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Stoneflies (Insecta: Plecoptera) Collected from the Kamchatka Peninsula and North Kuril Islands in 1996–1997

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Abstract Fourteen species, belonging to five families of stoneflies (Plecoptera) are recorded from the Kamchatka Peninsula and North Kuril Islands based on the collection made during the Biological Expedition to the Kamchatka Peninsula and North Kuril Islands in 1996 and 1997: five species of Perlodidae, three spp. of Chloroperlidae, one sp. of Taeniopterygidae, two spp. of Nemouridae and three spp. of Capniidae. Two species, *Mesocapnia gordkovi* Zhiltzova and Baumann and *Taenionema japonicum* (Okamoto), are newly recorded from North Kuril Islands.

Key words: stoneflies, Plecoptera, Kamchatka Peninsula, Kuril Islands.

The Biological Expedition to the Kamchatka Peninsula and 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 co-operation 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. In the present paper, a list of the stoneflies is presented based on material collected during the expedition. Some remarks are given in comparison with the previous works (Levanidova, 1970; Levanidova and Zhiltzova, 1979; Teslenko and others, 1997; Zhiltzova, 1997; Zhiltzova and Zapekina-Dulkeit, 1986; Zhiltzova and Levanidova, 1984).

Material and Methods

The specimens were collected from 17 sites in the Kamchatka Peninsula, during the periods 3rd to 17th July 1996, 7th to 10th July 1997 and 27th July to 5th August 1997. In the North Kuril Islands, specimens were collected from six sites on Paramushir Island and one site on Shumshu Island, during the

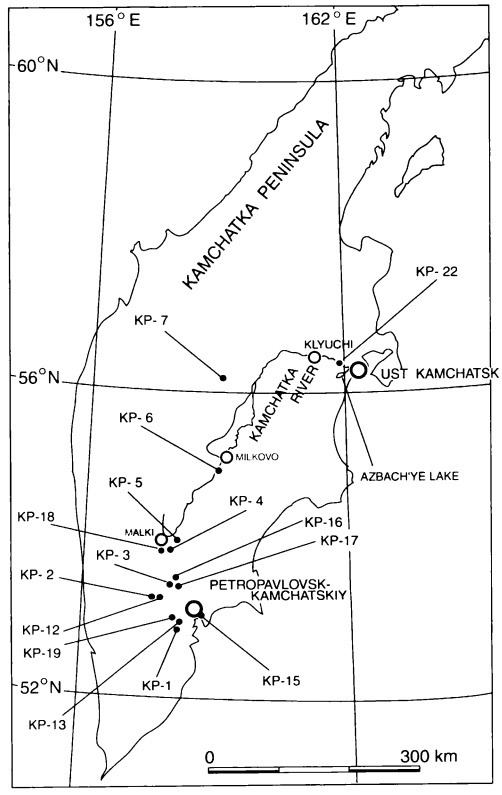

Fig. 1. Map of study sites in the Kamchatka Peninsula. For detailed explanations, see text.

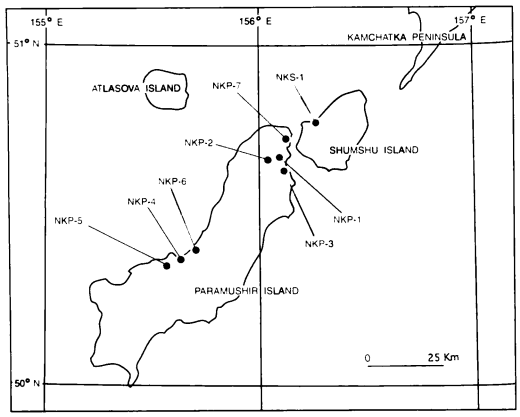

Fig. 2. Map of study sites in North Kuril Islands. For detailed explanations, see text.

periods 11th to 24th July 1997. These sites are shown in Figs. 1 and 2 and detailed information of them are given below.

Kamchatka Peninsula

KP-1: 5 km west of Mt. Vilyuchinsky (52°42′ N, 158°10′ E), alt. ca. 150 m.

KP-2: Lolyoryouka River (riverside), 11 km north of Malki (53°26′ N, 157°32′ E), alt. ca. 220 m.

KP-3: Poperechnaya River (upper part), 25 km from Malki Village (53°05′ N, 157°52′ E), alt. ca. 470 m.

KP-4: Bystraya River (riverside), 70 km north of Malki, (53°58′ N, 157°45′ E), alt. ca. 470 m.

