A review of *Tsudayusurika* Sasa, 1985 (Diptera: Chironomidae, Orthocladiinae), with the description of a new species

Masaru Yamamoto¹ and Nao Yamamoto²


*Tsudayusurika* Sasa, 1985 is reviewed based on material from Taiwan and Japan. This orthocladiine genus is characterized by having a female antenna with 10 flagellomeres and large and rhombic cerci. The male antenna has 13 flagellomeres and the anal point is transparent, short and prominently wide. *Tsudayusurika fudosecunda* Sasa, the type species of the genus, and *T. multiannulata* (Tokunaga) are redescribed. A new species, *T. suginoi*, from Okinawa Island is described and figured as male and female. *Kuroyonyusurika* Sasa, 1996 is presented as a new junior synonym of *Tsudayusurika* and the type species *K. kuroheius* is transferred to this genus and redescribed. *Tsudayusurika cladochaita* Wang and *T. yufunivea* (Sasa et Suzuki) are removed from *Tsudayusurika* and tentatively placed in *Bryophaenocladius*.

doi: 10.5324/fn.v31i0.1401. Received: 2011-10-29. Accepted: 2012-07-05. Published on paper and online: 2012-10-17.

Keywords: Chironomidae, Orthocladiinae, *Tsudayusurika*, Japan and Taiwan, new species

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INTRODUCTION

Tokunaga (1940) described a curious orthocladi species, *Spaniotoma* (*Orthocladius*) *multiannulata* from Arisan, Formosa (Taiwan), which was characterized by the female having an antenna with 10 flagellomeres and large, rhombic cercus. Although the body coloration and male antennal ratio were given, details of the male and female genitalia were not described. Sasa (1985) erected the genus *Tsudayusurika* for a new species, *T. fudosecunda*, from Japan, which has a female antenna with 10 flagellomeres in common with *S. multiannulata*, and he illustrated the male genitalia. Further, Sasa (1996) erected the genus *Kuroyonyusurika* for a new species, *K. kuroheius*, from Honshu, Japan. Sæther et al. (2000) transferred this species to *Bryophaenocladius* Thienemann, 1934 and Yamamoto (2004) accepted this placement. Recently by the courtesy of Mr. H. Sugino of Okinawa Prefecture we had the opportunity to examine specimens identified as *Tsudayusurika* collected in Yanbaru Forest, Okinawa Island and it became clear that *Kuroyonyusurika* is a junior synonym of *Tsudayusurika*.

Identification and delineation of species based on male adults is quite difficult using hypopygial characters, but the females are easily distinguished from each other by the combination of characters in the genitalia, antenna and clypeus. Consequently, we concluded that the specimens collected on Okinawa Island belong to an undescribed species. This species is described and figured below. We also redescribe *Tsudayusurika fudosecunda* Sasa, 1985, *T. kuroheius* (Sasa, 1996) and *T. multiannulata* (Tokunaga, 1940).

MATERIAL AND METHODS

As the most important taxonomic character appears on the dorsal side of the female genitalia, a few slide-mounted specimens of *T. fudosecunda*, the type species of *Tsudayusurika*,
were remounted. Specimens of the new species and the type specimens of *Spaniotoma multiannulata* had been preserved in alcohol. After being macerated in 5% KOH solution, these specimens were mounted temporarily in glycerol for drawing. The specimens used for description and illustration finally were mounted permanently on slides in Euparal. For the allotype of *Spaniotoma multiannulata*, the number of temporal setae, clypeal setae, dorsocentral setae, prealar setae and scutellar setae were counted before the specimens were macerated.

The holotype of the new species is housed in the collection of the Osaka Prefecture University, Osaka, Japan.

**RESULTS AND DISCUSSION**

**Tsudayusurika Sasa**


*Kuroyonyusurika* Sasa, 1996: 23. **Syn. nov.**

Type species: *Tsudayusurika fudosecunda* Sasa, 1985, by original designation and monotypy.

Other included species: *Tsudayusurika kuroheius* (Sasa) **comb nov.**; *T. multiannulata* (Tokunaga); *T. suginoi* **sp. nov.**

The male diagnosis given by Sasa (1985) is emended and the female is diagnosed in detail.

