

Species evenness and diversity of soil invertebrates at different agricultural lands and A forest reserve at Kota Belud, Sabah

ABSTRACT

Increasing agricultural activities can lead to changes in soil ecosystems, potentially impacting soil invertebrate communities as they are highly responsive to soil disturbances. The composition of soil invertebrates within each agricultural habitat provides insights into how these communities respond to their environmental conditions. This study aimed to investigate the evenness and diversity of soil invertebrates in agricultural areas of Kota Belud, Sabah. Soil samples were collected from three different agricultural sites, a rubber plantation, an oil palm plantation, and a paddy field, as well as a forest reserve as a control site. Pitfall traps and Berlese-Tullgren funnels were used to collect soil invertebrates. A total of 180 soil samples and 474 individuals of soil invertebrates were collected and analyzed. Physicochemical analyses, including moisture content, soil texture, pH, soil nutrient content, and organic matter, were conducted on all soil samples to assess their influence on the composition of soil invertebrates. Results indicated that Julida, Coleoptera, Gastropoda and Araneae were frequently associated with high organic matter, pH, moisture content and phosphorus. On the other hand, Haplotaxida appeared to be more sensitive to potassium levels. Notably, the Blattodea, Orthoptera, Hymenoptera, Isopoda, Polydesmida and Diptera, were found to be abundant in areas with lower organic matter and pH in the control site, i.e., forest reserve area. These findings underscore the significance of soil layer activities in influencing the presence and survival of soil invertebrates. Given their vital role in sustaining life, prioritizing the enhancement of soil invertebrate populations is crucial, particularly in Sabah, a prominent food crop-producing state in Malaysia.