Chironomidae collected at the seashore and estuaries in Japan

Koichiro KAWAI^{*,1)}, Katsuo SUGIMARU²⁾, Hidetoshi SAITO¹⁾ and Hiromichi IMABAYASHI¹⁾

^{*} Corresponding author: Koichiro Kawai, Laboratory of Ecology, Graduate School of Biosphere Science, Hiroshima University, 1–4–4, Kagamiyama, Higashihiroshima, Hiroshima 739–8528, Japan
(E-mail: kawagogi@hiroshima-u.ac.jp)

¹⁾ Laboratory of Ecology, Graduate School of Biosphere Science, Hiroshima University, 1–4–4, Kagamiyama, Higashihiroshima, Hiroshima 739–8528, Japan

²⁾ Research Dept. Fumakira co.ltd., 1–11–1, Umehara, Hatsukaichi, Hiroshima 739–0494, Japan

(Received: 15 March 2011; Accepted: 2 September 2011)

Abstract: Chironomids collected at seashore and estuaries by bottom sampling of larvae and sweeping and light sampling of adults were compiled during 1994 to 2010 throughout the Japanese Archipelagoes. A total of 87 species of 44 genera in the 4 subfamilies was collected. Eight genera were estimated to comprise marine species additionally to the 17 genera reported to date. Among 3 sampling methods, the highest number of species was collected by light sampling. *Ainuyusurika tuberculatum* and *Cladotanytarsus vanderwulpi* were the most widely collected from the Honshu to Yaeyama Islands, whereas *Thalassosmittia nemalionis* and *Thalassomya japonica* were collected in the Honshu and Shikoku Islands, and from the Kyushu to Yaeyama Islands, respectively. *Tanytarsus boodlea* and *Yaetanytarsus iriomotensis* were collected by all the methods, whereas *Clunio tsushimensis* was not collected by light sampling, suggesting the lack of phototaxis or weak flying ability of the species.

Key words: chironomid, bottom sampling, estuary, seashore, sweeping, light sampling

INTRODUCTION

Chironomidae (Diptera) comprises about 15,000 species in the world, of which about 2,000 species have been recorded from Japan (Nihon yusurika kenkyu-kai, 2010). It is most widely distributed among the aquatic insects, and is the most abundant in both numbers of species and the amounts in existence (Pinder, 1986). Physiological and ecological studies of some marine species have been reported (Hashimoto, 1975, 1976; Sunose and Fujisawa, 1982). However, the marine chironomid fauna has not been studied after Tokunaga (1932, 1933, 1936a, 1936b) in Japan.

In this study, marine chironomid fauna

was conducted to be clarified for coastal regions throughout the Japanese Archipelagoes by three different sampling methods: bottom sampling, sweeping/sucking and light sampling and the differences in distribution range and in collecting methods were discussed among the species.

MATERIALS AND METHODS

Chironomid samples were collected at the rocky seashore or estuaries of the 65 sites from the Honshu to southwestern islands in Japan in 1994 to 2010. Bottom sampling, sucking/sweeping and light sampling were performed to collect as many species as possible at each site.

Bottom materials, containing larvae,

comprising green algae grown on the stone, waterweeds, mud, sand and gravels in the intertidal zone near the ebb of the spring tide (from the barnacle zone to waterweed zone) were brought to the laboratory with gentle cooling and constant aeration, and were put into a container ($\Phi 15\text{ cm} \times \text{H}9\text{ cm}$) at 24°C . A container was filled with 1/4 to 3/4 seawater to 5 cm level according to the condition of each site, and aerated using a filtration system (Roka Boy Mini, GEX, Osaka). Emerging adults were collected for about 2 months, and males were used for identification. Sucking was performed using a sucking tube ($\Phi 22 \times 90\text{ mm}$) for the resting midges on the rocks or buildings. Sweeping was performed with a sweeping net ($\Phi 36\text{ cm}$) over the rocks and vegetation. Light sampling was usually performed by collecting midges attracted to the light emitted by a variety of vending machines. A portable fluorescent light, equipped with a black lamp (6w, 350 nm in peak wavelength), was used in case that vending machines were not available.

Wings of males were removed and mounted dry on slide glass, the body was macerated in hot 10% KOH solution, washed in water, and mounted in gum-chloral solution.

The specimens were identified under microscope mainly according to Tokunaga (1937), Pinder (1978), Wiederholm (1989), Sasa and Kikuchi (1995) and Saether (2006).

RESULTS AND DISCUSSION

A total of 87 species of 44 genera in 4 subfamilies was collected (Table 1). Among these, 34, 41 and 63 species were collected by bottom, sweeping/sucking and light samplings, respectively. This shows the

highest efficiency of light sampling in species collection among the 3 methods.

Among 87 species, *Tanytarsus lamnicaudus* Tokunaga, originally described on the specimen collected in the Caroline Islands was firstly collected from Japan in this study. A total of 11 species belonging to 8 genera, *Ainuyusurika* Sasa et Shirasaka (1 species), *Clunio* Haliday (3 species), *Pontomyia* Edwards (1 species), *Semiocladius* Sublette et Wirth (1 species), *Telmatogeton* Schiner (2 species), *Thalassomyia* Schiner (1 species), *Thalassosmittia* Strenzke et Remmert (1 species) and *Yaetanytarsus* Sasa (1 species) have been described as marine or blackish whereas a total of 17 species in other 9 genera, *Chironomus* Meigen (1 species), *Cladotanytarsus* Kieffer (1 species), *Cricotopus* van der Wulp (1 species), *Dicrotendipes* Kieffer (3 species), *Kiefferulus* Goetghebuer (1 species), *Limnophyes* Eaton (1 species), *Polypedilum* Kieffer (2 species), *Pseudosmittia* Goetghebuer (1 species) and *Tanytarsus* van der Wulp (6 species) have been reported to comprise marine or blackish species (See Table 1; Tokunaga, 1964; Sasa and Kikuchi, 1995; Wiederholm, 1989; Cranston, 2007; Sugimaru et al., 2008). Other 18 species in additional 8 genera, *Corynoneura* Winnertz (1 species), *Cryptochironomus* Kieffer (1 species), *Eukiefferiella* Kieffer (1 species), *Microchironomus* Kieffer (2 species), *Paracladopelma* Harnisch (1 species), *Paratanytarsus* Bause (1 species), *Paratrachocladius* Santos-Abreu (1 species), *Phaenopsectra* Kieffer (1 species) to above-mentioned 7 genera, *Chironomus* (1 species), *Cladotanytarsus* (1 species), *Dicrotendipes* (2 species), *Kiefferulus* (1 species), *Limnophyes* (2 species), *Pseudosmittia* (1 species) and *Tanytarsus* (1 species) were proven to comprise brackish or marine species by bottom larval

sampling. Other genera were also shown to be likely to dwell in brackish or marine habitats, although they could comprise those attracted to light sources set near seashores from focal freshwater habitats.

