N O T E

Preliminary Data on Presence of *Ophraella communa* (Coleoptera: Chrysomelidae) in the Southeast of Bosnia and Herzegovina[1]

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Ophraella communa LeSage, 1986 (Coleoptera: Chrysomelidae) is an invasive alien species from North America whose first finding in Europe was recorded in August 2013. (Boriani et al. 2013, In. Agrar. 69: 61). Given that this species primarily feeds on common ragweed, *Ambrosia* spp., not long after its discovery, the question was raised whether *O. communa* as a natural enemy could contribute to a sustainable way to control *Ambrosia* spp. in Europe. Altogether, this resulted in a large number of studies on its presence, distribution, biology, host range, and potential status (Bašić and Đikić 2022, Works of the Faculty of Agriculture and Food Sciences University of Sarajevo 71: 91–104).

Because of the possibility of light and dispersion (Chen et al. 2013, Chin. J. Biol. Control 29: 362–369; Guo et al. 2011, Biocontrol Sci. Technol. 21: 1049–1063; Kiritani 1998, Entomol. Sci. 1: 291–298; Tanaka and Yamaka, 2009, Environ. Entomol. 38: 235–241), which can be measured on average more than a 100 km/yr (Moriya and Shiyake 2001, Jpn. J. Entomol. 4: 99–102), after the first finding in the north of Italy (Boriani et al. 2013) and the south of Switzerland (Müleler-Schärer et al. 2014, Weed Res. 54: 109–119), the area of distribution of *O. communa* expanded toward the southeast of Europe as expected. In the Balkans, it was first found in western Slovenia (Seljak 2017, http://www1.pms-lj.si/animalia/galerija.php?load=5263, last accessed 20 May 2023) and then in Croatia along the border with Bosnia and Herzegovina (B&H) (Zadravec 2019, Bioinvasions Rec. 8: 521–529), in Serbia,

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in the area of Belgrade (Petrović-Obradović et al. 2020, A. Entomol. Serb. 25: 101–104), and northern B&H (Karrer et al. 2020, 11th Intern. Conf. Biol. Inv., Croatia; Vidović et al. 2022, EPPO Bull. 52: 493–498).

In areas of northern Italy where *O. communa* established, there have been significant changes. Almost all *Ambrosia* spp. plants were affected. The degree of damage was severe enough to fully defoliate the majority of *Ambrosia* spp. plants and stop them from lowering and setting seeds (Müller-Schärer et al. 2014). Lemić et al. (2023, J. Central Euro. Agric. 24: 178–188) report that in the area of continental Croatia, of the 34 places evaluated in total, at 7 studied locations, there was between 50 and 80% damage to *Ambrosia* spp. It was discovered that *O. communa* decreased the density of male inflorescences and ragweed pollen production (Augustinus et al. 2020, Biol. Control 150: 1–7; Lommen et al. 2017, Noti. Soc. Bot. Ital. 1: 13–14). Italy and other European countries could emulate China's strategy, which involves mass breeding *O. communa* and releasing it in large numbers in the spring to achieve a significant impact on reducing pollen and propagule production of *Ambrosia* spp. even in years with relatively low temperatures (Müller-Schärer et al. 2017, Noti. Soc. Bot. Ital. 1: 7–9).

In light of the aforementioned and the fact that *O. communa* has not been thoroughly researched in B&H, the objective of this study was to look at the existence and severity of *O. communa* damage to *Ambrosia* spp. plants in the southeastern part of B&H.

