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THE SPECIES OF *ERYTHMELUS* ENOCK, 1909 (*HYMENOPTERA*, *MIMARIDAE*) IN THE BALKAN PENINSULA

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Abstract. Faunistic data about all the species of genus *Erythmelus* Enock, 1909, established by now in the Balkan Peninsula, are given. The species to the fauna of the Balkan Peninsula are *E. angelovi* Donev; *E. lygivorus* Viggiani et Jesu; *E. flavovarius* Walker; *E. israeliensis* Viggiani et Jesu; *E. soykai* Donev; *E. agilis* Enock; and *E. panis* Enock. Keys of females of four species of the subgenus *Erythmelus* and two species of the subgenus *Enaesius* are given.

Key words. *Mymaridae*, *Erythmelus*, species, Balkan Peninsula, key.

INTRODUCTION

The species of the genus *Erythmelus* Enock, 1909 contains 16 nominal species in the Palearctic realm and classified into two subgenera *Erythmelus* and *Parallelaptera* Enock. The subgenus *Erythmelus* is divided into three species groups - *agilis*, *flavovarius* and *helopeltidis* (TRIAPITSYN, 2003). Many of the recorded species are known as egg-parasites of Heteroptera (mainly Miridae and Tingidae) (DONEV, 1987; GONCHARENKO and FURSOV, 1988; NOYES, 2001). It is proposed here the number of subgenera to be 3: *Erythmeus*, *Enaesius* and *Parallaptera*, on the basis of the morphological differences between their species-groups.

Genus *Erythmelus* Enock, 1909

Parallelaptera, Enock, 1909: Type-species: *Parallelaptera panis* Enock, p.454.
Erythmelus Enock, 1909: Type-species: *Erythmelus goochi* Enock, p.454.

- Enaesius* Enoch, 1909: Type-species: *Enaesius agilis* Enoch, p.456.
Anthemiella, Girault, 1911: Type-species: *Anthemiella rex* Girault, p.185.
Erythmelellus Viggiani et Jesu, 1985: Type-species: *Erythmelellus lygivorus* Viggiani et Jesu, 487.

Key of the subgenera of genus *Erythmelus* in the Balkan Peninsula

1. Funicle of female antenna usually 5-segmented, flagelum of male antenna 10-segmented and F2 much shorter than F1 or F3; forewing margins almost parallel.
.....*Parallelaptera*
- Funicle of female antenna usually 6-segmented, flagelum of male antenna 11 segmented, F 2 about as long or longer than F 1 or F 3, forewings margins not parallel.....2
2. Funicular segments long. Club shorter than funicle segments F4-F6 together. Sensory ridges on funicle segments present for F6 and other funicle segments..... *Enaesius*
- Funicular segments short, progressively longer than preceding ones. Club long an equal length for F 3-F 6 together or longer. Sensory ridges on funicle segments present for F 6 only *Erythmelus*

Subgenus *Erythmelus* Enoch, 1909

- Erythmelus* Enoch, 1909:454; Debauche, 1948:192; Kryger, 1950: 58-59; Anneske & Douth, 1961: 18; Hellen, 1974: 28; Trjapitzin, 1978: 527.
Erythmelus (as a subgenus of *Erythmelus*): Beardsley et Huber, 2000: 14.
Erythmelellus (as a subgenus of *Erythmelus*): Viggiani et Jesu, 1985: 487.

Key of the species groups

1. Ovipositor long, reaching by the base of gaster with a strong arch shaped part. Ovipositor hind tibia ratio about and longer than 2.....*helopeltidis* group
- Ovipositor short, not reaching by the base of gaster. Ovipositor hind tibia ratio less than 2.....*flavovarius* group

***helopeltidis* species group**

This species group is very closely related to the *flavovarius* group. The species characterized by a long ovipositor, reaching by the base of gaster with a strong arch shaped part. Chaetotaxy on the forewing present only at the wing apex. Funicle segments longer than wide. Ovipositor/ hind tibia ratio about 2,3- 2,5.

Key of the species

1. Club equal length for F4, F5, and F6 taken together. Funicle segments 1-5 two times longer than wide. F6 three times longer than wide..... *angelovi*
 - Club equal length for F3, F4, F5, and F6 taken together. Funicle segments 1 -5 mostly one and a half longer than wide. F6 two times longer than wide *lygivorus*

***Erythmelus (Erythmelus) angelovi* Donev, 1985**

Erythmelus angelovi Donev , 1985 b: 77

Diagnosis. (Female). General color dark brown. Head , antennae, thorax and apical half of gaster dark brown; fore coxae brown, medial and hind coxae yellow- brown, basal half of gaster orange brown. Antennae: Funicle segments 1-5 two times longer than wide. F6 three times longer than wide. Club equal length for F4, F5, and F6 taken together. F6 with two sensory ridges, clava with 5 sensory ridges. Characterized by a long ovipositor, reaching by the base of gaster with a strong arch shaped part. Ovipositor/ hind tibia ratio about 2,5. FWL/ FWW ratio 4,14.

