New data on the family Himantariidae Bollman, 1893 (Chilopoda: Geophilomorpha) from Kazakhstan

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Abstract

Polyporogaster porosa (Sseliwanoff, 1881) is new to the fauna of Kazakhstan; Bothriogaster signata (Kessler, 1874) is new to the fauna of the South Kazakhstan Region, while Stigmatogaster sp. is new to the East Kazakhstan Region. The distribution-map of all members of the family Himantariidae occurring in Kazakhstan and an identification key are provided.

Key words: Chilopoda, Himantariidae, fauna, new records, Polyporogaster, Bothriogaster, Stigmatogaster, Central Asia.

Introduction

Two species of the family Himantariidae Bollman, 1893 have been recorded from Kazakhstan, viz. Bothriogaster signata (Kessler, 1874) and Polyporogaster schnitnikowi Lignau, 1929 (both Almaty Region), as well as specimens of the genus Stigmatogaster Latzel, 1880 (Tian-Shan Mts) (Lignau 1929a, b; Titova 1965, 1978; Dobroruka 1979); the considerable part of this large country has never been investigated. Based on new material from W, S and E Kazakhstan I provide new data on the fauna of these regions.

Materials and Methods

Present paper is based on the material collected in 2016–2018 (Fig. 1). Centipedes were taken by hand and preserved in 70% ethanol. The pictures have been taken using an Olympus DP74 digital camera attached to an Olympus SZX16 stereo microscope or Olympus XC50 camera attached to an Olympus BX51 microscope. The images were prepared with the help of Helicon Focus 6.7.1 and Paint.net 4.1.4, software. The material is shared between the collections of the Altai State University, Barnaul (ASU), the Zoological Museum of the Moscow State University, Moscow (ZMMU) and the Hungarian Natural History Museum, Budapest, Hungary (HNHM); the additional materials from the ZMMU, the Zoological Institute of the Russian Academy of Sciences, Saint Petersburg (ZIN) and the Perm State University, Perm (PSU) were also examined. Abbreviations of collectors: YD – Yu.V. Dyachkov, AF – A.A. Fomichev, MG – M.S. Ghilarov, AI – A. Ivanov, DL – D.V. Logunov, YK – Yu. Kabanov, TP – T.S. Perel, DP – D.D. Piriulin, KT – K.O
Tuneva, VY – V.V. Yanushev. Locality data are given below as on the original labels. The standardized terminology proposed by Bonato et al. (2010) was followed.

Figure 1. Distribution of the Himantariidae members in Kazakhstan: square – Bothriogaster signata; star – Polyporogaster porosa; triangle – Polyporogaster schnitnikowi; oval – Stigmatogaster sp. White marks indicate new data, black marks concern literature data.

List of the species

Class Chilopoda Latreille, 1817

Order Geophilomorpha Pocock, 1895

Family Himantariidae Bollman, 1893

Genus Bothriogaster Sseliwanoff, 1879

*Bothriogaster signata* (Kessler, 1874)

Material. **South Kazakhstan Region**, Karatau Mt Range: 14 ♂, 5 ♀ (ASU No 77), 10 km SW Abay Village, Karatau State Nature Reserve, grasses and tulip steppe, under stones, N43°47'04.2", E68°46'42.0", 1020 m a.s.l., 06–07.V.2017, coll. YD; 2 ♂, 4 ♀ (HNHM chilo-7677), Syrdarya-Turkestan Natural Park, near Terekty Village, bottom-land of Boralday River, under stones, N42°51'48.2", E69°51'55.0", 529 m a.s.l., 14–15.V.2017, coll. YD; 1 ♂, 2 ♀ (PSU), 7 km NE Boralday, 11–13.V.2010, KT; 2 ♂, 1 ♀, 2 juv. (PSU), Talap Pass, *Betula*, 05.V.2010, coll. AI; 1 ♀ (PSU), Besaryk River bank, N43°49'34.5", E67°51'26.7", 446 m a.s.l., 05.V.2010, coll. AI; 1 ♀ (HNHM chilo-7675), 64 km SW Arys Town, Betlau Mts, steppe, under stones, N41°50'09.9", E68°32'15.4", 392 m a.s.l., 08–09.VI.2017, coll. YD; 1 ♂, 1 ♀, 1 juv. (HNHM chilo-7678), steppe, grasses, under stones, N41°50'28.5", E68°32'30.3", 392 m a.s.l., 12–13.V.2017, coll. YD; 2 ♂, 5 ♀, 1 juv. (ZMMU Re 7725), near Arys Town, Artemisia steppe, in fissures, 24.IV–05.V.1988, coll. DL; 1 ♂, 3 ♀, 1 juv. (HNHM chilo-7676), 50 km NW Achisay Village, Kyzylkol Lake shore, in loam stones, N43°46'34.0", E69°30'36.4", 328 m a.s.l., 08–09.V.2017, coll. YD; 1 ♀(ZMMU...
**Polyporogaster porosa** (Sseliwanoff, 1881)

Figs 1, 8–13.

