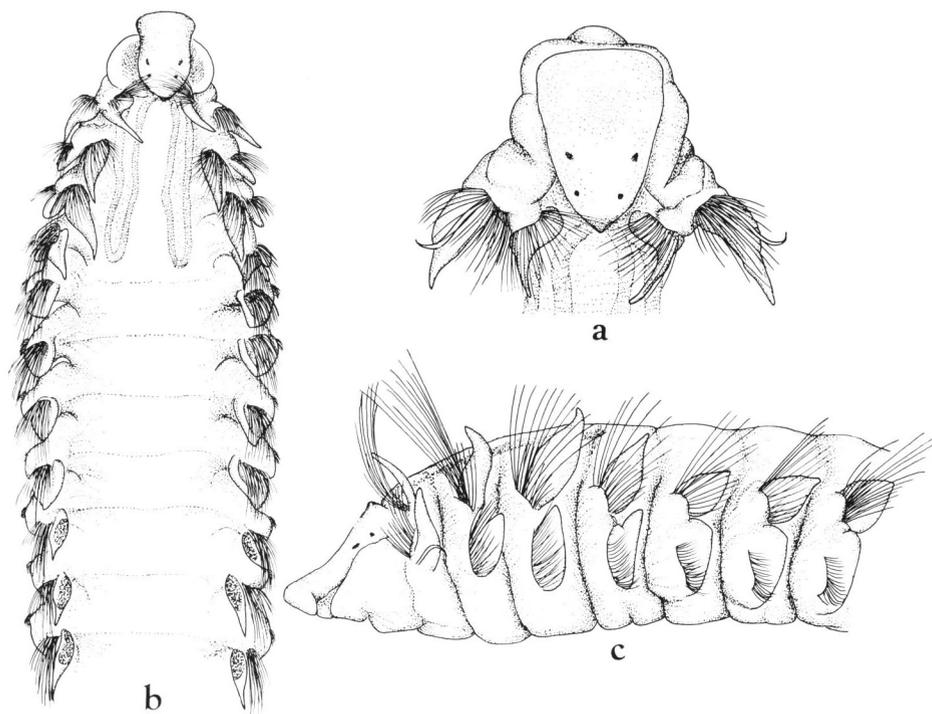


Fig. 10. *Spiophanes urceolata* sp. nov.—a, Prostomium and setiger 1 of paratype, dorsal view,  $\times 35$ ; b, anterior end of holotype, dorsal view,  $\times 20$ ; c, anterior end of holotype, lateral view,  $\times 35$ .

$35^{\circ}03.9'N$ ,  $138^{\circ}48.8'E$ – $35^{\circ}03.6'N$ ,  $138^{\circ}49.6'E$ , in 123–112 m (1), VI–1973, KT–73–6;  $35^{\circ}04.0'N$ ,  $138^{\circ}47.4'E$ – $35^{\circ}04.0'N$ ,  $138^{\circ}47.4'E$ , in 252–270 m (1),  $35^{\circ}01.6'N$ ,  $138^{\circ}51.1'E$ – $35^{\circ}02.5'N$ ,  $138^{\circ}50.6'E$ , in 88–99 m (1), X–1973, KT–73–15;  $34^{\circ}54.6'N$ ,  $138^{\circ}45.4'E$ , in 147 m (1), II–1976, KT–76–3. Tsushima Strait,  $34^{\circ}27.6'N$ ,  $129^{\circ}43.8'E$ , in 100 m (1), VIII–1968.

*Description.* All material posteriorly incomplete; holotype measuring 18 mm in length and about 1.7 mm in width for 35 setigers including parapodia.

Prostomium triangular to bell-shaped with rounded to truncated anterior margin; tapered posteriorly to a raised, pigmented tip; occipital tentacle absent; two pairs of eyes present, arranged in rectangle. Peristomium enlarged, lateral and ventral to prostomium. Dorsal nuchal organ forming W-shaped pattern extending to setiger 4 (Fig. 10a, b).