**Diagnosis (emended)**

Head. With well-developed coronal suture in both sexes. Temporal setae uniserial. Clypeus with 2-9 setae in male, 1-10 in female. Stipes nearly triangular in shape. Cornua of cibarial pump distinct. Tentorium slender, long, with or without distinct rounded projection anteriorly. Male antenna with 13 flagellomeres and well developed plume, groove beginning at flagellomere 4; female antenna with 10 flagellomeres, ultimate flagellomere with or without subapical seta. Antennal ratio of male excluding *T. kuroheius* 1.30-2.44. Flagellomeres 1-9 in female antenna and flagellomeres 1-5 or 6 in male antenna each with a pair of simple long sensilla basiconica; ultimate flagellomere with several simple sensilla basiconica and a few sensilla coeloconica in both sexes. Thorax. Antepronotum well developed, lobes meeting at distinct V-shaped notch anterior to anterior margin of scutum. Scutum smoothly rounded. Lateral antepronotals 1-4; dorsocentrals erect, several, uniserial; acrostichals weak, starting some distance from antepronotum; prealars several, uniserial; no supraalar. Scutellum with several uniserially setae.

Wing. Membrane bare, covered with microtrichia; anal lobe distinct, rounded. Squama with or without setae. R and R1 with several to 10 or more setae; R4-5 with few to 10 or more setae apically in male, with about 10-20 setae in apical 1/2-3/4 in female.


Hypopygium. Anal point very short and prominently wide, hyaline. T IX with paired, low tubercles posterolaterally each with about 10 short setae. Paramere large, nearly triangular in shape. Basal lobe of gonocoxite well developed, strongly sclerotized, semicircular or triangular in shape, bare in apical half. Gonostylus gently curved, without crista dorsalis. Megaseta long and slender.

Female genitalia. Tergum IX completely divided into two parts by rather wide or narrow median longitudinal membranous area; each part rather small and completely fused with larger laterosternite (gonocoxite IX **sensu** Sæther, 1977, 1980). Segment X without setae. Sternum VIII long, with posteromedian lobe (gonapophysis VIII **sensu** Sæther, 1977, 1980) with distinct concavity on lateral margin and horizontal concavity anterior to median eleft. Egg-guide divided into large ventrolateral lobe and small dorsomedian lobe. Apodeme lobe small, indistinct. Gonoxapodeme distinctly curved. Notum as long as or longer than length of sternum VIII. Postgenital plate triangular. Cercus large, long, rhombical and directed posteriorly. Spermathecal duct long, slightly curved. Seminal capsule large, about 1/2-2/3 as long as length of VIII sternum.

**Systematic remarks.** The genus *Tsudayusurika* keys to *Bryophaenocladius* Thienemann in the Holarctic key (Cranston et al. 1989), and in the Manual of Palaearctic Diptera (Sæther et al. 2000). Although *Tsudayusurika* is characterized by the presence of pseudospurs on tarsomeres, a wide, short, transparent anal point and large, sclerotized basal lobe of gonocoxite in the male, the characters are not sufficient to define *Tsudayusurika* as a separate genus distinct from *Bryophaenocladius*. For example, *Tsudayusurika* shares a wide and short anal point with *Bryophaenocladius dentatus*, and some species of *Bryophaenocladius* have comparatively large, sclerotized, bare basal lobes of the gonocoxites in the male. In contrast, although *Tsudayusurika* shares the egg-guide divided into large, rounded ventrolateral lobe and small, narrow dorsomedial lobe with *Bryophaenocladius*, the females of the genus are distinct based on the following combination of characters: 1) flagellum with 10 flagellomeres; 2) each flagellomere with simple long sensilla basiconica. As a note here, Cranston (1987) redescribed the parthenogenetic species *Bryophaenocladius furcatus* (Kieffer, 1916) with unusual forked long sensilla basiconica on each flagellomere. This character also is observable in the Japanese species of the *Bryophaenocladius* such as *B. oiraseanus* (Sasa, 1991) and *B. tusimocedeus* (Sasa et Suzuki, 1999); 3) tergum IX completely divided into two parts by a median longitudinal membrane;
4) laterosternite (gonocoxite IX sensu Sæther, 1977, 1980) completely fused with tergum IX; 5) lateral margins of posteromedian lobes of sternum VIII (gonapophysis VIII sensu Sæther, 1977, 1980) distinctly concave, and posteromedian area of sternum VIII anterior to median cleft with a horizontal concavity; 6) cercus large, long and rhombical, projecting posteriorly. Characters 1, 3, 5 and probably 6 may be suggested as autapomorphous characters for Tsudayusurika. Character 5 may be related to mating behavior; when mating, the anal point and the basal lobes may be fitted in the horizontal and lateral concavities of the posteromedian lobes, respectively. However, to clarify the systematic position of Tsudayusurika, further studies of the immature stages are required.

