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Bipaliid Land Planarians from Nagasaki Prefecture and the Vicinity, Kyûshû, Japan: Color Photographs of Living Specimens and the Karyotypes

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Introduction

Kawakatsu, Sluys & Ogren (in preparation) is the latest paper on the taxonomy of bipaliid land planarian species from Japan based upon slides (serial sections) prepared by Kawakatsu during the past several years. The descriptions of 5 new species with morphological and taxonomic review of bipaliid species reported previously from Japan, Korea, Taiwan and China will be given in that paper.

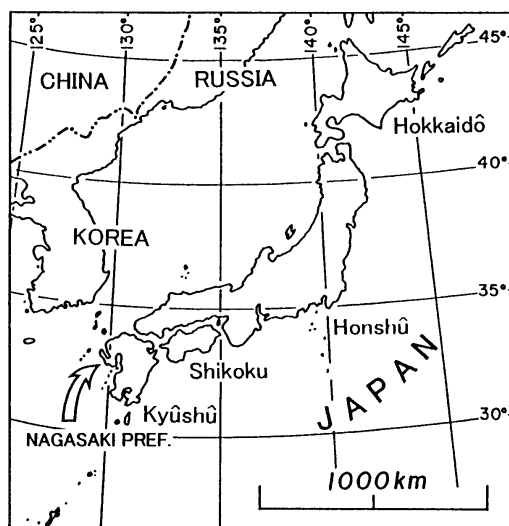


Fig. 1. The Japanese Islands: Location of Nagasaki Prefecture in Kyûshû.

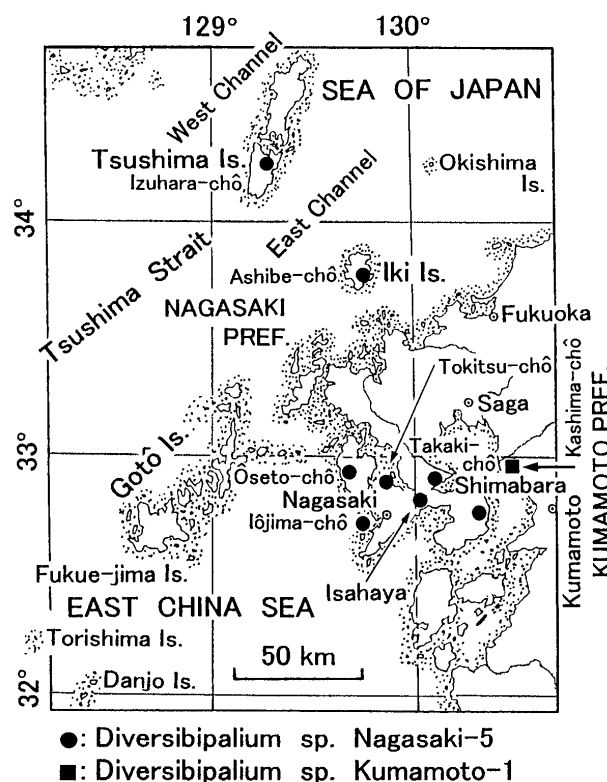


Fig. 3. Sketch map showing the known localities of 2 bipaliid species from Nagasaki Prefecture and the vicinity: *Diversibipalium* sp. Nagasaki-5 (●) and *Diversibipalium* sp. Kumamoto-1 (■) (after Yamamoto, 2002, modified).

In the course of this taxonomic study, Kawakatsu believed that the external morphological characters of Far Eastern and SE Asiatic bipaliid species (a shape of the head with auricles, coloration, patterns and stripes on the dorsal and/or ventral sides of the body, etc.) have very important taxonomic value.

In recent years, under the supervision of Kawakatsu, Yamamoto studied chromosomal analysis of bipaliid species collected in Nagasaki Prefecture and the vicinity (Yamamoto, 1996, 1999, 2000, 2002, 2003a, b; see also Kawakatsu, Yamamoto, Ogren & Takai, 2000; Yamamoto, Takai, Ogren & Kawakatsu, 2000, 2001; Fig. 1). Up to the present, he studied karyotypes of 9 bipaliid species. However, his samples have not been identified yet by the examination of serial sections except for 3 wide distributed species.

