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Research Article

Geographical Distribution of *Nezara viridula* L. (Heteropteran: Pentatomidae) in Yazd Province of Iran Using Maximum Entropy Modeling

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ABSTRACT

Understanding the features that affect the distribution of invasive species has always been one of the principles of IPM strategy. Modeling the potential distribution makes it impossible to apply the necessary management tactics for controlling the invading species before damage begins. Yazd province, located in the dry belt of the Iranian plateau, is one of the most critical regions for pistachio production, and *Nezara viridula* L., which belongs to the category of Pentatomid bugs, is a cosmopolitan polyphagous pest that has numerous plant hosts, including pistachio. The sampling pattern of *N. viridula* concentrated on dividing provinces and pistachio orchards. According to a distribution prediction model, six climate layers plus altitude were selected, and datasets were performed through maximum entropy modeling (MaxEnt). The climates were chosen based on the climatic stratification method introduced by the International Center for Agricultural Research in the Dry Areas (ICARDA). Modeling the distribution maps for *N. viridula* based on Maxent and the areas under the receiver operating characteristic (AUC) illustrated climate changes including A-C-W, A-K-W, SA-K-M. It represented that small parts of the southern and northern regions of A-C-V-W were suitable for the presence and distribution of *N. viridula* in Yazd Province. The AUC value was more significant than 0.5, indicating that the selected environmental parameters had significantly affected the distribution of *N.viridula*. Eventually, it was concluded that the expansion of quasi-natural vegetation (primarily Pistachio orchards) could be considered an essential factor in the distribution of *N. viridula* compared to other environmental factors in this province.

Key words: *Nezara viridula*, Distribution models, Maxent, Pistachio orchards, Yazd province