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A Preliminary Report on Freshwater Planarians (Turbellaria: Tricladida: Paludicola) Collected from the Kamchatka Peninsula and the North Kuril Islands in 1996–1997

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Abstract Tentative identification of freshwater planarians collected from the Kamchatka Peninsula and Shumshu Island in the North Kuril Islands is made in the present paper, and photographs of the recorded species are given. Two species in two genera are identified: *Polycelis* (*Polycelis*) cf. *elongata* (Zabusova, 1929) (from three localities in Kamchatka and a single locality in Shumshu Island) and *Seidlia* cf. *schmidti* (Zabusov, 1916) (from seven localities in Kamchatka).

Key words: freshwater planarians, Turbellaria, Tricladida, Paludicola, Kamchatka Peninsula, North Kuril Islands.

The Biological Expedition to the Kamchatka Peninsula and the North Kuril Islands of the Natural History Museum and Institute, Chiba, was carried out in 1996 and 1997. It was a part of a project entitled "The Origin and Biogeography of the Northeast Asian Biota" in cooperation with the Institute of Biology and Pedology and the Institute of Marine Biology belonging to the Far Eastern Branch of the Russian Academy of Sciences, Vladivostok. During the expedition, the second author (Kuranishi) collected some freshwater planarians and submitted to the first author (Kawakatsu) for identification.

The Kamchatkan freshwater planarian fauna was studied by Zabusov (1916) and Zabusova (1929, 1936). A total of six planariid and four dendrocoelid species were described in these old-fashioned taxonomic papers. In the North Kuril Islands, Miyadi (1937) reported the occurrence of two freshwater planarians (*Polycelis schmidti*? and *Bdellocephala* sp.) from "Simushu-tô Island". In a recent taxonomic study by Dyganova and Porfirjeva (1990), the Kamchatkan freshwater planarians were reclassified into two *Polycelis* (Planariidae) and a single *Bdellocephala* (Dendrocoelidae) species. No dendrocoelid species were found in the present collection.

In the present report, a tentative result of identification of the samples examined is given, together with photographs showing their external appearance. More detailed identification will be made in cooperation with Dr. Ronald Sluys, Zoological Museum, University of Amsterdam.

Materials and Methods

Specimens were collected from seven stations in the Kamchatka Peninsula during the periods 3rd to 17th July 1996, 7th to 10th July 1997 and 27th July to 5th August 1997, and from a single station in Shumshu Island of the North Kuril Islands on 22th July 1997. The sampling localities are shown in Fig. 1 and detailed data is listed below with KSL numbers (Kawakatsu's Specimen Lot Numbers registered in his fixing notebook according to his permanent recording system). When samples of the two species were found in a single tube, they were tentatively separated as "A" and "B" in the same KSL Number.

