Phytology

Exploring flora and their associated animal species in the village ecosystem of Goa

Dafilgo Fernandes[1,2*], Neville Socorro Cruz Gama[1], Chenoa Coutinho[3] and Fulgencio Cardozo[1]

[1] Verna Biodiversity Management Committee (VBMC), Goa State Biodiversity Board (GSBB), Saligao, Goa, India

[2] School of Earth, Ocean and Atmospheric Sciences, Goa University, Taleigao Plateau, Goa, India

[3] Bharati Vidyapeeth Institute of Environmment Education and Research (BVIEER), Dhankawadi, Pune, Maharashtra, India

Correspondence Author: Dafilgo Fernandes

Received 6 Nov 2024; Accepted 1 Jan 2025; Published 6 Jan 2025

DOI: https://doi.org/10.54660/.IJPR.2025.5.1.1-19

Abstract

The survey of plant species carried out in the village of Verna resulted in documentation of 666 plant species and 4 mushroom species. Preliminary observations in the village show that the slopes of the plateau areas are rich in endemic flora. Most of the plant species found in the study area are representative of the Western Ghats rainforest. The plant species profile of the village is closely tied to the region's rainfall pattern. The distribution pattern of plant species in the village varies in different locations, mainly due to topography and is influenced by the soil type in the locality. This study reveals the plant species found in this village, setting a reference for biodiversity conservation in the village.

Keywords: Plant, Fauna, Species, Biodiversity, Conservation

1. Introduction

A sizable part of the endemic flora in the world is found on the tropical Indian peninsula. The Western Ghats are a group of mountain ranges that run parallel to the west coast of India and act as a barrier to the south-westerly monsoon winds. This region experiences heavy seasonal rainfall, and has a high endemic rainforest, making it one of the most important biodiversity hotspots in India (Chatterjee, 1939; Ahmedullah & Nayar, 1986; Ramesh & Pascal, 1997; Blasco, 1970; Nayar, 1996; Gopalan & Henry, 2000; Mishra & Singh, 2001; Krishnan, 2002) [4, 1, 15, 2, 14, 7, 13, 12]. Goa is the smallest state in India, located on the southwestern coast, and accounts for about 2% of the Western Ghats area (Joshi & Janarthanam, 2004) [10]. The topography of Goa is mainly occupied by plateaus covered by dry and moist deciduous forests and flat river basins (Gune, 1979; Widdowson, 2009; Suprit *et al*., 2010) [8, 18, 17]. As a coastal state, the Goa ecosystem is composed primarily of marine and terrestrial forest biomes. However, in recent decades, the Goa ecosystem has become vulnerable to erosion as a result of pollution, urbanization and climate change. Understanding the biodiversity of the Goa local ecosystem is essential for the sustainable management of the Goa ecosystem. Plants are essential for the life forms to thrive, which are the basis for the functioning of the food web and the biodiversity of a particular locality. Goa is rich in endemic species, which are indicative of the Western Ghats, many of which continue to be found in present-day (Joshi & Janarthanam, 1997; Braganza, 1998; Janarthanam *et al*., 1999) [11, 3, 9].

In this study, Verna is a small village of ~ 15.69 km^2 in the western Goa coastal zone (Fernandes *et al*., 2024) [5]. Previous, survey of insects in the village found 33 species of Odonata and 374 species of Lepidoptera (Fernandes, 2024; Fernandes *et al*., 2024) [5, 6]. However, in recent decades, threats such as climate change, forest degradation by roads and settlement developments, forest fires, clearing of native species for agriculture and water scarcity have all put a significant strain on the micro-ecosystems in the village. As a result, biodiversity management in Goa is becoming challenging. Many forest species are critical to wild life, and are being shunned by recent human activities, which have resulted in the loss of their habitats. Incidents of wild animals invading public settlements in Goa are on the rise. In this study, we present a list of the forest flora found in the village in order to better understand native species and their influence on wildlife for biodiversity conservation.

2. Study area and Methods

The study area, Verna village is located between 15º 20' 24'' N and 73º 56' 24'' E (Fig. 1) (Fernandes, 2024; Fernandes *et al*., 2024) [5, 6]. The area to the north-east is dominated by higher plateaus, reaching up to 150 m and the west by lower, flat alluvial plains. The area experiences an average temperature of 21 ºC and 30 ºC and receives monsoonal rainfall averaging around 3,500 mm, maximum received in June and July, followed by a gradual retreat from September onwards (Joshi & Janarthanam, 2004) [10]. Maximum temperature occurs between the months of March and May, and the temperatures can rise to 40 ºC. Also, with the proximity of the village to the sea, this area experiences a warm and humid climate. The major soil type in plateau areas is the laterite soil formed by the weathering of the laterite rock, while the lower flat plain areas, in contrast, are covered by river alluvium which consists of

sandy loam soils, suitable for paddy and coconut cultivation (Fernandes *et al*., 2024) [6]. The Sal River, which originates in the area, is dammed annually to control water supply, serves as the main source of irrigation for cultivation. The Ambulor lake, situated in the centre of the village, is an important water storage reservoir, which helps to recharge the ground watertable and provides a stable supply of water throughout the winter and summer periods to carry out farming in lower Sal areas. The slope of the plateau in the village is mostly mixed tropical dry and moist deciduous forest (Rao, 1985–86) [16]. The higher open plateau areas are mainly grassland and scrub forest.

During field surveys, plant species visiting various locations in the village were photo-documented for their flowers, leaves and seeds using the Redmi 9 camera (Fig. 2, 3, 4). The plant species were identified using Google Lens, literature and images from online sources and websites, including indiabiodiversity.org. The Goa Regional Plan 2021 (RPG-2021) for Village Panchayat Verna, Salcete Taluka, from the Regional Plan Division of the Town and Country Planning Department, Government of Goa, was used to map the study area and demarcate the village boundaries. The study area map was generated using QGIS and Google Earth Pro.

