

COMMENTARY

Pollinators and environment

JO-ANNE NINA SEWLAL

BSc., MPhil., FLS., AMSB.
Dept of Life Sciences, University
of the West Indies



TO THE many people who suffer from hay fever (referred to as "sinus" in this country), pollen is not appreciated.

However, pollen is very important to the existence of our environment, as they contain the genetic material of plants. The transfer of pollen from plant to plant is called pollination and is the method plants use to reproduce. Pollination has taken place for thousands of years so why the big deal about it? Well plants are stationary organisms so in order to exchange genetic material especially with other plants of the same species at great distances away; some species enlist the help of a "middle-man", an organism that will transfer the pollen for them.

However, there is a global decline of pollinators which may spell disaster to the existence of certain crops we depend on for food and ecosystems on a whole. In this article I will look more in depth at the importance of plants and in turn pollinators, reasons for pollinator decline and what measures can be taken to remedy this.

First of all plants capture the energy needed to run our ecosystems from the sun which is incorporated into their tissues via photosynthesis. This energy

is passed along to animals which consume plants. This energy is transported further along the food web by carnivores which eat these herbivores and other carnivores. Therefore this entire process is driven by the process of pollination.

Just to give you an idea of how important pollinators are to the existence of plants, in 2000, CNN reported that one-third of all the fruits and vegetables the global population use as feed would not exist without animal pollinators. Some animal pollinators that plants depend on include bees, butterflies and some species of wasps. These tiny animals in their search for nectar in the flowers rub against the stamens thus transferring pollen on themselves, then transferred to other flowers that they visit.

There are many reasons for the worldwide decline of pollinators; one reason may be the misuse of pesticides. Some farmers spray their crops when they are in bloom although this practise is against the application instructions.

Also this pesticide is allowed to drift over to other plants in the area like weeds which may also be in bloom.

The same principle when applied to your lawn, if general pesticides are used will kill not only the pests but pollinators as well. In lawns, certain plants like dandelions are seen as weeds, but these act as havens for pollinators acting as shelters

for pollinators and provide food for the pollinators while the crops are germinating and growing before they bloom.

Globalisation has also sped up the transfer of diseases and parasites, for instance, imported fire ants have destroyed ground nesting bees in large areas in Southern USA. Another example is the Varroa mite (*Varroa* spp.) which attaches to honeybees and suck their blood.

Destruction of habitat is another cause for the decline in pollinators. When it comes to agriculture, the removal of hedges makes the area look neater but what is actually being done is the removal of valuable vegetation that the pollinators use for food and shelter. Removal of vegetation for urbanisation also moves pollinator habitats. Replacing one type of vegetation with another may sound like a good way to keep pollinators around but not all vegetation is suitable habitat for pollinators.

For example, when mixed forests which are replaced with pine forest, pollinator numbers decline because the hollow trees that wild bees use to nest are removed along with the hardwoods whose blooms, the pollinators depend on for food.

Some destruction of habitat is wilful such as the removal of hives around homes and properties; however this is done in the interest of the safety of the homeowner and their family. However, there have been reports by beekeepers of their

hives being destroyed. These malicious acts have been attributed to the fear of "killer bees".

Pollution is also thought to have a serious effect on the existence of pollinators.

For instance chemicals that cause air pollution like those found in vehicular exhaust emissions bond with the scent molecules from flowers, thereby interfering with the pollinators' ability to find the flower. Another form of pollution is light pollution which affects the navigation ability of nocturnal species of animals like moths which are needed by night blooming flowers.

Some pollinators like bees can be threatened by other bee species which are invasive in nature therefore they are better competitors. So if they eliminate the population of native species in that area, the plants that depend on the native species for pollination might also cease to exist as their main form of pollination has ceased.

Some pollinators are migratory by nature, for example, Monarch butterflies, as well as some species of hummingbirds and bats. In order to get to the crop or plant of interest to humans and pollinate it, the pollinator species has to travel in some cases great distances. Therefore along the way it needs to feed and the plants that it feeds on along the way form what can be referred to as a nectar corridor.

These animals rely on these

corridors for food while the crop is growing.

In terms of reducing the pollinator decline, conservation methods like the establishment of wildlife preserves, and the use of many species in landscaping rather than having lawns with one grass species. Restoring habitats used for permanently or as nectar corridors may also prove to be helpful.

There has also been talk of using alternative pollinator species. However, what we have to remember is that pollinators can either be generalists or specialists, so that some plants depend on only one species of animal to pollinate them. It is hoped that over time they will attract an alternative pollinator species in response to dwindling numbers of their preferred species but only time will tell if this is true. The problem with generalist pollinators is that they may pollinate every other plant except the one of importance, for instance all the weeds get pollinated and not the crop plant.

The global decline of pollinators should serve to alert us to the importance of how plants and animals interact in order for our environment to exist. There are many reasons for pollinator decline ranging from habitat destruction, pesticide misuse and invasive species.

However, only time will tell if remedial methods like conservation and restoration prove to be effective.