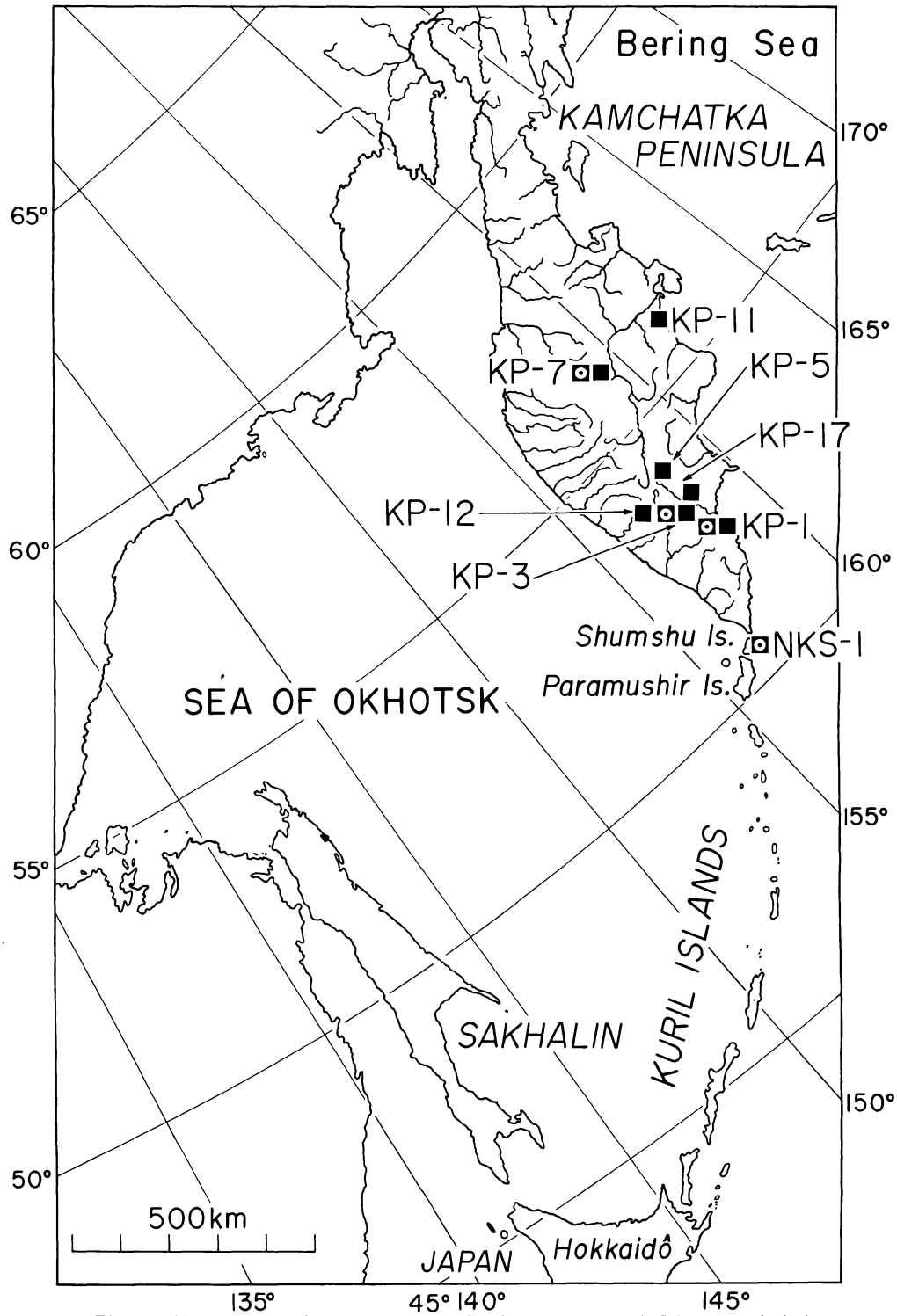

Fig. 1. Sketch map of the Kamchatka Peninsula, the Kuril Islands and their vicinities, showing the sampling locations of freshwater planarians.
⊡: *Polycelis* (*Polycelis*) cf. *elongata* (Zabusova, 1929); ■: *Seidlia* cf. *schmidti* (Zabusov, 1916).

Kamchatka Peninsula

KP-1: small stream at 5 km west of Mt. Vilyuchinsky (52°42′N, 158°10′E), alt. ca. 150 m (KSL No. 2338 A and B).

KP-3: Poperechnaya River (upper part), 25 km from Malki Village (53°05′N, 157°52′E), alt. ca. 450 m (KSL No. 2340 A and B).

KP-5: Pravaya River (upper part), 23 km south of Pushchino (54°01′N, 157°51′E), alt. ca. 540 m (KSL No. 2342).

KP-7: basin of Bystraya River, 10 km southeast of Anavgay (56°02′N, 159°04′E), alt. ca. 310 m (KSL No. 2343 A and B).

KP-11: Athal Stream near Azhabach'ye Lake (56°11′N, 161°41′E), alt. ca. 20 m (KSL No. 2344).

KP-12: small stream near the Hot spring, Malka (52°25′N, 157°30′E), alt. ca. 20 m (KSL No. 2339).

KP-17: Poperechnaya River, Bystraya River basin, 17 km from main road (53°22-23′N, 157°41′E), alt. ca. 400 m (KSL No. 2341).

North Kuril Islands: Shumshu Island

NKS-1: Lake Bol'shoye (50°46′N, 156°15′E), alt. 15 m (KSL No. 2345).

The specimens were collected by the second author using a forceps from a cobble in springs or mountain streams. Animals were killed in 4% formaldehyde and subsequently transferred to 70% ethanol. The material is deposited in the Natural History Museum and Institute, Chiba (CBM, with code of ZX) and the Zoological Museum, University of Amsterdam (ZMA).