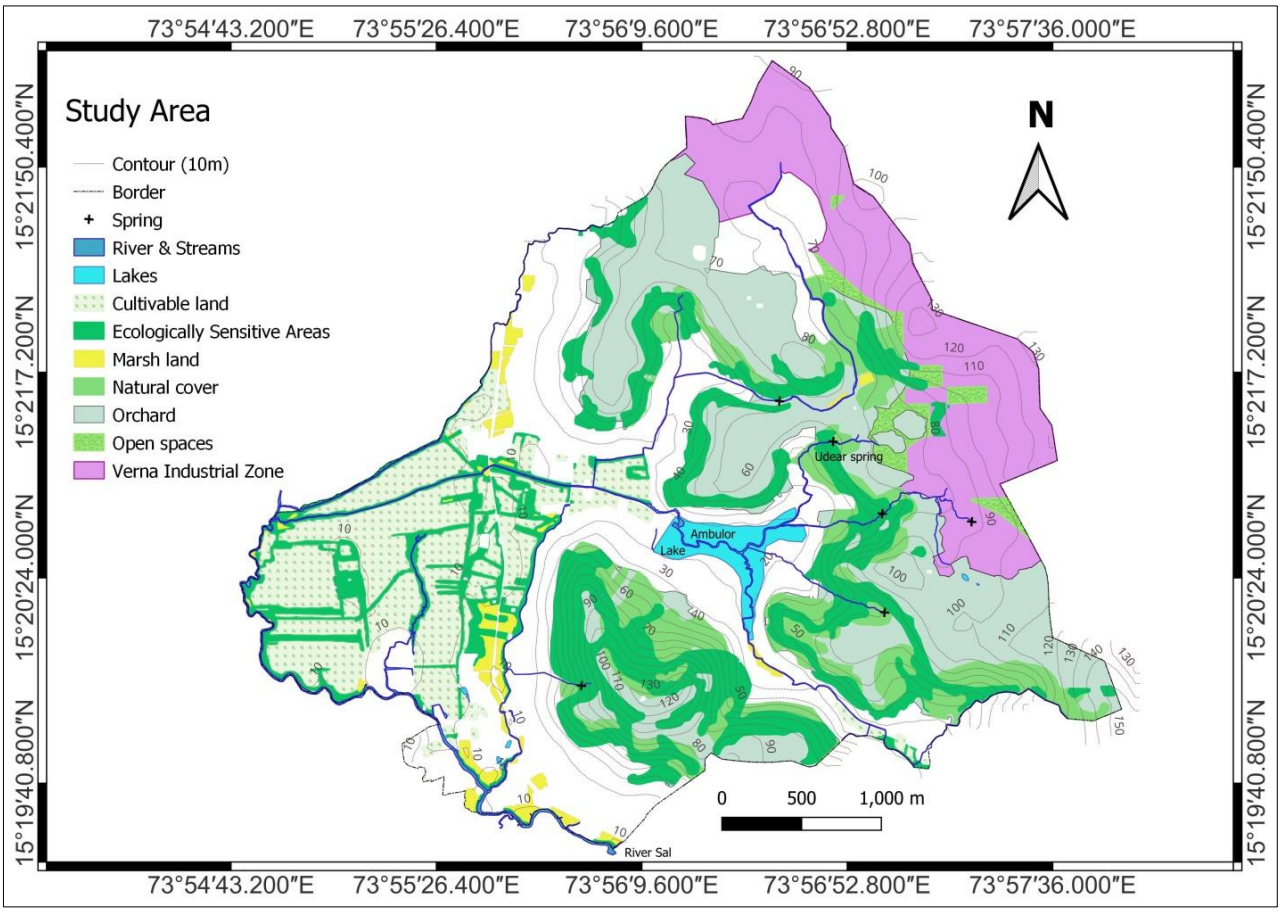

Fig 1: Study area map showing Verna village Ecologically Sensitive Areas including Orchard and open spaces, cultivated land, and marsh areas, and showing the Sal River drainage network

3. Results and Discussion

In this study, 666 plant species belonging to 121 families were documented as part of the plant species survey. The plant family Fabaceae has the highest number of species (12%), followed by the Poaceae (10%), Malvaceae (5%), Asteraceae (4%) Acanthaceae (4%) and Rubiaceae (4%) (Table 1.). Based on the analysis of the species recorded, 50% are herbs, 27% trees, 11% shrubs and 12% climbers. The higher percentage of herbs seen in this study is mainly due to the number of different species; the density and population of each species, based on their habit and distribution, were not investigated in this survey.

The lower flat areas are mostly settlement and cultivated areas that are dominated by herbs. The predominant indigenous plantation growing in these settlement areas is *Cocos nucifera*, which primarily spreads outwards from the plateau roots. Most of the herbs occur in the canopy of *Cocos nucifera* plantations. Some of the most common species of herbs and climbers found in these sand covered alluvial areas include; *Acmella radicans, Ageratum conyzoides, Albizia saman, Aristolochia indica, Alloteropsis cimicina, Arundinella metzii, pumila, Axonopus compressus, Arthraxon lanceolatus, Abelmoschus manihot, Alternanthera ficoidea, sessilis, Aerva lanata, Bulbostylis barbata, Brachiaria ramosa, Blumea lacera, Colocasia esculenta, Cyanthillium cinereum, Cyperus iria, polystachyos, squarrosus, Commelina benghalensis, communis, diffusa, Cucumis sativus var. hardwickii, Crotalaria incana, pallida, Cyanotis axillaris, cristata, Cyclea peltata, Cleome rutidosperma, Chromolaena odorata, Corchorus aestuans, capsularis, olitorius, Dicliptera foetida, Digitaria bicornis,*

compacta, longiflora, setigera, Desmodium triflorum, Dactyloctenium aegyptium, Drimia indica, Echinochloa colonum, Emilia sonchifolia, Elatostema cuneatum, Eragrostis amabilis, cilianensis, pilosa, unioloides, viscosa, Elephantopus scaber, Eleusine indica, Erigeron annuus, bonariensis, canadensis, Fimbristylis dipsacea, dauciformis, ferruginea, miliacea, schoenoides, Grona triflora, Hymenocallis littoralis, Hyptis capitata, Hibiscus surattensis, Ipomoea marginata, pes-tigridis, triloba, Ischaemum dalzellii, indicum, semisagittatum, travancorense, Ichnocarpus frutescens, Kyllinga nemoralis, Luffa aegyptiaca, Lindernia manilaliana, Laportea interrupta, Leucas aspera, Melochia corchorifolia, Mimosa pudica, Murdannia spirata, Malachra capitata, Nothosaerva brachiata, Oldenlandia corymbosa, Peperomia pellucida, Phyllanthus asperulatus, Panicum brevifolium, notatum, Paspalum canarae, paspalodes, scrobiculatum, Polypogon viridis, Physalis angulate, joe-diasii, minima, Ruellia prostrate, tuberosa, Sida acuta, alnifolia, cordata, cordifolia, rhombifolia, Scoparia dulcis, Spermacoce ocymoides, Scleromitrion verticillatum, Senna occidentalis, Synedrella nodiflora, Tragia involucrate, Tinospora cordifolia, Triumfetta rhomboidea, Urochloa setigera, and *Urena lobata*. A significant part of the village lower land that is cultivated also contains small marsh areas in between. The plant species commonly observed in the cultivated areas include; *Achyranthes aspera, Brachiaria ramosa, Chrysopogon aciculatus, Crotalaria retusa, Cleome viscosa, Corchorus olitorius, Ceratopteris thalictroides, Cyperus rotundus, Eleusine indica, Grangea maderaspatana, Hygrophila auriculata, Heliotropium indicum, Isachne gracilis, Lindernia antipoda, ciliata, Ludwigia adscendens, octovalvis, perennis, Mollugo verticillata, Melochia corchorifolia, Mosla dianthera, Malachra capitata, Portulaca oleracea, Sphaeranthus indicus, Spermacoce articularis, hispida, Sphenoclea zeylanica,* and *Tridax procumbens*. Some of the common shrubs found in these areas are mainly *Calotropis gigantean, Leea indica, Microcos paniculata, Ricinus communis, Syzygium caryophyllatum,* and *Vitex trifolia,*

