

**OR027***Amino acid role in high protein diet toxicity in ants***Sara Arganda**, Sofia Bouchebti, Sepideh Bazazi, Gerard Latil, Steve Simpson, Jacques Gautrais, Audrey Dussutour

In solitary and social insects, the balance between the amount of ingested proteins (P) and carbohydrates (C) affects the performance of tasks such as reproduction, growth and survival. For example, *Drosophila melanogaster* females die faster under a high protein diet (high P:C ratio), while their reproductive output increases. Similarly to flies, ant workers also die faster when restricted to a high P:C ratio. This could be caused by digestion problems (low level of midguts proteases or blockage of their narrow petiole) or by toxic effects of the amino acids resulting from protein digestion. Supporting this latter idea, it has been found that lifespan of flies depends on the composition of a supplementary mix of free amino acids. Our aim was to investigate the causes of high protein diets toxicity on ants, both in social and isolated condition. To do so, we restrained worker colonies and isolated ants of *Linepithema humile* to a single diet containing either proteins or their translation in free amino acids. We explored the nutritional landscape of those two nitrogen sources using a range of different P:C ratios and concentrations. We have found that for all P:C ratios, ants die sooner when proteins are replaced by free amino acids, and that the higher the P:C ratio, the higher the mortality. We have also observed that isolated ant workers live shorter than in groups, but the effect of P:C ratio and amino acid sensibility on lifespan remains similar in both social conditions. To identify whether some amino acids were more toxic than others, we constrained isolated ants to diets in which just one amino acid was overrepresented. We identified Methionine, Serine, Threonine and Phenylalanine as especially toxic.