Not simply accept relationships: editorial comment on the article “Accidental associates are not symbionts: the absence of a non-parasitic endosymbiotic community inside the common periwinkle *Littorina littorea* (Mollusca: Gastropoda)” by J. T. Carlton et al. (2020)

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This paper cleverly shows that a correlation between the presence of symbionts and a host species does not necessarily imply a close endosymbiotic relationship. It is always important to not simply accept relationships such as these (or many others) on face value, but to question them and propose and test simpler alternatives. Here, the authors demonstrate that the extensive community of organisms associated with the periwinkle *Littorina littorea* does not appear to have a commensal or symbiotic role, but are likely organisms that the snail “picks up” via its food, or mucus-covered foot, while grazing on the substratum. The paper questions what an endosymbiotic community is and emphasizes the need to demonstrate a symbiotic relationship exists, rather than simply rely on the association between organisms and any host species. The implications are important for a wider range of circumstances, as it is too easy to provide untested explanations for either positive or negative associations among species, which can easily rapidly become accepted as “the truth”—another “ecological paradigm” to add to the list. It is

always important to keep thinking of and testing alternative hypotheses for any observations and, as shown here, often the simpler ones seem the most likely. This paper should shed light on the many confusions surrounding the field of endosymbiosis and, hopefully, encourage other researchers to reconsider ways of testing some of the other widely accepted ideas, which have not always been rigorously put to the test against alternative explanations.

Reference

Carlton JT, Blakeslee AMH, Fowler AE (2020) Accidental associates are not symbionts: the absence of a non-parasitic endosymbiotic community inside the common periwinkle *Littorina littorea* (Mollusca: Gastropoda). Mar Biol. <https://doi.org/10.1007/s00227-020-03694-x>

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