KP-5: Pravaya River (upper part), 23 km south of Pushchino (54°01′ N, 157°51′ E), alt. ca. 540 m.

KP-6: Milkovo Village, (54°42′ N, 158°36′ E), alt. 110 m.

KP-7: Basin of Bystraya River, 10 km southeast of Anavgay (56°02′ N, 159°04′ E), alt. ca. 310 m.

KP-9: Inlet small stream, Azhabach'ye Lake (left side) (56°9′ N, 161°55′ E), alt. ca. 20 m.

KP-11: Athal stream near Azhabach'ye Lake (56°11′ N, 161°41′ E), alt. ca. 20 m.

KP-12: Hot Spring (riverside), Malki (52°25′ N, 157°30′ E), alt. ca. 250 m.

KP-13: 10 km south of Paratunka (52°53′ N, 158°11′ E), alt. ca. 100 m.

KP-15: Nagornyi, near Petropavlovsk-Kamchatskiy (53°07′ N, 158°31′ E), alt. ca. 150 m.

KP-16: Poperechnaya River, Bystraya River basin, 17 km from main road, (53°23′ N, 157°41′ E), alt. ca. 320 m.

KP-17: Poperechnaya River, Bystraya River basin, 17 km from main road (53°23′ N, 157°41′ E), alt. ca. 400 m.

KP-18: Bystraya River basin, 30 km north of Ganaly (53°58′ N, 157°45′ E), alt. ca. 390 m.

KP-19: Mt. Vachkazhets, upper part of Takhkoloch River, Basin of Plotnikova (53°05′ N, 157°55′ E), alt. ca. 550 m.

KP-22: Ebet Mountains (south part), 42 km northwest of Usuti-Kamchatsk (56°30′ N, 161°59′ E), alt. ca. 150 m.

North Kuril Islands: Paramushir Island

NKP-2: Matrosskaya River, near Severo-Kurilsk (50°40′ N, 156°05′ E), alt. 30–128 m.

NKP-3: 3–8 km south of Severo-Kurilsk (50°38′ N, 156°08′ E), alt. 5–30 m.

NKP-4: Shelekhovo (50°22′ N, 155°37′ E), alt. 10 m.

NKP-5: Shelekhovo to Shimoyur River (50°22′ N, 155°37′ E⇔50°22′ N, 155°34′ E), alt. 0–100 m.

NKP-6: Shelekhovo to Medvezhiy Waterfall (50°22′ N, 155°37′ E⇔50°22′ N, 155°39′ E), alt. 0–10 m.

NKP-7: 4 km north of Severo-Kurilsk (50°43′ N, 156°08′ E), alt. 100 m.

North Kuril Islands: Shumshu Island

NKS-1: Lake Bol'shoye (50°46′ N, 156°15′ E), alt. 15 m.

The specimens were collected by using sweep nets, light trap and malaise trap, and were preserved in glassine envelopes or in 70–80% ethyl alcohol. All specimens are deposited in the Natural History Museum and Institute, Chiba (CBM, with a code of ZI).

List of collected species

The arrangement of families by Zwick (1973) was adopted and the genera and species are arranged alphabetically within each family. When identification could only be made to the generic level, specimen(s) was treated as unidentified species, if it was clearly distinguishable from all other recorded species.

Information about specimens is given in

the following sequence: scientific name, site of collection (abbreviated), date, number of specimens, and collector. Collector's names are abbreviated as follows: AS=Akiko Saito; RBK=Ryoichi B. Kuranishi.

In the following list, 14 species of five families are recorded from the Kamchatka Peninsula and North Kuril Islands: five species of Perlodidae, three spp. of Chloroperlidae, one sp. of Taeniopterygidae, two spp. of Nemouridae and three spp. of Capniidae. *Mesocapnia gordkovi* Zhiltzova and Baumann, 1986 is recorded for the first time from North Kuril Islands, though it was known from the southern parts of the Russian Ear East. *Taenionema japonicum* (Okamoto, 1922) is also first collected from the North Kuril Islands. Almost all species collected are distributed widely in the Russian Far East or the Palearctic region. Five of these species are common to Hokkaido, Japan.

