RESPONSES OF THE PILO-PLEISTOCENE
FRESHWATER GASTROPODS
OF KOS (GREECE, AEGEAN SEA)
TO ENVIRONMENTAL CHANGES

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Abstract: In the Pli-Pleistocene freshwater gastropods of Kos, three different kinds of faunal responses to the changing environment can be referred to:
1) Varying species numbers as responses of the fauna as a whole,
2) evolutionary changes in shell morphology, and
3) non-hereditary modifications in shell colour as a reaction to varying salinity.

Evolutionary changes in shell sculpture must be explained as an expression of adaptation to certain environmental factors, which, however, are still unknown. Nevertheless, some extrinsic forces important for gastropod evolution can be determined. Separating mechanisms within the basin caused splitting of populations, and the populations separated from each other had different evolutionary trends (microgeographical differentiation, e.g. Mikrogoniochilus minutus). Micro-Allopatry can also be observed in Rhodopyrgula rhodensis from the Pliocene of Rhodes. Some more widespread populations were split by the separation of the eastern Kos lake from inland waters in central Kos (Melanopsis gorceixi, Theodoxus doricus), and in the latter species they became reconnected, when there was subsequent contact between these waters. A similar development seems to have occurred in the Rhodian Viviparus rhodensis.

On the other hand, lack of separating mechanisms within the basin led to gradual evolution along non-splitting lineages (e.g. Prososthenia sturanyi and large portions of the Viviparus and Melanopsis lineages). Evolutionary rates increased when the populations became relatively small (bottleneck effect). In the case of Melanopsis, reduction of population size was caused by marine transgressions, in the case of Viviparus brevis by the shrinkage of lake size.

INTRODUCTION

Neogene freshwater gastropods are among the classic examples of evolutionary lineages. Lineages from a small lake on Kos island in Greece, from the Steinheim basin in Germany and from Slavonia have become especially famous (TOURNOUER, 1876;
NEUMAYR, 1880, 1889; HILGENDORF, 1866, 1867, 1879 etc.; NEUMAYR & PAUL, 1875) from studies in the 19th century. Many more endemic Neogene gastropod faunas -- showing gradual transformations -- were described from southern Europe later on (e.g. BUKOWSKI, 1893, 1895; GORJANOVIC-KRAMBERGER, 1923; OLUIJIC, 1936; JEKELIUS,