The tree species covering the village lower settlement areas show a scattered distribution, with common species such as *Alstonia scholaris, Acacia auriculiformis, Butea monosperma, Casuarina equisetifolia, Ceiba pentandra, Caryota urens, Dalbergia latifolia, Ficus benghalensis, callosa, drupacea, hispida, racemosa, religiosa, Flacourtia jangomas, Gliricidia sepium, Garcinia indica, Mimusops elengi, Albizia lebbeck, Macaranga peltata, Peltophorum pterocarpum, Sapindus trifoliatus, Senna alata, Syzygium cumini, Trema orientale, Thespesia populinea, Ziziphus mauritiana,* and *xylopyrus*. Among the rare species found mainly in the vicinity of marsh areas are species such as *Gmelina arborea* and *Celastrus paniculatus,* which are often associated. In addition, the following species are introduced in this area for domestic obtaining of fruits, flowers and wood that include: *Averrhoa bilimbi, carambola, Anacardium occidentale, Annona muricata, reticulata, squamosa, Areca catechu, Ananas comosus, Alpinia purpurata, Artocarpus altilis, heterophyllus, Azadirachta indica, Bougainvillea glabra, Benincasa hispida, Basella alba, Curcuma longa, Chrysanthemum indicum, Catharanthus roseus, Crossandra infundibuliformis, Coccinia grandis, Citrus aurantiifolia, maxima, meyeri, Cascabela thevetia, Clerodendrum paniculatum, Cordyline fruticosa, Codiaeum variegatum, Carica papaya, Cocos nucifera, Celosia cristata, Dieffenbachia seguine, Gomphrena globosa, Hibiscus rosa-sinensis, Jatropha curcas, Kalanchoe pinnata, Kalanchoe blossfeldiana, Mussaenda erythrophylla, Morus alba, Murraya koenigii, Melia composita, Myristica malabarica, Mangifera indica, Manilkara kauki, zapota, Manihot esculenta, Musa paradisiaca, Moringa oleifera, Melia azedarach, Polyscias balfouriana, fruticosa, Plumeria rubra, Psidium guajava, Phyllanthus acidus, emblica, Piper nigrum, Plumeria obtusa, Pouteria campechiana, Persea americana, Rosa indica, Syzygium jambos, samarangense, Sansevieria trifasciata, Spondias pinnata, Tagetes erecta, Tectona grandis, Terminalia catappa,* and *Tamarindus indica*. Among these domestic species *Mangifera indica* in particular shows a well distribution and wide specie variation. The main crop cultivated in the village is *Oryza sativa,* the main varieties of which are Jaya and Jyoti, grown in the June-September monsoons. However, there are also rabi crops, the most important of which is *Vigna unguiculata,* and other crops grown include, *Allium cepa, Abelmoschus esculentus, Amaranthus paniculatus, viridis, Brassica oleracea var. gongylodes, Capsicum annuum, Cucurbita pepo, Cyamopsis tetragonoloba, Citrullus lanatus var. lanatus, Cucumis melo, Eleusine coracana, Luffa acutangula, Lagenaria siceraria, Macrotyloma uniflorum, Raphanus sativus var. longipinnatus, Solanum melongena, Trichosanthes cucumerina,* and *Zea mays*. Furthermore several species such as *Albizia amara, Crotalaria verrucosa, Centrosema virginianum, Ipomoea pes-tigridis, Leucaena leucocephala, Macroptilium atropurpureum, Merremia vitifolia, Operculina turpethum, Ricinus communis,* and *Stachytarpheta urticifolia,* occur in the vicinity of passing national highway areas are derived from road materials and are invasive species. Many other species found in the industrial areas along the road ways include: *Lagerstroemia indica, speciosa, Spathodea campanulata* and *Terminalia catappa* which are introduced species. Other introduced species along the village streets include *Cordia dichotoma, myxa, sebestena, Kigelia africana, Pterocarpus marsupium,* and *Pithecellobium dulce.*

The riparian strip of the Sal is lined with a particular type of plant species, mostly *Alstonia scholaris, Acacia auriculiformis, Abrus precatorius, Aristolochia indica, Antidesma ghaesembilla, Bridelia retusa, Barringtonia acutangula, Carallia brachiata, Canthium coromandelicum, Caryota urens, Carissa carandas, Careya arborea, Cinnamomum malabatrum, Cayratia trifolia, Derris scandens, trifoliata, Dalbergia horrida, Ficus heterophylla, Glochidion zeylanicum, Holigarna arnottiana, Ferrugiana, grahamii, Ixora coccinea, Lantana camara, Leea indica, Macaranga peltata, Microcos paniculata, Mussaenda laxa, Memecylon wightii, Pongamia pinnata, Phyllanthus reticulatus, Pandanus odorifer, tectorius, Premna serratifolia, Sterculia foetida, Syzygium caryophyllatum, Streblus asper, Sphagneticola*

trilobata, *Smilax zeylanica*, *Urochloa mutica*, *Ziziphus oenopolia*, and *rugosa*. The two species *Barringtonia acutangula* and *Pandanus tectorius* alone forms the riparian lining of the Sal, and their roots acts as an protective-mechanism against erosion, to hold the river banks in place, despite the species, such as *Antidesma ghaesembilla*, *Aristolochia indica*, *Caryota urens*, *Careya arborea*, *Carallia brachiate*, *Cayratia trifolia*, *Derris scandens*, *trifoliate*, *Dalbergia horrida*, *Holigarna arnottiana*, *ferrugiana*, *grahamii*, *Ixora coccinea*, *Leea indica*, *Premna serratifolia*, *Phyllanthus reticulatus*, and *Syzygium caryophyllatum* are also common along the Sal.

Fig 2: Wild flowers of the forest, 1 - *Ochna serrulata*, 2 - *Argyreia nervosa*, 3 - *Canscora shrirangiana*, 4 - *Memecylon talbotianum*, 5 - *Euphorbia curtisii*, 6 - *Cajanus scarabaeoides*, 7 - *Barleria cristata*, 8 - *Helicteres isora*, 9 - *Mackenziea integrifolia*, 10 - *Ichnocarpus frutescens*, 11 - *Thespesia lampas*, 12 - *Tricholepis glaberrima*, 13 - *Ixora coccinea*, 14 - *Eranthemum roseum*, 15 - *Holarrhena pubescens*, 16 - *Alysicarpus longifolius*, 17 - *Celosia argentea*, 18 - *Flacourtia indica*, 19 - *Desmodium heterocarpon*, 20 - *Carissa carandas*, 21 - *Calycopteris floribunda*, 22 - *Boerhaavia diffusa*, 23 - *Terminalia paniculata*, 24 - *Rauvolfia serpentina*, 25 - *Pseuderanthemum malabaricum*.

