Two New Species of *Composetia* (Annelida: Nereididae) from Small Estuaries in the Ryukyu Islands, Southern Japan, with a List of All Species Currently Belonging to *Composetia*

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Two new species *Composetia kumensis* and *C. tokashikiensis* (Nereididae) are described based on specimens collected from subtropical small estuaries in the Kume-jima and Tokashiki-jima islands in the middle Ryukyu Islands, southern Japan, respectively. Both species have the following diagnostic characteristics of *Composetia* Hartmann-Schröder, 1985: (1) having conical paragnaths in the maxillary ring of the proboscis and lacking paragnaths or papillae in the oral ring, (2) prostomium with entire anterior margin, (3) the absence of falcigers among notochaetae, and (4) the absence of simple chaetae among upper neurochaetae. These new species share the following diagnostic characters: (1) presence of notoacicula on chaetigers 1 and 2, (2) absence of notopodial prechaetal lobe throughout body, (3) presence of neuropodial postchaetal lobe only in anterior body, (4) neuropodial falcigers all heterogomph, and (5) oral ring greatly enlarged in full-everted proboscis. However, *C. tokashikiensis* sp. nov. is distinguishable from *C. kumensis* sp. nov. by the presence of heterogomph spinigers among the upper neurochaetae around chaetiger 5. A list of all of 34 species currently belonging to *Composetia* and a key to Japanese species of *Composetia* are also provided.

**Key Words:** East Asia, non-marine species, notoacicula, polychaete, subtropical estuaries, taxonomy.

**Introduction**

Most polychaetes are marine species and only a limited number of species known as non-marine species occur in freshwater or brackish-water habitats (about 200 species, about 2% of the estimated 9000–12000 species worldwide); the family Nereididae includes the most abundant non-marine species (61 species) (Glasby et al. 2009). However, taxonomical surveys of non-marine species seem to be insufficient in tropical and subtropical Asia, which is an area with the greatest diversity of coastal marine species in the world (e.g., Tittensor et al. 2010).

During a survey on nereidid fauna in subtropical small estuaries surrounded by coral reefs in the middle Ryukyu Islands in southern Japan, two morphologically similar undescribed species of *Composetia* Hartmann-Schröder, 1985 [as *Ceratonereis* (*Composetia*) in Sato (2012); see Sato and Sakaguchi 2016; Sato 2017] were found from a unique habitat exposing to usually fresh water, but sometimes full-strength sea water. Here, the two species are described as new species of *Composetia*. Additionally, a key to species of *Composetia* recorded from Japan is also provided based on this study and previous references.

**Materials and Methods**

Specimens were collected from two small estuaries on islands of the middle of Ryukyu Islands, southern Japan: an estuary consisting in a small creek in the upper intertidal zone of the uplifted coral reef on Kume-jima island in 1999–2013, and the another one in the Tokashiki-gawa river on Tokashiki-jima island in 1991. Specimens were found in sediment samples, which were obtained by shoveling from intertidal sandy bottoms. The specimens were fixed in 10% formalin or in 80 or 99% ethanol, and transferred to 80 or 99% ethanol for preservation. Photographs of live specimens were taken with a digital camera (Konica-Minolta Alpha-7). Water temperature and salinity were measured with a SCT meter (Model 30, Yellow Springs Instrument, Co.).

For the preserved specimens, body length (BL) from the anterior end of the prostomium to the posterior end of the pygidium excluding anal cirri, and anterior maximum body width (BW) excluding parapodia were measured. Photographs of the specimens were taken with a digital camera (Nikon COOLPIX) on a stereoscopic microscope. Drawings were prepared with a camera lucida.

Terminology of paragnath groups on proboscis, and that of parapodial and chaetal morphology are according to Bakken and Wilson (2005).

Type specimens are deposited in the polychaete collection of the National Museum of Nature and Science, Tsukuba, Japan (NSMT).
**Taxonomic Account**

**Family Nereididae** de Blainville, 1818  
**Genus Composetia** Hartmann-Schröder, 1985

*Ceratonereis* (Composetia) Hartmann-Schröder, 1985: 49.  
*Composetia*: Khlebovich 1996: 122; Bakken and Wilson 2005: 520–521; Bakken et al. 2018: 25.

**Diagnosis.** Prostomium with entire anterior margin, one pair of antennae, one pair of palps, and two pairs of eyes. Eversible proboscis with conical paragnaths only on maxillary ring, without any paragnath and papilla (or soft cushion) on oral ring. Four pairs of tentacular cirri. Parapodia of first two chaetigers sub-biramous, all following parapodia biramous. Sub-biramous parapodia with or without notoacicula. Notopodial prechaetal lobe present or absent. Notochaetae all homogomph spinigers. Neurochaetae all compound with homogomph, sesquigomph or heterogomph articulations, simple chaetae absent.

**Gender.** Feminine.

**Type Species.** *Nereis costae* Grube, 1840, fixed by original designation.

**Remarks.** Formerly, the nereidids that have the proboscis with conical paragnaths on the maxillary ring only were all identified as the genus *Ceratonereis* Kinberg, 1865 (Faucauld 1977). Later, Hartmann-Schröder (1985) divided this genus into three subgenera: *Ceratonereis* (Ceratonereis) characterized by the prostomium with an indented anterior margin, the presence of soft cushions or papillae on the areas VI in the oral ring, and all the chaetae compound with both hemigomph (sesquigomph) and heterogomph articulations; *Ceratonereis* (Composetia) characterized by the prostomium with an entire anterior margin, the absence of soft cushions or papillae on the area VI, and all the chaetae compound with both homogomph and heterogomph articulations; and *Ceratonereis* (Simplisetia) Hartmann-Schröder, 1985 characterized by the prostomium with an entire anterior margin, the absence of soft cushions or papillae on the area VI, and the presence of simple chaetae in middle and posterior neuropodia in addition to both compound homogomph and heterogomph chaetae. Khlebovich (1996) elevated each of the three subgenera to the rank of genus, and he noticed that *Ceratonereis* is also distinguishable from *Simplisetia* and *Composetia* in the presence of notopodial sesquigomph falcigers in contrast to the absence of the same in the latter two genera, highlighting that Hartmann-Schröder (1985) incorrectly described that all of the three subgenera have such falcigers.

