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***Molluscan Megadiversity:
Sea, Land and Freshwater***

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ABSTRACTS

Speciation in ancient Lake Ohrid – freshwater limpets of the genus *Ancylus*

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Ancient lakes like Lake Ohrid on the Balkan Peninsula have long been recognized as evolutionary theaters and hot spots of endemism; they provide prime models for the study of *in situ* evolution. Extraordinarily shaped endemic freshwater limpets of the genus *Ancylus* of lake Ohrid were regarded as paleoendemics or relictary species. We studied the two endemic species, *A. scalariformis* and *A. tapirulus*, using mitochondrial (COI, 16S) and nuclear (ITS-1) genetic markers to determine phylogenetic relationships between the Ohrid endemics and other European *Ancylus* species.

The analyses show that the endemic lake Ohrid *Ancylus* species form a monophyletic group. However, nucleotide divergences between the lake Ohrid species and other taxa are relatively low and preliminary molecular clock analyses indicate that the Ohrid species are phylogenetically younger than the assumed geological age of the lake. The data indicate an intralacustrine origin from a single invasion of the lake and a rapid evolution of the distinct “ancient” shell structure and shape of Ohrid species. Therefore, *A. tapirulus* and *A. scalariformis* can not be regarded as relicts. This assumption is also supported by the incomplete reciprocal monophyly inferred in the ITS-1 analysis due to incomplete lineage sorting.

A combination of spatial isolation, patchiness and low mobility of ancylid populations could have triggered intralacustrine speciation. Further studies will focus on the selective regimes like small-scale ecological differences, predation and sexual selection.

A molecular phylogenetic perspective on the evolution of freshwater pulmonate snails (Basommatophora)

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The order Basommatophora represents a large and diverse group of predominantly limnic pulmonate gastropods that are distributed worldwide. Members of the most widespread and species-rich families Lymnaeidae and Planorbidae are of immense economic and public health importance.

In order to identify major phylogenetic groups within the Basommatophora, to clarify relationships between and within putative families, to define origin and age of lineages, and to establish hypotheses of freshwater basommatophoran evolution, we used two independent

molecular markers; mitochondrial cytochrome c subunit I DNA and nuclear small subunit rRNA (18S rRNA) with a total of 2348 base pairs.

The previously recognized superfamilies of Basommatophora *s. str.* formed highly supported monophyletic groups in our analysis. The short branch length of the splits between Acroloxoidea, Planorboidea and Physoidea/Lymnaeidea suggests a nearly simultaneous divergence of these lineages. The families Acroloxidae, Physidae, Bulinidae, Lancidae and Lymnaeidae were found to be well-supported monophyla as well. The Ancyliidae and Planorbidae, however, were not monophyletic and clustered within the Planorboidea. A sister-group relationship of Physidae and Lymnaeidae was well supported in our analyses. Previously, such a relationship was never considered in hypotheses based on morphological data.

Contradictory to the commonly held view that patelliform Basommatophora are derived groups, it appears that freshwater limpets (e.g. *Burnupia*, Acroloxidae, *Lanx*) represent ancestral forms in several independent lineages of the Basommatophora.

Evolutionary pathways and systematic implications are discussed based on the robust and comprehensive phylogeny inferred in our study.

"Atlas of Antarctic Mollusca" - towards a monograph of molluscs south of the convergence

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Our book-project is an attempt to cover the biodiversity of extant Mollusca from Antarctic waters south of the convergence, from the intertidal to the deep sea, with special emphasis on the Weddell Sea, Scotia Sea including South Sandwich, and Antarctic Peninsula. A multi-author approach (Engl & Schrödl, eds) with experts for all molluscan subgroups (classes) shall achieve 1) to include and pleasantly document as many species as possible (> 500), 2) to guarantee high scientific quality over the various groups, 3) to make species accurately identifiable for non-specialists, i.e. to provide a fully illustrated guide to Antarctic Mollusca. For our new book, vast museum material and specimens collected during various Antarctic expeditions, mainly the ANT XV, XVII-3, XIX-3-5 expeditions with RV "Polarstern", have been examined. So far, 10 polyplacophoran, 2 monoplacophoran, 4 scaphopod, 68 bivalve, 370 gastropod and 33 cephalopod species have been revised and illustrated. Type material of