List of Species

The samples may consist of two species of the genera *Polycelis* Ehrenberg, 1831, and *Seidlia* Zabusova, 1936. Collection data is formatted as follows: scientific name, abbreviation for eight collection sites, date, number of specimens, range of body size in parentheses, registration number of the museum (CBM-ZX), Kawakatsu's Specimen Lot Numbers (KSL) and known distribution.

Order TRICLADIDA
Suborder PALUDICOLA or PROBURSALIA
Family Planariidae Stimpson, 1857
Genus *Polycelis* Ehrenberg, 1831

Polycelis (*Polycelis*) cf. *elongata* (Zabusova, 1929)

(Fig. 2A-I)

Material examined. **KP-1:** 3. VII. 1996, 1 asexual specimen (6 mm long and 0.8 mm wide), CBM-ZX 1, KSL No. 2338 A; **KP-3:** 6. VII. 1996, 2 to 3 sexual specimens (8–10 mm long and 1–2.5 mm wide) and 20 or more asexual (8–10 mm long and 1–1.5 mm wide) specimens, CBM-ZX 2, KSL No. 2340 A; **KP-7:** 10. VII. 1996, 3 or more sexual (10 mm long and 2 mm wide) and approximately 10 asexual (5–8 mm long and 0.8–1 mm wide) specimens, CBM-ZX 3, KSL No. 2343 A; **NKS-1:** 22. VII. 1997, 2 sexual (5–10 mm long and 1.8–2 mm wide) and over 100 asexual (5–8 mm long and 0.5–1 mm wide) specimens, CBM-ZX 4, KSL No. 2345.

Distribution. *Polycelis* (*P.*) *elongata* is distributed in Kamchatka, Bering Island and Sakhalin (Zabusova-Zhdanova, 1956; Porfirjeva and Shcheglova, 1979; Porfirjeva, Umylina and Shcheglova, 1979; Dyganova and Porfirjeva, 1990; see also Kawakatsu and Timoshkin, 1998: 309, fig. 1; Kawakatsu and Mitchell, 1998: 103–104).

Remarks. Zabusova (1929) described three new species of the genus *Sorocelis* from Kamchatka: *S. elongata, S. eudendrocoeloides* and *S. relicta.* Zabusova (1936) added two new species also from Kamchatka: *Polycelis polyopsis* and *Seidlia eurantron.* However, Dyganova and Porfirjeva (1990) reclassified these five Kamchatkan planariid species as a single species, *Polycelis elongata* (Zabusova, 1929). We employed the subgeneric classification system as *Polycelis* (*Polycelis*) (cf. Kawakatsu and Timoshkin, 1998; see also fig. 1 on p. 309).

Polycelis (*P.*) *elongata* has light brown coloration; the head has a broad, subtriangular form with a pair of rather broad and rounded auricles. There are many small eyes arranged in two bands, one on either side of the midline of the head region, situated at a considerable distance from the head margin both an-