After Khlebovich (1996), 29 of 30 species categorized as *Ceratonereis* (Composetia) by Hartmann-Schröder (1985) and Hartmann-Schröder and Rosenfeldt (1988) have been assigned to the genus *Composetia*, except for *Ceratonereis* (Composetia) *burmensis* (Monro, 1937) that was regarded as a junior synonym of *Neanthes glandicincta* Southern, 1912 by Lee and Glasby (2015). Additionally, Pamungkas and Glasby (2015) transferred *Nereis* (Ceratonereis) *marmorata* Horst, 1924, which was described based on only epitokous specimens and classified as “insufficiently known species” by Hartmann-Schröder (1985), to *Composetia*. Thereafter, one more species of *Composetia*, *C. bundaensis* Hsueh, 2018, was described (Hsueh 2018), summarizing a total of 31 species have been assigned to *Composetia* up to date (Table 1).

However, the following eight species should be reexamined in future, because it seems uncertain whether they belong to *Composetia* or not: three species, *C. beringiana* (Levenstein, 1961), *C. gorbusnovi* (Uschakov, 1950) and *C. paucidentata* (Moore, 1903), have several paragnaths on oral ring according to their original descriptions, deviating from the generic diagnosis; three species, *C. dunckeri* (Augener, 1925), *C. monronis* (Westheide, 1977) and *C. tunicatae* (Hartman, 1936), have notopodial homogomph falcigers in posterior chaetigers, deviating from the generic diagnosis; two species, *C. dubia* (Ruhlner, 1972) and *C. pietschmannii* (Holly, 1935) were described based on only epitokous specimens, without any more additional description of atokes.

Though *C. marmorata* also lacks information of atokous morphology in both the original description and the redescription by Pamungkas and Glasby (2015), its assignment to *Composetia* is supported by the description of epitokous specimens from China by Wu et al. (1985; as *Ceratonereis marmorata*), who described that all chaetae (homogomph spinigers and heterogomph falcigers) compound, lacking simple chaeta, and notopodial falcigers absent.

*Ceratonereis tripartita* Horst, 1918 was also originally described based on only epitokous specimens (type locality: Malay Archipelago) and classified as “insufficiently known species” by Hartmann-Schröder (1985). However, Fauvel (1932, 1953) described that an atokous specimen of this species collected from the Andaman Islands had only compound chaetae (homogomph and heterogomph spinigers, and hererogomph falcigers) lacking neuropodial simple chaetae and notopodial falcigers, well supporting that his species belongs to the genus *Composetia*. Therefore, this species is newly assigned to *Composetia* in the present study, though it is not enough evidenced whether the atokous specimen of Fauvel (1932, 1953) really belongs to the same species as the epitokous type specimens.

Furthermore, two new species are described as members of this genus in the present study (see below). Thus, a total of 34 species currently belong to *Composetia* (Table 1).

*Composetia* was redefined by Bakken and Wilson (2005), who provided the generic diagnosis based on the descriptions of the non-type species, *C. irritabilis* (Webster, 1879) and *C. scottiae* (Berkley and Berkeley, 1956), owing to their situation that the type material of the type species *C. costae* could not be located. In fact, however, at least 11 syntypes of *C. costae* have been safely preserved in the Museum of Natural History in Berlin (Hertwich 1993; recent unpublished observation by the present author). *Composetia* seems not to be a monophyletic group, but to include some morphologically distinct groups, as suggested by Bakken and Wilson (2005). Revision of *Composetia* with the exact generic definition based on the redescription of the type material of *C. costae* is needed.
Table 1. A list of all of 34 species currently belonging to the genus Composetia Hartmann-Schröder, 1985.

| Species and subjective synonyms | Original combination | Type locality |
|---------------------------------|----------------------|---------------|
| 31 species previously assigned to Composetia | Ceratonereis anulata | between Brittany and Ireland, Atlantic Ocean |
| C. anulata (Amoureux, 1982) | Ceratonereis (Composetia) antarctica | South Shetland Islands, off Antarctic Peninsula |
| Ceratonereis (Composetia) antarctica | Nereis articulata | off Sand Key, Florida, Atlantic Ocean |
| Nereis articulata | Nereis (Ceratonereis) beringianus | western parts of the Bering Sea |
| Nereis (Ceratonereis) beringianus | Ceratonereis (Nereis) brasiliensis | Brazil, Atlantic Ocean |
| Ceratonereis (Nereis) brasiliensis | Composetia bundaei | Taiwan, Pacific Ocean |
| Composetia bundaei | Nereis (Ceratonereis) coracina | Singapore and Philippines, Pacific Ocean |
| Nereis (Ceratonereis) coracina | Nereis costae | Mediterranean Sea |
| Nereis costae | Madeira, Atlantic Ocean |
| Ceratonereis costae Grube, 1878 | Cannes, France, Atlantic Ocean |
| Ceratonereis costae | Gulf of Naples, Mediterranean Sea |
| Gulf of Naples, Mediterranean Sea | Philippines, Pacific Ocean |
| Philippines, Pacific Ocean | Gulf of Naples, Mediterranean Sea |
| Nereis rubroannulata Claparède in Grube, 1870 | 2 Several paragnaths present on oral ring in the three species, deviating from the generic diagnosis (see also Table 2). |
| 6 Notopodial homogomph falcigers present in posterior chaetigers, deviating from the generic diagnosis (see also Table 2). |
| 4 synonymized to Nereis (Ceratonereis) costae by Fauvel (1923). |
| 3 synonymized to Nereis (Ceratonereis) costae by Fauvel (1953). |
| 1 Several paragnaths present on oral ring in the three species, deviating from the generic diagnosis (see also Table 2). |
| 5 Since the original description was based on only epitokous specimens, without any more additional description of atokes, further study is needed to confirm whether this species belongs to Composetia or not. |
| 6 Notopodial homogomph falcigers present in posterior chaetigers, deviating from the generic diagnosis (see also Table 2). |
| 7 Original description and redescriptions (Pamungkas and Glassby 2015) was based on only epitokous specimens. Atokous morphology was described by Wu et al. (1985). |
| 8 Original description was based on only epitokous specimens. Atokous morphology was described by Fauvel (1932, 1953). |

Three species added by the present study

| Species and subjective synonyms | Original combination | Type locality |
|---------------------------------|----------------------|---------------|
| C. tripartita (Horst, 1918) comb. nov. | Ceratonereis tripartita | Malay Archipelago, Pacific Ocean |
| C. kumensis sp. nov. | Composetia kumensis sp. nov. | Ryukyu Islands, southern Japan, Pacific Ocean |
| C. tokashikimensis sp. nov. | Composetia tokashikimensis sp. nov. | Ryukyu Islands, southern Japan, Pacific Ocean |

The generic diagnosis presented above is based on not Bakken and Wilson (2005) but Hartmann-Schröder (1985) and Khllebovich (1996), partially modified here to allow for some unique characteristics of the two new species in the present study (see below).
Composetia sp. 2: Sato 2017: 483.

