

Comparative sensitivity to methyl eugenol of four putative *Bactrocera dorsalis* complex sibling species-further evidence that they belong to one and the same species *B. dorsalis*

ABSTRACT

Males of certain species belonging to the *Bactrocera dorsalis* complex are strongly attracted to, and readily feed on methyl eugenol (ME), a plant secondary compound that is found in over 480 plant species worldwide. Amongst those species is one of the world's most severe fruit pests the Oriental fruit fly, *Bactrocera dorsalis* s.s., and the former taxonomic species *Bactrocera invadens*, *Bactrocera papayae* and *Bactrocera philippinensis*. The latter species have been recently synonymised with *Bactrocera dorsalis* based on their very similar morphology, mating compatibility, molecular genetics and identical sex pheromones following consumption of ME. Previous studies have shown that male fruit fly responsiveness to lures is a unique phenomenon that is dose species-specific, besides showing a close correlation to sexual maturity attainment. This led us to use ME sensitivity as a behavioural parameter to test if *Bactrocera dorsalis* and the three former taxonomic species had similar sensitivity towards odours of ME. Using Probit analysis, we estimated the median dose of ME required to elicit species' positive response in 50% of each population tested (ED₅₀). ED₅₀ values were compared between *Bactrocera dorsalis* and the former species. Our results showed no significant differences between *Bactrocera dorsalis* s.s., and the former *Bactrocera invadens*, *Bactrocera papaya* and *Bactrocera philippinensis* in their response to ME. We consider that the *Bactrocera* males' sensitivity to ME may be a useful behavioural parameter for species delimitation and, in addition to other integrative taxonomic tools used, provides further supportive evidence that the four taxa belong to one and the same biological species, *Bactrocera dorsalis*.

Keyword: *Bactrocera dorsalis*; *Bactrocera invadens*; *Bactrocera papaya*; *Bactrocera philippinensis*, Methyl eugenol; Male response; Lure sensitivity