Ainuyusurika tuberculata (Tokunaga), *Microchironomus tener* (Kieffer), *Polypedilum tananense* Sasa et Hasegawa, *Cladotanytarsus vanderwulpi* (Edwards) and *Yaetanytarsus iriomotensis* Sasa were the most widely collected from the Honshu to Yaeyama Islands, and *Cricotopus sylvestris* (Fabricius), *Paratrichocladius rufiventris* (Meigen) and *Semiocladius endocladiae* (Tokunaga) were also widely collected from the Honshu to Okinawa Islands. In contrast, *Thalassosmittia nemalionis* (Tokunaga) and *Thalassomya japonica* Tokunaga et Komyo were collected in the Honshu and Shikoku Islands, and from the Kyushu to Yaeyama Islands, respectively. *Pseudorthocladius fujiocavus* Sasa, and *Hanochironomus tsumerestylus* Ree and *Kiefferulus glauciventris* (Kieffer) were collected in the Satsunan to Okinawa Islands and Okinawa to Yaeyama Islands, respectively. There were some differences in collection area among the species for several genera. For the genus *Limnophyes*, *Limnophyes minimus* (Meigen) was widely collected from the Honshu to Yaeyama Islands whereas *L. natalensis* Kieffer was collected only in the Kume and Tokashiki Islands. For the genus *Clunio*, *C. pacificus* Edwards and *C. setonis* Tokunaga were collected in the Kyushu to Yaeyama Islands and the Shikoku, Kyushu and Okinawa Islands, respectively, whereas *C. tsushimensis* Tokunaga collected in the Honshu, comprising the Sea of Japan and Seto Inland Sea, and Shikoku Islands. For *Telmatogeton*, *T. pacificus* Tokunaga was collected only in the Shikoku Island whereas *T.*

japonicus Tokunaga collected in the Honshu, comprising the Sea of Japan and Seto Inland Sea, Shikoku and Satsunan Islands. For *Dicrotendipes*, *D. enteromorphae* (Tokunaga) was collected from the Honshu, Shikoku, Kyushu to Okinawa Islands whereas *D. flexus* (Johannsen) was much more widely from the Honshu to Yaeyama Islands. For *Tanytarsus*, *T. boodleeae* Tokunaga was the most widely collected from the Honshu to Yaeyama Islands, and *T. pelagicus* Tokunaga was also widely collected from the Honshu, Kyushu to Okinawa Islands whereas *T. churamarinus* Sugimaru, Kawai et Imabayashi was collected only in the Okinawa and Yaeyama Islands. Of these species, *Y. iriomotensis* has been recorded only from Iriomote Island until this study.

Pontomyia pacifica Tokunaga, *Bryophaenocladius togaflex* Sasa et Okazawa and *Thalassosmittia nemalionis*, and *Hanochironomus tsumerestylus* were collected only by bottom sampling, sweeping/sucking and light sampling, respectively. For *Pontomyia*, female adults are well known to be completely devoid of locomotory power and males to only glide on water surface by means of the fluttering wings (Tokunaga, 1932). Besides, most species of *Bryophaenocladius* larvae are known to be terrestrial or semi-terrestrial. Since *Thalassosmittia* larvae were reported to be a littoral shore dweller (Wiederholm, 1989), they are possible to live in a little lower zone than our sampling ranges and additionally to have no positive phototaxis. *Hanochironomus tsumerestylus* was originally described on the samples collected at the Korean coastal village (Ree, 1992) and the larvae were collected from the sand-filter beds in filtration plants located along streams (Yamamoto et al., 2007).

Semiocladius endocladiae, *Telmatogeton japonicus*, *Thalassomya japonica*, *Tanytarsus pelagicus* etc. were collected only by sweeping/sucking and light sampling. As the larvae of these species were known to live in the intertidal zone including algal matting (Tokunaga, 1933; Wiederholm, 1989), they might dwell in rather deep zones near the infralittoral one. *Clunio tsushimensis* was collected only by bottom sampling and sweeping/sucking. This suggests the lack of positive phototaxis and/or a weak flying ability of the species due to their rather atrophied wings (Tokunaga, 1937). *Cryptochironomus albofasciatus*, *Dicretendipes enteromorphae*, *Kiefferulus glauciventris* etc. were collected only by bottom and light samplings, suggesting the lack of roaring behavior of the adults on or just above the seashore. *Paratrichocladius rufiventris*, *Limnophyes minimus*, *Ainuyusurika tuberculatus*, *Cladotanytarsus vanderwulpi*, *Tanytarsus boodleae* etc. were collected by all the methods, suggesting their larval habitats in rather high intertidal zone, a more or less high activity and positive phototaxis of the adults.

REFERENCES

- Cranston, P. S. 2007. The chironomidae larvae associated with the Tsunami-impacted waterbodies of the coastal plains of southwestern Thailand. *Raffles Bull. Zool.*, 55: 231–244.
- Hashimoto, H. 1975. Seasonal emergence of *Clunio aquilonius* Tokunaga (Diptera: Chironomidae). *Kontyû*, 43: 52–57.
- Hashimoto, H. 1976. Non-biting midges of marine habitats (Diptera: Chironomidae). Marine insects. North Holland Publishing Company, Amsterdam. 377–414.
- Nihon yusurika kenkyu-kai. 2010. Illustrated guide to the Chironomidae of Japan. Bun-ichisogoshuppan, Tokyo. 353 pp. (in Japanese)
- Pinder, L. C. V. 1978. A key to adult males of British Chironomidae. Part 1. The key; Part 2. Illustrations of the hypopygia. *Scient. Publ. Freshwat. Biol. Ass.*, 37: 169 pp., 189 Figs.
- Pinder, L. C. V. 1986. Biology of freshwater Chironomidae. *Ann. Rev. Ent.*, 16:211–230.
- Ree, H.-I. 1992. A new genus and new species of Chironomidae from Korea. *Jpn. J. Sanit. Zool.*, 43: 19–22.
- Sasa, M. and Kikuchi, M. 1995. Chironomidae [Diptera] of Japan. University of Tokyo Press. 333 pp.
- Saether, O. A. 2006. Japanese *Pseudosmittia* Edwards (Diptera: Chironomidae). *Zootaxa*, 1198: 21–51.
- Sugimaru, K., Kawai, K. and Imabayashi, H. 2008. A new marine chironomid species of the genus *Tanytarsus* (Diptera: Chironomidae) from Okinawa, Japan. *Plankton Benthos Res.*, 3: 240–242.
- Sunose, T. and Fujisawa, T. 1982. Ecological studies of the intertidal chironomid *Telmatogeton japonicus* Tokunaga in Hokkaido. *Res. Popl. Ecol.*, 24: 70–84.
- Tokunaga, M. 1932. Specially evolved chironomids, *Pontomyia natans* Edwards and *P. pacifica* Tokunaga, as marine insects. *Dobutsugakuzasshi*, 44: 1–3.
- Tokunaga, M. 1933. Chironomidae from Japan II. Marine *Tanytarsus*. *Philip. J. Sci.*, 51: 357–367.
- Tokunaga, M. 1936a. Chironomidae from Japan VII. New species and a new variety of the genus *Chironomus* Meigen. *Philip. J. Sci.*, 60: 71–85.
- Tokunaga, M. 1936b. Chironomidae from Japan VIII. Marine or seashore *Spaniotoma*, with description of the immature forms of *Spaniotoma melanione*, sp. nov. and *Tanytarsus boodleae* Tokunaga. *Philip. J. Sci.*, 60: 303–319.
- Tokunaga, M. 1937. Nihon Dobutsu Bunrui (Fauna Nipponica). Vol. 10, Fasc. 7, No. 1. Family Chironomidae (1). 1–110 (in Japanese)
- Tokunaga, M. 1964. Insects of Micronesia Diptera: Chironomidae. *Insects of Micronesia*, 12: 486–628.
- Yamamoto, M., Hirabayashi, K. and Matsuzawa, M. 2007. The Korean species *Hanoichironomus tumerestylus* Ree, 1992 taken on Ishigaki Island, Japan (Diptera: Chironomidae). In: Contribution to the systematics and ecology of aquatic Diptera—a tribute to Ole A. Saether, 2007 (ed. Andersen, T.), pp. 335–346. The Caddis Press.
- Wiederholm, T. 1989. Chironomidae from the Holarctic Region—Keys and diagnoses. *Entomol. Scand. Suppl.*, 34, 532 pp.

Table 1 Records of chironomid collection at the seashores or estuaries throughout the Japanese Archipelagoes.

○, bottom sampling; △, sweeping/sucking; ×, light sampling.