**Keys to species of the genus Tsudayusurika**

**Adult males**

Tsudayusurika kuroheius is not included due to insufficient knowledge of diagnostic characters.

1. Ultimate antennal flagellomere with or without subapical setae; clypeus with 2-4 setae .................................................. 2
   - Ultimate antennal flagellomere with subapical seta; clypeus with 7-9 setae ..................................... *T. suginoi*

2. Ultimate antennal flagellomere without subapical seta .......................................................... *T. fudosecunda*

- Ultimate antennal flagellomere with subapical seta .......................................................... *T. multiannulata*

**Adult females**

The female of *T. kuroheius* is not known.

1. Median longitudinal membranous area on T IX very wide (Figure 2A, Figure 8A); ultimate antennal flagellomere with or without subapical seta .................................................. 2
   - Median longitudinal membranous area on T IX narrow (Figure 3B, Figure 5A); ultimate antennal flagellomere with subapical seta (Figure 4C) ......................... *T. multiannulata*

2. Ultimate antennal flagellomere with subapical seta; clypeus with 8-10 setae (Figure 7D) .................. *T. suginoi* sp. n.
   - Ultimate antennal flagellomere without subapical seta; clypeus with 1-4 setae (Figure 1C) ............ *T. fudosecunda*

**Tsudayusurika fudosecunda** Sasa

(Figures 1-2)

Tsudayusurika fudosecunda Sasa, 1985: 62.

**Material examined.**


**Diagnostic characters.**

The female of this species shares the median wide longitudinal membranous area with *T. suginoi* sp. n. However the species can be separated from the latter by the ultimate antennal flagellomere lacking subapical seta, fewer setae on clypeus and the semicircular basal lobe of the gonocoxite.

**Male** (n = 12, unless otherwise stated)

Total length 3.4-4.0, 3.7 mm. Wing 2.3-2.4, 2.4 mm long, 0.5-0.6, 0.6 mm wide; wing length / wing width 3.77-4.20, 4.00. Coloration. Head dark brown; mouth parts pale brown. Thorax including antepronotum and pleura predominantly dark brown, scutellum pale brown. Halter pale brown. Squama brown. Legs predominately dark brown, all coxae dark brown. Abdomen including genitalia dark brown.

**Female** (n = 4, unless otherwise stated)

Total length 3.3-3.9, 3.7 mm. Wing 1.5-1.6, 1.6 mm long; 0.4-


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0.6, 0.4 mm wide; wing length / wing width 3.44-3.67, 3.53.

**Coloration.** As in male. Cercus brown.

**Head.** (Figures 1C-G). Temporal setae 5-6, uniserial.

Flagellomere lengths (in µm, n = 2): 58-62; 50; 56; 50-54; 54; 42; 44-46; 40-42; 40-42; 48; 80-98; with 2, 6, 6-7, 6, 6, 6, 6, 6, 5, 6-8 setae, respectively. Ultimate flagellomere without subapical seta. Palpomere lengths (in µm): 22 (2); 34-52, 47; 98-110, 105; 78-81, 80; 90-120, 107; palpomeres with 0, 2-4, 12-15, 6-9, 6-7 setae, respectively; third palpomere with 4-8 sensilla clavata (Figures 1E, F). Clypeus with 1-4 setae. Cornua well developed.

**Thorax.** Lateral antepronotals 3 (3); dorsocentrals 6-8, uniserial; prealars 4-5, uniserial; acrostichals 3-9, biserial, supraalar 0. Scutellum with 6 (3) setae, uniserial.

