

STUDY OF SPECIES DIVERSITY IN SACRED GROVE, MADAYIKKAVU, KANNUR, KERALA



By

JAIN JAMES

Roll No: 1928

NATURAL SCIENCE

PKM COLLEGE OF EDUCATION, MADAMPAM.

2019 – 2021 BATCH

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DECLARATION

I hereby declare that the project work entitled '**STUDY OF SPECIES DIVERSITY IN SACRED GROVE, MADAYIKKAVU, KANNUR, KERALA**' is an authentic record of the original project work done by me under the supervision and guidance of Mrs. Jomol Jose, Asst. Professor in Natural Science, P K M College of Education, Madampam for the partial fulfilment of the requirements for the degree of bachelor of education of the Kannur university.

Date:

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B Ed Natural Science, 1st semester

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INTRODUCTION

Sacred groves of India are forest fragments of varying sizes, which are communally protected, and which usually have a significant religious connotation for the protecting community. Hunting and logging are usually strictly prohibited within these patches. Other forms of forest usage like honey collection and deadwood collection are sometimes allowed on a sustainable basis. Sacred groves did not enjoy protection via federal legislation in India. Some NGOs work with local villagers to protect such groves. Traditionally, and in some cases even today, members of the community take turns to protect the grove. However, the introduction of the protected area category community reserves under the Wild Life (Protection) Amendment Act, 2002 has introduced legislation for providing government protection to community held lands, which could include sacred grove.

Madayikkavu is a hillock located near Pazhayangadi in Kannur district of Kerala. It is typical of the laterite foot hills of the Western Ghats. The region has a rich variety of plants, birds and butterflies. is rich in its bio-diversity. It is a home to nearly 300 types of flowering plants and about 30 varieties of grass which also include some unique and sparsely distributed endemic plants that are quite rare. It also has several rare medicinal herbs which are sought by people from near and far off places.

Flora includes rare species of numerous tiny orchids and plants, which takes life in different seasons. So, the entire land has different hues in varying season. The land is more beautiful around the month August- September when the monsoon leaves the Northern Kerala because flowers of different colors blooms creating a blue and white carpet all around the landscape.

This land has a great population of Butterflies nearly 70 species some specialists say may be more species yet to be seen. This is because numerous host plants for the butterflies are spread around the boundaries of this rocky terrain. I have seen Spotless yellow grass, Gaudy baron and all species of flashes, numerous species of blues including Guava blue, Red spot and other swallowtail species. The other attraction of this land is the variety of bird species depend this land for growing their chicks, laying eggs. There are smaller species as well as larger species of birds; most of them are migratory according to seasons. One can also find different species of Kingfishers on this land if one has such patience.

We can find tiny tiny frogs and Toads jumping all around in between grasses and rocks. There are many species to be discovered and many rare species of amphibians are found here. Hence there are also healthy snake species.

Around summer, dragonflies are of plenty and spread all around this land flying. There are two natural waterholes on this high rock terrain that supports all the species. The land accommodates a Temple which is centuries old and a Fort assumed to be built by Tipu sultan.

Now the land is under threat of Clay mining, Tourism projects, Irresponsible vehicle riding which can wipe out the entire species in future. It is more important to preserve this land for not tourism, but for the species that depend this land for living. It is better to notify this land as a "Nationally important flower sanctuary" by taking land from outer edges to preserve and to avoid man land conflict in future.

A preliminary study on abundance and diversity of insect fauna in Gulbarga District, Karnataka, India was conducted by Belamkar and Jadesh (2012). A total of 11,318 insects from 6 orders, 26 families and 54 species were recorded [2].

In an intensive study made by Quadros *et al.* (2009) in IIT Bombay campus, a total of 302 types of insect types important natural pest controllers. From 14 orders were recorded. On the basis of number of families recorded among the insect orders in the campus, the Lepidoptera was the most dominant [12]. Patel *et al.* (2015) in Jabalpur Community Forest Reserve, a total of 774 individual insects from 13 orders were recorded during the study [8].

Hymenoptera is one of the most diverse orders of insects, including over 115,000 described species representing 84 families. Hymenoptera are not only diverse in terms of structure, size, and numbers of species, but also in their habits and life histories. Some are phytophagous (plant feeding), while others are herbivorous, predatory, or even parasitic. Many Hymenoptera lead a solitary lifestyle, while some of the bees, ants, and wasps show some of the highest degrees of social organization of any animals. Lepidoptera are commonly known as 'butterflies' and 'moths'. The various publications on Butterflies and Moths of India have been published by Wynter-Blyth 1957 [16], Marshall and De Niceville 1882 [6], Mathew and Rahamathulla 1993 [7], Tiple *et al.* 2006 [10], Tiple *et al.* 2007 [11], Tiple 2012 [9].

METHODOLOGY

STUDY AREA

The area selected for present study is "Madayikkavu" located in Kannur district in Kerala. This area is well known for its rich diversity of plants. The aquatic and semi-aquatic plants form extensive carpets of blue, pink, white and yellow during the monsoon season. It is typical of the Laterite foothills of the Western Ghats. The area is notable for the presence of some of the rarest plants of the world such as *Nymphoides krishankesara*, *Rotala malabarica*, *Lindernia madayiparens*, *Eriocaulon madayiparens*, etc.

The midland hillocks of northern Kerala have its own characteristic floral composition supporting scrub jungles and cashew plantations on the hill slopes and grasslands and associated aquatic and semi-aquatic plants on the hilltops. Even though these hills are exposed directly to the sunlight and wind, they harbor rich species diversity. Recent plant explorations revealed more additions to the known plant species of the area some of which turned out to be new to science, and endemic to the locality. The vegetation of the hillocks may be classified mainly into grasslands and scrub jungles. The grasslands can again be categorized into wet phase and dry phase grasslands based on the seasons. More than 500 plant species have been recorded from Madayipara.

The vegetation of the hillocks may be classified mainly into grasslands and scrub jungles. The grasslands can again be categorized into wet phase and dry phase grasslands based on the seasons.

METHODS

The study was carried out for a period of 3 months from August 2019 to October 2019. The area was visited and photographs were taken at the spot itself. The specimens were identified with experts in entomology and botany. Further details were collected from standard literatures, websites and expert opinions.

RESULTS

Trilophidia annulata (Plate 1)

Kingdom:	Animalia
Phylum:	Arthropoda
Class:	Insecta
Order:	Orthoptera
Suborder:	Caelifera
Family:	Acrididae
Subfamily:	Oedipodinae
Tribe:	Trilophidiini
Genus:	<i>Trilophidia</i>
Species:	<i>T.annulata</i>

Body brown with black markings. Antennae slightly thickened. Pronotum rugosa, with a median carina, forming two teeth in front and with lateral carinae. Tegmina grey; wings yellow at the base, black beyond. Hind femora pale outside, spotted with brown. Hind tibiae brown with a pale band towards the base and with a slight pale band beyond the middle.

This species is mainly found on bare ground by the side of pond orkachcha road along with green grasses. This species may attack on Paddy and Cowpea. Adults and nymphs are found throughout the year. It has tri annual generation. The highest population is seen in the month of August and less in February. It occurs in almost all types of vegetation.