	Tohoku			Hokuriku			Tokai	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tanypodinae								
<i>Procladius choreus</i>					×			
<i>Tanypus craatzi</i>						△		
Orthoclaadiinae								
Orthoclaadiini								
<i>Cricotopus sylvestris</i>						△		
<i>C. tricinctus</i>								
<i>C. trifasciatus</i>						△		
<i>Eukiefferiella coelurescens</i>								
<i>Hydrobaenus kondoi</i>								△
<i>Paratrichocladius rufiventris</i>								
<i>Rheocricotopus tamabrevis</i>								
Metriocnemini								
<i>Bryophaenocladius akiensis</i>								
<i>B. joganbilobus</i>								
<i>B. togaflex</i>								
<i>Bryophaenocladius</i> sp.								
<i>Krenosmittia</i> sp.								
<i>Limnophyes akanangularius</i>								
<i>L. minimus</i>						△		
<i>L. natalensis</i>								
<i>L.</i> sp.								
<i>Parachaetocladius akanoctavus</i>								
<i>P. kuramasingularius</i>								
<i>Parametriocnemus shoukouzoensis</i>								
<i>Paraphaenocladius impensus</i>								
<i>Pseudorthocladius fujioclavus</i>								
<i>P. pilosipennis</i>								
<i>Pseudosmittia bifurcata</i>								
<i>P. forcipata</i>								
<i>P. oxoniana</i>								
<i>P. topei</i>								
<i>P.</i> sp.								
<i>Semiocladius endocladiae</i>								
<i>Smittia itachipennis</i>								
<i>S. gusukuensis</i>								
<i>S. pratorum</i>								
<i>S. togaquirea</i>								
<i>Thalassosmittia nemalione</i>								
Corynoneurini								
<i>Corynoneura longipennis</i>								
<i>C. tenuistyla</i>								
Clunioni								
<i>Clunio pacificus</i>								
<i>C. setonis</i>								
<i>C. tsushimensis</i>								
Telmatogetoninae								
<i>Telmatogeton japonicus</i>								
<i>T. pacificus</i>								

(1) Lake Jusan (2) Lake Ogawara (3) Iwaki (4) Toyama (5) Shibayamagata (6) Mikata Lakes (7) Lake Hamanako (8) Kuwana

Table 1 Continued

○, bottom sampling; △, sweeping/sucking; ×, light sampling.

	Tohoku			Hokuriku			Tokai	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Thalassomya japonica</i>								
Chironominae								
Chironomini								
<i>Ainuyusurika tuberculatum</i>								
<i>Chironomus crassiforceps</i>								
<i>C. salinarius</i>				○			×	
<i>C. sp.</i>								
<i>Cryptochironomus albofasciatus</i>								
<i>Dicrotendipes enteromorphae</i>								
<i>D. inouei</i>		×				○		
<i>D. lobiger</i>								
<i>D. nigrocephalicus</i>			×					
<i>D. pelochloris</i>						△		
<i>D. yaeyamanus</i>								
<i>Hanoichironomus tsumerestylus</i>								
<i>Harnischia sp.</i>								
<i>Kiefferulus glauciventris</i>								
<i>K. longilobus</i>								
<i>Lipiniella moderata</i>			×		×			
<i>Microchironomus ishiii</i>								
<i>M. tener</i>						△		
<i>M. teruyai</i>								
<i>Nilodrum barbatitarsis</i>								
<i>Paracladopelma hibarasecundum</i>								
<i>P. tamanipparai</i>								
<i>Phaenopsectra flavipes</i>								
<i>Polypedilum (Pentapedilum) convexum</i>								
<i>P. (Pe.) kamossecundum</i>								
<i>P. (Tripodura) tananense</i>								
Tanytarsini								
<i>Cladotanytarsus vanderwulpi</i>								
<i>C. utonaiquartus</i>	×							
<i>Micropectra sp.</i>								
<i>Neozavrelia bicoliocula</i>								
<i>N. tamanona</i>								
<i>Paratanytarsus stagnarius</i>								
<i>Pontomyia pacifica</i>								
<i>Rheotanytarsus aestuarius</i>								
<i>R. parvicrinis</i>								
<i>Tanytarsus boodleae</i>								
<i>T. churamarinus</i>								
<i>T. formosanus</i>								
<i>T. lamnicaudus</i>								
<i>T. miyakobrevis</i>								
<i>T. pelagicus</i>								
<i>T. pontophilus</i>								
<i>T. sp.</i>								
<i>Yaetanytarsus iriomotensis</i>								

(1) Lake Jusan (2) Lake Ogawara (3) Iwaki (4) Toyama (5) Shibayamagata (6) Mikata Lakes (7) Lake Hamanako
 (8) Kuwana

Table 1 Continued

○, bottom sampling; △, sweeping/sucking; ×, light sampling.

	San-in						Kinki	
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16) (17)
Tanypodinae								
<i>Procladius choreus</i>								
<i>Tanypus craatzi</i>								
Orthoclaadiinae								
Orthoclaadiini								
<i>Cricotopus sylvestris</i>								
<i>C. tricinctus</i>								
<i>C. trifasciatus</i>								
<i>Eukiefferiella coelurescens</i>								
<i>Hydrobaenus kondoi</i>								
<i>Paratrithocladus rufiventris</i>	○			○				
<i>Rheocricotopus tamabrevis</i>								
Metriocnemini								
<i>Bryophaenocladus akiensis</i>								
<i>B. joganbilobus</i>								
<i>B. togaflex</i>								
<i>Bryophaenocladus</i> sp.								
<i>Krenosmittia</i> sp.								
<i>Limnophyes akanangularius</i>								
<i>L. minimus</i>								
<i>L. natalensis</i>								
<i>L. sp.</i>								
<i>Parachaetocladus akanoctavus</i>								
<i>P. kuramasingularius</i>								
<i>Parametriocnemus shoukouzoensis</i>								
<i>Paraphaenocladus impensus</i>								
<i>Pseudorthocladus fujioclavus</i>								
<i>P. pilosipennis</i>								
<i>Pseudosmittia bifurcata</i>								
<i>P. forcipata</i>								
<i>P. oxoniana</i>							○	
<i>P. topei</i>								
<i>P. sp.</i>								
<i>Semiocladus endocladiae</i>				×				×△
<i>Smittia itachipennis</i>								
<i>S. gusukuensis</i>								
<i>S. pratorum</i>								
<i>S. togaquirea</i>								×
<i>Thalassosmittia nemalione</i>								
Corynoneurini								
<i>Corynoneura longipennis</i>								
<i>C. tenuistyla</i>								
Clunioni								
<i>Clunio pacificus</i>								
<i>C. setonis</i>								
<i>C. tsushimensis</i>					△			
Telmatogetoninae								
<i>Telmatogeton japonicus</i>					△			×
<i>T. pacificus</i>								

(9) Lake Koyama (10) Lake Togo (11) Lake Nakaumi (12) Lake Shinji (13) Hamada (14) Masuda (15) Susa
 (16) Kushimoto (17) Shirahama

Table 1 Continued

○, bottom sampling; △, sweeping/sucking; ×, light sampling.

