FIG: A KEYSTONE RESOURCE IN WESTERN GHATS

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Kerala is one of the smallest states of India, is a narrow strip of land with its own natural boundaries, hemmed by Western Ghats on the east. The climate is almost uniform with very little variations. The temperature ranges normally from 25^0-32^0C and drops to 21^0 C or less in highlands and very occasionally it goes up to zero level on the peaks of the Western Ghats. The South-West monsoon brings shower during June-September and North-East monsoon brings rain during the months of October and November. The humidity ranges between 40-90%. The altitude decreases west wards from the majestic heights of Western Ghats through modulating country side to the coastal area. About 41 rivers and a number of rivulets and streams criss-cross the state throughout.

Tropically Kerala is divided into lowlands, midlands and highlands. The lowland stretches along the coastal plains of western side. Its soil is mainly alluvial. The high land or upland is constituted by the Western Ghats ranges that stretch throughout the eastern side. It is marked by the rising peaks of about 2400 m or above, the steeply rising hills and its thick forests, high altitude resorts, plantations etc. The vegetation types can be included as tropical evergreen forests, shoals, tropical moist deciduous forests and grass lands.

Figure 4&2 : Fig trees with fruits

There are about 23 species of *Ficus* found in Kerala, including three species endemic to Western Ghats. Eight sections belonging to all subgenera are present in this region. Fig trees have a vital role in the wildlife by contributing a major share in the tropical forests as trees, stranglers, epiphytes, shrubs, bushes and vines and by serving as a main food source for various types of vertebrates such as birds, mammals and several invertebrates including insects. Very many varieties of animals and plants are depended on fig trees for their food and shelter. The common species of *Ficus* with their pollinator wasps are shown in Table 1.

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Table 1: The common species of Ficus with their pollinator wasps

Sl.No.	***Ficus* species**	**Pollinator wasp**
1	*Ficus hispida*	*Ceratosolen solmsi marchali*
2	*F. exasperata*	*Kradibia gestroi*
3	*F. drupacea*	*E. belgaumensis*
4	*F.racemosa*	*C. fusciceps*
5	*F. microcarpa*	*E. verticillata*
6	*F. benghalensis*	*E. masoni*
7	*F.amplissima*	*Maniella delhiensis*
8	*F.talboti*	*E. (Parapristina) keralensis*

FIG POLLINATION SYSTEM

Half of the 900 fig species belonging to the subgenus *Urostigma* are strangler figs. In tropical forests where strangler figs are most common have very dense canopies which allow only an occasional shaft of sunlight to illuminate the forest floor. In ecological point of view they are known as keystone resources. Their absence affects the survival of whole lot of other animal and plant species. The importance of *Ficus* plants to the ecosystem is due to their intimate relationship with their species specific, obligate pollinator wasps (Agaonidae, Chalcidoidea, Hymenoptera) as per the table cited. This is one of the best known plant-animal mutualisms. Fig wasps pollinate and lay eggs in the enclosed fig syconium. The pollinator's offspring subsequently feed on some of the developing seeds. In the monoecious figs, wasps and uneaten seeds mature together within the syconium. Several weeks later mating occurs within the syconium; the female wasp then collect pollen from newly mature anthers and departs in search of receptive, B phase fig in which to oviposit. Pollinators are known to be attracted to their host fig by a species specific volatile chemical signal that is emitted by the receptive syconium. The tiny adult fig wasps do not feed and they are short lived. Hence, there is a very brief period during which they must locate a syconium of the correct stage. So their life has clear consequences for the ecology and evolution of their interaction with figs.

