

Eurytoma caninae (Hymenoptera: Eurytomidae) in the parasitoid community of unilocular Diplolepis galls in the Carpathian Basin

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Abstract – *Eurytoma caninae* Lotfalizadeh et Delvare, 2007 is known as a parasitoid in *Diplolepis* Geoffroy, 1762 galls, however it has not been recorded until now from the unilocular galls of *D. eglanteriae* (Hartig, 1840) and from the Carpathian Basin. We analysed samples of *D. spinosissima* (Giraud, 1859), *D. nervosa* (Curtis, 1838) and *D. eglanteriae* galls in the eastern Carpathian Basin, Romania. Presence of *E. caninae* is reported from all three species' galls as new host association for *D. eglanteriae* and as new species for the Romanian fauna. New host plant species for *E. caninae*: *Rosa balsamica* Besser and *Rosa subcanina* (Christ) Vuk. are also reported. With 5 figures.

Key words – new host plant association, new insect host association, new species for fauna, Romania, *Rosa*

INTRODUCTION

One of the most intriguing model systems of multitrophic communities are those including insect herbivores and their parasitoids (STONE & SCHÖNRÖGGE 2003). These systems are species rich but confined usually to well delimited appearances like leaf mines or insect galls on different parts of plants (ASKEW 1980). Interactions between compounding species are approximately easy to map in comparison with large trophic webs (PIMM & LAWTON 1978). Therefore evolutionary or ecological aspects of trophic webs can be adequately investigated with these model systems (NYMAN *et al.* 2007). Another benefit of using these communities as study systems is the virtual knowledge of the taxonomy of component species. However, in the last decade, the use of integrative methods has led to the

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discovery of cryptic species and also other overlooked ones (LOTFALIZADEH *et al.* 2007, BOYADZHIEV & TODOROV 2013, AL KHATIB *et al.* 2014).

These communities occurring in galls caused on oaks (*Quercus* sp.) and roses (*Rosa* sp.) are compound by the gall inducer (the cynipid herbivore), its inquiline (plant consumer inhabitant) and parasitoids (predatory inhabitants). Parasitoids usually belong to the families of Chalcidoidea and Ichneumonoidea. Species belonging to the family Eurytomidae (Hymenoptera: Chalcidoidea) are a few of the parasitoids associated with cynipid galls on roses (*Rosa* sp.) (ASKEW *et al.* 2006a). Eurytomids are usually seed consumers (LAKATOS *et al.* 2016) or are parasitising herbivore insects (STOJANOVA *et al.* 2011, ZHANG *et al.* 2014). Eurytomids developing in cynipid galls are considered to be omnivorous, presumably because they feed also on gall tissues (CLARIDGE & ASKEW 1960).

Eurytomidae inhabiting *Diplolepis* galls in the Nearctic are more speciose than those from the Palaearctic (ASKEW *et al.* 2006a, ZHANG *et al.* 2017). However, in the Nearctic the number of *Diplolepis* species is also higher than in the Palaearctic (ABE *et al.* 2007). In the Western Palaearctic usually only one species of Eurytomidae occurs in *Diplolepis* galls: *Eurytoma rosae* Nees, 1834 which is the parasitoid of the inquiline *Periclistus brandtii* Ratzeburg, 1831. *E. caninae* Lotfalizadeh et Delvare, 2007 was only recently described from the Mediterranean and from the Middle East and it was also confirmed to occur in Ukraine (KLYMENKO 2009). *Eurytoma caninae* was described based on specimens emerged from galls of *Diplolepis rosae* (Linnaeus, 1758), *D. mayri* (Schlechtendal, 1876), *D. fructuum* (Rübsaamen, 1882), *D. spinosissimae* (Giraud, 1859) and with a question mark from *D. nervosa* (Curtis, 1838) collected in France, Iran and Morocco (LOTFALIZADEH *et al.* 2007).

In this paper, we report the species *E. caninae* for the first time emerging from galls of *D. eglanteriae* and for the first time for the fauna of the eastern Carpathian Basin (Transylvania, Romania).

Eurytoma caninae Lotfalizadeh et Delvare, 2007

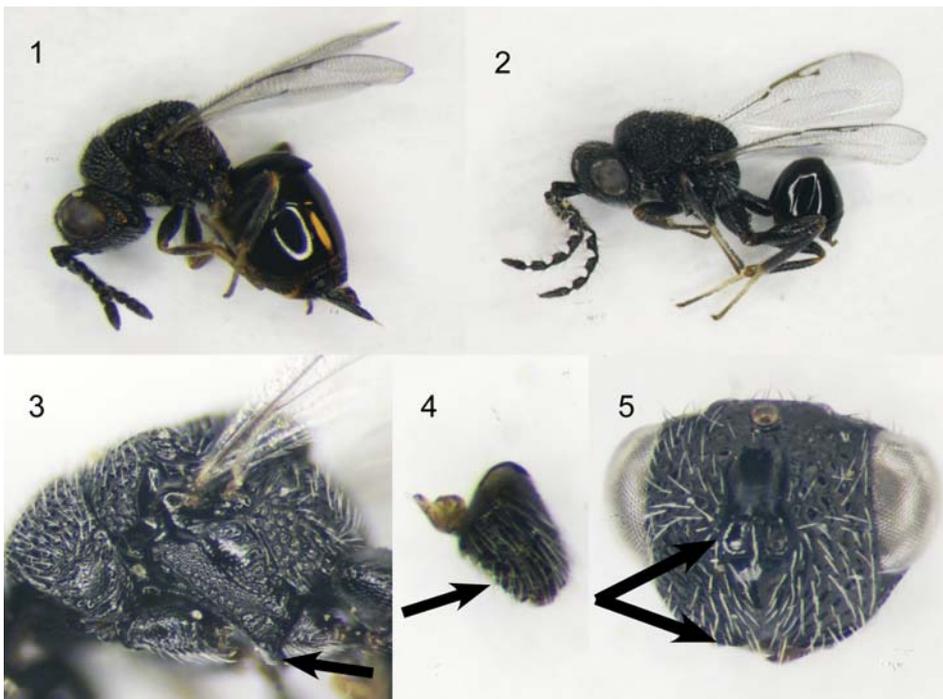
(Figs 1–5)

