**OR107**

*Wing polyphenism in ants: new insights from the* Mystrium *genus*

**Julien Behague**, Romain Paronnet, Ehab Abouheif, Mathieu Molet

Winged queens and wingless workers in ants represent an extreme example of phenotypic plasticity, the phenomenon by which a single genotype produces various phenotypes in response to environmental cues. Studying the developmental mechanisms responsible for winglessness is important to understand the evolution of the worker caste. For instance, Abouheif et al. (2002) compared the genetic network required for wing development in larvae of several species and they demonstrated that it is conserved across species in winged queens, while it is surprisingly interrupted at different points in workers, suggesting its evolutionary lability. Workers are not the only wingless caste in ants. Other castes such as soldiers and ergatoid queens evolved repeatedly. The aim of our study is to understand how development could produce ergatoid queens during ant evolution. Our hypothesis is that ergatoid queens evolved by recombining traits from the already existing winged queen and worker castes (Molet et al., 2012). To address this issue, we focus on wing polyphenism in two closely related Poneroid species: *Mystrium rogeri* and *Mystrium oberthueri*. While queens are winged in *M. rogeri*, they are ergatoid in *M. oberthueri*. We extensively study the wing genetic network in imaginal discs of developing larvae by combining whole mount in situ hybrizations and immunostainings. This allows us to compare the molecular signatures of ergatoid queens to workers and winged queens. We expect similar molecular signatures between wing discs of ergatoid queens and workers, indicating that parts of the worker developmental program is being recycled and incorporated for the evolution of a new ergatoid queen caste.

Abouheif E and Gregory A. Wray, Science 297, 249 (2002) Molet M., Wheeler D. E., Peeters C. American Naturalist (2012)