Family Perlodidae

1. *Arcynopteryx polaris* Klapálek, 1912

Material examined. **KP-4**: 7.VII.1996, 1 female, RBK leg., CBM-ZI 83572; **KP-5**: 7.VII. 1996, 1 larva, RBK leg., CBM-ZI 83573; **KP-6**: 8.VII.1996, 1 male, RBK leg., CBM-ZI 83574; **KP-7**: 9.VII.1996,13 larvae, RBK leg., CBM-ZI 83575; KP-12: 17.VII.1996, 8 females, RBK leg., CBM-ZI 83576; **KP-15**: 10.VII.1997, 2 females, RBK leg., CBM-ZI 83577; **KP-16**: 27. VII.1997, 1 female, RBK leg., CBM-ZI 83578; **KP-17**: 28.VII.1997, 1 male, RBK leg., CBM-ZI 83579; **KP-19**: 1.VIII.1997, 1 male, 1 female, RBK leg., CBM-ZI 83580.

Distribution. Russian Far East: Chukotka, southern Magadan, Kamchatka Peninsula, Khabarovsk, Primorye; Sayan, Altai, Mongolia.

Remarks. Though this species was called as *A. altaica* Zapekina-Dulkeit, 1960, Zhiltzova (1995) provided a full specific status for *A. dichroa* var. *polaris* Klapálek, 1912, and removed it from the synonymy with *A. compacta* (McLachlan, 1872). *A. altaica* was then synonymized with *A. polaris*. Four species of the genus *Arcynopteryx* are recorded from the Palearctic and only *A. compacta* is in spread to the Nearctic. Though at least three species of the genus was have been recorded herewith, the identity of the several female specimens is still questionable. They are listed under two unidentified categories below.

2. *Arcynopteryx compacta* (McLachlan, 1872)

Material examined. **KP-16**: 27.VII.1997, 1 female, RBK leg., CBM-ZI 83581.

Distribution. Russian Far East: widespread in the Far East; Zabaikal'e, Sayan, Altai, Europe and U.S.A. Levanidova (1970) recorded this species from the Kamchatka Peninsula for the first time.

Arcynopteryx compacta? (McLachlan, 1872)

Material examined. **KP-6**: 8.VII.1996, 2 females, RBK leg., CBM-ZI 83582.

Arcynopteryx sp.

Material examined. **KP-5**: 7.VII.1996, 1 female, RBK leg., CBM-ZI 83583; **KP-22**: 11. VII.1996, 1 female, RBK leg., CBM-ZI 83584.

3. *Diura majuscula* (Klapálek, 1912)

Material examined. **KP-2**: 5.VII.1996, 1 female, RBK leg., CBM-ZI 83585.

Distribution. Russian Far East: Southern Magadan, Kamchatka Peninsula, Khabarovsk, Primorye, southern Sakhalin; Zabaikal'e, Sayan, Altai, Mongolia.

4. *Pictetiella asiatica* Zwick and Levanidova, 1971

Material examined. **KP-2**: 5.VII.1996, 4 males 3 larvae, RBK leg., CBM-ZI 83586; **KP-7**: 9.VII.1996, 1 larva, RBK leg., CBM-ZI 83587; **KP-16**: 27.VII.1997, 2 males, RBK leg., CBM-ZI 83588, 29.VII.1997, 1 female, AS leg., CBM-ZI 83589.

Distribution. Russian Far East: Kamchatka Peninsula, southern Khabarovsk, Amur, Primorye; Zabaikal'e, Sayan, Altai.

5. *Skwala pusilla* (Klapálek, 1912)

Material examined. **KP-6**: 8.VII.1996, 1 female, RBK leg., CBM-ZI 83590.

Distribution. Russian Far East: widespread in the Far East; Zabaikal'e, Sayan, Altai, Mongolia, Japan (Hokkaido and Honshu).

Perlodidae sp.

Material examined. **KP-1**: 3.VII.1996, 1 larva, RBK leg., CBM-ZI 83591; **KP-17**: 28.VII. 1997, 11 larvae, RBK leg., CBM-ZI 83592.

Remarks. The nymphs are all young. Thus, it is difficult to identify them even to generic level.

Family Chloroperlidae

6. *Alloperla deminuta* Zapekina-Dulkeit, 1970

Material examined. **KP-17**: 28.VII.1997, 2 females, RBK leg., CBM-ZI 83593.

Distribution. Russian Far East: Southern Magadan, Kamchatka Peninsula, Khabarovsk, Primorye; Zabaikal'e, Sayan, Altai, Mongolia.

7. *Alloperla mediata* (Návas, 1925)

Material examined. **KP-2**: 5.VII.1996, 1 female, RBK leg., CBM-ZI 83594; **KP-7**: 9.VII. 1996, 1 female, RBK leg., CBM-ZI 83595; **KP-9**: 13.VII.1996, 1 male, RBK leg., CBM-ZI 83596; **KP-16**: 27.VII.1997, 1 female, AS leg., CBM-ZI 83597; **KP-19**: 31.VII.1997, 1 female, RBK leg., CBM-ZI 83598; **NKP-3**: 13.VII.1997, 1 male, RBK leg., CBM-ZI 83599.