	San-in							Kinki	
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
<i>Thalassomya japonica</i>									
Chironominae									
Chironomini									
<i>Ainuyusurika tuberculatum</i>								×	
<i>Chironomus crassiforceps</i>									
<i>C. salinarius</i>									
<i>C. sp.</i>								×	
<i>Cryptochironomus albofasciatus</i>	○	○	○	○					
<i>Dicrotendipes enteromorphae</i>								×	
<i>D. inouei</i>									
<i>D. lobiger</i>									
<i>D. nigrocephalicus</i>				○		○			
<i>D. pelochloris</i>	○								
<i>D. yaeyamanus</i>									
<i>Hanochironomus tsumerestylus</i>									
<i>Harnischia sp.</i>									
<i>Kiefferulus glauciventris</i>									
<i>K. longilobus</i>									
<i>Lipiniella moderata</i>	×								
<i>Microchironomus ishiii</i>									
<i>M. tener</i>									
<i>M. teruyai</i>									
<i>Nilodrum barbatitarsis</i>									
<i>Paracladopelma hibarasecundum</i>									
<i>P. tamanipparai</i>		○							
<i>Phaenopsectra flavipes</i>		○							
<i>Polypedilum (Pentapedilum) convexum</i>							○		
<i>P. (Pe.) kamossecundum</i>									
<i>P. (Tripodura) tananense</i>									
Tanytarsini									
<i>Cladotanytarsus vanderwulpi</i>	○	○		○					
<i>C. utonaiquartus</i>				○					
<i>Micropsectra sp.</i>									
<i>Neozavrelia bicoliocula</i>									
<i>N. tamanona</i>									
<i>Paratanytarsus stagnarius</i>									
<i>Pontomyia pacifica</i>									
<i>Rheotanytarsus aestuarius</i>									
<i>R. parvicrinis</i>									
<i>Tanytarsus boodleae</i>								×	
<i>T. churamarinus</i>									
<i>T. formosanus</i>									
<i>T. lamnicaudus</i>									
<i>T. miyakobrevis</i>									
<i>T. pelagicus</i>									
<i>T. pontophilus</i>									
<i>T. sp.</i>									
<i>Yaetanytarsus iriomotensis</i>									

(9) Lake Koyama (10) Lake Togo (11) Lake Nakaumi (12) Lake Shinji (13) Hamada (14) Masuda (15) Susa
 (16) Kushimoto (17) Shirahama

Table 1 Continued

○, bottom sampling; △, sweeping/sucking; ×, light sampling.

	Setouchi									
	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	
Tanypodinae										
<i>Procladius choreus</i>										
<i>Tanypus craatzi</i>										
Orthocladiinae										
Orthocladiini										
<i>Cricotopus sylvestris</i>										
<i>C. tricinctus</i>						×				
<i>C. trifasciatus</i>										
<i>Eukiefferiella coelurescens</i>										
<i>Hydrobaenus kondoi</i>										
<i>Paratrithocladus rufiventris</i>						○△		○		
<i>Rheocricotopus tamabrevis</i>										
Metriocnemini										
<i>Bryophaenocladus akiensis</i>										
<i>B. joganbilobus</i>										
<i>B. togaflex</i>						△				
<i>Bryophaenocladus</i> sp.										
<i>Krenosmittia</i> sp.										
<i>Limnophyes akanangularius</i>						△				
<i>L. minimus</i>										
<i>L. natalensis</i>										
<i>L.</i> sp.										
<i>Parachaetocladus akanoctavus</i>										
<i>P. kuramasingularius</i>										
<i>Parametriocnemus shoukouzoensis</i>										
<i>Paraphaenocladus impensus</i>										
<i>Pseudorthocladus fujiotavus</i>										
<i>P. pilosipennis</i>										
<i>Pseudosmittia bifurcata</i>				△						
<i>P. forcipata</i>										
<i>P. oxoniana</i>										
<i>P. topei</i>										
<i>P.</i> sp.										
<i>Semiocladus endocladiae</i>		△		×						
<i>Smittia itachipennis</i>										
<i>S. gusukuensis</i>										
<i>S. pratorum</i>						△				
<i>S. togaquirea</i>										
<i>Thalassosmittia nemalione</i>					△	△				
Corynoneurini										
<i>Corynoneura longipennis</i>										
<i>C. tenuistyla</i>						△				
Clunioni										
<i>Clunio pacificus</i>										
<i>C. setonis</i>										
<i>C. tsushimensis</i>		△			△	△				
Telmatogetoninae										
<i>Telmatogeton japonicus</i>						×	△			
<i>T. pacificus</i>										

(18) Lake Kojima (19) Tajiri (20) Mihara (21) Yasuura (22) Kure (23) Ujina (24) Itsukaichi (25) Ohtake
 (26) Ikuchi Is.

Table 1 Continued

○, bottom sampling; △, sweeping/sucking; ×, light sampling.

	Setouchi								
	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
<i>Thalassomya japonica</i>									
Chironominae									
Chironomini									
<i>Ainuyusurika tuberculatum</i>				×		△			
<i>Chironomus crassiforceps</i>									
<i>C. salinarius</i>							○		
<i>C. sp.</i>									
<i>Cryptochironomus albofasciatus</i>									
<i>Dicrotendipes enteromorphae</i>									
<i>D. inouei</i>									
<i>D. lobiger</i>									
<i>D. nigrocephalicus</i>						△		○	
<i>D. pelochloris</i>	×								
<i>D. yaeyamanus</i>									
<i>Hanochironomus tsumerestylus</i>									
<i>Harnischia sp.</i>									
<i>Kiefferulus glauciventris</i>									
<i>K. longilobus</i>									
<i>Lipiniella moderata</i>	×								
<i>Microchironomus ishiii</i>	×		○						
<i>M. tener</i>		○							
<i>M. teruyai</i>									
<i>Nilodrum barbatitarsis</i>	×								
<i>Paracladopelma hibarasecundum</i>									
<i>P. tamanipparai</i>									
<i>Phaenopsectra flavipes</i>									
<i>Polypedilum (Pentapedilum) convexum</i>									
<i>P. (Pe.) kamossecundum</i>									
<i>P. (Tripodura) tananense</i>									
Tanytarsini									
<i>Cladotanytarsus vanderwulpi</i>						○△			
<i>C. utonaiquartus</i>									
<i>Micropsectra sp.</i>									
<i>Neozavrelia bicoliocula</i>						△			
<i>N. tamanona</i>						△			
<i>Paratanytarsus stagnarius</i>			○						
<i>Pontomyia pacifica</i>									
<i>Rheotanytarsus aestuarius</i>									
<i>R. parvicrinis</i>									
<i>Tanytarsus boodlea</i>									
<i>T. churamarinus</i>									
<i>T. formosanus</i>				×					
<i>T. lamnicaudus</i>									
<i>T. miyakobrevis</i>									
<i>T. pelagicus</i>				△	△				
<i>T. pontophilus</i>									
<i>T. sp.</i>	×			×					
<i>Yaetanytarsus iriomotensis</i>									

(18) Lake Kojima (19) Tajiri (20) Mihara (21) Yasuura (22) Kure (23) Ujina (24) Itsukaichi (25) Ohtake
 (26) Ikuchi Is.

Table 1 Continued

○, bottom sampling; △, sweeping/sucking; ×, light sampling.

	Setouchi						Shikoku		
	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)
Tanypodinae									
<i>Procladius choreus</i>									
<i>Tanypus craatzi</i>									
Orthoclaadiinae									
Orthoclaadiini									
<i>Cricotopus sylvestris</i>									
<i>C. tricinctus</i>									
<i>C. trifasciatus</i>									
<i>Eukiefferiella coelurescens</i>									○
<i>Hydrobaenus kondoi</i>									
<i>Paratrachocladus rufiventris</i>									
<i>Rheocricotopus tamabrevis</i>									
Metriocnemini									
<i>Bryophaenocladus akiensis</i>									
<i>B. joganbilobus</i>				×					
<i>B. togaflex</i>									
<i>Bryophaenocladus</i> sp.									
<i>Krenosmittia</i> sp.									
<i>Limnophyes akanangularius</i>									
<i>L. minimus</i>									×
<i>L. natalensis</i>									
<i>L.</i> sp.									
<i>Parachaetocladus akanoctavus</i>									
<i>P. kuramasingularius</i>									
<i>Parametriocnemus shoukouzoensis</i>									
<i>Paraphaenocladus impensus</i>									
<i>Pseudorthocladus fujioctavus</i>									
<i>P. pilosipennis</i>									×
<i>Pseudosmittia bifurcata</i>									
<i>P. forcipata</i>									
<i>P. oxoniana</i>									
<i>P. topei</i>									
<i>P.</i> sp.									
<i>Semiocladus endocladiae</i>				△×			×		△×
<i>Smittia itachipennis</i>									×
<i>S. gusukuensis</i>									
<i>S. pratorum</i>							×		
<i>S. togaquirea</i>									
<i>Thalassosmittia nemalione</i>			△	△		△			△
Corynoneurini									
<i>Corynoneura longipennis</i>									○
<i>C. tenuistyla</i>									
Clunioni									
<i>Clunio pacificus</i>									
<i>C. setonis</i>									×
<i>C. tsushimensis</i>			○△	△					○
Telmatogetoninae									
<i>Telmatogeton japonicus</i>			△×			△		△	△
<i>T. pacificus</i>									△×

(27) Aba Is. (28) Ohshiba Is. (29) Kamagari Is. (30) Kurahashi Is. (31) Etajima Is. (32) Ninoshima Is. (33) Naruto
 (34) Muroto (35) Tosashimizu

Table 1 Continued

○, bottom sampling; △, sweeping/sucking; ×, light sampling.

