Copepods Against *Aedes* Mosquitoes: A Very Risky Strategy

Azevedo-Santos and colleagues (2016, p. 84) argue that, owing to the recent Zika epidemic, "proposals to eradicate *Aedes* mosquitoes will intensify in many countries, particularly in the tropics." Copepods have also been touted as a strategy to combat *Aedes aegypti* (e.g., see the supplemental material). Similarly, the World Health Organization (2016, p. 6) provides the following information: "use of copepods as predators […]" are "new tools for vector control." Actually, this strategy has already been used in some regions in the past (e.g., Marten et al. 1994, Kay and Nam 2005). We expand the critique of Azevedo-Santos and colleagues (2016), using the precautionary principle to argue that using copepods to control *Aedes* should be avoided by the authorities.

Although several laboratory studies show efficacy on predation by copepods of mosquito larvae (e.g., Micieli et al. 2002), use of copepods is risky and would be ineffective against *Aedes*. Using copepods may result in introductions of nonnative species of zooplankton into natural environments. For example, Suárez-Morales and colleagues (2011), in their work on "morphological variability and distribution," suggested that *Mesocyclops thermocyclopoides* Harada, 1931, could be introduced outside its natural geographical area for biological control programs. Indeed, we believe that publicity through the media about copepods as potential biological control agents can result in export (by official or clandestine programs) to nonnative tropical regions; this is extremely problematic, because introductions of nonnative zooplankton may generate negative environmental and economic impacts (e.g., Walsh et al. 2016).

In general, *Aedes* reproduce in small containers (Pinheiro and Tadei 2002). Azevedo-Santos and colleagues (2016, p. 85) argued: "It is difficult or impractical to release fish into these small environments." The same applies to copepods. In fact, it is better and easier to remove water from these environments than to introduce individuals. In addition, cultivating copepods requires facilities with technologies suitable for large-scale, high-cost production with chemical reagents required to produce algae (e.g., Sipaúba-Tavares and Rocha 1993), which will be costly.

Therefore, investing in education campaigns, establishing and imposing fines for owners of potential breeding sites (Azevedo-Santos et al. 2016) or providing repellents would all be safer and more effective alternatives in attempting to control *Aedes* mosquitoes and spread of viruses.

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