Diabolocatantops innotabilis (Plate 1)

Kingdom: Animalia

Phylum: Arthropoda

Class: Insecta

Order: Orthoptera

Suborder: Caelifera

Family: Acrididae

Tribe: Catantopini

Genus: *Diabolocatantops*

Species: *D. innotabilis*

Lateral lobe of pronotum without coloured pattern; external disc of hind femur without black median spot below upper carinula; male circus more up curved, with more broadened at apex and more projecting upper apical angle.

Body testaceous brown; antenna paler towards base, darker towards apex; tegmina mottled with brown, radial area with pale spots; wings hyaline; pale oblique band laterally on metathorax; hind femur with two oblique black bands above, which extends to medial area internally; in addition there are one black spot at base and another at apex on inner side; lower part of outer medial area of hind femur yellowish, 3 or 4 black spots apically on lower carina; hind tibia red with black tipped spines. | Head: Very short, mostly covered by oval eye; vertex between eye narrower than frontal ridge; a longitudinal depression centrally; antenna filiform; fastigium horizontal with a depression in center foveolae obsolete; frontal ridge parallel sided, impressed in middle, starting from median ocellus to clypeus, faintly punctured; lateral carinae arising from inner margin of eye, almost straight.

Chrotogonus oxypterus (Plate 1)

Kingdom:Animalia

Class:Insecta

Order:Orthoptera

Superfamily:Pyrgomorphoidea

Family:Pyrgomorphidae

Genus:*Chrotogonus*

Species:*Chrotogonus oxypterus*

Colour: Brown, pale, ventrally with black spots on thorax and metasoma; antennae darker towards tip; tegmen uniform brown wings black hyaline; external carinae of hind femur with black spots; hind tibial spines black tipped.| Head: Subconical; fastigium concave; carinulae straight, converging anteriorly meeting at right angles, behind continuing as a border to eyes; medium carina extending till pronotum; fastigial foveolae prominent, rectangular, narrow; eyes large, protruding; antenna filiform with dorsal, basal, longitudinal groove; vertex with granules; frontal ridge raised high above median ocellus, almost flat below it, sulcus narrow, carinae almost touching each other; lateral carinae arising from between eyes and antennal base, diverging towards clypeus.| Mesosoma: Pronotum with rugae and granules; median and lateral carinae marked only on metazona; metazona longer or as long as prozona, hind border obtusely angular with five lobe like markings; lateral lobes with concavity; pronotum with two complete sulci; prosternum forming a collar like extension hiding the lower mouth parts; mesosternal lobes separate, as wide as long, inner margin obtuse; metasternal lobes widely separate; tegmina shorter than metasoma and hind femur, reaching about half of the metasoma; ulnar vein with nodes; hind femur stout slightly longer than metasoma inner side concave; hind tibia without external apical spine, seven spines on external ridge.| Metasoma: Metasoma stout with median carina; supra-anal Plate short, triangular; cerci short, conical, stumpy; valves curved, pointed, toothed; subgenital Plate with an upcurve at posterior border.

Acrida exaltata (Plate 1)

Kingdom: Animalia

Phylum: Arthropoda

Class: Insecta

Order: Orthoptera

Suborder: Caelifera

Superfamily: Acridoidea

Family: Acrididae

Subfamily: Acridinae

Tribe: Acridini

Genus: *Acrida*

Species: *A. exaltata*

Colour: Perfectly green, below eye is a longitudinal yellow line till pronotum, bordered below by a black line; lateral carina of pronotum yellow bordered above by black line; sometimes tegmen with whitish streak a medial region, wings infuscated. Head: Long, conical sloping upwards; fastigium of vertex long extending well beyond eyes, wider than distance between eyes, slightly concave, apex roundedly truncate at extremity; fastigial foveolae absent; antenna ensiform, flattened at base, 3 sided, tapering towards tip, placed towards apex of head; eyes small; face strongly oblique; slightly concave; frontal ridge represented by carinae, compressed and slightly raised b/n antennae, almost joined at base of antennae gradually widening and becoming parallel, lateral carinae of face arising from base of antennae. Mesosoma: Pronotum compressed, hind margin acutely angular, well-marked median & lateral carinae present, media carina traversed by posterior sulcus, lateral carinae parallel in prozona, excurved in metazona; prozona compressed and metazona bulging, lateral lobes with longitudinal sulcus; mesosternal lobes separate with rounded inner margin; metasternal lobes separate; tegmina pointed at apex, finely reticulated; wings acutely pointed at apex; medial area dilated forming speculum traversed by 9 to 13 veinlets; legs slender; posterior femur long stick like; knee lobes acute (pointed); posterior tibia slender with 27 – 29 small spines on either carinae.

***Sphingonotus longipennis* (Plate 1)**

Kingdom:Animalia

Phylum:Arthropoda

Class: Insecta

Order:Orthoptera

Suborder:Caelifera

Family:Acrididae

Subfamily:Oedipodinae

Genus:*Sphingonotus*

Speccies:*S.longipennis*

Body medium size; wings bluish in the middle, followed by a broad black band, curving from the middle of the coasta to above the anal angle; hind femora blue; inner surface black with a pale band before the tip, and with black bands above; hind tibiae alternately banded with blue and black. The species is seen on dry riverbeds covered with rocks and pebbles and in mountains with stones and rocks covered with small thorny bushes.

Epeus species (Plate 1)

Kingdom:Animalia

Phylum:Arthropoda

Class:Arachnida

Order:Araneae

Family:Salticidae

Subfamily:Plexippinae

Genus:*Epeus*

Females are 7–9 mm long, males 6–9 mm. They are long-legged with a long opisthosoma, and quite colorful. Males have a characteristic v-shaped crest of raised, long hairs on the head, resembling a mohawk.

E. gloriatus, described in 1985, has a pale orange carapace with a deep orange crest of hairs. The three rear eye pairs have black surrounds with white squamose hairs, the opisthosoma is pale yellow. The four frontal legs of the male are brown with yellowish tarsi at the end, the other four legs are light brown. The legs of the female are pale yellow with black tips. Members of this genus are distributed throughout southern Asia.

Oxyopes shweta (Plate 1)

Kingdom:	Animalia
Phylum:	Arthropoda
Subphylum:	Chelicerata
Class:	Arachnida
Order:	Araneae
Family:	Oxyopidae
Genus:	<i>Oxyopes</i>
Species:	<i>O. Shweta</i>

Oxyopid body length ranges from 3-25mm. Oxyopids are easily recognized by their high carapaces, distinctive eyes, numerous spines on their legs, and bright colors in some species. Some have cryptic coloration. The carapace is longer than wide, high and angular or rounded with a wide, flattened clypeus. The abdomen is usually oval shaped and tapers to a point. Oxyopids have eight eyes. *Oxyopes* can be identified by cephalothorax covered with white pubescence. Two distinct black longitudinal lines present, starting from below of anterior median eye up to above of chelicerae. Ocular region whitish in color. A narrow black line is present on either side of the cephalic portion of the cephalothorax. Abdomen elongated and tapered posteriorly. A white band extends longitudinally on the abdomen mid-dorsally. Legs are long, spiny and greenish-brown in color.