Fig 3: Continued wild flowers of the forest, 1 - *Cheilocostus speciosus*, 2 - *Vigna vexillata*, 3 - *Grewia tiliifolia*, 4 - *Barleria prionitis*, 5 - *Naregamia alata*, 6 - *Rotala malampuzhensi*, 7 - *Lantana camara*, 8 - *Curculigo orchioides*, 9 - *Rotheca serrata*, 10 - *Grewia serrulata*, 11 - *Euphorbia neriifolia*, 12 - *Callicarpa tomentosa*, 13 - *Lepidagathis lutea*, 14 - *Scleria terrestris*, 15 - *Indigofera trifoliata*, 16 - *Ampelocissus latifolia*, 17 - *Crotalaria filipes*, 18 - *Xenostegia tridentata*, 19 - *Neanotis foetida*, 20 - *Jasminum malabaricum*, 21 - *Gloriosa superba*, 22 – *Pogostemon sp.*, 23 - *Oryzopsis hymenoides*, 24 - *Themeda quadrivalvis*, 25 – *Heteropogon contortus*.

Fig 4: Continued wild flowers of the forest, 1 - *Tabernaemontana alternifolia*, 2 - *Xeromphis spinosa*, 3 - *Terminalia bellirica*, 4 - *Bombax ceiba*, 5 - *Cassia fistula*, 6 - *Syzygium caryophyllatum*, 7 - *Garcinia xanthochymus*, 8 - *Mimusops elengi*, 9 - *Pongamia pinnata*, 10 - *Dillenia pentagyna*, 11 - *Careya arborea*, 12 - *Celastrus paniculatus*, 13 - *Cassytha filiformis*, 14 - *Passiflora foetida*, 15 - *Alseodaphne semecarpifolia*, 16 - *Ixora brachiata*, 17 - *Glochidion zeylanicum*, 18 - *Lagerstroemia microcarpa*, 19 - *Tadehagi triquetrum*, 20 - *Stereospermum personatum*, 21 - *Clerodendrum infortunatum*, 22 –*Micrococs paniculata*, 23 - *Gmelina arborea*, 24 - *Cynarospermum asperrimum*, 25 - *Cissus repanda*.

Many of the species mentioned above, particularly herbs, which are found in the lower areas, do not occur in the higher areas of the lateritic plateau and vice versa. There are tree species on the slopes of the plateaus which are mostly native to the deciduous forests; they represent the Western Ghat rainforest. The higher plateau flat areas are largely open grasslands with species such as *Apluda mutica*, *Anamirta cocculus*, *Eulalia trispicata*, *Eriocaulon dalzellii*, *redactum*, *Heteropogon contortus*, *Ischaemum dalzellii*, *jayachandranii*, *sagittatum*, *semisagittatum*, *Oryzopsis hymenoides*, *Pennisetum pedicellatum*, *Rhynchospora wightiana*, *Scleria terrestris*, *Themeda quadrivalvis* and *tremula*. The herbs that are dominant in higher plateau areas of open scrub and dry forest areas include species such as *Argyreia nervosa*, *Adiantum philippense*, *Alysicarpus longifolius*, *Alternanthera sessilis*, *Abelmoschus manihot*, *Abrus precatorius*, *Amorphophallus konkanensis*, *Asparagus racemosus*, *Aristolochia indica*, *Ampelocissus latifolia*, *Blumea obliqua*, *oxyodonta*, *virens*, *Boerhavia diffusa*, *Barleria cristata*, *Crassocephalum crepidioides*, *Curculigo orchioides*, *Cassytha filiformis*, *Chamaecrista mimosoides*, *Crotalaria filipes*, *Cajanus goensis*, *scarabaeoides*, *Canscora shrirangiana*, *Celosia argentea*, *Cheilocostus speciosus*, *Cynarospermum asperrimum*, *Cissus repanda*, *Derris scandens*, *Drosera indica*, *Dioscorea bulbifera*, *oppositifolia*, *villosa*, *Diploclisia glaucescens*, *Desmodium heterocarpon*, *incanum*, *Dendrolobium triangulare*, *Dalbergia horrida*, *Dicliptera foetida*, *Euphorbia curtisii*, *hirta*, *Ecbolium ligustrinum*, *Eranthemum roseum*, *Enicostemma verticillatum*, *Gloriosa superba*, *Hemidesmus indicus*, *Hyptis suaveolens*, *Indigofera linifolia*, *Ipomoea grandifolia*, *quamoclit*, *Indigofera trifoliata*, *Impatiens kleiniformis*, *pulcherrima*, *Ichnocarpus frutescens*, *Indigofera dalzellii*, *Justicia procumbens*, *wynaadensis*, *Lepidagathis cuspidate*, *lutea*, *Luffa acutangula var. amara*,

Lindernia ciliate, manilaliana, Mucuna pruriens, Microstachys chamaelea, Murdannia edulis, semiteres, Microstachys chamaelea, Micrococca mercurialis, Naregamia alata, Neanotis foetida, rheedei, Pedilanthus tithymaloides, Pseuderanthemum malabaricum, Paramignya monophylla, Passiflora foetida, Pothos scandens, Pogostemon sp., Rhamphicarpa longifolia, Rungia pectinata, Rotheca serrate, Rotala indica, Senna obtusifolia, tora, Sesamum indicum, Smithia conferta, Scleria terrestris, Sesamum radiatum, Smilax zeylanica, Tacca leontopetaloides, Typhonium trilobatum, Tragia involucrata, Tricholepis glaberrima, Vigna vexillata, Wiesneria triandra, and *Xenostegia tridentata.* Species of shrubs that are common in higher open dry deciduous forests include *Allophylus cobbe, Bridelia stipularis, Celastrus paniculatus, Carissa carandas, inermis, spinarum, Combretum indicum, latifolium, Capparis zeylanica, Clerodendrum infortunatum, Calycopteris floribunda, Eranthemum roseum, Flemingia semialata, Grewia serrulata, Gnetum edule, Hultholia mimosoides, Holarrhena pubescens, Ixora brachiata, coccinea, nigricans, Jasminum malabaricum, Justicia adhatoda, Leea latifolia, macrophylla, Lantana camara, Mackenziea integrifolia, Microcos paniculata, Memecylon talbotianum, Neuracanthus sphaerostachyus, Nilgirianthus barbatus, Ochna serrulata, Rotheca serrata, Rauvolfia serpentina, Thespesia lampas, Tabernaemontana alternifolia, Thelepaepale ixiocephala, Tadehagi triquetrum, Woodfordia fruticosa, Xeromphis spinosa, Ziziphus oenopolia,* and *rugosa.*

Table 1: List of plant and mushroom species recorded in the village where, A – plateau, B – plains, E – marsh, D – aquatic and the respective local names of several species provided in parenthesis