Yamamoto's serial papers cited above (2000, 2002, 2003a) include color photographs of living bipaliid species. However, an international reference of his papers in Japanese language is very difficult because those were published in series of a local bulletin of private high school in Nagasaki.

The purpose of the present web article is an open to the public of the reproduced color photographs of Yamamoto's bipaliid animals in the 'planarian.net' by Kawakatsu-&-Sasaki. In addition, a tentative taxonomic list of Yamamoto's bipaliid samples and their karyological data are also given.

Tentative Taxonomic List and the Karyology

Suborder Tricladida Lang, 1884

Infraorder Terricola Hallez, 1892

Family Bipaliidae von Graff, 1896

Genus *Bipalium* Stimpson, 1857

(Japanese name: Kôgai-biru Zoku)

- 1) *Bipalium nobile* Kawakatsu et Makino, 1982

Japanese name: Ô-misuji-kôgai-biru

Chromosome no.: $2x=10$, with a karyotype of $2m + 2m + m \& sm + 2sm + 2sm$.

- 2) *Bipalium kewense* Moseley, 1878

Japanese name: Watari-kôgai-biru

Chromosome no.: $2x=18$, with karyotypes of $2m + 2m + 2m + 2st + 2sm + 2sm + 2sm + 2sm + 2sm$; $2m + 2m + 2m + 2sm + m \& st + 2st + 2st + 2sm + 2sm$.

Genus *Diversibipalium* Kawakatsu, Ogren, Froehlich et Sasaki, 2002*

New Japanese name: Midôtei-kôgai-biru-Zoku

* Note. Collective group to temporarily assign species inquirendae and nomina nuda.

- 3) *Diversibipalium multilineatum* (Makino et Shirasawa, 1983)

Japanese name: Tasuji-kôgai-biru

Chromosome no.: $2x=10$, with karyotypes of $2m + sm \& st + 2sm + 2sm + sm \& st$; $2m + 2sm + 2st + 2sm + 2sm$; $2m + sm \& st + 2st + 2st + sm \& st$.

- 4) *Diversibipalium* sp. Nagasaki-1

Chromosome no.: $2x=10$, with a karyotype of $2m + 2m + 2m + 2m + 2sm$.

- 5) *Diversibipalium* sp. Nagasaki-2

Chromosome no.: $2x=10$, with a karyotype of $2m + 2st + 2sm + 2m + m \& sm$.

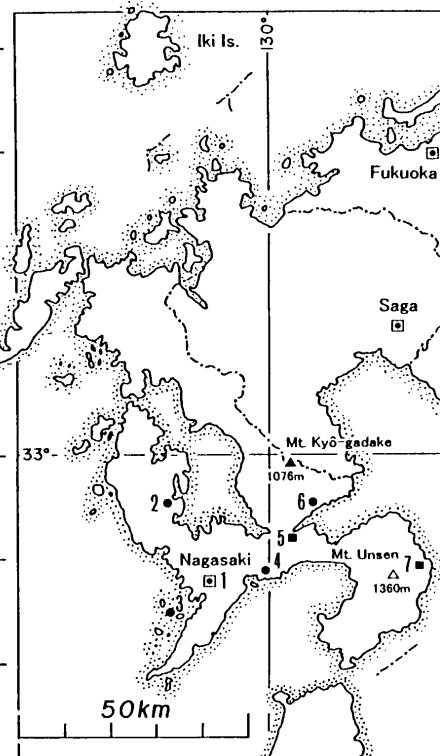
- 6) *Diversibipalium* sp. Nagasaki-3

Chromosome no.: $2x=10$, with a karyotype of $2m + 2m + m \& sm + 2m + 2m$.

- 7) *Diversibipalium* sp. Nagasaki-4

Chromosome no.: $2x=10$, with a karyotype of $2m + m \& sm + 2sm + 2m + 2m$.

