Research group suggests using guppies to control mosquitoes be abandoned

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Male and female guppies (Poecilia reticulata). Image: Wikipedia.

(Phys.org)—A team of researchers with members from the U.S., the West Indies, Canada and Brazil has conducted a survey of research efforts looking into the effectiveness and safety of releasing guppies to reduce the number of mosquitoes and report that evidence supporting such use is lacking—they also note that guppies can become an invasive species putting other species at risk. In their paper published in the journal *Biology Letters*, the team describes their research and why they believe that guppies are not an effective tool for fighting the spread of infectious diseases.

As the researchers note, humans have been tossing guppies into lakes, streams and other places where there is standing water to reduce

mosquito populations for centuries. Once released, they eat mosquito larvae that lie on the surface, preventing them from growing to maturity and biting people. Most such instances have been in response to outbreaks of mosquito-borne diseases—locals have used the practice in the studied regions very recently to slow the spread of the Zika virus, for example. But such a tactic, the researchers contend, is not only unproven, but harmful to other animal species in the same water.

Curious about the practice of using guppies to control mosquitoes, the researchers combed multiple studies in the areas of conservation, epidemiology, evolution and ecology—looking for those that included guppies. In so doing, they found scant evidence supporting the notion that using guppies to control mosquitoes actually works. They found much more evidence that suggested that guppies should be classified as an invasive species when introduced outside of its native environment. They found instances of the fish reproducing so rapidly and consuming so much of the local food sources that other animals living in the same water died out. They suggest that the use of guppies to control mosquitos for any purpose be abandoned or that its use be used "much more rigorously."

Not everyone is likely to agree with this assessment, however, as some researchers such as those working for the Malaria Consortium have found that putting guppies in water tanks in tropical areas helps reduce the spread of dengue fever in places like Viet Nam—with such an approach, they claim, there is no chance of the fish invading an established ecosystem.

More information: Rana W. El-Sabaawi et al. Biodiversity and ecosystem risks arising from using guppies to control mosquitoes, *Biology Letters* (2016). DOI: 10.1098/rsbl.2016.0590

Abstract

Deploying mosquito predators such as the guppy (Poecilia reticulata) into bodies of water where mosquitoes breed is a common strategy for limiting the spread of disease-carrying mosquitoes. Here, we draw on studies from epidemiology, conservation, ecology and evolution to show that the evidence for the effectiveness of guppies in controlling mosquitoes is weak, that the chances of accidental guppy introduction into local ecosystems are large, and that guppies can easily establish populations and damage these aquatic ecosystems. We highlight several knowledge and implementation gaps, and urge that this approach is either abandoned in favour of more effective strategies or that it is used much more rigorously. Controlling mosquitoes does not need to come at the expense of freshwater biodiversity.