

## Identification of *Culex pipiens* Linnaeus (Diptera: Culicidae) immunogens recognized by host humoral immunity and their impact on survival and fecundity

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Insecticide use continues to be the primary control strategy to reduce insect vector populations. Concerns about insecticide resistance in target organisms, environmental degradation, and possible deleterious impact on human health have led researchers to seek a variety of alternative control strategies. We tested a relatively new method for controlling mosquitoes using host immune response. New Zealand White (NZW) rabbits (*Oryctolagus cuniculus*) were immunized with salivary gland (SGE), midgut (MGE), or ovary (OVE) extracts from female *Culex pipiens* L. Immunized rabbits were then exposed to unfed adult mosquitoes which were subsequently observed for changes in survival, fecundity, and hatch success. Parents that fed upon MGE- ( $P < 0.001$ ), SGE- ( $P < 0.018$ ) and OVE- ( $P < 0.018$ ) immunized rabbits experienced significantly higher mortality within 48 hours than parents fed on control rabbits. Midgut extract elicited the strongest effects upon survival ( $P < 0.001$ ), oviposition activity ( $P < 0.001$ ), and hatch success ( $P < 0.001$ ) in the parent generation. Survival ( $P < 0.018$ ), oviposition activity ( $P < 0.001$ ), and hatch success ( $P < 0.001$ ) were likewise strongly reduced in parents fed on SGE-immunized rabbits. Ovary extract-fed parents experienced less pronounced, but significant reductions, in survival ( $P < 0.018$ ) and hatch success ( $P < 0.034$ ). Surviving progeny were most strongly impacted by feeding upon MGE-immunized rabbits. Our study suggests that manipulating host immune response may be a suitable technique for reducing *Cx. pipiens* mosquito survival and fecundity, and subsequently the potential risk of disease transmission by this species.