**Type material.** Holotype (NSMT-Pol H-766), female, Gushicha Gusuku on Kume-jima island, Okinawa Prefecture (26°22'52.6"N, 126°45'15.2"E) in the central Ryukyu Islands, southern Japan, 22 November 2013, coll. M. Sato, fixed in 80% ethanol. 17 paratypes: 12 individuals (NSMT-Pol P-767–770), data as for holotype (fixed in 80 or 99% ethanol); two females (NSMT-Pol P-771, 772), locality same as holotype, 24 March 2007, coll. K. Satake, fixed in 10% formalin; three individuals (NSMT-Pol P-773), locality same as holotype, 25 March 1999, coll. K. Satake, fixed in 10% formalin.

**Non-type materials examined.** One individual, data as for holotype. No longer preserved since whole body used for a DNA analysis (Sato et al. 2020) after morphological examination.

**Diagnosis.** Notoacicula present in first 2 chaetigers. Notopodial prechaetal lobe absent throughout body. Neuro-rodial postchaetal lobe present only in anterior body. Upper neurochaetae comprising of homogomph spinigers and heterogomph falcigers throughout, lacking heterogomph spinigers. Lower neurochaetae comprising of heterogomph spinigers and heterogomph falcigers throughout, lacking homogomph or sesquigomph falcigers. Oral ring greatly enlarged in full-everted proboscis.

**Description.** Holotype (Figs 1A, 2B–H), complete female, 12 mm BL, 1.0 mm BW, with 53 chaetigers. Paratypes 9–17 mm BL, 0.8–1.5 mm BW, with 49–64 chaetigers.

Body stout almost throughout, tapering around pygidium (Fig. 1A). Dorsum convex, venter relatively flat with longitudinal midventral groove. Colour in live specimens brown with greenish pigmentation on anterior dorsum (Fig. 1B). Colour in preserved specimens whitish cream with brownish or greenish pigmentation on anterior dorsum (Fig. 1A, C).

Prostomium pear-shaped. Antennae short, tapered, separated from each other (Figs 1B, C, 2A). Palps with massive palpophores and short subconical palpostyles. Both pairs of eyes arranged trapezoidally, anterior pair more separated and as large as (or slightly larger than) posterior pair; anterior pair reniform, posterior pair round (Figs 1B, C, 2A). Mid-longitudinal white cleft present on dorsal anterior surface of prostomium (Figs 1B, C, 2A).

Apodous segment (peristomium) slightly longer than subsequent chaetigers, with four pairs of tentacular cirri of unequal length; posterior dorsal tentacular cirri longest, reaching back to chaetiger 10 in holotype (chaetigers 6–14

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**Fig. 1.** Composetia kumensis sp. nov. A, dorsal view of the whole body of the preserved specimen of holotype (NSMT-Pol H-766). Arrow indicates the enlarged oral ring of the everted proboscis. B, C, paratype (NSMT-Pol P-772): B, dorsal view of the anterior body of a live specimen; C, dorsal view of anterior end of the preserved specimen. D, Jaw of paratype (NSMT-Pol P-773). Scale bars: 1 mm (A, B); 0.5 mm (C); 0.1 mm (D).
Two new species of estuarine nereidids in paratypes, usually chaetigers 10–14.

Proboscis with pair of amber jaws, each with around 6 marked teeth (Fig. 1D). Brown paragnaths with usually sharply pointed tip present only on maxillary ring (Fig. 2B, C). Paragnath numbers in holotype (range for all type series in parentheses): area I: 1 (0–2, \( n = 18 \)); area II: 24 on each side in two or three arched rows, total 48 (40–59, \( n = 17 \)); area III: 14 (13–25, \( n = 17 \)) in ovoid patch along base of maxillary ring; area IV: 20 on left and 19 on right, in triangular patch, total 39 (21–52, \( n = 16 \)). Oral ring greatly enlarged into trapezoidal shape in full-erected proboscis, 2.2 times longer and 1.6 times wider than maxillary ring in holotype, without any paragnaths or papillae (Figs 1A, 2B, C).

Parapodia most enlarged around chaetigers 5–10 (Fig. 2E, F). Sub-biramous parapodia of first 2 chaetigers with thin notoacicula (Fig. 2D). Notopodial dorsal ligule conical with tapering tip throughout. Notopodial prechaetal lobe absent throughout. Notoacicular process absent throughout. Notopodial ventral ligule conical with tapering tip throughout, subequal to or slightly smaller than notopodial dorsal ligule throughout. Dorsal cirri slender, tapering, as long as or longer than notopodial dorsal ligule throughout. Three whitish glandular patches present on dorsal edge of notopodia; distalmost glandular patch larger than others, covering whole conical projection of notopodial dorsal ligule throughout (Fig. 2E–H).

Neuropodial postchaetal lobe with tapering tip present in first 8 chaetigers in holotype (6–10 chaetigers in paratypes), absent in following chaetigers. Superior lobe in acicular ligule absent throughout. Inferior lobe conical in anterior...
parapodia, diminishing in middle parapodia, absent in posterior parapodia (Fig. 2D, F–H). Ventral ligule conical with tapering tip throughout, diminishing from middle parapodia, shorter than neuroacicular ligule. Ventral cirrus slender with tapering tip, not beyond ventral ligule throughout.

Notochaetae all homogomph spinigers, having long blades with finely serrated edge (Figs 3A, 4A); in holotype, 7, 4, and 3 spinigers present in chaetigers 5, 20, and 41, respectively; up to 11 spinigers in paratypes.

