

## CONTRIBUTION TO THE FAUNA OF CYNIPID GALL WASPS (HYMENOPTERA: CYNIPIDAE) OF MT. OBLA GLAVA (SERBIA)

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### Abstract

During 2005-2017 on Mt. Obla Glava (southeastern Serbia), 30 species of gall wasps were recorded from two tribes [Cynipini (26) and Diplolepidini (4)] and 8 genera [*Andricus* (17 species), *Diplolepis* (4), *Cynips* (3), *Neuroterus* (2), *Aphelonyx* (1), *Biorhiza* (1), *Dryocosmus* (1), and *Pseudoneuroterus* (1)]. The highest number of species was found on *Quercus pubescens* (17), somewhat less on *Q. frainetto* (13) and *Q. petraea* (11), and the least on *Q. cerris* (6) and *Rosa* sp. (4). *Andricus stefanii* is the first record for Serbia. Localities, dates of gall collecting and host plants for all recorded species are given.

KEY WORDS: Serbia, *Quercus*, *Rosa*, fauna, Hymenoptera

### Introduction

The cynipid gall wasp (Hymenoptera: Cynipidae) is a large group (about 1400 species) of small insects that induce variously shaped galls (Csóka *et al.*, 2005). They have been studied by several authors in Serbia (Langhoffer, 1915; Baudyš, 1928; Pal, 1983a, 1983b; Mihajlović & Marković, 2003; Glavendekić & Mihajlović, 2004; Marković & Stojanović, 2007, 2009, 2017; Drekić, 2006; Marković, 2014, 2015; Stojanović & Marković, 2016, 2017). According to the results of their research, 83 species have been identified so far. However, not all of their results on the faunistic research in Serbia have been published yet. The species that we collected at Mt. Obla Glava will be listed in this paper.

## Materials and Methods

Cynipid galls were collected during 2005-2017 at nine localities on Mt. Obla Glava: Lake Bovansko Jezero-Osaja (43°39'N, 21°43'E); Bujmir (43°30'N, 21°45'E); Crna Bara (43°34'N, 21°48'E); Glogovica (43°32'N, 21°44'E); Rujevica (43°32'N, 21°43'E); Stanci (43°32'N, 21°47'E); Subotinac (43°35'N, 21°41'E); Šumatovac (43°32'N, 21°44'E); and Vakup (43°33'N, 21°43'E). After being brought into the Laboratory of Entomology of Belgrade University's Faculty of Forestry, some of the collected galls were herbarized, identified, and deposited in the herbarium of zoocercariae of the Forestry Faculty's Department of Forest Protection. Another portion of galls was put in photoelectors for the rearing of adult gall wasps. During the emergence period, the photoelectors were inspected daily and the emerging wasps were collected and mounted. All reared wasps are deposited in the insect collection of the Department of Forest Protection.

The collected galls and reared adult wasps were identified by Č. Marković and A. Stojanović using Ionescu (1957), Eady & Quinlan (1963), Ambrus (1974), Zerova *et al.* (1988), Melika *et al.* (2000, 2010), Melika (2006a, 2006b) and Ács *et al.* (2007).

## Results and Discussion

Obla Glava is a mountain in southeastern Serbia: on Sedi Vrh, its highest point (813 m a.s.l.) which is covered by oak forest, we recorded 30 species of cynipid gall wasps from two tribes [Cynipini (26) and Diplolepidini (4)] and 8 genera [*Andricus* (17 species), *Diplolepis* (4), *Cynips* (3), *Neuroterus* (2), *Aphelonyx* (1), *Biorhiza* (1), *Dryocosmus* (1), and *Pseudoneuroterus* (1)]. The greatest number of species was found on *Quercus pubescens* Willd. (17), somewhat less on *Q. frainetto* Ten. (13) and *Q. petraea* (Matt.) Liebl. (11), and the least were found on *Q. cerris* L. (6) and *Rosa* sp. (4). *Andricus stefanii* (Kieffer, 1897) was recorded for the first time in Serbia. *A. inflator* Hartig, 1840 and *A. superfetationis* (Giraud, 1859) were recorded for the first time in southeastern Serbia.

Most of the gall wasps recorded on Mt. Obla Glava are widely distributed in oak forests in Serbia. It can be said that they were expected on this mountain. The total number of gall wasps found is certainly greater than the number recorded in this paper (30) considering some expected species have not been found so far.

