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RESEARCH ARTICLE

# A review of the subfamily Poemeniinae Narayanan & Lal, 1953 (Hymenoptera, Ichneumonidae) from Carpathians

**Oleksandr Varga**[1]

[1]*Schmalhausen Institute of Zoology, NAS of Ukraine. The Alexandru Ioan Cuza University of Iasi. e-mail: Sancho.Varga@gmail.com*

**Abstract:** The species of the subfamily Poemeniinae Narayanan & Lal, 1953 of the Carpathians are reviewed. *Neoxorides varipes* (Holmgren, 1860), *Poemenia collaris* (Haupt, 1917), *P. notata* Holmgren, 1859, and the genus *Pseudorhyssa* Merrill, 1915 with two species, *P. alpestris* (Holmgren, 1860) and *P. nigricornis* (Ratzeburg, 1852), are recorded in the Ukrainian fauna for the first time. Diagnostic features and illustrations of species are provided. Seasonal dynamics and high-altitude zone distribution of Poemeniinae species in the Ukrainian part of Carpathians are discussed.

**Key words:** Parasitoids, Ichneumonidae, Poemeniinae, Carpathians, Romania, Ukraine, new records.

## Introduction

Poemeniinae Narayanan & Lal, 1953 (Hymenoptera, Ichneumonidae) is a relatively small cosmopolitan subfamily represented worldwide by 11 genera and 91 species, 13 of them belonging to 6 genera, are known from Europe (Yu *et. al.* 2012).

The Carpathian Mountains, a geologically young European mountain chain forming the eastward continuation of the Alps. From the Danube Gap, near Bratislava, Slovakia, they swing in a wide crescent-shaped arc some 900 miles (1,450 kilometres) long to near Orsova, Romania, at the portion of the Danube River valley called the Iron Gate. The Carpathians are usually divided into three major parts: the Western Carpathians (Czech Republic, Poland, Slovakia), the Eastern Carpathians (southeastern Poland, eastern Slovakia, Ukraine, Romania), and the Southern Carpathians (Romania, Serbia).

While the Romanian Ichneumonidae fauna are well studied (Constantineanu & Pisica 1977; Pisica & Popescu 2009), fauna of the adjacent territories of the Ukrainian Carpathians is almost unknown: only some ihcneumonid genera and subfamilies have been recently revised by the author (Varga 2012, 2013a,b, 2014a,b,c,d,e). Up to now, only six Poemeniinae species recorded so far from the territory of Ukraine (mainly from central and eastern parts of the country) by Kasparyan (1981).

Generally most of the European poemeniins are idiobiont ectoparasitoids. Some attack the immature stages of wood-boring beetles (*Deuteroxorides*, *Neoxorides*, *Podoschistus*), or aculeates nesting in tunnels or hollows in woody stems (*Poemenia*) (Fitton *et al.* 1988; Kasparyan 1981). Among the European Poemeniinae, species of *Pseudorhyssa* are cleptoparasites of Rhyssinae: the *Pseudorhyssa* female inserts her long but weak ovipositor into the oviposition hole made by a rhyssinae and lays an egg that ecloses to yield particularly well-armoured larva that destroys the rhyssiane egg or larva and then feeds on the host paralysed by the adult rhyssinae wasp (Spradbery 1969).

The present study provides a list of species belonging to the subfamily Poemeniinae recorded mainly from the territories of the Eastern and Southern Carpathians (Ukraine, Romania).

# Material and methods

This study is mainly based on specimens collected by sweep netting, using Malaise traps and conical trunk traps for collecting parasites of xylobionts, so-called Tereshkin′s trap (Tereshkin 1990). Sampling was conducted by the author in various locations of the Ukrainian Carpathians and adjacent territories in 2009-2014. Specimens are deposited in the collections of the Schmalhausen Institute of Zoology (SIZK) (Ukraine) and the Alexandru Ioan Cuza University of Iasi (UAIC) (Romania) were also studied. Morphological terminology used in the study follows that of Gauld (1991). Photographs of specimens were taken at UAIC with a Leica stereomicroscope 205A with DFC 500 camera, combined with Zerene® software.

# Results

## Taxonomy

### Genus *Deuteroxorides* Viereck, 1914

**Diagnosis:** This genus can be distinguished from other Poemeniinae genera by the combination of the following characters: epicnemial carina absent; temple dorsally finely sculptured; clypeus small and flat; mandible with a single tooth; fore and mid tarsal claws with additional tooth (as on Fig. 5); fore wing with vein 3rs-m absent.

This genus comprises 5 species worldwide, with a single European species, *D. elevator* (Panzer, 1799) (Yu *et. al.* 2012).

### *Deuteroxorides elevator* (Panzer, 1799)

**Diagnosis:** This species is characterized by the antenna stripped with white and the apically white hind tarsus.

**Material examined:** ROMANIA: ♀, Iasi Country, Breazu (locality 19 on Fig. 12), 9.V.1969 (leg. C. Pisica) (UAIC). UKRAINE: ♂, Ivano-Frankivsk Region, Bogorodchany District,