Family	Specie name	Habit	Habitat	Family	Specie name	Habit	Habitat
Acanthaceae	*Andrographis paniculata* (Kirantem)	Herb	B	Hydrocharitaceae	*Blyxa echinosperma*	Herb	B, D
	Asystasia gangetica	Herb	B		*Hydrilla verticillata*	Herb	B, D
	Barleria cristata	Shrub	A		*Najas indica*	Herb	B, D
	Barleria prionitis	Shrub	A	Gnetaceae	*Gnetum edule*	Climber	A
	Cynarospermum asperrimum	Herb	A	Hypoxidaceae	*Curculigo orchioides*	Herb	B, A
	Dicliptera foetida	Herb	B, A	Juncaceae	*Juncus inflexus*	Herb	B, E
	Ecbolium ligustrinum	Herb	A	Lamiaceae	*Callicarpa tomentosa*	Tree	A
	Eranthemum roseum (Raan Abolim)	Herb	A		*Clerodendrum glandulosum*	Shrub	B, A
	Gymnostachyum glabrum	Shrub	A		*Clerodendrum infortunatum*	Shrub	B, A
	Haplanthodes neilgherryensis	Herb	A		*Gmelina arborea* (Shivan)	Tree	A
	Hygrophila auriculata (Buthao)	Herb	B		*Hyptis capitata*	Herb	B
	Justicia adhatoda (Odoso)	Shrub	A		*Hyptis suaveolens*	Herb	B, A
	Justicia procumbens	Herb	A		*Leonotis nepetifolia*	Herb	A
	Justicia wynaadensis	Herb	A		*Leucas aspera* (Tumbo)	Herb	B
	Lepidagathis cuspidata (Umru kanto)	Herb	A		*Mosla dianthera*	Herb	B, E
	Lepidagathis keralensis	Herb	A		*Pogostemon sp.*	Herb	A
	Lepidagathis lutea	Herb	A		*Premna serratifolia*	Shrub	B, A
	Mackenziea integrifolia	Shrub	A		*Rotheca serrata*	Shrub	A
	Neuracanthus sphaerostachyus	Shrub	A		*Tectona grandis* (Shael)	Tree	B, A
	Nilgirianthus barbatus	Shrub	A		*Vitex negundo*	Tree	A
	Petalidium barlerioides	Shrub	A		*Vitex trifolia*	Shrub	B
	Pseuderanthemum malabaricum	Herb	A		*Vitex altissima*	Tree	A
	Ruellia prostrata	Herb	B	Lauraceae	*Cassytha filiformis* (Tannel)	Climber	B
	Ruellia tuberosa	Herb	B		*Cinnamomum malabatrum* (Ticky)	Tree	B, A
	Rungia pectinata	Herb	A		*Cinnamomum verum*	Tree	B, A
	Strobilanthes callosa	Shrub	A		*Persea macrantha* (Olamb)	Tree	A
	Thelepaepale ixiocephala	Shrub	A		*Litsea coriacea*	Tree	A
Achariaceae	*Hydnocarpus pentandrus*	Tree	A		*Alseodaphne semecarpifolia* (Myrio)	Tree	A
Aizoaceae	*Sesuvium portulacastrum*	Herb	B		*Actinodaphne angustifolia*	Tree	A
Alismataceae	*Wiesneria triandra*	Herb	A, E		*Cryptocarya wightiana*	Tree	A
Amaranthaceae	*Achyranthes aspera* (Kantmogra)	Herb	B	Lecythidaceae	*Barringtonia acutangula* (Panshiro)	Tree	B
	Aerva lanata	Herb	B		*Careya arborea* (Kombiyo)	Tree	B
	Alternanthera ficoidea	Herb	B, A	Lentibulariaceae	*Utricularia aurea*	Herb	B, D
	Alternanthera sessilis	Herb	B, A		*Utricularia lazulina*	Herb	B, A, D
	Celosia argentea (Kudduky bhaji)	Herb	A		*Utricularia malabarica*	Herb	B, D
	Cyathula prostrata	Herb	B		*Utricularia praeterita*	Herb	B, A, D
	Nothosaerva brachiata	Herb	B	Linderniaceae	*Lindernia antipoda*	Herb	B, E
Amaryllidaceae	*Hymenocallis littoralis* (Bulkando)	Herb	B		*Lindernia ciliata*	Herb	B, A, E
Anacardiaceae	*Lannea coromandelica* (Moie)	Tree	B, A		*Lindernia manilaliana*	Herb	B, A, E
	Buchanania lanzan (Charam)	Tree	A		*Lindernia nummulariifolia*	Herb	B, E
	Holigarna arnottiana (Bibbord)	Tree	B, A		*Lindernia viscosa*	Herb	B, E
	Holigarna ferrugiana	Tree	B, A	Loganiaceae	*Mitreola oldenlandiodes*	Herb	A, E
	Holigarna grahamii	Tree	B, A		*Strychnos nux-vomica* (Caryo)	Tree	A
	Semecarpus anacardium	Tree	A	Loranthaceae	*Dendrophthoe falcata*	Shrub	B, A
Ancistrocladaceae	*Ancistrocladus heyneanus*	Shrub	A		*Helicanthes elastica* (Bendhol)	Shrub	B, A
Annonaceae	*Miliusa tomentosa*	Tree	A		*Scurrula ferruginea*	Shrub	A

