

Avoid spreading infectious amphibian diseases



Information from the Nordic Network for actions Against Chytridiomycosis with grants from the Nordic Council of Ministers

Background

Chytridiomycosis is an infectious disease in amphibians caused by the aquatic chytrid fungi *Batrachochytrium dendrobatidis* (**Bd**) and *Batrachochytrium salamandrivorans* (**Bsal**). The pathogens affect frogs, toads and newts and have been linked to the global decline of amphibians and the extinctions of some amphibian species. No feasible measure is known for control of the disease in wild populations, so we must therefore avoid spreading it unintentionally.

Bd and Bsal both originated in East Asia. Bd has become widespread throughout Europe since it was first detected in 1998, while Bsal has only recently been found in the wild in The Netherlands, Belgium, and Germany.



How do Bd and Bsal spread?

Bd is found in keratin-containing tissues, such as epidermal cells of the terrestrial stages and the mouth parts (labial teeth) of the larvae.

There are several strains of Bd with differing virulences, and there are also variations in the sensitivities of amphibian species. Subsequently, some amphibian species can be vectors (reservoir hosts) of Bd and Bsal without showing symptoms. In these cases, the presence of Bd and Bsal can only be detected by DNA analyses, for example of skin swabs or water samples.

Bd predominantly affects the outermost layers of skin. Clinical symptoms of disease include unnatural behaviour and posture, shedding of skin and poor condition. Larvae can have deformed labial teeth.

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How to avoid spreading Bd and Bsal

There are many ways to avoid spreading waterborne infectious diseases.

1. You should always comply with national legislation in the event of any trade and import of amphibians. In case of import, trade or purchase, always demand documentation showing that the animals are free from infectious diseases!
2. You should never release amphibians, or substrates/water in which amphibians have been held in captivity, into the wild. You should never move amphibians between sites without permission.
3. Urge all personnel visiting or sampling freshwater environments to follow the precautions given below. This will reduce the risk of spreading not only amphibian diseases (chytridiomycosis, ranaviruses and herpes) but also other waterborne infectious diseases such as the fungus causing crayfish plague.

Before visiting a new site you should always:

- Clean boots and other equipment that has been in contact with water.
- Make sure your hands and skin are dry or use a refreshing tissue (containing ethanol).
- For other gear, use completely dry and clean equipment! If this is not possible, use a brush and water to clean off dirt, mud etc before disinfection.

The following disinfection methods should be used depending on what is feasible for each type of gear or equipment.:

Method	Concentration/temperature	Time
Virkon S® (biodegradable disinfectant)	10 mg/l of water	at least 7 minutes
NaCl	10% salinity	10 minutes
Ethanol	70% concentration	1 minute
Heat (in air or water)	at least 37° C	4 hours
	at least 60° C	5 minutes
Washing of clothes with washing detergent	at least 40° C	



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If sick animals are observed

If an outbreak of Bd, Bsal or any other infectious disease is suspected, the responsible authority should be contacted immediately for advice and analyses.

Responsible authorities:

Sweden - the Swedish Board of Agriculture -
www.jordbruksverket.se

Norway – Norwegian Food Safety Authority -
www.mattilsynet.no

Denmark – the Danish Veterinary and Food Administration - www.foedevarestyrelsen.dk

Finland – the Finnish Food Authority -
www.ruokavirasto.fi



Further reading

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