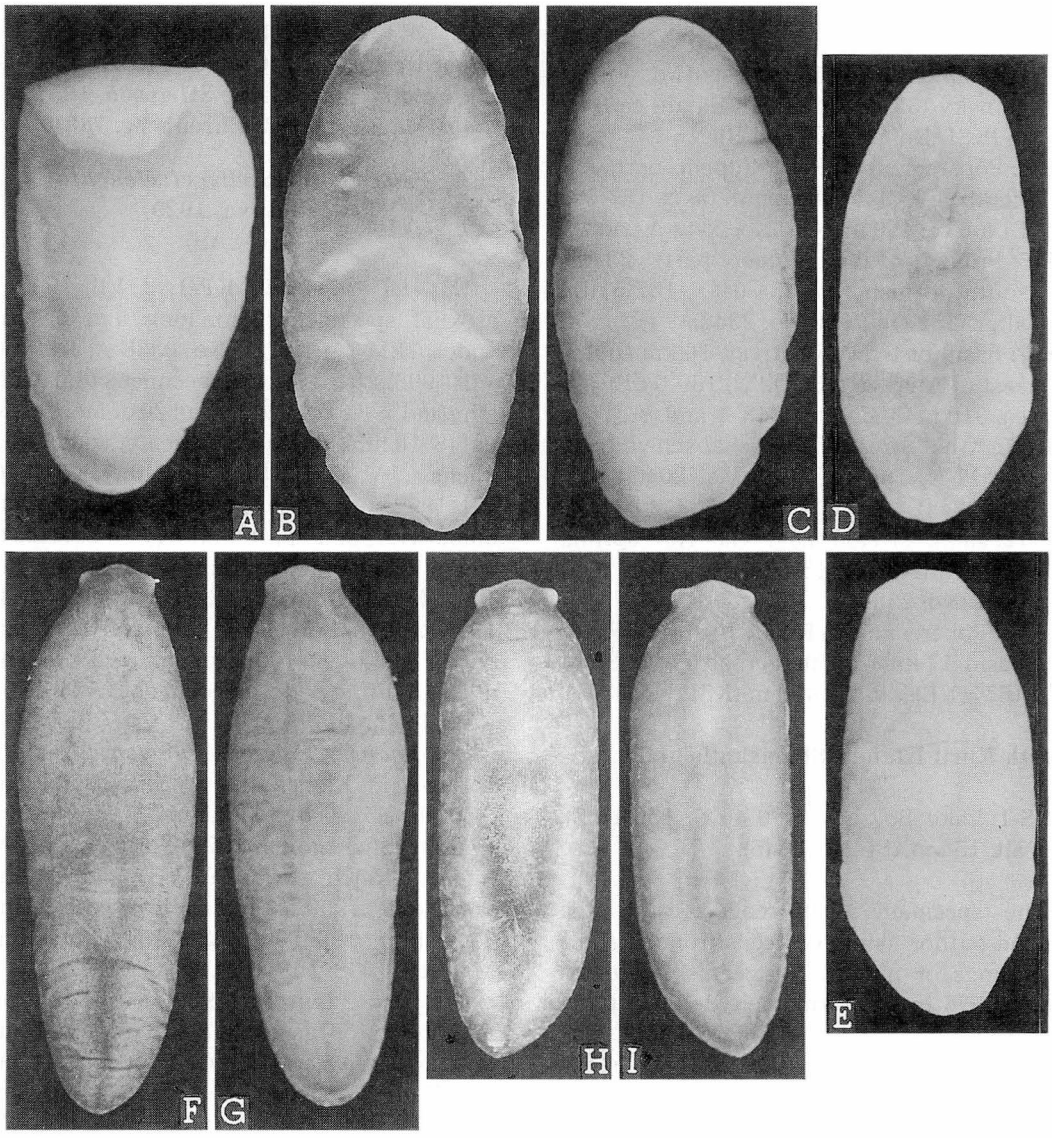

Fig. 2. A-I, *Polycelis* (*Polycelis*) cf. *elongata* (Zabusova, 1929). A-C: CBM-ZX 2 (KSL No. 2340 A). A, ventral; B, dorsal, C, ventral. D and E: CBM-ZX 3 (KSL No. 2343 A). D, dorsal, E, ventral. F-I: CBM-ZX 4 (KSL No. 2345). F, dorsal, G, ventral, H, dorsal, I, ventral.

teriorly and laterally, and fairly converging anteriorly. These external characters are quite different from those of another Kamchatkan species, *Seidlia schmidti*.

Genus *Seidlia* Zabusova, 1936

Seidlia cf. *schmidti* (Zabusov, 1916)

(Fig. 3J-T)

Material examined. **KP-1:** 3. VII. 1996, 1 asexual specimen (8 mm long and 1.2 mm wide), CBM-ZX 5, KSL No. 2338 B; **KP-3:** 6. VII. 1996, 2 to 3 sexual specimens (8–10 mm long and 1.5–3 mm wide) and 20 or more asexual (8–10 mm long and 1–1.5 mm wide) specimens, CBM-ZX 6, KSL No. 2340 B; **KP-5:** 8. VII. 1996, 12 to 15 sexual (10 mm long and 3–6 mm wide) and over 40 asexual (5–10 mm long and 1 mm wide) specimens, CBM-ZX 7, KSL No. 2342; **KP-7:** 10. VII. 1996, 3 or more sexual (10 mm long and 3 mm wide) and approximately 10 asexual (6–8 mm long and 1