	Polyalthia longifolia	Tree	B	Lycopodiaceae	*Lycopodium clavatum*	Herb	A
	Polyalthia fragrans	Tree	A		*Huperzia squarrosa*	Herb	A
	Sageraea laurina	Tree	A	Lygodiaceae	*Lygodium flexuosum*	Climber	B, A
Apiaceae	*Centella asiatica*	Herb	B, E	Lythraceae	*Lagerstroemia microcarpa*	Tree	A
	Oenanthe javanica	Herb	B, E		*Lagerstroemia speciosa*	Tree	B
Apocynaceae	*Alstonia scholaris* (Saton)	Tree	B, A		*Lagerstroemia indica*	Tree	B
	Asclepias curassavica	Shrub	A		*Lagerstroemia parviflora* (Nano)	Tree	A
	Calotropis gigantea (Rhui)	Shrub	B		*Rotala indica*	Herb	A, D
	Carissa carandas (Kanda)	Shrub	B, A		*Rotala malampuzhensi*	Herb	A, D
	Carissa congesta	Shrub	B, A		*Rotala macrandra*	Herb	A, D
	Carissa inermis	Shrub	B, A		*Woodfordia fruticosa*	Shrub	A
	Carissa spinarum	Shrub	B, A	Malvaceae	*Abutilon indicum*	Herb	B
	Ceropegia attenuate	Herb	A		*Abelmoschus manihot*	Herb	B, A
	Ceropegia fantastica	Climber	A		*Bombax ceiba* (Sanwor)	Tree	B, A
	Hemidesmus indicus (Dudhshiri)	Climber	B		*Corchorus aestuans*	Herb	B
	Heterostemma dalzellii	Climber	A		*Corchorus capsularis*	Herb	B
	Holarrhena antidysenterica (Kudo)	Shrub	A		*Corchorus olitorius*	Herb	B
	Ichnocarpus frutescens	Climber	B, A		*Ceiba pentandra*	Tree	B, A
	Rauvolfia serpentina (Atki)	Shrub	A		*Corchorus trilocularis*	Herb	B
	Tabernaemontana alternifolia	Shrub	A		*Decaschistia trilobata*	Shrub	A
	Tylophora dalzellii	Climber	A		*Grewia optiva*	Tree	A
	Wrightia tinctoria	Shrub	A		*Grewia serrulata*	Shrub	A
Araceae	*Amorphophallus commutatus*	Herb	A		*Grewia tiliifolia* (Dhamen)	Tree	A
	Amorphophallus konkanensis	Herb	A		*Helicteres isora* (Murund shing)	Tree	A
	Colocasia esculenta (Tehro)	Herb	B		*Hibiscus surattensis*	Herb	B
	Pothos scandens	Climber	A		*Kydia calycina*	Tree	A
	Typhonium trilobatum	Herb	A		*Malachra capitata*	Herb	B
Arecaceae	*Caryota urens* (Belmaad)	Tree	B, A		*Melochia corchorifolia*	Herb	B
	Phoenix sylvestris (Hazur)	Tree	A		*Microcos paniculata* (Chinvare)	Shrub	B, A
Aristolochiaceae	*Aristolochia indica*	Climber	B		*Pterygota alata*	Tree	A
Asparagaceae	*Asparagus racemosus*	Climber	A		*Sida acuta*	Herb	B
	Drimia indica	Herb	B		*Sida alnifolia*	Herb	B
	Scilla hyacinthina	Herb	A		*Sida cordata*	Herb	B
Asteraceae	*Acmella radicans*	Herb	B		*Sida cordifolia*	Herb	B
	Ageratum conyzoides	Herb	B		*Sterculia foetida*	Tree	A
	Artemisia vulgaris (Maanpotri)	Herb	B		*Sterculia guttata*	Tree	A
	Blumea lacera	Herb	B		*Sida rhombifolia*	Herb	B
	Blumea obliqua	Herb	A		*Sterculia urens* (Chando)	Tree	A
	Blumea oxyodonta	Herb	A		*Thespesia lampas*	Shrub	A
	Blumea virens	Herb	A		*Thespesia populinea* (Bhendi)	Tree	B
	Chromolaena odorata	Herb	B		*Triumfetta rhomboidea*	Herb	B
	Crassocephalum crepidioides	Herb	A		*Urena lobata*	Herb	B
	Cyanthillium cinereum	Herb	B		*Urena sinuata*	Herb	B
	Eclipta prostrata	Herb	B		*Pterospermum diversifolium*	Tree	A
	Elephantopus scaber (Bonvro)	Herb	B	Marantaceae	*Schumannianthus virgatus*	Herb	B, A
	Emilia sonchifolia	Herb	B	Marattiaceae	*Angiopteris evecta*	Tree	A
	Erigeron annuus	Herb	B	Marsileaceae	*Marsilea minuta*	Herb	B, E
	Erigeron bonariensis	Herb	B	Melastomataceae	*Memecylon talbotianum*	Tree	A
	Erigeron canadensis	Herb	B		*Memecylon umbellatum* (Ronzon)	Tree	A
	Grangea maderaspatana	Herb	B		*Memecylon wightii*	Tree	B, A
	Melanthera biflora	Herb	B		*Osbeckia virgata*	Herb	A
	Mikania micrantha	Climber	B		*Sonerila rheedii*	Herb	A
	Phyllocephalum ritchiei	Herb	A	Meliaceae	*Chukrasia tabularis*	Tree	A
	Phyllocephalum tenue	Herb	A		*Aphanamixis polystachya*	Tree	A
	Senecio belgaumensis	Herb	A		*Naregamia alata* (Teen panam)	Herb	A
	Sphaeranthus indicus	Herb	B	Menispermaceae	*Cocculus hirsutus*	Climber	A
	Sphagneticola trilobata	Herb	B		*Cyclea peltata* (Paad val)	Climber	B
	Synedrella nodiflora	Herb	B		*Diploclisia glaucescens*	Climber	A
	Tithonia diversifolia	Shrub	B		*Tinospora cordifolia* (Giloy)	Climber	A
	Tricholepis glaberrima	Herb	A		*Anamirta cocculus*	Climber	A
	Tridax procumbens	Herb	B	Menyanthaceae	*Nymphoides indica*	Herb	B, D
Balsaminaceae	*Impatiens kleiniformis*	Herb	A	Molluginaceae	*Mollugo verticillata*	Herb	B, E
	Impatiens pulcherrima	Herb	A	Moraceae	*Artocarpus gomezianus* (Otambe)	Tree	A
Begoniaceae	*Begonia crenata*	Herb	A		*Artocarpus hirsutus*	Tree	A
Bignoniaceae	*Kigelia africana*	Tree	B		*Ficus amplissima*	Tree	B
	Millingtonia hortensis	Tree	A		*Ficus arnottiana*	Tree	B, A
	Oroxylum indicum (Dokto)	Tree	A		*Ficus benghalensis* (Ord)	Tree	B, A
	Spathodea campanulata	Tree	A		*Ficus callosa* (Bencro)	Tree	B, A

