

Abstract

A study was undertaken to assess (a) temporal patterns of insect activity and diversity, (b) evaluate the measures of biological diversity and, (c) identify possible indicator groups of total insect diversity in an agroecosystem at GKVK Campus, University of Agricultural Sciences, Bengaluru. The study used light traps to collect insects from 8th May, 2015 to 6th December, 2016 at 21 day intervals. A total of 209,098 individuals belonging to 764 morpho-species or Operational Taxonomic Units (OTUs), representing 101 families from 12 orders were collected. The Simpson's index of diversity was 0.9732, the Shannon- Wiener index was 4.4443 and Avalanche index was 1.1693. Five orders, viz., Coleoptera, Hemiptera, Lepidoptera, Diptera and Hymenoptera dominated the collections. The relative proportions of these five orders at GKVK agroecosystem were different from those of the global and Indian insect communities; Coleoptera was over represented at GKVK while Lepidoptera, Diptera and Hymenoptera were under represented. Order Coleoptera was found to be a good indicator of the total insect diversity and this perhaps is because it was the most predominant component of the collections. The study recommends that light traps may be used for addressing broad ecological questions and to estimate the total insect diversity. While Simpson and Shannon-Weiner indices were strongly correlated with the species richness, Avalanche Index (AI) was not; probably because the biological heterogeneity that AI captures was not strongly reflected in species richness. Insect diversity and abundance was higher during summer and post monsoon and less during winter and rainy seasons. Rainfall and relative humidity over three days negatively affected the insect diversity and activity. Temperature cumulated over three week period negatively impacted the species richness though the abundance was not affected. Width of body increased with length at higher rate in Coleoptera and Hemiptera than Hymenoptera and Diptera suggesting that the former tend to become broader than the later. Coleoptera also had higher rate of increase in body weight with length probably due to the elytra. We have argued that insects adopt varying degrees of the two competing strategies for their protection: Thickening of forewing and adoption of flight agility. While Coleoptera and Hemiptera adopt the former, the Lepidoptera, Diptera and Hymenoptera adopt the later strategy.