



How does individual personality modulate group level behaviour?

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Behavioural variation has important implications for decision making at both the individual and colony level. Decisions on behavioural strategies, from foraging choice to shelter selection, are in many cases linked to the repeatable behaviour (personality) of that individual or group. Despite the importance of animal personality at multiple levels, the link between individual and group level personality profiles are not yet fully understood. In this study we combine agent-based modelling with colony manipulation experiments to address the question, how does individual personality modulate group level behaviour? The contribution of an individual personality to group level behaviour is investigated through the development of an agent-based model validated by laboratory observations of a facultatively social isopod. Previously, agent-based models have been developed for shelter choice modulated by sociality and behavioural variation in woodlice. Our work develops the understanding of the role which personality could play in this collective decision, and how this can be modulated by the environment. We also extend our findings from this facultatively social system to a eusocial study system: ant colonies. Using a range of empirical methods including colony manipulation, video tracking, and RFID tagging, we have been able to provide greater insights into the crucial link between individual and group level behaviours in the context of group decision making. We hope that this work will spark discussion about the role which personality variation within a caste may play in colony social organisation.