	Setouchi						Shikoku		
	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)
<i>Thalassomya japonica</i>									
Chironominae									
Chironomini									
<i>Ainuyusurika tuberculatum</i>				×					
<i>Chironomus crassiforceps</i>									
<i>C. salinarius</i>									
<i>C. sp.</i>									
<i>Cryptochironomus albofasciatus</i>									
<i>Dicrotendipes enteromorphae</i>									○
<i>D. inouei</i>									
<i>D. lobiger</i>									×
<i>D. nigrocephalicus</i>			×						○×
<i>D. pelochloris</i>									
<i>D. yaeyamanus</i>									
<i>Hanochironomus tsumerestylus</i>									
<i>Harnischia sp.</i>									
<i>Kiefferulus glauciventris</i>									
<i>K. longilobus</i>									
<i>Lipiniella moderata</i>									
<i>Microchironomus ishiii</i>									
<i>M. tener</i>									
<i>M. teruyai</i>									
<i>Nilodrum barbatitarsis</i>									
<i>Paracladopelma hibarasecundum</i>									
<i>P. tamanipparai</i>									
<i>Phaenopsectra flavipes</i>									
<i>Polypedilum (Pentapedilum) convexum</i>									×
<i>P. (Pe.) kamossecundum</i>							×		
<i>P. (Tripodura) tananense</i>									
Tanytarsini									
<i>Cladotanytarsus vanderwulpi</i>									
<i>C. utonaiquartus</i>									
<i>Micropectra sp.</i>					△				
<i>Neozavrelia bicoliocula</i>									
<i>N. tamanona</i>									
<i>Paratanytarsus stagnarius</i>									
<i>Pontomyia pacifica</i>								○	
<i>Rheotanytarsus aestuarius</i>									
<i>R. parvicrinis</i>									
<i>Tanytarsus boodleae</i>									
<i>T. churamarinus</i>									
<i>T. formosanus</i>									
<i>T. lamnicaudus</i>									
<i>T. miyakobrevis</i>									
<i>T. pelagicus</i>			△	×					
<i>T. pontophilus</i>	△	△							
<i>T. sp.</i>									
<i>Yaetanytarsus iriomotensis</i>			×	×					×

(27) Aba Is. (28) Ohshiba Is. (29) Kamagari Is. (30) Kurahashi Is. (31) Etajima Is. (32) Ninoshima Is. (33) Naruto
 (34) Muroto (35) Tosashimizu

Table 1 Continued

○, bottom sampling; △, sweeping/sucking; ×, light sampling.

	Satsunan Islands							
	(36)	(37)	(38)	(39)	(40)	(41)	(42)	(43)
Tanypodinae								
<i>Procladius choreus</i>								
<i>Tanypus craatzi</i>								
Orthoclaadiinae								
Orthoclaadiini								
<i>Cricotopus sylvestris</i>			×△					
<i>C. tricinctus</i>								
<i>C. trifasciatus</i>								
<i>Eukiefferiella coelurescens</i>								
<i>Hydrobaenus kondoi</i>								
<i>Paratrichocladius rufiventris</i>		×△○	×△	×		○		
<i>Rheocricotopus tamabrevis</i>								
Metriocnemini								
<i>Bryophaenocladus akiensis</i>								
<i>B. joganbilobus</i>								
<i>B. togaflex</i>								
<i>Bryophaenocladus</i> sp.								
<i>Krenosmittia</i> sp.								
<i>Limnophyes akanangularius</i>				×				
<i>L. minimus</i>		×	△					
<i>L. natalensis</i>								
<i>L. sp.</i>								
<i>Parachaetocladus akanoctavus</i>								
<i>P. kuramasingularius</i>								
<i>Parametriocnemus shoukouzoensis</i>								
<i>Paraphaenocladus impensus</i>								
<i>Pseudorthocladus fujioctavus</i>	×	×		×				
<i>P. pilosipennis</i>								
<i>Pseudosmittia bifurcata</i>								
<i>P. forcipata</i>				×				
<i>P. oxoniana</i>			△					
<i>P. topei</i>		△		×				
<i>P. sp.</i>								
<i>Semiocladus endocladiae</i>	×	×△		×	△			
<i>Smittia itachipennis</i>								
<i>S. gusukuensis</i>								
<i>S. pratorum</i>								
<i>S. togaquirea</i>								
<i>Thalassosmittia nemalione</i>								
Corynoneurini								
<i>Corynoneura longipennis</i>								
<i>C. tenuistyla</i>								
Clunioni								
<i>Clunio pacificus</i>								
<i>C. setonis</i>								
<i>C. tsushimensis</i>								
Telmatogetoninae								
<i>Telmatogeton japonicus</i>			×					
<i>T. pacificus</i>								

(36) Kuro Is. (Satsuma) (37) Tanegashima Is. (38) Yakushima Is. (39) Amami Is. (40) Kakeroma Is. (41) Kikai Is.
 (42) Tokunoshima Is. (43) Yoron Is.

Table 1 Continued

○, bottom sampling; △, sweeping/sucking; ×, light sampling.

	Satsunan Islands							
	(36)	(37)	(38)	(39)	(40)	(41)	(42)	(43)
<i>Thalassomya japonica</i>				△				
Chironominae								
Chironomini								
<i>Ainuyusurika tuberculatum</i>		○	×○			×	○	
<i>Chironomus crassiforceps</i>								
<i>C. salinarius</i>								
<i>C. sp.</i>								
<i>Cryptochironomus albofasciatus</i>								
<i>Dicrotendipes enteromorphae</i>			○			×		
<i>D. inouei</i>		×○						
<i>D. lobiger</i>								
<i>D. nigrocephalicus</i>		×	×○	×				
<i>D. pelochloris</i>								
<i>D. yaeyamanus</i>								
<i>Hanochironomus tsumerestylus</i>								
<i>Harnischia sp.</i>								
<i>Kiefferulus glauciventris</i>								
<i>K. longilobus</i>								
<i>Lipiniella moderata</i>								
<i>Microchironomus ishihi</i>								
<i>M. tener</i>								
<i>M. teruyai</i>								
<i>Nilodrum barbatitarsis</i>								
<i>Paracladopelma hibarasecundum</i>		×						
<i>P. tamanipparai</i>								
<i>Phaenopsectra flavipes</i>								
<i>Polypedilum (Pentapedilum) convexum</i>								
<i>P. (Pe.) kamossecundum</i>								
<i>P. (Tripodura) tananense</i>								
Tanytarsini								
<i>Cladotanytarsus vanderwulpi</i>		×○		○	○			
<i>C. utonaiquartus</i>				×				
<i>Micropsectra sp.</i>								
<i>Neozavrelia bicoliocula</i>								
<i>N. tamanona</i>	×							
<i>Paratanytarsus stagnarius</i>								
<i>Pontomyia pacifica</i>								
<i>Rheotanytarsus aestuarius</i>				×				
<i>R. parvicrinis</i>								
<i>Tanytarsus boodleeae</i>		×				×		
<i>T. churamarinus</i>								
<i>T. formosanus</i>		△						○
<i>T. lamnicaudus</i>								
<i>T. miyakobrevis</i>			○					
<i>T. pelagicus</i>								
<i>T. pontophilus</i>								
<i>T. sp.</i>								
<i>Yaetanytarsus iriomotensis</i>		×	×	×		×		

(36) Kuro Is. (Satsuma) (37) Tanegashima Is. (38) Yakushima Is. (39) Amami Is. (40) Kakeroma Is. (41) Kikai Is.
 (42) Tokunoshima Is. (43) Yoron Is.

