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Regional-scale variation in size and abundance of the bivalve Varicorbula (Middle Miocene, Central Paratethys)

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Varicorbula gibba (Olivi, 1792) is a geologically long-ranging and ecologically generalistic bivalve species that appears in the Oligocene and persists to present, occurring in the tropical and northern temperate Eastern Atlantic and in the Mediterranean. Although it is one of the most frequent species in the benthic communities in the Paratethys during the Middle Miocene, spatial variation in its abundance, size, and shape is poorly known. Using bulk samples sieved with 1 mm mesh size, we investigate size and abundance variation of this taxon in molluscan communities in two basins in the Middle Miocene (Serravalian) sediments of the Central Paratethys. Bulk samples are derived from boreholes from the western (Vienna Basin) and eastern (Danube Basin) margins of the Malé Karpaty Mountains (Slovakia). We find that this taxon shows significant regional-scale differences in size distribution between the Vienna and Danube basins. In subtidal muds in the northern parts of the Vienna Basin, it achieves very high proportional community-level abundance and its median shell width ranges between 6-10 mm. In contrast, in muddy sands on the northeastern margin of the Danube Basin, community composition is more even and median width ranges just between 3-4 mm. The higher sandy content and lower sedimentation rates (as evidenced by higher taphonomic damage, with higher proportion of bored specimens, in the Danube Basin) imply that the size can partly positively correlate with nutrient supply. Morphometric analyses indicate that height and width of individuals of this taxon undergo significant allometry and that smaller-sized individuals in the Danube Basin have a smaller width/height ratio, suggesting that some shape differences between the two basins are unrelated to size differences.