Monitoring of *O. communa* presence was conducted during July–September 2022 in the area of Sarajevo Canton (SC) (southeastern part of B&H). Localities where *Ambrosia* spp. has been present (ruderal habitats and agricultural areas) for an extended period were chosen for monitoring. Throughout the period, some of the locations were revisited more than once. Identification based on morphology was made according to LeSage (1986, Pp. 3–74, *In* Mem. Entomol. Soc. Can.) and Warchaowski (2010, The Palearctic Chrysomelidae. Identification Keys. Natura Optima Dux Foundation, Warszawa, Poland). At locations where any developmental stage of *O. communa* was detected, according to Zandigiacomo et al. (2020, Bull. Insectol. 73: 87–94), the damage observed on *Ambrosia* spp. plants was subdivided into six levels (0 to 5): 0, no trace of feeding damage but any developmental stage of the *O. communa* present; 1, light feeding damage on a few leaves; 2, feeding damage on some leaves; 3, many leaves with feeding damage; 4, defoliation (plants partially dried); and 5, complete defoliation and reproductive structures injured. The presence of possible natural enemies of *O. communa* was also monitored. Several collected specimens (larvae and adults) were deposited and transported to the Laboratory of Plant Protection at the Faculty of Agriculture and Food Sciences (University of Sarajevo, B&H). Maps with *O. communa* presence and distribution were made using QGis 3.30.3 software.

During monitoring in the SC area, of 50 inspected localities, the presence of the species *O. communa* was observed in 22 localities (44%) (Fig. 1). This observation is also the first documented finding of *O. communa* in the area of SC and the southeastern part of B&H. The largest number of localities where the species has been recorded is located in the municipality of Ilijaš (7) and Hadžići (6). In other municipalities, except or Trnovo and Center, this species is also reported. A greater number of localities with the presence of *O. communa* are located on lower

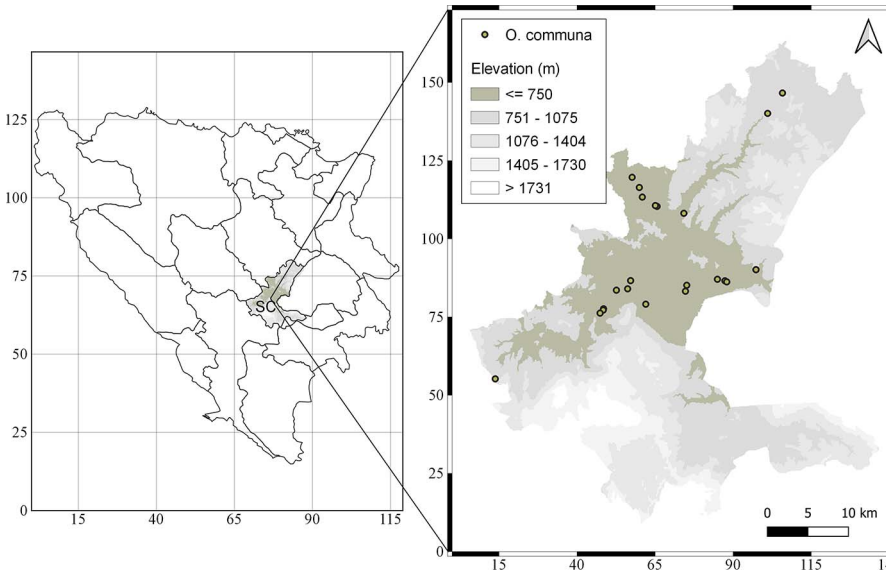

Fig. 1. Presence and distribution map of *O. communa* in SC (left: B&H map, right: SC map).

elevations (445–562 m). As expected, the largest number of records was registered in ruderal habitats (along roadsides and railways and in abandoned areas) with high common ragweed infestation (Table 1). During August, all developmental stages of *O. communa* were found in a large number of locations. When examining *Ambrosia* spp. plants, it was noticed that *O. communa* lays eggs mostly on the upper surface of young and mature leaves. The number of eggs within the groups varied from a few (6) to several dozen (32).

In August, the predatory stink bug *Perillus bioculatus* (F.) (Hemiptera: Pentatomidae) was discovered in the Ilijaš area, where an increased presence and activity of *O. communa* was recorded. Ladybugs (Coleoptera: Coccinellidae) were also found in several localities. In the introduced area, larvae and adults of *P. bioculatus* are considered predators of *O. communa* larvae (Leonardo et al. 2021, A. Uni. Orad, Fas.: Environ. Prot. 36: 43–50), whereas ladybugs are considered natural enemies of *O. communa* eggs (Dernovici et al. 2006, Biocontrol Sci. Technol. 16: 669–686). The effectiveness of biocontrol may also be influenced by *O. communa* enemies (Šipek et al. 2023, Bioinvasions Rec., 12: 615–623), which should definitely be taken into account during further research.