RESOURCE UTILIZATION BY VERTEBRATE FAUNA

The dependence of frugivorous birds, bats and primates on ripe fig is well known. Several insects are major seed predators. Such interactions have a major impact on the distribution of these associates. Ripe figs generally make attractive fruit resource with their easy edibility and high nutrient value per fruit flesh and also contributed by dead wasp inside the figs. The frugivores are attracted to the brightly coloured figs. There are birds like green pigeon, barbets feeding figs even in green colour. The great pied hornbill, Malabar grey hornbill, small quaker babblers, parakeets, Malabar trogon and cuckoo-shrike are known fig eaters. The mammals like monkeys, deer, bears, wild pigs and mongoose and the some nocturnal creatures like fruit bats, flying squirrels and civets visit the fig trees. Once the fruiting season is complete, the frugivores satiated with the fig feast disperse the fig seeds through their droppings.

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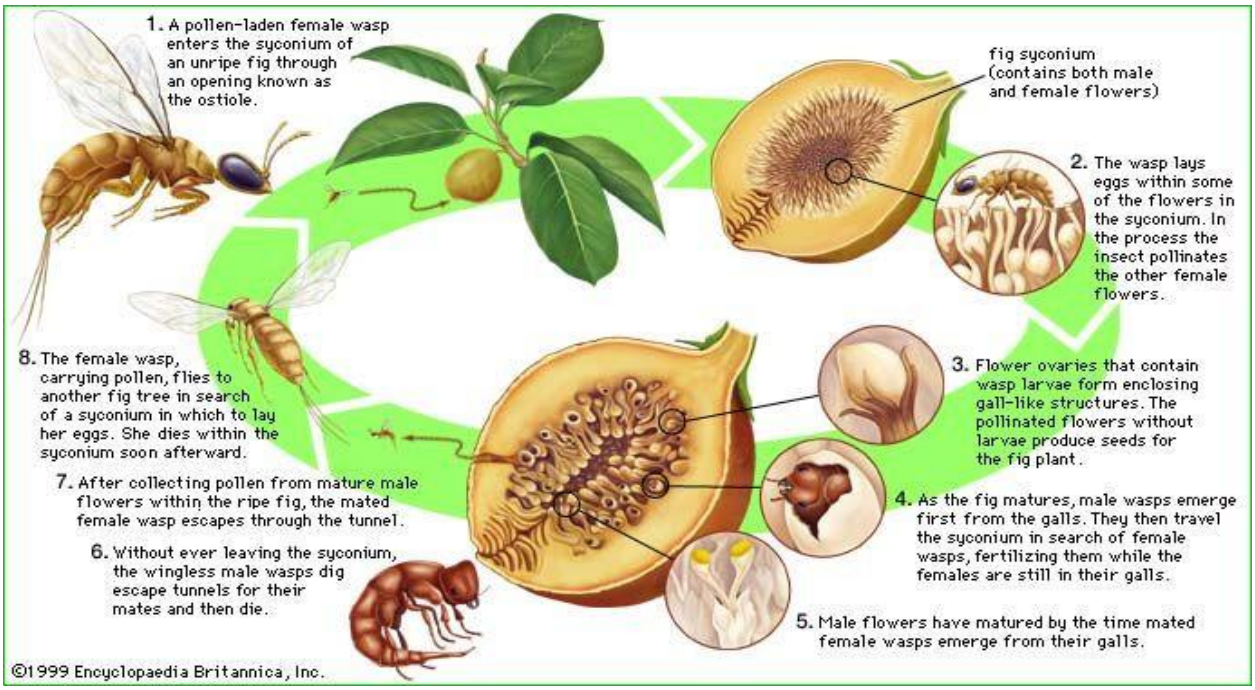

Figure 3: Schematic representation of fig pollination mechanism

Figure 4: Fig eating ants

Figure 5: Fig eating bird

Figure 6: Fig eating bat

Figure 7: Fig eating monkey

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CONCLUSION

The biology and pollination ethology of only some species of *Ficus* have been studied so far. The combined efforts of entomologists and botanists of different parts of the world will enable to explore phylogeny and co-evolution of different sections of the genus *Ficus* and associated species of fig wasps. The pollinator wasp population is maintained through asynchrony in flowering which will ensure the food supply for the frugivores when other fruiting trees are scare. So, the resource utilization by organisms and its implications has to be further evaluated.

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