Speaker Abstracts - Wednesday 5 December

Luna

Insect-Bacteria-Plant Interactions: Microbiomes of Russian Wheat Aphid (*Diuraphis noxia*) Contain Bacteria that Increase Virulence to Wheat

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Phenotypic responses to biotic stresses are often studied as the interactions between two species; however, in the phytobiome, these responses frequently result from complex interactions involving several organisms. We previously demonstrated that variation in chlorosis caused by feeding of Russian wheat aphid (RWA, *Diuraphis noxia*), a major pest of wheat world-wide, is determined, in part, by aphid-associated bacteria. The saliva of the aphid contains proteins mainly from bacteria in the families *Enterobacteriacae* and *Erwiniacae*. As a first step in determining which bacteria are necessary for the increased virulence of aphids, we characterized the microbiome of artificial diets fed upon by either control aphids or aphids reared with reduced bacterial populations using 16S sequencing and whole genome sequencing with Pacbio SMRT sequencing. Additionally, we characterized the microbiome of wheat leaves fed upon by either control aphids or aphids with reduced bacterial populations. This data revealed that the microbiomes of artificial diets fed upon by RWA, like the RWA saliva, are comprised mainly of bacteria from families *Enterobacteriacae* and *Erwiniacae.* Genome annotation of relatively abundant bacteria suggest a repertoire of virulence factors such as: type III and type VI secretion systems as well as antibiotic resistance genes. Bacteria in communities from wheat leaves infested by RWA were similar to those from artificial diets fed upon by RWA, suggesting bacteria were delivered to leaves by RWA.