Table 1 Continued

○, bottom sampling; △, sweeping/sucking; ×, light sampling.

	Okinawa Islands							
	(44)	(45)	(46)	(47)	(48)	(49)	(50)	(51)
Tanypodinae								
<i>Procladius choreus</i>								
<i>Tanypus craatzi</i>								
Orthoclaadiinae								
Orthoclaadiini								
<i>Cricotopus sylvestris</i>	×		○					
<i>C. tricinctus</i>								
<i>C. trifasciatus</i>								
<i>Eukiefferiella coelurescens</i>								
<i>Hydrobaenus kondoi</i>								
<i>Paratrichocladus rufiventris</i>			○					
<i>Rheocricotopus tamabrevis</i>			△			×		
Metriocnemini								
<i>Bryophaenocladus akiensis</i>						×		
<i>B. joganbilobus</i>								
<i>B. togaflex</i>								
<i>Bryophaenocladus</i> sp.					△			
<i>Krenosmittia</i> sp.								
<i>Limnophyes akanangularius</i>						○		
<i>L. minimus</i>			△○					
<i>L. natalensis</i>						○		○
<i>L. sp.</i>								
<i>Parachaetocladus akanoctavus</i>								
<i>P. kuramasingularius</i>								
<i>Parametriocnemus shoukouzoensis</i>								
<i>Paraphaenocladus impensus</i>		△						
<i>Pseudorthocladus fujiocavus</i>			×					
<i>P. pilosipennis</i>								
<i>Pseudosmittia bifurcata</i>				△				
<i>P. forcipata</i>								
<i>P. oxoniana</i>								
<i>P. topei</i>						×		
<i>P. sp.</i>								
<i>Semiocladus endocladiae</i>		×	×				×	△
<i>Smittia itachipennis</i>								
<i>S. gusukuensis</i>			×					
<i>S. pratorum</i>								
<i>S. togaquirea</i>								
<i>Thalassosmittia nemalione</i>								
Corynoneurini								
<i>Corynoneura longipennis</i>								
<i>C. tenuistyla</i>								
Clunioni								
<i>Clunio pacificus</i>								
<i>C. setonis</i>			△					
<i>C. tsushimensis</i>								
Telmatogetoninae								
<i>Telmatogeton japonicus</i>								
<i>T. pacificus</i>								

(44) Iheya Is. (45) Izena Is. (46) Okinawa Is. (47) Ie Is. (48) Aguni Is. (49) Kume Is. (50) Zamami Is.
 (51) Tokashiki Is.

Table 1 Continued

○, bottom sampling; △, sweeping/sucking; ×, light sampling.

	Okinawa Islands							
	(44)	(45)	(46)	(47)	(48)	(49)	(50)	(51)
<i>Thalassomya japonica</i>							△	×
Chironominae								
Chironomini								
<i>Ainuyusurika tuberculatum</i>			×			×		
<i>Chironomus crassiforceps</i>		△						
<i>C. salinarius</i>								
<i>C. sp.</i>								
<i>Cryptochironomus albofasciatus</i>	×	○	×					
<i>Dicrotendipes enteromorphae</i>		○				×		
<i>D. inouei</i>						×	×	
<i>D. lobiger</i>								
<i>D. nigrocephalicus</i>			×○			×		
<i>D. pelochloris</i>								
<i>D. yaeyamanus</i>			○					
<i>Hanochironomus tsumerestylus</i>			×					
<i>Harnischia sp.</i>								
<i>Kiefferulus glauciventris</i>			○					
<i>K. longilobus</i>								
<i>Lipiniella moderata</i>								
<i>Microchironomus ishihi</i>								
<i>M. tener</i>					△		×	
<i>M. teruyai</i>								
<i>Nilodrum barbatitarsis</i>								
<i>Paracladopelma hibarasecundum</i>								
<i>P. tamanipparai</i>								
<i>Phaenopsectra flavipes</i>								
<i>Polypedilum (Pentapedilum) convexum</i>			○×					
<i>P. (Pe.) kamosecundum</i>								
<i>P. (Tripodura) tananense</i>								
Tanytarsini								
<i>Cladotanytarsus vanderwulpi</i>	×○							
<i>C. utonaiquartus</i>								
<i>Micropsectra sp.</i>								
<i>Neozavrelia bicoliocula</i>								
<i>N. tamanona</i>								
<i>Paratanytarsus stagnarius</i>								
<i>Pontomyia pacifica</i>								
<i>Rheotanytarsus aestuarius</i>								
<i>R. parvicrinis</i>						×		
<i>Tanytarsus boodleeae</i>			×		×	×		
<i>T. churamarinus</i>						×	×	
<i>T. formosanus</i>	×		×○					
<i>T. lamnicaudus</i>								
<i>T. miyakobrevis</i>								
<i>T. pelagicus</i>				△				
<i>T. pontophilus</i>								
<i>T. sp.</i>								
<i>Yaetanytarsus iriomotensis</i>	×	×	×○		×	×	×	

(44) Iheya Is. (45) Izena Is. (46) Okinawa Is. (47) Ie Is. (48) Aguni Is. (49) Kume Is. (50) Zamami Is.
 (51) Tokashiki Is.

Table 1 Continued

○, bottom sampling; △, sweeping/sucking; ×, light sampling.

	Yaeyama Islands								Izu Islands
	(52)	(53)	(54)	(55)	(56)	(57)	(58)	(59)	(60)
Tanypodinae									
<i>Procladius choreus</i>									
<i>Tanypus craatzi</i>									
Orthocladiinae									
Orthocladiini									
<i>Cricotopus sylvestris</i>									
<i>C. tricinctus</i>									
<i>C. trifasciatus</i>									
<i>Eukiefferiella coelurescens</i>									
<i>Hydrobaenus kondoi</i>									
<i>Paratrithocladus rufiventris</i>									
<i>Rheocricotopus tamabrevis</i>									
Metriocnemini									
<i>Bryophaenocladus akiensis</i>									
<i>B. joganbilobus</i>									
<i>B. togaflex</i>				△				△	
<i>Bryophaenocladus</i> sp.									
<i>Krenosmittia</i> sp.						×			
<i>Limnophyes akanangularius</i>									
<i>L. minimus</i>				×					
<i>L. natalensis</i>									
<i>L.</i> sp.						×			
<i>Parachaetocladus akanoctavus</i>									
<i>P. kuramasingularius</i>									
<i>Parametriocnemus shoukouzoensis</i>				×					
<i>Paraphaenocladus impensus</i>									
<i>Pseudorthocladus fujiocavus</i>									
<i>P. pilosipennis</i>									
<i>Pseudosmittia bifurcata</i>									
<i>P. forcipata</i>									
<i>P. oxoniana</i>									
<i>P. topei</i>				×		×			
<i>P.</i> sp.						×			
<i>Semiocladius endocladiae</i>									
<i>Smittia itachipennis</i>				×		×			△
<i>S. gusukuensis</i>									
<i>S. pratorum</i>				×					
<i>S. togaquirea</i>									
<i>Thalassosmittia nemalione</i>									
Corynoneurini									
<i>Corynoneura longipennis</i>									
<i>C. tenuistyla</i>									
Clunioni									
<i>Clunio pacificus</i>						△			
<i>C. setonis</i>									
<i>C. tsushimensis</i>									
Telmatogetoninae									
<i>Telmatogeton japonicus</i>									
<i>T. pacificus</i>									

(52) Miyako Is. (53) Irabu Is. (54) Shimoji Is. (55) Ishigaki Is. (56) Yonakuni Is. (57) Iriomote Is. (58) Kuro Is. (Yaeyama)
 (59) Hateruma Is. (60) Hachijo Is.

