

Japanese beetles and other alien species

There is a beetle that has been invading the Italian countryside and cities for some time now, a small insect with iridescent green and brown colouring and a row of black and white tufts along each side of its body. This beetle eats plant leaves and ruins crops. There are very many of them, especially in the northern regions of Italy, and it is strange that we do not remember seeing them in past years. How come? Simple, because there were none.



Popillia japonica. Credits:

[https://it.wikipedia.org/wiki/Popillia_japonica#/media/File:Japanese_Beetle_\(Popillia_japonica\)_-_London,_Ontario_02.jpg](https://it.wikipedia.org/wiki/Popillia_japonica#/media/File:Japanese_Beetle_(Popillia_japonica)_-_London,_Ontario_02.jpg)

The beetle, called *Popillia japonica*, is native to Japan and is just the latest in a long line of alien organisms. Alien? Yes, but not because they come from other worlds; these aliens come from other parts of this world. Alien, or allochthonous species are those organisms - animals, plants, fungi and bacteria - that have been artificially introduced into a new environment. But what are they doing here?

Some were introduced because they were good to eat, others because they were beautiful and ornamental, some species arrived because they were considered useful, others arrived accidentally, perhaps hidden among goods. Often they do not adapt and they die. Sometimes they succeed and then they become pests. This is because in the new environment they have no natural predators, and often they are competitive, voracious, aggressive species that proliferate at the expense of local species. When they increase disproportionately and cause damage, these organisms are called invasive. What damage? Alien species are among the main causes of loss of global biodiversity. In Europe, 10 billion Euro a year is spent on controlling non-native species and limiting and compensating for damage. The brown marmorated stink bug, for example, which arrived in Italy in 2012, devastates fields and orchards with damage that had already exceeded 740 million Euro in 2020. The spread of alien species is increasing due to trade with distant countries, transport, tourism and climate change. There are over 10,000 alien species in Europe and Italy is one of the countries most affected by the phenomenon. In the Mediterranean, for example, there are many organisms from tropical and subtropical seas, partly due to global warming. *Some micro-organisms are also aliens: an unfortunately well-known example is the xylella, a bacterium that arrived from Costa Rica and has devastated the olive groves of Salento.*

Alien insects most dangerous for plants include the red palm weevil, which attacks palm trees, and the citrus long-horned beetle. The larvae of these beetles feed on wood and bore long tunnels in the trunk. An infested plant gradually dries up and usually does not survive. Some non-native insects are harmful to human health, such as the tiger mosquito. It is a

mosquito that arrived from Asia, probably with water accumulated inside old tyres. Tiger mosquitos sting during the day and can carry viruses responsible for severe diseases, such as dengue, Chikungunya and yellow fever.

There are alien insects that are dangerous to other insects. The Asian hornet, for example, is native to south-east Asia and attacks beehives, killing the honeybees inside them. This insect is responsible for great economic and environmental damage because it exterminates bees and other important pollinating insects. An interesting case is the harlequin ladybird, which was imported from Asia for pest management. Ladybirds eat aphids and other plant pests, so they are excellent allies in protecting the health of plants, especially those that produce fruit and flowers. The harlequin ladybird is particularly voracious, and thus it was deliberately introduced to control aphids. However, the harlequin ladybird does not just attack aphids but many other insects too, including local ladybirds which, unlike the alien species, has fewer spots and is smaller.



*Comparison of ladybirds: on the left the harlequin ladybird (*Harmonia axyridis*): a ladybird up to 8 mm in size, it has a wide range of colour forms. On the right is the common ladybird (*Coccinella septempunctata*): this is a 6-7 mm, red ladybird with seven black spots (hence the Latin name *septempunctata*).*

How do you combat alien insects? First, care must be taken to avoid importing them, especially accidentally. Other solutions involve the application of specific traps that do not harm the local fauna and flora but only capture harmful species. An effective but somewhat risky method is to look for natural predators in the countries of origin: organisms that attack or make the pests ill but which, if not studied very carefully, may turn out to be equally harmful aliens in the new environment.

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