Wing. VR 1.07-1.17, 1.13. Costal extension as long as RM, ca. 90 µm long. R with 16-18 setae, R1 with 11-13 setae and apical 1/2 of R4+5 with11-15 setae. Brachiolum with 2-4 setae medially; with 8-12 basal, 3 median and 8 subapical sensilla campaniformia. Squama without setae.

Legs. Fore, mid and hind coxae with 2, 4-5, 4-6 marginal setae, respectively; fore, mid and hind trochanters with 7-8, 8-10, 5-7 marginal setae, respectively. Spur of fore tibia 48-54 µm long (3); mid tibia with anteroventral spur 24-26 µm long (2) and posteroventral spur 42-46, 45 µm long; hind tibia with anteroventral spur 24-28 µm long and posteroventral spur 62-72 µm long (n=2). Tibial comb with 7-11 spine-like setae. Lengths and proportions of legs as in Table 2.

**Genitalia (Figures 2A-E).** Sternal VIII with 28-33 setae. Tergum IX completely divided into two parts by a wide median longitudinal membrane. Tergite IX with 6-8 setae, laterostenite of T IX with 16-19 setae. Notum 180-224, 202 µm long.

**Remarks.** The type locality, Lake Fudo, is a crater lake situated in volcanic area in mid Kyushu. If the larvae are aquatic, they live in the highly acidic water in the crater lake where also *Chironomus acerbiphilus* Tokunaga, 1939 has been recorded.

**Distribution.** Japan (Kyushu).

**Tsudayusurika kuroheius** (Sasa) comb nov. (Figure 3A)


**Material examined.** Holotype male (NMST, No. 284:24), Japan, Honshu, Toyama Pref., Mt. Tate, Kuroyon Lake, sweep net, 14. x. 1994, M. Sasa.
Table 3. Lengths (in µm) and proportions of legs of Tsudayusurika kuroheius, male (n = 1) (Holotype).

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Diagnostic characters.
Due to missing antennae of the holotypes of K. kuroheius and S. multiannulata and the missing hypopygium of the holotype of S. multiannulata, no certain diagnosis to separate the species from other taxa in Tsudayusurika can be given.

Male (n = 1).
Total length 3.7 mm. Wing 2.4 mm long, 0.6 wide; wing length / wing width 3.97.
Coloration. As in T. fudosecunda.
Head (Sasa 1996: Figure 7a). Temporal setae 7. Antenna lost. Palpomere 1-4 lengths (in µm; palpomere 5 lost): 32, 72, 160, 130; with 0, 4-5, 18, 11 setae, respectively; third palpomere with 4 sensilla clavata. Clypeus with 3 setae. Cornua weakly developed.
Thorax (Sasa 1996: Figure 7b, c). Lateral antepronotals 3; dorsocentrals 7, uniserial; acrostichals 6, biserial; prealars 6, uniserial; spiracular 0. Scutellum with 6 setae, uniserial.
Wing (Sasa 1996: Figure 7d). Membrane with moderately strong punctuation. Anal lobe rounded. Costal extension as long as RM, 100 µm long. VR 1.23. R with 10 seta, R1 with 14, apical 1/2 of R4+5 with 6 setae. Brachiolum with 4 rident seta; with 9 basal, 3 median, and 8 subapical sensilla comamorpha. Squama without setae.
Legs. Fore, middle and hind coxae with 2, 8, 6 marginal setae, respectively; fore, mid and hind trochanters with 8, 8, 6 marginal setae, respectively. Mid tibia with anteroventral spur 42 µm long, and with posteroventral spur broken; hind tibial spur broken. Distal portion of hind tibia do not form a distinct terminal comb as mentioned by Sasa’s original description. Lengths and proportions of legs as in Table 3.
Hypopygium (Figure 3A; Sasa 1996: Figure 7j). Tergum IX with 15 setae on each side, sternum IX with 11 setae dorsolaterally. Gonocoxite 256 µm long, with large, semicircular basal lobe, without microtrichia on dorsal surface, with microtrichia on basal 1/2 of ventral surface. Sternapodeme narrow, with weak rounded anteroventral projection; anterior margin slightly convex medially. Virga composed of 6 needle-like spines, 28µm long (Sasa, 1996). Gonostylus 122 µm long. HR 2.10.
Remarks.
The presence or absence of a subapical seta on the ultimate flagellomere and a few setae (1-4 in number) on the clypeus are important taxonomic characters for identifying Tsudayusurika species. Unfortunately, we could not confirm the former character state because the antennae were lost in both holotypes of Kuroyonyusurika kuroheius and Spaniotoma multiannulata. The male shares the latter character state with T. fudosecunda and T. multiannulata. The paramere of the species are smaller than those of T. fudosecunda and T. suginoi, but as the male genitalia of the holotype is lost, we cannot compare the paramere with that of T. multiannulata. The species might thus be a synonym of either T. fudosecunda or T. multiannulata. If so, it is most probably a synonym of T. multiannulata due to the small paramere.

