

**Analyzing life expectancy as a major factor determining pro-social behavior in ants:
rescue actions among Formicidae**

Heroic acts are thought to be characteristically human. Yet, other animals also show similar behavior, directed at helping individuals in grave danger. Such actions are termed rescue, and they occur despite the risk of injury or death to the rescuer. Rescue has been observed in many different animals, such as dolphins, capuchin monkeys, rats or birds. It comprises a group of pro-social behavior, i.e. behavior beneficial to others, which is still poorly understood and therefore of great scientific interest.

Rescue behavior is most prevalent and most often studied in animals with much less complicated nervous systems than those of dolphins or rats - the ants. Indeed, ants may rescue each other from dangerous situations. For example, an individual captured by a predatory antlion may elicit vigorous rescue actions in its nestmates. Why would ants do that? As it turns out, every individual counts. When successful, rescues are beneficial for the colony and allow for higher colony size. Nevertheless, there is many unknowns when it comes to rescue expression in ants. We do not know, for instance, why some species engage in rescue activity whereas other species do not.

The aim of the project is to investigate the connection between the life expectancy of ants and the intensity of their rescue proneness. I hypothesize that ant species with lower life expectancies (in which individuals die off rather quickly) are less likely to get involved in rescue than ant species with higher life expectancies (in which individuals live for longer). Why? On the one hand, when the individual's life expectancy is relatively long, rescuing it from danger is "profitable" because such individual will still contribute for a long time to the good of the colony. On the other hand, when the individual's life expectancy is relatively short, it will die soon even if it is rescued. There is simply no need for rescue in species with low life expectancies. I believe that this rule should hold as a general principle, which is why I will test several different ant species from different tribes within the Formicidae family and inhabiting different types of environments, to check the importance of life expectancy as a major factor dictating rescue occurrence in ants. I will first determine the life expectancy of individuals of each species, and then test each species for rescue occurrence in entrapment simulations conducted in the laboratory.

The project will enable expanding our knowledge about ants as social insects, and about pro-social behavior in general. The interdisciplinary character of this project may cause interest of ecologists, behavioral ecologists and evolutionists. This significantly increases chances of publishing the results in high impact factor journals with broad readership. Additionally, advanced social behaviors of ants are often used in science popularization. Rescue is without a doubt an interesting example of pro-social behavior and it can be widely used in popularization for the needs of the public.