Polyphenol-Mediated Impairment of Egg Eclosion in *Aedes aegypti*

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**Introduction:** Mosquitoes are the vectors of most human prevalent diseases. This is due to many biological reasons including their ability to generate a huge amount of eggs. It was originally demonstrated that egg formation is under nutritional (mTOR pathway) and hormonal control. We have evaluated the role of nutritionally-administered polyphenols on *Aedes aegypti* on egg formation and viability. We have tested the effect of 09 different polyphenols on mosquito metabolism, lifespan and egg eclosion. A major target of polyphenols is the AMP-dependent protein kinase (AMPK), a repressor of mTOR pathway.

**Materials and Methods:** Polyphenol feeding was conducted in cotton previously impregnated in each drug and then placed in mosquito cages. Egg eclosion was determined by visual inspection. The mosquitoes locomotor activity was evaluated by the Activity Monitor inside a Precision Scientific Incubator.

**Results and Discussion:** Polyphenols increased mosquito lifespan, but decreased the total number of eclosed larvae. Triacylglycerol (TG) content of treated mosquitoes was decreased in an AMPK-dependent fashion. TGs are the major lipid constituent of egg yolk and the major source of energy for flight activity. However, neither the number of laid eggs nor total locomotor activity were changed by polyphenol treatment. Such observations provided a scenario where AMPK modulation may not affect the flux of metabolites to growing eggs. Thus, the effects on egg eclosion may be related either to a detoxification step of polyphenols on the midgut or a different pathway of mTOR regulation by insect AMPK. According to these hypotheses, the use of polyphenols with a more specific effect on AMPK pathway may lead to a decrease on larval eclosion.

**Conclusion:** These preliminary results showed that the increase on mosquito lifespan promoted by dietary polyphenols imposes an arrest on egg development and this mechanism may provide a novel environmental strategy to block disease transmission by mosquitoes.

**Key Words:** *Aedes aegypti*, AMPK, Egg eclosion, Polyphenols.