Committee: Environment
Question of: The Question of the Possible Decline in Insects
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Introduction:

Recent regional reports and trends in biomonitoring suggest that insects are experiencing a multicontinental crisis that is apparent as reductions in abundance, diversity, and biomass. Given the fact that that insects are crucial to terrestrial ecosystems and the food chain that supports humans, the importance of addressing these declines cannot be overstated.

Several studies report what appears to be a substantial decline in insect populations. Some of the insects most affected include bees, butterflies, moths, beetles, dragonflies and damselflies. Possible causes of the decline have been identified as habitat destruction, including intensive agriculture, the use of pesticides, urbanization and industrialization, introduced species and climate change. Although it is a big issue, not every insect is affected in the same way and many groups are the subject of limited research as the decline of the scientific field of entomology may also be contributing to errors in data analysis and overgeneralization from limited findings, resulting in exaggeration of the decline in insect populations.

To achieve the UN’s sustainable development goal number 15 “life on land”, ensuring the not decline in insects is essential to protect biodiversity and natural habitats. For this, urgent and significant action should be taken to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species.

The issue:

The planet is at the start of a sixth mass extinction in its history, with huge losses already reported in larger animals that are easier to study. But insects are by far the most varied and abundant animals, outweighing humanity by 17 times. They are “essential” for the proper functioning of all ecosystems, the researchers say, as food for other creatures, pollinators and recyclers of nutrients.
Insect population collapses have recently been reported in Germany and Puerto Rico, but the review strongly indicates the crisis is global. The researchers set out their conclusions in unusually forceful terms for a peer-reviewed scientific paper: “The insect trends confirm that the sixth major extinction event is profoundly impacting on life forms on our planet.

Experts recommend taking radical and immediate action to prevent large scale insect extinction. These include overhauling existing agricultural methods. Integrated pest management is one such approach to sustainably managing insects, as it focuses on prevention rather than treatment, and uses environmentally friendly options to safeguard crops. The goal is not to eliminate insect pests entirely, but to keep their numbers at a point to which they no longer cause a problem.

Causes:

The decline has been attributed to habitat destruction caused by intensive farming and urbanisation, pesticide use, introduced species, climate change, and artificial lighting. The use of increased quantities of insecticides and herbicides on crops have affected not only non-target insect species, but also the plants on which they feed. Climate change and the introduction of exotic species that compete with the indigenous ones put the native species under stress, and as a result they are more likely to succumb to pathogens and parasites. While some species such as flies and cockroaches might increase as a result, the total biomass of insects is estimated to be decreasing by about 2.5% per year.

Insect populations persisting on small, highly fragmented and isolated islands of habitat, are tended to go extinct over time due to the well-understood principles of island biogeography. Species may go extinct on habitat islands, but this process will be accelerated if islands become polluted with agrochemicals or other pollutants from the surrounding land uses, or are in other ways degraded.

Consequences:

Insect population decline affects ecosystems, other animal populations, and humanity. Insects are at "the structural and functional base of many of the world's ecosystems." A 2019 global review warned that, if not mitigated by decisive action, the decline would have a catastrophic impact on the planet's ecosystems. Birds and larger mammals that eat insects can be directly affected by the decline. Declining insect populations can reduce the ecosystem services provided by beneficial bugs, such as pollination of agricultural crops, and biological waste elimination.

It’s hard to imagine the world without insects. Many insects are so small that we don’t always appreciate all the jobs they do for nearly all living things. But with insects making up 80 percent of all species on Earth, wiping out the insect population would have a huge effect on the web of life.

To be more concrete, the decline in insects will affect on the next facts:
1. Animals that mainly eat insects, such as birds and frogs, would die from lack of food, and later on, the animals that eat those birds and frogs would also die of hunger. Eventually, animals at the top of the food chain, including bears, leopards, and humans, would face extinction, too.

2. Flowering plants, including trees and many crops that humans grow for food, including tomatoes and apples, could possibly die without insects to pollinate them.

3. All plants would lack the nutrients they need to grow, and could possibly die, without insects doing the work of breaking down dead animals and other plants that fertilize the soil.

4. Plant roots would lack the underground air they need, and could possibly die, without insects burrowing into the soil and creating air spaces in it.

