

***Erthesina* Spinola, 1837 – a new alien genus for Europe found in Albania (Hemiptera: Pentatomidae)**

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Abstract. The genus *Erthesina* is recorded for the first time in Europe. It has been observed at least 16 times in Albania since 2017 and since nymphs were found, it means the species is well implanted, can survive in winter, may become invasive and cause damage to crops.

Key words: Heteroptera, Halyini, *Erthesina fullo*, Yellow Spotted Stink Bug, true bugs, invasive pest, *Citrus*, *Pyrus*, Albania.

Introduction

Since March 2017, a large 20 to 25 mm dark stink bug species never seen before in Europe has been observed in Albania, close to the cities of Tirana and Durrës. A total of 13 observations of this Pentatomidae species were submitted to the iNaturalist internet platform (<https://www.inaturalist.org>), three observations were submitted to the Facebook group “Registri Elektronik i Specieve Shqiptare”, as photographs of specimens by various observers, as summarized below.

Material

ALBANIA: 1 adult, 22.03.2017, Tirana, phot. teamcoordinator; 1 adult, 30.10.2017, Tirana, phot. Aleksander Golemaj (Fig. 1); 1 adult, 04.2018, Tirana, phot. Besjan Cangu; 1 adult 09.2018, Linzë (Tirana), phot. Mediterranean loves Albania; 1 adult, 24.12.2018, Durrës, phot. Marsel Mersinaj; 1 adult, 01.06.2019, Durrës, phot. Arian; 1 adult, 04.06.2019, Durrës, phot. Arian; 1 nymph 4th instar, 17.06.2019, Durrës, phot. Arian; 1 adult, 27.07.2019, Durrës, phot. Arian; 1 nymph 4th instar, 27.07.2019, Durrës, phot. Arian (Fig. 2); 8 nymphs (6 at 4th instar and 2 at 5th instar), 29.07.2019, on the trunk of a plane tree, Durrës, phot. Arian; 1 adult, 07.09.2019, Durrës, phot. Arian; 1 adult, 14.09.2019, Durrës, phot. Scott; 1 nymph at 5th instar, 15.09.2019, Durrës, phot. Scott; 1 adult, 14.11.2019, Tirana, phot. Eridan Xharahi; 1 adult, 29.03.2020, on strawberry, Tirana, phot. Eral Pishtari (Fig. 3).

Discussion

This insect is a pentatomid with five-segmented antennae and it belongs to the tribe Halyini characterized by antennal insertions on the head, separated from eyes by a distance at least equal to their diameter (Derjanschi & Péricart 2005). It is blackish with many little irregular yellow spots and a continuous longitudinal median yellow line across the head and pronotum;

connexivum alternates black and yellow markings and tibiae are yellow-banded. The head is relatively long, pointed and tapered. These morphological characters and comparisons with preserved specimens and photographs made us identify those specimens as a species belonging to the genus *Erthesina* Spinola, 1837.



Fig. 1. Adult of *Erthesina* cf. *fullo* (Thunberg, 1783) from Tirana, Albania, 30.10.2017 (photo: Aleksander Golemaj).

Three other species of Pentatomidae found in Europe and Albania look similar: *Rhaphigaster nebulosa* (Poda, 1761), *Halyomorpha halys* (Stål, 1855) and *Apodiphus amygdali* (Germar, 1817). The first two can easily be distinguished because they are smaller than

17 mm and because the shape of the apex of their head is rounded and not pointed. *A. amygdali* may have the same size, but its head ends with two sharp teeth corresponding to the external borders of its jugae. All those three species do not have a yellow middle longitudinal line on the head and the pronotum.



Fig. 2. Nymph (4th instar) of *Erthesina cf. fullo* (Thunberg, 1783) from Durrës, Albania, 27.07.2019 (photo: Arjan Ndoni).



Fig. 3. Adult of *Erthesina cf. fullo* (Thunberg, 1783) from Tirana, Albania, 29.03.2020 (photo: Ermal Pishtari).

In their revision of the genus *Erthesina*, Ahmad et al. (2004) recognized seven known world species distributed from Pakistan to Japan: *E. aberrans* Distant, 1918, *E. acuminata* Dallas, 1851, *E. fullo* (Thunberg, 1783), *E. guttata* (Fabricius, 1787), *E. ilia* China, 1925, *E. pakistanensis* Ahmad, Memon & Kamaluddin, 2003, and *E. robertsi* Distant, 1908.

The head of *E. fullo* is as long as the pronotum so it can be distinguished from *E. pakistanensis* with a head longer than the pronotum and from *E. aberrans* with a head shorter than the pronotum. In *E. fullo* antennomeres II are longer than III, although in *E. robertsi* they are subequal and III shorter than II in *E. ilia*. *E. guttata*'s body is olivaceous green and it is testaceous brown in *E. fullo*. The head of *E. acuminata* is remarkably pointed in the front with lateral margins slightly toothed near the apex. Also its labium is long, reaching the base of the last abdominal segment, although it is only reaching the third abdominal segment in *E. fullo*.

From this revision of the genus *Erthesina*, we could conclude that the species found in Albania is *E. fullo*. However, Rider (2020) believes there are only two *Erthesina* species in the world, one from the oriental region, *E. fullo*, and one from the Indian subcontinent, *E. acuminata*, meaning the other ones should be intra-specific variations and considered as synonyms.

In order to distinguish *E. fullo* from *E. acuminata*, the best would have been to examine the length of the labium on the ventral side of the specimens from Albania, since the shape of the head seems to be a variable character. But unfortunately, all the photographs from Albania show the dorsal side of the specimens. Thus, we cannot conclude without examining the specimens from Albania if they are *E. fullo* or *E. acuminata*, and as a consequence, if the species was introduced from Southeast Asia or India.

