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On the egg parasitoids of *Aproceros leucopoda* (Hymenoptera: Argidae), an invasive pest species from Japan

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Abstract. In this paper we present the parasitic Hymenoptera reared from *Aproceros leucopoda* Takeuchi, 1939 eggs and also we give notes regarding the different parasitoids of this invasive saw fly. *Asecodes* (*Teleopterus*) *erxias* (Walker, 1848) was reared for the first time from the eggs of *Aproceros leucopoda*. From unidentified eggs on *Ulmus minor* we also reared *Anastatus bifasciatus* (Geoffroy, 1785). From pupae of *A. leucopodae* emerged also few specimens of an ichneumonid wasp.
Key Words: *Asecodes* (*Teleopterus*) *erxias*, egg parasitoids, *Aproceros leucopoda*, new host record.

Rezumat: Lucrarea se intitulează "Parazitoizii oofagi ai speciei *Aproceros leucopoda* (Hymenoptera: Argidae), specie invazivă provenită din Japonia". În această lucrare prezentăm himenopterele parazitoide obținute din ouă şi pupe de *Aproceros leucopoda* Takeuchi, 1939, de asemenea dăm note despre diferiții parazitoizi ce atacă această specie invazivă de viespe fierăstrău. *Asecodes* (*Teleopterus*) *erxias* (Walker, 1848) este obținut pentru prima dată din ouă de *Aproceros leucopoda*. Din ouăle unei gazde neidentificate de pe *Ulmus minor* am obtinut de asemenea specia *Anastatus bifasciatus* (Geoffroy, 1785). Din pupe de *A. leucopodae* au rezultat şi câteva specimene de viespi ichneumonizi.
Cuvinte cheie: *Asecodes (Teleopterus) erxias*, parazitoizi oofagi, *Aproceros leucopoda*, gazdă nouă.

Introduction. *Aproceros leucopoda* Takeuchi, 1939 is a member of the Argidae, a group of sawflies, of which there are almost 900 species worldwide and 68 in Europe (Taeger & Blank 2008). The generally free-feeding larvae are usually monophagous or associated with several closely related host species of angiosperms. The Arginae, one of the two European subfamilies of Argidae, include a number of destructive, multivoltine species. The East Asian sawfly *Aproceros leucopoda* Takeuchi, 1939 causes outbreaks in south-eastern Europe and severely defoliates elms (Blank et al 2010; Taeger & Blank 2008). In Romania the biology of *A. leucopoda* was studied in detail by Cardaş et al (2010).

In this paper we present the known parasitoids obtained from *Aproceros leucopoda*. Until now the only known parasitoid of *A. leucopoda* was *Blondelia nigripes* (Fallén, 1810) (Diptera: Tachinidae) (Shima 2006). *Asecodes* (*T.*) *erxias* (Walker, 1848) was reared for the first time by us from the eggs of *Aproceros leucopoda* (Fig. 1). From unidentified eggs, collected from *Ulmus sp.* we reared also *Anastatus bifasciatus* (Geoffroy, 1785). From pupae of *A. leucopoda* collected from forest soil we reared also a parasitoid species belonging to the Family Ichneumonidae (Fig. 1). In this note we will present only the data obtained from the eggs of *A. leucopoda*.

Asecodes (*T.*) *erxias* (Walker, 1848) was recorded for the first time in Romania, from Uzlina - Dobrogea region by Andriescu (1993). *Anastatus bifasciatus* was recorded from Romania by many authors, e.g. Andriescu (2003). Contributions to the study of some egg parasitoids were made also by Pricop (2009).

Material and Method. Elm leafs with eggs of *Aproceros leucopoda* were collected in June and August from Dărăbani and Brodoc (Botoşani county) – Romania. The material was kept under laboratory conditions until the parasitoids emerged.

Results and Discussion. All data on reared material are presented in detail in Table 1 and Figure 1.