Mochary, 48°50'51.17"N, 24°35'26.91"E, 300-350 m, mixed forest, 5 km NE of Bogorodchany (locality 1 on Fig. 12), sweep netting, 3.V.2011; ♂, ibid., sweep netting, 12.V.2011; ♂, ibid., sweep netting, 5.V.2012; ♂, ibid., sweep netting, 6.V.2012; ♂, ibid., sweep netting, 12.V.2012; ♀, ibid., sweep netting, 18.V.2012; ♀, ♂, ibid., sweep netting, 31.V.2012; ♀, ibid., sweep netting, 10.VI.2012; ♀, ibid., sweep netting, 10.VII.2012; 2 ♀, ibid., sweep netting, 24.VII.2012; ♂, ibid., sweep netting, 18.VIII.2012; 3 ♂, ibid., sweep netting, 12.V.2013; ♀, ibid., sweep netting, 14.V.2013; ♀, ibid., sweep netting, 21.V.2013; 5 ♀, ibid., sweep netting, 17–19.VIII.2013; 2 ♂, Zhbyr, 48°47'4.92"N, 24°28'46.45"E, 400 m, mixed forest, 7-8 km SW of Bogorodchany (locality 1 on Fig. 12), sweep netting, 23.V.2012; ♂, ibid., sweep netting, 29.IX.2012; 2 ♀, 2 ♂, ibid., sweep netting, 13.VI.2013; ♀, ibid., trunk trap, sweep netting, 15–31.V.2013; ♀, ibid., trunk trap, 13–25.VII.2013; 2 ♀, ibid., trunk trap, 25.VII–16.VIII.2013; ♀, ibid., trunk trap, 14.VIII–16.IX.2013; ♀, ibid., trunk trap, 16.VIII–14.IX.2013; ♂, Dibrova, 48°46'10.35"N, 24°30'20.28"E, 310 m, oak forest, 5 km SW of Bogorodchany (locality 1 on Fig. 12), sweep netting, 23.VI.2011; 2 ♂, ibid., sweep netting, 2.VI.2013; 2 ♂, ibid., sweep netting, 5.VI.2013; 2 ♂, ibid., sweep netting, 27.IV.2014; ♂, Gorgany, 48°36'42.77"N, 24°09'10.69"E, 1200 m, coniferous forest, 5 km SW of Stara Guta (locality 2 on Fig. 12), sweep netting, 8–9.VI.2012; ♀, ♂, ibid., sweep netting, 1.VII.2012; ♂, Gorgany, 48°35'54.68"N, 24°7'52.56"E, 1375 m, upper limit of coniferous forest (locality 1 on Fig. 12), Malaise trap, 24.V–13.VI.2014; ♀, Nadvirna District, Gorgany, Elmy, 48°24’39.50”N, 24°24’50.28”E, 800-900 m, coniferous forest, 15 km SW of Yaremche (locality 3 on Fig. 12), sweep netting, 21.VI.2012; ♂, Transcarpathian Region, Rakhiv District, slopes of m. Sheshul, 48°09’23.13”N, 24°21’27.15”E, 1400-1500 m, subalpine zone, 6-7 km E of Kvasy (locality 5 on Fig. 12), sweep netting, 16–18.VI.2012; 4 ♂, ibid., sweep netting, 15.VI.2013 (leg. O. Varga) (SIZK).

**Genus *Neoxorides* Clément, 1938** (Figs. 1–4)

**Diagnosis:** This genus can be distinguished from other Poemeniinae genera by the combination of the following characters: epicnemial carina absent; temple dorsally strongly denticulate (Fig. 3); clypeus small and flat; mandible with a single tooth; all tarsal claws simple; fore wing with vein 3rs-m absent; metasomal tergites with indistinct punctures.

This Holarctic genus comprises 10 species, 4 of them occur in Europe (Yu *et. al.* 2012), 3 of them have been found in Carpathians.

***Neoxorides collaris* (Gravenhorst, 1829)** (Figs. 1, 4)

**Diagnosis:** This species can be distinguished from other European species by the combination of the following characters: collar simple (unmodified), hind coxae red, face of male entirely yellow and paramere with subapical white sclerotized area (Fig. 4).

**Material examined:** ROMANIA: ♀, Ceahlau, Pangarati (locality 16 on Fig. 12), 14.VII.1959 (misidentified by C. Pisica as *Neoxorides nitens*); ♂, Varful Toaca, Ceahlau (locality 15 on Fig. 12), 13.VII.1958; ♀, Suceava Country, Codru Slatioara (locality 13 on Fig. 12), 18.IX.1962 (leg. C. Pisica) (UAIC). UKRAINE: ♂, Ivano-Frankivsk Region, Bogorodchany District, Mochary, 48°50'51.17"N, 24°35'26.91"E, 300-350 m, mixed forest, 5 km NE of Bogorodchany (locality 1 on Fig. 12), sweep netting, 9.V.2011; 5 ♂, ibid., sweep netting, 28.IV.2012; 4 ♂, ibid., sweep netting, 29.IV.2012; ♂, ibid., sweep netting, 30.IV.2012; 7 ♂, ibid., sweep netting, 1.V.2012; 4 ♀, 2 ♂, ibid., sweep netting, 5.V.2012; 3 ♀, ♂, ibid., sweep netting, 12.V.2012; ♂, ibid., sweep netting, 19.V.2012; ♀, ibid., sweep netting, 31.V.2012; 2 ♀, ibid., sweep netting, 2.VI.2012; 2 ♀, ibid., sweep netting, 10.VI.2012; 2 ♀, ♂, ibid.,

