FLORISTIC PATTERN AND COLONY PERFORMANCE OF HONEYBEES (Apis cerana) IN DIFFERENT AGROCLIMATIC ZONES OF SRI LANKA

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Honeybees play a vital role in pollination and ecosystem functioning and their productivity is strongly influenced by floral resource availability and environmental conditions. This study evaluates the floristic patterns and colony performance of Asian honeybee (Apis cerana) across five distinct agro-climatic zones in Sri Lanka, Matara, Kegalle, Gannoruwa, Nawalapitiya and Monaragala. The research aimed to identify the floral resources available in these ecosystems and determine their influence on honeybee productivity using Colony Performance Index (CPI). Floristic assessment was conducted within a 300meter radius of the apiaries at three weeks of intervals over a four-month period. Colony performance was assessed by recording the number of pollen carrying forages and total incoming bees during three daily observation periods (8:00-9:00a.m., 11:00-12:00p.m. and 3:00-4:00p.m.), and CPI was calculated as the ratio of pollen carrying foragers to total incoming bees within observation period. Data were analyzed using descriptive statistics, One-way ANOVA, and Tukey HSD tests using IBM SPSS statistics (v.32) at 95% confidence level. Floristic occurrence varied among locations, indicating differences in floral resource composition across agroclimatic zones. The highest Species richness was recorded in Matara, with 36 species including 27 plant families, while Asteraceae was the most frequently recorded plant family. Spatial variation among the agroclimatic zones did not have a statistically significant effect on overall colony performance ($F=0.573$, $p= 0.682$). Matara recorded the highest mean CPI (7.2±15.77) and Gannoruwa marked lowest (5.07±9.4), overall foraging activity remained relatively stable across the different locations. Significant differences in CPI within a day, observed in Matara($p=0.025$), Kegalle($p=0.003$) and Gannoruwa ($p<0.001$). The study concludes that Apis cerana exhibits high ecological adaptability across Sri Lanka's diverse landscapes. Short-term environmental factors, such as daily weather patterns and floral secretion cycles, appear to play a more dominant role in regulating foraging behavior than broader agro-climatic differences. These findings provide a foundational baseline for developing region-specific beekeeping management strategies and pollinator conservation efforts in Sri Lanka.

Keywords: apiary, beekeeping, colony performance index, floristic assessment, foraging activity, species richness