Upper neurochaetae consisting of homogomph spinigers and heterogomph falcigers (Fig. 4A) throughout. Heterogomph falcigers with short finely-serrated blades (Fig. 3C) located at inferior/anterior position; in holotype, 6, 10, 4, and 1 falcigers present in chaetiger 1, 5, 20, and 41, respectively; up to 11 falcigers in paratypes. Heterogomph spinigers with finely-serrated blades (Fig. 3B) located at posterior position; in holotype, 7, 7, 4, and 3 spinigers present in chaetiger 1, 5, 20, and 41, respectively; up to 12 spinigers in paratypes.

Pygidium with anus on dorsal side, with slender anal cirri.

Small oocytes (50–75 µm in diameter) present in coelom of holotype.

**Variations.** In our subsequent extensive surveys, additional specimens of this species were collected from 10 additional sites on five islands in the Ryukyu Islands. The variations of morphological characteristics among the geographically separated populations will be shown in a subsequent paper (Sato et al. 2020).

**Reproduction.** The coelom of two paratype specimens (NSMT-Pol P-771, 772) collected in March in 2007 was filled with large oocytes (about 250 µm and 150 µm, respectively, in maximum diameter). None of the specimens show epitokous metamorphosis.

**Habitat.** Sandy bottom with pebbles in a small creek originating from a freshwater spring within the upper intertidal zone of the uplifted coral reef, surrounded by salt-marsh vegetation (Fig. 5). Based on my field survey on 22 and 23 November 2013 in the type locality in Kume-jima
Two new species of estuarine nereidids from Okinawa, Japan

island and daily tidal records of observed sea level in Naha, Okinawa-jima island, close to Kume-jima (Japan Meteorological Agency 2019), the habitat condition was judged as follows: living usually under fresh-water conditions, which drastically changes to a marine regime during the most extreme spring high tides for a few days in a month (around 6 days in November 2013), with salinities ranging from 0.2 to 33.1 psu and temperatures from 19.2°C to 22.6°C.

Etymology. The species name is an adjective derived from the island name of the type locality, Kume-jima.

Composetia tokashikiensis sp. nov.
[New Japanese name: Tokashiki-nagare-gokai]
(Figs 4B, 6–8)

Composetia sp. A: Sato and Sakaguchi 2016: 85.
Composetia sp. 1: Sato 2017: 483.

Type material. Holotype (NSMT-Pol H-774), female, the upper reaches of a small estuary in the Tokashiki-gawa river on Tokashiki-jima island, Okinawa Prefecture (26°11′46.81″N, 127°21′46.82″E) in the central Ryukyu Islands, southern Japan, 20 November 1991, coll. M. Sato, fixed in 80% ethanol. 18 paratypes: 9 individuals (NSMT-Pol P-775–783), data as for holotype; 9 individuals (NSMT-Pol P-784), locality same as holotype, 27 May 2012, coll. M. Sato, fixed in 80% ethanol.

Non-type materials examined. Two individuals, data as for holotype. No longer preserved since whole body used for a DNA analysis (Sato et al. 2020) after morphological examination.

Diagnosis. Notoacicula present in first 2 chaetigers. Notopodial prechaetal lobe absent throughout body. Neuroropodial postchaetal lobe present only in anterior body. Upper neurochaetae comprising of homogomph spinigers and heterogomph falcigers except for around first 20 chaetigers, where most or all of heterogomph falcigers replaced by heterogomph spinigers. Lower neurochaetae comprising of heterogomph spinigers and heterogomph falcigers except for around first 20 chaetigers, where most or all of heterogomph falcigers replaced by heterogomph spinigers. Oral ring greatly enlarged in full-everted proboscis.

Description. Holotype (Figs 6A, 7D–G, 8A–C), complete female, 19 mm BL, 1.5 mm BW, with 59 chaetigers. Paratypes 15–21 mm BL, 1.0–1.6 mm BW, with 57–63 chaetigers.

Body stout almost throughout, tapering around pygidium. Dorsum convex, venter relatively flat with longitudinal midventral groove. Colour in live specimens brownish. Colour in preserved specimens whitish cream with brownish pigmentations on anterior dorsal. Prostomium pear-shaped or triangular. Antennae short, tapered, separated from each other (Figs 6B, C, 7A). Palps with massive palpophores and short subconical palpostyles. Both pairs of eyes arranged trapezoidally, anterior pair reniform, more separated and as large as (or larger than) posterior pair; posterior pair round. Mid-longitudinal white cleft present on dorsal anterior surface of prostomium, bordered by dark pigmentation.

Apodous segment slightly longer than subsequent chaetigers, with four pairs of tentacular cirri of unequal length; posterior dorsal tentacular cirri longest, reaching back to chaetiger 8 in holotype (chaetigers 6–12 in paratypes, usually chaetigers 6–10) (Fig. 7A).

Proboscis with pair of amber jaws, each with 8 marked teeth in holotype (7–9 teeth in paratypes). Brown paragnaths usually with sharply pointed tip present only on maxillary ring (Figs 6C, D, 7B, C). Paragnath numbers in holotype (range for all materials in parentheses): area I: 0 (0–0, n=21); area II: 26 on left and 24 on right in two or three arched rows, total 50 (35–58, n=21); area III: 23 (14–25, n=21) in ovoid patch along base of maxillary ring; area IV: 22 on left and 21 on right in triangular patch, total 43 (16–47, n=20). Oral ring greatly enlarged into trapezoidal shape in full-everted proboscis, 1.7 times longer and 1.8 times wider than maxillary ring in holotype, without any paragnaths or papillae (Figs 6A–D, 7C).

Sub-biramous parapodia of first 2 chaetigers with thin notoacicula (Fig. 7D). Notopodial dorsal ligule conical with tapering tip throughout. Notopodial prechaetal lobe absent.

