Ethogram and classification of the mating and egg-laying behaviour of the Southeast Asian apple snail Pila virescens (Deshayes, 1824) (Mollusca, Gastropoda, Caenogastropoda, Ampullariidae)

ABSTRACT

The status of the indigenous Southeast Asian apple snails belonging to the genus Pila is of concern due to their fast rate of population decline, possibly as a result of multiple factors including habitat loss or disturbance and the introduction of globally-invasive apple snails, Pomacea spp. Conservation actions, including captive breeding of the native Pila species, have been suggested as urgent remedial practices, but the lack of knowledge regarding the fundamental reproductive biology of indigenous Pila spp. makes such practices difficult. In the present study, observations on the mating and egg-laying behaviour of an economic valuable apple snail native to Southeast Asia, P. virescens, were conducted using video recording to examine and describe their reproductive behaviour under a laboratory condition. A total of 15 types of mating and seven egg-laying behaviour were recorded. The mating sequence which subsequently resulted in egg laying was comprised of seven types of major sequential behaviour: mate probing, mounting, shell circling, positioning, insemination posture, sheath withdrawal and dismounting. Rejection of mating attempts by the female was frequently observed. Egg laying occurred during either day or night. A sequence of seven distinct types of behaviour were performed during oviposition: climbing, positioning, forming a temporary tube, mucous secreting, egg depositing, leaving and resting. Overall, these results provide an understanding of the egg-laying behavioural process and highlight its complexity in P. virescens. In addition, detailed ethograms of mating and egg-laying behaviour were derived. These will promote further systematic comparative studies of the reproductive behaviour of apple snails.