Joannea Geol. Paläont. 11: 64-65 (2011)

Ostracod assemblages of "Lake" Pebas (Western Amazonia; Late Miocene): Taxonomy, sedimentology and palaeoenvironments

Martin Gross, Maria Ines F. Ramos, Marco Caporaletti, Frank Gitter & Werner E. Piller

During the Miocene, a vast wetland existed in Western Amazonia, which is called "Lake Pebas". Its sedimentary environments are still heavily disputed and models range from a "mega-lake" (Wesselingh et al. 2002), a "mega-wetland" (Hoorn et al. 2010) with some marine incursions (Hovikoski et al. 2010) to a "wetland on a mega-fan" (Latrubesse et al. 2010). Equally, stratigraphical correlations as well as its palaeogeographical configuration remain matter of debate. However, "Lake" Pebas represented an enormous inland water system for millions of years and faced spectacular speciation events (e.g., gastropods, bivalves as well as ostracods; Wesselingh & Ramos 2010). Among ostracods, especially the genus Cyprideis experienced a species flock with c. 20 described species (e.g., Purper 1979; Muñoz-Torres et al. 1998).

We investigated six outcrops located around Eirunepé (SW Amazonas state, Brazil; upper part of the Solimões Formation; Late Miocene). The low diverse ostracod fauna (~15 species) comprise of typically freshwater dwellers (*Alicenula*, *Cypria*, *Pelocypris*, ?*Heterocypris*, *Cytheridella*) as well as the anomalohaline genus *Cyprideis*. The latter genus is recorded with 8 species, which frequently co-occur within one sample. Traditional (qualitative) descriptors of morpho-species (e.g., shape, ornamentation, hinge, spines) enable a clear species differentiation, which can be also used to distinguish associated juvenile valves. Based on these observations, we suggest that we are dealing with (in some way) genetically separated populations. Interestingly, valve size (of the same species) varies considerably even within one layer, while other diagnostic characters remain stable. This may hint to high-frequency fluctuations of – until now unclear – ecological parameters. Our systematical evaluation reveals several taxonomical problems, which makes an adjustment of the current biostratigraphical zonation as well as of palaebiogeographical considerations necessary.

Nevertheless, ostracod assemblages and very light $\delta^{18}O$ and $\delta^{13}C$ values, measured on *Cyprideis* valves, refer to exclusively freshwater conditions. Based on sedimentological analyses, these sediments are interpreted as fluvial deposits, possibly of an anastomosing river system. Lacustrine environments are restricted to local floodplain ponds/lakes (Gross et al. 2011). Hence, the existence of a long-lived lake ("Lake Pebas") or any influx of marine waters can be excluded – at least – for that region during the Late Miocene.

This work is supported by the Austrian Science Fund (P21748-N21).

References

Gross, M., Piller, W.E., Ramos, M.I. & Paz da Silva, J.D. (2011): Late Miocene sedimentary environments in south-western Amazonia (Solimões Formation; Brazil). – Journal of South American Earth Sciences, doi:10.1016/j.jsames.2011.05.004, Amsterdam.

Hoorn, C., Wesselingh, F.P., Hovikoski, J. & Guerrero, J. (2010): The development of the Amazonian mega-wetland (Miocene; Brazil, Colombia, Peru, Bolivia). – In Hoorn, C. & Wesselingh, F.P. (eds.): Amazonia, Landscape and Species Evolution: A Look into the Past. – 121-142, Wiley-Blackwell, Oxford.

Hovikoski, J., Wesselingh, F.P., Räsänen, M., Gingras, M. & Vonhof, H.B. (2010): Marine influence in Amazonia: evidence from the geological record. – In: Hoorn, C. & Wesselingh, F.P. (eds.): Amazonia, Landscape and Species Evolution: A Look into the Past. – 143-161, Wiley-Blackwell, Oxford.

Latrubesse, E.M., Cozzuol, M., Silva-Caminha, S.A.F., Rigsby, C.A., Absy, M.L. & Jaramillo, C. (2010): The Late Miocene paleogeography of the Amazon Basin and the evolution of the Amazon River system. – Earth-Science Reviews, 99: 99-124, Amsterdam.

Muñoz-Torres, F., Whatley, R.C. & Van Harten, D. (1998): The endemic non-marine Miocene ostracod fauna of the Upper Amazon Basin. – Revista Española de Micropaleontología, 30: 89-105, Madrid.

Purper, I. (1979): Cenozoic Ostracods of the Upper Amazon Basin, Brazil. – Pesquisas, 12: 209-281, Porto Alegre.

Wesselingh, F.P. & Ramos, M.I.F. (2010): Amazonian aquatic invertebrate faunas (Mollusca, Ostracoda) and their development over the past 30 million years. – In: Hoorn, C. & Wesselingh, F.P. (eds.): Amazonia, Landscape and Species Evolution: A Look into the Past. – 302-316, Wiley-Blackwell, Oxford.

Wesselingh, F.P., Räsänen, M.E., Irion, G., Vonhof, H.B., Kaandorp, R., Renema, W., Romero Pittman, L. & Gingras, M. (2002): Lake Pebas: a palaeoecological reconstruction of a Miocene, long-lived lake complex in western Amazonia. – Cainozoic Research, 1: 35-81, Leiden.

Authors addresses:
Martin Gross & Frank Gitter
Department for Geology & Palaeontology, Universalmuseum Joanneum, Weinzöttlstrasse 16, 8045 Graz, Austria
martin.gross@museum-joanneum.at, frank.gitter@museum-joanneum.at

Maria Ines F. Ramos
Coordenação de Ciências da Terra e Ecologia, Museu Paraense Emílio Goeldi, Avenida Perimetral, s/n Terra Firme, Belém-PA 66077-830, Brazil; mramos@museu-goeldi.br

Marco Caporaletti & Werner E. Piller
Institute for Earth Sciences, Karl-Franzens-University, Heinrichstrasse 26, 8010 Graz, Austria; marco.caporaletti@uni-graz.at, werner.piller@uni-graz.at