Fig. 5. Landscape of the type locality of Composetia kumensis sp. nov. at the uplifted coral reef at Gushicha Gusuku on Kume-jima island (photographed on 22 November 2013). A, overview of the uplifted coral reef around the sampling site; B, the sampling site in a small creek originating from a freshwater spring (arrow) in the upper intertidal zone of the uplifted coral reef, surrounded by salt-marsh vegetation. Scale bar in B: 1 m.
throughout. Notoacicular process present in few parapodia in chaetigers 5–10 in holotype and some large paratypes more than 1.5 mm BW (Fig. 7F). Notopodial ventral ligule conical with tapering tip throughout, shorter than notopodial dorsal ligule in anterior parapodia and subequal to that in posterior parapodia. Dorsal cirri slender, tapering, as long as or shorter than notopodial dorsal ligule throughout, except for posteriormost few parapodia where dorsal cirri longer than notopodial dorsal ligule. Three whitish glandular patches present on dorsal edge of notopodia; distalmost glandular patch larger than others, covering whole conical projection of notopodial dorsal ligule throughout (Fig. 7E–H).

Neuropodial postchaetal lobe with tapering tip present in first 18 chaetigers in holotype (12–25 chaetigers in paratypes) (Fig. 7D–F), absent in following chaetigers (Fig. 7G, H). Superior lobe in acicular ligule absent throughout. Inferior lobe conical in anterior parapodia, diminishing in middle parapodia, and absent in posterior parapodia (Fig. 7D–H). Ventral ligule conical with tapering tip throughout, diminishing from middle parapodia, shorter than neuracicular ligule. Ventral cirrus slender with tapering tip, shorter than ventral ligule throughout.

Notochaetae all homogomph spinigers, having long

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**Fig. 6.** *Composetia tokashikiensis* sp. nov. A, dorsal view of the whole body of the preserved specimen of holotype (NSMT-Pol H-774). Arrow indicates the enlarged oral ring of the everted proboscis. B–D, anterior end of a paratype (NSMT-Pol P-783): B, dorsal view of prostomium, peristomium, and anterior chaetigers; C, dorsal view of the everted proboscis; D, ventral view of the everted proboscis. E, landscape of the type locality at the upper reaches of a small estuary in the Tokashiki-gawa river in Tokashiki-jima island (photographed on 27 May 2012). Scale bars: 1 mm (A); 0.5 mm (B–D).
Two new species of estuarine nereidids

blades with finely serrated edge (Fig. 8A); in holotype, 3, 8 and 6 spinigers present in chaetiger 3, 5 and 32, respectively; up to 11 spinigers in paratypes.

Upper neurochaetae consisting of homogomph spinigers and heterogomph falcigers except for anterior chaetigers (around first 20 chaetigers), where most or all of heterogomph falcigers replaced by heterogomph spinigers (Fig. 8B). Heterogomph falcigers with short finely-serrated blades located at superior/anterior position; in holotype, no falcigers present in chaetigers 3 and 5; up to 3 falcigers in paratypes; in holotype, 3 falcigers present in chaetiger 32; up to 3 falcigers in paratypes. Heterogomph spinigers with short finely-serrated blades (Fig. 8B) present only in anterior chaetigers (most abundant around chaetiger 5); in holotype,
4 and 6 spinigers present in chaetigers 3 and 5, respectively; up to 9 spinigers in paratypes; spinigers with long blades (Fig. 8C) located at posterior position; spinigers with short blades (Fig. 8D) located at inferior/anterior position.

Pygidium with anus on dorsal side, with slender anal cirri.

Variations. In our subsequent extensive surveys, additional specimens of this species were collected from 20 additional sites on six islands in the Ryukyu Islands, and also from a site in Thailand. The variations of morphological characteristics among the geographically separated populations will be shown in a subsequent paper (Sato et al. 2020).

Reproduction. The coelom of a paratype specimen (NSMT-Pol P-775) collected in November in 1991 was filled with large oocytes (about 250 µm in maximum diameter). None of the specimens show epitokous metamorphosis.

Habitat. Intertidal sandy bottom in the upper reaches of a small estuary (Fig. 6E). Salinity of interstitial water that drained into the remaining holes after taking the sediment samples was 0.3 psu at a low tide around 16:00 on 27 May 2012.

Etymology. The species name is an adjective derived from the island name of the type locality, Tokashiki-jima.

Remarks. Composetia tokashikiensis sp. nov. is distinguishable from C. kumensis sp. nov. by the arrangement of neurochaetae in anterior chaetigers around chaetiger 5, where heterogomph falcigers are mostly or completely replaced by heterogomph spinigers with short blades in both upper and lower fascicles of neurochaetae.

Discussion

In the present study, two new species of Composetia (C. kumensis sp. nov. and C. tokashikiensis sp. nov.) were described based on specimens collected from small estuaries in the central Ryukyu Islands, southern Japan. The two new species are distinguishable from all other congeners by some key characters including the following diagnostic characters for the new species: the presence of notoacicula in chaetigers 1 and 2; the absence of notopodial prechaetal lobe throughout; the presence of neuropodial postchaetal lobe only in anterior body; neurochaetae consisting of homogomph and heterogomph spinigers and heterogomph falcigers; and greatly enlarged oral ring in the full-everted proboscis. Table 2 shows a summary of the comparison of diagnostic characteristics of 25 species of Composetia recorded from Indo-Pacific Ocean, including C. burmensis that was synonymized to Neanthes glandicincta by Lee and Glasby (2015).