sweep netting, 25.VI.2012; 7 ♀, ♂, ibid., sweep netting, 10.VII.2012; 5 ♂, ibid., sweep netting, 19.VII.2012; 5 ♀, 5 ♂, ibid., sweep netting, 24.VII.2012; 3 ♀, ibid., sweep netting, 18.VIII.2012; 13 ♂, ibid., sweep netting, 1.V.2013; 3 ♀, 21 ♂, ibid., sweep netting, 6.V.2013; 2 ♀, ♂, ibid., sweep netting, 14.V.2013; 3 ♀, ibid., sweep netting, 4.VI.2013; ♀, ♂, ibid., sweep netting, 17–19.VIII.2013; ♂, ibid., trunk trap, 9–27.VI.2014; ♀, 4 ♂, ibid., trunk trap, 27.VI.–13.VII.2014; ♀, 2 ♂, ibid., trunk trap, 13–29.VII.2014; ♀, ibid., trunk trap, 15–31.VIII.2014; ♀, 2 ♂, Zhbyr, 48°47'4.92"N, 24°28'46.45"E, 400 m, mixed forest, 7-8 km SW of Bogorodchany (locality 1 on Fig. 12), sweep netting, 24.VI.2012; ♀, 2 ♂, ibid., trunk trap, 14–30.VI.2013; 2 ♀, 2 ♂, ibid., trunk trap, 30.VI.–12.VII.2013; 6 ♀, 2 ♂, ibid., trunk trap, 13–25.VII.2013; 3 ♀, ♂, ibid., trunk trap, 25.VII.–16.VIII.2013; ♂, Dibrova, 48°46'10.35"N, 24°30'20.28"E, 310 m, oak forest, 5 km SW of Bogorodchany (locality 1 on Fig. 12), sweep netting, 19.V.2011; ♂, ibid., sweep netting, 20.V.2011; 2 ♂, ibid., sweep netting, 23.VI.2011; ♂, ibid., sweep netting, 17.VII.2011; ♂, ibid., sweep netting, 30.IV.2012; ♂, ibid., sweep netting, 10–11.V.2012; 2 ♀, ibid., sweep netting, 2.VI.2012; ♀, ♂, ibid., sweep netting, 18.VI.2013; ♂, Zhuraky, 48°44'26.65"N, 24°30'13.46"E, 450-500 m, mixed forest, 8 km S of Bogorodchany (locality 1 on Fig. 12), sweep netting, 22.V.2011; ♀, ♂, Gorgany, 48°36'42.77"N, 24°09'10.69"E, 1200 m, coniferous forest, 5 km SW of Stara Guta (locality 2 on Fig. 12), sweep netting, 8–9.VI.2012; ♀, ♂, ibid., sweep netting, 1.VII.2012; 10 ♂, Gorgany, 48°33’32.30”N, 24°07’41.34”E, 1250-1300 m, coniferous forest, 11-12 km SW of Stara Guta (locality 2 on Fig. 12), sweep netting, 20-22.V.2012; ♀, 5 ♂, Nadvirna District, Gorgany, Elmy, 48°24’39.50”N, 24°24’50.28”E, 800-900 m, coniferous forest, 15 km SW of Yaremche (locality 3 on Fig. 12), sweep netting, 14.VII.2011; ♀, 5 ♂, ibid., sweep netting, 20–23.VI.2012; 3 ♀, 31 ♂, ibid., sweep netting, 8.VI.2013; ♂, Transcarpathian Region, Rakhiv District, slopes of m. Sheshul, 48°09’23.13”N, 24°21’27.15”E, 1400-1500 m, subalpine zone, 6-7 km E of Kvasy (locality 5 on Fig. 12), sweep netting, 15.VI.2013 (leg. O. Varga) (SIZK).

**Remark:** Another European species, *N. montanus* Oehlke, 1966, is similar to *N. collaris*, but it has more prolonged metasoma with elongate tergites I-III (at least tergite III usually quadrate to transverse in *N. collaris*) and male’s paramere with apical white sclerotized area.

### *Neoxorides nitens* (Gravenhorst, 1829) (Fig. 3)

**Diagnosis:** This species can be distinguished from other European species by the combination of the following characters: collar modified (Fig. 3) and face of male white stripped.

**Material examined:** HUNGARY: Apatistvanfalva, 30.VI.1994 (leg. A. Kotenko) (SIZK).

**Remark:** No specimens were examined from the studied region, but this species has been recorded from Ukraine and Romania (Kasparyan, 1981, Constntineanu and Pisica, 1977), so potentially can be found also in Carpathians.

### *Neoxorides varipes* (Holmgren, 1860) (Fig. 2)

**Diagnosis:** This species can be distinguished from other European species by the combination of the following characters: collar simple (unmodofied), hind coxae black (at most with brownish mark), face of male entirely yellow and paramere with subapical white sclerotized area (as on Fig. 4).

**Material examined:** UKRAINE: ♂, Ivano-Frankivsk Region, Bogorodchany District, Mochary, 48°50'51.17"N, 24°35'26.91"E, 300-350 m, mixed forest, 5 km NE of Bogorodchany (locality 1 on Fig. 12), sweep netting, 28.IV.2012; 3 ♂, 4 ♀, ibid., sweep

netting, 29.IV.2012; ♀, ♂, ibid., sweep netting, 1.V.2012; 5 ♀, ibid., sweep netting, 5.V.2012; 6 ♀, 10 ♂, ibid., sweep netting, 6.V.2012; ♀, ♂, ibid., sweep netting, 12.V.2012; 2 ♀, ibid., sweep netting, 19.V.2012; 6 ♀, 9 ♂, ibid., sweep netting, 1.V.2013; 8 ♀, ♂, ibid., sweep netting, 6.V.2013; ♂, ibid., trunk trap, 11–26.V.2014; ♀, ♂, Zhbyr, 48°47'4.92"N, 24°28'46.45"E, 400 m, mixed forest, 7-8 km SW of Bogorodchany (locality 1 on Fig. 12), sweep netting, 23.V.2012; 4 ♀, ♂, Dibrova, 48°46'10.35"N, 24°30'20.28"E, 310 m, oak forest, 5 km SW of Bogorodchany (locality 1 on Fig. 12), sweep netting, 10–11.V.2012; ♂, Gorgany, 48°35'54.68"N, 24°7'52.56"E, 1375 m, upper limit of coniferous forest (locality 2 on Fig. 12), sweep netting, 1.VII.2012 (leg. O. Varga) (SIZK).

