

P192*Balancing act: Head stabilisation in Myrmecia ants during twilight***Chloe Raderschall, Ajay Narendra, Jochen Zeil**

As animals move, they generate image motion in their visual field. Image motion generated by translation contains information about the environment, while image motion generated by rotations does not and therefore needs to be minimised. Locomotion - be it flying or walking - induces rotations of the body and of the head of an animal thereby degrading vision. To reduce these unintended locomotion-induced eye rotations, animals are known to perform compensatory head movements that help stabilise gaze. To date, most studies investigating gaze stabilisation in insects have come from flying species. Yet, walking insects have a special problem in keeping their gaze stable because they are in direct contact with the substrate, which will induce complex and unpredictable body rotations as they walk. Bull ants (*Myrmecia pyriformis*) are crepuscular animals that experience a wide range of light intensities during their foraging trips. These ants rely heavily on visual cues for navigation and for catching prey. To measure their ability to control head orientation in the presence of substrate-induced body roll, we took advantage of the ants' motivation for walking along fallen sticks. We induced ants to walk along a twisted band that gradually induced body roll. Filming ants from the front allowed us to quantify head and body roll in a range of ambient light conditions in the ants' natural habitat, as well as in room light and complete darkness in the laboratory. We find that (1) ants are able to keep their head horizontally aligned against body roll of up to 60 degrees; (2) head stabilisation is partly visually controlled, because there is a small degradation of the response as light levels drop; (3) however, the ants also compensate partially for body roll in complete darkness, suggesting non-visual information contributing to head stabilisation.