Mt. Obla Glava is located near the mountains Jastrebac and Rtanj. In terms of gall wasp fauna, there is not much difference between these three mountains (Marković, 2014, 2015). Because of their proximity, they comprise one area in which 42 species have been identified to date and in which, besides Vojvodina (Langhoffer, 1915; Pal, 1983a, 1983b; Stojanović & Marković, 2016, 2017) and Belgrade (Baudyš, 1928; Drekić, 2006; Marković & Stojanović, 2017), gall wasps have been studied the most in Serbia. So far, 36 species have been identified there for the first time for southeastern Serbia. By the number of species identified, this area can only be compared with northern Serbia (63), because gall wasps have not yet been investigated much in other parts of the country.

All gall wasps recorded on Mt. Obla Glava are listed below in alphabetical order. Localities, dates of gall collecting, host plants, alternate generations and number of emerged wasps are given for each species.

### List of Gall Wasp Species

#### Tribe Cynipini

*Andricus amblycerus* (Giraud, 1859)

Asexual generation bud galls: Rujevica 31.03.2006 *Quercus* sp., Subotinac 16.07.2017 *Q. pubescens*.

*A. caliciformis* (Giraud, 1859)

Asexual generation bud galls: Bujmir 18.08.2011, 14.08.2012 *Q. pubescens*, Rujevica 05.08.2012. *Q. frainetto*, Šumatovac 17.07.2017 *Q. frainetto*, Vakup 31.07.2016 *Q. pubescens*.

*A. caputmedusae* (Hartig, 1843)

Asexual generation acorn galls: Crna Bara 18.08.2011 *Q. frainetto*, Glogovica 15.10.2016 *Q. frainetto*, Subotinac 16.07.2017 *Q. pubescens*, Šumatovac 17.07.2017 *Q. frainetto*, Vakup 31.07.2016 *Q. pubescens*, *Q. frainetto*.

*A. coriarius* (Hartig, 1843)

Asexual generation bud galls: Glogovica 15.10.2016 *Q. frainetto*, *Q. petraea*, Rujevica 02.09.2007 *Quercus* sp., Vakup 31.07.2016 *Q. pubescens*.

*A. coronatus* (Giraud, 1859)

Asexual generation bud galls: Bovansko Jezero-Osoja 08.08.2011 *Q. frainetto*, Bujmir 18.08.2011 *Q. pubescens*, Crna Bara 18.08.2011 *Q. frainetto*, Glogovica 15.10.2016 *Q. frainetto*, *Q. petraea*, Rujevica 31.03.2006, 02.09.2007 *Quercus* sp., 28.07.2011 *Q. frainetto*, Stanci 18.08.2011 *Q. frainetto*, Subotinac 16.07.2017 *Q. pubescens*.

*A. cydoniae* Giraud, 1859

Sexual generation galls on tips of twigs: Rujevica 31.03.2006 *Q. cerris*, Subotinac 16.07.2017 *Q. cerris*, Vakup 31.07.2016 *Q. cerris*.

*A. galeatus* (Giraud, 1859)

Asexual generation bud galls: Glogovica 15.10.2016 *Q. petraea*, Rujevica 31.03.2006 *Q. cerris*, Vakup 31.07.2016 *Q. pubescens*.

*A. hartigi* (Hartig, 1843)

Asexual generation bud galls: Bovansko Jezero-Osoja 08.08.2011 *Q. frainetto*, Crna Bara 18.08.2011. *Q. frainetto*, Rujevica 31.03.2006, 30.6.2008 *Q. frainetto*, Stanci 18.08.2011 *Q. frainetto*, Vakup 31.07.2016 *Q. frainetto*.

*A. inflator* Hartig, 1840

Asexual generation gall on shoot: Glogovica 15.10.2016 *Q. petraea*.

*A. lucidus* (Hartig, 1843)

Asexual generation bud galls: Bovansko Jezero-Osoja 08.08.2011 *Q. frainetto*, Bujmir 18.08.2011 *Q. frainetto*, Glogovica 15.10.2016 *Q. petraea*, Subotinac 16.07.2017 *Q. pubescens*, Vakup 31.07.2016. *Q. pubescens*.

*A. multiplicatus* Giraud, 1859

Sexual generation bud galls: Rujevica 06.11.2011 *Q. cerris*, Subotinac 16.07.2017 *Q. cerris*, Vakup 31.07.2016 *Q. cerris*.

*A. polycerus* (Giraud, 1859)

Asexual generation bud gall: Vakup 31.07.2016 *Q. pubescens*.

*A. quercustozae* (Bosc, 1792)

Asexual generation bud galls: Bovansko Jezero-Osoja 08.08.2011 *Q. frainetto*, Bujmir 18.08.2011, 14.08.2012 *Q. pubescens*, Crna Bara 18.08.2011 *Q. frainetto*, Glogovica 15.10.2016 *Q. petraea*, Stanci 18.08.2011 *Q. frainetto*, Subotinac 16.07.2017 *Q. pubescens*, Šumatovac 17.07.2017 *Q. frainetto*, Vakup 31.07.2016 *Q. frainetto*, *Q. pubescens*.

