



## Alternative colony-founding strategies in the Alpine silver ant

Author(s): Pierre Blacher, Pierre Blacher , Ornela De Gasperin , Michel Chapuisat

Institution(s): Department of Ecology and Evolution, University of Lausanne, Switzerland ; Department of Ecology and Evolution, University of Lausanne, Switzerland ; Department of Ecology and Evolution, University of Lausanne, Switzerland ; Department of Ecology and Evolution, University of Lausanne, Switzerland

Social organization varies greatly in the social insects but the causes of this variation remain poorly understood. The Alpine silver ant *Formica selysi* provides a special opportunity to study this question because this species has two social forms controlled by a supergene: within populations, some colonies are headed by a single queen while others are headed by multiple fertile queens. Here we investigated whether colony-founding strategies of queens contribute to the maintenance of this social polymorphism. Specifically, we tested the influence of queen social origin on the propensity of queens to found a nest alone or cooperatively. We predicted that queens originating from monogynous colonies ('M queens' hereafter) would tend to found their nest independently (i.e. haplometrosis) while queens originating from polygynous colonies ('P queens' hereafter) would tend to associate for founding a nest (i.e. pleometrosis). We grouped three newly-mated non-nestmate queens of various social origins in plastic boxes filled with sand, so that the queens could dig and build a nest alone or cooperatively. We monitored queens' location, behaviour and survival. In accordance with our predictions, the propensity to associate was higher for P queens than for M queens. P queens showed higher levels of social attraction, cooperation and tolerance to other queens. As a result, P queens founded their nest mainly cooperatively and M queens mainly solitarily. Overall, our study demonstrates that queen social origin influences the behaviour and cooperation of queens during colony founding. Through these distinct reproductive strategies, each social form contributes to the propagation of its own form, and thus to the persistence of social polymorphism in *F. selysi*.