Distribution.
Japan (Honshu).

Tsudayusurika multiannulata (Tokunaga) (Figures 3-5.)
Spaniotoma (Orthocladius) multiannulata Tokunaga, 1940: 287.
Tsudayusurika multiannulata (Tokunaga); Sasa & Kikuchi (1995: 74, 185).

Material examined.

Diagnostic characters.
The species can be easily separated from both T. fudosecunda and T. suginoi sp. n. on the comparative narrow median longitudinal membranous area on T IX in the female. Furthermore, in the female, the species is also distinct from T. suginoi sp. n. by having 4 setae on the clypeus and from T. fudosecunda as the ultimate antennal flagellomere has a subapical seta. Diagnostic characters in the male are not certain due to the missing antennae of the holotype. However, based on female characteristics, the ultimate antennal flagellomere should bear a subapical seta and this would separate T. multiannulata from T. fudosecunda, the other species with 8-10 setae on clypeus.

Holotype male.
Tokunaga (1940) give the total length as about 3.8 mm, the antennal ratio as about 2.44, and the coloration as follows: thorax black, shiny; leg entirely dark brown, abdomen of male
dark brown, each tergum with a narrow dark caudal band. Thoracic and cephalic setation not observable. Anal lobe of wing distinct, rounded. Squama with weak 1 seta.

Lengths and proportions of legs are given from the holotype as in Table 4.

Tokunaga (1940: Figure 57) gives the illustration of the gonostylus. However it is difficult to separate this species from other congeneric species based on the shape of the gonostylus.

**Allotype female.**

Total length 2.7 mm. Head. Temporal setae 5. Second to ultimate flagellomere lengths (in µm): 50, 52, 44, 52, 50, 48, 54, 102; 4th to ultimate flagellomere with 6, 6, 6, 6, 6, 6, 6, at least 7 setae, respectively. Ultimate flagellomere with subapical seta. Maxillary palpus broken. Clypeus with 4 setae. Cornua short but distinct.

Thorax. Lateral antepronotals 2; dorsocentrals 7, uniserial; prealars 5, uniserial; acrostichals not countable; supraalar 0. Wing. Squama with 4 setae. Setae on veins not countable.

Legs. Fore, mid coxae with 2, 8 marginal setae, respectively; mid trochanter with 9 marginal setae. Spur of fore tibia 66 µm long; mid tibia with posteroventral spur 54 µm long. Tibial comb with 12 spine-like setae. Lengths and proportions of legs as in Table 5.

Genitalia (Figures 3B-D). Tergum IX completely divided into two parts by comparatively narrow median longitudinal membrane, and each tergite with 3 or 4 setae; laterosternite with 15 setae. Notum ca. 200 µm long.

**Additional female specimen (n = 1)**

Total length 3.7 mm. Wing 2.6 mm long, 0.8 mm wide, wing length / wing width 3.12.

Head (Figures 4A-E). Temporal setae 7. Flagellomere lengths as in Table 4.
(in µm): 78, 60, 56, 52, 52, 48, 56, 106; with 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 10 setae, respectively. Ultimate flagellomere with subapical seta. Palpomere lengths (in µm): 30, 50, 100, 96, 138; palpomeres with 0, 1, 3, 8, 4 setae, respectively; third palpomere with 3 sensilla clavata. Clypeus with 4 setae. Cornua short but distinct.

Thorax (Figure 4F). Lateral anteronotals 3; dorsocentrales 1 1 or 12, prealars 6, both uniserial; acrostichals 3; supraalar 0. Scutellum with 8 setae, uniserial.

