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The fossil pulmonate snails of Sandelzhausen (Early/Middle Miocene, Germany): Succineidae, Testacelloidea and Helicoidea

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Abstract

Sandelzhausen is an Early/Middle Miocene (Mammal Neogene zone MN5) fossil site near Mainburg, S Germany, and despite its small size it harbors a rich fossil record. Hundreds of fossil continental mollusks, almost exclusively pulmonates snails, were recovered during the excavations, but never received due attention by researchers. Here, the second part of a formal taxonomical treatment of the fossil pulmonates from Sandelzhausen is presented, dealing with the superfamilies Succineoidea, Testacelloidea and Helicoidea, and including the description of a new hygromiid species. The following species were found in the material: *Succinea minima* (Succineidae); *Palaeoglandina* sp. (Spiraxidae); *Testacella zellii* (Testacellidae); *Klikia* cf. *coarctata* (Elonidae); *Cepaea* cf. *eversa*, *Cepaea* cf. *sylvestrina* and *Tropidomphalus* cf. *incrasatus* (Helicidae); ?*Helicodonta* sp. and Helicodontidae indet. (Helicodontidae); *Leucochroopsis kleinii* and *Urticicola perchtae* **sp. nov.** (Hygromiidae).

Key words: Gastropoda, MN5 European Mammal Neogene zone, Pulmonata, Stylommatophora, *Urticicola perchtae* new species

Introduction

The Sandelzhausen fossil site is one of the most important continental sites in Europe (Moser *et al.* 2009a) and its bounty include hundreds of specimens of gastropods. Still, only two works dealt specifically with the mollusks: Gall (1972), who identified 49 gastropods and two bivalves in the material recovered, but based his work heavily on younger faunas; and Moser *et al.* (2009b), who dealt with paleoecological questions. Here is presented the second part of a formal taxonomic treatment of the continental mollusks from Sandelzhausen (for the first part, see Salvador, in press), dealing with the superfamilies Succineoidea, Testacelloidea and Helicoidea, and including the description of a new hygromiid species. Works describing the remaining fauna will soon follow.

Geological setting

Sandelzhausen fossil site was located in the vicinities of the city of Mainburg, 60 km north of Munich, in the Molasse Basin (Molassebecken) of southern Germany, which harbors the “formation” known as Upper Freshwater Molasse (Ober Sü?wassermolasse, OSM; Moser *et al.* 2009a). The fossils belong to a member of the OSM called Nördlicher Vollschocter, composed primarily of marl and gravel (Moser *et al.* 2009a). The age of the deposits was established by stratigraphic, biostratigraphic and magnetostratigraphic correlations: the Early/Middle Miocene Burdigalian/Langhian boundary (~16.47–16.27 Ma; Moser *et al.* 2009a), within the early-middle MN5 European Mammal Neogene zone.

The division of Sandelzhausen deposits into facies was established by Fahlbusch and Gall (1970), receiving only some posterior refinement (Moser *et al.* 2009a): **Layer A:** marly gravels, sometimes cemented by carbonates; fossil content rare and limited to robust skeletal parts; **Layer B:** gravel-rich marl, in which size and number of