

## NOTA / NOTE

# Confirmation of the presence of *Halyomorpha halys* (Stål, 1855) (Hemiptera: Pentatomidae) in mainland Portugal. <sup>1</sup>

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**Abstract:** The presence of the brown marmorated stink bug, *Halyomorpha halys* (Stål, 1855) (Hemiptera: Pentatomidae), in mainland Portugal is confirmed. The European and Iberian distribution of the species is summarized. A possible approach to deal with this problematic pest in the country is briefly discussed.

**Key words:** Hemiptera, Pentatomidae, *Halyomorpha halys*, brown marmorated stink bug, Portugal, confirmation.

**Resumen:** Confirmación de la presencia de *Halyomorpha halys* (Stål, 1855) (Hemiptera: Pentatomidae) en Portugal continental. Se confirma la presencia del chincheapestoso marrón, *Halyomorpha halys* (Stål, 1855) (Hemiptera: Pentatomidae) en Portugal continental. Se resume la distribución europea e ibérica de la especie. Se discute brevemente el posible abordaje para tratar con esta problemática plaga en el país.

**Palabras clave:** Hemiptera, Pentatomidae, *Halyomorpha halys*, chincheapestoso marrón, Portugal, confirmación.

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**Recibido:** 16 de octubre de 2020  
**Aceptado:** 22 de octubre de 2020

**Publicado on-line:** 26 de octubre de 2020

The brown marmorated stink bug (BMSB), *Halyomorpha halys* (Stål, 1855) (Hemiptera: Pentatomidae), is a species native of East Asia (China, Korea, Japan, and Taiwan) (RIDER, 2006; LEE et al., 2013) and has been accidentally introduced into a number of countries distributed worldwide, mostly in Europe and North America, but with a few records in South America, Oceania, and an unconfirmed report from Northern Africa (cf. ROCA-CUSACHS et al., 2018 and references therein). A synthesis of the ecology and behaviour of this species was presented by ROCA-CUSACHS et al. (2018), showing it as a serious agricultural pest and a major source of economic, ecological, and social concern. Furthermore, the potential global distribution of the BMSB using bioclimatic niche models highlighted the Mediterranean and warm-temperate climates to be at substantial risk (KRITICOS et al., 2017).

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<sup>1</sup> This work was partially supported by Operational group i9Kiwi - Developing strategies for the sustainability of kiwifruit production through creation of an added value product, funded by PDR2020.

The earliest European records date from 2004, from Liechtenstein (ARNOLD, 2009) and Switzerland (cf. HAYE et al., 2014). About a decade later, CLAEREBOUT et al. (2018) and CIANFERONI et al. (2018) presented comprehensive surveys of the progress of the impressive invasion of Europe and its Asian surroundings by *H. halys*, listing 28 countries with published records (\* denotes countries where the species was intercepted but is not established): Albania, Austria, Belgium, Bulgaria, Croatia, Czech Republic, France, Georgia, Germany, Great Britain\*, Greece, Hungary, Iceland\*, Italy, Kazakhstan, Liechtenstein, North Macedonia, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden\*, Switzerland, Turkey, and Ukraine. Since then, *H. halys* was also recorded from Bosnia and Herzegovina (ZOVKO et al., 2019), Malta (TASSINI & MIFSUD, 2019), the Netherlands (AUKEMA et al., 2019), Portugal (NAVES, 2019), and Norway\* (EPPO, 2020).

According to the literature, the current known Iberian distribution includes the Spanish provinces of Girona (DIOLI et al., 2016), Barcelona (ROCA-CUSACHS et al., 2018), Gipuzkoa (PAGOLA-CARTE & ZABALEGUI, 2019), and Lleida and Tarragona (ESCUADERO-COLOMAR, 2020). Regarding Portugal, NAVES (2019) reports its presence in the country without any details about the region, locality or collection date.

Bearing in mind the spreading history of *H. halys* in Europe and its relevance as an important pest of many fruit trees and herbaceous crops, the Portuguese Kiwifruit Producers Association (APK), in the scope of the i9Kiwi project, encouraged the University of Coimbra to develop an awareness campaign to alert to the problematic of this invasive pest. This was materialized with the creation of a Facebook group, dissemination materials, and presentation of seminars with stakeholders, in particular producers' associations and farmers. Here we confirm the presence of *H. halys* in Portugal and record it from precise Portuguese locations for the first time, including some records obtained as a result of the awareness campaign described.

#### Material examined:

##### PORTUGAL:

- **Braga district:** Braga municipality: União de Freguesias de São João de Souto e São Lázaro (29TNF49), 13/09/2020, 1 specimen (H. Gaspar det.).
- **Coimbra district:** Coimbra municipality: Department of Life Sciences, University of Coimbra (40.206956° N, -8.422999° W; 29TNE4950), 28/09/2020, 1 ♂ (H. Gaspar leg. & det., in coll. FLOWer Lab; Fig. 1a).
- **Leiria district:** Pombal municipality: Guia (29SNE12), November/2018, 1 specimen (INIAV det.); February/2019, 2 ♂♂ and 2 ♀♀ (H. Gaspar det., in coll. INIAV).
- **Lisbon district:** Lisbon municipality: Instituto Superior de Agronomia (Tapada da Ajuda) (38.707628° N, -9.182306° W; 29SMC8484), 12/10/2020, 1 specimen (photographed by Francisco Amorim; Fig. 1b).

