

OR121*Caste plasticity maximises personal fitness at the origin of sociality***Emily Bell**, Robin Sounthon, Solenn Patalano, Andy Radford, Seirian Sumner

The evolution of sociality is a major evolutionary transition, the peak of which is found in the eusocial insects. One of their defining features is the emergence of phenotypic commitment and division of labour whereby individuals specialise as reproductives (queens) or provisioners/carers (workers). Inclusive fitness theory explains why reproductive division of labour can evolve, and provides some mechanistic predictions for how phenotypic commitment arises at the origin of sociality. Specifically, it predicts that both direct and indirect fitness are important for all group members (irrespective of caste) in the early stages of social evolution, enabling each individual to adopt different strategies to maximise their own personal genetic fitness, depending on the opportunities available. An alternative hypothesis is that workers and queens should become committed to their roles in stable, established societies, possibly maximising group-level productivity. Here we show, through manipulation experiments, that females in colonies of the primitively eusocial paper wasp, *Polistes canadensis*, retain the behavioural plasticity necessary to maximise personal genetic fitness, through direct and indirect reproduction, irrespective of their original phenotype or stage in colony development. By isolating queens and workers on nests before and after worker emergence, we show that all females retain equivalent abilities to reproduce and provision young, regardless of phenotype and stage of colony cycle. All females therefore, retain the ancestral ability to switch reproductive strategies to exploit both direct and indirect fitness, suggesting that personal fitness is the driver at the early stages of social evolution.