Chromosomes & Localities		1	2	3	4	5	6	7	8	9
Bipalium kewense	Nagasaki	[idiogram]								
	Bunkyô	[idiogram]								
	Kakidô	[idiogram]								
Ns.-g.	Nagayo	[idiogram]								
		[idiogram]								
		[idiogram]								
Bipalium nobile	Nagasaki	[idiogram]								
Diversibipalium multilineatum	Nameshi	[idiogram]								
	Bunkyô	[idiogram]								
	Kinkai	[idiogram]								
	Kinkai	[idiogram]								
Diversibipalium sp. Nagasaki-1	Nagayo	[idiogram]								
		[idiogram]								
		[idiogram]								
Diversibipalium spp. Nagasaki-2	Isahaya	[idiogram]								
		[idiogram]								
		[idiogram]								
Diversibipalium spp. Nagasaki-3	Shimabara	[idiogram]								
		[idiogram]								
		[idiogram]								
Diversibipalium spp. Nagasaki-4	Nagasaki	[idiogram]								
		[idiogram]								
		[idiogram]								
Nagasaki-5	Shimabara	[idiogram]								



- 1: Nagasaki City (Bunkyô-chô; Nameshi; Kakidô).
2: Kinkai-chô in Nishisonogi-gun.
3: Iôjima-chô in Nishisonogi-gun.
4: Nagayo-chô in Nishisonogi-gun.
5: Isahaya City.
6: Takaki-chô in Kitataakaki-gun.
7: Shimabara City (Benten-chô).

Fig. 2. Idiograms of 8 bipaliid species (2 *Bipalium* and 6 *Diversibipalium* species) from Nagasaki Prefecture. The right-side map shows the localities of animals (after Kawakatsu, Yamamoto, Ogren & Takai, 2000; Yamamoto, 2003a; modified).

- 8) *Diversibipalium* sp. Nagasaki-5
Chromosome no.: $2x=12$, with karyotypes of $2m + 2st + 2m + 2sm + 2m + 2m$; $2m + 2st + 2m + 2sm + 2m + 2m$.
- 9) *Diversibipalium* sp. Kumamoto-1.
Chromosome no.: $2x=10$, with a karyotype of $2m + 2sm + 2m + 2sm + 2sm$.

Idiograms of 9 species listed in this Section and their localities are shown in Figs. 2-4.

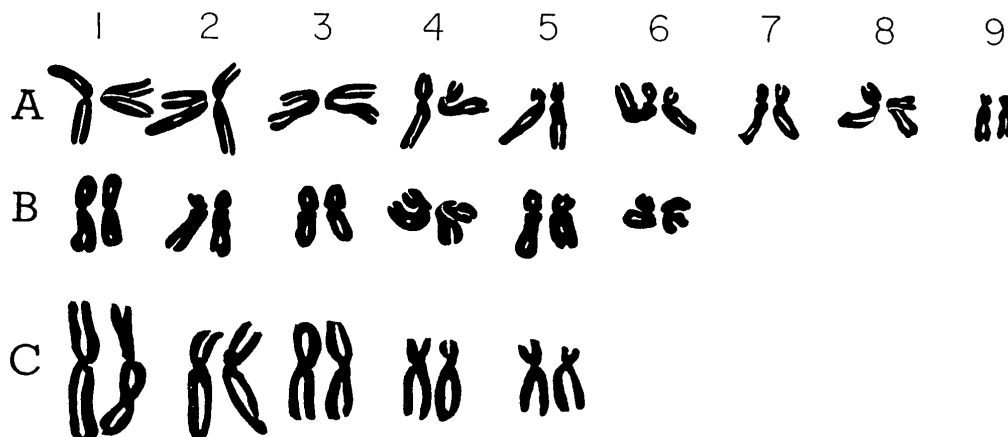


Fig. 4. Additional idiograms of *Bipalium kewense* (A) and *Diversibipalium* sp. Nagasaki-5 (B) from Tanabe City, Wakayama Prefecture, Honshu (after Kubota, Yamamoto & Kawakatsu, 2001). An idiogram of *Diversibipalium* sp. Kumamoto-1 (C) is also shown (after Yamamoto, 2000; slightly modified).