Most of Composetia are marine species; only four species, C. bundaiensis, C. burmensis, C. keiskama (Day, 1953) and C. microcephala (Grube, 1878) have been previously known as non-marine species, collected from estuaries (Table 2). Composetia keiskama, which occurred in estuarine waters of “very low salinity” in South Africa (Day 1953), is similar to the Japanese two new species in major diagnostic characteristics, though it is unknown whether C. keiskama has noto-...
| Species        | Distribution in Pacific and Indian Oceans | Habitat          | Serration of jaws | Notoaccula in first 2 chaetigers | Notopodial prechaetal lobe | Neuropodial homogomph falcigers | Neuropodial heterogomph or sesquigomph falcigers | Other diagnoses                                                                 | References                                                                 |
|---------------|------------------------------------------|------------------|-------------------|---------------------------------|---------------------------|-------------------------------|-----------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| *C. beringiana* | western Bering Sea, 510–4400 m in depth | marine            | present           | absent                          | ?                         | ?                             | ?                                 | eyes absent; a few paragnaths present in oral ring.                             | Levenstein (1961)                                                     |
| *C. bundatensis* | west central Taiwan estuarine mudflats    | estuarine mudflats | present           | absent                          | present                   | absent                        | present                           | falcigers present only in posterior body.                                       | Hsueh (2018)                                                          |
| *C. burmensis*  | India, Myanmar, Singapore, Malaysia       | estuary           | present           | absent                          | present                   | absent                        | present                           | sometimes few minute paragnaths present in oral ring; falcigers present in middle body; oral ring enlarged. | Southern (1921); Monro (1937); Lee and Glasby (2015); Ibrahim et al. (2019) |
| *C. concina*    | Philippines, Singapore                    | ?                 | present           | ?                               | absent                     | present                       | present                           | unusual small notopodial dorsal ligule.                                       | Grube (1878)                                                          |
| *C. costae*     | coasts of Indian Ocean, South China Sea, Japan | marine            | present           | absent                          | present in anterior parapodia | absent                       | present                           | 1 or 2 stout falcigers with a short blade present in posterior body; 0 or 1 paragnath present in area I. | Fauvel (1953); Wu et al. (1985); Imajima (2003, 2015)                      |
| *C. dubia*      | New Caledonia                             | marine            | present           | ?                               | absent                     | present                       | present                           | a row of 10 paragnaths in area II; curved tip of falcigers.                    | Rullier (1972)                                                         |
| *C. dunckeri*   | New Pomerania                             | marine            | present           | ?                               | absent                     | present                       | present                           | notopodial homogomph falcigers present in posterior body.                      | Augener (1925)                                                        |
| *C. fakaravae*  | Tuamotu Islands                           | marine            | inconspicuous     | ?                               | present                    | ?                             | ?                                 | short tentacular cirri.                                                        | Chamberlin (1919)                                                     |
| *C. flagellipes*| Ganjam Coast, India, 93 fins in depth     | marine            | present           | ?                               | absent                     | absent                        | present                           | parapodial ligules flagelliform in middle body.                               | Fauvel (1932, 1953)                                                   |
| *C. gorbunovi*  | Okhotsk Sea, 182–335 m in depth           | marine            | present           | ?                               | present                    | ?                             | ?                                 | 5 or 6 large paragnaths present in area VII–VIII.                              | Uschakov (1965)                                                       |
| *C. hircinicola*| Indian Ocean, China, Korea, Japan         | marine            | present           | ?                               | absent (Japan), or present (China, Korea) | absent                       | present                           | heterogomph spinigers absent.                                                 | Imajima (1972); Wu et al. (1985); Paik (1989); Imajima (1996, 2003)       |
| *C. hyalognatha*| Ambon in Indonesia                        | marine            | present           | ?                               | absent                     | absent                        | present                           | red-brown longitudinal stripe in dorsum; homogomph spiniger absent in neuropodia. | Ehlers (1920)                                                         |
| *C. keiskama*   | coast of South Africa                     | estuary (very low salinity) | present           | ?                               | absent                     | absent                        | present                           | notopodial dorsal ligule reduced in posterior body; oral ring enlarged.       | Day (1953)                                                            |
| *C. marmonata*  | Indonesia, Vietnam, southern China        | marine            | present           | ?                               | absent                     | absent                        | present                           | heterogomph spinigers absent.                                                 | Horst (1924); Wu et al. (1985)                                        |
| Species          | Distribution in Pacific and Indian Oceans | Habitat                        | Serration of jaws | Notoacicular in first 2 chaetigers | Notopodial prechaetal lobe | Neuropodial homogomph falcigers | Neuropodial heterogomph or sesquigomph falcigers | Other diagnoses                                                                 | References |
|------------------|------------------------------------------|---------------------------------|-------------------|-----------------------------------|----------------------------|-------------------------------|-------------------------------------------|-----------------------------------------------|------------|
| C. microcephala  | Philippines                               | ?                               | ?                 | ?                                 | ?                          | ?                             | ?                                         | metamorphosing to heteronereid form; small prostomium. | Grube (1878) |
| ditto            | Taleh-Sap, Gulf of Siam                   | estuary                         | ?                 | ?                                 | absent                     | present in anterior parapodia | absrent                      | oral ring enlarged.                              | Fauvel (1932, 1953) |
| C. monronis      | Galapagos                                 | Marine (shallow sublittoral)     | present           | absrent                           | present in anterior parapodia | present                      | notopodial homogomph falcigers present in posterior body. | Westheide (1977) |
| C. moorei        | Central Japan and Kurile Islands          | marine                          | present           | ?                                 | present                    | absent                        | present                      | jaws with 3 teeth in basal half and 1 double tooth near apical fang. | Moore (1903); Izuka (1912); Imajima (1972, 1996) |
| C. paucidentata   | north of the Aleutian Islands, Bering Sea | marine                          | present           | ?                                 | absent                     | absent                        | present                      | 3 small paragnaths present in area VII–VIII; stout falcigers present in neuropodia. | Moore (1903) |
| C. pietschmanni  | Hawaii                                    | marine                          | present           | present                           | absent                     | absent                        | present                      | slender ligules in anteriormost parapodia.       | Holly (1935) |
| C. tripartita    | Malay Archipelago, Andaman Islands        | marine                          | present           | ?                                 | absent                     | absent                        | present                      | stout falcigers present in neuropodia.          | Horst (1918, 1924); Fauvel (1932, 1953) |
| C. tunicatae     | California                                | marine                          | present           | ?                                 | absent                     | ?                             | ?                                         | notopodial homogomph falcigers present in posterior body. | Hartman (1936) |
| C. vermillionensis | off western Mexico                       | marine                          | present           | absent                            | absent                     | absent                        | present only in upper fascicles | eyes absent; notopodial dorsal ligule reduced in posterior body. | Fauchald (1972) |
| C. vulgata       | Hawaii                                    | marine                          | present           | ?                                 | present in anterior parapodia | absrent                      | present                      | short blade of falcigers with crotchetlike tip.     | Kinberg (1866); Hartman (1949) |
| C. kumensis sp. nov. | Rykyu Islands, Japan                | estuary                         | present           | present                           | absent                     | absent                        | present                      | heterogomph spinigers absent among upper neurochaetae; oral ring enlarged. | Present study |
| C. tokashikiensis sp. nov. | Rykyu Islands, Japan | estuary                         | present           | present                           | absent                     | absent                        | present                      | heterogomph spinigers present among upper neurochaetae around chetiger 5; oral ring enlarged. | Present study |
acicula in chaetigers 1 and 2 or not. However, C. keiskama differs from the two new species in terms of extremely reduced notopodial dorsal ligule in posterior parapodia. Composetia microcephala, which was recorded from Philippines (type locality, with no information about the habitat) and an estuarine lake (Taleh-Sap) in Thailand (Fauvel 1932, 1953), is also somewhat similar to the two new species. However, C. microcephala differs from the two new species in terms of jaws with a smooth edge and the presence of homogomph falcigers in the anterior neuropodia. Composetia bundaiensis differs from the two new species in terms of the absence of notoacicularia in chaetigers 1 and 2, the presence of notopodial prechaetal lobe and the presence of long sesquigomph notoacicula in chaetigers 1 and 2, the presence of notopodial dorsal ligule in posterior parapodia.

