

ЦРНОГОРСКА АКАДЕМИЈА НАУКА И УМЈЕТНОСТИ
ГЛАСНИК ОДЈЕЉЕЊА ПРИРОДНИХ НАУКА, 12, 1998.

ЧЕРНОГОРСКАЈА АКАДЕМИЈА НАУК И ИСКУССТВ
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KNOWLEDGE OF PROTURA AND DIPLURA OF MONTENEGRO

A b s t r a c t

The investigated material of *Protura* and *Diplura* consisted of 160 individuals: 32 specimen of *Protura* belonging to 5 species and 128 specimen of *Diplura* belonging to 12 species (*Insecta*). The most common species of *Protura* was *Acerentulus confinis*, that of *Diplura* was *Campodea (Paurocampa) suenisoni*. The other species were much less numerous. All the species (17) are new for the fauna of the Republic of Montenegro.

Key words: *Diplura, Protura, Insecta*, disribution, Montenegro

POZNAVANJE PROTURA I DIPLURA CRNE GORE

I z v o d

Istraživani materijal *Protura* i *Diplura* sačinjava 160 jedinki: 32 uzorka *Protura* spadaju u 5 vrsta i 128 uzorka *Diplura* spadaju u 12 (*Insecta*). Najčešća vrsta od *Protura* je bila *Acerentulus confinis*, dok od *Diplura* je bila *Campodea (Paurocampa) suenisoni*. Ostale vrste su manje brojne.

Sve vrste (17) su nove za faunu Republike Crne Gore.

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INTRODUCTION

This article is the first knowledge about the fauna of Protura and Diplura, groups of primare wingless insects from the Republic of Montenegro. The length of body by: *Protura* is about 2 mm, but *Diplura* has gone to 10 mm and in some cases more.

MATERIAL AND METHODS

The investigated material was collected from different regions and localities of Montenegro (areas of Monastery Morača and Ravna Rijeka - mountain Bjelasica; Durmitor mountain, also its caves and near of the Adriatic sea coast – Lepetani, Sozina hill) in different ecosystems (deciduous forests and meadows: in litter, soil, under stones and rocks) collected by: B. Blesić, G. Andrić, I. Karaman and S. Pešić. Hundred and sixty individuals were separated from samples on usual way.

The material was determined on the basis of classification given by Condé (1956), Ionescu (1955), Nosek (1973), Paclt (1957), Páges (1953) and Palissa (1964).

The materials mounted on slides are deposited on the Faculty of Sciences, University of Kragujevac.

RESULTS AND DISCUSSION

This article presents the data for 17 identified species.

Order: *PROTURA* Silvestri, 1907

Suborder: *EOSENTOMOIDEA* Condé, 1951, emend Tuxen, 1964

Family: *Eosentomoidae* Berlese, 1909

Genus: *Eosentomon* Berlese, 1909

1. *Eosentomon transitorium* Berlese, 1908

Material:

– **Morača Monastery** (W. of Kolašin) eastern hornbeam litter, June 19, 1978, 1 male (leg. B. Blesić).

– **Ravna Rijeka** (S. of Bijelo Polje, on side of mountain Bjelasica) in Požari (oak litter) July 21, 1992, 1 female; Ostrelj (beech litter) July 24, 1992, 1 male (leg. G. Andrić).

Distribution: Norway, Sweden, Finland, England, Belgium, Denmark, Germany, Poland, Russia, Portugal, Spain, France, Switzerland, Austria, Czech Republic, Slovakia, Hungary, Romania, Bulgaria, Slovenia, Slovenia, Greece, Italy, Corsica, Minorca, Morocco, Sahara, Algeria, Ivory Coast, Montenegro (Yugoslavia), Republic of Macedonia (Blesić, 1997a).

Suborder: *ACERENTOMOIDEA* Condé, 1951

Family: *Acerentomidae* Silvestri, 1907

Genus: *Acerentulus* Berlese, 1908

2. *Acerentulus confinis* (Berlese, 1908)

Material:

Ravna Rijeka (S. of Bijelo Polje, on side of mountain Bjelasica) hilly meadow: August 20, 1988, 2 males and 5 females; oak litter: December 2, 1991, 3 females (leg. G. Andrić)

Distribution: England, Spain, Portugal, France, Germany, Czech Republic, Slovakia, Poland, Russia, Austria, Switzerland, Hungary, Roumania, Bulgaria, Slovenia, Yugoslavia (Serbia and Montenegro), Greece, Italy, Corsica, Minorca, Algeria, Sahara, Morocco occidental, USA (Nosek, 1973).

