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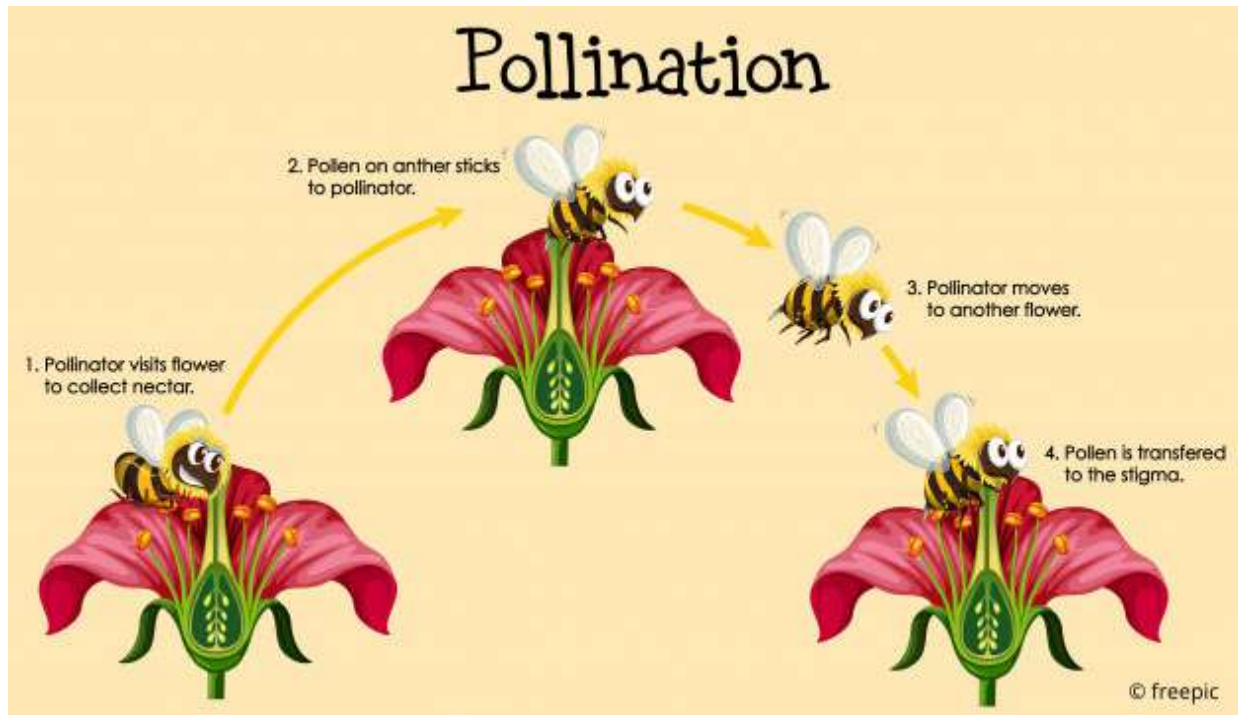
EARTH HERO



• Ecosystem • Forest • Animal • Environmental Issue • Actions



Other than insects, some species of bats are known as the main pollinator for species of economically important forest and fruit trees. Old World fruit bats, like cave nectar bats and large flying foxes, are known as the main pollinators of *Durio* species. Some of the bird species in Malaysia, like sunbirds, spectacle birds (*Zosteropidae*) and spider hunters (*Nectariniidae*) are known as pollinators too.



Other than their role as a pollinator, animals play a crucial role as a seed disperser, which is important for the survival of a plant species. When plants grow very close to each other, competition for light, water and nutrients from the soil will occur. Dispersing the seed will prevent the plant from competing with one another and allows it to spread to a new area. Dispersing agents such as the wind, water and animals disperse the trees' seeds in the tropics.

A study conducted in 1997 by Wunderle shows that seeds dispersal by animals is the key process in the dynamic of natural vegetation and forest succession on forest land. Various animals act as seed dispersers in the forest including birds, bats and mammals. Most of them are fruit-eating animals. There are three stages of seed dispersal by the animals. Firstly, pre-dispersal, where the animals select the fruits. Secondly, the dispersal phase, where the animals eat, transport, and throw out seeds during their foraging activities. Seeds then germinate and grow in the final stage, the post-dispersal phase.

