

Invasive Species Alert!

Zebra mussels have been detected in numerous living “moss ball” products marketed for freshwater aquarium and water terrarium use. Sold online, as well as at aquarium and pet stores, under a variety of names, for example “Marimo Moss Balls” or “Betta Buddy Marimo Balls”, these naturally occurring velvety-green balls of algae (not an actual moss) may harbor an unwanted surprise - invasive zebra mussels!

What are zebra mussels?

Zebra mussels (*Dreissena polymorpha*) are small, fingernail-sized, freshwater bivalves native to the Caspian Sea region of Asia. In spite of their small size, they are regarded as one of the most concerning invasive species in North America.

Once zebra mussels become established in large numbers they out-compete other species, disrupt food-chains, and alter water chemistry (sometimes leading to harmful algal blooms). Attaching to hard surfaces, mussels will also clog pipelines used for water supply and hydropower and can damage boat hulls and engines. The presence of zebra mussels has been known to contribute to taste and odor issues in drinking water and their small sharp shells can render beaches unusable.

Zebra mussels have three life stages – larval, juvenile, and adult. In their microscopic larval stage, the mussels live freely in the water column, allowing them to be easily and unknowingly transported. As juveniles, the mussels settle out of the water column and attach themselves to hard surfaces using a dense array of small threads. Adult zebra mussels are quite hardy, can stay alive for several days out of water, and are common hitchhikers on boats, fishing equipment – and aquarium plant products!



What should I do if I recently purchased moss balls?

If you have recently purchased a moss ball live aquatic plant product, we recommend that you take the following steps: **DESTROY, DISPOSE, DRAIN.**

Do not dispose of the moss balls or aquarium water in drains, waterways, or gardens. Moss balls must be destroyed and disposed of in a sealed container in the trash.

When following any of the methods listed below, ensure that the disposal method you choose is in compliance with your local state laws and animal welfare regulations.

DESTROY in one of three ways:

Freeze - Place the moss ball into a sealable plastic bag and freeze for at least 24 hours.

Boil - Place the moss ball in boiling water for at least 1 full minute.

Bleach / Vinegar - Submerge the moss ball in chlorine bleach diluted to one cup of bleach to gallon of water or undiluted white vinegar for 30 minutes.

DISPOSE of the moss ball and any of its packaging in a sealed plastic bag in the trash. If vinegar, boiling water, or bleach was used, the liquid can be disposed down a household drain - never down a storm drain where it could enter and damage local waterways.

If the moss ball was placed in an aquarium or other habitat, please take these additional steps.

DRAIN and clean the aquarium or water terrarium.

Collect any fish or other living organisms and place them in another container, with water from a separate, uncontaminated water source. Inspect other aquatic plants for evidence of zebra mussels or other organisms that were not intentionally added to the aquarium environment. Decontaminate and dispose of any suspect or contaminated living items using same process as for the moss balls. Sterilize the contaminated aquarium water by adding ¼ teaspoon bleach for each gallon of water. Let the water sit for 10 minutes and then dispose the sterilized water down a household drain.

Clean the aquarium and accessories using one of the following methods, ensuring that the method you choose is in accordance with aquarium manufacturers' recommendations:

- Hot Water Method:
 - Use water that is 140 degrees F to fill the tank and cover all accessory surfaces for a minimum of 5 minutes, OR
 - Use water that is 120 degrees F to fill the tanks and cover all accessory surfaces for a minimum of 30 minutes
- Disinfection Method:
 - Add ¼ teaspoon bleach for each gallon of water or ¼ cup of bleach per 10 gallons into standing aquarium water.
 - Soak the aquarium, substrate, rocks, décor, and filter media in the bleach water solution for 30 minutes.
 - Dispose of the previously used filter media and replace with new media.
 - If chlorine is used, apply a dechlorinating product to neutralize any residual chlorine prior to reintroducing aquatic life.

It is recommended that you do another water change within a week and continue to monitor the tank for any unusual or unexpected aquatic life.

Thank you for helping to protect our waters from invasive species!

These guidelines are preliminary or provisional and are subject to revision. They are being provided to meet the need for timely best science. If you have any question please contact your state's appropriate governing body for aquatic invasive species. This document adapted from guidance developed by the USFWS. Photo credits USGS.