Cephalothorax high and rounded with the anterior part vertical and it then continues almost level for most of its length to a steep thoracic part. Eye pattern 2,2,2,2 with the very small anterior medians being over halfway up to the front of the face and the posterior medians just beyond the top of the front face. Posterior row of eyes strongly procurved and equidistant from each other. Ocular quadrangle longer than wide and limited by the posterior median eyes and the anterior lateral eyes. A thin black straight line starts from each of the anterior medians down the vertical face and continues down the center of the long pale chelicerae to the tip. Abdomen long and thin, rounded and widest at the front and then tapering all the way to the spinnerets.

Aculias species (Plate 1)

Kingdom:Animalia

Phylum:Arthropoda

Subphylum:Chelicerata

Class:Arachnida

Order:Araneae

Infraorder:Araneomorphae

Family:Araneidae

Genus:*Acuilas*

Species:*A. coccineus*

Acuilas coccineus is a species of spider in the family Araneidae, found from India and China to Indonesia (the Moluccas). In India particularly, it has been known by the synonym *Phonognatha vicitra* Sherriffs, 1928, but this is based on a misidentification. In India, it is found in woodlands and among shrubs. It is a small orb-weaver. The spider is distinguished by having a curled leaf at the center of its web, in which it shelters. The curled leaf also shelters eggs

The body length varies from 5mm up to 10mm. Their bodies are fat and oval shaped with long tapered legs. *Acuilas coccineus* is found from India and China to Indonesia (the Moluccas). Only a few observations in India are known to exist since W.R. Sherriffs in 1928. The spider is commonly found in open woodland and forest habitats.

***Hamadrus* spiders (Plate 1)**

Kingdom: Animalia
Phylum: Arthropoda
Subphylum: Chelicerata
Class: Arachnida
Order: Araneae
Family: Oxyopidae
Genus: *Lynx*

They are large spiders, 7-15 mm, females usually larger than males. The abdomen dorsally often has a species-specific geometric colour pattern. Species in this genus are distinguished by the carapace being lower, the head having straight sides sinuating to the thorax instead of regularly convex as in *Hamataliwa* and *Tapponia*. The head width is 25% less than carapace width and the carapace dorsally have a shallow saddle and is higher in front than behind.

The front and rear face are slightly sloping and the rear slope is shorter than front slope. in *Hamataliwa* the rear slope is longer than the front slope. The legs are relatively much longer than in *Hawatalima*, the 1st pair is longer than the 2nd which is longer than the 3rd which is longer than the 4th. The abdomen is 50-100% longer than the carapace and differently shaped from that in *Tapponia* and *Hamataliwa*. The epigyne is probably indistinguishable from that in *Hamataliwa* and *Tapponia*. in males by the shape of the embolus tip, the shape of conductor and embolus and the distal chitin bulge on the RTA, females by the size, shape and structure of the epigyne. At present this spider is known from Burma, Thailand, Malaysia, Borneo, Indonesia (Sumatra, Lombok), India and China.

***Hersilia* spider (Plate 1)**

Kingdom:Animalia

Phylum:Arthropoda

Subphylum:Chelicerata

Class: Arachnida

Order: Araneae

Infraorder:Araneomorphae

Family:Hersiliidae

Genus: *Hersilia*

Hersilia, also known as long-spinnered bark spiders and two-tailed spiders, is a genus of tree trunk spiders that was first described by Jean Victoire Audouin in 1826. Their nicknames are a reference to their greatly enlarged spinnerets. Males can grow up to 8 millimetres (0.31 in) long, and females can grow up to 10 millimetres (0.39 in). They are found in Africa, Asia, and Australasia, on tree trunks, in gardens, or in jungle fringes.

The Hersiliidae is a family of spiders noted for their elongated posterior lateral spinnerets which can be as long as the abdomen in long-spinnered bark spiders and less in rock living species. Hersiliids are small to medium (4.5-12.5mm body length) dorso-ventrally flattened spiders, especially the arboreal genera. They are cryptically coloured in variegated shades of cream, orange, green, brown, grey and black, features they share with the family Selenopidae. Both families are quick and difficult to capture as they disappear into the narrowest of crevices the carapace is oval with the 8 eyes situated in two recurved rows, on a raised hump or tubercle. The anterior median eyes are largest. The oval abdomen is wider posteriorly with the posterior lateral spinnerets extending out parallel to each other. The inner edge of these spinnerets is lined with silk-producing tubules (spine-like spigots) as opposed to the distally placed spigots of most spiders.

***Menemerus bivittatus* (Plate 2)**

Kingdom:Animalia

Phylum:Arthropoda

Subphylum:Chelicerata

Class: Arachnida

Order: Araneae

Infraorder:Araneomorphae

Family:Salticidae

Genus: Menemerus

Species:*M. bivittatus*

Menemerus bivittatus is a spider in the Salticidae family commonly known as the gray wall jumper. It is a pantropical species and is usually found on the walls of buildings or on tree trunks where it stalks its prey. Gray wall jumpers are dorso-ventrally flattened and are covered with short dense, grayish-white hairs. There are tufts of dark brown bristles near the large, forward-facing eyes. The spiders are about nine millimetres long, the male being slightly smaller than the female. The male has a blackish longitudinal dorsal stripe with a brownish-white stripe on either side of the abdomen. The carapace and chelicerae are also black and white and the legs have transverse bandings of the same colours. The female is generally paler and browner, with a larger carapace and abdomen. Her carapace is edged with two black bands and a thin white stripe and her abdomen is edged with broad black stripes on each side which unite at the posterior end. Her legs are banded but are paler than those of the male. Immature spiders resemble the female.

***Myrmarachne plataleoides* (Plate 2)**

Kingdom: Animalia

Phylum: Arthropoda

Subphylum: Chelicerata

Class: Arachnida

Order: Araneae

Infraorder: Araneomorphae

Family: Salticidae

Genus: *Myrmaplata*

Species: *M. plataleoides*

Myrmaplata plataleoides (syn.: *Myrmarachne plataleoides* also called the Kerengga ant-like jumper, is a jumping spider that mimics the Kerengga or weaver ant (*Oecophylla smaragdina*) in morphology and behavior. This species is found in India, Sri Lanka, China and many parts of Southeast Asia.

Commonly seen actively moving on small trees, bushy shrubs and on walls. Silk retreats are made on the under surface of leaves. They closely mimic red ants in their body structure.

Cephalothorax elongated, pale orange in color. Ocular region flattened. Eight eyes present, area surrounding eyes have black coloration. Chelicerae very long with swollen tips in males and of normal size and flattened in females. Fangs with curved tips. Pedicel is very distinct, slender and long. Abdomen elongated and pale orange in color.

Asemonea tenuipes (Plate 2)

Kingdom: Animalia

Phylum: Arthropoda

Subphylum: Chelicerata

Class: Arachnida

Order: Araneae

Infraorder: Araneomorphae

Family: Salticidae

Genus: *Asemonea*

Species: *A. tenuipes*

Asemonea tenuipes is a species of Salticidae (jumping spiders) which can be found on Andaman Islands and in such countries as Burma, India, Sri Lanka, and Thailand. It is commonly referred to as tailed jumper. Prefer habitats of slightly hilly areas. Seen generally under broad leaves of short heighted trees.

Cephalothorax elongate with elevated ocular region. Cephalothorax is black with a yellow band in the mid- dorsal area and orange colored ocular region in males. Females are uniformly cream colored. Eight eyes are arranged in four rows, anterior lateral eyes and posterior median eyes are present on distinct tubercles. Ocular area covered with yellow-white hairs. Abdomen of male is elongated, yellow colored with an orange patch and a white mark near the tip. Females have cream colored abdomen. Distinct tail like slender spinnerets present. Legs are long, slender, cream colored and covered with spines.