**Material. South Kazakhstan Region:** 1 ♂, 2 ♀ (ZMMU Rc 7752), near Arys Town, 24.IV–05.V.1988; 1 ♂ (ZMMU Rc 7787), Kyzylkum desert, near Tabakbulak Village, under stones, N42°18′03.7″, E67°34′45.1″, 257 m a.s.l., 30.IV.2017, coll. YD; 1 ♂, 3 ♀ (ZMMU Rc 7788), Karatau Mt Range, 10 km SW Abay Village, steppe, grasses, *Tulipa*, under stones, N43°47′04.2″, E68°46′42.0″, 1029 m a.s.l., 06–07.V.2017, coll. YD; **Almaty Region:** 1 ♂ (ZMMU Rc 7789), Dzungarian Alatau Mts, between Verkhnaya Taldy and Nizhny Taldy Rivers, stony mountain steppe, under stones, N44°25′, E79°51′, 1300 m a.s.l., 26.VI.2016, coll. AF; 1 ♂ (ZMMU Rc 7790), Ili River Valley, 40 km km NNW Kasphtagay City, loess slope on river bank, at night, N44°15′, E76°54′, 430 m a.s.l., 16.IV.2016, coll. AF; **Mangystau Region:** 1 adult. (ZMMU Rc 7791), eastern coast of Caspian Sea, between Sagandyk and Karmandy Capes, 13.V.1966, coll. YK; 1 ♀ (ASU No 19), Western Chink of Ustyurt, near Bashzhira Mt, slope of chink, under stones, N43°22′42″, E54°07′25″, 150 m a.s.l., 15.IV.2018, coll. AF; **Kyzylorda Region,** Aral District, Barsa-Kelmes (former island): 1 fragm. (ZIN), flat bottom land, 06.V.1983, coll. DP; 1 ♀ (ZIN), 1983, coll. DP.

**Description.** Body length 70–145 mm; males with 113–115 leg-bearing segments, females with 111, 119–125, 129–131 ones. Labrum (Fig. 3) has numerous small denticles. Maxillary complex: telopodites of the first maxillae longer than the coxal projections; lappets of both coxosternite and telopodites absent. The second maxillae: coxosternite entire, its anterior margin slightly convex in the middle (arrow in Fig. 4). Forcipular coxosternite without denticles, chitin-lines reaching the condyles. Tarsungula, when closed, not reaching the anterior margin of the head (Fig. 2). Metasternites have pore-fields, large in anterior part of body and smaller in posterior part; two penultimate metasternites also have large pore-fields. Well-developed sternobothria accompanied by lateral gutters (Fig. 5) located mostly on 37–47 metasternites in male and on 40–53 metasternites in female. Ultimate metasternite wide, trapeziform with central longitudinal depression (Fig. 6). Coxal pores opening on ventral and dorsal sides in 2 groups (Figs 6, 7). Ultimate legs without pretarsus, swollen in male.

**Distribution.** Balkan Peninsula, Cyprus, N Africa, Russia (Volgograd Region), Western Asia, Central Asia (Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan) (Kessler 1874; Sseliwanoff 1881; Attems 1904; Lignau 1929a; Verhoeff 1930; Zapparoli 1991; Stoev 2000; Volkova 2016). Kazakhstan: Almaty («Almaty») (Dobroruka 1979) and South Kazakhstan regions (new).

**Remarks.** The specimens studied agree well with the descriptions by Kessler (1874), Attems (1929), Lignau (1929a), Chalande and Ribaut (1909). This species is new to the fauna of the South Kazakhstan Region.

**Genus Polyporogaster Verhoeff, 1899**
Figures 2–21. *Bothriogaster signata* (Kessler, 1874): 2 – head and first segment, ventral view; 3 – cephalic plate, ventral view; 4 – maxillary complex, ventral view; 5 – some anterior sternites, ventral view; 6 – terminal part of body (male), ventral view; 7 – same, dorsal view; *Polyporogaster porosa* (Sseliwanoff, 1881): 8 – head and two anterior segments, ventral view; 9 – labrum, ventral view; 10 – maxillary complex, ventral view; 11 – some anterior sternites, ventral view; 12 – terminal part of body (male), ventral view; 13 – same, dorsal view; *Stigmatogaster* sp.: 14 – head and two anterior segments, ventral view; 15 – labrum, ventral view; 16 – maxillary complex, ventral view; 20 – same, schematic draw, ventral view; 17 – some anterior sternites, ventral view; 18 – terminal part of body (female), ventral view; 19 – same, dorsal view; *Polyporogaster schnitnikowi* Lignau, 1929 (after (Lignau 1929b)): 21 – labrum, ventral view. Scale: 1–14 – 0.2 mm, 15–20 – 0.1 mm; 21 – without scale.