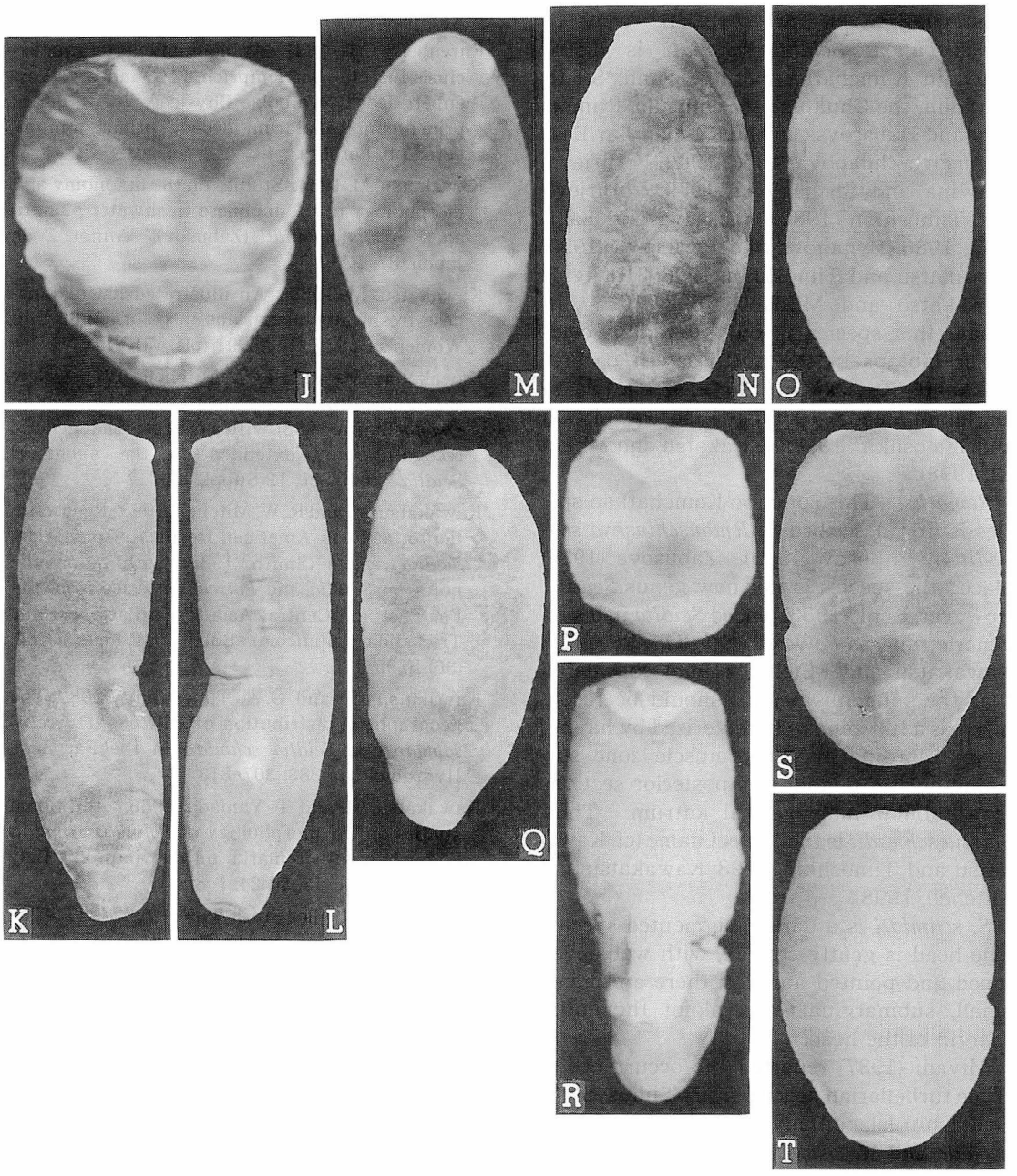

Fig. 3. J-T, *Seidlia* cf. *schmidti* (Zabusov, 1916). J-L: CBM-ZX 11 (KSL No. 2341). J, ventral; K, dorsal, L, ventral. M-P: CBM-ZX 7 (KSL No. 2342). M, ventral; N, dorsal, O, ventral; P (ventral). Q and R: CBM-ZX 8 (KSL No. 2343 B). Q, dorsal; R, ventral. S and T: CBM-ZX 9 (KSL No. 2344). S, dorsal, T, ventral.

