

Zbl. Geol. Paläont. Teil I	1997	H. 1/2	233–292	Stuttgart, Juni 1998
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Evolutionary history of East African fresh water gastropods interpreted from the fauna of Lake Tanganyika and Lake Malawi

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with 1 figure and 7 plates in the text

Abstract: The long-lived Lake Tanganyika has a molluscan fauna that differs from other lakes in the area and from short lived lakes in general. Lake Malawi similar in shape, climatic conditions, size, and depth has a different molluscan fauna. The radula and ontogeny of the endemic (thalassoid) gastropods of Lake Tanganyika reveal the presence of at least seven separate groups that probably represent monophyletic lineages derived from at least seven original immigrants to the lake: (1) the Paramelaniinae sensu strictu (with *Paramelania*), (2) the Spekiinae n. subfam. with *Spekia*, *Stormsia*, and *Bridouxia*, (3) the possible *Cleopatra* relation around *Reymondia*, (4) the viviparous Lavigeriinae with the species of *Lavigeria*, (5) the minute sand- and thicket-dwelling Syrnelopsidae with *Syrnelopsis*, *Anceya*, and *Martelia*, (6) the Tanganyiciinae n. subfam. with *Tanganyicia rufofilosa* that has been described as having a brood pouch in the head-foot and would therefore represent a possible member of the Thiaridae, (7) the *Neothauma* group of viviparids. An eighth group has species living also outside of the lake with the basommatophoran *Bulinus* and *Burnupia*. A minute hydrobiid was newly discovered while the mostly monotypic genera *Tiphobia*, *Mysorelloides*, *Limnotrochus* and *Chytra* are thalassoid species, but were not encountered alive and may represent additional groups (probably two). While the radiation of fresh water caenogastropods characteristic of Lake Tanganyika has commonly been assigned to mainly one single family Thiaridae with exception of *Neothauma*, it has become evident that the thalassoid species are not monophyletic, but rather of polyphyletic origin. None of the species appear to be closely related to any of the species of the Thiarinae, even though the representative of this taxon, *Melanoides* is living in the larger tributaries of the lake. *Neothauma* appears to have been more widespread in the past, but with exception of the basommatophorans all others are restricted to actual Lake Tanganyika.

Lake Malawi in contrast, which appears to be of about four million years of age has no unique gastropod fauna that differentiates it from other lakes and even ponds and rivers of the region. The special fauna here has no endemic genera, and even the species here are the same or similar to those of the outside. Basically *Lanistes*, *Melanoides*, *Bellamyia* and *Gabbiella* represent caenogastropods of the lake, and all four demonstrate a morphological spectrum which may represent a speciation still close to the founder, but could also represent only intraspecific variability. With exception of *Gabbiella* the founder species of all groups are also living in the lake. Comparison to fossil faunas of about two million years of age indicate that the fauna since then has little changed. A similar picture arises when fossil species found connected to the other lakes of the East-African Rift are compared with those of Lake Tanganyika. The fauna of the Lake Malawi type has been recognized here and their

0340–5109/98/1997–0233 \$ 15.00

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