***Runcinia* species (Plate 2)**

Kingdom: Animalia

Phylum: Arthropoda

Class: Arachnida

Order: Araneae

Family: Thomisidae

Genus: *Runcinia*

These spiders live and hunt on bushes, flowers and grasses. They are yellowish and have a white band around the eyes. Males are darker than females and are a lot smaller. Cephalic region with prominent ocular tubercles, clothed with hairs and spines. Legs long and stout abdomen long, spined, narrower behind. Lateral sides with conspicuous muscular corrugation.

They are generally living in peat bogs, fens, and meadows, although it has also been known to inhabit urban areas. They usually mature to adulthood in the summer. They have short, broad bodies, which are covered in hair and spines. They have clear muscular corrugation on their sides, and, on small raised bumps on their heads, eight small eyes. Males are usually 2.5–3.5mm in length, females 4–6mm. They are predators, and eat various species of insects.

***Thelacantha* species (Plate 2)**

Kingdom:Animalia

Phylum:Arthropoda

Subphylum:Chelicerata

Class: Arachnida

Order: Araneae

Infraorder:Araneomorphae

Family:Araneidae

Genus: *Thelacantha*

This genus is represented with only one described species. Prominently white coloured pubescences on dark coloured abdomen make the spider attractive. Carapace of this genus is with cephalic region much elevated at the middle and sloping interiorly and posteriorly. Ocular quad wider behind than in front, median eyes usually equal in size. Abdomen large, sub quadrate, transversely oblong or narrowed laterally, impressed with large sigilla, provided with an anterior, a median and posterior spine on abdomen.

Females grow to about 6 to 10 millimetres (0.24 to 0.39 in) long, while males reach a size of 3 to 5 millimetres (0.12 to 0.20 in).[3] Females have six abdominal spines ending in distinct sharp points. Most have two large white spots on the upper surface of their abdomens, which are otherwise mottled with black, brown, and white patterns.

Anoplolepis gracilipes (Plate 2)

Kingdom: Animalia

Phylum: Arthropoda

Class: Insecta

Order: Hymenoptera

Family: Formicidae

Subfamily: Formicinae

Tribe: Plagiolepidini

Genus: *Anoplolepis*

Species: *A. gracilipes*

The yellow crazy ant (*Anoplolepis gracilipes*) is a species of ant, introduced accidentally to northern Australia and Christmas Island in the Indian Ocean, that has caused ecological damage in both locations and is now found in the northern suburbs of Brisbane. It is colloquially called "crazy" because of its erratic movements when disturbed. Its long legs and antennae make it one of the largest invasive ant species in the world. This is a "tramp ant", a species that easily becomes established and dominant in new habitat due to traits such as aggression toward other ant species, little aggression toward members of its own species, efficient recruitment, and large colony size. Also known as the long-legged ant or Maldivian ant, it is on a list of "one hundred of the world's worst invasive species" formulated by the International Union for Conservation of Nature (IUCN). It has invaded ecosystems from Hawaii to Seychelles, and formed super colonies on Christmas Island in the Indian Ocean.

It is typically small to medium-sized and range from 1-2mm, the ant, also known as the long-legged ant, is notable for its remarkably long legs and antennae. *A. gracilipes* workers are monomorphic, displaying no physical differentiation. It has a yellow-brownish body colour, and is weakly sclerotized. Workers have a long slender gracile body, with the gaster usually darker than the head and thorax. It may subdue or kill invertebrate prey or small vertebrates by spraying formic acid.

Camponotus compressus (Plate 2)

Kingdom: Animalia

Phylum: Arthropoda

Class: Insecta

Order: Hymenoptera

Family: Formicidae

Subfamily: Formicinae

Genus: *Camponotus*

Species: *C. compressus*

Camponotus compressus is a species of ant found in India and Southeast Asia. It is a frequent visitor to toilets as it consumes urea. It is one of the many species which tends plant-sap-sucking insects like aphids and tree hoppers. These ants stroke their antenna on the hind parts of these insects stimulating them to excrete a sugar rich liquid, called honeydew, which the ants consume. In return, they are known to protect the insects from predators like ladybugs.

It is commonly called as Black ant. *C. compressus* can be distinguished by the dull black color of the head and body, and by whitish or yellowish hairs on the abdomen. All castes of this species (including the major and minor workers, queens, and males) are black or blackish. Colonies' workers are not all the same size (polymorphism). The queens and the largest workers (also called super majors) are quite large and are some of the largest ants found on the North American continent. As with all ants, the antennae are elbowed. Workers usually have 12 antenna segments. Alates typically have yellowish wings. In their natural environment, Black ants nest in dead trees and other dead wood. This enhances decay, which has ecological benefits. However, the ant achieves pest status when a colony invades the wood of a house or other structure, damaging its structural integrity. Since they favour moist wood as a habitat, any condition that promotes moisture should be eliminated to prevent infestation. The easiest of these is keeping gutters clear so water does not run down the side of the structure or gain entry.

***Camponotus irritans* (Plate 2)**

Kingdom:Animalia

Phylum:Arthropoda

Class: Insecta

Order: Hymenoptera

Family:Formicidae

Subfamily:Formicinae

Tribe: Camponotini

Genus: *Camponotus*

Species: *C. irritans*

Camponotus is an extremely large and complex, globally distributed genus. At present, more than 1000 species and nearly 500 subspecies belonging to 45 subgenera are described (Bolton, 2012) and it could well be the largest ant genus of all. The enormous species richness, high levels of intraspecific and geographic variation and polymorphism render the taxonomy of *Camponotus* one of the most complex and difficult. Revisionary studies on *Camponotus* are generally confined to species groups and/or small geographical regions (e.g. Robertson & Zachariades, 1997; Snelling, 2006; McArthur, 2007; Shattuck & Janda, 2009). These ants live in a variety of habitats and microhabitats and the sheer size of the genus makes any characterisation of their biology challenging. Nests are built in the ground, in rotten branches or twigs, or rarely into living wood (Bolton, 1973a) and most species possess a highly generalistic diet.

***Componotus sericeus* (Plate 2)**

Kingdom:Animalia

Phylum:Arthropoda

Class: Insecta

Order: Hymenoptera

Family:Formicidae

Subfamily:Formicinae

Tribe: Camponotini

Genus: *Camponotus*

Species: *C. sericeus*

Workers are active throughout Rawdhat Khorim, Saudi Arabia, being abundant from March through October, with a major peak in June. Workers of *C. sericeus* occur on *Acacia* trees and on the giant milkweed *Calotropis procera* (Aiton) W. T. Aiton (Apocynaceae). Several workers have been observed foraging on *C. procera* plants and attending aphids (Sharaf et al., 2013).

Ionescu-Hirsch (2009) - This species can be recognized by the robust build (the major worker with very broad head and mesosoma), the coarse sculpture of the head and mesosoma, and by the gaster covered with thick, appressed, golden-mossy pubescence. The head of major workers is truncated posteriorly, with the anterior margin of the clypeus not extending beyond the anterior margin of the gena, broadly rounded and incised medially. The mesosoma has a distinct metanotal groove, the propodeal dorsum is broad and flat, margined laterally and posteriorly, with obtuse teeth.