In a large number of localities with the presence of *O. communa*, the second and third damage level was recorded, which on average manifests itself on a few and on the majority of *Ambrosia* spp. leaves. At location no. 20, along the railway line, the highest level of damage to *Ambrosia* spp. was observed, with almost complete defoliation and reproductive structures injured. On these plants, larvae and adults completely devoured the leaves, leaving only the thicker veins. The largest number of damaged ragweed plants at the mentioned location was in the neoteny form. Toward the end of the summer, the damage observed on the *Ambrosia* spp. plants by *O.*

Table 1. Sites within SC with the presence of *Ophraella communa* and damage level on *Ambrosia* spp.

No.	Municipality	Latitude	Longitude	Elevation (m)	Habitat	Damage Level (0–5)
1	Hadžići	43°44′53.02″N	18°2′31.99″E	886	Roadside	1
2	Hadžići	43°49′32.02″N	18°12′29.99″E	550	Abandoned area	3
3	Hadžići	43°49′26.71″N	18°12′28.02″E	554	Roadside	2
4	Hadžići	43°49′14.66″N	18°12′10.65″E	562	Railway	3
5	Hadžići	43°50′46.01″N	18°13′41.22″E	525	Railway	3
6	Hadžići	43°50′51.41″N	18°14′43.28″E	515	Roadside	2
7	Ilidža	43°51′24.04″N	18°14′59.94″E	519	Roadside	2
8	Ilidža	43°49′49.81″N	18°16′23.10″E	497	Roadside	2
9	Ilidža	43°50′41.05″N	18°20′2.55″E	501	Roadside	2
10	Novi Grad	43°51′4.72″N	18°20′9.82″E	506	Railway	2
11	Novo Sarajevo	43°51′28.11″N	18°22′59.43″E	530	Railway	2
12	Novo Sarajevo	43°51′21.76″N	18°23′40.85″E	532	Park	1
13	Novo Sarajevo	43°51′17.57″N	18°23′50.85″E	531	Parking area	1
14	Stari Grad	43°52′5.70″N	18°26′32.55″E	765	Cemetery	1
15	Vogošća	43°55′51.91″N	18°19′55.51″E	500	Roadside	1
16	Ilijaš	44°3′49.89″N	18°29′4.77″E	1025	Roadside	2
17	Ilijaš	44°2′28.98″N	18°27′41.93″E	757	Roadside	3
18	Ilijaš	43°56′57.21″N	18°16′6.05″E	456	Abandoned area	3

Table 1. Continued.

No.	Municipality	Latitude	Longitude	Elevation (m)	Habitat	Damage Level (0–5)
19	Ilijaš	43°57′35.56′′N	18°15′49.61′′E	450	Abandoned area	4
20	Ilijaš	43°58′16.27′′N	18°15′9.87′′E	445	Railway	5
21	Ilijaš	43°56′20.18′′N	18°17′27.39′′E	462	Abandoned area	
22	Ilijaš	43°56′23.22′′N	18°17′18.02′′E	464	Railway	3

communa has further increased, which has been confirmed in studies by Bosio et al. (2014, Boll. della Soc. Entomol. Ital. 146: 17–30), Müller-Schärer et al. (2014), and Lemić et al. (2023).

This observation is the first documented finding of *O. communa* in the area of SC and the southeastern part of B&H. Considering the large distribution area, there is a possibility that this species first appeared in the southeast of B&H a little earlier. Based on the presented data, it can be concluded that the area of distribution of this species has expanded in a relatively short period of time. Feeding damage on *Ambrosia* spp. plants by *O. communa* was recorded in a large number of localities, mostly on leaves. Further research is needed to examine as many parameters of the population dynamics of this species as possible and to assess the effective role of this beetle in the suppression of invasive alien species *Ambrosia* spp. in the B&H area. To do this, the national authorities in B&H should follow the initiative of France and some other countries in Europe.