

Pollinators! not just bees!

Pollinators come in all species, sizes, shapes and shades

Where in the world does your food come from?

Do you eat fruits? vegetables? nuts? seeds? grains? Where do you get them? Usually Mom or Dad go to the market and purchase fresh vegetables and fruits. They bring them home, wash them and cook them for you. Where do these healthy foods come from in the beginning though? They come from farms, kitchen gardens, greenhouses, agriculture ... all over, but how do they materialize?

Veggie babies

In a way, these fruits and vegetables are just like babies being born... it is a natural process, for foodstuffs, called Pollination. It is said that 75% of these foods depend on pollination from animals, and some fruit crops totally rely on it. If there were no pollinating animals and plants, human beings would have to go around sifting pollen on plants.

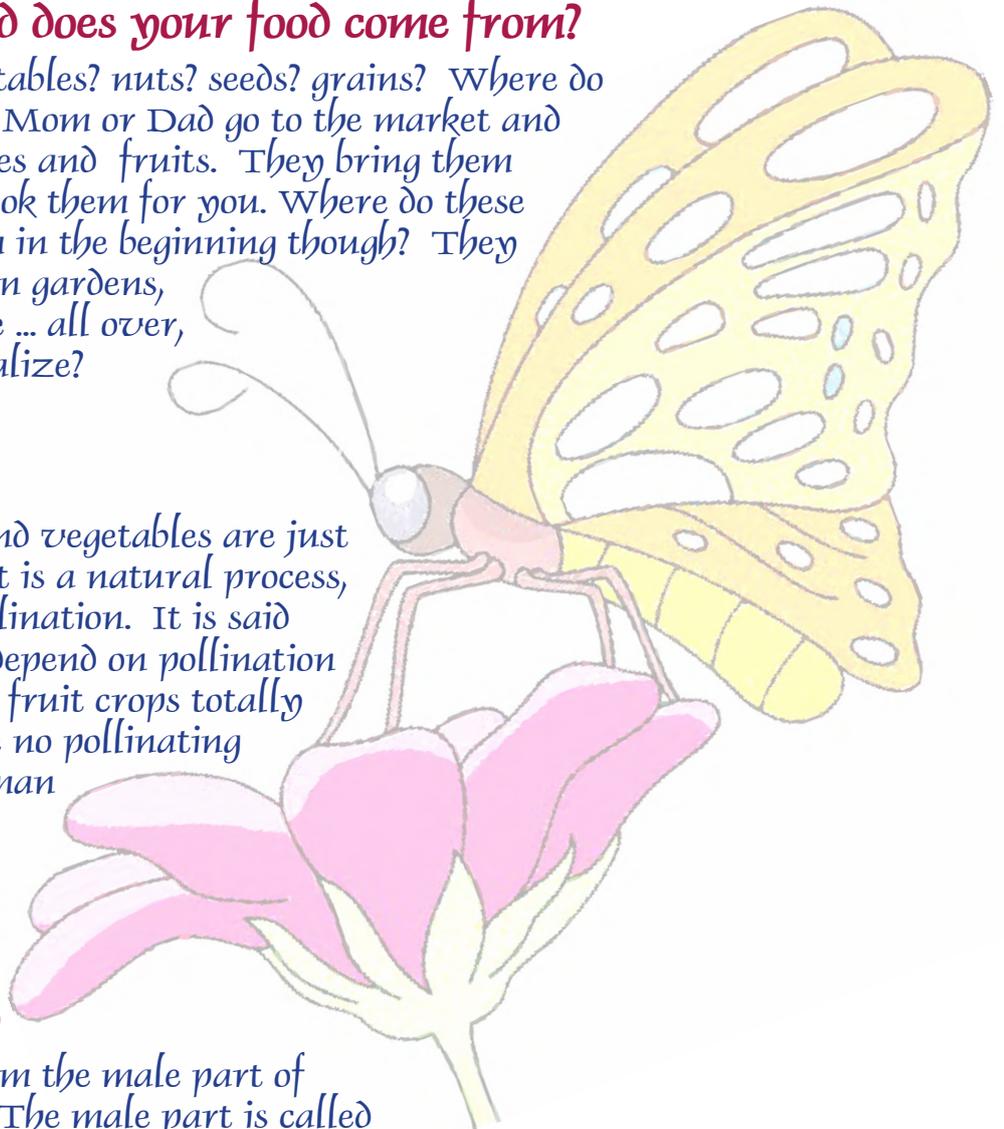
Pollination is sexy

Pollen is transferred from the male part of the plant to the female. The male part is called "anther" and the female part is called "stigma".

Like sex is for human beings and animals to have babies, pollination is for plants. It is an essential ecological function. Human beings and the earth's terrestrial ecosystems could not be sustained without sex and pollination.

Secret bond between plants and pollinators

There are two kinds of pollination: one is wind and water-borne and in the other, pollen is carried and spread by animals. The plants and the pollinators have a secret bond -- they are partners. Neither can survive without the other.



Pollination is important

Pollination is so important -- the quality of a plant depends on how well pollinated it is ... it will produce fruits with more seeds and the seeds will have a better ability to germinate and this produces bigger and more beautiful fruits. Human beings also depend on pollination for their well being, through farming. We get our life's energy from the fruits and veggies that come off the farm. In turn these foods require successful pollination for a harvested crop.



Pollinators: what would we do without you!

Animals are our hero pollinators. About 30% of animals in the wild are our pollinator helpers which include both vertebrates (have a backbone) and invertebrates (no backbone). Some animals visit all flowers while others specialize.

Invertebrate pollinators

By estimation, over 40,000 invertebrate species are pollinators in the service of man, animal and plant. The majority of invertebrate pollinators are bees, butterflies, moths, flies, wasps, beetles, and spiders. Later in this booklet more will be told about these interesting insects.