***Carebara affinis* (Plate 2)**

Kingdom: Animalia

Phylum: Arthropoda

Class: Insecta

Order: Hymenoptera

Family: Formicidae

Subfamily: Myrmicinae

Tribe: Crematogastrini

Genus: *Carebara*

Species: *C. affinis*

Carebara affinis (*Pheidologeton affinis*) is mainly known for having the biggest size differences between the minor and the major workers. They are high aggressive ants which attack everything within their territorium. Pheidologeton need a high amount of nutrition. During the drier season their diet persists up to 50% of small seeds. Pheidologeton is very prone to mites so old food must always be taken out of the arena. The balance between humidity and ventilation is very fragile and should always be controlled to avoid mold and mites.

Development: mating flight: dry areas once a year, wetter areas every three month possible
Found as claustral but also budding and adoption are possible. Broodcycle: minors: egg to larvae 9 days, larvae to pupae 9 days, pupae to worker 10 days. Majors need a little bit longer with approx. 45 days of development.

colony size: monogyne 20. 000 to 30. 000, polygyne up to 50.000 workers. One fertilized queen with workers (see selection); brood (depending on the season and development).

***Strychnos nux- vomica* (Plate 3)**

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Eudicots

Clade: Asterids

Order: Gentianales

Family: Loganiaceae

Genus: *Strychnos*

Species: *S. nux-vomica*

Strychnos nux-vomica, the strychnine tree, also known as nux vomica, poison nut, semen strychnos, and quaker buttons, is a deciduous tree native to India and to southeast Asia. It is a medium-sized tree in the family Loganiaceae that grows in open habitats. Its leaves are ovate and 2–3.5 inches (5.1–8.9 cm) in size. The branches are irregular and are covered with a smooth ashen bark. The young shoots are a deep green colour with a shiny coat. The leaves have an opposite decussate arrangement. It is a major source of the highly poisonous, intensely bitter alkaloids strychnine and brucine derived from the seeds inside the tree's round, green to orange fruit *Strychnos nux-vomica* is a medium-sized tree with a short, thick trunk. The wood is dense, hard white, and close-grained.

Abrus precatorius (Plate 3)

Kingdom: Plantae

(unranked): Angiosperms

(unranked): Eudicots

(unranked): Rosids

Order: Fabales

Family: Fabaceae

Genus: *Abrus*

Species: *A. precatorius*

It is commonly known as jequirity bean or rosary pea, is a herbaceous flowering plant in the bean family Fabaceae. It is a slender, perennial climber with long, pinnate-leafleted leaves that twines around trees, shrubs, and hedges. The plant is best known for its seeds, which are used as beads and in percussion instruments, and which are toxic because of the presence of abrin. Ingestion of a single seed, well chewed, can be fatal to both adults and children. The plant is native to Asia and Australia. It has a tendency to become weedy and invasive where it has been introduced.

***Abutilon indicum* (Plate 3)**

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Eudicots

Clade: Rosids

Order: Malvales

Family: Malvaceae

Genus: *Abutilon*

Species: *A. indicum*

Abutilon indicum (Indian abutilon, Indian mallow) is a small shrub in the family Malvaceae, native to tropic and subtropical regions and sometimes cultivated as an ornamental. It is found in Tamil Nadu. This plant is often used as a medicinal plant and is considered invasive on certain tropical islands. Its roots and leaves are used for curing fever.

In traditional medicine, *A. indicum* various parts of the plant are used as a demulcent, aphrodisiac, laxative, diuretic, sedative, astringent, expectorant, tonic, anti-inflammatory, anthelmintic, and analgesic and to treat leprosy, ulcers, headaches, gonorrhea, and bladder infection. The whole plant is uprooted, dried and is powdered. In ancient days, maidens were made to consume a spoonful of this powder with a spoonful of honey, once in a day, for 6 months until the day of marriage, for safe and quick pregnancy. The plant is very much used in Siddha medicines. The root, bark, flowers, leaves and seeds are all used for medicinal purposes by Tamils. The leaves are used as adjunct to medicines used for pile complaints. The flowers are used to increase semen in men.

***Aegle marmelos* (Plate 3)**

Kingdom: Plantae

Clade: Angiosperms

Clade: Eudicots

Clade: Rosids

Order: Sapindales

Family: Rutaceae

Subfamily: Aurantioideae

Tribe: Aurantieae

Subtribe: Balsamocitrinae

Genus: *Aegle*

Aegle marmelos L., commonly known as bael also Bengal quince, golden apple, Japanese bitter orange, stone apple or wood apple, is a species of tree native to the Indian subcontinent and Southeast Asia. It is present in Sri Lanka, Thailand, and Malesia as a naturalized species. The tree is considered to be sacred by Hindus.

Bael is the only member of the monotypic genus *Aegle*. It is a deciduous shrub or small to medium-sized tree, up to 13 m tall with slender drooping branches and rather shabby crown. The flowers are 1.5 to 2 cm, pale green or yellowish, sweetly scented, bisexual, in short drooping unbranched clusters at the end of twigs and leaf axils. They usually appear with young leaves. The calyx is flat with 4(5) small teeth. The four or five petals of 6–8 mm overlap in the bud. Many stamens have short filaments and pale brown, short style anthers. The ovary is bright green with an inconspicuous disc.

The fruits of the plant can be eaten either fresh from trees or after being dried and produced into candy, toffee, pulp powder or nectar. If fresh, the juice is strained and sweetened to make a drink similar to lemonade. The leaves and small shoots are eaten as salad greens.

***Aerva lanata* (Plate 3)**

Kingdom: Plantae

Clade: Angiosperms

Clade: Eudicots

Clade: Core eudicots

Order: Caryophyllales

Family: Amaranthaceae

Subfamily: Amaranthoideae

Genus: *Aerva*

Species: *A. lanata*

It (mountain knotgrass) is a woody, prostrate or succulent, perennial herb in the family Amaranthaceae of the genus *Aerva*, native to Asia, Africa. It has been included as occurring in Australia by the US government, but it is not recognised as occurring in Australia by any Australian state herbarium. The plant sometimes flowers in the first year.

A. lanata is a common weed which grows wild everywhere in the plains of India. The root has a camphor-like aroma. The dried flowers which look like soft spikes, are sold under the commercial names Buikallan and Boor. It is one of the plants included in Dasapushpam, the ten sacred flowers of Kerala.

Mountain knotgrass is an annual with a branching, somewhat woody root system. The stems are mostly straggling and sprawling and spread widely, sometimes as much as 6 feet (1.8 m) in length. The often stalkless leaves are alternate, oval and 0.5 to 1.5 in (13 to 38 mm) long. They grow from whitish papery stipules with two lobes and red bases. The tiny clusters of two or three flowers grow in the leaf axils. The flowers are about 0.1 in (2.5 mm) long, pink, green or dull white. The flowers are normally self-pollinated. Flowering time is from May to October.

***Celosia argentea* (Plate 3)**

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Eudicots

Order: Caryophyllales

Family: Amaranthaceae

Genus: *Celosia*

Species: *C. argentea*

It was likely originally native to India, where it was saved from extinction in cultivation by the religious significance and superstitions attached to the variety by Indian, Burmese, and Chinese gardeners who planted it near temples. The name cockscomb is used as the flower looks like the head on a rooster (cock). The plants are hardy and resistant to most diseases, and grow equally well indoors or out, though the perfect place is one with no shade and a well-drained soil, as the plant is susceptible to fungal diseases.

