Summary

This PhD thesis aimed to explore unanswered questions about ants and one of the most intriguing forms of pro-social and altruistic behaviour observed in the animal kingdom, rescue behaviour. This behaviour is manifested as helping relatives in danger. Despite a growing number of studies devoted to rescue behaviour, the sources of variation in its expression remain unclear. The present dissertation consists of a general introduction (**Chapter I**), three main chapters in the form of two published papers (**Chapters II** & **III**) and one manuscript submitted for publication (**Chapter IV**), and a general discussion (**Chapter V**). In the first two studies, I focused on factors influencing the expression of rescue behaviours in ants on a within-species scale, while in the third study, I examined the conditions under which these behaviours are more likely to be expressed on a between-species scale. My first study (**Chapter II**) shows that body size is an important factor in determining behavioural persistence in ants. Specifically, the rescue persistence of workers that provide help to others and the activity of individuals that require help is higher in smaller than in larger workers. My second study (**Chapter III**) demonstrates that injury in ants leads to a survival cost, decreasing life expectancy. My results show that this handicap affects rescue behaviour toward nestmates but not aggressive behaviour toward alien species. Specifically, injured workers take part in rescue actions more likely toward intact nestmates. My third study (**Chapter IV**) indicates that inter-species variation in ant rescue tendencies can be partly explained by general worker life expectancy. Specifically, ant species differ strongly in how long their workers generally live and rescue proneness is more frequent in species characterised by higher worker life expectancy compared to those with lower life expectancy. The presented results demonstrate a notable variance in rescue behaviour expression both within and between species. Furthermore, they highlight the importance of body size and individual as well as species-characteristic life expectancy for shaping rescue patterns in ants. Importantly, this phenomenon calls for more extensive

research, considering the diverse physiologies, life histories, and ecologies across different species. Overall, the thesis holds significant implications for understanding differences in decision-making processes in social animals and provides potential directions for future studies.