	Stereospermum personatum	Tree	A		*Ficus drupacea*	Tree	B, A
Bixaceae	*Cochlospermum religiosum*	Tree	A		*Ficus exasperata*	Tree	A
Blechnaceae	*Lorinseria areolata*	Herb	B, A		*Ficus heterophylla*	Tree	B, A
Boraginaceae	*Adelocaryum coelestinum*	Herb	A		*Ficus hispida*	Tree	B, A
	Cordia dichotoma	Tree	B		*Ficus racemosa* (Rumbda)	Tree	B, A
	Cordia myxa (Shelutam)	Tree	A		*Ficus religiosa* (Pimpod)	Tree	B, A
	Cordia sebestena	Tree	B		*Ficus tinctoria*	Tree	B, A
	Coldenia procumbens	Herb	B, E		*Ficus talbotii*	Tree	B, A
	Heliotropium indicum	Herb	B		*Ficus virens*	Tree	B
Burseraceae	*Garuga pinnata*	Tree	B, A		*Streblus asper*	Tree	B
	Canarium strictum	Tree	A	Muntingiaceae	*Muntingia calabura*	Tree	B
Calophyllaceae	*Calophyllum calaba*	Tree	A	Myristicaceae	*Gymnacanthera farquhariana*	Tree	A
	Calophyllum inophyllum	Tree	B		*Knema attenuate*	Tree	A
	Mammea suriga (Surgin)	Tree	A		*Myristica malabarica* (Raan jaifol)	Tree	A
Cannabaceae	*Trema orientale*	Tree	B, A	Myrtaceae	*Eucalyptus tereticornis* (Nilgiri)	Tree	A
Capparidaceae	*Capparis rheedii*	Shrub	A		*Syzygium caryophyllatum* (Bendsa)	Tree	B, A
	Capparis zeylanica	Shrub	A		*Syzygium cumini* (Zambla)	Tree	B, A
Casuarinaceae	*Casuarina equisetifolia*	Tree	B		*Syzygium salicifolium*	Tree	A
Celastraceae	*Celastrus paniculatus*	Tree	A	Nyctaginaceae	*Boerhavia diffusa* (Kaakye vokod)	Herb	A
	Gymnosporia emarginata	Shrub	A	Nymphaeaceae	*Nymphaea pubescens* (Sallok)	Herb	B, D
Ceratophyllaceae	*Ceratophyllum demersum*	Herb	B, D		*Nymphaea rubra*	Herb	B, D
Chrysobalanaceae	*Parinari curatellifolia* (Matoma)	Tree	B	Ochnaceae	*Ochna serrulata*	Shrub	A
Cleomaceae	*Cleome rutidosperma*	Herb	B	Oleaceae	*Jasminum angustifolium*	Climber	A
	Cleome viscosa	Herb	B		*Jasminum grandiflorum*	Climber	B
Clusiaceae	*Garcinia indica* (Bhiron)	Tree	B, A		*Jasminum malabaricum* (Kusdaam)	Climber	A
	Garcinia gummigutta	Tree	A		*Jasminum sambac* (Mogrim)	Climber	B
	Garcinia talbotii	Tree	A		*Olea dioica*	Tree	A
	Garcinia xanthochymus (Zar ambe)	Tree	A	Onagraceae	*Ludwigia adscendens*	Herb	B, E
Colchicaceae	*Gloriosa superba*	Climber	A		*Ludwigia octovalvis*	Herb	B, E
	Iphigenia indica	Herb	A		*Ludwigia perennis*	Herb	B, E
Combretaceae	*Combretum indicum*	Climber	A	Ophioglossaceae	*Ophioglossum fibrosum*	Herb	A
	Combretum latifolium	Climber	A	Orchidaceae	*Acampe praemorsa*	Herb	B
	Calycopteris floribunda (Uski)	Shrub	A		*Dendrobium ovatum*	Herb	A
	Terminalia arjuna (Orzun)	Tree	A		*Habenaria grandifloriformis*	Herb	A
	Terminalia bellirica (Gutkin)	Tree	A	Orobanchaceae	*Rhamphicarpa longifolia*	Herb	A
	Terminalia catappa	Tree	B, A		*Striga gesneroides*	Herb	A
	Terminalia chebula (Hirda)	Tree	A	Oxalidaceae	*Biophytum reinwardtii*	Herb	B, E
	Terminalia elliptica (Matti)	Tree	A	Poaceae	*Arthraxon lanceolatus*	Herb	B, A
	Terminalia paniculata (Kindal)	Tree	A		*Apluda mutica*	Herb	A
Commelinaceae	*Commelina benghalensis*	Herb	B		*Arthraxon lancifolius*	Herb	B
	Commelina communis	Herb	B		*Arundinella metzii*	Herb	B, A
	Commelina diffusa	Herb	B		*Arundinella pumila*	Herb	B
	Cyanotis axillaris	Herb	B		*Arundinella tuberculata*	Herb	B
	Cyanotis cristata	Herb	B		*Alloteropsis cimicina*	Herb	B
	Murdannia edulis	Herb	A		*Alloteropsis semialata*	Herb	B
	Murdannia semiteres	Herb	A		*Aristida setacea*	Herb	A
	Murdannia spirata	Herb	B		*Arundinella pumila*	Herb	B
	Murdannia versicolor	Herb	B, A		*Axonopus compressus*	Herb	B
Convolvulaceae	*Argyreia nervosa*	Climber	A		*Bambusa bambos*	Climber	B
	Argyreia pilosa	Climber	A		*Bambusa vulgaris*	Climber	B, A
	Evolvulus alsinoides	Herb	B, E		*Brachiaria ramosa*	Herb	B
	Ipomoea cairica	Climber	B		*Cenchrus ciliaris*	Herb	B, A
	Ipomoea grandifolia	Climber	B, A		*Chrysopogon aciculatus*	Herb	B, A
	Ipomoea marginata	Climber	B		*Cynodon dactylon*	Herb	B
	Ipomoea obscura	Climber	B		*Dactyloctenium aegyptium*	Herb	B, A
	Ipomoea pes-caprae	Climber	B		*Danthonidium gammiei*	Herb	A
	Ipomoea pes-tigridis	Climber	B		*Dendrocalamus strictus*	Climber	B
	Ipomoea quamoclit	Climber	B, A		*Digitaria bicornis*	Herb	B
	Ipomoea reptans	Climber	B		*Digitaria longiflora*	Herb	B
	Ipomoea triloba	Climber	B		*Digitaria setigera*	Herb	B
	Ipomoea turbinata	Climber	B		*Dimeria veldkampii*	Herb	A
	Ipomoea violacea	Climber	B		*Dimeria woodrowii*	Herb	A
	Merremia hederacea	Climber	B		*Echinochloa colonum*	Herb	B
	Merremia vitifolia	Climber	B		*Eleusine indica*	Herb	B
	Operculina turpethum	Climber	B		*Eragrostis amabilis*	Herb	B
	Xenostegia tridentata	Climber	A		*Eragrostis pilosa*	Herb	B
Costaceae	*Cheilocostus speciosus*	Herb	A		*Eragrostis cilianensis*	Herb	B
Cucurbitaceae	*Cucumis sativus var. hardwickii* (Karatem)	Climber	B		*Eragrostis unioloides*	Herb	B

