

Physiological approach to explain the ecological success of 'superclones' in aphids: Interplay between detoxification enzymes, metabolism and fitness

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'Superclones' are predominant and time-persistent genotypes, exhibiting constant fitness across different environments. However, causes of this ecological success are still unknown. Therefore, we studied the physiological mechanisms that could explain this success, evaluating the effects of wheat chemical defences on detoxification enzymes [cytochrome P450 monooxygenases (P450), glutathione S-transferases (GST), esterases (EST)], standard metabolic rate (SMR), and fitness-related traits [adult body mass and intrinsic rate of increase (r_m)] of two 'superclones' (Sa1 and Sa2) of the grain aphid, *Sitobion avenae*. Additionally, we compared 'superclones' with a less-frequent genotype (Sa46). Genotypes were reared on three wheat cultivars with different levels of hydroxamic acids (Hx; wheat chemical defences). Detoxification enzymes and SMR did not differ between wheat hosts. However, GST and EST were different between 'superclones' and Sa46, while Sa1 showed a higher SMR than Sa2 or Sa46 (p