References

- Graff, L. von, 1896. Über das System und die geographische Verbreitung der Landplanarien. Verhandl. Deutsch. Zool. Gesellschaft, 6: 75-93.
- Hallez, P., 1892. Catalogue des Turbellariés (Rhabdocoelides, Tricladés et Dendrocoelides) du Nord de la France & de la Côte Boulonnaise. Rev. Biol. Nord France, Lille, IV, (8): 304-326.
- Kawakatsu, M., Ogren, R. E. & Froehlich, E. M., 1998. The taxonomic revision of several homonyms in the genus *Bipalium*, family Bipaliidae (Turbellaria, Seriata, Tricladida, Terricola). Bull. Fuji Women's College, (36), II: 83-93.
- Kawakatsu, M., Sluys, R. & Ogren, R. E., In preparation. Five new species of land planarian from Japan (Platyhelminthes, Tricladida, Bipaliidae), with a morphological review of all Japanese bipaliids and a biogeographic overview of Far Eastern species.
- Kawakatsu, M., Yamamoto, K., Ogren, R. E. & Takai, M., 2000. Figures of the poster presentation given at the Ninth International Symposium on the Biology of Turbellaria, Barcelona, Spain, June 27-July 1, 2000. Occ. Publ., Biol. Lab. Fuji Women's College, Sapporo (Hokkaido), Japan, (34): 1-4.
- Kubota, S., Yamamoto, K. & Kawakatsu, M., 2001. First distributional record of three bipaliid species (Platyhelminthes, Turbellaria, Tricladida) in Wakayama Prefecture, Honshu, Japan. Nankiseibutusu (Nanki Biol. Soc.), 43 (1): 6-10. (In Japanese with English summary.)
- Lang, A., 1884. Die Polycladen (Seeplanarien) des Golfes von Neapel und der angrenzenden Meeresabschnitte. Fauna und Flora des Golfes von Neapel, Monographie XI. Pp. i-ix + 1-688; pls. 1-39. Wilhelm Engelmann, Leipzig.
- Stimpson, W., 1857. Prodromus descriptiones animalium evertibratorum quae in Expeditione ad Oceanum, Pacificum Septentrionalem a Republica Federata missa, Johnne Rodgers Duce, observavit et descripsit. Proc. Acad. Nat. Sci. Philad., 9: 19-31.
- Yamamoto, K., 1996. Three land planarian species collected from 4 localities in Nagasaki Prefecture (*Bipalium nobile*, *Bipalium fuscatum*? and *Bipalium kewense*?), with special reference to their chromosomes. Junshin Chugakkô = Junshin Joshi Kôtôgakkô Kiyô, (23): 35-40 (+pls. 1 and 2). (In Japanese.)

- Yamamoto, K., 1999. Distribution records of two land planarian species (*Bipalium nobile* and *Bipalium kewense*) in Nagayo-chô, Nagasaki Prefecture, Kyûshû, Japan. Junshin Chûgakkô = Junshin Joshi Kôtôgakkô Kiyô, (25): 69-76 (+pls. 1-4). (In Japanese.)
- Yamamoto, K., 2000. *Bipalium* sp. Kumamoto-1. Junshin Chûgakkô = Junshin Joshi Kôtôgakkô Kiyô, (27): 39-41. (In Japanese.)
- Yamamoto, K., 2002. Distribution of *Bipalium* sp. Nagasaki-5 and its karyotype. Bull. Junshin Junior Highschool & Junshin Women's Highschool, (29): 37-43. (In Japanese, with English summary.)
- Yamamoto, K., 2003a. Bipaliid land planarians collected in Nagasaki Prefecture, Kyûshû, Japan. Rika-Kaishi (Nagasaki-ken Kôtô-Gakkô Kyôiku-Kenkyû-kai Rika-Bukai), (42): 63-70. (In Japanese.)
- Yamamoto, K., 2003b. Bipaliid land planarians collected in Nagasaki and Kumamoto Prefectures, Kyûshû, Japan. Trans. Nagasaki Biol. Soc., (56): 00-00. (In Japanese.) Note. This is an abstract of a lecture given at the 32nd Ann. Meet. of the Nagasaki Biol. Soc. held in Nagasaki, on January 13, 2003.
- Yamamoto, K., Takai, M., Ogren, R. E. & Kawakatsu, M., 2000. Chromosomes of bipaliid land planarians from the vicinities of Nagasaki in Kyûshû, Southern Japan. IXth ISBT Programme & Abstracts (Barcelona, June 26-July 1, 2000): 57.
- Yamamoto, K., Takai, M., Ogren, R. E. & Kawakatsu, M., 2001. Chromosomes of bipaliid land planarians from the vicinities of Nagasaki in Kyûshû, Southern Japan (Platyhelminthes, Tricladida, Terricola). Berg. Jour. Zool., 131 (Suppl. 1): 221-222.