Vertebrate pollinators

As many as 1500 species of vertebrates are pollinators, including birds, mammals such as bats, non-flying mammals like monkeys, rodents, reptiles, and squirrels. Pollinators affect over one third of crop production in the world. They help increase the amount of crops and also medicines made from plants.

What percentage pollinates what ?

Much of the world's cultivated crops (such as cashews, squash, mangoes, berries) are pollinated by bees, e.g. 73%! Also 19% by flies, 6.5% by bats, 5% by wasps, 5% by beetles, 4% by birds, and 4% by butterflies and moths.

Some major invertebrate pollinators

- Moths ... are nocturnal, e.g., active during twilight or nighttime, seeking nectar from flowers and transferring pollen among flowers. Nocturnal flowers get heavy with large amounts of diluted nectar that attract insects.

Fantastic Facts

Pollinators need a healthy environment for themselves to sustain healthy ecosystems for us all

Thus good pollination services depend on an abundance and diversity of pollinators. Also pollinators need food, shelter, water, etc. for their healthy survival. They are more likely to get these things from the natural environment IF it is not disturbed. Pollinators play an important role in maintaining the balance and biodiversity necessary for a healthy ecosystem. There has been a global decline in biodiversity due to habitat loss, introduced species, pollution, population growth, and the overuse of resources.

The bad news - Pollinator decline

Pollinator declines or disrupted pollination systems have been reported on every continent. Hundreds of pollinator species, primarily vertebrates, are on the verge of extinction.

Potential consequences of pollinator decline

Crop harvest reduction has been reported due to pollinator scarcity combined with other factors. Loss of pollinators from an area is not easily correctable. Better not to lose pollinators.

- Bees ... with 20K species in the world, are efficient pollinators. Honey bees and bumble bees are most commonly seen. If bees are absent in a season, farmers can lose up to 75% of their crop.
- Beetles ... Beetle-pollinated flowers are very fragrant, large, and bowl-shaped. The shape makes it easier for the clumsy-flying beetles to land inside the flower and eat their way through petals.
- Flies ... Flies, with one set of wings, are the first pollinators of early flowering plants. Flies visit flowers for food in the form of nectar, sometimes pollen and to lay eggs.
- Wasps ... Fig wasps are small in size. They have evolved with fig plants which partnership was so successful that now there are over 900 species of fig plants, each with its own species of wasp.
- Butterflies ... Highly perched on long thin legs, butterflies are not efficient pollinators. Unlike bees that can hover while feeding, butterflies need a place to land because they cannot feed while flying.



Things you can do to help pollinators:

- Dispose garbage properly. Some pollinators are lured by sugar-coated food or garbage containing sugars, when they are needed to collect nectar and spread pollen on plants.
- You kids can learn about nature while creating a garden with plants that attract and feed pollinators. You will also get a chance to observe the pollinators that visit the flowers.
- Observe friends/family outdoors to see if they are driving away or killing pollinating insects or mammals. Explain that they are useful to man so they should not harm them.
- Create pollinator habitats. Grow native plants that provide nectar for pollinators.
- Be careful using pesticides. If you MUST use them, follow directions carefully. The way you apply and dispose of a pesticide can make a big difference for pollinators.
- Purchase organic produce, local honey, native plants, local fruits and fibers when possible to reduce environmental impact.

Some Major Vertebrate pollinators

Vertebrates are animals with backbones. Biologists claim 1500 vertebrate species act as pollinators globally. Many of them (82 mammals and 103 birds) are threatened with extinction (IUCN).

Flying mammal pollinators - Bats

Seven species of fruit-eating bats in India are pollinators. Pollen grains left after bats lap nectar transfer to flowers. Flowering for bat-pollinated trees matches bat breeding season providing food.

Non-flying mammal pollinators - Rodents, Shrews, Primates

Many non-flying mammals feed on nectarous flowers. A Diversity of non-flying mammals visit the flowers of trees and shrubs, but their relative roles in effective pollination are not well understood.



Fantastic Facts

- Learn more about pollinators in your area. Join nature loving friends and create small projects in plant-poor localities.
- Share your experience with your friends and neighbours and with Zoo Outreach Organisation so we can share with readers.

List of vertebrate (backbone) pollinators around the world

We generally presume that invertebrates such as bees and beetles are the only pollinators. Actually there are many (~1500) vertebrate species around the world that are pollinators, including India and other South Asian countries.

Some vertebrate pollinators around the world are:

Marsupials: Marsupial Mice -- Found in Australia and New Guinea
Bats: Flying foxes -- Found in South Asia, Australia, Philippines and many other countries
Lemurs: Brown Lemurs -- Found in Madagascar
Marmosets: Found in Brazil
Monkeys: Tamarins -- Found in Colombia
Rodents: Tree Squirrels -- Found in United States of America
Birds: Humming birds, United States of America
Reptiles: Geckos -- Found in New Zealand.

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Vertebrate pollinators - Birds

Bird pollination is more common than bat pollination in nearly 500 genera of plants. Pollination by both birds and bats total to about 3–11% of all flowering plants. In India 58 bird species pollinate 93 flowering plants.



Vertebrate pollinators - Reptiles

Reptiles are generally known as seed dispersers. Their role as pollinators is controversial since they consume reproductive parts of plants. Only a few reptiles have plant materials in their diet.



Human pollinators

In some countries bee keepers move their colonies (commercial pollinators) into the area that needs pollinating. Honey bees are used often because they form large but easy to transport colonies.

Nature is Best

Commercial pollinators spread disease resulting in the decline of wild pollinators. Disease-carrying commercial pollinators escape from greenhouses and interact with wild bees at flowers.