Table 1

Identified egg parasitoids associated with *Ulmus minor,* collected from Romania (see also Figure 1)

No.	*Species*	*Coll. locality and sample number*	*Day/month/ year*	*Specimens number and sex*	*Host*
1	*Asecodes erxias*	Dărăbani (BT) – S.1	1.VIII.2011	11♀+2♂	*Aproceros leucopoda*
2	*Asecodes erxias*	Dărăbani (BT) – S.2	1.VIII.2011	12♀+1♂	*A. leucopoda*
3	*Asecodes erxias*	Dărăbani (BT) – S.3	1.VIII.2011	15♀+1♂	*A. leucopoda*
4	*Anastatus bifasciatus*	Brodoc (BT)	27.VI.2011	3♂	unidentified

S1, S2, S3 = sample number

Family Eulophidae, Subfam. Entedontinae:
***Asecodes (=Teleopterus)* Walker**

In the Palearctic region, the egg-parasitism in Superfamily Chalcidoidea is present in 7 families: Aphelinidae, Encyrtidae, Eulophidae Mymaridae, Pteromalidae, Tetracampidae and Trichogrammatidae. Few egg parasitoids are grouped under *Asecodes* (=*Teleopterus*) belonging to Eulophidae*,* a genus with a worldwide distribution. Until present time are described only 20 species belonging to *Asecodes*, this species are parasitoids of different Diptera, Lepidoptera, Coleoptera and Hymenoptera (Noyes 2003). We treat here *Teleopterus* as a subgenus belonging to *Asecodes*, the forewings in *Teleopterus* are characteristic, the cause is the presence of 3 rows of hairs, two rows connected with the stigma and another one, the cubital line of hairs (Fig. 1e).

***Asecodes* (*Teleopterus*) *erxias* (Walker, 1848)** (= *Teleopterus bicolor* Erdos, 1955; *Omphale scutellata* Ferriere, 1952):

Material examined: a total of 38♀♀ and 4♂♂ (Tab. 1) (Leg. G. Cardaş), collected on 1.VIII.2011 from Dărăbani (BT = Botoşani). All the material except one female is deposited in the collection of the first author (P.EM. collection). A single female is deposited in the collection of the last author. A female is illustrated in Fig. 1. The species was identified with the key of Medvedev (Ed.) (1978) and Hansson (1994).

Primary hosts: *Cassida* sp.*, Cassida nebulosa* (Coleoptera: Chrysomelidae); *Agromyza oryzae, Liriomyza* sp., *Liriomyza trifolii*, *Phytomyza horticola* (Diptera: Agromyzidae); *Dacus oleae* (Diptera: Tephritidae); *Anoplonyx* sp., *Hemichroa croce*a, *Heterarthrus* sp., *Heterarthrus ochropodus* (Hymenoptera: Tenthredinidae); *Gracillaria syringella, Lithocolletis corylifoliella, Phyllocnistis citrella, Phyllocnistis citrella, Phyllonorycter laciniatae* (Lepidoptera: Gracillariidae); *Lyonetia clerkella* (Lepidoptera: Lyonetiidae); *Stigmella malella* (Lepidoptera: Nepticulidae); *Prays oleae* (Lepidoptera: Yponomeutidae) Boucek & Askew (1968), Noyes (2003), Viggiani & Pappas (1975)*.*

Parasitoid hosts: *Tetrastichus rhosaces* (Hymenoptera: Eulophidae) Szelényi (1964), *Cyrtoptyx dacicida* (Hymenoptera: Pteromalidae) (Boucek & Askew (1968), Noyes (2003), Viggiani & Pappas (1975))*. Asecodes* (*Teleopterus*) *erxias* (Walker, 1848) is now recorded for the first time from the eggs of *Aproceros leucopoda* (Hym.: Argidae)*.*

Plant associates: *Chenopodium album, Citrus* sp.*, Citrus aurantium, Colutea arborescens, Fraxinus excelsior, Olea europaea, Prunus persica, Solanum melongena, Ulmus laciniata* (Noyes 2003), now for the first time from *Ulmus minor* Mill.

Distribution: Holarctic region. The species is recorded for the first time from Moldova region (Romania).

Taxonomical note: In our specimens of *A. erxias* the forewings are a little broader than in the original redescription.

Figure. 1 *Aproceros leucopoda* attack and the two identified parasitoids associated with *Ulmus* sp.: a, b - attacked leaf with parasitized egg; c, d, e – habitus, female antenna and fore wing of *Asecodes erxias* (Walker, 1848) (Hym.: Eulophidae) emerging from egg; f, g, h, i – male antenna, forewing vein, male habitus and genitalia of *Anastatus bifasciatus* (Geoffroy, 1785) (Hym.: Eupelmidae); j – ichneumonid wasp (Hym.: Ichneumonidae) (original).

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