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# Safe and effective biocontrol of common carp

**To the Editor** — Invasive species have had devastating impacts in Australia, and continue to be a major problem[1]. A potential biological control programme for one such species, the common carp (*Cyprinus carpio*), is being developed for Australia. However, Lighten and van Oosterhout[2] express fears about the release of cyprinid herpesvirus 3 (CyHV-3, formerly known as koi herpesvirus[3]) as a biocontrol agent. Here we respond to their concerns.

First, in any biological control programme, safety for non-target species, including humans, is paramount. Carp are an important farmed fish in the world[4], but despite severe CyHV-3 epizootics over the past 20 years, there is no evidence of human infection nor adverse ecological consequences in any species other than carp. In addition, we demonstrated that CyHV-3 does not replicate, let alone cause disease, in a wide range of immunologically immature native fish, lampreys, amphibians, reptiles, birds, mice and a freshwater crustacean[5]. This is also consistent with the fact that, despite almost-global distribution, CyHV-3 has never been associated with disease in any other species, including other closely related cyprinid fish. Although the evolution of new host associations cannot be excluded, the ability of herpesviruses to jump hosts has been inferred using phylogenetic approaches considering evolutionary events over millions of years[6], not the decades expected of this control strategy.

Second, we contend that the release of CyHV-3, for which vaccines are available, in a country with a minute commercial carp industry, and a history of highly regulated management of import and export risks for aquatic animal viruses, does not constitute a serious risk to global food security. Standard quarantine procedures for any carp products exported from Australia would protect against new outbreaks of disease.

Third, an epizootiological modelling programme is well under way to allow rational selection of virus release sites, and to predict the scale and temporal variation of carp mortalities in different regions of Australia. These predictions will provide focus to clean-up operations. As part of the modelling programme, freshwater ecologists will assess all potential risks to ecosystems; these will be monitored post-release of CyHV-3. Controlled studies simulating the effects of mass mortality events on water quality are also in progress. Together, these are the public relations imperatives supported by government investment.

Finally, it is clear that the release of CyHV-3, alone, is not the answer to the carp problem. Lessons from the past have taught us that, for greatest impact, we will need a combination of control measures to complement the activity of CyHV-3[7]. It will be important to integrate biocontrol with the strategic use of current localized control methods (for example, carp traps, commercial harvesting, electrofishing and environmental controls), research into naturally evolving new virulent generations of CyHV-3[8], and the continued search for other relevant technological solutions.

In the early 1990s, an overseas fear campaign was mounted against the release of rabbit haemorrhagic disease virus in Australia[9]. Those fears proved groundless. Given the extensive pre-release work on CyHV-3, we expect it to be a similar safe and effective biocontrol agent. ❐


## References

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## Competing interests

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