*A. solitarius* (Fonscolombe, 1832)

Asexual generation bud gall: Subotinac 16.07.2017 *Q. pubescens*, Šumatovac 17.07.2017 *Q. frainetto*, Vakup 31.07.2016 *Q. frainetto*.

*A. stefanii* (Kieffer, 1897)

Asexual generation bud galls: Rujevica 31.03.2006 *Quercus* sp.

*A. superfetationis* (Giraud, 1859)

Asexual generation galls on acorn cups: Rujevica 05.08.2012 *Q. frainetto*.

*A. truncicolus* (Giraud, 1859)

Asexual generation bud gall: Vakup 31.07.2016 *Q. pubescens*.

*Aphelonyx cerricola* (Giraud, 1859)

Asexual generation bud galls: Bovansko Jezero-Osoja 08.07.2009, 08.08.2011 *Q. cerris*, Bujmir 18.08.2011, 14.08.2012 *Q. cerris*, Crna Bara 18.08.2011 *Q. cerris*, Glogovica 15.10.2016 *Q. cerris*, Rujevica 31.03.2006 *Q. cerris*, Subotinac 16.07.2017 *Q. cerris*, Vakup 31.07.2016 *Q. cerris*.

*Biorhiza pallida* (Olivier, 1791)

Sexual generation galls at the end of shoots: Bovansko Jezero-Osoja 08.08.2001 *Q. petraea*, Bujmir 14.08.2012 *Q. pubescens*, Crna Bara 18.08.2011 *Q. frainetto*, Rujevica 25.04.2008, 28.07.2011, 06.11.2011 *Q. frainetto*, Stanci 18.08.2011 *Q. frainetto*, *Q. pubescens*.

*Cynips cornifex* Hartig, 1843

Asexual generation galls on leaves: Bujmir 14.08.2012 *Q. pubescens*, Vakup 31.07.2016 *Q. pubescens*.

*C. quercus* (Fourcroy, 1785)

Asexual generation galls on leaves: Bovansko Jezero-Osoja 08.08.2011 *Q. frainetto*, Bujmir 18.08.2011, 14.08.2012 *Q. pubescens*, Crna Bara 18.08.2011 *Q. frainetto*, Glogovica 15.10.2016 *Q. frainetto*, *Q. petraea*, Rujevica 08.08.2010, 28.07.2011, 06.11.2011, 05.08.2012 *Q. frainetto*, Stanci 18.08.2011 *Q. pubescens*, Šumatovac 17.07.2017 *Q. frainetto*, Vakup 31.07.2016 *Q. pubescens*, *Q. frainetto*.

*C. quercusfolii* (Linnaeus, 1758)

Asexual generation galls on leaves: Vakup 31.07.2016 *Q. pubescens*.

*Dryocosmus cerriphilus* (Giraud, 1859)

Sexual generation galls on leaves: Rujevica 25.04.2006 *Q. cerris*.

Asexual generation galls on twigs: Bovansko Jezero-Osoja 08.08.2011 *Q. cerris*, Bujmir 18.08.2011 *Q. cerris*, Rujevica 31.03.2006, 23.04.2008 *Q. cerris*, Stanci 18.08.2011 *Q. cerris*.

*Neuroterus anthracinus* (Curtis, 1838)

Asexual generation galls on leaves: Crna Bara 18.08.2011 *Q. frainetto*, Glogovica 15.10.2016 *Q. petraea*, Šumatovac 17.07.2017 *Q. frainetto*, Vakup 31.07.2016 *Q. pubescens*, *Q. frainetto*.

*N. quercusbaccarum* (Linnaeus, 1758)

Imagoes asexual generation: Rujevica 28.07.2011 *Q. frainetto* (4♀♀).

Asexual generations galls on leaves: Bovansko Jezero-Osoja 08.08.2011 *Q. frainetto*, Stanci 18.08.2011 *Q. pubescens*, *Q. frainetto*, Crna Bara 18.08.2011 *Q. frainetto*, Rujevica 05.08.2012 *Q. frainetto*, Bujmir 18.08.2011 *Q. pubescens*, 14.08.2012 *Q. pubescens*, *Q. frainetto*, Vakup 31.07.2016 *Q. pubescens*, *Q. frainetto*, Glogovica 15.10.2016 *Q. petraea*, Šumatovac 17.07.2017 *Q. frainetto*.