Hosts. Unknown.

Distribution: Bulgaria, Kirghizstan.

Material examined.

Bulgaria (DONEV, 1985: 77) Rhodopes: above Assenovgrad, place "Lukovitza", 08.VI. 1980, 1 female.

***Erythmelus (Erythmelus) lygivorus* Viggiani et Jesu, 1985**

Donev, 1988 b:205 – *Erythmelus angelovi*

Diagnosis. (Female). General color dark brown. Head, thorax and apical half of gaster dark brown; legs dark brown, fore tibiae and basal half of medial and hind tibiae yellowish, basal third of gaster orange brown. Antennae: Funicle segments 1-5 mostly one and a half longer than wide. F6 two times longer than wide. Club equal length for F3, F4, F5, and F6 taken together. F6 with two sensory ridges, clava with 5 sensory ridges. Characterized by a long ovipositor, reaching by the base of gaster with a strong arch shaped part. Ovipositor/ hind tibia ratio about 2,3. FWL/ FWW ratio about 4,2 .

Hosts. *Lygus pratensis* Linn. and *L. rugilipennis* Poppius (Miridae) (VIGGIANI and JESU, 1985).

Distribution: Spain, France, Italy, Hungary, Bulgaria.

Material examined.

Bulgaria (DONEV, 1988:205): South-West Bulgaria, Sandanski, 20.V.1988, 1 female; North- Eastern Bulgaria (Silistra, 17.VIII.1988 2 females); Mt. Rila (pl. „Bodrost“, 02.VIII.1979, 1 female).

***flavovarius* species group**

This species group is characterized by a relatively compact antenna with and funicle segments slightly elongated to the apex. F 6 usually longest with 1 or 2 sensilla. Pedicel equal length or longer than F1-F2 taken together. Forewing disc with few or a large bare area in the apical half.

Key of the species

1. Ovipositor/middle tibia ratio about 1,6-1,8. Ovipositor occupying about 0,8 from gaster length. Forewing disc uniformly setose at middle part to apex***flavovaris***
- Ovipositor/middle tibia ratio about 1,2. Ovipositor occupying about 0,5 from gaster length. Forewing disc with 5-8 microtrichia in anterior margin of apex and 8-10 microtrichia in posterior margin..... ***israeliensis***

***Erythmelus (Erythmelus) flavovarius* (Walker,1846)**

Panthus flavovarius Walker, 1846:

Erythmelus goochi Enoch,1909:

Enaesus parvus Soyka,1932:

Enaesaius dichromocnemus Novitcky,1953

Diagnosis. (Female). General color brown. Posterior half, lateral lobes of mesoscutum, basal half of gaster and legs yellow. Antennae:Scape and pedicel yellowish; funicular segments light brown; all segments of funicle longer than wide. F1- F5 usually without longitudinal sensilla. F6 with 1 or 2 longitudinal sensilla, 3 times longer than wide. Club equal length for F3, F4, F5, and F6 taken together, with 5 sensory ridges. Forewing 4,5-5 x as long as wide, 1/3 of apical part of disc more or less evenly setose, longest marginal cilia 1,5-1,8 maximal forewing width. Ovipositor occupying about 0,8 of gaster length, barely exerted beyond apex. Ovipositor/metatibia ratio about 1,6-1,8.

Hosts. *Pilophorus perplexus* Douglas et Scott, 1875 (DONEV, 1987); *Polymerus cognatus* (Fieber, 1858) (Miridae) (NOYES, 2001).

Distribution:Spain, France, Belgium, Austria, Sweden, Finland, Germany, Switzerland, Netherlands, Denmark, Poland, Italy, Hungary, Greece, Romania, Bulgaria, Russia, Turkmenistan.

Material examined.

Bulgaria (DONEV, 1987;1988A;1988B): South-West Bulgaria, vill. Novo Delchevo, 20.V.1988,1 female; Mt. Rila (pl.“ Bodrost“ 21.VII.1984, 2 females and 2 males). North- Eastern Bulgaria (reserve “Srebarna“, 17.VIII.1988 3 females, 5 males; vill. Kralevo, 30.VI.1988, 4 females; Dobrich, 12.V.1988, 1 female); Rhodopes (peak „Snezhanka“, 24.VIII. 1980, 1 male; 11.VIII. 1981, 1 female; peak „Persenk“, 2.VIII.1978, 1 female; Kardzhali, 18.V.1981, 2 females, vill. Orechovo, 4.VIII. 1979)

North-West Bulgaria (Montana, 4.V.2000, 1 female). Central Bulgaria (vill.Pavel Banya, VII. 1987, 4 females).

