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Bullfrog linked to fungus spread

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An invasive frog species may be implicated in the spread of a fungus linked to global amphibian decline, research indicates.

Scientists writing in the journal *Biology Letters* found that non-native North American bullfrog populations routinely carry the chytrid fungus.

The deadly fungus has been implicated in many amphibian extinctions.

The scientists suggest the bullfrog may act as a vector because it can carry the fungus without developing disease.

Frog-legs

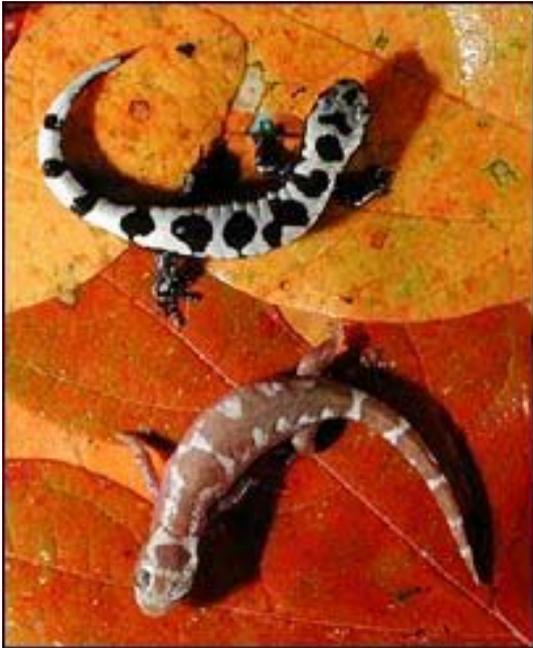
The North American bullfrog (*Rana catesbeiana*) is the largest of the North American frogs, growing to 20cm (8in) in length and 0.5kg (1lb) in weight.

The bullfrog was initially introduced to countries around the world to be farmed for frog-legs, and was later imported as a pet or to decorate garden ponds. But it has since proven a scourge to many native frog species, either by competing with or even preying on them.

WHAT ARE AMPHIBIANS?

- Group includes frogs, toads, salamanders and caecilians
- First true amphibians evolved about 250m years ago
- Adapted to many different aquatic and terrestrial habitats

- Present today on every continent except Antarctica
- Undergo metamorphosis, from larvae to adults



But this latest study also implicates the frog with the spread of a fungus which causes disease and death in many species of amphibians.

An international team of researchers analysed tissue samples from populations of bullfrogs introduced from their native North American regions into Brazil, Uruguay, UK, France, Italy and Japan, as well other regions of Canada and the US.

They discovered that the frogs in every country apart from Japan carried the chytrid fungus (*Batrachochytrium dendrobatidis*).

"We have shown that introduced bullfrogs consistently carry the fungus in the wild," explained Dr Trent Garner, lead author of the paper and a wildlife epidemiologist from the Zoological Society of London.

Previous research, he said, has revealed that although bullfrogs can be infected with the fungus, they do not go on to develop disease - unlike many other species of amphibians.

"We cannot say for certain that this means they have carried the chytrid fungus all around the planet. But it does mean that if you are going to treat introduced bullfrogs as an invasive species you really have to treat their diseases as invasive as well," he told the BBC News website.

Dramatic losses

Plan to save amphibians

Pregnancy test link to fungus



Amphibians around the globe are in dramatic decline. The Red List of Threatened Species and the Global Amphibian Assessment put about one third of all amphibian species at high risk of extinction.

The chytrid fungus has been suggested as a key candidate for these dwindling numbers.

It clings to the skins of amphibians, causing a disease called chytridiomycosis, although the exact cause of death is still to be determined.

This is not the first time human intervention has been linked to the spread of the fungus.

The export of the South African clawed frog, *Xenopus laevis*, in the 1930s and 1940s to Europe for use in pregnancy tests has been suggested as a possible origin of the epidemic.