Editorial

Effect of pesticides on pollinators

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Plant are cultivated around the world for food, beverages, medicines and fabrics especially grains, cereals, millets, vegetables, fruits, tea, coffee, aloe, cotton, etc. Among the plants, 75% are pollinated by the biotic pollinators and play a major role in human food production. The angiosperms either directly or indirectly provide food, drugs, fibre, and fuel to human beings. Worldwide 90% of the angiosperms reproductions depend on the pollinators. Pollinators are most important organism in the terrestrial ecosystems as it plays a unique role in maintaining the nativity of a particular ecosystem, including agricultural ecosystems. On the other hand, pollinators play a vital role in maintaining biodiversity of forest ecosystems by pollinating the wild plants which in turns provides food sources for the wild animals and birds. Insect pollinators include bees, (honey bees, solitary species, and bumblebees); pollen wasps (Masarinae); ants; flies including bee flies, hoverflies and mosquitoes; lepidopterans, both butterflies and moths; and flower beetles are the major source of pollination. Apart from this, birds bats, bees, butterflies, beetles and other animals that also pollinate plants and sustain the ecosystems.

Among these, honey bees are only insects which provide food for human beings. Honey contains enzymes, vitamins, minerals, water and pinocembrin. Honey bees olfactory competence are social communication within the hive, odor identification for finding food, sense of smell to differentiate hundreds of different floral varieties and recognize whether flower carries pollen or nectar from meters away using 170 odorant receptors. They have incredible capacity to learn, remember things, distance travelled and foraging proficiency.[1]

Apart from this pesticide reduce the ability of gathering of food from plant and also kill the bees. There are two pesticides commonly used by farmers namely, neonicotinoids and coumaphos could affect bees brains. Studies also indicate that, bees that feed on neonicotinoid contaminated pollen and nectar produces fewer offspring. On the other hand, certain pesticides can attach or destroy cells in the gut, brain, or other tissues, thus affecting the bee's physiology and behaviour; and also pesticide directly affect the reproductive potential of the bee by reducing sperm viability in drones that causes poor mating for queens, and disruption of ovary activation in the developing queen. Risk assessment tools are used by the Regulatory authorities to find out whether the use of a pesticide is consistent. Protection of the pollinator community provides the diversity of the species associated with pollination in the particular ecosystem. Pesticides must be used only when necessary and not during the flowering stage. Practicing Integrated Pest Management (IPM) also helps in maintaining the pollinator population and the diversity of the ecosystem.

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Conflicts of interest

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References

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