Wing. VR 1.10. Costal extension as long as RM, 108 µm long. R with 17 setae, R₁ with 14 setae and apical 3/4 of R₄+₅ with 26 setae. Brachiolum with 3 or 4 median setae; with 12 basal, 3 or 4 median, 10 subapical sensilla campaniformia. Squama with 8 or 10 setae.

Legs. Fore, mid and hind coxae with 2, 6, 7 marginal setae, respectively; fore, mid and hind trochanters each with 9 marginal setae. Spur of fore tibia 64 µm long; mid tibia with anteroventral spur 18 µm long and posteroventral spur 50 µm long; hind tibia with anteroventral spur broken and posteroventral spur 70 µm long. Tibial comb with 10 spine-like setae. Lengths and proportions of legs as in Table 6.

Genitalia (Figures 5A-C). Sternum VIII with 31 setae. Tergum IX completely divided into two parts by a narrow median longitudinal membrane, and each tergite with 4 setae; laterosternite with 10 or 12 setae. Notum ca. 260 µm long. Postgenital plate slender and long.

Distribution.
Taiwan (Arisan), Japan (Honshu).

Tsudayusurika suginoi sp. n.
(Figures 6-8)

Type material:
Holotype: male (OPU-IN-DI2001X0001), slide mounted in Euparal: Japan, Ryukyus, Okinawa Prefecture, Okinawa Island, Kunigami-son, Aha, malaise trap. 17-23.i.2009, K. Sugino. Paratypes: 9 males, 4 females, as previous except 7-17.i.2009; 3 females, as holotype; 3 females, as previous except 23.i.- 4.ii.2009.

Diagnostic characters.
The species is distinct from the other species by the ultimate antennal flagellomere bearing a subapical seta, clypeus with several to 10 setae and the triangular basal lobe of gonocoxite in hypopygium.

Etymology.
Named in honour of Mr. K. Sugino of Okinawa Prefecture, the collector of the material examined.

Male (n = 10, unless otherwise stated)
Total length 3.1-3.5, 3.3 mm. Wing 2.1-2.2, 2.1 mm long, 0.5-

0.6, 0.5 mm wide; wing length / wing width 3.71-4.04, 3.87. Coloration. As in Tsudayusurika fudosecunda.

Head (Figures 6A-D). Temporal setae 6-11. AR 1.65-1.90, 1.75. Ultimate flagellomere with subapical seta. Palpomere lengths (in µm): 26-36, 30; 48-66, 56; 126-142, 133; 120-140, 131; 146-176, 165; with 0, 2-6, 11-15, 9-11, 6-9 setae, respectively. Cornua weakly developed. Clypeus with 7-9 setae.

Thorax (Figure 6E). Lateral anteronotals 1-3; dorsocentrales 5-9, uniserial; acrostichals 2-7, biserial; prealars 4-6, uniserial; supraalar 0. Scutellum with 5-9 setae, uniserial.

Wing (Figure 6F). VR 1.08-1.16, 1.13. Costal extension as long as RM, ca. 80 µm long. R with 12-14 setae, R₁ with 4-8 setae and apical 1/6-1/3 of R₄+₅ with 2-7 setae. Brachiolum with 3-4 (mostly 3) median setae, with 10-11 basal, 3 median, 9-10 subapical sensilla campaniformia. Squama with 2-4 setae.

Legs. Fore, mid and hind coxae with 1-2 (mostly 2), 4-7, 4-8 marginal setae, respectively; fore, mid and hind trochanters with 8-11, 8-11, 7-12 marginal setae, respectively. Spur of fore tibia 46-64, 56 µm long; mid tibia with anteroventral spur 18-26, 23µm long and posteroventral spur 38-42, 41 µm long; hind tibia with anteroventral spur 24-32, 27 µm long and posteroventral spur 46-62, 56 µm long. Tibial comb of hind leg with 11-15 spine-like setae. Lengths and proportions of legs as in Table 7.

Hypopygium (Figures 7A-C). Tergum IX with 5-7 (6) setae on each side, S IX with 10-13 (6) setae dorsilaterally. Gonocoxite
Figure 7. *Tsudayusurika suginoi* sp. nov, male hypopygium (A-C) and female head (D-G). A. dorsal view. B. ventral view. C. basal portion of gonocoxite, excluding T IX. D. head, frontal view. E. head, caudal view. F. cibarial pump, dorsal view. G. tentorium, lateral view.

