

**APETHYMUS FILIFORMIS (HYMENOPTERA:
TENTHREDINIDAE), NEW HOST FOR FIVE PARASITOID
SPECIES (HYMENOPTERA: BRACONIDAE, ICHNEUMONIDAE)**

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The paper presents some aspects about the attack and biology of *Apethymus filiformis* (Klug.), a non-indigenous defoliator pest of the sessile oak forest stands, *Quercus petraea* (Matt.) Liebl., 1784. It was recorded for the first time in Romania in 1999, but misidentified as *Apethymus abdominalis* Lep., a synonym of *A. cereus* Klug., an accepted species, but not present in the Romanian fauna. We established five new host – parasitoid relationships. In the laboratory we obtained from *Apethymus filiformis* larvae, by rearings, five new ichneumonoid parasitoid species: *Charmon extensor* (Linnaeus) (Hymenoptera: Braconidae: Charmontinae), *Temelucha ophtalmica* (Holmgren) (Hymenoptera: Ichneumonidae: Cremastinae), *Gelis cinctus* (Linnaeus) (Hymenoptera: Ichneumonidae: Cryptinae), *Diplazon laetatorius* (Fabricius) (Hymenoptera: Ichneumonidae: Diplazontinae), and *Phytodietus ornatus* (Desvignes) (Hymenoptera: Ichneumonidae: Tryphoninae).

Keywords: *Apethymus filiformis*, Ichneumonoidea, parasitoids, new host, *Quercus petraea*.

INTRODUCTION

Apethymus filiformis (Klug.) was recorded in Romania for the first time by Ciornei & Mihalache (1999), but misidentified as *Apethymus abdominalis* Lep., a synonym of *A. cereus* Klug., a species which is not present in the Romanian fauna, according to Fauna Europaea. During the period 1999 – till now, in some papers, *Apethymus filiformis* was misidentified as *Apethymus abdominalis* Lep. (Ciornei *et al.*, 2001, 2003, 2005). Later, it was recorded correctly by Popa (2006), being identified by Constantineanu Raoul.

Apethymus filiformis (Fig. 1) is a widespread species in Europe, being previously reported from 21 countries (according to Fauna Europaea).

It is not known how it was introduced in Romania, but in the absence of its natural enemies, it produced outbreaks in some forests in Moldova, Romania. Later, in Romania, some biological limiting factors for *Apethymus filiformis* were recorded: the oophagous parasitoid *Trichogramma* sp. (in the Heltiu, Păltinata and Cornățel forests, Silvicultural District Căiuți, Bacău county) (Ciornei *et al.*, 2005). In the same forests, Ciornei *et al.* (2005) recorded also the following predator

birds: *Dendrocopos major* (L., 1758), *Picus canus* Gmel., 1788 (Picidae), *Lanius collurio* L., 1758 (Laniidae), *Ficedula albicollis* (Temminck, 1815) (Muscicapidae), *Phylloscopus collybita* (Vieillot, 1817) (Phylloscopidae), *Sturnus vulgaris* L., 1758 (Sturnidae), *Sylvia atricapilla* (L., 1758), *Sylvia communis* (Latham, 1787) (Sylviidae), *Coccothraustes coccothraustes* (L., 1758) (Fringillidae) and *Emberiza citrinella* L., 1758 (Emberizidae). Later it was recorded correctly by Popa (2006), being identified by Raoul Constantineanu.

