

BOOK REVIEW

Neuroecology and Neuroethology in Molluscs: The Interface between Behaviour and Environment

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This book makes a strong case for the importance of molluscs in the study and development of neuroecology as a discipline. At first sight, molluscs do not seem to be a promising group of animals for this area of biology. There appears to be a mismatch between the model organisms used for neuroethology and those species that are most valuable for ecological studies (Prologue). However, information reviewed in this book shows that by studying behavioural and ecological interactions of selected species, molluscs provide important examples that illustrate how populations and communities are regulated. Some of the most striking examples come from predator-prey interactions that are described in considerable detail (chapters 4 and 5 with related chapters on chemical ecology, chapter 1, and olfaction/chemoreception, chapters 3 and 6). These are mainly mediated by chemical environmental stimuli that are released by both prey and predator. Many marine and freshwater snails escape from predator chemicals by increases in locomotion or crawling out of water. Active defensive responses to predators are also known. For instance, sea hares release a cloud of ink as a defence against fish. This is one of the best examples where sensory responses, the structure of the deterrent chemical signals and the neural circuits underlying inking behaviour are all known. Molluscs also act as predators and there are well-known examples from gastropods and cephalopods that involve both chemical and visual signals. Predator preferences also can be altered by learning and there is a growing evidence that ecological interactions between species are likely to be influenced by previous experience. Underlying this are changes in central neural circuits that are responsible for changes in behaviour (chapters 7 and 8). Neuroendocrine mechanisms are also important in neuroecology. The large amount of information on neuroendocrine systems available in certain gastropod and cephalopod model systems is extremely useful (e.g. chapter 6 and 7). For instance, it enables the relationship between growth and reproduction and the processes underlying sexual selection to be investigated. My overall impression is that molluscs offer an enormous potential for joining 'neuro' and 'eco' with the stipulation that the multidisciplinary approach required for future success should focus on certain key species.

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