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Importance of Insects in Ecosystem and Rapidly Declining Biodiversity

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Abstract: Insects play an important fundamental role in ecosystem. We need to maintain an ecosystem with insects in the environment as these are an important biological structure. The decrease in insect biomass and biodiversity is due to the spread of agriculture, global warming, anthropogenic impact, increasing CO_2 and O_3, temperature and changes in rainfall pattern during the previous century.

Keywords: Insects, Biodiversity, Global warming, Ecosystem, Agriculture

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Introduction

Insects play important functions in our ecological system, such as herbivorous, pollinators, predators and parasitoids and changes in insect abundance, biodiversity or community may alter forest ecosystem and the services they provide (Hillstron and Lindroth, 2008). Plants and insects evolved at about the equal time some 475 million years ago in the Ordovician period of Paleozoic era (Misof *et al.,* 2014). Anthropogenic emission of CO_2 and different greenhouse gases are presently responsible for these changes in climate (Houghton *et al.,* 2001). Many living life are highly responsive to environmental changes that alter the vital functions of organism such as metabolism, growth, reproduction etc. (David, 1989). Species of animals have biotic indicator that are useful to surveillance and identify the health of an ecological and qualitative situation of environment. Insect establish substantial proportion in terrestrial species balance and biomass and play an important function in ecosystem (Mcgeoch, 1998). The clearing of natural ecosystem to grow food crops and livestock production, use of huge amount of water and application of agricultural chemicals are providing a background for important changes in ecological system (Pimentel *et al.,* 2000). In this review the importance of insects in ecosystem and some of the causes which are responsible for declining of insect biodiversity are discussed.

Importance of insects in ecosystem:

Pollination: Over 75 per cent of wild flowering plant species in temperate area need insects for pollination and almost two-third of all plants species depend on insects for pollination. Bees, beetles, butterflies and flies are very important pollinators (Schoonhoven *et al.,* 2005).

Predation: Involving the higher trophic levels as secondary or tertiary consumer, predators and parasites, insects assist with controlling the population increase of primary consumers or phytophagous living organisms below threshold. Insectivore insects becoming pests are under normal control by insect predators and parasitoids (Van Lenteren, 2012).

Decomposition: Dung beetles benefit to soil health by increasing total proteins content or nitrogen, phosphorous, potassium, calcium and magnesium (Macfadyen *et al.,* 2015). Dung beetles also help to the carbon cycle reducing GHG emission within 7% and 12% (Nichols *et al.,* 2008). Carrion contributes food to a diverse community of insect with big functions for insect- detritivores including flies and beetles (Merritt and De Jong, 2015).

Ecological controlling: Insects of order Coleoptera play an important role in controlling soil quality, population regulation of other invertebrates and energy flow and participate to the chemistry of soil formation (Ghannem *et al.,* 2017).

Agriculture: Insects are essential for human life, because crops cannot be produced without the pollination by insects. Almost 72% of the world's crops subordinated on insect for pollination (Dicke, 2017). 18% of world agricultural production are damaged by herbivorous insects and they are mainly controlled by chemical methods (Losey and Vaughan, 2006).

Insects as bioindicator: In trophic levels (the place that a life form involves in a food chain), the appropriation of harmful components in the biosphere is emphatically affected by concentrations of race metals in insects, because insects represent basic links intermediates to metal transport chains (Ghannem *et al.,* 2017). The impacts of forest interference on beetles in Cameroon and Brazil showed that totally clearance had negative effect on beetle's species variety (Lawton *et al.,* 1998).

Declining insect biodiversity:

Global warming: Glaciation and falling ocean levels around 30 million years resulted in the extinction of an expected 86 per cent of all marine species on earth at the Ordovician-Silurian period of Paleozoic era (Christie *et al.,* 2013). Peoples, along with our trained warm blooded animals, make up 95% of all mammalian biomass in the world; generally wild mammals add up to just 5% of all mammalian biomass today (Bar-on *et al.,* 2018). With such an additional customary level of people pre-dominance it is no big surprise that insect biodiversity is disappearing quickly (Seibold *et al.,* 2019; Wagner *et al.,* 2020).

Increase of agriculture: Increased human population lead unavoidably to more clearing for farming and direct uses of forest of the woodland for different purposes, bringing about the rapid loss of biodiversity, both species number and in biomass (Curtis *et al.,* 2018). The agribusiness need to decrease its own Ozone depleting substance emanation in the event that we are to be effective in controlling environmental changes (Arcipowska *et al.,* 2020).

Impact of human initiated habitat changes on useful insect diversity: High agrochemical inputs in crop fields are the essential reason for the fast diminishing of biodiversity (Robinson *et al.,* 2002). The deficiency of this rural biodiversity has both financial and social production, as well as enduring consequence for agrarian efficiency, affecting food security in the long time retained with supportable land use in random and changing is just conceivable with protection of most extreme biodiversity.

Temperature: Temperature directly affects insects' development, survival and abundance (Bale *et al.*, 2002). Direct impacts of temperature on insect life history are probably increased and more significant than some other factors on insect life history and physiology (Bale *et al.,* 2002).

Effect of CO_2 and O_3: Climate changes induced by human greatly affects the forest ecosystems. Carbon dioxide (CO_2) and tropospheric ozone (O_3) have opposing impacts on forests and insects which have close association (Hillstron

and Lindroth, 2008). Hillstron and Lindroth (2008) have reported that elevated CO_2 reduced abundance of phloem-feeding herbivores and increased abundance of chewing herbivores. They further stated that elevated O_3 have opposite effects on insect abundance than those of elevated CO_2.

Extinction rates of insect biodiversity: Organic destruction is continuing quickly to such an extent that most scientist concur that we have entered the beginning phase of a 6th significant destruction occasion and have previously crossed the final turning point (Kolbert, 2014; Barnosky, 2015; Dasgupta and Ehrlich, 2019). We can then contrast this rate and the assessed extents of risk in land plants and different groups for which the current species are somewhat notable. Considering in the two sorts of proof, it shows up probable that about a fifth of all types of eukaryotes will vanish in the following not many years and may be, even double that the extent before the finish of century (Schefferes *et al.,* 2012; Pimm *et al.,* 2014; Pimm and Raven, 2017; Raven, 2020). First and foremost the worth of insect to humankind needs better communication valuation. One methodology is to address prosperity with preservation system liable to be more powerful when we center on these social qualities (Chan *et al.,* 2016).

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