mm wide) specimens, CBM-ZX 8, KSL No. 2343 B; **KP-11:** 15. VII. 1996, 9 sexual (10 mm long and 2.5–6 mm wide) and over 30 asexual (6–9 mm long and 0.8–2 mm wide) specimens, CBM-ZX 9, KSL No. 2344; **KP-12:** 17. VII. 1996, 2 asexual specimens (5–8 mm long and 1.2–2 mm wide), CBM-ZX 10, KSL No. 2339; **KP-17:** 29. VII. 1997, 2 sexual (10 mm long and 1.5–4 mm wide) and over 40 asexual (5–10 mm long and 0.4–1.5 mm wide) speci-

mens, CBM-ZX 11, KSL No. 2341.

Distribution. *Seidlia schmidti* is distributed in Kamchatka, Bering Island, South Sakhalin, the Chukotskiy Peninsula, Primorskiy and Habarovsk in the Russian Far East (Zabusova-Zhdanova, 1956, 1960; Porfirjeva, Umylina and Shcheglova, 1979; Porfirjeva and Timoshkin, 1980; Porfirjeva and Sabitova, 1986; Dyganova and Porfirjeva, 1990; Kawakatsu and Timoshkin, 1998: 310, fig. 2; Kawakatsu and Mitchell, 1998: 103). In Japan, this species is only found in cold-water biotops in the northeastern part of Hokkaidô (Kawakatsu, 1964, 1969; Kawakatsu and Yamada, 1966; see also Kawakatsu and Timoshkin, 1998; Kawakatsu and Mitchell, 1998).

Remarks. This common Kamchatkan species is first described as *Rjabuschinskya schmidti* by Zabusov (1916). Zabusova (1936) placed the species in her new genus *Seidlia*. However, Kenk (1953) placed *Seidlia* in a subgeneric rank as *Polycelis* (*Seidlia*). Recently, Kawakatsu and Mitchell (1995) considered that the subgenus *Seidlia* should be recognized as a full genus, characterized by having an extraordinarily thick muscle zone surrounding the middle and posterior sections of a tubular male genital antrum. Thus, *Seidlia schmidti* is the correct name (cf. Kawakatsu and Timoshkin, 1998; Kawakatsu and Mitchell, 1998).

S. schmidti is a darkly pigmented species. The head is gently convex, with well-develloped and pointed auricles; there are many, small, submarginal eyes along the entire margin of the head.

Miyadi (1937) reported the occurrence of three turbellarian species from "Simusyu" (= Shumshu) Island: *Polycelis schmidti*?, *Bdellocephala* and *Mesostoma*?. In the present samples examined, *Polycelis* (*P.*) cf. *elongata* was only found. However, it is highly probable that Shumshu Island may include in the distributional range of *S. schmidti*. The freshwater planarian fauna of the Kuril Islands is not yet studied.

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1996–1997年に採集されたカムチャツカ半島と北千島の淡水棲三岐腸類（予報）

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1996年と1997年に，カムチャツカ半島と北千島で千葉県立中央博物館とロシア科学アカデミーの生物学共同調査が行われ，渓流や湧水環境から淡水棲三岐腸類が採集された．外部形態の観察に基づく検査で，*Polycelis* (*Polycelis*) *elongata* (Zabusova, 1929) と考えられる種がカムチャツカ半島（3地点）と北千島（シュムシュ島1地点）から，*Seidlia schmidti* (Zabusov, 1916) キタカズメウズムシと考えられる種がカムチャツカ半島（7地点）から検出された．それぞれの種の最終同定には生殖個体の切片標本の検査が必要で，アムステルダム大学動物学博物館のR. Sluys博士との共同研究の結果を待ちたい．戦前に行われたシュムシュ島の生物相の調査では，3種の渦虫類が見出されているが（*Polycelis* sp. と *Bdellocephala* sp. と *Mesostoma* sp.; Miyadi, 1937），今回の調査では *Polycelis* 属の1種にとどまった．今後の精査が望まれる．