3. *Acerentulus trægardhi* Ionescu, 1937

Material:

– **Morača Monastery** (W. of Kolašin) eastern hornbeam litter: June 19, 1978, 1 female (leg. B. Blesić);

– **Ravna Rijeka** (S. of Bijelo Polje, on side of mountain Bjelasica) Požari (oak litter) July 21, 1992, 1 female and 1 larva (leg. G. Andrić)

Distribution: Sweden, Ireland, Denmark, Germany, Belgium, Poland, Czech Republic, Slovakia, Hungary, Romania, Spain, France, Italy, Greece, Yugoslavia (Serbia and Montenegro), Republic of Macedonia (Nosek, 1973).

Genus: *Acerentomon* Silvestri, 1907

4. *Acerentomon balcanicum* Ionescu, 1933

Material:

Ravna Rijeka (S. of Bijelo Polje, on side of mountain Bjelasica) Požari (beech litter) July 29, 1992, 4 males, 2 females and 2 larvae (leg. G. Andrić).

Distribution: Sardinia, Italy, Yugoslavia (Serbia and Montenegro), Bosnia, Greece (Nosek, 1973; Plisša, 1964).

5. *Acerentomon meridionale* Nosek, 1960

Material:

Ravna Rijeka (S. of Bijelo Polje, on side of mountain Bjelasica) Ostrelj (beech litter) July 24, 1992, 1 female (leg. G. Andrić); Požari (beech litter) July 30, 1992, 4 males, 2 females and 1 larva (leg. ibid.).

Distribution: Italy, Slovenia, Bosnia, Austria, Czech Republic, Slovakia, Carpathian Ukraine, Montenegro (Yugoslavia) (Nosek, 1973).

Order: *DIPLURA*Suborder: *RHABDURA* Cook, 1896, emend Pages, 1959Family: *Campodeidae* Lubbock, 1873Genus: *Campodea* Westwood, 1842Subgenus: *Campodea* Westwood, 1842, emend Silvestri, 19326. *Campodea (Campodea) lankesteri* Silvestri, 1912

Material:

– Stari katun (1900 m, Durmitor Mt.) August 5, 1992, 1 female (leg. I. Karaman).

Distribution: England, Belgium, France, Germany, Denmark, Sweden

(Pališić 1964), Montenegro (Yugoslavia).

7. *Campodea (Campodea) plusiochaeta* Silvestri, 1912

Material:

– Morača Monastery (W. of Kolašin) litter of mixed deciduous forest: May 3, 1989, 2 males and 3 females (leg. I. Karaman).

Distribution: cosmopolitan (Blesić, 1981).

8. *Campodea (Campodea) wallacei* Bagnall, 1918

Material:

– Morača Monastery (W. of Kolašin) litter of mixture deciduous forest: June 19, 1978, 1 female (leg. B. Blesić);

– Sozina hill (up to Sutomore, about 10 km NW from Bar harbour) under stones: May 12, 1992, 2 males (leg. I. Karaman).

Distribution: England, Sweden, France, Roumania, Yugoslavia (Serbia and Montenegro), Croatia (Blesić, 1997b), Republic Macedonia (Blesić, 1997a).

Subgenus *Dicampa* Silvestri 19329. *Campodea (Dicampa) aristotelis* Silvestri, 1912

Material:

– Lepetani (between Tivat and Kotor, under stones) May 1, 1989, 1 male and 1 female (leg. I. Karaman); May 13, 1991, 2 males and 3 females (ibid.).

Distribution: Spain, (Silvestri, 1932), Montenegro (Yugoslavia).

10. *Campodea (Dicampa) campestre* Ionescu, 1955

Material:

– Ravna Rijeka (S. of Bijelo Polje, on side of Mt. Bjelasica) Požari (oak litter) April 27, 1988 1 larva (leg. G. Andrić); July 20, 1992, 1 male,

1 female (ibid.), Gornja Ališnica (Durmitor Mt.) July 5, 1992, 1 female (leg. I. Karaman). Bardov Do (Bjelasica Mt.) under stones July 14, 1993, 1 female (leg. S. Pešić).

Distribution: Bulgaria, Roumania, Yugoslavia (Serbia and Montenegro) (B l e s i ć, 1981).

11. *Campodea (Dicampa) frenata* Silvestri, 1931

Material:

– Ravna Rijeka (S. of Bijelo Polje, on side of mountin Bjelasica) meadow August 20, 1988, 2 females; Latinska kosa (oak litter) July 20, 1992, 2 females; Požari (oak litter) July 21, 1992, 4 males, 2 females and 2 larva, December 30, 1992, 1 male (all leg. G. Andrić).

Distribution: Bulgaria, Roumania, Czech Republic, Slovakia, Yugoslavia (Serbia and Montenegro) (B l e s i ć, 1997b).

Subgenus: *Paurocampa* Silvestri, 1932

12. *Campodea (Paurocampa) rocasolanoi* Silvestri, 1932

Material:

– Lepetani (between Tivat and Kotor, under stones) April 24, 1997, 3 females (leg. I. Karaman).