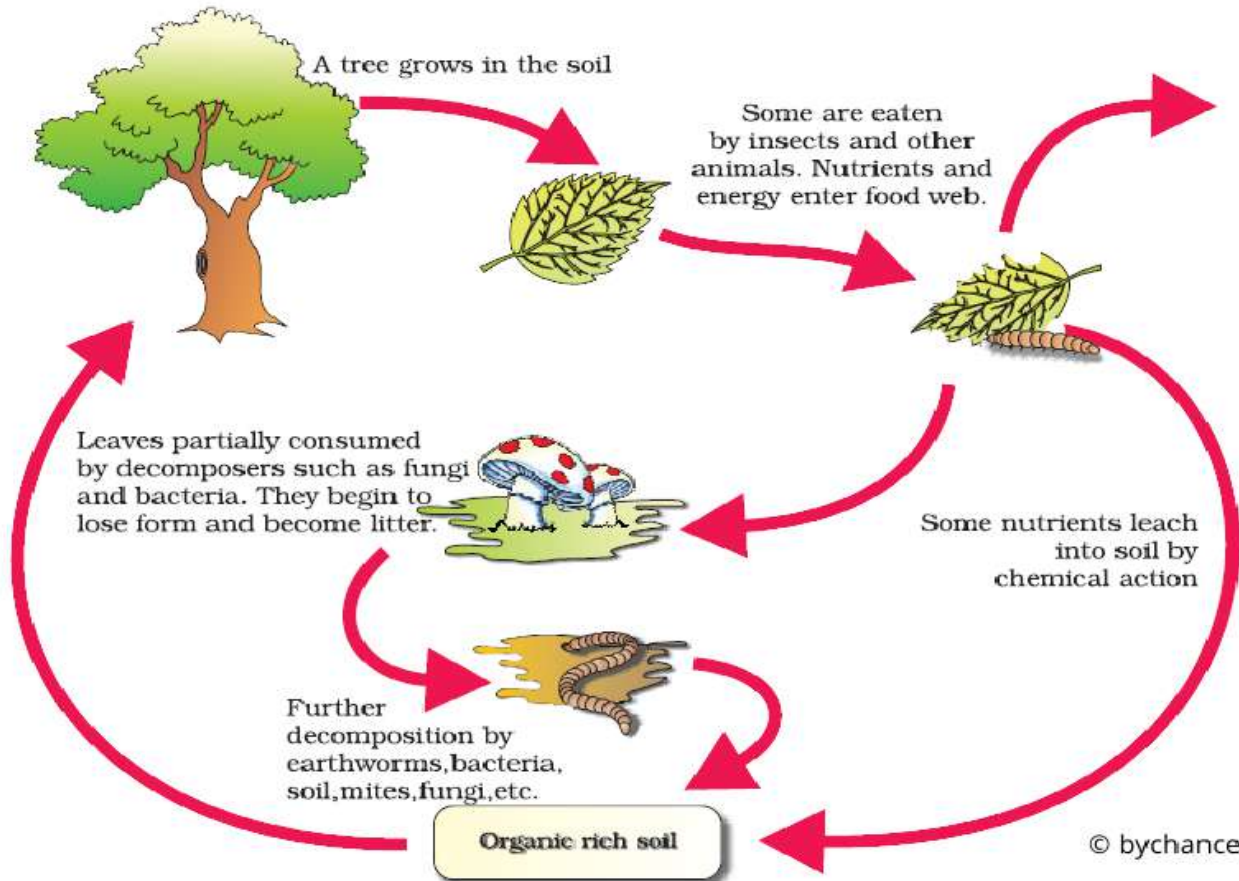
Bats are among the most common and significant seed dispersal agents in the tropical region. In Peninsular Malaysia, there are more than 50 plant species that depend on bats for pollination and seed dispersal (Yazid et al., 2019). A study on the pollen and seed dispersed by bats in Kenyir Forest Area, Terengganu by Yazid et al, shows that common short nosed fruit bat (*Cynopterus brachyotis*), larger dog-faced fruit bat (*C. horsefieldi*) and cave nectar bat (*E. spelaea*) were the fruit bats that act as seed dispersal agents for five different tree species of *Ficus* sp.

Large mammals, especially primates, are also very important seed dispersers in the forest. This role has been examined since the 1970s. Some primates are known to consume food from over 400 species of plants. The macaques, such as long-tailed macaque (*M. fascicularis*), have been known to be effective seed dispersers. Why are they a good seed disperser? This is due to their ability to eat many types of fruit of various colour, fruit size, seed size and presence or lack of seed protection. Macaques have a long gut retention time, long daily travels, and a huge home range which helps to increase the probability that they will disperse seeds far from the mother plant. Gibbons are another known seed disperser. They eat the ripe pulp of fruits, swallowing seeds of most species and excrete them whole, and often at great distances from the main tree. They also often revisit food sources, making them reliable as seed transporters.



It is undeniable that animals' roles in the forest ecosystem are crucial as they contribute to the carbon and nutrient cycle of the forest ecosystem. By physically disturbing the soil, particularly consuming plant matter, releasing carbon and nutrients through excretion, egestion and decomposition of animal bodies, they keep the nutrient cycle going. In this cycle, decomposition by soil organisms is an important part as it is the centre of the transformation and cycling of nutrients through the environment.

Decomposition can be defined as the process of breaking down dead organic substances into simpler organic or inorganic matter such as water, a simple sugar, carbon dioxide and mineral salts. With the help of decomposer animals such as earthworms, millipede, termite, beetle and snails, the nutrients released during the decomposition process will be used by plants to grow. Without this process, the nutrients taken by animals and plants would remain in their cells and there is no way to return the nutrients to the soil after they die. This will cause low nutrients and poor quality of soil for plant growth. In this part, soil organisms are crucial in helping the nutrient cycle balance.



Animals play a key role in nurturing the forest ecosystem. Imagine what would happen if there were no animals in the forest? Can our forests survive in the long term? All the components in the forest ecosystem are interconnected with each other. From the largest to the smallest animal, they all have important roles in balancing our forest ecosystem. We too have an important role which is to protect our animals, forest, and planet. We all are part of this ecosystem and are responsible for maintaining a healthy ecological balance of our Earth.