Distribution. Russian Far East: Magadan, Kamchatka Peninsula, Khabarovsk, Primorye, Sakhalin, Kuril Islands; Zabaikal'e, Sayan, Altai, northern China.

Remarks. This species is very similar to *Alloperla ishikariana* Kohno, 1950 known from Hokkaido, Japan. Future study may eventually reveal that the *A. shikariana* may be conspecific with *A. mediata.*

Chloroperlidae sp.

Material examined. **KP-3**: 6.VII.1996, 4 larvae, RBK leg., CBM-ZI 83600; **KP-9**: 13.VII. 1996, 2 larvae, RBK leg., CBM-ZI 83601; **KP-11**: 15.VII.1996, 2 larvae, RBK leg. CBM-ZI 83602; **KP-17**: 28.VII.1997, 1 larva, RBK leg., CBM-ZI 83603; **NKS-1**: 22.VII.1997, 1 larva, RBK leg., CBM-ZI 83604.

Remarks. The nymphs are all young. Thus, it is difficult to identify them even to generic level.

8. *Suwallia teleckojensis* (Sámal, 1938)

Material examined. **KP-11**: 15.VII.1996, 10 males, 5 females, RBK leg., CBM-ZI 83605; **KP-16**: 27.VII.1997, 2 males, 5 females, RBK leg., CBM-ZI 83606; 29.VII.1997, 4 females, RBK leg., CBM-ZI 83607; **KP-17**: 28.VII.1997, 4 females, RBK leg., CBM-ZI 83608; **KP-18**: 30.VII.1997, 2 females, AS leg., CBM-ZI 83609; **NKP-5**: 17.VII.1997, 2 males, 3 females, RBK leg., CBM-ZI 83610; **NKP-6**: 17. VII.1997, 1 female, AS leg. CBM-ZI 83611.

Distribution. Russian Far East: widespread in the Far East (Chukotka Peninsula, Kamchatka Peninsula, continental coast of the sea of Okhotsk, Sikhote-Alin' Mountains (Terney), Sakhalin, Kuril Islands (Kunashir, Paramushir), Sayan, Altai, Mongolia, Japan.

Remarks. Levanidova and Zhiltzova (1979) pointed out the present species is the senior subjective synonym of *Alloperla jezoensis* (Kohno, 1953) described from Japan.

***Suwallia* sp.**

Material examined. **KP-1**: 3.VII.1996, 2 larvae, RBK leg., CBM-ZI 83612; **NKP-3**: 13. VII.1997, 12 larvae, RBK leg., CBM-ZI 83613.

Remarks. The nymphs are all young. Thus, it is difficult to identify them to specific level.

Family Taeniopterygidae

9. *Taenionema japonicum* (Okamoto, 1922)

Material examined. **KP-1**: 3.VII.1996, 1 male, 1 female, RBK leg., CBM-ZI 83614; **KP-2**: 5.VII.1996, 25 males, 22 females, RBK leg., CBM-ZI 83615; 7.VII.1996, 10 males, 14 females, RBK leg. CBM-ZI 83616; **KP-3**: 6.VII. 1996, 1 male, 5 females, RBK leg., CBM-ZI 83617; **KP-4**: 7.VII.1996, 5 males, 1 female, RBK leg., CBM-ZI 83618; **KP-5**: 7.VII.1996, 1 female, RBK leg., CBM-ZI 83619; **KP-7**: 10. VII.1996, 1 male, RBK leg., CBM-ZI 83620; **KP-13**: 7.VII.1997, 1 male, 1 female, RBK leg., CBM-ZI 83621; **KP-16**: 27.VII.1997, 3 females, RBK leg., CBM-ZI 83622; **KP-18**: 30. VII.1997, 3 females, AS leg., CBM-ZI 83623; **KP-19**: 31.VII.1997, 2 females, RBK leg., CBM-ZI 83624; 1.VIII.1997, 1 female, RBK leg., CBM-ZI 83625; **KP-22**: 11.VII.1996, 1 male, 1 female, RBK leg., CBM-ZI 83626; **NKS-1**: 21.VII.1997, 2 males, 3 females, AS leg. CBM-ZI 83627; 22.VII.1997, 1 male, 1 female, RBK leg., CBM-ZI 83628, **NKP-2**: 12. VII.1997, 1 female, RBK leg., CBM-ZI 83629;

14. VII. 1997, 3 females, RBK leg., CBM-ZI 83630, **NKP-3**: 13. VII. 1997, 2 males, 1 female, RBK leg., CBM-ZI 83631, **NKP-4**: 19. VII. 1997, 1 female, AS leg., CBM-ZI 83632, **NKP-7**: 24. VII. 1997, 1 female, AS leg., CBM-ZI 83632.