Figure 8. *Tsudayusurika suginoi* sp. nov., female genitalia. A. dorsal view. B. ventral view. C. lateral view.

Table 7. Lengths (in µm) and proportions of legs of *Tsudayusurika suginoi* n. sp., male (n =9).

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<td>p₃</td>
<td>1000-1160, 1080</td>
<td>1200-1280, 1231</td>
<td>720-780, 753</td>
<td>360-400, 380</td>
<td>260-280, 275</td>
</tr>
</tbody>
</table>

Table 8. Lengths (in µm) and proportions of legs of *Tsudayusurika suginoi* n. sp. female (n =10).

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<tbody>
<tr>
<td>p₁</td>
<td>5840-980, 912</td>
<td>980-1200, 1086</td>
<td>760-980, 874</td>
<td>420-560, 484 (9)</td>
<td>200-300, 267 (9)</td>
</tr>
<tr>
<td>p₂</td>
<td>780-960, 902</td>
<td>840-1020, 978</td>
<td>500-660, 608</td>
<td>260-340, 312</td>
<td>160-240, 204</td>
</tr>
<tr>
<td>p₃</td>
<td>820-1040, 988</td>
<td>1060-1240, 1180</td>
<td>660-760, 711 (7)</td>
<td>360-400, 366 (7)</td>
<td>240-280, 263 (7)</td>
</tr>
</tbody>
</table>

Table 7. Lengths (in µm) and proportions of legs of *Tsudayusurika suginoi* n. sp., male (n =9).

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<tr>
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</thead>
<tbody>
<tr>
<td>p₁</td>
<td>140-180, 167</td>
<td>100-120, 117</td>
<td>0.72-0.88, 0.77</td>
<td>2.81-3.09, 2.94</td>
<td>2.20-2.56, 2.45</td>
</tr>
<tr>
<td>p₂</td>
<td>120-140, 133 (8)</td>
<td>100-120, 105 (8)</td>
<td>0.53-0.64, 0.60</td>
<td>3.26-3.89, 3.44</td>
<td>3.09-3.58, 3.24</td>
</tr>
<tr>
<td>p₃</td>
<td>140-160, 158</td>
<td>100-120, 113</td>
<td>0.59-0.63, 0.62</td>
<td>3.13-3.52, 3.31</td>
<td>2.97-3.21, 3.07</td>
</tr>
</tbody>
</table>

Table 8. Lengths (in µm) and proportions of legs of *Tsudayusurika suginoi* n. sp. female (n =10).

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</thead>
<tbody>
<tr>
<td>p₁</td>
<td>120-160, 148 (9)</td>
<td>100-120, 104 (9)</td>
<td>0.78-0.83, 0.80</td>
<td>2.73-2.98, 2.87 (9)</td>
<td>2.19-2.40, 2.29</td>
</tr>
<tr>
<td>p₂</td>
<td>120-140, 126</td>
<td>80-100, 96</td>
<td>0.60-0.65, 0.62</td>
<td>3.21-3.50, 3.37</td>
<td>2.91-3.24, 3.09</td>
</tr>
<tr>
<td>p₃</td>
<td>120-160, 137 (7)</td>
<td>100-120, 103 (7)</td>
<td>0.58-0.62 (7)</td>
<td>3.22-3.42, 3.31 (7)</td>
<td>2.85-3.14, 3.04 (7)</td>
</tr>
</tbody>
</table>
200-220, 213 µm long, with large, nearly triangular basal lobe. Sternapodeme narrow, convex medially, with moderately produced anterolateral projection. Virga of several needle-like spines, about 10 µm long. Gonostylus 92-104, 99 µm long; megaseta 16-22, 20 µm long. HR 2.04-2.27, 2.16.

**Female** (*n* = 10, unless otherwise stated)
Total length 2.8-3.5, 3.1 mm. Wing 2.0-2.2, 2.1 mm long; 0.6-0.7, 0.6 mm wide; wing length / wing width 3.31-3.49, 3.29 (7). Coloration. As in male. Cercus pale brown.

