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Behavior as a mechanism of insecticide resistance: evaluation of the evidence.

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Highlights

- Behavioural resistance is often claimed but rarely supported upon close scrutiny.
- Most cases represent some form of general behavioural avoidance to the insecticide formulation or aversion response to its effects not a de novo selected response.
- The best examples of behavioural resistance show a change in receptor responses that are under genetic control and have been selected similar to classic insecticide resistance.

Abstract/summary:

As a mechanism of insecticide resistance, “behavioral resistance” must be clearly defined in a manner that is consistent with other mechanisms of resistance and be based on heritable change in the gene pool. Current definitions of the proposed phenomenon are vague and most claimed cases of behavioral resistance to insecticides are simply aversion behaviors that are either learned or based on simple repellency or avoidance. Although studies have shown changes in taste/ odour receptors (e.g. cockroaches that demonstrate a heritable change in their responses to glucose), unequivocal demonstration of behavioral resistance to insecticides is rare. The fundamental problems are:

1. Inferring resistance from observations, with little evidence of “normal” behavior prior to exposure to insecticides.
2. Interpreting behaviors as insecticide resistance with no evidence that either resistance is detectable or, more importantly, testing the hypothesis that it is

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