First three notopodial lamellae inserted dorsolaterally (Fig. 10b); notopodial lamellae of setiger 1 digitiform, more slender than neuropodial lamellae (Figs. 10b, c, 11a); notopodial lamellae of setigers 2 and 3 increasingly larger and broader, directed up and back (Figs. 10c, 11b); notopodial lamellae of setiger 4 lanceolate, inserted

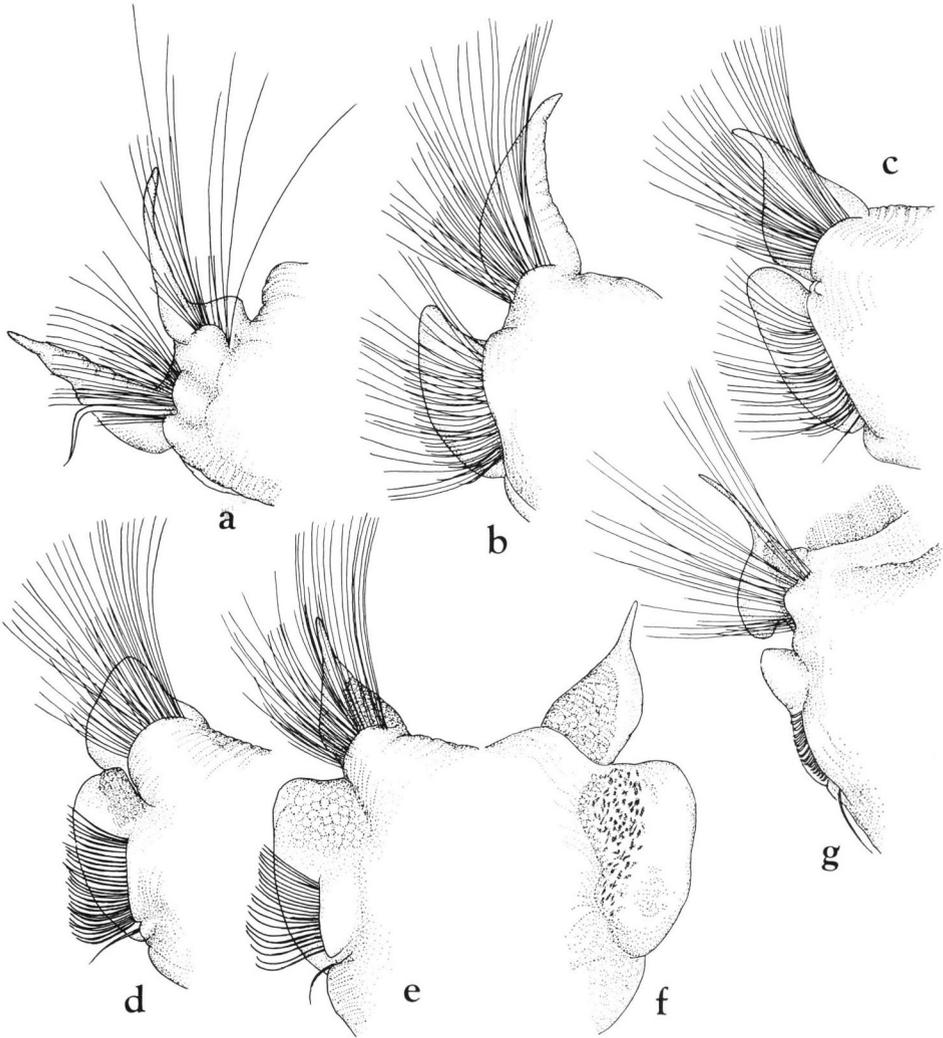


Fig. 11. *Spiophanes urceolata* sp. nov.—a, Right parapodium from setiger 1, anterior view,  $\times 47$ ; b, right parapodium from setiger 3, anterior view,  $\times 47$ ; c, right parapodium from setiger 4, anterior view,  $\times 47$ ; d, right parapodium from setiger 5, anterior view,  $\times 47$ ; e, right parapodium from setiger 9, anterior view,  $\times 47$ ; f, same, posterior view, noto- and neuropodial setae omitted,  $\times 47$ ; g, right parapodium from setiger 20, anterior view,  $\times 47$ .

laterally (Fig. 11c); following lamellae of setigers 5–8 short, triangular to rounded triangular (Fig. 11d). Notopodial lamellae of setigers 9–15 subulate with reddish-brown pigment basally (Fig. 11e, f); thereafter, lamellae becoming slender, digitiform, with broad base (Fig. 11g). Neuropodial lamellae of setiger 1 well developed, subulate, somewhat angular (Fig. 11a), lamellae of setigers 2–4 broadly triangular (Fig.