Table 1 Continued

○, bottom sampling; △, sweeping/sucking; ×, light sampling.

	Yaeyama Islands								Izu Islands
	(52)	(53)	(54)	(55)	(56)	(57)	(58)	(59)	(60)
<i>Thalassomya japonica</i>				×	×	×△		×	
Chironominae									
Chironomini									
<i>Ainuyusurika tuberculatum</i>	×			×△		×○			
<i>Chironomus crassiforceps</i>	○	○							
<i>C. salinarius</i>									
<i>C. sp.</i>									
<i>Cryptochironomus albofasciatus</i>									
<i>Dicrotendipes enteromorphae</i>									
<i>D. inouei</i>				×					
<i>D. lobiger</i>									
<i>D. nigrocephalicus</i>	×			×○					
<i>D. pelochloris</i>									
<i>D. yaeyamanus</i>									
<i>Hanochironomus tsumerestylus</i>				×		×			
<i>Harnischia sp.</i>					×				
<i>Kiefferulus glauciventris</i>		○			×○			○	
<i>K. longilobus</i>				×○					
<i>Lipiniella moderata</i>									
<i>Microchironomus ishiii</i>									
<i>M. tener</i>				×		×			
<i>M. teruyai</i>			△						
<i>Nilodrum barbatitarsis</i>						×		×	
<i>Paracladopelma hibarasecundum</i>									
<i>P. tamanipparai</i>									
<i>Phaenopsectra flavipes</i>									
<i>Polypedilum (Pentapedilum) convexum</i>									
<i>P. (Pe.) kamossecundum</i>									
<i>P. (Tripodura) tananense</i>	×			×△		×			
Tanytarsini									
<i>Cladotanytarsus vanderwulpi</i>						○			
<i>C. utonaiquartus</i>									
<i>Micropsectra sp.</i>									
<i>Neozavrelia bicoliocula</i>									
<i>N. tamanona</i>									
<i>Paratanytarsus stagnarius</i>									
<i>Pontomyia pacifica</i>									
<i>Rheotanytarsus aestuarius</i>									
<i>R. parvicrinis</i>									
<i>Tanytarsus boodlea</i>					△	○△		○	
<i>T. churamarinus</i>				×○		×○		×	
<i>T. formosanus</i>	×				○	×○			
<i>T. lamnicaudus</i>				×	×				
<i>T. miyakobrevis</i>									
<i>T. pelagicus</i>									
<i>T. pontophilus</i>									
<i>T. sp.</i>									
<i>Yaetanytarsus iriomotensis</i>						×△			

(52) Miyako Is. (53) Irabu Is. (54) Shimoji Is. (55) Ishigaki Is. (56) Yonakuni Is. (57) Iriomote Is. (58) Kuro Is.(Yaeyama)
 (59) Hateruma Is. (60) Hachijo Is.

Table 1 Continued

○, bottom sampling; △, sweeping/sucking; ×, light sampling.

	Kyushu				
	(61)	(62)	(63)	(64)	(65)
Tanypodinae					
<i>Procladius choreus</i>					
<i>Tanypus craatzi</i>					
Orthoclaadiinae					
Orthoclaadiini					
<i>Cricotopus sylvestris</i>					
<i>C. tricinctus</i>					
<i>C. trifasciatus</i>					
<i>Eukiefferiella coelurescens</i>					
<i>Hydrobaenus kondoi</i>					
<i>Paratrichocladus rufiventris</i>		△			
<i>Rheocricotopus tamabrevis</i>			×		
Metriocnemini					
<i>Bryophaenocladus akiensis</i>					
<i>B. joganbilobus</i>					
<i>B. togaiflex</i>					
<i>Bryophaenocladus</i> sp.					
<i>Krenosmittia</i> sp.					
<i>Limnophyes akanangularius</i>					
<i>L. minimus</i>		△			
<i>L. natalensis</i>					
<i>L.</i> sp.					
<i>Parachaetocladus akanoctavus</i>		×			
<i>P. kuramasingularius</i>		×			
<i>Parametriocnemus shoukouzoensis</i>					
<i>Paraphaenocladus impensus</i>					
<i>Pseudorthocladus fujiocavus</i>					
<i>P. pilosipennis</i>					
<i>Pseudosmittia bifurcata</i>					
<i>P. forcipata</i>					
<i>P. oxoniana</i>					
<i>P. topei</i>					
<i>P.</i> sp.					
<i>Semiocladus endocladiae</i>		△			×
<i>Smittia itachipennis</i>			×		
<i>S. gusukuensis</i>					
<i>S. pratorum</i>					
<i>S. togaquirea</i>			×		
<i>Thalassosmittia nemalionae</i>					
Corynoneurini					
<i>Corynoneura longipennis</i>					
<i>C. tenuistyla</i>					
Clunioni					
<i>Clunio pacificus</i>		△			
<i>C. setonis</i>		△			
<i>C. tsushimensis</i>					
Telmatogetoninae					
<i>Telmatogeton japonicus</i>					
<i>T. pacificus</i>					

(61) Usuki (62) Nichinan (63) Sata (64) Shimabara (65) Ushibuka

Table 1 Continued

○, bottom sampling; △, sweeping/sucking; ×, light sampling.

	Kyushu				
	(61)	(62)	(63)	(64)	(65)
<i>Thalassomya japonica</i>			×△	△	
Chironominae					
Chironomini					
<i>Ainuyusurika tuberculatum</i>					
<i>Chironomus crassiforceps</i>					
<i>C. salinarius</i>					×
<i>C. sp.</i>					
<i>Cryptochironomus albofasciatus</i>					
<i>Dicrotendipes enteromorphae</i>		○	×		
<i>D. inouei</i>					
<i>D. lobiger</i>					
<i>D. nigrocephalicus</i>			○		
<i>D. pelochloris</i>					
<i>D. yaeyamanus</i>					
<i>Hanochironomus tsumerestylus</i>					
<i>Harnischia sp.</i>					
<i>Kiefferulus glauciventris</i>					
<i>K. longilobus</i>					
<i>Lipiniella moderata</i>					
<i>Microchironomus ishihi</i>					
<i>M. tener</i>					
<i>M. teruyai</i>					
<i>Nilodrum barbatitarsis</i>					
<i>Paracladopelma hibarasecundum</i>					
<i>P. tamanipparai</i>					
<i>Phaenopsectra flavipes</i>					
<i>Polypedilum (Pentapedilum) convexum</i>					
<i>P. (Pe.) kamossecundum</i>					
<i>P. (Tripodura) tananense</i>					
Tanytarsini					
<i>Cladotanytarsus vanderwulpi</i>					
<i>C. utonaiquartus</i>					
<i>Micropsectra sp.</i>					
<i>Neozavrelia bicoliocula</i>					
<i>N. tamanona</i>					
<i>Paratanytarsus stagnarius</i>					
<i>Pontomyia pacifica</i>					
<i>Rheotanytarsus aestuarius</i>					
<i>R. parvicrinis</i>					
<i>Tanytarsus boodleae</i>		○△			
<i>T. churamarinus</i>					
<i>T. formosanus</i>					
<i>T. lamnicaudus</i>					
<i>T. miyakobrevis</i>					
<i>T. pelagicus</i>	△	△			
<i>T. pontophilus</i>					
<i>T. sp.</i>					
<i>Yaetanytarsus iriomotensis</i>					