*Pseudoneuroterus macropterus* (Hartig, 1843)

Asexual generation galls on shoots: Bujmir 18.08.2011, 14.08.2012 *Q. cerris*, Crna Bara 18.08.2011 *Q. cerris*, Rujevica 08.08.2010, 06.11.2011 *Q. cerris*, Subotinac 16.07.2017 *Q. cerris*.

Tribe Diplolepidini

*Diplolepis eglanteriae* (Hartig, 1840)

Galls on leaves: Bujmir 14.08.2012 *Rosa* sp., Rujevica 05.08.2012 *Rosa* sp.

*D. nervosa* (Curtis, 1838)

Galls on leaves: Rujevica 05.08.2012 *Rosa* sp.

*D. rosae* (Linnaeus, 1758)

Imagoes sexual generation: Bujmir 05.10.2013 *Rosa* sp. (3♀♀), Rujevica 06.11.2011 *Rosa* sp. (1♀), 14.01.2013 *Rosa* sp. (2♀♀).

Galls on leaf buds and young shoots: Bovansko Jezero-Osoja 10.08.2011, 25.08.2012 *Rosa* sp., Bujmir 18.08.2011, 14.08.2012 *Rosa* sp., Crna Bara 18.08.2011 *Rosa* sp., Glogovica 15.10.2016 *Rosa* sp., Rujevica 02.10.2011, 5.08.2012, 08.08.2010 *Rosa* sp., Subotinac 16.07.2017 *Rosa* sp., Šumatovac 17.07.2017 *Rosa* sp., Vakup 31.07.2016 *Rosa* sp.

*D. spinosissimae* (Giraud, 1859)

Galls on leaves: Bujmir 14.08.2012 *Rosa* sp., Rujevica 05.08.2012 *Rosa* sp.

## References

- Ács, Z., Melika, G., Péntzes, Z., Pujade-Villar, J., & Stone, G. N. (2007). The phylogenetic relationships between *Dryocosmus*, *Chilaspis* and allied genera of oak gall wasps (Hymenoptera, Cynipidae: Cynipini). *Systematic Entomology*, 32(1), 70-80.
- Ambrus, B. (1974). *Cynipida-Gubacsok-Cecidia Cynipidarum. Magyarország állatvilága (Fauna Hungariae), XII, 2.* Budapest: Akadémiai Kiadó, pp. 120.
- Baudyš, E. (1928). Příspěvek k rozšíření zoocecidii v Jugoslavii a zemích sousedních. *Sborník Vysoké školy zemědělské v Brně*, 13, 1-99.
- Csóka, G., Stone, G. N., & Melika, G. (2005). Biology, Ecology, and Evolution of Gall-inducing Cynipidae. In Raman, A., Schaefer, C.W., Withers, T.M. (Eds.): *Biology, Ecology, and Evolution of Gall-inducing Arthropods*. Enfield (NH), USA, 573-642, Science Publishers Inc.
- Drekić, M. (2006). *Proučavanje štetnih insekata žira hrasta lužnjaka u semenskoj plantaži u Banovom Brodu*. Magistarski rad, Šumarski fakultet, Beograd, 76 pp.
- Eady, R. D., & Quinlan, J. (1963). *Handbooks for the Identification of British Insects-Hymenoptera: Cynipoidea*. Royal Entomological Society of London. 8/1(a), 81 pp.
- Glavendekić, M., & Mihajlović, Lj. (2004). Fitofagni insekti u hrastovim šumama Nacionalnog parka Đerdap. *Šumarstvo*, 4, 19-30.
- Ionescu, M. (1957). *Fauna Republicii Populare Romîne, Insecta, Cynipinae*. Bucuresti: Academia Republicii Populare Romine, pp. 243.
- Langhoffer, A. (1915). Šiške naših hrastova. *Šumarski list*, 5-6, 134-138.
- Marković, Č. (2014). Contribution to knowledge of the fauna of cynipid gall wasps (Hymenoptera, Cynipidae) of Mt. Jastrebac (Serbia). *Acta entomologica serbica*, 19(1/2), 63-72.
- Marković, Č. (2015). Contribution to knowledge of the cynipid gall wasp (Hymenoptera, Cynipidae) fauna of Mt. Rtanj (Serbia). *Acta entomologica serbica*, 20, 137-143.
- Marković, Č., & Stojanović, A. (2007). Prilog poznavanju faune osa šišaruša (Hymenoptera, Cynipidae) hrasta u Srbiji. In Anonymous (Ed.), *Zbornik rezimea XIII simpozijuma sa savetovanjem o zaštiti bilja sa međunarodnim učesćem, Zlatibor, Srbija, 26-30 novembar 2007*. Zlatibor: Društvo za zaštitu bilja Srbije, 42.
- Marković, Č., & Stojanović, A. (2009). Novoutvrđene vrste galikolnih Cynipidae (Hymenoptera) u Srbiji. In Anonymous (Ed.), *Preliminarni referati i rezimei, Sokobanja, Srbija, 23-27 septembar 2009*. Sokobanja: Entomološko društvo Srbije, 61.
- Marković, Č., & Stojanović, A. (2017). Contribution to knowledge of the fauna of Cynipid gall wasps on the territory of Belgrade. *Acta entomologica serbica*, 22, 113-122.
- Melika, G. (2006a). *Gall wasps of Ukraine Cynipidae*. *Vestnik Zoologii, Supplement 21(1)*, 300pp.
- Melika, G. (2006b). *Gall wasps of Ukraine Cynipidae*. *Vestnik Zoologii, Supplement 21(2)*, 301-644.
- Melika, G., Csóka, G. & Pujade-Villar, J. (2000). Check-list of oak gall wasps of Hungary, with some taxonomic notes (Hymenoptera: Cynipidae, Cynipinae, Cynipini). *Annales Historico-Naturales Musei Nationalis Hungarici*, 92, 265-296.
- Melika, G., Pujade-Villar, J., Abe, Y., Tang, C. T., Nicholls, J., Wachi, N., Ide, T., Yang, M. M., Péntzes, Z., Csóka, G., & Stone, G. N. (2010). Palaearctic oak gall wasps galling oaks (*Quercus*) in the section Cerris: reappraisal of generic limits, with descriptions of new genera and species (Hymenoptera: Cynipidae: Cynipini). *Zootaxa*, 2470, 1-79.

