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Toxic in Binary and Ternary Manner on Honey Bees (Apis Mellifera)

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[illegible]

cyhalothrin (GCY), beta-cyfuthrin (BCY), and spinosad (SPI).

[illegible]: Toxicology; Honey bees; Pesticides

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e use of pesticides remains one of the main pest management strategies in modern agriculture. However, the unintentional misuse of pesticides in farming areas can pose certain risks to the environment and non-target organisms, such as bees. Honey bees (Apis mellifera) play a major role in the maintenance of plant biodiversity and food security through agricultural productivity [1].

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e honey bee (A. mellifera) queenright colonies that we employed in our research were originally bought from beekeepers that were situated close to the Mississippi cities of Magee and Perkinston in pine forest and pasture settings. At a solitary bee yard in the Mississippi Wildlife Management Area, bee colonies were established (North Stoneville, MS, USA). Frames with sealed brood covering more than 50% of them were moved into a lab incubator with no light and a temperature of 33 0.5 °C [2, 3].

[illegible]

In this investigation, nine pesticides from seven chemical classes were chosen, including CLO (Belay 50 WDG, Valent), CAR (Sevin XLR Plus, Bayer CropScience), and THI (Larvin 3.2F, Bayer); CHL (Lorsban 4E, Dow AgroSciences); BCY (Baythroid XL 1 EC, Bayer); GCY (Declare, Cheminova); TET (Domark 230 ME (Steward EC, DuPont). Instead of using these pesticides' active ingredients, commercial formulations were used because our goal was to imitate eld circumstances and assess the possible interaction toxicities of chemical combinations to honey bees using formulations typically used in eld applications [4,5].

[illegible]

CLO was binarily and ternarily combined with the other eight pesticides in order to uncover any potential interacting e ects of pesticide combinations on honey bees. Using honey bee workers subjected to sucrose solutions containing CLO and other compounds, the toxicities of chemical combinations were evaluated. In parallel testing, we directly contrasted the toxicity of the individual drugs and their mixtures. Honey bees were exposed to repeated dilutions of each chemical with a xed equitoxic constant mixture ratio (the same toxicity impact from each chemical according to individual 4-day LC50 values) in order to evaluate the combined e ects of pesticide combinations.

pesticide mixtures should receive more consideration because they can seriously endanger natural ecosystems [9, 10].

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