(61) Usuki (62) Nichinan (63) Sata (64) Shimabara (65) Ushibuka

Table 1 Continued

	References	
	Freshwater	Brackish or marine
Tanypodinae		
<i>Procladius choreus</i>	Nihon Yusurika Kenkyu-kai (2010)	Sasa and Kikuchi (1995)
<i>Tanypus craatzii</i>	Nihon Yusurika Kenkyu-kai (2010)	
Orthoclaadiinae		
Orthoclaidiini		
<i>Cricotopus sylvestris</i>	Sasa and Kikuchi (1995)	Sasa and Kikuchi (1995)
<i>C. tricinctus</i>	Sasa and Kikuchi (1995)	
<i>C. trifasciatus</i>	Sasa and Kikuchi (1995)	
<i>Eukiefferiella coelurescens</i>	Nihon Yusurika Kenkyu-kai (2010)	
<i>Hydrobaenus kondoi</i>	Nihon Yusurika Kenkyu-kai (2010)	
<i>Paratrachocladus rufiventris</i>	Nihon Yusurika Kenkyu-kai (2010)	
<i>Rheocricotopus tamabrevis</i>	Nihon Yusurika Kenkyu-kai (2010)	
Metriocnemini		
<i>Bryophaenocladus akiensis</i>	Sasa and Kikuchi (1995)	
<i>B. joganbilobus</i>	Sasa and Kikuchi (1995)	
<i>B. togaflex</i>	Sasa and Kikuchi (1995)	
<i>Bryophaenocladus</i> sp.		
<i>Krenosmittia</i> sp.		
<i>Limnophyes akanangularius</i>	Sasa and Kikuchi (1995)	
<i>L. minimus</i>	Sasa and Kikuchi (1995)	Sasa and Kikuchi (1995)
<i>L. natalensis</i>		
<i>L.</i> sp.		
<i>Parachaeotcladius akanoctavus</i>	Sasa and Kikuchi (1995)	
<i>P. kuramasingularius</i>	Sasa and Kikuchi (1995)	
<i>Parametriocnemus shoukouzoensis</i>	Sasa and Kikuchi (1995)	
<i>Paraphaenocladus impensus</i>	Sasa and Kikuchi (1995)	
<i>Pseudorthocladus fujiocavus</i>	Sasa and Kikuchi (1995)	
<i>P. pilosipennis</i>	Nihon Yusurika Kenkyu-kai (2010)	
<i>Pseudosmittia bifurcata</i>		Sasa and Kikuchi (1995)
<i>P. forcipata</i>		
<i>P. oxoniana</i>		
<i>P. topei</i>		
<i>P.</i> sp.		
<i>Semiocladus endocladiae</i>		Sasa and Kikuchi (1995)
<i>Smittia itachipennis</i>	Sasa and Kikuchi (1995)	
<i>S. gusukuensis</i>		Sasa and Kikuchi (1995)
<i>S. pratorum</i>	Sasa and Kikuchi (1995)	Sasa and Kikuchi (1995)
<i>S. togaquirea</i>	Sasa and Kikuchi (1995)	
<i>Thalassosmittia nemalione</i>		Sasa and Kikuchi (1995)
Corynoneurini		
<i>Corynoneura longipennis</i>	Sasa and Kikuchi (1995)	
<i>C. tenuistyla</i>	Sasa and Kikuchi (1995)	
Clunioni		
<i>Clunio pacificus</i>		Sasa and Kikuchi (1995)
<i>C. setonis</i>		Sasa and Kikuchi (1995)
<i>C. tsushimensis</i>		Sasa and Kikuchi (1995)
Telmatogetoninae		
<i>Telmatogeton japonicus</i>		Sasa and Kikuchi (1995)
<i>T. pacificus</i>		Sasa and Kikuchi (1995)

Table 1 Continued

	References	
	Freshwater	Brackish or marine
<i>Thalassomya japonica</i>		Sasa and Kikuchi (1995)
Chironominae		
Chironomini		
<i>Ainuyusurika tuberculatum</i>		Sasa and Kikuchi (1995)
<i>Chironomus crassiforceps</i>	Sasa and Kikuchi (1995)	
<i>C. salinarius</i>		Sasa and Kikuchi (1995)
<i>C. sp.</i>		
<i>Cryptochironomus albofasciatus</i>	Nihon Yusririka Kenkyu-kai (2010)	
<i>Dicrotendipes enteromorphae</i>		Sasa and Kikuchi (1995)
<i>D. inouei</i>		Sasa and Kikuchi (1995)
<i>D. lobiger</i>	Nihon Yusririka Kenkyu-kai (2010)	Sasa and Kikuchi (1995)
<i>D. nigrocephalicus</i>	Nihon Yusririka Kenkyu-kai (2010)	
<i>D. pelochloris</i>	Nihon Yusririka Kenkyu-kai (2010)	
<i>D. yaeyamanus</i>	Sasa and Kikuchi (1995)	
<i>Hanochironomus tsumerestylus</i>	Yamamoto et al., 2007	Ree (1992)
<i>Harnischia sp.</i>		
<i>Kiefferulus glauciventris</i>	Nihon Yusririka Kenkyu-kai (2010)	
<i>K. longilobus</i>		Cranston, 2007
<i>Lipiniella moderata</i>	Nihon Yusririka Kenkyu-kai (2010)	
<i>Microchironomus ishiii</i>		Sasa and Kikuchi (1995)
<i>M. tener</i>	Nihon Yusririka Kenkyu-kai (2010)	
<i>M. teruyai</i>	Nihon Yusririka Kenkyu-kai (2010)	
<i>Nilodrum barbatitarsis</i>	Nihon Yusririka Kenkyu-kai (2010)	
<i>Paracladopelma hibarasecundum</i>	Sasa and Kikuchi (1995)	
<i>P. tamanipparai</i>	Sasa and Kikuchi (1995)	
<i>Phaenopsectra flavipes</i>	Sasa and Kikuchi (1995)	
<i>Polypedilum (Pentapedilum) convexum</i>	Nihon Yusririka Kenkyu-kai (2010)	Cranston, 2007
<i>P. (Pe.) kamosecundum</i>	Sasa and Kikuchi (1995)	
<i>P. (Tripodura) tananense</i>	Sasa and Kikuchi (1995)	Nihon Yusririka Kenkyu-kai (2010)
Tanytarsini		
<i>Cladotanytarsus vanderwulpi</i>	Sasa and Kikuchi (1995)	Sasa and Kikuchi (1995)
<i>C. utonaiquartus</i>	Sasa and Kikuchi (1995)	
<i>Micropsectra sp.</i>		
<i>Neozavrelia bicoliocula</i>	Sasa and Kikuchi (1995)	
<i>N. tamanona</i>	Sasa and Kikuchi (1995)	
<i>Paratanytarsus stagnarius</i>	Nihon Yusririka Kenkyu-kai (2010)	
<i>Pontomyia pacifica</i>		Sasa and Kikuchi (1995)
<i>Rheotanytarsus aestuarius</i>	Nihon Yusririka Kenkyu-kai (2010)	Nihon Yusririka Kenkyu-kai (2010)
<i>R. parvicrinis</i>	Sasa and Kikuchi (1995)	
<i>Tanytarsus boodleae</i>		Sasa and Kikuchi (1995)
<i>T. churamarinus</i>		Sugimaru, Kawai et Imabayashi (2008)
<i>T. formosanus</i>		Sasa and Kikuchi (1995)
<i>T. lamnicaudus</i>		Tokunaga (1964)
<i>T. miyakobrevis</i>	Sasa and Kikuchi (1995)	
<i>T. pelagicus</i>		Sasa and Kikuchi (1995)
<i>T. pontophilus</i>		Sasa and Kikuchi (1995)
<i>T. sp.</i>		
<i>Yaetanytarsus iriomotensis</i>		Sasa and Kikuchi (1995)