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BROWN MARMORATED STINK BUG (BMCB) IN THE CONDITIONS OF ROMANIA VS ALGERIA

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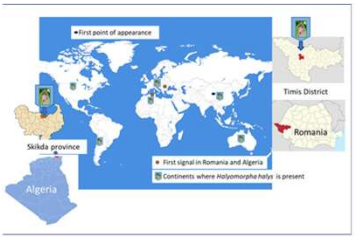
Abstract:

Through this work we want to do a comparative study between the distribution of Halyomorpha halys species in Romania and Algeria. We are also considering the exposure of the host plants through updating. The aim is to see if there are differences or similarities in frequency and feeding behavior in the two mentioned countries, considering that they are part of 2 different climatic zones. The species originating from China, arrived in Romania in 2015 and in Algeria much later, in 2021. Our searches showed that it is widespread all over Europe and only in 2 countries in North Africa.

Introduction

Brown marmorated stink bug (BMCB) known by the scientific name of Halyomorpha halys is an insect of the order Hemiptera, family Pentatomidae. This, originally from Asia (China) (JOSIFOV AND KERZHNER, 1978), has experienced a spectacular expansion over time, managing to be present on most continents (Asia, North America, South America, Europe and Africa) (HOEBEKE AND CARTER, 2003; CALLOT AND BRUA, 2013; DE MICHELE AND GROZEA, 2018; GAO ET AL., 2019; GYAWALI ET AL., 2019; LOONEY ET AL., 2019; KONJEVIC, 2020; EPPO, 2021).



Distribution of the species Halyomorpha halys in the world; study areas in Romania and Algeria

Material and method

Observations on the spot

In the University Park (USVT) in Timisoara and in the Botanical Park, we made biweekly direct observations between April 1 - May 7 (5 weeks) from 2023. Special containers for large insects were used for collection.

Plants subject to observation

From the range of plant species existing in the parks, 23 species (grasses, shrubs and trees) were subjected to macroscopic observations. Only by simply viewing a passage in the time interval 14-17 (sunny days and cloudy).

Identification studies

In order to identify the specimens found, I used a binocular magnifying glass as well as other additional tools from the Phytosanitary Diagnosis and Expertise Laboratory (figure 2).

Results and discussions

The first reports in the 2 countries under analysis showed that the species Halyomorpha halys does not take into account the climatic conditions, considering that in Romania it appeared in a central area (Transylvania) (MACAVEI ET AL., 2015) with an annual average temperature of 8-9°C and in Algeria in a northern area (Skikda) (VAN DER HEYDEN, 2021; EPPO, 2022) with an average of 19°C.

The situation in Romania, however, is different, where the species is present everywhere, explainable, considering the 6 years ahead of Algeria. In order to update the situation of the population level, following biweekly observations during the period April - May, 2023 we found that in the city of Timisoara it is still present at a high level (185+84 adults, i.e 269 ad.).

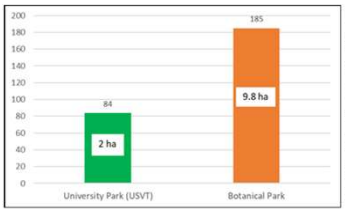


Fig. 3

In parks subject to observation, 84 ind./ULST park and respectively 185/ Botanical Park (PB) were found. Considering the surfaces from which the insect samples were collected, the ratio between the locations was 2:1 (ULST: PB) (figure 3).

They were identified as belonging to the category of vegetables, ornamental plants, vines, fruit trees and crop plants. The insect was observed in various places such as public parks, private gardens, orchards, vineyards, but also on agricultural land.

Halyomorpha halys (adult stage) on host plants in parks from Timisoara (Romania): 1, 3, 4- ornamental plants (Japanese quince, border forsythia and rose); 2- fruit tree (apple); the pictures taken in the parks of Timisoara, in April 2023

The bimonthly evolution of hibernating adult insects is shown in Figure 4. Anyway, the trend for the April-May period, from the appearance of the first hibernating insects, is one of slow progressive growth and which probably would have increased if the research had continued.

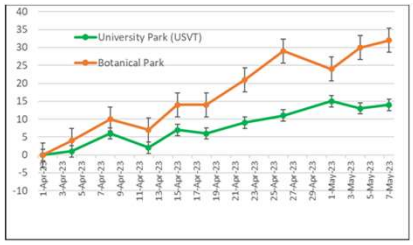


Fig. 4

Table 3

The host plant for feeding		Category	Area type
Latin identity	Common identity		
Ziziphus mauritiana	Jujube	Ornamental plant	Green space*
Washingtonia sp.	Palm	Ornamental plant	Public Park*
Malum granatum	Pomegranate	Ornamental plant	Green space*
Ailanthus altissima	Heaven-tree	Ornamental plant	Public Park*

*The plants were mentioned by VAN DER HEYDEN (2021)

Table 3 mentions 4 species of ornamental plants that are actually supposed to be host plants for Halyomorpha because it was seen near them.

Conclusions

As a conclusion, it is clear that the trade in plants between countries and the neighbourhoods are the causes of the spread. Like, they probably arrived in the north of Algeria through the trade with Spain and in Romania also through the intra-European trade of ornamental plants. However, the expansion within a country or region is caused by the host plant area and the climatic conditions, and these must be with normal to high temperatures, with sunshine.

Acknowledgement

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Bibliography (selective)

VAN DER HEYDEN T., SACI A., DIOLI P (2021). First record of the brown marmorated stink bug Halyomorpha halys (Stal, 1855) in Algeria and its presence in North Africa (Heteroptera: Pentatomidae). Revista gaditana de Entomología XII(1), 147-154.

MACAVEI L. I., BAETAN R., OLTEAN I., FLORIAN T., VARGA M., COSTI E., MAISTRELLO L. (2015). First detection of Halyomorpha halys Stal, a new invasive species with a high potential of damage on agricultural crops in Romania. Lucrari Stiintifice seria Agronomie 58, (1):105-108.

DE MICHELE A., GROZEA I. (2018). Review of the spreading of Halyomorpha halys in Italy and confirmation of presence in Romania Research Journal of Agricultural Science,50 (4): 111-115.

HOEBEKE E.R., CARTER M.E. (2003). Halyomorpha halys (St+l) (Heteroptera: Pentatomidae): a polyphagous plant pest from Asia newly detected in North America. Proceedings of the Entomological Society of Washington, 105(1):225-237.