

SHORT COMMUNICATION

The first interception record of *Halyomorpha halys* (Hemiptera: Heteroptera: Pentatomidae: Pentatominae), an invasive true bug and serious threat, in Israel

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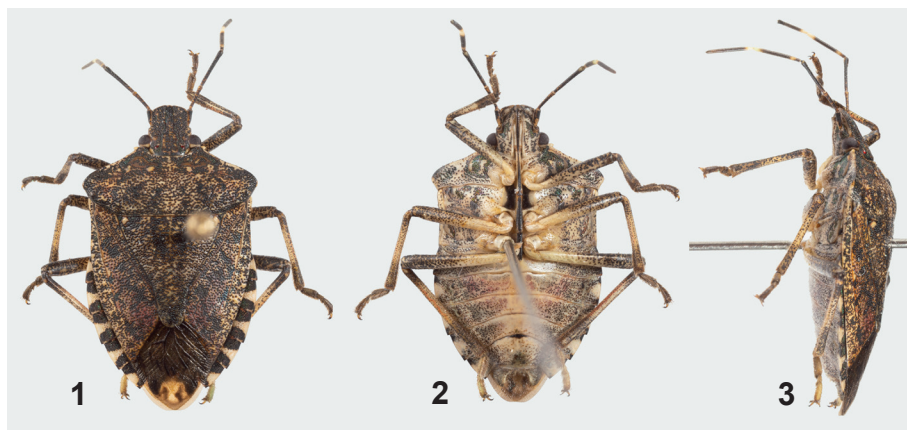
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Halyomorpha halys (Stål, 1855), the brown marmorated stink bug (BMSB), is native to East Asia: China (excluding the western continental areas), Taiwan, Japan, Korea and Vietnam (Kment *et al.* 2021). Its presence beyond its original distribution range was initially documented in 1996 in the USA, specifically in Allentown, Pennsylvania (Hoebeke *et al.* 2003). Since then, it has demonstrated a remarkable ability to spread and establish populations in various regions and continents: in West Palearctic (Europe, Transcaucasia, Turkey, Kazakhstan, North Africa), Nearctic Region, Neotropical Region and Oceania (Australia and New Zealand) (Kment *et al.* 2021, 2023). As for Oceania, there to note the successful experience of the BMSB eradication (Leskey *et al.* 2013; Carapezza & Lo Verde 2017; EPPO 2023).

Halyomorpha halys has emerged in recent decades as a major insect pest of worldwide importance due to its exceptional capacity for invasiveness in new habitats. The BMSB causes millions of dollars' worth of crop damage and control costs every year (Hoebeke *et al.* 2003; Gyeltshen *et al.* 2005; Nielsen & Hamilton 2009; Leskey *et al.* 2012; Martinson *et al.* 2013; Wallner *et al.* 2014; Brunner, 2014; Rice *et al.* 2014; Véték *et al.* 2014; Carapezza & Lo Verde 2017; Hamilton *et al.* 2017; Leskey & Nielsen 2018; Anonymous 2021). It has also become a nuisance to homeowners due to its use of buildings and other technical structures as overwintering sites (Inkley 2012).

The detection of *H. halys* in Israel is not unexpected, and two officially confirmed cases of interception attributed to tourism and imported goods, are reported herein.

On January 20, 2022, Ron Lustigman shared a photograph of an adult *H. halys*, intercepted in the Ashdod Port (Israel) in a car imported from the USA, in the Facebook group *Arthropods, Reptiles and Amphibian Photography* (<https://www.facebook.com/groups/bugsphoto>). On May 2, 2023, Odelia Portnoy posted in the same group photographs of another adult *H. halys*, following the discovery of the insect in their luggage upon returning to Israel from Italy. Both specimens were



Figs 1–3. *Halyomorpha halys*, adult male, habitus, SMNHTAU-I383508: (1) dorsal view, (2) ventral view, (3) lateral view.

donated to the insect collection of the Steinhardt Museum of Natural History, Tel Aviv University, Israel (SMNHTAU) for further study. The specimens have been databased as SMNHTAU-I383508 and SMNHTAU-I428239, respectively.

Using the key for the separation of *Halyomorpha halys* from similar-appearing pentatomids (Wyniger & Kment 2010), it is easy to distinguish this species (Figs 1–3) from other similar-looking stink bugs in our region.

Halyomorpha halys has the characteristic “shield” shape common to most stink bugs. Its adults are among the largest stinkbugs, with body length 14–17 mm. The insects are mottled brownish grey and have smooth anterolateral pronotal margins with untoothed edges. The BMSB has two distinct white bands on its otherwise dark antennae. The connexivum also has this alternating dark and light banding. The underside of the BMSB is white with some dark markings. The eggs are elliptical, light yellow to yellow-red, with minute spines forming fine lines. The eggs are attached, side-by-side, to the underside of leaves in masses of 20 to 30 eggs. There are five nymphal instars (Hamilton *et al.* 2017), ranging in size from the 1st to the 5th instar at 2.4–12 mm body length. The eyes of nymphs are deep red. The abdomen is yellowish red in the first instar and progresses to off-white with reddish spots in the fifth instar. Protuberances are found before each of the abdominal scent glands on the dorsal surface. The legs, head and thorax are black. Spines are located on the femur, anteriorly to each eye, and on the lateral margins of the thorax.

According to Leskey *et al.* (2013, updated in 2023) and EPPO (2023) global distribution data, no countries neighboring Israel have reported interception or confirmed presence of the BMSB (Fig. 4).

It is recommended that the Israeli Agricultural Research Organization conducts research on established plant protection methods, as the spread of this pest in the country appears to be imminent.



Fig. 4. The distribution of established populations of *H. halys* in the Mediterranean (countries in red, follows Leskey *et al.* (2013)). The map was created using <https://www.mapchart.net>.

Early detection provides an opportunity to establish the BMSB monitoring system in Israel and develop a comprehensive strategy to effectively control this invasive pest.

Assessing the potential economic consequences of the BMSB in Israel is a complex issue. Israel has a well-established agricultural sector with arable land distributed throughout the country. It is a significant exporter of fresh agricultural products, including fruits and vegetables (Ministry of Agriculture and Rural Development [n.d.]).

Our extensive research highlights the importance of integrating biological control methods into the pest management strategies for *Halyomorpha halys*. To mitigate the impact of BMSB in Israel, predatory insects and spiders can be utilized. The Israeli native fauna already includes Hymenoptera natural enemies of *H. halys*, such as the Eupelmidae *Anastatus bifasciatus* (Geoffroy, 1785) and the Scelionidae *Telenomus ordanus* Kononova, 2008 and *T. lunatus* Kononova, 2008.

It is crucial to take timely and proactive measures to monitor, control and prevent further spread of this invasive pest to minimize its adverse economic impact. Implementing citizen science monitoring is an effective approach, as confirmed by the discovery history of the BMSB in this report.

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