**Remark:** According to Kasparyan (1981) two close species, *N. collaris* and *N. varipes*, can be separated using the ovipositor length (ovipositor approximately 2.0 times as long as hind tibia in *N. collaris* and only slightly longer than hind tibia in *N. varipes*). The Carpathian specimens of *N. collaris* show high variability in size and body shape (from slender to relatively stout specimens with ovipositor from approximately 1.1-1.2 to 2.0 times as long as hind tibia), so only the coloration of coxae can be used as the most reliable character for separating these two species.

### Genus *Podoschistus* Townes, 1957 (Fig. 5)

**Diagnosis:** This genus can be distinguished from other Poemeniinae genera by the combination of the following characters: epicnemial carina absent; temple dorsally strongly denticulate (as on Fig. 3); clypeus small and flat; mandible with a single tooth; all tarsal claws with additional tooth (Fig. 5); fore wing with vein 3rs-m absent; metasomal tergites finely punctate.

This genus comprises 6 species worldwide, with a single European species, *P. scutellaris* (Desvignes, 1856) (Yu *et. al.* 2012).

### *Podoschistus scutellaris* (Desvignes, 1856) (Fig. 5)

**Diagnosis:** This species is characterized by the yellow scutellum and metascutellum (entirely black in one examined female specimen).

**Material examined:** ROMANIA: ♀, Neamt Country, Oantu (locality 16 on Fig. 12), 10.VII.1959; ♀, Mehedinti County, Dubova (locality 20 on Fig. 12), 15.V.1967 (leg. C. Pisica) (UAIC).

### Genus *Poemenia* Holmgren, 1859 (Figs. 6–11)

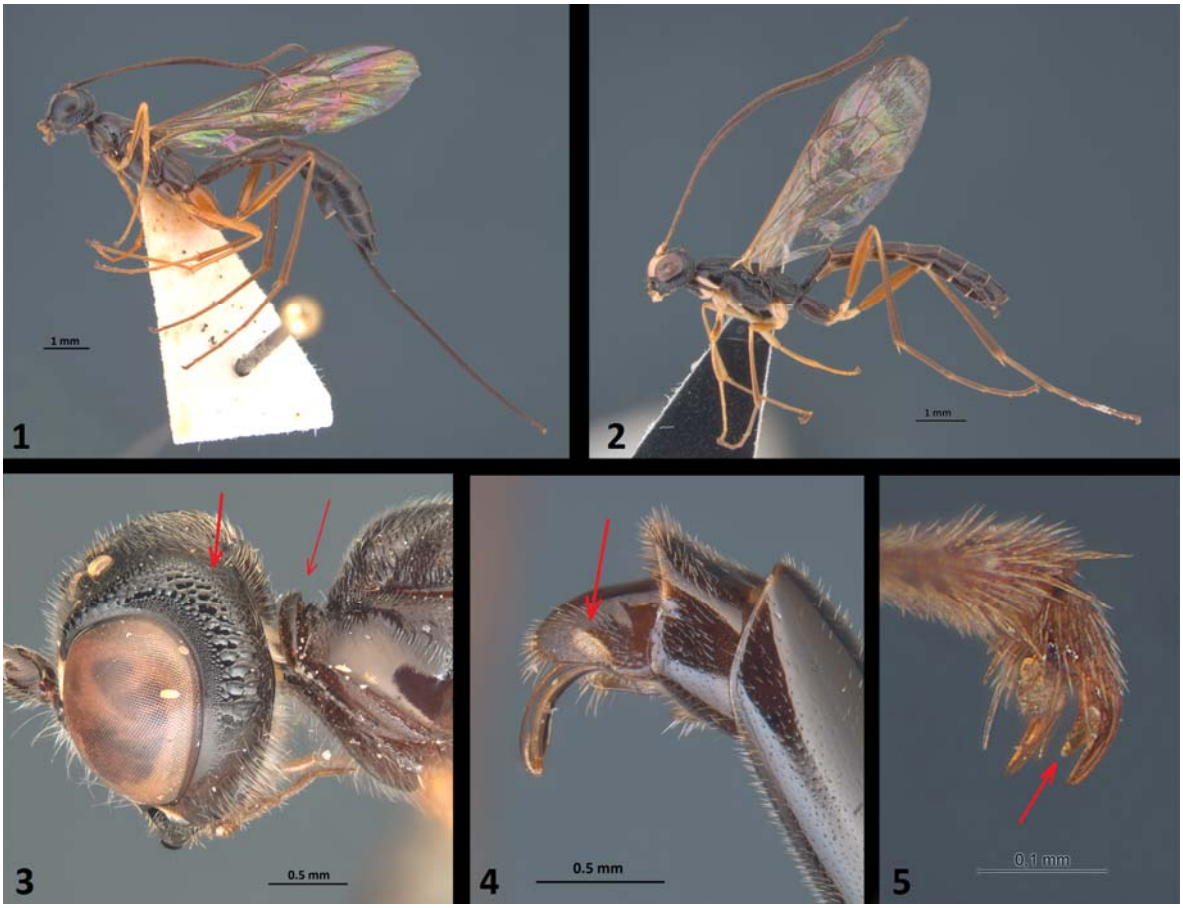
**Diagnosis:** This genus can be distinguished from other Poemeniinae genera by the combination of the following characters: epicnemial carina absent; temple dorsally finely sculptured; clypeus large and convex; mandible bidentate.

This genus comprises 14 species worldwide, 4 of them occur in Europe (Yu *et. al.* 2012) and all of them have been found in Carpathians.

### *Poemenia brachyura* Holmgren, 1860 (Fig. 6)

**Diagnosis:** This species can be distinguished from other European species genera by the combination of the following characters: fore wing with vein 3rs-m present, mesosoma black, and female with ovipositor short (only slightly longer than the hind tibia) (Fig. 6).