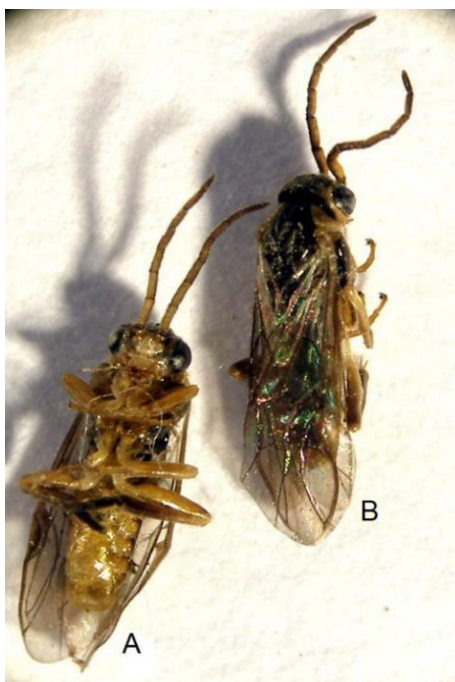


Fig. 1. *Apethymus filiformis* (Klug.), adults: A – ventral view; B – dorsal view (orig).

Ciornei *et al.* (2005) caught in the Barber traps many species of Carabidae (Coleoptera) and they supposed that especially the following species: *Molops piceus* (Panz.), *Pterostichus oblongopunctatus* (F.), *Carabus arvensis* Herbst, *Calosoma inquisitor* (L.) and *Abax ovalis* (Duftschmid) can limit the populations of *Apethymus filiformis*.

MATERIAL AND METHODS

The field observations of the attack of *Apethymus filiformis* and the collectings of its larvae, were made during the period of May 2005 – June 2007 in Heltiu, Păltinata and Cornățel forests, Silvicultural District Căiuți, situated in the Trotuș valley, between the localities Onești (Bacău county) and Adjud (Vrancea

county), Eastern Romania. Păltinata and Cornățel are sessile oak and beech mix forest stands and Heltiu is a sessile oak stand. The last stage larvae of *Apethymus filiformis* (Fig. 2), were collected especially from the stalks of the sessile oak trees. At each scientific trip we collected 100 larvae of *Apethymus filiformis* at the following forests: Heltiu (10.05.2005 and 12.06.2006), Păltinata (12.05.2006) and Cornățel (02.05.2007). It were studied four different samples of 100 larvae each.

Laboratory rearings were performed as follows: each larva of *Apethymus filiformis* collected from infested oak forests, was introduced into an individual new vials of 30 ml capacity, labeled and checked every day. Each vial was covered with a cotton plug, to provide the air needed for the larva to survive. Each larva was fed with clean oak leaves, uninfested with other pests. There were provided conditions close to those in nature, regarding temperature (20–21°C), humidity, feeding. After a few days, the last stage larvae turned into eonymph (Fig. 3), a stage from which the parasitoids emerged.



Fig. 2. *Apethymus filiformis* – last instar larva (orig.).



Fig. 3. *Apethymus filiformis* – eonymph (orig.).

RESULTS

From the *Apethymus filiformis* larvae reared in the laboratory, we obtained the adults of the following five ichneumonoid parasitoids: *Charmon extensor* (L.) (Hymenoptera: Braconidae: Charmontinae) (Fig. 4, Fig. 5), *Temelucha ophtalmica* (Holmgr.) (Hymenoptera: Ichneumonidae: Cremastinae) (Fig. 6), *Gelis cinctus* (L.) (Hymenoptera: Ichneumonidae: Cryptinae) (Fig. 7), *Diplazon laetatorius* (F.) (Hymenoptera: Ichneumonidae: Diplazontinae) (Fig. 8) and *Phytodietus ornatus* (Desv.) (Hymenoptera: Ichneumonidae: Tryphoninae) (Fig. 9, Fig. 10).



Fig. 4. *Charmon extensor*, ♀ – lateral view (orig.).



Fig. 5. *Charmon extensor*, ♂ – dorsal view (orig.).



Fig. 6. *Temelucha ophthalmica*, ♀ – dorsal view (orig.).



Fig. 7. *Gelis cinctus*, ♀ – dorsal view (orig.).



Fig. 8. *Diplazon laetatorius*, ♀ – dorsal view (orig.).



Fig. 9. *Phytodietus ornatus*, ♀ – dorsal view (orig.). Fig. 10. *Phytodietus ornatus*, ♂ – dorsal view (orig.).