Key to species of Composetia recorded from Japan

1. Notopodial prechaetal lobe present in anterior chaetigers ............................. 2
   - Notopodial prechaetal lobe absent throughout .......................... 3

2. Jaws with three teeth in basal half separated by wide interval from double tooth near apical fang; 5 parapathams in longitudinal series in area I .................. C. moorei
   - Jaws with four teeth without separated double tooth; 0 or 1 paragnath present in area I .................. C. costae

3. Neuropodial heterogomph spinigers absent through-out .............................. C. hitcinicola
   - Neuropodial heterogomph spinigers present through-out ......................... 4

4. Heterogomph spinigers present among upper neurochaetae around chaetiger 5 . . . C. tokashikinsis sp. nov.
   - Heterogomph spinigers absent among upper neurochaetae throughout .......... C. kumensis sp. nov.

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References

Augener, H. 1925. Die Polychaeten der Südsee-Expedition der Hamburgischen Wissenschaftlichen Stiftung 1908–1909. Mitteilungen aus dem Zoologisches Staatsinstitut und Zoologischen Museum in Hamburg 41: 53–70.

Bakken, T., Glasby, C. J., Santos, C. S. G., and Wilson, R. S. 2018. Nereididae Blainville, 1818. Pp. [1–43]. In: Westheide, W., Purschke, G., and Böggemann, M. (Eds) Handbook of Zoology Online. A Natural History of the Phyla of the Animal Kingdom. Annelida: Polychaetes. De Gruyter, Osnabrück.

Bakken, T. and Wilson, R. S. 2005. Phylogeny of nereidids (Polychaeta, Nereididae) with paragnaths. Zoologica Scripta 34: 507–547.

Chamberlin, R. V. 1919. The Annelida Polychaeta [Albatross Expedi-
tions]. Memoirs of the Museum of Comparative Zoology at Harvard College 48: 1–514.

Day, J. H. 1953. The polychaet fauna of South Africa. Part 2. Errant spe-
cies from Cape shores and estuaries. Annals of the Natal Museum 12: 397–441.

de Blainville, H. 1818. Mémoire sur la classe des Sétipodes, partie des Vers à sang rouge de M. Cuvier, et des Annélides de M. de La-marck. Bulletin des Sciences, par la Société Philomatique de Paris 1818: 78–85.

Ehlers, E. 1920. Polychaeten von Java und Ambonina. Ein Beitrag zur Kenntnis der malaiischen Strandfauna. Abhandlungen der königlichen Gesellschaft der Wissenschaften zu Göttingen, neue folge 10: 1–73.

Fauchald, K. 1972. Benthic polychaetous annelids from deep water off western Mexico and adjacent areas in the Eastern Pacific Ocean. Allan Hancock Monographs in Marine Biology 7: 1–575.

Fauchald, K. 1977. The Polychaete Worms. Definitions and Keys to the Orders, Families and Genera. Natural History Museum of Los An-
geles County, Los Angeles, 188 pp.

Fauvel, P. 1923. Faune de France. Vol 5. Polychètes Errantes. Paul Lech-
evalier, Paris, 488 pp.

Fauvel, P. 1932. Annelida Polychaeta of the Indian Museum, Calcutta. Memoirs of the Indian Museum 12: 1–262.

Fauvel, P. 1953. The Fauna of India including Pakistan, Ceylon, Burma and Malaya: Annelida, Polychaeta. The Indian Press, Ltd., Alla-
habad, xii + 507 pp.

Glasby, C. J., Timm, T., Muir, A. I., and Gil, J. 2009. Catalogue of non-marine Polychaeta (Annelida) of the world. Zootaxa 2070: 1–52.

Grube, A. E. 1878. Annulata Semperiana. Beiträge zur Kenntniss der Annelidenfauna der Philippinen. Mémoires de l'Académie Impériale des Sciences de Saint-Pétersbourg, 7e Série 25: 1–300.

Hartman, O. 1936. New species of polychaetous annelids of the family Nereidae from California. Proceedings of the United States Na-
tional Museum 83: 467–480.

Hartman, O. 1949. The marine annelids erected by Kinberg with notes on some other types in the Swedish State Museum. Arkiv för Zo-
ologii 42A: 1–137.

Hartman, O. 1959. Catalogue of the polychaetous annelids of the world. Part I. Allan Hancock Foundation Publications, Occasional Paper 23: 1–353.
Hartmann-Schröder, G. 1985. Revision der Gattung Ceratonereis Kinberg (Nereididae, Polychaeta) (Mit besonderer Berücksichtigung der Arten mit eingeschnittenem Prostomium). Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut 82: 37–59.

Hartmann-Schröder, G. and Rosenfeldt, P. 1988. Die Polychaeten der "Polarstern"-Reise ANT III/2 in die Antarktis 1984. Teil 1: Euphausiidae bis Chaetopteridae. Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut 85: 25–72.

Hertwich, G. 1993. Die Polychaeten-Typen des Zoologischen Museums in Berlin. Mitteilungen aus dem Zoologischen Museum in Berlin 69: 73–154.

Holly, M. 1935. Polychaeta from Hawaii. Bulletin of the Bernice P. Bishop Museum 129: 3–33.

