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Spatiotemporal analysis of pollen assemblages in ""Apis cerana indica"" (Fab.) honey: A melissopalynological perspective from Kodagu, Karnataka, India

Nidhi Cheppudira Natesh[1], Raghupati Ningaraddi Kencharaddi[2]
[1]Department of Entomology, College of Agriculture, Iroisemba, Central Agricultural University, Imphal-795004, Manipur, INDIA e-mail: nidhicheppudira@gmail.com
[2]Department of Forest Biology and Tree Improvement, College of Forestry, Ponnampet-571216, KSN University of Agricultural and Horticultural Sciences, Shivamogga, Karnataka, INDIA e-mail: rnkencharaddi@uahs.edu.in

Honey, a natural sweetener produced by honeybees plays a vital role in nutrition, medicine, and biodiversity conservation. Melissopalynology, the study of pollen in honey, helps identify floral sources, assess honey quality, and understand bee foraging patterns. Since honey composition varies with floral availability, analyzing pollen diversity is crucial for sustainable beekeeping and ecosystem management. Despite the significance of beekeeping in Kodagu region of Western Ghats, Karnataka,India research on the spatiotemporal dynamics of pollen in the native ""Apis cerana indica"" (Fab.) honey remains scarce. Here we show that honey samples from different forest ecosystems during major and minor honey flow periods exhibit distinct pollen compositions, reflecting seasonal shifts in floral resource availability. Analysis of eight honey samples, following Erdtman's (1953) methodology, identified five unifloral and three multifloral samples. During the minor honey flow period (November–December), ""Tabebuia""sp., ""Sapindus laurifolius"", and ""Alternanthera sessilis"" were dominant in semi-evergreen, moist deciduous, and dry deciduous forests, respectively. In the major honey flow period (March–April), ""Cocos nucifera"" and ""Taraxacum"" sp. were predominant in semi-evergreen and dry deciduous forests. Absolute Pollen Concentration (APC) classified the honey samples as moderately high (Louveaux classes III and IV). Pollen diversity was highest in evergreen forests during the minor honey flow period and in semi-evergreen forests during the major honey flow period. These findings will also through light in understanding the pollen dynamics for sustenance of bees and for their development. These findings provide insights into floral resource dynamics, support conservation strategies, and promote sustainable beekeeping in the Kodagu region of the Western Ghats, Karnataka,India.