Serbia: (DONEV, 1985) Voivodina (nr. Novi Sad, 28.VI.1984, 3 females, 1 male).

Greece: (DONEV,1985) Peloponnes (Mt. Taigetos,11.VII.1983, 1 female; Sparti, 11.VII.1983, 1 female) Central Greece (Levadia, 14.VII.1983, 2 females).

***Erythmelus (Erythmelus) israeliensis* Viggiani et Jesu,1985**

Erythmelus israeliensis Viggiani et Jesu,1985:485

Diagnosis. (Female). General color dark brown and close to *E. flavovarius*. Posterior half, lateral lobes of mesoscutum, basal half of gaster and legs light brown. Antennae: scape, pedicel and all funicular segments light brown; F1 subglobular, F2-F5 cylindrical, usually without sensory ridges. F6 with 1 sensory ridges. Club with 5 sensory ridges. Forewing disc with 5-8 microtrichia in anterior margin of apex and 8-10 microtrichia in posterior margin. Forewing 5,3-5,5 x as long as wide, Ovipositor/middle tibia ratio about 1,2. Ovipositor occupying about 0,5 from gaster length.

Hosts. Unknown.

Distribution: Bulgaria, Russia, Turkmenistan, Iran, Israel.

Material examined.

Bulgaria (DONEV,1999): North- Eastern Bulgaria (Silistra, reserve „ Srebarna“, 17.VIII.1988, 7 females, 2 males;

Subgenus *Enaesius* Enoch 1909

Enaesius Enoch,1909: Type-species: *Enaesius agilis* Enoch, p.456.

Diagnosis. This subgenus includes middle and large species (about 0,8- 1.2 mm.) It is characterized by a relatively slender female antenna, with funicular segments cylindrical and subequal in length. In the middle species F1 at least 0,7 length of the pedicel, but in the larger -F1 as long and longer than pedicel. Forewing disc usually with microtrichia, more or less uniformly setose in the apical half .

Key of the species

1. Forewing 3,5 x as long as wide. F4,F5 and F6 with sensory ridges . Club with 5 sensory ridges, 3 x longer than width..... *soykai*
- Forewing narrow 5,5 x as long as wide. F5 without sensory ridges. Club with 5 sensory ridges, 4,5 x longer than width *agilis*

***Erythmelus (Enaesius) agilis* (Enock,1909)**

Enaesius agilis Enoch, 1909: 456.

Enaesius laticeps Enoch, 1909: 456.

Enaesius limburgensis Soyka, 1932, 82.

Diagnosis. (Female): General color dark brown. Midlobe of mesoscutum with a light brown, transverse, median band, and with basal two terga of gaster yellow. Legs yellow. Antennae: scape and pedicel light brown to yellowish; funicular segments brown; F1- F3 usually without longitudinal sensilla. F4 with 1 or 2 longitudinal sensilla, F6 with 2 longitudinal sensilla. Club with 5 sensory ridges, 4,5 x longer than width. Forewing 5,0-5,7 x as long as wide, the longest marginal cilia 0.9-1.1 x maximal forewing width, Forewing disc usually with microtrichia, more or less uniformly setose in the apical half. Ovipositor occupying about 0,8 of gaster length, a little exerted beyond apex. Ovipositor/ metatibia ratio about 1,5.

Hosts. *Leptopterna dolabrata* (Linnaeus, 1758) (Miridae) (NOYES,2001)

Distribution: England, Belgium, Sweden, Finland, Germany, Switzerland, Netherlands, Denmark, Italy, Greece, Bulgaria, Russia, Kcrghczstan.

Material examined.

Bulgaria: Rhodopes (place "Rozhen", 03.VIII.1975, 1 female; Kardzhali, 15.V.1981, 1 female, 3 male; Momchilgrad, 10.V.1981, 1 female; vill. Avren, 19.V.1981, 2 males; vill. Shiroka Polyana, 18.V.1981, 1 male); North-West Bulgaria (Klisurski monastery, 1.V.2000, 1 female; Montana, 4.V.2000, 3 females). Mt. Vitosha (Ridni Doll, 1-30.VI.2000, 1 female, 1 male). New to Bulgaria.

Serbia: (DONEV, 1985) (nr. Novi Sad, 28.VI.1984, 3 females, 1 male).

Macedonia: (Kavadartzi, 21.V.1987, 1 female, 1 male). New to the Republic of Macedonia.

Greece: (DONEV, 1985) Peloponnes (Leonidion, 11.VII.1983, 2 ♂; Taigetos, 1 ♀, 2 ♂); Olympos, (m.h. Prioni, 07.VII.1983, 2 males; vill. Agios Dionissios, 07.VII.1983, 1 female, 1 male).

***Erythmelus (Enaesius) soykai* Donev, 1998**

Erythmelus (Enaesius) soykai Donev, 1998: 185.