**Material examined:** ROMANIA: ♀, Timis Country, Ignis (locality 9 on Fig. 12), 16.VII.1964; ♀, Neamt Country, Bicaz (locality 18 on Fig. 12), 13.VII.1959 (leg. C. Pisica) (UAIC). UKRAINE: ♀, Ivano-Frankivsk Region, Bogorodchany District, Mochary, 48°50'51.17"N, 24°35'26.91"E, 300-350 m, mixed forest, 5 km NE of Bogorodchany (locality 1 on Fig. 12), sweep netting, 10.VI.2012; ♀, Dibrova, 48°46'10.35"N, 24°30'20.28"E, 310 m, oak forest, 5 km SW of Bogorodchany (locality 1 on Fig. 12), sweep netting, 18.VI.2013; ♀, Gorgany, 48°36'42.77"N, 24°09'10.69"E, 1200 m, coniferous forest, 5 km SW of Stara Guta (locality 2 on Fig. 12), sweep netting, 8-9.VI.2012; ♀, sweep netting, 30.V.2013; ♀, ibid., sweep netting, 20.VI.2013 (leg. O. Varga); ♀, Transcarpathian Region, Rakhiv District, Rakhiv, beech forest (locality 7 on Fig. 12), 3.VIII.1994 (leg. A. Kotenko) (SIZK).




**Figures 1–5.** Poemeniinae spp. **1,** *Neoxorides collaris* (Gravenhorst, 1829), lateral view of female habitus; **2,** *N. varipes* (Holmgren, 1860), lateral view of male habitus; **3,** *N. nitens* (Gravenhorst, 1829), lateral view of female head and pronotum; **4,** *N. collaris* (Gravenhorst, 1829), lateral view of male parameres; **5,** *Podoschistus scutellaris* (Desvignes, 1856), lateral view fore tarsal claws.

### *Poemenia collaris* (Haupt, 1917) (Figs. 7–9)

**Diagnosis:** This species can be distinguished from other European species genera by the combination of the following characters: fore wing with vein 3rs-m present, mesopleuron punctate (Fig. 8), mesosoma with red marks, female with ovipositor approximately 2.0 times as long as hind tibia, and paramere of male rounded apically (Fig. 9).

**Material examined:** ROMANIA: ♀, 6 ♂, Ceahlau, Duruitoarea (locality 15 on Fig. 12), 12.VII.1967 (leg. C. Pisica) (UAIC). UKRAINE: ♀, Ivano-Frankivsk Region, Bogorodchany

District, Mochary, 48°50'51.17"N, 24°35'26.91"E, 300-350 m, mixed forest, 5 km NE of Bogorodchany (locality 1 on Fig. 12), sweep netting, 19.VII.2012 (leg. O. Varga) (SIZK).

***Poemenia hectica* (Gravenhorst, 1829)** (Figs. 10–11)

**Diagnosis:** This species is similar to *P. collaris*, but has a rugulose mesopleuron with indistinct punctures (Fig. 10), a black mesosoma, and paramere of male with apically prolonged and narrowed apex (Fig. 11).

**Material examined:** ROMANIA: ♀, Maramures Country, Prislop Pass (locality 10 on Fig. 12), 7.VIII.1971 (misidentified by C. Pisica as *Poemenia collaris*); ♀, Suceava Country, Mestecanis (locality 11 on Fig. 12), 27.VI.1971 (leg. I. Nemes); ♀, Neamt Country, Cheile Bicazului (locality 17 on Fig. 12), 15.VII.1979 (misidentified by C. Pisica as *Poemenia collaris*) (UAIC). UKRAINE: ♀, Ivano-Frankivsk Region, Bogorodchany District, Mochary, 48°50'51.17"N, 24°35'26.91"E, 300-350 m, mixed forest, 5 km NE of Bogorodchany (locality 1 on Fig. 12), sweep netting, 30.V.2011; ♀, ibid., sweep netting, 4.VI.2011; ♀, ibid., sweep netting, 12.V.2012; ♀, ibid., sweep netting, 29.V.2012; ♀, ibid., sweep netting, 25.VI.2012; 2 ♀, ibid., trunk trap, 11–26.V.2014; 3 ♀, ibid., trunk trap, 26.V–9.VI.2014; 3 ♀, ibid., trunk trap, 9–27.VI.2014; ♀, ibid., trunk trap, 27.VI.–13.VII.2014; ♀, ibid., trunk trap, 29.VII.–15.VIII.2014; ♀, ibid., trunk trap, 31.VIII.–14.IX.2014; ♀, Dibrova, 48°46'10.35"N, 24°30'20.28"E, 310 m, oak forest, 5 km SW of Bogorodchany (locality 1 on Fig. 12), sweep netting, 5.VI.2011; ♀, ibid., sweep netting, 23.VI.2011; ♂, ibid., sweep netting, 6.VI.2013; ♀, ibid., sweep netting, 18.VI.2013; 5 ♀, Gorgany, 48°36'42.77"N, 24°09'10.69"E, 1200 m, coniferous forest, 5 km SW of Stara Guta (locality 2 on Fig. 12), sweep netting, 8–9.VI.2012; 2 ♀, ibid., sweep netting, 1.VII.2012; ♀, trunk trap, 30.V.–20.VI.2013; ♀, ibid., sweep netting, 20.VI.2013; 2 ♀, ♂, Nadvirna District, Gorgany, Elmy, 48°24’39.50”N, 24°24’50.28”E, 800-900 m, coniferous forest, 15 km SW of Yaremche (locality 3 on Fig. 12), sweep netting, 8.VI.2013; ♂, Transcarpathian Region, Rakhiv District, slopes of m. Sheshul, 48°09’23.13”N, 24°21’27.15”E, 1400-1500 m, subalpine zone, 6-7 km E of Kvasy (locality 5 on Fig. 12), sweep netting, 15.VI.2013 (leg. O. Varga); ♀, Golovach, near Bogdan (locality 6 on Fig. 12), 7.VI.1969 (leg. V. Tolkanitz); ♀, Svydovets, 48°09'08.89"N, 24°15'58.35"E, 850-900 m, beech forest, 2-3 km NW of Kvasy (locality 4 on Fig. 12), trunk trap, 5–29.VI.2014; ♀, ibid., trunk trap, 29.VI.–15.VII.2014; ♀, ibid., Malaise trap, 29.VI.–15.VII.2014 (leg. O. Varga) (SIZK).