Note. The following 2 web articles are also related to the present web article.

- Sasaki, G.-Y., Murayama, H. & Kawakatsu, M., 2001. A reprint edition of four English abstracts and a single text of land planarian papers published in the SHIBUKITSUBO (1998-2001). Web article only.
<http://planarian.net/lp/shibukitsubo/lp.html>
<http://planarian.net/lp/shibukitsubo/lp.pdf>
- Kawakatsu, M. & Sasaki, G.-Y., 2002. An electronic reproduction of the late Dr. T. Kaburaki's three color plates attached to his 1922 papers on Japanese marine, freshwater and land planarians (Plathelminthes, "Turbellaria", Tricladida), with a taxonomic commentary. Web article only.
<http://planarian.net/kswp/36/Kaburaki.pdf>

Fig. 5. (on pp. 6-9). Color photographs of living specimens of 9 bipaliid species from Nagasaki Prefecture and the vicinity.

- ① - ④ : *Bipalium nobile* Kawakatsu et Makino, 1982 (① and ②, dorsal; ③, dorsal and ventral; ④, dorsal).
 Loc. ① and ② : Iôjima-chô, Nishisonogi-gun; ③ and ④ : Nameshi, Nagasaki City.
- ⑤ - ⑦ : *Bipalium kewense* Moseley, 1878 (⑤ and ⑦, dorsal; ⑥, ventral). Loc. ⑤ and ⑥ : Bunkyo-chô, Nagasaki City; ⑦, Isahaya City.
- ⑧ - ⑭ : *Diversibipalium multilineatum* (Makino et Shirasawa, 1983) (⑧ - ⑩ and ⑬, dorsal; ⑪ - ⑫ and ⑭, ventral). Loc. ⑨ - ⑫ : Kinkai-chô, Nishisonogi-gun; ⑬ and ⑭ : Nagayo-chô, Nishisonogi-gun.
- ⑮ - ⑰ : *Diversibipalium* sp. Nagasaki-1 (⑮ and ⑯, dorsal; ⑰, ventral). Loc. ⑮ - ⑰ : Isahaya City.
- ⑱ - ⑳ : *Diversibipalium* sp. Nagasaki-2 (⑱ and ⑲, dorsal; ⑳ and ㉑, ventral). Loc. ⑱ - ㉑ : Shimabara City.
- ㉒ - ㉔ : *Diversibipalium* sp. Nagasaki-3 (㉒ - ㉔, dorsal; ㉕, ventral). Loc. ㉒ - ㉕ : Shimabara City; ㉖ and ㉗ : Nagasaki City.
- ㉘ - ㉚ : *Diversibipalium* sp. Nagasaki-4 (㉘ and ㉚, dorsal; ㉙, ventral). Loc. ㉘ - ㉚ : Nagasaki City.
- ㉛ - ㉝ : *Diversibipalium* sp. Nagasaki-5 (㉛ - ㉝ and ㉞, dorsal; ㉞ - ㉟, ventral). Loc. ㉛ - ㉝ : Kuro'nita, Takaki-chô, Kitataki-gun; ㉞ : Iôjima-chô, Nishisonogi-gun; ㉞ and ㉟ : Isahaya City; ㊱ and ㊲ : Benten-chô, Shimabara City.
- ㊳ and ㊴ : *Diversibipalium* sp. Kumamoto-1 (㊳, dorsal; ㊴, ventral). Loc. ㊳ and ㊴ : Kashima-chô, Kami-mashiki-gun, Kumamoto Prefecture.

Note. Many photographs of this web article were partly published in previous articles by Kawakatsu, Yamamoto, Ogren & Takai (2000, black-and-white photographs printed from negative color films) and Yamamoto (1999, 2000, 2002, 2003a, b). Color photographs were taken by Yamamoto. Printed photographs were edited by Kawakatsu and Sasaki.