**Key events:**

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<td>Krefeld study</td>
<td>In 2013 the Krefeld Entomological Society reported a &quot;huge reduction in the biomass of insects&quot; caught in malaise traps in 63 nature reserves in Germany. A reanalysis published in 2017 suggested that, in 1989–2016, there had been a &quot;seasonal decline of 76%, and mid-summer decline of 82%, in flying insect biomass over the 27 years of study&quot;. The decline was &quot;apparent regardless of habitat type&quot; and</td>
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could not be explained by "changes in weather, land use, and habitat characteristics".

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<th>Netherlands and Switzerland</th>
<th>In 2019 a study by Statistics Netherlands and the Vlinderstichting (Dutch Butterfly Conservation) of butterfly numbers in the Netherlands from 1890 to 2017 reported an estimated decline of 84 percent. When analysed by type of habitat, the trend was found to have stabilised in grassland and woodland in recent decades but the decline continued in heathland. The decline was attributed to changes in land use due to more efficient farming methods, which has caused a decline in weeds.</th>
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<td>Decline in studies</td>
<td>At the 2019 Entomology Congress, leading entomologist Jürgen Gross said that entomologists themselves were an endangered species as in the universities they had lost nearly all experts. General biology courses in college give less attention to insects, and the number of biologists specialising in entomology is decreasing as specialties such as genetics expand. In addition, studies investigating the decline tend to be done by collecting insects and killing them in traps, which poses an ethical problem for conservationists.</td>
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**Previous attempts to solve the issue:**

**German government’s Action Programme for Insect Protection**

In 2018 the German government initiated an "Action Programme for Insect Protection" With its Action Programme for Insect Protection, the German government was aiming to improve the living conditions of insects and enhance biological diversity in Germany in order to tackle insect decline. The action programme was created to swift implementation of specific measures to achieve a trend reversal.

The Action Programme for Insect Protection will aim to improve the conservation and restoration of insect habitats, in terms of both quality and quantity, and to tackle problems where insects are directly harmed. This will be done by supporting insect habitats and structural diversity in the
agricultural landscape, by reducing the use of pesticides and most importantly, by promoting civic commitment as the commitment of a wide range of stakeholders is essential to halting insect decline.

Entomologists

In 2019 a group of 27 British entomologists and ecologists wrote an open letter calling on the research establishment in the UK "to enable intensive investigation of the real threat of ecological disruption caused by insect declines without delay" with regards to their position as scientists.

While headlines implying that imminent extinction are exaggerated, entomologists and ecologists think there is good evidence that insects are declining, and the ecological consequences may be serious. Insects massively outrank all other animals in diversity, numbers and biomass. Since insects underpin most non-marine food networks, serious declines would threaten the stability of wild nature, leading to reductions in numbers of insectivorous animals and those that eat them. The loss of pollinators would also adversely affect agriculture, since many crops depend on insects to set seed.

Europeans commission

The EU has already in place a range of measures to help pollinators, in particular under environment and health policies as well as under the Common Agricultural Policy, cohesion policy and research and innovation policy.

Now they are taking action again and the initiative is part of the EU efforts to halt the loss of biodiversity and degradation of ecosystem services by 2020 and contribute towards commitments made under the UN Sustainable Development Goals.

The objectives of the EU Pollinators Initiative set a long-term perspective towards 2030, with a number of short term actions to be implemented until 2020. The commission is proposing measures to improve knowledge of pollinator decline, including the causes and consequences. Moreover, it looks for measures to tackle the causes of the decline, such as action plans for the habitats of the most threatened pollinating insects and identifying conservation and management approaches to help Member States. And last but not least, to raise awareness, engage citizens and promote collaboration. By the end of 2020, the Commission will review the progress on the implementation and, if necessary, propose further action.

Possible solutions:

- Improving protected areas for insect habitats because insect numbers and diversity are also in major decline in protected areas.
- Reduce the use of pesticides
● Intensify research and strengthen knowledge. Research on insects and their decline needs to be intensified to close existing gaps in knowledge. Linking and harmonising data will be crucial for effective monitoring. Additionally, taxonomy training and teaching of expertise on species at universities, schools and in volunteer capacities should be improved.

● Reduce inputs of nutrients and pollutants in soil and water because excessively high inputs of nutrients, especially nitrogen, from agriculture, transport and the energy sector reduce the diversity and quality of habitats and eliminate important food plants for insects.

● Improve financing and create incentives. There should be greater reward for actions by the agricultural sector to protect the environment, climate, biodiversity and natural resources. Furthermore, national funds for insect protection will increase.

● Reduce light pollution as nocturnal insects are drawn to artificial lighting and are then either killed by the light source itself or fall prey to predators.

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