***Poemenia notata* Holmgren, 1859**

**Diagnosis:** This species can be distinguished from other European species genera by the combination of the following characters: fore wing with vein 3rs-m absent, mesosoma with red marks, and metasomal tergites finely punctate.

**Material examined:** UKRAINE: ♀, Ivano-Frankivsk Region, Bogorodchany District, Zhbyr, 48°47'4.92"N, 24°28'46.45"E, 400 m, mixed forest, 7-8 km SW of Bogorodchany (locality 1 on Fig. 12), sweep netting, 24.VI.2012 (leg. O. Varga) (SIZK).

**Genus *Pseudorhyssa* Merrill, 1915**

**Diagnosis:** This genus is distinguishable from other Poemeniinae genera in having a distinct epicnemial carina, mesoscutum with transverse rugae, small, apically notched clypeus, second metasomal tergite with basolateral grooves.

*Pseudorhyssa* is a Holarctic genus with 3 species, 2 of them occur in Europe (Yu *et. al.* 2012) and have been found in Carpathians.


**Figures 6–11.** *Poemenia* spp. **6,** *P. brachyura* Holmgren, 1860, lateral view of female habitus; **7–9,** *P. collaris* (Haupt, 1917): **7,** lateral view of male habitus; **8,** lateral view of female mesopleuron; **9,** lateral view of male parameres; **10–11,** *P. hectica* (Gravenhorst, 1829): **10,** lateral view of female mesopleuron; **11,** lateral view of male parameres.

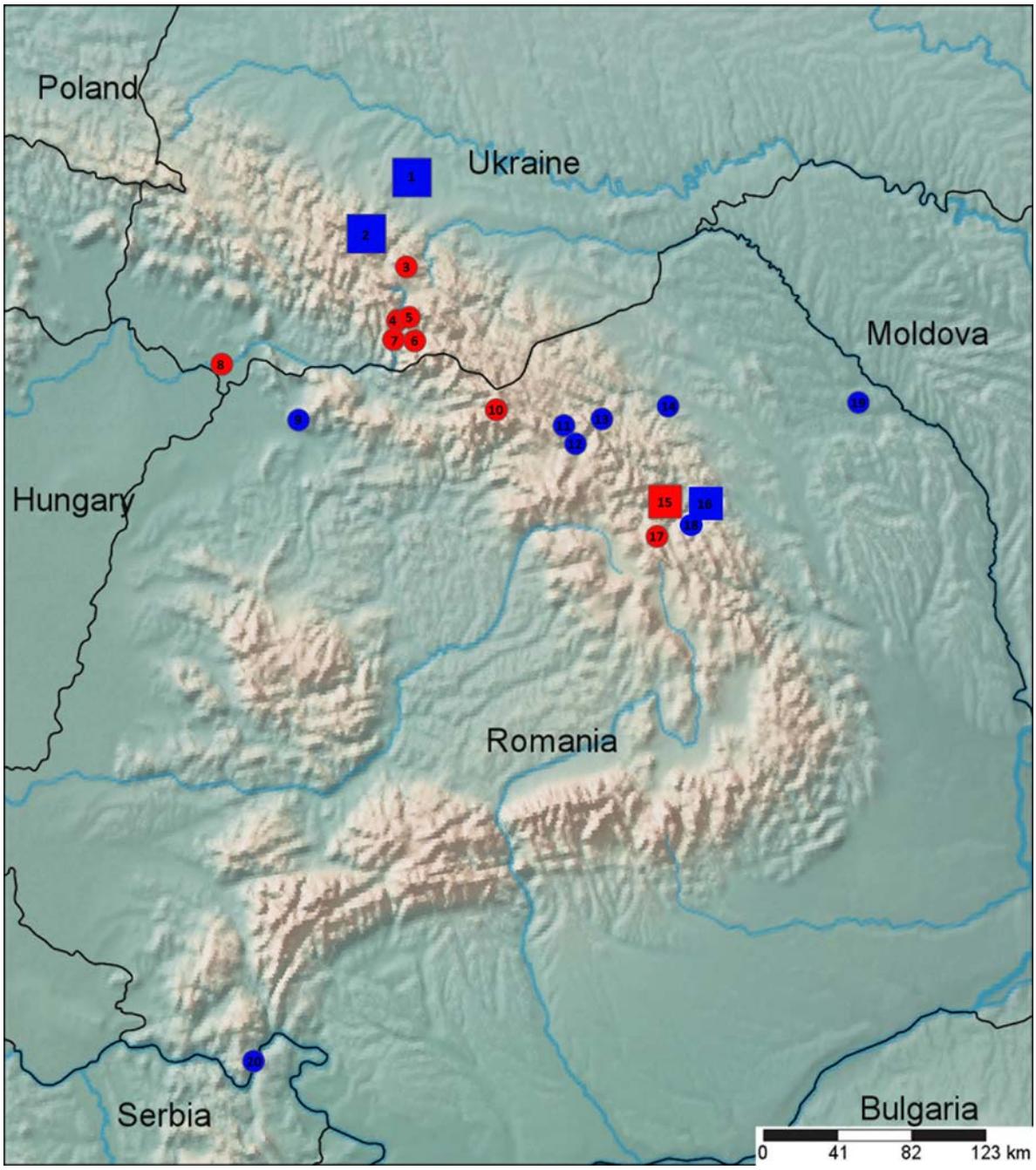



**Figure 12.** Carpathian Poemenninae distribution map. Circle indicates a single collecting locality and quadrate indicates a group of closely situated localities (for locality number see 'material examined'). Symbols marked with red indicate localities in the nature protected areas).

