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Probing the bite: electropenetrography (EPG) investigation on mosquito-host interaction



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Culicidae, known as mosquitoes, are a dipteran family whose adult females are blood-feeders. The meal is performed with a piercing-sucking buccal apparatus, the proboscis. Blood feeding behaviour consists of two main phases: probing, in which the proboscis, inserted in host derma, searches for a blood vessel, and ingestion, in which blood is pumped through the alimentary channel. While probing, mosquitoes inject saliva into host tissues, with haemostatic and immunoregulatory functions. Little is known about effects of saliva on the mosquito itself and the regulation of the feeding behaviour. Studies on blood feeding lack objectivity and quantitative data, as they are based on direct observation, performed by the operator, of processes occurring in host's opaque tissues. Electropenetrography (EPG) is a methodology based on the analysis of electric signals recorded through a circuit closed by the insect-host interaction. Voltage variation over time is visualized in waveforms, each typical of a feeding phase. This method provides accurate timing of the data and different feeding phases. Our aim is to understand the role of salivary proteins in the feeding behaviour of the invasive mosquito *Aedes albopictus*. To achieve this goal, we need to characterise *Ae. albopictus* blood feeding behaviour with EPG. Successively, we will generate knockout mosquito lines for each salivary protein and analyse them with EPG. We are describing the waveforms library, which is the waveforms set proper for a species. This represents the first EPG description for *Ae. albopictus*. Knockout mosquito line for LIPS-2 salivary protein is in production, using CRISPR/Cas9 system.

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