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## **Parasitism and fitness of invaders: oligochaete *Chaetogaster limnaei* produces gill damage and increased respiration rates in freshwater Asian clams**

Florencia Liquin<sup>1,2</sup>, Leandro A. Hünicken<sup>3,4</sup>, Florencia Arrighetti<sup>3,4</sup>, Dora Davies<sup>1</sup>, Esteban M. Paolucci<sup>3,4</sup>, Francisco Sylvester<sup>1,2</sup>

<sup>1</sup>Instituto para el Estudio de la Biodiversidad de Invertebrados, Facultad de Ciencias Naturales, Universidad Nacional de Salta, Salta, Argentina

<sup>2</sup>Consejo Nacional de Investigaciones Científicas y Técnicas, Salta, Argentina

<sup>3</sup>Consejo Nacional de Investigaciones Científicas y Técnicas, Buenos Aires, Argentina

<sup>4</sup>Museo Argentino de Ciencias Naturales 'Bernardino Rivadavia', Buenos Aires, Argentina

### **Abstract:**

Biological interactions between invasive and resident species are perceived as a key factor mediating impacts in invaded ecosystems, although symbiotic interactions have received relatively little attention. To evaluate the association between the invasive clam *Corbicula fluminea* and its oligochaete symbiont *Chaetogaster limnaei*, we conducted laboratory assessments of prevalence and intensity of infection, external and internal macroscopic alterations, and histological analyses of the gills of uninfected clams collected from the shores of the Rio de la Plata estuary in Argentina. To evaluate potential ramifications of physical alterations on physiological traits and host fitness, we conducted respiration experiments on the same clams. Worm prevalence was higher in smaller than large clams. While no macroscopical alterations were detected, several histopathological changes were observed in the gills of infected clams. Infected clams had significantly higher metabolic rates than uninfected conspecifics and smaller clams had higher metabolic rates than larger conspecifics. Increased host metabolic rates, even at very low infections intensities, were likely a compensatory response to the stress caused by gill damage inflicted by the oligochaetes. The relationship between *C. limnaei* and invasive *C. fluminea* in Rio de la Plata best fits as parasitism.

Keywords: Asian clam, *Chaetogaster limnaei*, metabolism, parasites, histopathology, effects on fitness