The plant is mainly cultivated as an ornamental plant for its spectacular flowering and is highly appreciated by horticulturists for its originality because it has inflorescences in the form of wavy crest. The flowers can be cut and dried to make dry bouquets and are used frequently as ornamental plants indoors. Their leaves and flowers can be used as vegetables. They are often grown as foods in India, Western Africa, and South America.

Adenanthera pavonina (Plate 4)

Kingdom: Plantae

Clade: Angiosperms

Clade: Eudicots

Clade: Rosids

Order: Fabales

Family: Fabaceae

Genus: *Adenanthera*

Species: *A. pavonina*

Adenanthera pavonina is a perennial and non-climbing species of leguminous tree. Its uses include food and drink, traditional medicine, and timber.

This tree is useful for nitrogen fixation, and it is often cultivated for forage, as an ornamental garden plant or urban tree, and as a medicinal plant. For example, the young leaves can be cooked and eaten. The raw seeds are toxic, but may be eaten when cooked. The tree is fast-growing, with an attractive, spreading canopy that makes it suitable as a shade tree, and for ornamental purposes in large gardens or parks. However, it is also known for producing lots of litter in the form of leaves, twigs and especially seed pods which crack open while still on the branch, so releasing their seeds, before themselves falling to the ground.

Premna serratifolia (Plate 4)

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Eudicots

Clade: Asterids

Order: Lamiales

Family: Lamiaceae

Genus: *Premna*

Species: *P. serratifolia*

Premna serratifolia is a small tree in the family Lamiaceae. Its flowers and fruits between May and November. During flowering season, it attracts a large number of butterflies and bees. Synonyms of *Premna serratifolia* Linn. include *P. corymbosa* (Burm. f.) Merr., *P. integrifolia* L. and *P. obtusifolia* R. Br.).

Trees, to 7 m high. Leaves simple, opposite, estipulate; petiole 4–14 mm, slender, pubescent, grooved above; lamina, elliptic, elliptic-oblong, base acute, obtuse, subcordate or rounded, apex acuminate, mucronate, obtuse, margin entire or subserrate, glabrous above except along the appressed midrib, chartaceous; lateral nerves 3–5 pair, pinnate, prominent, puberulous beneath; intercostae reticulate, obscure. Flowers bisexual, greenish-white, in terminal corymbose paniced cymes; bracts small; calyx small campanulate, 5 lobed; corolla tube short, lobes 5; stamens 4, didynamous, inserted below the throat of the corolla tube; anther ovate; ovary superior, 2–4-celled, ovules 4; style linear; stigma shortly bifid. Fruit a drupe, seated on the calyx, globose, purple; seeds oblong.

***Wattakaka volubilis* (Plate 4)**

Kingdom: Plantae

Order: Gentianales

Family: Apocynaceae

Subfamily: Asclepiadoideae

Genus: *Dregea*

Species: *D. volubilis*

It is a stout, smooth, hoary, or mealy, woody vine. The leaves are ovate, or somewhat rounded, 7.5-15 centimeters long, 5-10 centimeters wide, rather leathery, rounded or pointed at the base, and pointed at the tip. Flower cymes are axillary or interpetiolar, and umbellike. The flowers are green or yellowish green, about 1 cm across, fragrant. The follicles long, turgid, longitudinally ribbed, and velvety until mature. The seeds are elliptic, concave, smooth, shining, sharp-edged, and crowned with very fine, white, silky hairs. Flowering: April-September.

The leaves are much employed as an application to boils and abscesses. The roots and tender stalks are considered emetic and expectorant. The young roots are cut and the exuding juice is inserted into the nose to cause sneezing.

Alternanthera tenella (Plate 4)

Kingdom: Plantae

Division: Magnoliophyta

Class: Magnoliopsida

Order: Caryophyllales

Family: Amaranthaceae

Genus: *Alternanthera*

Species: *Alternanthera sessilis*

Erect or ascending, bushy perennial herb (commonly cultivated as an annual), c. 5–45 cm. tall, stem and branches villous when young but soon glabrescent, older parts terete, younger bluntly quadrangular. Leaves narrowly or more broadly elliptical to oblanceolate or rhomboid-ovate, acute to acuminate at the apex, attenuate into a slender, indistinctly demarcated petiole below, thinly furnished with fine, whitish hairs to subglabrous, often reddish or purple suffused and not rarely variegated.

Heads axillary, sessile, usually solitary, globose to ovoid, 4–6 mm. in diam.; bracts pale, deltoid-ovate, c. 2 mm. long, glabrous, lacerate-margined, aristate with the excurrent midrib; bracteoles similar but slightly shorter. Tepals white, lanceolate to oblong-elliptic, 3.5–4 mm. long, acute, mucronate with the excurrent midrib; outer 2 prominently 3-nerved below and darker in the nerved area, with a line of whitish, minutely barbellate hairs on each side of this area, the hairs becoming denser towards the base of the tepal; inner 2 slightly shorter, narrower and less rigid, mostly 1–2-nerved; central tepal intermediate. Stamens 5, at anthesis much exceeding the ovary and style, the alternating pseudostaminodes subequalling the filaments plus anthers, narrowly oblong, lacinate at the apex. Ovary strongly compressed, obpyriform, 0.6 mm. long, style about the same length. Ripe fruit and seeds not seen.

Ampelocissus latifolia (Plate 4)

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Eudicots

Clade: Rosids

Order: Vitales

Family: Vitaceae

Genus: *Ampelocissus*

Species: *A. latifolia*

Scandent shrub; branches striate, nearly glabrous, hollow. Leaves simple, often 5-gonal, sometimes 3-5 lobed, usually deeply cordate at base, serrate at margin, acute to acuminate at apex, 10-25 x 10-24 cm, glabrous; nerves prominent beneath; petioles 5-15 cm long, deeply grooved in upper half. Inflorescences pyramidal-thyrsoïd; primary branch 1.5-5 cm long; thyrses 3-7 cm long; peduncles 5-10 cm long; tendrils branched, 10-15 cm long. Flowers reddish brown; pedicels ca 1 mm long, puberulous. Calyx saucer-like, entire and glabrous. Petals oblong, ca 1.5 x 0.8 mm, glabrous. Disc enclosing about half of ovary, 5-grooved. Berries globose, 7-9 mm, black when ripe, 2-4 seeded. Seeds elliptic-oblong in outline, 6-7 x 4-5 mm, with a longitudinal, broad ridge and a groove on either side on adaxial surface and an oblong-elliptic chalazal knot and prominent fissures radiating towards margin on abaxial surface.

Aristolochia indica (Plate 4)

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Magnolids

Order: Piperales

Family: Aristolochiaceae

Twining perennial herbs; branchlets slender. Leaves 3.5-8 x 2-3.5 cm, ovate-lanceolate or ovate-oblong, base truncate, apex acute to acuminate, glabrous; 3-5-nerved at base; petiole to 2.5 cm long. Flowers in few-flowered axillary racemes; pedicels c. 7 mm long, elongate in fruits. Bracts c. 1.5 mm long, lanceolate. Perianth tube dull brown, 1-1.5 cm long, bulbous base 3-5 mm across, green; limb 2-2.5 cm long, linear-oblong, rounded at apex, greyish-green. Stamens 6. Ovary c. 2 mm long; stigmas 6, fleshy. Capsule 1.5-3 x 1.5-2 cm, globose-pyriform, 6-ridged, dehiscing from the base, after dehiscence parachute-like. Seeds 4-6 mm across, broadly deltoid, flat, winged.