Erythmelus (Enaesius) soykai Donev, 1998, Trjapitzin, 2003

Diagnosis. (Female). General color brown; head and metasoma dark brown. Lateral parts of the mesoscutum, mesopleura and apical part of fore and hind coxae yellow-brown. Basal part of the metasoma yellowish. Antennae: scape long 3,2 x as long as pedicel. F1 a little shorter than pedicel; F4, with one sensory ridge; F5 and F6 with two sensory ridges. Club with 5 sensory ridges, 3 x longer than width. Forewing 3,5 x as long as wide, the longest marginal cilia 0,58 x maximal forewing width. F WL/ WWW ratio about 4. Ovipositor equal length with gaster, a little exerted beyond apex (about 0,8). Ovipositor/ metatibia ratio about 1,3-1,4.

Hosts. Unknown.

Distribution: Austria, Hungary, Bulgaria, Kcrghizstan.

Material examined.

Bulgaria. North-West Bulgaria (Montana, 4.V.2000, 1 female). New to Bulgaria.

Subgenus *Parallelaptera* Enoch,1909

Parallelaptera Enoch,1909:454

Anthemella Girault, 1911:187.

Erythmelus Schauff, 1984:45.

Diagnosis. This subgenus includes small species (body length of most species is about 0,5 mm). Funicle of female antenna with 5 – segmented; flagelum of male antenna 10-segmented, F2 much shorter than F1 and F3. Forewing with almost parallel anterior and posterior margins beyond venation.

***Erythmelus (Parallelaptera) panis* Enoch, 1909**

Parallelaptera panis Enoch, 1909: 454

Parallelaptera foucarti Mathot in Demaire, 1973: 30

Parallelaptera panchama Subba Rao, 1989:165

Diagnosis. (Female). General color brown; head and lateral part of metasoma dark brown. Antennae, legs, axillae and basal part of the metasoma light brown. Antennae: scape long 2,5 x as long as pedicel, 4x longer than wigth. F1 and F2 equal length than pedicel; F3- F4, equal length or slightly longer than F5. F5 with two sensory ridges. Club with 5 sensory ridges, 4,5 x longer than width. Forewing 9 x as long as wide, the longest marginal cilia 4-4,2 x maximal forewing width. F WL/ WWW ratio about 4. Ovipositor longer than gaster, a little exserted beyond apex.(about 0,8). Ovipositor/ metatibia ratio about 1,4.

Hosts. *Corythucha ciliata* (Sey,1832) (VIGGIANI and JESU,1988) and *Stephanitis pyri* (Fabricius,1775) (GONCHARENKO and FURSOV,1988; AKBARZADEH-SHOUKAT,1998)

Distribution: Spain, France, Belgium, Austria, Sweden, Finland, Germany, Switzerland, Norway, Netherlands, Denmark, Poland, Italy, Hungary, Greece, Romania, Bulgaria, Russia, Turkmenistan, Iran, India, Congo (Zair), Ruanda.

Material examined.

Bulgaria (DONEV, 1981): Rhodopes (mountain hostel „Persenk“ 04.VIII.1979, 1 female; v.Javorovo, 11.VII.1978, 1 female, 1 male; ab. Assenovgrad, place „Lukovitza“, 8.VI.1980, 1 male); North-West Bulgaria (Montana, 4.V.2000, 1 female); Mt. Rila (place „Bodrost“, 20.VII.1983, 2 females); North- Eastern Bulgaria (Silistra,17.VIII.1977, 7 females, 4 males); South Bulgaria (Sadovo, 16.VI. 1984, 3 females; vill. Muldava, 8.V.1980, 4 females,1 male);

Mt. Vitosha (above Sofia, 15.V.1984, 2 females, 1 male; Ridni Doll, 1-30.VI.2000, 2 females, 1 male); Mt. Strandzha (East of Elhovo, 15.V.1985, 1 female)

Greece: (DONEV, 1985) Peloponnes (Astros, 10.VII.1983, 2 females). Central Greece (Agrino, 14.V.1987, 1 female).

Serbia: (nr. Novi Sad, 15.V.1985, 2 females; 20.VI.1986, 1 female). New to Serbia.

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**ВИДОВЕТЕ ОТ РОД *ERYTHMELUS* ENOCK, 1909
(HYMENOPTERA, MIMARIDAE)
НА БАЛКАНСКИЯ ПОЛУОСТРОВ**

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(Резюме)

Съобщават се 7 вида от род *Erythmelus* за фауната на Балканския полуостров, разделени в 3 подрода (*Erythmleus*, *Enaesus*, *Parallelaptera*). Подрод *Erythmelus* е разделен на две групи от видове – *helopeltidis* и *flavovarius*. Предложени са определителни таблици на подродовете и групите от видове, и техните характеристики..