***Pseudorhyssa alpestris* (Holmgren, 1860)**

**Diagnosis:** This species can be distinguished from another European species by the red hind coxae and metasomal tergites I-II usually with smooth reddish triangle apically (sometimes fuscous and almost indistinct).

**Material examined:** ROMANIA: ♀, Suceava Country, Zugreni (locality 12 on Fig. 12), 21.VI.1984; ♀, Malini (locality 14 on Fig. 12), 26.V.1962 (leg. C. Pisica) (UAIC). UKRAINE: ♂, Ivano-Frankivsk Region, Bogorodchany District, Mochary, 48°50'51.17"N,

24°35'26.91"E, 300-350 m, mixed forest, 5 km NE of Bogorodchany (locality 1 on Fig. 12), sweep netting, 1.V.2012; ♂, ibid., sweep netting, 6.V.2012; 7 ♂, Dibrova, 48°46'10.35"N, 24°30'20.28"E, 310 m, oak forest, 5 km SW of Bogorodchany (locality 1 on Fig. 12), sweep netting, 27.IV.2014; ♀, Transcarpathian Region, Vinogradiv District, Nove Selo (locality 8 on Fig. 12), 31.V.1963 (SIZK).

***Pseudorhyssa nigricornis* (Ratzeburg, 1852)**

**Diagnosis:** This species can be distinguished from another European species by the black hind coxae and entirely black metasoma.

**Material examined:** ROMANIA: ♀, Ceahlau, Duruitoarea (locality 15 on Fig. 12), 11.VII.1964; ♀, ibid. 12.VII.1964 (leg. C. Pisica) (UAIC). UKRAINE: ♂, Ivano-Frankivsk Region, Bogorodchany District, Mochary, 48°50'51.17"N, 24°35'26.91"E, 300-350 m, mixed forest, 5 km NE of Bogorodchany (locality 1 on Fig. 12), sweep netting, 10.V.2011; ♀, ibid., sweep netting, 30.V.2011; ♀, ibid., sweep netting, 6.VI.2011; ♀, ibid., sweep netting, 24.VII.2012; 7 ♀, ♂, ibid., trunk trap, 11–26.V.2014; 7 ♀, ibid., trunk trap, 26.V.–9.VI.2014; ♀, ibid., trunk trap, 27.VI.–31.VII.2014; ♀, Zhbyr, 48°47'4.92"N, 24°28'46.45"E, 400 m, mixed forest, 7-8 km SW of Bogorodchany (locality 1 on Fig. 12), sweep netting, 18.V.2011; ♀, ibid., sweep netting, 23.V.2012; 2 ♂, Dibrova, 48°46'10.35"N, 24°30'20.28"E, 310 m, oak forest, 5 km SW of Bogorodchany (locality 1 on Fig. 12), sweep netting, 19.V.2011; ♂, ibid., sweep netting, 10–11.V.2012; ♀, Gorgany, 48°36'42.77"N, 24°09'10.69"E, 1200 m, coniferous forest, 5 km SW of Stara Guta (locality 2 on Fig. 12), sweep netting, 8–9.VI.2012; 6 ♀, Nadvirna District, Gorgany, Elmy, 48°24’39.50”N, 24°24’50.28”E, 800-900 m, coniferous forest, 15 km SW of Yaremche (locality 3 on Fig. 12), sweep netting, 14.VII.2011; 2 ♀, ibid., sweep netting, 20–23.VI.2012; 2 ♀, ♂, ibid., sweep netting, 8.VI.2013 (leg. O. Varga) (SIZK).

# Discussion

**Remarks on Poemeniinae collection deposited in UAIC.**

According to Yu *et. al.* (2012), most of the specimens from Ichneumonidae collection (including types), published by M. Constantineanu and C. Pisica are deposited at the Faculty of Biology (UAIC) in Iasi, Romania. In reality, all M. Constantineanu’s collection was removed to his home and after his death was passed to his son, R. Constantineanu. Currently, this collection is stored and abandoned in M. Constantineanu’s house, being unavailable for study because R. Constantineanu doesn’t give an access to the collection. So, real condition of specimens (including types) cannot be checked. C. Pisica prepared his own collection, which is now deposited at the Faculty of Biology (UAIC). This collection contains specimens, identified by C. Pisica, and a large part of unsorted ichneumonids (approximately 30–40% of collection). All material were examined, sorted and identified or re-identified (for misidentification see comments under each species).

**High-altitude zone distribution and seasonal dynamics of Poemeniinae species in the Ukrainian Carpathians.**

During the investigations carried out in various locations of the Ukrainian Carpathians in 2009–2014 nine species of the subfamily Poemeniinae were recorded. One genus and five species were recorded for the first time from Ukraine. The most abundant Poemeniinae

species between 2009 and 2014 was *N. collaris* (nearly 50 % of the total number of specimens).