Horst, R. 1918. On a species of Lysiastris and three aberrant forms of Nereididae from the Dutch East Indies. Zoologische Mededeelingen (Leiden) 4: 246–250.

Horst, R. 1924. Polychaeta Errantia of the Siboga Expedition. Pt. 3. Nereidae and Hesionidae. Siboga-Expedition 24: 145–198.

Hsueh, P.-W. 2018. First records of Composetia, Euniceae and Nectonereis (Annelida: Nereididae) from Taiwan, with descriptions of two new species. Zootaxa 4531: 211–224.

Ibrahim, N. F., Ibrahim, Y. S., and Sato, M. 2019. New record of an estuarine polychaete, Neanthes glandicincta (Annelida, Nereididae) on the eastern coast of Peninsular Malaysia. ZooKeys 831: 81–94.

Imajima, M. 1972. Review of the annelid worms of the family Nereididae of Japan, with descriptions of five new species or subspecies. Bulletin of the National Science Museum, Tokyo 15: 37–153.

Imajima, M. 1996. [Annelida Polychaeta]. Biological Research Co., Tokyo, 530 pp. [In Japanese]

Imajima, M. 2003. Polychaetous annelids from Sagami Bay and Sagami Sea collected by the Emperor Showa of Japan and deposited at the Showa Memorial Institute, National Science Museum, Tokyo (II), Orders included within the Phyllodocida, Amphimnida, Spintherida and Enicida. National Science Museum Monographs 23: 1–221.

Imajima, M. 2015. [Annelida Polychaeta IV]. Biological Research Co., Tokyo, 332 pp. [In Japanese]

Izuka, A. 1912. The errantiate Polychaeta of Japan. Journal of the College of Science, Imperial University of Tokyo 30: 1–262, 24 pls.

Japan Meteorological Agency. 2019. [Tide level data (Nansei Islands)] Available at http://www.data.jma.go.jp/gmd/kaiyou/db/tide/genbo/g_nansei.php (19 September 2019).

Khilevich, V. V. 1996. [Fauna of Russia and neighbouring countries. Polychaetous annelids. Volume III. Polychaetes of the family Nereididae of the Russian seas and the adjacent waters]. Nauka Publishing House, St. Petersburg, 221 pp. [In Russian]

Kinberg, J. G. H. 1866. Annulata nova. Öfversigt af Kongl. Vetenskaps- och Vitterhets-Samhällsets Handlingar, Stockholm 22: 167–179.

Lee, Y. L. and Glassby, C. J. 2015. A new cryptic species of Neanthes (Annelida: Phyllodocida: Nereididae) from Singapore confused with Neanthes glandicincta Southern, 1921 and Ceratonereis (Composetia) burmensis Monro, 1937. Raffles Bulletin of Zoology 31: 75–95.

Levenstein, R. J. 1961. [Polychaeta in the deep-sea area of the Bering Sea]. Pp. 147–178. In: Zenkevich, L. A. (Ed.) Works of the Institute of Oceanology Vol. 46: Biological Researches of the Ocean (Benthos). Center of the Academy of Sciences, USSR, Moscow.

Monro, C. C. A. 1937. On two new polychaetes from Indian Ocean. Annals and Magazine of Natural History, Tenth Series 19: 531–538.

Moore, J. P. 1903. Polychaeta from the coastal slope of Japan and from Kamchatka and Bering Sea. Proceedings of the Academy of Natural Sciences of Philadelphia 55: 401–490.

Paik, E.-I. 1989. Illustrated Encyclopedia of Fauna & Flora of Korea. Vol. 31 Polychaeta. Ministry of Education Republic Korea, Seoul, 764 pp. [In Korean]

Pamungkas, J. and Glassby, C. J. 2015. Taxonomy of reproductive Nereididae (Annelida) in multispecies swarms at Ambon Island, Indonesia. ZooKeys 520: 1–25.

Read, G. and Fauchald, K. (Eds) 2019. World Polychaeta database. Nereis rubrostomata Claparède in Grube, 1870. Accessed through: World Register of Marine Species. Available at http://www.marinespecies.org/aphia.php?p=taxdetails&id=339132 (18 November 2019).

Rullier, F. 1972. Annelid polychètes de Nouvelle-Calédonie recueillis par Y. Plessis et B. Salvat. Expédition Française sur les Récifs Coralliens de la Nouvelle-Calédonie 6: 6–169.

Sato, M. 2012. Ceratonereis (Composetia) sp. P. 223. In: Japanese Association of Benthology (Ed.) Threatened Animals of Japanese Tidal Flats: Red Data Book (RDB) of Seashore Benthos. Tokai University Press, Hadano. [In Japanese]

Sato, M. 2017. Nereididae (Annelida) in Japan, with special reference to life-history differentiation among estuarine species. Pp. 477–512. In: Motokawa, M. and Kajihara, H. (Eds) Species Diversity of Animals in Japan. Springer Japan, Tokyo.

Sato, M. and Sakaguchi, T. 2016. Nereisid polychaetes inhabiting the land–sea interface in Amami Islands. Occasional papers of Research Center for the Pacific Islands, Kagoshima University 57: 83–85. [In Japanese]

Sato, M., Ebihara, T., Satake, K., Kojima, S., Fukumori, H., and Angsupanich, S. 2020. Distributions and variations of two estuarine species of Composetia (Annelida: Nereididae) in the Ryukyu Islands, southern Japan, with a new record of Composetia tokashikienis from Thailand. Species Diversity 25: 25–38.

Southern, R. 1921. Polychaeta of the Chilka Lake and also of fresh and brackish waters in other parts of India. Memoirs of the Indian Museum 5: 563–659.

Tittensor, D. P., Mora, C., Jetz, W., Lotze, H. K., Ricard, D., Vanden Berghe, E., and Worm, B. 2010. Global patterns and predictors of marine biodiversity across taxa. Nature 466: 1098–1103.

Uschakov, P. V. 1965. Polychaeta of the Far Eastern Seas of the U.S.S.R. Israel Program for Scientific Translations, Jerusalem, 419 pp.

Westheide, W. 1977. Interstitielle Fauna von Galapagos. XVIII. Neereididae, Eunicidae, Dorvilleidae (Polychaeta). Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut 82: 37–52.