



## **Symbioses between deep-sea mussels (*Mytilidae*: *Bathymodiolinae*) and chemosynthetic bacteria: diversity, function and evolution**

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Mussels of the subfamily Bathymodiolinae thrive around chimneys emitting hot fluids at deep sea hydrothermal vents, as well as at cold seeps and on sunken organic debris (sunken wood, whale falls). Despite the absence of light-driven primary production in these deep-sea ecosystems, mussels succeed reaching high biomasses in these harsh conditions thanks to chemosynthetic, carbon-fixing bacterial symbionts located in their gill tissue. Since the discovery of mussel symbioses about three decades ago our knowledge has increased, yet new findings are published regularly regarding their diversity, role and evolution. This paper attempts to summarize current knowledge about symbiosis in Bathymodiolinae, focusing on mussel species for which information is available regarding both hosts and symbionts. Besides, new data obtained from small mussels inhabiting sunken woods around the Philippines are provided. Indeed, mussel species from organic falls remain poorly studied compared to their vents and seeps relatives despite their importance for the understanding of the evolution of symbiosis in the subfamily Bathymodiolinae.