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Editorial Comment on the Highlight Article “Ontogenetic changes in digestive enzyme activity and biochemical indices of larval and post larval European lobster (*Homarus gammarus*, L)” by Renata Goncalves et al.

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Much of what we know about the biochemistry and physiology of marine organisms comes from studies of adult life stages. As a community, we know much less about early life stages and how these life stages balance the physiological trade-offs of navigating the complex and dynamic marine environment, while maintaining energy allocation to fundamental developmental processes and growth (Sokolova et al. 2012). Challenges to early life history stages can have significant implications for the persistence of a species and the evolution of populations (Hamdoun and Epel 2007) and therefore building an understanding of how physiological and biochemical processes develop across ontogeny is critical. For cultured species, early life stages are often bottlenecks for successful and sustainable cultivation and production. Marine invertebrate species are well recognized for their complex, multiple distinct stage and bipartite life cycle (Pandori and Sorte 2018), making their culture particularly challenging. Specifically in the European lobster, *Homarus gammarus*, culture is hampered by low survival and growth rates of early life stages (Hinchcliffe et al. 2020). Goncalves and colleagues (2022) conducted a study focusing on the digestive enzymes, RNA:DNA ratios, energy storage and growth of early life stages of the lobster (larvae and post-larvae following metamorphosis). The purpose of the study was to better understand the changes in digestive capacity and nutritional requirements through development and what might be currently limiting growth in cultivation of the European lobster. Experiments on early life stages are difficult to run and Goncalves and colleagues (2022) have provided a very comprehensive examination of energy metabolism

associated with growth and development across complex and distinct life stages. The results of the study demonstrate that there are ontogenetic shifts in digestive capacity, suggesting that some dietary requirements are shifting through development and could be potential avenues to explore to enhance the success of productive efforts of the European lobster. The study also provided evidence of the importance of conducting these early developmental studies across many families to capture the interfamily variability in nutritional status when considering broodstock decisions in aquaculture of lobster. Overall, the study highlights the importance of looking beyond adults to understand the physiological and biochemical requirements of marine invertebrates, particularly in the context of aquaculture production for both conservation and food.

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Data availability There is no data associated with this Editorial Comment.

Declarations

Conflict of interest The author declares no competing interests.

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