

P167*Steps towards eusociality - lessons from a digger wasp species***Thomas Schmitt**, Mareike Wurdack, Heike Feldhaar, Jurgen Liebig, Carlo Polidori

In Hymenoptera, eusociality evolved several times independently and subsequently reached different levels of complexity. In some taxa like honeybees and various ant species, queens and workers live in perennial colonies and display a strong morphological and reproductive dimorphism. In several bee species e.g. from the family Halictidae, however, eusocial colonies have an annual life cycle with colonies consisting of one or a few reproductive females and reproductively totipotent helpers. Within the large group of solely solitary digger wasp species, *Cerceris rubida* shows definite traits of eusociality. A single fertile female is producing male and female offspring early in the season. Emerging daughters stay in the nest and help their mother with provisioning her offspring. All individuals from the same nest share a similar cuticular hydrocarbon (CHC) profile and they are able to recognize each other. Individuals accept only other nestmates and treat foreign intruders aggressively. Furthermore, the founding female exhibits a unique aspect of her CHC profile that may serve as fertility signal as discovered in several other eusocial Hymenoptera. Although all females are mated and thus they are capable of producing offspring of both sexes, most offspring within one nest are daughters of the founding female. All in all, several traits indicating eusociality could be detected for the first time within the digger wasps. Finally, we compare the traits of eusociality of *C. rubida* with those of other eusocial taxa in the Hymenoptera to give insights in the evolution of sociality in the studied species.