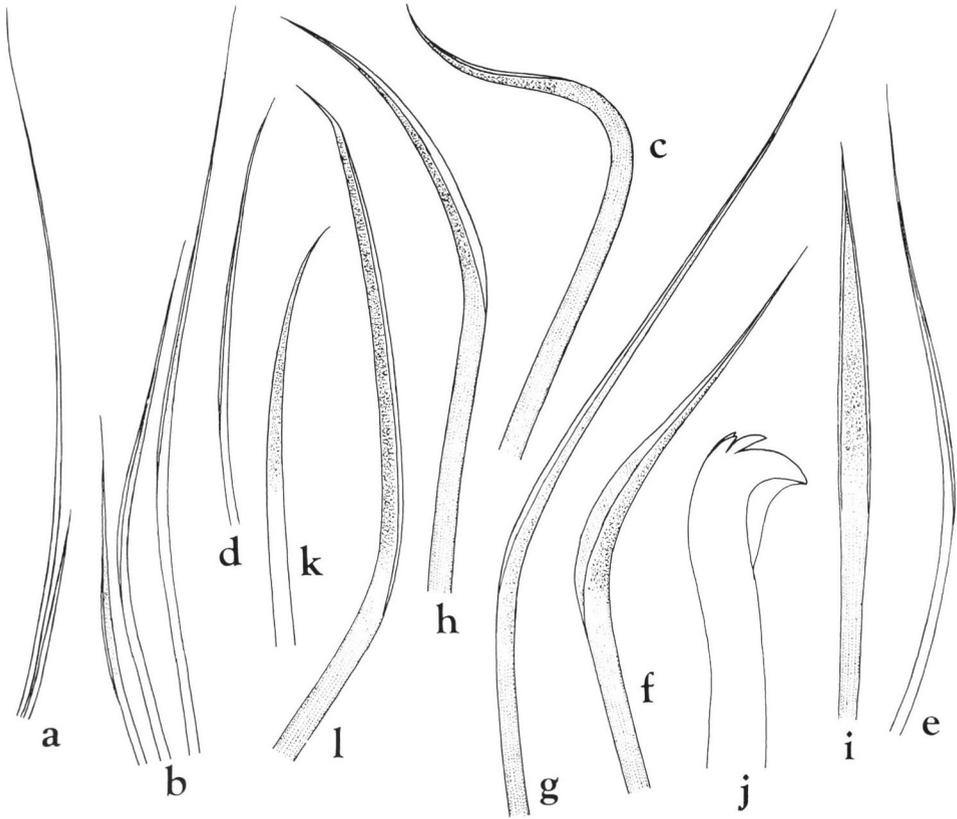


Fig. 12. *Spiophanes urceolata* sp. nov.—a, Short and long notopodial setae of setiger 1,  $\times 130$ ; b, short to long notopodial setae of setiger 4,  $\times 192$ ; c, neuropodial curved seta from setiger 1,  $\times 192$ ; d, e, short and long neuropodial capillary setae of setiger 1,  $\times 255$ ; f, neuropodial seta in anterior row of setiger 4,  $\times 375$ ; g, neuropodial seta in posterior row of same setiger,  $\times 375$ ; h, i, neuropodial setae from setiger 9, lateral (h) and frontal (i) views,  $\times 375$ ; j, neuropodial hooded hook,  $\times 960$ ; k, ventral sabre seta from setiger 4,  $\times 375$ ; l, ventral sabre seta from setiger 20,  $\times 375$ .

11b, c), thereafter, neuropodial lamellae becoming padlike, with brownish pigment pattern (Fig. 11d–f), posterior lamellae considerably shorter, flattened (Fig. 11g). Transverse dorsal ridges appearing on setiger 15, most prominent on setigers 20–30 (Fig. 11g), inconspicuous thereafter. Lateral pouches absent.

Notopodial setae all capillaries; setae of setiger 1 arranged in two rows, setae of anterior row shorter with narrow sheath, those of posterior row longer without sheath (Fig. 12a). Notopodial setae of remaining setigers arranged in three rows; all setae with narrow sheath and granulations, setae of anterior row shortest (Fig. 12b). Neurosetae of setiger 1 include a single stout, geniculate seta (Fig. 12c) and

additional short-to-long, lightly granulated, limbate capillaries arranged in two rows (Fig. 12d, e); neurosetae of setigers 2–4 arranged in two rows, setae of anterior row shorter and thicker than those of posterior row (Fig. 12f, g); neurosetae of setiger 5 reduced to a single row; setae short, limbate, distally very granular (Fig. 12h, i). Neuropodial hooded hooks beginning on setiger 15, numbering 14–16 per fascicle; anterior hooks quadridentate with main fang surmounted by single unpaired tooth and pair of smaller teeth, appearing tridentate in lateral view, with reduced hood (Fig. 12j). Ventral sabre setae present from setiger 4, moderately granulated (Fig. 12k), those of more posterior setigers stout, with short bent filament at tip (Fig. 12l). Nature of pygidium unknown.