Material examined – 2 males, Romania, [Cluj county,] Feiurdeni, N 46.895785°, E 23.620792°, 2017.06.28, exp. *D. spinosissimae*, leg. Z. László & H. Prázsmári; 2 males, Romania, [Cluj county,] Bârlea, N 46.975740°, E 23.754435°, 2017.06.22, exp. *D. spinosissimae*, leg. Z. László & H. Prázsmári; 3 females 1 male, Romania, [Cluj county,] Luna de Jos, N 46.925073°, E 23.734081°, 2017.06.22, exp. *D. spinosissimae*, leg. Z. László & H. Prázsmári; 1 male, Romania, [Cluj county,] Bârlea, N 46.975740°, E 23.754435°, 2017.06.22, exp. *D. nervosa*, leg. Z. László & H. Prázsmári; 1 female, Romania, [Cluj county,] Borșa-Cătun, N 46.887692°, E

23.706754°, 2017.09.29, exp. *D. eglanteriae*, leg. Z. László & H. Prázsmári; 1 female, Romania, [Harghita county,] Voşlobeni, N 46.666667°, E 25.651353°, on the road to the Sugó cave, 2017.07.06, exp. *D. eglanteriae*, leg. Z. László & H. Prázsmári.

All rose galls were collected from rose shrubs belonging to three species of the *R. canina* group. The collected galls were placed in punched plastic bags, which enabled airing and were kept under standard laboratory conditions. The emerged specimens were separated, then preserved in 70% ethanol for later identification.

Remarks – *Eurytoma caninae* was overlooked with *E. rosae* for a long time as stated by LOTFALIZADEH *et al.* (2007). We have analysed large samples of *E. rosae* emerged from galls of *D. rosae* and *D. mayri* but until now have not found any specimens belonging to *E. caninae* (LÁSZLÓ *et al.* 2014). Based on our experience, in the eastern part of the Carpathian Basin the species is confined to unilocular *Diplolepis* galls.



Figs 1–5. *Eurytoma caninae* Lotfalizadeh et Delvare, 2007 emerged from unilocular *Diplolepis* galls: 1 = female, 2 = male, 3 = mesosoma in lateral view (arrow pointing to precoxal tooth on ventral shelf of metapleuron), 4 = middle coxa in lateral view (arrow pointing to lack of lamella), 5 = head (arrows pointing to the: upper – raised margins of antennal toruli, lower – hardly emarginated clypeus) (photo Zoltán László)

We have carefully analysed all distinguishing features between *E. rosae* and *E. caninae* given by LOTFALIZADEH *et al.* (2007). One of the most prominent character states is the presence of the precoxal tooth on ventral shelf of metapleuron (Fig. 3). This tooth was clearly distinguishable on each specimen. Another clear diagnostic character state separating *E. caninae* from *E. rosae* is the lack of lamella on the middle coxa in *E. caninae* (Fig. 4). This lamella was missing on the analysed specimens. Not so prominent distinguishable but also good character states can be found on the head of specimens. On *E. caninae* the raised inner margins of the antennal toruli are acuminate and the ventral edge of the clypeus are hardly emarginated (Fig. 5).

Species belonging to Eurytomidae and parasitising *Diplolepis* galls in the Palaearctic are enumerated in several cases (ASKEW *et al.* 2006a, LOTFALIZADEH *et al.* 2007). Prior to description of *E. caninae* in 2007, the species were *Aximopsis collina* (Zerova, 1984), *E. rosae*, *E. pistacina* Rondani, 1877, *E. cynipicola* Zerova, 1976, *E. nikolskayae* Zerova, 1989, *E. parvula* Thomson, 1876, *Sycophila biguttata* (Swederus, 1795) and *S. variegata* (Curtis, 1831). Despite the relatively high number of eurytomid species, the diversity is low since in most samples *E. rosae* is the parasitoid, while the other species appear only occasionally as it is in the case of oak gall cynipid parasitoids parasitising in rose galls (ASKEW *et al.* 2006b). In the eastern Carpathian Basin *E. rosae* is usually the parasitoid of *D. rosae* and *D. mayri*, while *E. caninae* is the parasitoid in *E. spinosissima*, *E. eglanteriae* and *E. nervosa*.

Specimens of *E. caninae* emerged in autumn without any prior cold period, which means that they may have two emerging peaks: some of the specimens emerge in the same vegetation period when they were conceived, and some later after the winter diapause. Compared with *E. rosae* which has only one emergence peak (LÁSZLÓ & TÓTHMÉRÉSZ 2011) *E. caninae* shows also a phenological difference.

Regarding host species of the analysed unilocular *Diplolepis* galls these were collected from *Rosa canina* L, *R. balsamica* Besser (synonyms: *R. klukii* Besser; *R. tomentella* Léman, misapplied name: *R. obtusifolia* Desv.) and *R. subcanina* (Christ) Vuk. The nomenclature for *Rosa* species follows THE PLANT LIST (2013) and KURTTO (2009). *E. caninae* until now is known as emerging from galls collected from host plants as *R. canina* and *R. damascena* Miller, 1768 (LOTFALIZADEH *et al.* 2007).

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