

The influence of the Isthmus of Panama in the evolution of freshwater shrimps in America

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The evolution of freshwater shrimps species living in both sides of Central America, isolated by the closure of Isthmus of Panama (3 million years ago) were studied by molecular tools. Despite the small likelihood of species crossing the Isthmus from one side to the other through the channel exist, the genetic isolation of them were maintained over the time and the separation of Pacific and Atlantic sister species still unchanged. Sister species refer to pairs of species that are genetically and morphologically closely related, but reproductively isolated.

The collection of the species were done over a five-year period in rivers and estuaries in Brazil, Chile, Venezuela, and Costa Rica by the authors, whose are shrimp specialists and researchers in the Faculty of Philosophy, Sciences and Letters at Ribeirão Preto (FFCLRP), University of São Paulo (USP), Brazil, and in the Museum of Zoology, School of Biology, University of Costa Rica (MZUCR). Their results have been published in the open access journal *ZooKeys*.

"We expected some taxa of inbreeding between transisthmian species, once some species can be found in both sides of the Isthmus, but somehow they keep genetically isolated", said Dr Pileggi". "In another cases the genetic separation between sister species happened before the closure of the Isthmus what evidences that these species can be reproductively isolated even living in the same environments (micro-

allopatry). These species can occupy distinct niches and became reproductively isolated, which over the time could have contributed with the separation of the species".

Thus, the evolutionary life history of 12 transisthmian shrimps sister species could be recapitulated by the use of [molecular tools](#). In the late Pliocene (3 million years ago), the closure of the Isthmus of Panama contribute with the separation of previously continuous populations created two groups of extant species, which live now in the Atlantic and Pacific drainage systems. The results of the present study revealed that all sister species were valid taxonomic entities. Likewise they confirmed the role of the Isthmus of Panama as an effective barrier contributing in the separation of sister species by the mechanism of allopatric speciation (speciation after the emergence of a barrier). However, in other cases the separation happened before the closure of the Isthmus probably by the mechanism of sympatric speciation.

More information: Pileggi LG, Rossi N, Wehrtmann IS, Mantelatto FL (2014) Molecular perspective on the American transisthmian species of *Macrobrachium* (Caridea, Palaemonidae). In: Wehrtmann IS, Bauer RT (Eds) Proceedings of the Summer Meeting of the Crustacean Society and the Latin American Association of Carcinology, Costa Rica, July 2013. *ZooKeys* 457: 79-108. [DOI: 10.3897/zookeys.457.6818](https://doi.org/10.3897/zookeys.457.6818)

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