Distribution. Russian Far East: widespread in the Far East to the northern parts; Zabaikal'e, Sayan, Altai, Japan (Hokkaido), Mongolia.

Family Nemouridae

10. *Nemoura arctica* Esben and Peterson, 1910

Material examined. **KP-4**: 7. VII. 1996, 11 male, 12 females, RBK leg., CBM-ZI 83633.

Distribution. Russian Far East: Altai and Sayan; Arctic parts of Russia, Mongolia, northern Europe, North America.

Nemoura sp.

Material examined. **KP-7**: 10. VII. 1996, 1 female, RBK leg., CBM-ZI 83634.

Remarks. The status of this female remains uncertain.

Family Capniidae

11. *Capnia nigra* (Pictet, 1833)

Material examined. **KP-13**: 7. VII. 1997, 1 female, RBK leg., CBM-ZI 83635.

Distribution. Palearctic. Widespread in the Russian Far East, and Japan (Hokkaido).

Remarks. This species has been recorded from a wide-range in the Palearctic region. It was recorded from Hokkaido by Okamoto (1922) under the name of *C. conica* Klapálek, 1909, which is synonymous with *C. nigra*, though no additional records have been reported from Japan.

12. *Isocapnia* sp.

Material examined. **KP-13**: 7. VII. 1997, 1 female, RBK leg., CBM-ZI 83636.

Remarks. Four species of this genus are known from the Russian Far East, though only *I. guentheri* (Joost, 1970) was recorded from the Kamchatka Peninsula (Teslenko et al, 1997). The status of this female specimen remains uncertain.

13. *Mesocapnia gordkovi* Zhiltzova and Baumann, 1986

Material examined. **NKP-2**: 14. VII. 1997, 11 male, 15 females, RBK leg., CBM-ZI 83637.

Distribution. Russian Far East: Chukotka, Magadan, southern Khabarovsk, Kuril Islands (Paramushir Island).

Remarks. This species is recorded for the first time from the North Kuril Islands, and it has a wider distribution than previously thought. Zhiltzova and Levanidova (1984), however, recorded *Mesocapnia* sp. from the North Kuril Islands, and it was perhaps *M. gorodkovi*.

Family Leuctridae

14. *Paraleuctra cercia* (Okamoto, 1922)

Material examined. **KP-1**: 3. VII. 1996, 1 male, RBK leg., CBM-ZI 83638.

Distribution. Widespread in Russian Far East Japan (Hokkaido and Honshu).

Acknowledgments

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カムチャッカ半島と北千島のカワゲラ類

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1996年と1997年に行われた千葉中央博物館のカムチャッカ半島と北千島生物学調査において採集されたカワゲラ類についてリストを作成した．本調査を通じて，5科12属の少なくとも14種が記録された．記録された種類のうち，*Mesocapnia gordkovi* Zhiltzova and Baumann と *Taenionema japonicum* (Okamoto) の2種は，北千島からの初記録となる．

全体として確認された種の多くは，東部旧北区，あるいは旧北区に広く分布する種が多く，地域的な特異性は低く，北海道など日本との共通種も半数近く含まれていた．アミメカワゲラ科の5種は，いずれの種も東部旧北区に広く分布し，うち1種 *Skwala pusilla* (Klapálek) は，日本との共通種であった．ミドリカワゲラ科の3種はいずれの種も東部旧北区に広く分布し，うち1種 *Suwallia teleckojensis* (Sámal) については，日本との共通種であるが，*Alloperla mediata* (Návas) も今後の研究によっては，日本との共通種となる可能性がある．ミジカオカワゲラ科とホソカワゲラ科では，各1種が記録され，いずれも日本との共通種であった．クロカワゲラ科では3種のうち2種について種名が確定出来たが，*Capnia nigra* (Pictet, 1833) は日本との共通種であった．しかし，オナシカワゲラ科で1種だけ種名の確認された *Nemoura arctica* Esben and Peterson は，新旧北区に広く分布する種であるが，この種は日本には分布していない．