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EFFECTS OF AGROCLIMATIC CONDITIONS ON THE SURVIVAL AND REPRODUCTIVE POTENTIAL OF THE INVASIVE SPECIES *Halyomorpha halys* (Stal)

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Invasive species represent one of the most significant challenges for modern agriculture, as they disrupt ecosystem balance, reduce biodiversity, and cause substantial economic losses in agricultural production. Among these species, the invasive species *Halyomorpha halys* Stal (Hemiptera: Pentatomidae), commonly known as the brown marmorated stink bug, is distinguished by its polyphagous feeding behavior, high ecological plasticity, and remarkable ability to adapt to a wide range of soil and climatic conditions. Native to East Asia, this species has rapidly expanded its distribution range across Europe and North America, becoming a pest of major economic importance for fruit crops, vegetable crops, vineyards, and ornamental plants.

The invasive success of this species is determined by the interaction between its biological characteristics and the agroclimatic conditions of the colonized regions. Climatic factors, particularly winter temperature regimes and temperature and humidity conditions during the growing season, directly influence the survival of overwintering adults in diapause. In the context of climate change, characterized by increasing average temperatures and a reduction in the frequency of severe winters, an intensification of the establishment and spread of this species into new geographic areas is expected. In the Republic of Moldova, climatic conditions characterized by relatively mild winters and warm summers create favorable prerequisites for the survival and development of populations of the invasive species *Halyomorpha halys*.

The aim of this study was to evaluate the impact of agroclimatic conditions on overwintering survival and reproductive potential of the species *Halyomorpha halys*. The research was conducted through population monitoring under natural and laboratory conditions, with the analysis of post-winter survival rates, development

dynamics, and reproductive capacity. The results demonstrated that approximately 55% of adults survived the cold season, ensuring the continuity of populations in the following year. Adults resumed biological activity with an increase in average daily temperatures, initiating feeding and reproductive processes.

Favorable thermal conditions during the vegetation period accelerated the development of preimaginal stages and reduced the duration of the biological cycle. The species was capable of producing up to three generations during the growing season. High reproductive capacity contributed to the rapid increase in population density and intensification of damage to agricultural crops.

Climate change, expressed through increasing average temperatures, promotes the expansion of the species' distribution range and enhances its invasive potential. The obtained results confirm that the agroclimatic conditions specific to the Republic of Moldova provide favorable conditions for the survival of *Halyomorpha halys* during the diapause period, facilitating the maintenance of stable populations. The high level of post-hibernation survival, combined with considerable reproductive potential, represents a determining factor in the ecological adaptability and expansion of this species within agroecosystems of the Republic of Moldova.

Keywords: *Halyomorpha halys,* imago, diapause, climate factors.

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