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Pollinators, especially honey bees play a crucial role in global food security and ecological balance. However, pesticide exposure poses a serious threat to their survival, affecting foraging behavior, reproductive success, and overall colony health. Pesticides can exert both lethal and sublethal effects, leading to long-term colony declines and disruptions in pollination services. This study investigates the toxic effects of commonly used pesticides on *Apis cerana* through controlled topical bioassays. Worker bees were exposed to different pesticide concentrations and mortality was recorded at multiple time intervals after post-application. Bioassays were conducted using single-use bee rearing cups to ensure accurate exposure conditions. To assess toxicity, LC values were determined using probit analysis, with Abbott's correction applied for precise dose-response evaluation. Additionally, the hazard quotient (HQ) was calculated for each pesticide to determine its relative risk to *A. cerana* populations. Results indicate that insecticides, particularly broflanilide and imidacloprid, exhibited pronounced lethality, inciting substantial mortality even at infinitesimal concentrations. Conversely, chlorantraniliprole, along with the scrutinized fungicides and herbicides, manifested markedly lower toxicity. These findings highlight the heightened risk posed by certain insecticides, emphasizing the need for pollinator-friendly pest management practices. Implementing Integrated Pest Management (IPM) strategies that prioritize pollinator health can help mitigate harmful effects while maintaining agricultural productivity. Moreover, the hazard quotient analysis revealed the potential long-term risks associated with chronic pesticide exposure, even at sublethal doses, which can impair navigation, learning ability, and immune responses in honey bees.