**Polyporogaster schnitnikowi** Lignau, 1929

Figs 1, 21.

**Diagnosis.** Body length 60 mm, 81 leg-bearing segments, median arc shallow (Fig. 21), with 27 denticles. Coxopleural pores (5 on each side) opening in fossae on dorsal side, covered by lateral margin of tergite.

**Remarks.** This species is known from the original description only (Karatal River, vicinity of Balkhash Lake, Almaty Region) which is very succinct and provided with schematic figures of head (ventral view) and labrum. According to the original description this species is very close to the *P. porosa*; differs by shape of labral median arc only.
Genus *Stigmatogaster* Latzel, 1880

*Stigmatogaster* sp.

Figs 1, 14–20.

**Material. South Kazakhstan Region:** 1 ♂, 6 ♀ (ZMMU Rc 7754), Karatau Mt Range, Aktas, in soil, 0–10 cm, 14.V.1974; 1 ♂, 1 ♀ (ZMMU Rc 7756), *Crataegus, Malus*, wet forest, in soil, 0–10 cm, 12.V.1974; 1 ♂ (ZMMU Rc 7793), vicinity of the Aksu-Zhabagly Nature Reserve, Taldy-Bulak Village, sample No. 1, 1973; 1 ♂, 2 ♀ (ZMMU Rc 7762), M. Kayanda Village, meadow, *Prangos*, 18.VI.1972; 1 ♂ (ZMMU Rc 7755), Almaty Region, Trans-Ili Alatau Mt Range, in litter, 1972; 1 ♂, 7 ♀♀, 1 fragm. (ZMMU Rc 7751), East Kazakhstan Region, Urdzhark District, near Urdzhark Village, Tarbagatai Mt Range, bushes, *Malus, Berberis, Rosa*, 15.V.1981, MG, TP, VY.

**Description.** Labral median arc well-developed with 10 denticles (Fig. 15). Maxillary complex (Figs 16, 20): first maxillae with the telopodital lappets (arrow in Fig. 20); anterior margin of the second maxillae coxosternite concave backwards (arrow in Fig. 20). Forcipular tarsungula, when closed, not drawn beyond anterior margin of the head (Fig. 14). Each metasternite from 1 to penultimate with a single transverse pore field (Fig. 17). Ultimate sternite wider than long, posterior margin concave backwards (Fig. 18). Ventral coxopleural pores opening on the edge of ultimate sternite, dorsal coxal pores covered by lateral margin of tergite (Fig. 19).

**Distribution.** Almaty (Trans-Ili Alatau Mt Range) and South Kazakhstan (vicinity of the Aksu-Zhabagly Nature Reserve and Karatau Mt Range) regions (Titova 1965); East Kazakhstan Region (Tarbagatai Mt Range) (new).

**Remarks.** Titova (1965, 1978) reported on the "group of the similar species of the genus *Stigmatogaster* distributed from the southern borders of Tajikistan to the southern borders of Kazakhstan". Material from the ZMMU is in poor condition, but its morphological characters correspond well to the *Stigmatogaster* Latzel, 1880 diagnosis (Bonato 2011; Bonato et al. 2014).

**Key to the Himantariidae members known to occur in Kazakhstan**

1. Some anterior sternites with sternobothria…………*Bothriogaster signata* (Kessler, 1874)
   – Sternites without sternobothria………………………………………………………………………2

2. Coxopleural pores opening inside coxopleural fossae on dorsal side……………………..3
   – Coxopleural pores opening independently……………………………………*Stigmatogaster* sp.

3. Labral median arc deep…………………………*Polyporogaster porosa* (Sseliwanoff, 1881)
   – Labral median arc shallow…………………………*Polyporogaster schnitnikowi* Lignau, 1929

**Conclusions**

The family Himantariidae in Kazakhstan is represented by at last 4 species from 3 genera. The species *Polyporogaster porosa* (Mangystau, Kyzylorda, South Kazakhstan and Almaty regions) and *Bothriogaster signata* (South Kazakhstan and Almaty regions) are the most spread species on this territory, dwell mostly in the arid biotopes. *Polyporogaster schnitnikowi* was recorded from the Almaty Region only. Specimens of the genus *Stigmatogaster* are related with mountain regions (Ugam, Karatau and Trans-Ili Alatau and Tarbagatai Mt Ranges).

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