*Remarks.* *Spiophanes urceolata* is similar to *S. wigleyi* PETTIBONE, 1962 from the Georges Bank area off Massachusetts, in that the dorsal nuchal organ forms a W-shaped pattern extending to setiger 4 and the first three notopodial lamellae are inserted dorsolaterally. However, *S. urceolata* differs from *S. wigleyi* in that (1) the prostomium is triangular to bell-shaped with a rounded or truncated anterior margin, rather than somewhat ovum-shaped with a rounded anterior margin, (2) notopodial capillary setae are arranged in three rows throughout (except setiger 1), rather than two rows throughout and (3) ventral sabre setae are present from setiger 4, rather than from setiger 9.

*Type-series.* Holotype, NSMT–Pol. H 334; 1 paratype, NSMT–Pol. P 335.

*Distribution.* Japan; 83–350 m.

### Literature Cited

- BERKELEY, E., & C. BERKELEY, 1952. Annelida. Polychaeta Sedentaria. *Can. Pacif. Fauna, Fish. Res. Bd. Can.*, 9b(2): 1–139.
- BLAKE, J. A., 1983. Polychaetes of the Family Spionidae from South America, Antarctica, and adjacent seas and islands. *Antarct. Res. Ser. (Am. Geophys. U.)*, 39: 205–288.
- & J. D. KUDENOV, 1978. The Spionidae (Polychaeta) from southeastern Australia and adjacent areas with a revision of the genera. *Mem. natn. Mus. Vict.*, 39: 171–280.
- CAULLERY, M., 1944. Polychètes sédentaires de l'Expédition du *Siboga*: Ariciidae, Spionidae, Chaetopteridae, Chlorhaemidae, Opheliidae, Oweniidae, Sabellaridae, Sternaspidae, Amphictenidae, Ampharetidae, Terebellidae. *Siboga-Expéd.*, 24: 1–204.
- CLAPARÈDE, E., 1870. Les Annélides Chétopodes du Golfe de Naples. *Mém. Soc. Phys. Genève*, 20: 365–542.
- DAY, J. H., 1967. A monograph on the Polychaeta of Southern Africa. Part 2. Sedentaria. *Brit. Mus. (N. H.), Publ.*, (656): 459–878.
- 1973. New Polychaeta from Beaufort, with a key to all species recorded from North Carolina. *NOAA tech. Rep. NMFS Circ.*, 375: 1–140.
- FAUCHALD, K., 1972. Some polychaetous annelids from the deep basins in Sognefjorden, western Norway. *Sarsia*, 49: 89–106.
- FAUVEL, P., 1927. Polychètes sédentaires. Addenda aux Errantes, Archiannelides, Myzostomaires. *Faune de France*, 16: 1–494.
- FOSTER, N. M., 1971. Spionidae (Polychaeta) of the Gulf of Mexico and the Caribbean Sea. *Stud. Fauna Curaçao*, 36: 1–183.

- GRUBE, A.-E., 1860. Beschreibung neuer oder wenig bekannter Anneliden. *Arch. Naturg.*, **26**: 71-118.
- HARTMAN, O., 1966. Polychaeta Myzostomidae and Sedentaria of Antarctica. *Antarct. Res. Ser. (Am. Geophys. U.)*, **7**: 1-158.
- IMAJIMA, M., & O. HARTMAN, 1964. The polychaetous annelids of Japan. Part II. *Occ. Pap. Allan Hancock Fdn.*, (26): 239-452.
- LIGHT, W. J., 1977. Spionidae (Annelida: Polychaeta) from San Francisco Bay, California: a revised list of nomenclatural changes, new records, and comments on related species from the northeastern Pacific Ocean. *Proc. Biol. Soc. Wash.*, **90**: 66-88.
- 1978. *Invertebrates of the San Francisco Bay Estuary System*. Spionidae (Polychaeta; Annelida). xii+211 pp., Boxwood Press, Pacific Grove, Calif.
- MESNIL, F., 1896. Études de morphologie externe chez les annélides. I. Les spionidiens des côtes de la Marche. *Bull. Sci. France Belg.*, **29**: 110-187.
- OKUDA, S., 1937. Spioniform polychaetes from Japan. *J. Fac. Sci. Hokkaido Univ.*, (G), **5**: 217-254.
- PETTIBONE, M. H., 1962. New species of polychaete worms (Spionidae: *Spiophanes*) from the east and west coast of North America. *Proc. Biol. Soc. Wash.*, **75**: 77-88.

