

Maria J. Gołąb

Effects of habitat manipulation on reproductive behaviour in riverine damselflies

The persistence of species depends on their abilities to adapt to new or changing environment. Currently, world-wide, human-induced negative alterations of the natural environment are observed. Theoretical models predict that global warming will increase the intensity and frequency of rainfalls and flooding pulses. This leads to a growing interest in forecasting biological responses of freshwater organisms to flooding conditions. Nevertheless, the responses of riverine invertebrates to changes in water velocity have been rarely studied. The aim of this thesis was to broaden the knowledge on potential consequences of changes in quality of the breeding habitat caused by flooding to wild population of territorial damselflies, with particular reference to their behaviour, social status and population structure.

The study species was a territorial damselfly *Calopteryx splendens*. Males use riverine macrophyte patches as territories and females use these macrophytes as substrates for egg laying. In Chapter I damselfly behaviours between pre-flood and post-flood years were compared. Based on the game-theory models, the behaviours of non-territorial males and their settlement rules on patches of macrophytes were studied (Chapter II). The studies also focused on territorial residents and examined whether the intensity of patrolling varied across patch quality and differed among males of different social status (Chapter III).

Chapter I confirmed that flooding destroyed macrophytes and hence strongly affected damselfly behaviours. Chapter II demonstrated that deterioration of high-quality patches significantly reduced the number of non-territorial males, which were more sensitive to patch manipulations than resident males. Results presented in Chapter III revealed that males of various social status differed in their patrolling activity and differently reacted in patrolling activity to changes in patch quality.

To conclude, the thesis showed that temporal changes in riverine patch quality cause complex behavioural responses. The results suggests that future habitat changes will significantly affect *C. splendens* behavioural and social responses. Nevertheless, the species seems to be well adopted to temporal and spatial habitat changes and should persist future fluctuations in flooding regime.