Many organisms, including humans, group together and perform collective actions such as birds forming coordinated flocks to evade predators, forage or roost. Some, as social insects, have evolved
complex societies in which the unit of selection is not the individual, as in most vertebrates, but the colony. Yet, in both there is evidence of consistent behavioural variability among both individuals and groups. The study of collective behaviour - coordinated actions resulting in emergent properties at the group level - and the study of animal personality - between individual differences that are consistent over time and contexts - have progressed tremendously in the last two decades and are converging in their search for the link between individuality and collectivity, a fundamental and timely issue in biology. GROUPIND aims to investigate the relationship between individual personality and group personality by using insects (ants) and birds (starlings) as study organisms, both of which showing distinct collective behaviour and marked individual behavioural variability. The project will use a comparative approach to address the following objectives: (1) To characterize, also upon experimental manipulation, the composition of personalities in the group and understand how this relates to personality at the group level. Are group personalities an average of individual personalities within the group? Do they result from different distributions of individual personalities? Are there keystone individuals that exert a disproportionate influence on the group personality? (2) To understand how diversity of individual personalities contributes to decision making and to the ecological success at the group level, and how this would feed back at the individual level. By bridging two major fields of study, this project will shed new light on the ability of groups to function effectively, unravelling the consequences that personality differences can exert on social life and its evolution.

Work performed from the beginning of the project to the end of the period covered by the report and main results achieved so far

The project has been successfully implemented. Both insects (ants) and birds (starlings) proved to be valid organisms for assessing the role of individual personality on group behaviour. After a characterization phase, which revealed consistent (i.e. statistically significant repeatability) individual differences in classic personality traits such as exploration, we were able to manipulate group composition creating both homogeneous (individuals with very similar personality) and heterogeneous (one very different individual, so called « keystone », placed in a group of similar individuals) groups and thereafter to measure collective behaviour in different contexts.

Below the list of scientific papers produced so far, supervision of students, and exploitation/dissemination.

Scientific papers


Carere C., Audebrand C., Rödel H., d’Ettorre P. Individual behavioural type influences group performance in Formica fusca ants. Behav Ecol Sociobiol (submitted)

Carere C., Mather J.A. (Eds.) The Welfare of Invertebrate Animals. Springer. Invited Volume, Planned publication: 2018


Master thesis

Celine Audebrand (2016) L’individualité chez Formica fusca joue t-elle un rôle au niveau du groupe? Master 1 Ethologie, LEEC, Université Paris 13

Florian Desigaux (2016) Individual versus group level personality in the European Starling (Sturnus vulgaris), and implications for welfare. Master 2, Applied Ethology LEEC, Université Paris 13

Celine Audebrand (2017) From individual personality to group personality: role of keystone individuals in flocks of European Starlings (Sturnus vulgaris). Master 2, Fundamental and Comparative Ethology, LEEC, Université Paris 13

Stage reports


Plotine Jardat (2016) Existe-t-il un lien entre les personnalités individuelle et collective chez la fourmi Aphaenogaster senilis? Rapport de Stage, LEEC, Université Paris 13

Scientific talks


d’Ettorre P. (2017) Recognition of identity and cognitive abilities in ants. Institute of Ecology and
Carere C., Audebrand C., Rodel, H., d’Ettorre, P. (2017) Personality and group performance in a social insect. XXVII Meeting Italian Society of Ethology, Calci, 18-21 June (oral talk)


Dissemination for the general public

Gillman S. (2016) Patterns in society can reveal economic bubbles. Horizon - The EU Research & Innovation Magazine 30 March 2016 (interview on the GROUPIND project)

Ferrari M. (2016) Bestie di carattere. Focus Extra 72, pp. 46-50 (interview on animal personality)


Progress beyond the state of the art and expected potential impact (including the socio-economic impact and the wider societal implications of the project so far)

By bridging two major fields of study, this project will shed new light on the ability of groups to function effectively, unravelling the consequences that personality differences can exert on social life and its evolution.

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