ORAL SESSION 8

Biology of Freshwater Copepods (1)

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A synthesis on the dynamics of copepods in the Congo River basin

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The copepods of the Congo River Basin, the world's second-largest basin, remain largely unexplored, harboring a practically unknown diversity. This is the first extensive study on microcrustacean fauna with focus in copepods across the Congo River, Kasai River, and their tributaries. Copepod abundance and diversity were investigated along a 1,700 km gradient in the main channel of the Congo River and a 600 km gradient in the Kasai River. Sampling included 16 tributaries in three campaigns (60 sites per campaign), and 16 environmental variables were measured in each site. Sites were categorized by location (main river or tributary) and watercolor (black or white) for statistical analyzes. Twenty-eight copepod species were found and at least 08 species are new records for the Congo basin. A rare *Afrocyclops pauliani* Lindberg, 1951 was rediscovered, in addition to *Cryptocyclops falsus* (Kiefer, 1929). A high richness of *Microcyclops* genus was found, followed by *Mesocyclops* and *Thermocyclops*. Copepods (and cladocerans) showed greater abundance in the Congo River and its tributaries than in the Kasai River (high turbidity), and just to abundance a seasonal variation was observed. Copepods were dominated numerically and in diversity by cyclopoids (24 species), and just three species of calanoids were found. No endemism trends were found for Diaptomidae in Congo basin supported by our data, contrary to other parts of the world. Compared to cladocerans, for example, which diversity was higher in tributaries, copepods exhibited greater diversity and abundance in the main channel of the Congo River, allowing to consider the river continuum concept with an increase of diversity in larger rivers. Beta diversity of copepods was greater in rivers than in tributaries, reinforcing the difference between them and indicating a relationship with greater flow and connectivity of the main river, which favors the dynamics and turnover of species. Copepods from tributaries may significantly contribute to the species of the central Congo channel, some probably derived from lentic environments. Spatial variations of limnological variables between the main rivers (Congo or Kasai) and their tributaries influenced copepods distribution, especially by pH contrasting with dissolved organic carbon, colored dissolved organic matter, and particulate phosphorus, but without clear separation between black and white waters. The unique characteristics of each tributary, coupled with environmental variables and biogeographic factors, can explain the observed patterns. The differences between tributaries, especially for Diaptomidae Calanoida, warrant further exploration, given the potential endemic distribution patterns observed in the Americas and Europe. The rarefaction and extrapolation curves in the main channel of the Congo River for copepods indicate a greater diversity, as the curves are far from reaching the asymptote. The extrapolation curves for the Congo tributaries suggest a similar diversity pattern that observed in the Congo main channel. These results underscore the need for further research in the Congo River Basin, particularly in the tributaries, which present substantial potential for the discovery or rediscovery of species. The expansive spatial coverage of our study compensates the temporal limitation, emphasizing the importance of conducting more studies in this region.

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