#### Discussion

Considering the astonishing capacity of population growth and invasion ability of this agricultural pest, its arrival to Portugal was already expected. As such, for the last two years, actions have been conducted to raise awareness to this problem in Portugal. Such campaigns have been demonstrated to be very important in early detections (MAISTRELLO et al., 2016). Indeed, the arrival to Portuguese territory was confirmed between late 2018 and the beginning of 2019, by a farmer from Pombal region aware of this problematic, in a single event with live individuals being captured in agricultural equipment imported from Italy. No further detections were confirmed on the region (Pombal) by INIAV (National Institute for Agricultural and Veterinary Research) prospection program and it was considered to be an accidental interception (Portuguese National Authority for Animal Health, personal communication).

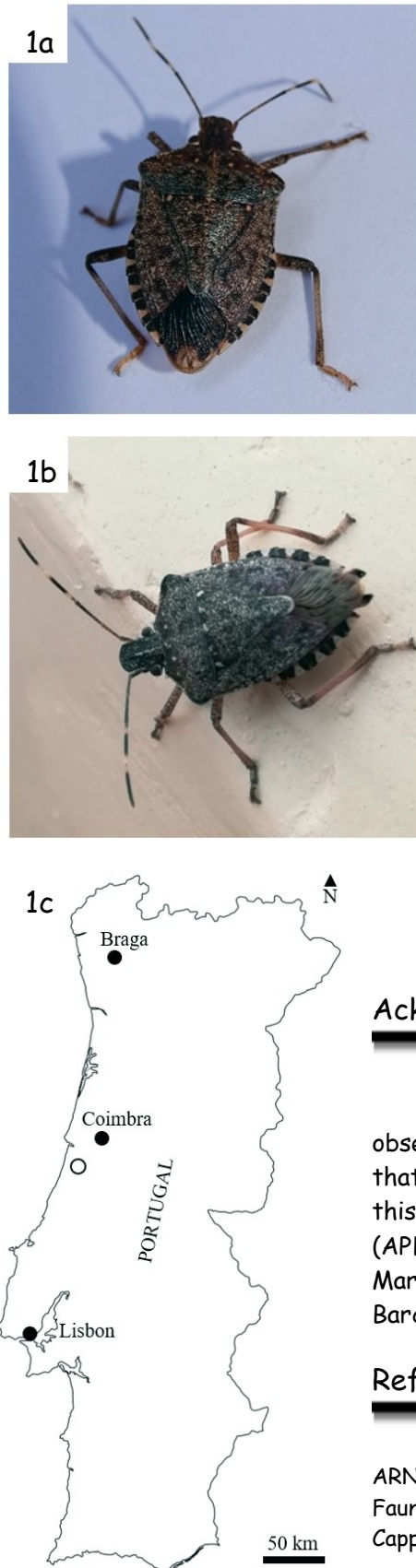


Fig. 1.- *Halyomorpha halys* in mainland Portugal. Specimens observed in 2020 in: a.- Coimbra. b.- Lisbon. c.- Map with the location of the four observations, including the late 2018 interception event in Leiria (white dot).

The three observations from 2020 in different regions of Portugal (Braga, Coimbra, and Lisbon), with no connection to the first interception (see map, Fig. 1c), coupled with the observed specimens being intact and not damaged, suggest that they likely bred in Portugal and that small stable populations may already exist. All the insects were observed alive in buildings inside city perimeters but next to green infrastructures (the Botanical Garden of the University of Coimbra in Coimbra, Tapada da Ajuda in Lisbon), or agricultural fields (in Braga).

Even though in other countries (in particular North America and other European countries), in the first stages of invasion, *H. halys* appears to be only an urban pest, because of its overwintering in houses and other anthropogenic structures, whereas the agricultural problems come later (LORU *et al.*, 2018), we cannot underestimate the silent spread of this problematic pest. Therefore, besides continuing to raise awareness for this invasive insect, national authorities should start monitoring programmes, aimed at early detection of its occurrence (using lures containing BMSB pheromone, for example), in order to control and understand local population dynamics, and thus prevent or at least increase the time until *H. halys* becomes pestiferous, while developing management strategies to prevent damage.

### Acknowledgements

The authors want to thank the contribution of the anonymous observers/collectors of the insects intercepted in Leiria and Braga, that responsibly responded to the awareness campaign focussing on this species, and also to the Portuguese Kiwifruit Producers Association (APK) for supporting the start of the campaign. We are grateful to Marta Goula and Jan T. Perarnau, both from the University of Barcelona, for their very helpful comments on the manuscript.

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