

Combined use of larval morphology and DNA barcoding in brachyuran crab systematics and phylogeny

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Date: **Friday 30th May 2025**

Time: 2:30 pm – 3:30 pm

Format: Online

Host: Dr Lee Bee Yan

Registration: <https://shorturl.at/ygiEu>



ABSTRACT:

The systematics of brachyuran crabs was largely based on adult morphological characters. Description of larval stages of decapods started as a complement to the knowledge of their life cycles, and studied species were chosen more related to the availability of ovigerous females or to successful cultures than to phylogenetic interest. Rice (1980) did the first serious attempt to apply decapod brachyuran larval morphology to systematics. According to him “the currently accepted brachyuran groupings [...] might be totally artificial in the sense that they fail to reflect phylogenetic affinity to any significant extent”. But until now, larval morphologists rarely proposed changes in the classification. Larval and adult morphology as independent source of data both present advantages and inconveniences. Most important are the strong convergence processes that decapod species may undergo, because adults show adaptations to a high number of different habitats. The use of larval morphology in systematics offers a less influenced source of data, as most larval stages are adapted to the same habitat. However, an important number of complete and good-quality descriptions need to be done in different taxonomic groups to have a complete tool of evidence to allow comparison and conclusions in higher systematics. As a third source of evidence, DNA barcoding brings valuable data for systematics and phylogeny, but also controversy about the results, depending on genes used or type of analysis applied. Combined use of these two new tools in systematics and phylogeny allows us to have a better and wider view of brachyuran crab relationships as contrast to classifications based only on adult morphology. Using these two independent taxonomic evidence we could stir towards a more natural classification. In this presentation several successful examples of the application of the combined use of larval morphology and DNA barcoding are shown.

About the Speaker:

Dr Jose A. Cuesta is a research scientist at the Institute of Marine Sciences of Andalusia (ICMAN-CSIC) since 2006. He obtained his PhD at University of Seville in 1999 and completed his postdoctoral internship at the University of Louisiana at Lafayette, USA between 2000–2002. His research focuses on different aspects of biology, ecology, molecular phylogeny, taxonomy and larval development of decapod crustaceans. He is also interested in introduced exotic decapods. He has reported several first occurrences of alien decapods in European and Spanish waters.