However, we strongly believe the specimens observed in Albania to be *E. fullo*. When we compare the 1170 observations of *E. fullo* in Southeast Asia on the iNaturalist platform, we realize that the Albanian specimens have the same relatively stable coloration pattern (globally dark brown with multiple small white spots and two large black impunctate patches on mesocoriae) while this coloration pattern is much more variable and different in the 64 observations of *E. acuminata* from India submitted to iNaturalist.

Also from these observations, we found in *E. fullo* that its basal white spot of the antennomere V is relatively small and represents less than 1/4 of its length, while in *E. acuminata* it is relatively long, representing about 1/3 of its length.

Although, taking into account the observations submitted to iNaturalist and Facebook, only five adults were observed in 2017 and 2018 in Albania, which could have been like accidental introductions without consequence, observations of six adults but especially of eleven 4th and 5th instars nymphs between June and November 2019 indicate that the species was able to settle in Albania, reproduce and spend there at least one or two winters.

Biology and damages

E. fullo is known as a phytophagous pest by the name Yellow Spotted Stink Bug or YSSB in Asia (Malaysia, Thailand, Cambodia, Vietnam, Laos, Southern China up to Beijing, Southern Japan up to Tokyo). It feeds on timber, leaves and fruits of different species of trees. It is considered as a major pest of orange and mandarin fruits (*Citrus* sp.) (Li et al. 1997) and pear fruits (*Pyrus* sp.) in Southern China. On common jujube (*Ziziphus jujuba*) no damages are mentioned on fruits, but loss is caused by precocious fruit drop (Song & Wang 1993). It is also known as a pest of pine trees and hardwood trees in Taiwan and of the cinnamon tree (*Cinnamomum cassia*) in Vietnam. It is also able to feed on various arbustive plants and trees in tropical and subtropical areas, including the genera *Ailanthus*, *Aver-*

rhoa, *Diospyros*, *Eucalyptus*, *Hibiscus*, *Mangifera*, *Melia*, *Prunus*, *Psidium*, *Punica*, *Populus*, *Salix* and *Tectona* (EPPO 2020).

Conclusions

E. fullo is known to spread as a hitchhiker and it could infest fruit consignments as eggs, nymphs or adults. One adult specimen was intercepted once, apart from its original geographical distribution, in New Zealand in 2014 (EPPO 2020), but it was managed and controlled and no other observation has been recorded there since. In Albania, specimens were found on plane tree (*Platanus* sp.), strawberries (*Fragaria* sp.) (Ermal Pishtari, personal communication), and sometimes at the homes or offices of various observers up to now (Besjan Cangu and Aleksander Golemaj, personal communications).

Before this actual report, it has never been recorded as an invasive species in Europe (Rabitsch 2008).

E. fullo might become an economic and ecological danger in Europe. In Albania, citrus (orange and mandarin) and pear crops should be inspected to check if this alien species is present there and in that case, control measures should be implemented to avoid the spreading of this pest, knowing what happened with *H. halys*, the Brown Marmorated Stink Bug (BMSB) imported from China, which has almost entirely invaded Europe and the United States (Leskey & Nielsen 2018).

Acknowledgements

We would like to thank Aleksander Golemaj, Arjan Ndoni and Ermal Pishtari for allowing us to use their photos to illustrate this paper and for additional information, Besjan Cangu, Besnik Fetiu, Roland Lelaj and I. Nanaj for useful information, Anja von Seth for reviewing the English language in this paper and the social forum "Regjistri Elektronik i Specieve Shqiptare" for introducing a useful "Citizen Science" in researches on the fauna of Albania.

References

- Ahmad I., Memon N., Kamaludin S. 2004. A Revision of Hayline Stink Bug Genus *Erthesina* Spinola (Hemiptera: Pentatomidae: Pentatominae) and Their Cladistics [sic!]. *Pakistan Journal of Zoology* **36**: 285–293.
- Derjanschi V., Péricart J. 2005. *Faune de France. – 90 –. Hémiptères Pentatomoidea euro-méditerranéens. Volume 1. Généralités, systématique: première partie.* Fédération Française des Sociétés de Sciences Naturelles, Paris, 496 pp.
- EPPO 2020. EPPO Global Database (Online database). <https://gd.eppo.int>. DROPSA, October 2016. *Erthesina fullo* (Hemiptera: Pentatomidae); available from: https://gd.eppo.int/download/doc/1184_minids_ERTNFU.pdf; accessed: 02.04.2020.
- Leskey T.C., Nielsen A.L. 2018. Impact of the Invasive Brown Marmorated Stink Bug in North America and Europe: History, Biology, Ecology, and Management. *Annual Review of Entomology* **63**: 599–618.
- Li L., Wang R., Waterhouse D.F. 1997. The Distribution and Importance of Arthropod Pests and Weeds of Agriculture and Forestry Plantations in Southern China. ACIAR, Monograph No. 46, Canberra, 185 pp.
- Rabitsch W. 2008. Alien True Bugs of Europe (Insecta: Hemiptera: Heteroptera). *Zootaxa* **1827**: 1–44.
- Rider D.A. 2020. *Erthesina* Spinola, 1837. Available from: https://www.ndsu.edu/pubweb/~rider/Pentatomoidea/Genus_Halyini/Erthesina.htm; accessed: 02.04.2020.
- Song H.W., Wang C.M. 1993. Damage by *Halyomorpha halys* (Stål) and *Erthesina fullo* (Thunberg) to jujube trees and their control. *Entomological Knowledge* **30** (4): 225–228.



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Received: 2 April 2020
Accepted: 18 May 2020