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Vespa velutina in Italy: a modelling approach to predict the new annual colonized area and improve management practices

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The Asian yellow-legged hornet *Vespa velutina* (Lepeletier 1836) is an invasive alien species that is colonizing Italy since 2012. *V. velutina* preys honeybees and other native insect species, generating impacts on beekeeping, biodiversity and ecosystem services associated with pollinators, besides to concern among citizens and management economic costs. For these reasons, Europe considers *V. velutina* as an invasive alien species of Union Concern (IAS Regulation - EU 1143/2014), and member states should act to prevent, contain and limit its spread. In Italy, the European LIFE STOPVESPA project is acting since 2015 to contain the spread of *V. velutina*.
Control activities aimed to limit the spread of an invasive species requires the assessment of the colonized range besides to the prediction of the areas more feasible to be colonized. Therefore, the distribution of *V. velutina* records (colonial nests) in Italy were analysed in order to understand the factors that influence species distribution and develop predictive models of expansion; such models are useful to improve management practices.
The variables that contribute more in determining the distribution of hornet nests at the local scale are the elevation above sea level (95% of nests located within 521 m a.s.l.) and the distance from source sites (95% of nests within 1.4-6.2 km from nests of the previous year). The probabilities to found *V. velutina* nests over the limits of its colonization range decreases rapidly with the increasing of distances from source sites. These data were used to build predictive models of expansion for the species.