

Alien flatworms: guidelines for nurseries to control infestations

Version: June 2022

Alien flatworms are spreading rapidly across Europe through the trade of potted and garden plants. The number of reported cases is also increasing in Switzerland. Careful handling can prevent further spread and major damage.

- Carefully inspect incoming goods (especially those imported from abroad).
- Immediately eliminate any flatworms and report them to the authorities.
- Prevent further spread to the customer's property.

So far, three problematic alien flatworms are known to occur in Switzerland: *Obama nungara*, *Caenoplana variegata* (also named *Caenoplana bicolor*) and *Diversibipalium multilineatum*. *Obama nungara* originates from South America, *Caenoplana variegata* from Australia and New Zealand, and *Diversibipalium multilineatum* from Japan.



Image sources: (Left) Sylvain Petit. <https://theconversation.com/obama-nungara-le-ver-venu-dargentique-qui-envahit-les-jardins-francais-131004/>.

Obama nungara flatworm with an egg, which is reddish at first but turns black after a few hours. *Obama nungara* flatworms are about 4–7 cm long when fully grown, whereas eggs are about 5 mm in diameter.

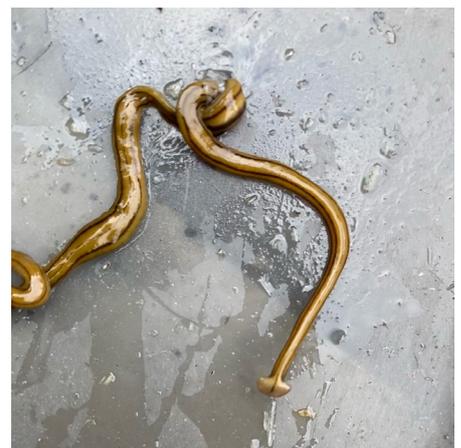


Caenoplana variegata flatworm found during an inspection in the canton of Zurich. This species becomes much longer than *O. nungara*, reaching 15–20 cm.



Image sources: (Left) Image used unedited. Jean-Lou Justine, Leigh Winsor, Delphine Gey, Pierre Gros, Jessica Thévenot. CC BY-SA 4.0: <https://creativecommons.org/licenses/by-sa/4.0/deed.en>. (Right) Specimen found in the canton of Ticino.

An *Obama nungara* flatworm digests an earthworm by secreting an enzyme slurry that liquefies the worm.



The flatworm *Diversibipalium multilineatum* with the typical head shape.

Information

Problem **Why are flatworms a problem?**

Obama nungara has no natural enemies in Europe and has a very broad diet, which is why it has an extremely high invasive potential. It feeds on earthworms, slugs and snails, among other organisms. *Caenoplana variegata*, by contrast, does not feed on earthworms, snails or slugs, but instead on almost all arthropods. Both alien flatworm species therefore have a considerable negative impact on ecosystem services and soil quality. In addition, native species are threatened by these invasive flatworms because their populations become smaller or their food sources diminish.

Many unanswered questions

These organism have only recently appeared in Europe, and little is known about their spread and control. In order to close these knowledge gaps, the national working group of the cantons (CE AG Vollzug Grüne Branche – Green Sector Enforcement) is collating reported occurrences and experiences and is working on projects to clarify open questions relevant for practice. Further, suitable measures are to be elaborated together with the Green Sector. We are most grateful for this cooperation.

Control

Based on current knowledge and experience from establishments that have already been infested, a soapy water bath seems to be effective in killing invasive flatworms. Hot water is also effective.

Spread **How do flatworms spread?**

Flatworms **reproduce** either sexually by laying eggs or asexually by splitting off sections of their abdomen (1–3 cm long), which then regenerate within three weeks. Note that severing a flatworm results in two individuals rather than killing it! **The main route of transport is via potted and garden plants or earth material moved by humans.** They can also overwinter in our country.

What should be done?

Typical infestation sites.
During the day flatworms seek shelter in dark, damp places.

- Check incoming plant shipments carefully.
- Regularly inspect damp spots on mats, on foils and under pots.



Egg (about 5 mm in diameter) on a gridded sheet. Fresh eggs are reddish, but they turn black after a few hours. Several worms hatch per egg capsule.

- Be sure to also check borders to private gardens and spaces with many slugs and snails.
- If you suspect that you have detected a flatworm, please send a photo to the cantonal alien species agency, then preserve the flatworm in a paper towel or in ethanol (70%). If your suspicion is confirmed, the specimen will be needed for more precise identification.

What to do if you find a flatworm

- **Report the occurrence to the cantonal alien species agency,**
- Collect and kill worms and eggs on a regular basis: crush the eggs (be careful, as a whitish liquid emerges), place worms in a soapy water bath, then wash your hands.
- To be safe, dispose of any dead flatworms as household waste.
- Be sure to inspect all boxes and pots that come from the infested area.
- **Be sure to inspect the outgoing goods of the facility for flatworms. It is important to prevent further spread to the customer.**

Contact Cantonal Alien Species Agency: <https://www.kvu.ch/de/adressen/neobiota>

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