Head (Figures 7D-G). Temporal setae 5-7. Flagellomere lengths (in µm): 60-66, 63; 50-56, 51; 46-56, 52; 46-56, 49; 42-50, 48; 40-48, 44; 38-44, 43 (9); 40-42, 41 (8); 40-48, 44 (8); 66-86, 77 (8); with 3-4, 5-6, 5-6, 6-7, 5-6, 5-6 (9), 5-6 (8), 5-6 (8), 6-7 (8) setae, respectively. Ultimate flagellomere with subapical seta. Palpomere lengths (in µm; *n* = 8): 20-34, 27; 40-50, 45; 100-116, 105; 94-118, 107; 138-164, 150; palpomeres with 0, 2-5, 5-6, 5-6, 5-6, 5-6, 5-6 (9), 5-6 (8), 6-7 (8) setae, respectively. Clypeus with 8-10 setae. Thorax. Lateral anterpronotals 1-3; dorsocentrals 6-9, uniserial; prealaras 4-6, uniserial; acrostichals 2-6, biserial; supraalar 0. Scutellum with 6-8 (9) setae, uniserial.

Wing. VR 1.00-1.17, 1.11. Costal extension as long as RM, ca. 80 µm long. R with 12-17 setae (7), R₁ with 7-12 (7) setae and apical 1/3-1/2 of R₄-₅ with 12-17 (7) setae. Brachiolum (8) with 2-3 median setae; with 10 basal, 3 median, 9-11 subapical sensilla campaniformia. Squama with 1-5 (7) setae. Legs. Fore, mid and hind coxae with 1-3, 4-6 (9), 2-7 (9) marginal setae, respectively; fore, mid and hind trochanters with 6-10, 8-10 (9), 8-10 (9) marginal setae, respectively. Spur of fore tibia 30-48, 40 µm long; mid tibia with anteroventral spur 12-28, 20 µm long and posteroverentral spur 32-42, 38 µm long; hind tibia with anteroventral spur 16-24, 20 µm long and posteroverentral spur 46-54, 50 µm long. Tibial comb with 8-12 spine-like setae. Lengths and proportions of legs as in Table 8. Genitalia (Figures 8A-C). Sternum VIII with 46-53 setae (6), Tergum IX completely divided into two parts by a wide median longitudinal membrane, and tergite with 6-9 setae; laterostenie with 13-18 setae. Notum 216-228, 222 µm long.

**Distribution.**
Japan (Okinawa Island).

“The *Tsudayusurika cladochaita*” Wang
Wang 1995, Figure 1. (A-F).


This species differs from all other known species of *Tsudayusurika* in having an extremely short maxillary palp, branched sensilla chaetae (long sensilla basiconica) on flagellomere, conspicuously extended costa, no anal point, no virga and no basal lobe of gonoxite. This species certainly does not belong to *Tsudayusurika*, but quite possibly to *Bryophaeonocladius*, or perhaps to a hitherto unnamed genus. Further study of the species and particularly of the female is required for a certain assignment.

**“Tsudayusurika yufunivea”** (Sasa et Suzuki)
Sasa and Suzuki 1991, Figure 5.3. (a-c).


*Tsudayusurika yufunivea* (Sasa et Suzli); Yamamoto (2004: 109).

Unfortunately the holotype of this species is missing. This species was transferred to the genus *Tsudayusurika* by Yamamoto (2004) based on the original description. The setose basal lobe with a few comparatively long setae on its posterior margin and the gonostylus with inner convex margin at about mid-length are different from any *Tsudayusurika*. This species certainly does not belong to *Tsudayusurika*, but possibly to *Bryophaeonocladius*.

**ACKNOWLEDGMENTS**
We are indebted to Dr. O. Tadauchi and Dr. S. Kamitani, Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka and Dr. A. Shinohara, the National Museum of Nature and Science, Tokyo, for the loan of the type material. We are especially thankful to Mr. K. Sugino of Kunigami Tourism Association, Okinawa and Dr. M. Sasakawa of Osaka Prefecture for offering invaluable specimens. We thank to Dr. P. S. Cranston, Australian National University, Canberra, Australia, for correcting the language of the manuscript and valuable suggestions. Cordial thanks are also due to two anonymous reviewers for their valuable advices.

**REFERENCES**


