Comparing the fitness of woolly apple aphid Eriosoma lanigerum populations: evidence of different biotypes in Australia?

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The woolly apple aphid (WAA), Eriosoma lanigerum Hausmann, is a major pest of apple orchards that is known to have a high economic impact on apple production in Australasia but also worldwide. Since its arrival in Australia two centuries ago, WAA populations have established in various locations that are geographically isolated. Because of their isolation, these populations could represent separate biotypes that have different biological features and adaptation to different environments. To determine whether each population could represent a different biotype, we measured, under controlled conditions, the fitness parameters of two WAA populations collected in New South Wales (Albury) and Victoria (Stanley). Both populations were reared on potted apple trees in glasshouses and further compared in laboratory trials (22°C; 16 L: 8D). The average fecundity, size (body length) and developmental time of apterous virginoparae on excised stems of apple trees (Malus domestica cv. Granny Smith) were estimated for each population. Similarly, we evaluated the survival rate, size, and developmental time of newly born nymphs. Results indicated that the Albury population presented distinct features compared to the Stanley population. Overall, this suggests that there could be different biotypes of this pest insect in Australia. This is in agreement with previous work that has indicated a difference in feeding behaviour for the Albury population relative to another population (from Batlow, NSW). We discuss the importance of the existence of different WAA biotypes in Australia on the development of future management strategies.