Distribution: Aegis, Yugoslavia (Serbia and Montenegro), Republic Macedonia (B l e s i ć, 1997a).

13. *Campodea (Paurocampa) suenisoni* Tuxen, 1930

Material:

– **Morača** Monastery (W. of Kolašin) litter of mixed deciduous forest: June 19, 1978, 4 males, 8 females and 9 larvae (leg. B. Blesić); May 3, 1989, 3 males (leg. I. Karaman).

– **Bjelasica** – Ravna Rijeka (S. of Bijelo Polje, on side of mountin Bjelasica) oak litter April 27, 1988 1 larva; Požari (oak litter) July 16, 1992, 1 larva; Ostrelj (beech litter) July 24, 1992, 2 females and 1 larva (all leg. G. Andrić); Bardov Do (under stone) July 14, 1993, 1 female (leg. S. Pešić).

– **Lepetani** (between Tivat and Kotor, under stones) May 12, 1992, 8 females; April 24, 1997, 2 females.

– **Sozina** hill (up to Sutomore, about 10 km NW from Bar harbour) under stones: May 12, 1992, 2 male.

– **Durmitor Mt.** – Gornja Ališnica (2000 m) August 5, 1992, 5 males and 9 females; Stari katun (1900 m) August 7, 1992, 1 male and 1 female; Velika Kalica – August 9, 1992, 7 males, 9 females and 2 larvae (all leg. I. Karaman).

Distribution: Austria, Czech Republic, Slovakia, Croatia, Yugoslavia (Serbia and Montenegro), Greece, Republic of Macedonia (B l e s i ć, 1997a).

Genus *Plusicampa* Silvestri, 1912
syn. *Troglocampa* Denis 1930

14. *Plusicampa italica* Silvestri, 1912

Material :

– Lepetani (between Tivat and Kotor, under stones) May 1, 1989, 8 females (leg. I. Karaman).

Distribution: Italy, Republic of Macedonia (B l e s i ć, 1997a).

15. *Plusicampa (Stygiocampa) nivea* (Joseph, 1882)

syn. *Campodea nivea* Joseph, 1882

= *C. erebophila* Haman, 1896

= *Troglocampa nivea* Denis, 1930

Material :

– **Durmitor** – in cave – Arapova pećina August 18, 1995, 1 male and 4 females ;

– **Podgorica – Bar** (in cave) Šupinska jama February 3, 1997, 1 male (all leg. I. Karaman).

Distribution: Slovenia, France (C o n d e, 1956).

Suborder: *DICELLURATA* Pages, 1959

Family *J a p y g i d a e* Lubbock, 1873

Genus: *Metajapyx* Silvestri, 1932

16. *Metajapyx serratus* (Stach, 1929)

Material :

– **Sozina hill** (up to Sutomore, about 10 km NW from Bar harbour) under stones: May 12, 1992, 2 males (leg. I. Karaman).

– **Rijeka Crnojevića** – Selo Trnovo May 3, 1997, 1 female (leg. I. Karaman).

Distribution: Hungary, Austria, Yugoslavia (B l e s i ć, 1981).

Genus: *Parajapyx* Silvestri, 1948

17. *Parajapyx maior* (Grassi, 1886)

Material :

– Sozina hill (up to Sutomore, about 10 km NW from Bar harbour) under stones: May 12, 1992, 2 male (leg. I. Karaman).

Distribution: Mediterran, Republic of Macedonia (B l e s i ć, 1997a).

CONCLUSION

Protura are represented in Montenegro with 2 families (*Acerentomidae* and *Eosentomidae*) 3 genera (*Acerentomon*, *Acerentulus* and *Eosentomon*) and 5 species (*Acerentomon balcanicum* and *meridionale*, *Acerentulus confinis* and *tragardhi*, *Eosentomon transitorium*). The most numerous was *A. confinis*, the others occurring slightly less.

Order *Diplura* is represented with: 2 families (*Campodeidae* and *Japygidae*) 4 genera (*Campodea* and *Plusiocampa*; *Metajapyx* and *Parajapyx*) and 12 species: (*Campodea* (*C*) *lankesteri*, *plusiochaeta*, *wallacei*, (*D*) *aristotelis*, *campestre*, *frenata* and (*P*) *suensoni*, *rocasolanoi*; *Plusiocampa italica* and (*St.*) *nivea*; *Metajapyx serratus* and *Parajapyx maior*. Cosmopolitan genus *Campodea* is represented with 3 subgenera and 6 species. More commonly is species *Campodea* (*Paurocampa*) *suensoni* with 75 individuals, while the others are much less. From family *Japygiidae* were identified 2 genera and 2 species.

The all finding (17) species are new for the fauna of Montenegro.

This work is the contribution to knowledge of distribution *Protura* and *Diplura*, but also is important for the zoogeographical and the ecological investigations.

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