Polygala elongata (Plate 5)

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Eudicots

Clade: Rosids

Order: Fabales

Family: Polygalaceae

Tribe: Polygaleae

Genus: *Polygala*

Polygala elongata is a large species of flowering plants belonging to the family Polygalaceae. They are commonly known as milkworts or snakeroots. They are distributed widely throughout much of the world in temperate zones and the tropics. The genus name *Polygala* comes from the ancient Greek "much milk", as the plant was thought to increase milk yields in cattle.

Polygala elongata is a small annual herb, growing up to 15-40 cm tall. The roots often have a scent reminiscent of wintergreen. Alternately arranged leaves are stalkless, linear-oblong, 2-4 cm long, blunt-tipped with narrow point at the tip. The leaf blades are generally undivided and smooth-edged, and are alternately arranged in most species. The inflorescence is a raceme of several flowers. The flower is bilateral in shape, with two large petal-like sepals on the sides, often called the "wings", and three smaller sepals behind. There are three petals in shades of reddish purple, yellow or white, which are joined at the bases. The lower of the three is the keel petal, which is "boat-shaped, cucullate [hood-like], or helmet-shaped". The keel petal may have a beak or a fringe on the tip. Stamens and style are within the curve of the keel petal. The fruit is a capsule, sometimes winged. It contains two seeds, which are usually black, hairy and tipped with a large white aril. *Polygala* species are used as food plants by the larvae of some Lepidoptera species including large grizzled skipper.

Cajanus scarabaeoides (Plate 5)

Kingdom: Plantae

Clade: Angiosperms

Clade: Eudicots

Clade: Rosids

Order: Fabales

Family: Fabaceae

Genus: *Cajanus*

Species: *C. scarabaeoides*

Cajanus scarabaeoides is a very close wild relative species of *Cajanus cajan* (common name, pigeon pea). It is a dicot angiosperm of the family Fabaceae. *C. scarabaeoides* may be an annual or a perennial, making it a flexible crop for subsistence farmers. The branches of *C. scarabaeoides* can be straight or winding and up to 135 cm in length. *C. scarabaeoides* has pinnate leaves, typically arranged in a trifoliate manner with flowers that are yellow with red veins. The pods of *C. scarabaeoides* are oblong in shape, typically 11–34 mm in length and 6–10 mm in width. The seedpods are densely covered in a combination of short and long hairs and are typically a dark purple colour, containing anywhere from 1–7 seeds. The seeds of *C. scarabaeoides* range from 2.4–4 mm long, 1.8–3 mm wide, and 1–2 mm thick and are either black in colour or speckled. Compared to the pigeon pea cultivars, *C. scarabaeoides* has a higher pod seed percentage, 74% compared to 20%, and has more multiseed pods, on average 6.04 seeds compared to 3.0 seeds.

C. scarabaeoides occurs naturally in the wild, and can be found in open grassland and dry vegetation areas and in deciduous forests. It is often found along the ridges of cultivated fields, along roads or footpaths, or on hill slopes. In China, it is sometimes used as fodder, and has shown to be effective in reducing diarrhoea in cattle. In addition, the leaves of the plant species have been used to improve indigestion in traditional medicines as well as limit the excessive production of urine.

***Cleome viscosa* (Plate 5)**

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Eudicots

Clade: Rosids

Order: Brassicales

Family: Cleomaceae

Genus: *Cleome*

Species: *C. viscosa*

Cleome viscosa the Asian spider flower tick weed is an annual herb that grows up to a meter high. It belongs to the family Capparidaceae. It is commonly found in the rainy season.

The crushed leaves have been investigated as a treatment for stored seeds of cowpea, to prevent weevil infestation. The leaves are used as external application to wounds and ulcers. The seed are anthelmintic and carminative. The juice of the leaves is used as a remedy against discharge of pus from the ear.

In northern India, the seeds (called) Jakhya are used as a culinary herb, mainly for tempering. Plants (10–)30–100(–160) cm. Stems viscid. Leaves: petiole 1.5–4.5(–8) cm, glandular-hirsute; leaflet blade ovate to oblanceolate-elliptic, (0.6–)2–6 × 0.5–3.5 cm, margins entire and glandular-ciliate, apex acute to obtuse, surfaces glandular-hirsute. Racemes 5–10 cm (10–15 cm in fruit); bracts (often deciduous), trifoliate, 10–25 mm, glandular-hirsute. Pedicels 6–30 mm, glandular-hirsute. Flowers: sepals green, lanceolate, 5–10 × 0.8–1.2 mm, glandular-hirsute; petals arranged in adaxial semicircle before anthesis, radially arranged at anthesis, bright yellow, sometimes purple basally, oblong to ovate, 7–14 × 3–4 mm; stamens dimorphic, 4–10 adaxial ones much shorter with swelling proximal to anthers, green, 5–9 mm; anthers 1.4–3 mm; ovary 6–10 mm, densely glandular; style 1–1.2 mm.

***Commelina diffusa* (Plate 5)**

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Monocots

Clade: Commelinids

Order: Commelinales

Family: Commelinaceae

Genus: *Commelina*

Species: *C. diffusa*

Commelina diffusa, sometimes known as the climbing dayflower or spreading dayflower, is a pantropical herbaceous plant in the dayflower family. It has been introduced to the southeastern United States where it is most common in wet disturbed soils. There are two recognised varieties, one being the type and the other being *C. diffusa* var. *gigas*, which is native to Asia and has been introduced to Florida. It flowers from spring to fall and is most common in disturbed situations, moist places and forests. In China the plant is used medicinally as a febrifuge and a diuretic. A blue dye is also extracted from the flower for paints. In the Hawaiian Islands, it is known as "honohono grass", although it is technically not a grass. "Honohono" refers to the alternating structure of the leaves. At least one publication lists it as an edible plant in New Guinea.

Commelina diffusa is typically an annual herb, though it may be perennial in the tropics. It spreads diffusely, creeping along the ground, branching heavily and rooting at the nodes, obtaining stem lengths up to 1 metre. Pubescence on the stem is variable and ranges from glabrous to hispidulous, which can occur either in a line or throughout. The leaf blades are relatively variable, ranging from lanceolate to ovate,^[2] with proximal leaves tending to be more oblong. They measure 3 to 12 cm in length by 0.8 to 3 cm in width.

***Barleria courtallica* (Plate 5)**

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Eudicots

Clade: Asterids

Order: Lamiales

Family: Acanthaceae

Genus: *Barleria*

Species: *B. courtallica*

Yellow Throated Barleria is a prickly shrub with blue flowers with yellow throats, borne in glandular hairy tawny spikes. Flowers are borne in spike 3-10 cm long; bracts and bracteoles similar, 5 mm long, lanceshaped. Flowers are closely packed; outer sepals 18-20 x 6.5 mm, elliptic, tapering, velvet-hairy; inner sepals 15 mm long, linear, tapering, hairy; flower 4-5 cm long, tube and throat yellow or white; lobes 1.5 cm long, obovate, blue; filaments hairy at base. Leaves are 15-20 x 6-8 cm, elliptic, tip tapering, base narrowed, hairless, nerves 7-9 pairs; leaf-stalk 1-4 cm long. Capsule is 2.3 x 0.9 cm, elliptic, hairless; seeds 4, 5 x 5 mm, round, hairy, brown. Flowering: August-February.