Poemeniinae species have been recorded in various high-altitude zones of the Ukrainian Carpathians (Table 1). Poemeniinae species were most abundant in the foothill oak forest zone, reaching up to 150–400 m a. s. l. in Precarpathia and Transcarpathian lowland with mixed forests, where the main tree species are *Quercus robur*, *Q. rubra*, *Caprinus* sp., *Fraxinus* sp., *Picea abies*, *Abies alba*, and *Pinus sylvestris*, where all nine species were collected. All *Poemenia* and *Neoxorides* species, and *Pseudorhyssa nigricornis* are probably associated with xylobionts living in dead trunks of conifers: crabronid wasps, cerambycids and rhyssinae wasps respectively. These parasitoids can be usually found near *Picea abies* and *Abies alba* trunks. Another two species, *Pseudorhyssa alpestris* and *Deuteroxorides elevator*, are associated with xylobionts on deciduous trees and shrubs. *P. alpestris* seems to be a cleptoparasite of *Rhyssella approximator* (Fabricius, 1793) infesting woodwasps in shrubs, such as *Corylus avellana*. *D. elevator* is probably a parasitoid of cerambycids and was found under bark and near logs of *Quercus robur*. Two *Poemenia* species, *P. brachyura* and *P. hectica*, were found in the beech forest zone (400–1300 m a. s. l.) in Transcarpathia. Unlike the previous zone, here these species associated with aculeates nesting in *Fagus sylvatica* trunks. Six species were found in the coniferous boreal forest zone, situated at 900–1600 m a. s. l. in the mountainous part of the Carpathians, where the *Piceeta-abietis* community predominates. In addition, three of them, *Deuteroxorides elevator*, *Poemenia hectica*, and *Neoxorides collaris*, were also collected in the subalpine zone, at 1400–2061 m a. s. l., known as polonynys, which are high altitude open grasslands, partly taken over by bush. Two of these Poemeniinae species, *D. elevator* and *P hectica* are probably associated here with logs of *Pinus mugo* and *Dushekia viridis* and *N. collaris* was collected near dead *Picea abies* trunks.

**Table 1.** High-altitude zone distribution of Poemeniinae species in the Ukrainian Carpathians.

| Species | **foothill oak forest zone** 150–400 m a. s. l.) | **beech forest zone** 400–1300 m a. s. l.) | **coniferous boreal forest zone** 900–1000 m a. s. l.) | **subalpine zone** 1400–2061 m a. s. l.) |
|---|---|---|---|---|
| ***Deuteroxorides elevator*** | + | | + | + |
| ***Neoxorides collaris*** | + | | + | + |
| ***Neoxorides varipes*** | + | | + | |
| ***Poemenia brachyura*** | + | + | + | |
| ***Poemenia collaris*** | + | | | |
| ***Poemenia hectica*** | + | + | + | + |
| ***Poemenia notata*** | + | | | |
| ***Pseudorhyssa alpestris*** | + | | | |
| ***Pseudorhyssa nigricornis*** | + | | + | |

The flight season of Poemeniinae adults is prolonged, lasting more than five months, from the last third of April to the last third of September (Table 2.). The flight period of *Deuteroxorides elevator* is the most prolonged, lasting from the end of April to the end of September. These species seems to be a plurivoltine and has two generations at low altitudes and one generation in the subalpine zone per season. The similar situation can be found on the Romanian territory: according to Constantineanu and Pisica (1977) the flight period of this species lasting from May to September. The flight periods of another two species shorter,

lasting in *Neoxorides collaris* from the last third of April to the last third of August (from June to September in Romania (Constantineanu & Pisica 1977)) and in *Poemenia hectica* from the middle of May to the middle of August (examined specimens from Romania were collected from June to August). *N. collaris* most likely has two generations: spring generation with smaller specimens and summer generation (begins in July) with larger and generally stouter specimens, which probably depends from the hosts. There is a similar situation with *P. hectica*, but in this species probably has one generation ( in the middle of summer) in the coniferous and subalpine zones, and the size of generations doesn't vary.

**Table 2.** Appearance of Poemeniinae species adults in ten-day periods of the 2009-2014 seasons.

| Species | April | May | | | June | | | July | | | Aug | | | Sep | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| ***Deuteroxorides elevator*** | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| ***Neoxorides collaris*** | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| ***Neoxorides varipes*** | ■ | ■ | ■ | ■ | | | | ■ | | | | | | | | |
| ***Poemenia brachyura*** | | | | ■ | ■ | ■ | | | | | ■ | | | | | |
| ***Poemenia collaris*** | | | | | | | | | ■ | | | | | | | |
| ***Poemenia hectica*** | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |
| ***Poemenia notata*** | | | | | | | ■ | | | | | | | | | |
| ***Pseudorhyssa aplestris*** | ■ | ■ | | ■ | | | | | | | | | | | | |
| ***Pseudorhyssa nigricornis*** | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | |

The flight periods of *P. brachyura* and *N. varipes* are prolonged, but disrupt, *P. brachyura* was collected from the end of May to the middle of June, and at the beginning of August (one female specimen, collected by previous authors in the beech forest zone) and *N. varipes* was collected from the end of April to the end of May, and at the beginning of July. Romanian records of *P. brachyura* belong only to July (material examined; Constantineanu & Pisica 1977).

*P. collaris* and *P. notata* seems to be rare species. First one was collected only in the middle of July. According to the examined material and references (Constantineanu & Pisica 1977) this species can be found in Romania during June and July. Second species was collcted only during the last third of June (Romanian record belongs to June also (Constantineanu & Pisica 1977)).

The flight period of *Pseudorhyssa nigricornis* is prolonged, lasting from the beginning of May to the end of July (from June to July in the coniferous boreal zone). The similar situation can be found on the Romanian territory: according to Constantineanu and Pisica (1977) the flight period of this species lasting from May to July. Another species, *P. alpestris* was collected from the last third of April and during May, while the Romanian specimens can be found from May to July (material examined; Constantineanu & Pisica 1977).

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*Correspondence*: Oleksandr Varga, e-mail*:* *Sancho.Varga@gmail.com*
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