

Relationship between water quality & black flies (Diptera: simuliidae) abundance in Tambunan district, Sabah

ABSTRACT

A study to investigate the relationship between black flies (Simuliidae) pupa abundance and physio-chemical parameters such as velocity, water temperature, pH, dissolved oxygen, conductivity and total dissolved solid was conducted at Tambunan district, Sabah. A total of six rivers were selected as sampling stations. Five sampling points located at a distance of 5-10 meters were established in each sampling station. Sampling was conducted every fortnight for a duration of six months from October 2015 until March 2017. Samples of black flies' larvae and pupae were manually collected from substrates consisting of grasses, plant roots and plastics which were found stuck in between the rocks with running water area. Water quality parameters that were measured during every sampling, include water temperature, velocity, pH, dissolved oxygen, conductivity and total dissolve solids (TDS). Results from this study showed that The Principal Component Analysis (PCA) revealed two PC's which had eigenvalues >1.0 and together accounted for 78% total variability of the physio-chemical parameters. PC-1 which accounted 56% of variability defined a normal temperature (23-25°C), high water velocity, high dissolved oxygen, low conductivity and low total dissolved solid. While PC-2 explained 22% of the variability was related to water pH. Pearson's correlation result shows that only velocity had a significant relationship with the abundance of black flies ($r=0.512$, $p<0.01$), while other parameters did not show any significant relationship with its abundance. In conclusion, results from this study revealed that only water velocity had a significant relationship with the abundance of black flies.