From sample no 1 emerged one individual of *Gelis cinctus*, from sample no 2 emerged one individual of *Charmon extensor*, from sample no 3 emerged three individuals of parasitoid species: *Charmon extensor*, *Temelucha ophtalmica* and *Phytodietus ornatus*, from sample no 4 emerged three individuals of parasitoid species: *Temelucha ophtalmica*, *Phytodietus ornatus* and *Diplazon laetatorius* (Table 1).

The parasitization degree varied between 1 to 3%, which was very low, but the presence of these ichneumonoid parasitoid species in the population of *Apethymus filiformis* is very important because it were obtained for the first time from this host.

Table 1

Parasitization degree of each sample

Sample	Forest	Collecting date	Parasitoid	Parasitization degree
1	Heltiu	10.05.2005	<i>Gelis cinctus</i>	1%
2	Heltiu	12.06.2006	<i>Charmon extensor</i>	1%
3	Păltinata	12.05.2006	<i>Charmon extensor</i> <i>Temelucha ophtalmica</i> <i>Phytodietus ornatus</i>	3%
4	Cornățel	02.05.2007	<i>Temelucha ophtalmica</i> <i>Phytodietus ornatus</i> <i>Diplazon laetatorius</i>	3%

The laboratory rearings lasted 8 to 16 days (Table 2).

Table 2

The parasitoids of *Apethymus filiformis* larvae

Parasitoid species	Forest	Collecting date of <i>Apethymus filiformis</i> larvae	Emerging date of parasitoid species	
<i>Charmon extensor</i>	Păltinata	12.05.2006	25.05.2006	
	Heltiu	12.06.2006	20.05.2006	
<i>Temelucha ophthalmica</i>	Păltinata	12.05.2006	25.05.2006	
	Cornățel	02.05.2007	18.05.2007	
<i>Gelis cinctus</i>	Heltiu	10.05.2005	21.05.2005	
<i>Diplazon laetatorius</i>	Cornățel	02.05.2007	17.05.2007	
<i>Phytodietus ornatus</i>	Păltinata	12.05.2006	22.05.2005	
	Cornățel	02.05.2007	16.05.2007	

CONCLUSIONS

Apethymus filiformis (Klug.) is a new host for the following five ichneumonoid parasitoids: *Charmon extensor* (L.) (Hymenoptera: Braconidae: Charmontinae), *Temelucha ophthalmica* (Holmgr.) (Hymenoptera: Ichneumonidae: Cremastinae), *Gelis cinctus* (L.) (Hymenoptera: Ichneumonidae: Cryptinae), *Diplazon laetatorius* (F.) (Hymenoptera: Ichneumonidae: Diplazontinae) and *Phytodietus ornatus* (Desv.) (Hymenoptera: Ichneumonidae: Tryphoninae).

These parasitoid species belonging to the Ichneumonoidea Superfamily, have adapted to the pest invasive species from Romania, representing the parasitoid complex of *Apethymus filiformis*.

Apethymus filiformis is the first non-Lepidoptera host of the parasitoid *Charmon extensor* (L.).

Apethymus filiformis was previously misidentified, by different authors in Romania, as *Apethymus abdominalis* Lep., a synonym of *A. cereus*, species which is not present in the Romanian fauna.

The *Apethymus filiformis* status in Romania is updated.

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***https://fauna-eu.org/cdm_dataportal/taxon/e4e28818-ecfa-4a2a-a7a1-922384d9e92#distribution

Acknowledgements. We are grateful to Dr. Aurel Lozan (Institute of Entomology, Biology Centre of the Czech Academy of Sciences, Department of Biodiversity and Conservation Biology) for the identification of the braconid parasitoid *Charmon extensor*. This work was partially supported by the Romanian Ministry of Research and Innovation through the NUCLEU program (Project No. 19-270301) and Program 1-Development of the National R&D System, Subprogram 1.2-Institutional Performance-Projects for Excellence Financing in RDI (Contract no. 22PFE/2018).

Received February 14, 2022

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