

The tree-climbing behavior of *Cerithidea decollata* (Mollusca: Potamididae): how does this snail decide when to climb and where to stop?

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Abstract

Cerithidea decollata is a mangrove snail creeping on the ground during the low tide and resting on mangrove trees the whole high tide, migrating thus twice a day along the trunks for avoiding to be submersed. The snails start climbing on the trunks before the tide water arrival, reaching a height always between 20 and 40 cm above the level that water will reach. This migratory pattern is thus extremely variable, depending on the tide height: in particular, it is more evident at spring than at neap tide and at lower than at upper shore levels. In the last years, we performed a series of observations and experiments in the Kenyan mangroves of Mida Creek (Kenya) for clarifying various aspects of the migratory behavior of *C. decollata*. In primis, translocation experiments were designed to test whether snails rely on internal information or on external, direct cues, to adapt their behavior to local adaptations. Then, after having demonstrated the existence of a biological clock, we addressed the complex question of how these snails determine which height to reach on the trunk for avoiding to be submersed. We did a series of tests to assess which external (chemical or visual cues) or internal (energetic cost or memorization of the path length) factors might guide this snails in reaching this task. We used artificial trees (plastic pipes), 2 meters long, along which snails climbed and crawled just as on their own trees for experiments aiming at altering internal and external cues (i.e. we lowered, raised or tilted the pipes were, and we overloaded the snails).

Overall, our tests indicated that the snails do not rely on external information but only on internal ones. Moreover, this snail seems to “foreseen” when and where the incoming tide will arrived and not to set its migratory behavior on information from the previous tides.

Keywords

mangrove snail, *Cerithidea decollata*, migration