***Bulbophyllum rosemarianum* (Plate 5)**

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Monocots

Order: Asparagales

Family: Orchidaceae

Subfamily: Epidendroideae

Tribe: Dendrobieae

Genus: *Bulbophyllum*

Species: *B. rosemarianum*

Epiphytic pseudobulbous herbs with creeping rhizomes; pseudo bulbs 1.7-3.5 x 1.1-1.6 cm, quadrangular, pale yellowish green, arranged distantly on a thick and wiry rhizome, rooted below and 1-leaved. Leaves 5-18 x 1.6-3.2 cm, erect, oblong, thick and fleshy, deeply channeled in the middle region, narrowed at the base, obtuse at apex; petiole short. Inflorescence from the base of pseudo bulb, pale green, longer than leaf with 5.5-9.2 cm long scape bearing 4 cup-like sterile bracts and a short raceme (4-5 cm) of pale yellow flowers. Dorsal sepal 4-5 x 3-3.5 mm, ovate-elliptic, truncate-angulate, 5-veined, acute at apex, joined only at the central part at base leaving side-margins free; lateral sepals 8-9 x 4-4.5 mm, ovate-elliptic or boat-shaped, 5-veined, margins folded inwards, lower edges slightly connate near base, attached to column-foot at sides, acute at apex. Petals 2-2.5 x 1.5-2 mm, broad-based, ovate-aristate, slightly oblique and erose at margins, gland-dotted and 1-veined. Lip 3-3.5 x 1.5-2 mm, thick, yellow with brown markings, papillose throughout except the median furrow region, 3-lobed; side lobes represented by 2 auricles, ovate-oblong, attached to tip of column by a short ligament. Column 2-3 mm long, thick with 2 erects sharply pointed steliidia that raise above operculum. Column-foot about 2 mm long bearing lateral sepals on sides and lip a little below the apex.

***Cissus latifolia* (Plate 5)**

Kingdom: Plantae

Phylum: Tracheophyta

Class: Magnoliopsida

Order: Vitales

Family: Vitaceae

Genus: *Cissus*

Species: *C. latifolia*

Large, climbing shrubs. Stem thick; branchlets glaucous; tendrils usually forked. Leaves 8-16 x 6-13 cm, broadly ovate-cordate or orbicular, margin serrate, serrations with bristly tip, acuminate at apex, glaucous below; petiole to 15 cm. Cymes leaf-opposed. Calyx cupular, c. 2 mm long, fringed on margins. Petals 4, greenish-white, c. 2.5 mm long, hooded at apex. Stamens 4. Disc 4-lobed, adnate to ovary, yellow. Ovary tomentose; style thick; stigma truncate. Berries c. 1 cm across, ovoid, purplish, 1-seeded.

***Calotropis gigantean* (Plate 5)**

Kingdom: Plantae

Division: Magnoliophyta

Class: Eudicots

Order: Gentianales

Family: Apocynaceae

Genus: *Calotropis*

Species: *C. gigantea*

Shrubs, stem rounded. Leaves 10-16 x 8-10 cm, smaller in branchlets; elliptic-ovate to obovate, apex acute or obtuse, base cordate; lateral nerves 5-7 pairs, adpressed pubescent when young, becoming glabrous on maturity. Flowers pale purple or greenish-white, 3 cm across; pedicels to 3 cm long, stout; calyx lobes to 3 mm long; corolla campanulate, tube short, lobes ovate to oblong, recurved; staminal corona of 5 vertical lobes, 1 cm long. Fruit saccate, to 6 x 3 cm, ovoid; seeds many.

PLATE 1



Trilophidia annulata



Diabolocatantops innotabilis



Chrotogonus oxypterus



Acrida exultata



Sphingotonus longipennis



Epeus species



Oxyopes swetha



Acusilas species



Hamadrus species



Hersilia species

PLATE 2



Menemerus bivittatus



Myrmachne plataleoides



Asemonia tenuipes



Runcinia species



Telecatha species



Anoplolepis gracilipes



Camponotus compressus



Camponotus irritans



Camponotus serices



Carebara affinis



Streptocarpus vomica



Abrus precatorius



Abutilon indicum



Aegle marmelos



Aerva lanata



Celosia argentea



Adenanthera pavonina



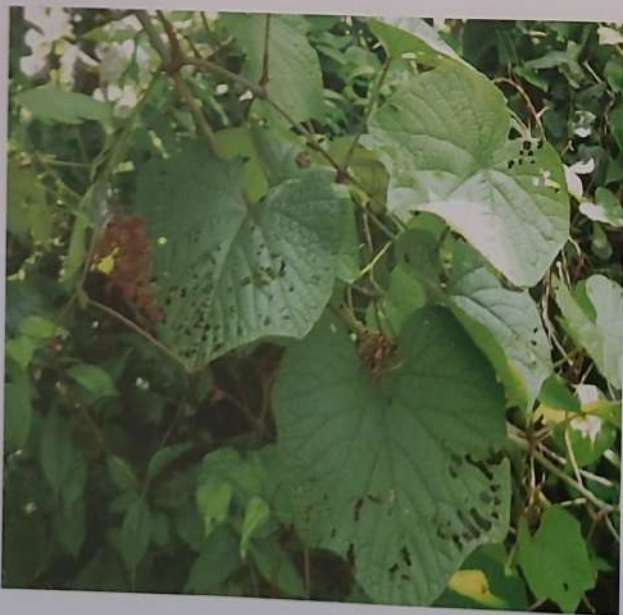
Premna serratifolia



Wattakaka volubilis



Altermanthera tenella



Ampelocissus latifolia



Arrstolochia indica



Polygala elongate



Cajanus scarabaeoides



Cleome viscosa



Commelina diffusa



Barleria courtallica



Bulbopyllum rosemarianum



Cissus latifolia



Caliotropis gigantea

CONCLUSION

Madayi kavu is a very famous sacred grove in kannur district. It is a part of Madayi hills. The land is rich in biodiversity. Almost every year new species are being identified from this ecological spot. As per our study on the diversity on the Madayi kavu we had listed out 5 grasshoppers, 10 spiders, 5 ants, and 20 plants. Some plants are endemic and deserves conservation.

Ethanobotanically the spot is a part of Madayi kavu temple. Almost every plants are ethnobotanically important. The plant listed falls under medicinal category. *Abrus precacius*, so called 'kunnikuru' in Malayalam is a very important medicinal plant.

List includes not only trees but also climbers, herbs etc. spiders, grasshoppers, ants also contribute to the diversity of the area. Seasonal changes are very significant in the area as it influences species occurring there. So many migratory birds and butterflies are an important aspect of its aesthetic beauty.

Even though it is a very important biodiversity, the grove is under the threat of extinction. Many of the plant species are been disappearing each year. Almost two by third of the land had disappeared.

So it is very important to know about the species richness and environmental value of the area. It is the duty of everyone to conserve and protect the sacred grove.

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