- Mihajlović, Lj., & Marković, Č. (2003). Štetne vrste insekata na divljim ružama. In Anonymous (Ed.), *Zbornik rezimea VI savetovanja o zaštiti bilja, Zlatibor, Srbija, 24-28 novembar 2003*. Zlatibor: Društvo za zaštitu bilja Srbije, 72.
- Pal, B. (1983a). Prilog poznavanju cecidofaune zeljastih biljaka Vojvodine. *Zbornik za prirodne nauke Matice Srpske*, 65, 131-140.
- Pal, B. (1983b). Prilog poznavanju cecidofaune Vojvodine II. *Zbornik radova Prirodno-matematičkog fakulteta Univerziteta u Novom Sadu, Biološka serija*, 13, 67-76.
- Stojanović, A., & Marković, Č. (2016). *Aylax papaveris* (Perris 1839) and *Barbotinia oraniensis* (Barbotin 1964): species new to the fauna of cynipid gall wasps (Hymenoptera, Cynipidae) of Serbia. *Acta entomologica serbica*, 21, 21-25.
- Stojanović, A., & Marković, Č. (2017). Findings of the species *Aulacidea tragopogonis* (Thomson) and *Timaspis cichorii* (Kieffer) (Hymenoptera, Cynipidae) in Serbia. *Acta entomologica serbica*, 22, 123-128.
- Zerova, M.D., Djakonchuk, L.A., & Ermolenko, V.M. (1988). *Nasekomye-galloobrazovateli kul'turnyh i dikorastuschih rastenij Evropejskoj chasti SSSR, Pereponchatokrylye*. Kiev: Naukova Dumka, pp. 166.

## ПРИЛОГ ФАУНИ ГАЛИКОЛНИХ ОСА (HYMENOPTERA: CYNIPIDAE) ПЛАНИНЕ ОБЛА ГЛАВА (СРБИЈА)

ЧЕДОМИР МАРКОВИЋ

### Извод

Проучавањем фауне галиколних оса на планини Обла глава (југоисточна Србија) у периоду од 2005. до 2017. године констатовано је 30 врста из 2 трибуса [Cynipini (26), Diplolepidini (4)] и 8 родова [*Andricus* (17 врста), *Diplolepis* (4), *Cynips* (3), *Neuroterus* (2), *Aphelonyx* (1), *Biorhiza* (1), *Dryocosmus* (1), *Pseudoneuroterus* (1)]. Највећи број њих пронађен је на *Quercus pubescens* (17), нешто мањи број на *Q. frainetto* (13) и *Q. petraea* (11), а најмањи на *Q. cerris* (6) и *Rosa* sp. (4). По први пут за фауну галиколних оса Србије констатована је врста *Andricus stefanii* (Kieffer, 1897). За све констатоване врсте у раду су наведени локалитети, датуми и домаћини на којима су оне пронађене.

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