# LIFE CYCLE RESPONSES OF THE MIDGE OF *CHIRONOMUS* SPECIES (DIPTERA: *CHIRONOMIDAE*) TO SUGARCANE AND PAPER PULP EFFLUENTS EXPOSURE

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**Abstract**
The aim of this study was to assess the life cycle responses of the midge of *Chironomus species* (Diptera: *Chironomidae*) to sugarcane and paper pulp effluents exposure in order to ascertain their use in the monitoring of freshwater ecosystems. Fourth instar of *Chironomid* midges were sampled on two locations in rivers Nzoia and Mbogo, a tributary joining River Nyando within the Lake Victoria Basin. All midges were taken to the laboratory and acclimatized in a controlled climate room for 24 hours. They were then exposed to the effluent dilutions (i.e. 100%, 50%, 25%, 12.5% and 6.25%) collected from Webuye Paper Mill and Chemelil Sugar Factory treatment ponds/lagoons. Complete Randomized Design was used, with ten midges put in each of the treatments replicated four times. Results indicated that emergence of the *Chironomus* species decreased with increase in the effluent concentration. Higher effluent concentration led to delay in emergence of chironomids over time. There was no significant difference ($p<0.05$) between the emergence of *Chironomus* species exposed to the two effluents. The study concluded that pulp paper and sugar cane effluents delayed the development of life cycle stages of *Chironomus* species. In conclusion life cycle stages of the midges, *Chironomus* species can be a good indicator of environmental degradation.

**Key words:** Pollution, toxicology, *Chironomus species*, effluent