	Sechium edule (Falgam)	Climber	A		*Eragrostis viscosa*	Herb	B
	Luffa aegyptiaca	Climber	B		*Eulalia trispicata*	Herb	A
	Luffa acutangula var. amara	Climber	A		*Glyphochloa acuminate*	Herb	B, A
	Mukia maderaspatana	Climber	B		*Glyphochloa divergens*	Herb	A
Cyatheaceae	*Cyathea crinita*	Herb	B		*Glyphochloa goaensis*	Herb	B, A
Cyperaceae	*Cyperus arenarius*	Herb	B		*Glyphochloa talbotii*	Herb	A
	Cyperus compactus	Herb	B		*Heteropogon contortus*	Herb	A
	Cyperus iria	Herb	B		*Isachne globosa*	Herb	B
	Cyperus odoratus	Herb	A, E		*Isachne gracilis*	Herb	B
	Cyperus polystachyos	Herb	B		*Ischaemum dalzellii*	Herb	B, A
	Cyperus rotundus	Herb	B		*Ischaemum indicum*	Herb	B, A
	Cyperus squarrosus	Herb	B, A		*Ischaemum jayachandranii*	Herb	B, A
	Cyperus substramineus	Herb	B		*Ischaemum molle*	Herb	B
	Cyperus tuberosus	Herb	B		*Ischaemum sagittatum*	Herb	B
	Fimbristylis ferruginea	Herb	B		*Ischaemum semisagittatum*	Herb	B
	Fimbristylis lawiana	Herb	A		*Ischaemum travancorense*	Herb	B, A
	Fimbristylis dauciformis	Herb	A		*Ophiuros bombaiensis*	Herb	A
	Fimbristylis dipsacea	Herb	B		*Oplismenus hirtellus*	Herb	A
	Fimbristylis miliacea	Herb	B		*Oryza meyeriana*	Herb	A
	Fimbristylis schoenoides	Herb	B		*Oryzopsis hymenoides*	Herb	A
	Kyllinga nemoralis	Herb	B		*Panicum brevifolium*	Herb	B
	Kyllinga odorata	Herb	B		*Panicum notatum*	Herb	B
	Bulbostylis barbata	Herb	B		*Panicum paianum*	Herb	B, A
	Fimbristylis dipsacea	Herb	B		*Panicum psilopodium*	Herb	B
	Fimbristylis dichotoma	Herb	B		*Paspalidium flavidum*	Herb	B
	Rhynchospora wightiana	Herb	A		*Paspalum canarae*	Herb	B, A
	Scirpus litoralis	Herb	B, E		*Paspalum paspalodes*	Herb	B
	Scleria terrestris	Herb	A		*Paspalum scrobiculatum*	Herb	B
Dilleniaceae	*Dillenia indica*	Tree	A		*Pennisetum pedicellatum*	Herb	A
	Dillenia pentagyna	Tree	A		*Polypogon viridis*	Herb	B
Dioscoreaceae	*Dioscorea bulbifera*	Climber	A		*Sacciolepis indica*	Herb	A, E
	Dioscorea hispida	Climber	A		*Setaria pallide fusca*	Herb	B
	Dioscorea oppositifolia	Climber	A		*Spinifex littoreus*	Herb	B
	Dioscorea villosa	Climber	A		*Themeda tremula*	Herb	A
	Tacca leontopetaloides	Climber	A		*Themeda quadrivalvis*	Herb	A
Dipterocarpaceae	*Hopea ponga*	Tree	A		*Urochloa mutica*	Herb	B
Droseraceae	*Drosera indica*	Herb	A		*Urochloa setigera*	Herb	B
Ebenaceae	*Diospyros angustifolia*	Tree	A	Pandanaceae	*Pandanus tectorius* (Kerky)	Tree	B
	Diospyros montana (Babbord)	Tree	A		*Pandanus odorifer*	Tree	B
	Diospyros ebenum	Tree	A	Passifloraceae	*Adenia hondala*	Climber	B
	Diospyros paniculata	Tree	A		*Passiflora foetida*	Climber	A
	Diospyros saldanhae	Tree	A		*Turnera subulata*	Herb	A
Elaeocarpaceae	*Elaeocarpus tuberculatus*	Tree	A	Pedaliaceae	*Sesamum radiatum*	Herb	A
Eriocaulaceae	*Eriocaulon cuspidatum*	Herb	A		*Seasamum indicum*	Herb	A
	Eriocaulon dalzellii	Herb	A	Petiveriaceae	*Rivina humilis*	Herb	B
	Eriocaulon eurypeplon	Herb	A	Phyllanthaceae	*Aporosa cardiosperma*	Tree	A
	Eriocaulon fysonii	Herb	A		*Antidesma diandrum*	Tree	B, A
	Eriocaulon lanceolatum	Herb	A		*Antidesma ghaesembilla* (Amtam)	Tree	B
	Eriocaulon redactum	Herb	A		*Bridelia stipularis*	Shrub	A
	Eriocaulon stellulatum	Herb	A		*Bridelia retusa* (Conza)	Tree	B, A
Euphorbiaceae	*Acalypha indica*	Herb	B, A		*Breynia retusa*	Shrub	A
	Dimorphocalyx glabellus	Tree	A		*Glochidion zeylanicum*	Shrub	B
	Euphorbia antiquorum	Shrub	A		*Phyllanthus asperulatus*	Herb	B
	Euphorbia curtisii	Herb	A		*Phyllanthus reticulatus* (Kanvlea dolle)	Shrub	B, A
	Euphorbia fusiformis	Herb	A	Piperaceae	*Peperomia pellucida*	Herb	B
	Euphorbia hirta	Herb	B, A	Plantaginaceae	*Limnophila sessiliflora*	Herb	B, E
	Euphorbia lactea	Shrub	A		*Mecardonia procumbens*	Herb	B, E
	Euphorbia neriifolia (Niuly kanto)	Tree	A		*Scoparia dulcis*	Herb	B
	Euphorbia notoptera	Herb	A	Polygalaceae	*Polygala elongata*	Herb	A
	Euphorbia thymifolia	Herb	A	Polypodiaceae	*Drynaria quercifolia*	Herb	B
	Falconeria insignis	Tree	A		*Tectaria coadunata*	Herb	B
	Microstachys chamaelea	Herb	A	Pontederiaceae	*Monochoria vaginalis*	Herb	B, D
	Micrococca mercurialis	Herb	B, A	Portulacaceae	*Portulaca oleracea* (Goenchi bhaji)	Herb	B, E
	Mallotus nudiflorus	Tree	A	Pteridaceae	*Adiantum philippense*	Herb	B, A
	Macaranga peltata (Chandlo)	Tree	B, A		*Acrostichum aureum* (Aakur)	Herb	B, E
	Mallotus philippensis (Temdri)	Tree	A		*Ceratopteris thalictroides*	Herb	B, E
	Mallotus repandus	Shrub	A		*Pteris vittata*	Herb	B, A
	Pedilanthus tithymaloides	Herb	B, A	Rhamnaceae	*Ventilago madraspatana*	Tree	A

	Ricinus communis	Shrub	B		*Ziziphus mauritiana* (Boram)	Tree	B, A
	Tragia involucrata	Herb	B, A		*Ziziphus glaberrima*	Tree	B, A
Fabaceae	*Abrus precatorius*	Climber	B, A		*Ziziphus oenopolia* (Coneram)	Shrub	B, A
	Acacia auriculiformis	Tree	B		*Ziziphus rugosa* (Churna)	Shrub	B, A
	Acacia catechu	Tree	A		*Zizyphus xylopyrus*	Tree	B, A
	Acacia mangium	Tree	B	Rhizophoraceae	*Carallia brachiata* (kandol)	Tree	B, A
	Albizia amara	Tree	B	Rubiaceae	*Adina cordifolia* (edhu)	Tree	A
	Albizia saman	Tree	B		*Anthocephalus cadamba*	Tree	A
	Albizia lebbeck (Siras)	Tree	A		*Borreria stricta*	Herb	B
	Albizia odoratissima (Kala sirus)	Tree	A		*Canthium coromandelicum*	Shrub	B, A
	Albizia procera	Tree	A		*Canthium dicoccum*	Tree	A
	Adenanthera pavonina (Gunj)	Tree	B		*Chassalia ophioxyloides*	Shrub	A
	Aeschynomene indica	Herb	A		*Hexasepalum teres*	Herb	B
	Alysicarpus longifolius	Herb	A		*Hymenodictyon obovatum*	Tree	A
	Alysicarpus vaginalis	Herb	A		*Ixora brachiata* (Lokonkandi)	Shrub	A
	Bauhinia purpurea	Tree	B		*Ixora coccinea* (Pitkollam)	Shrub	B, A
	Bauhinia racemosa (Apto)	Tree	B, A		*Ixora nigricans*	Shrub	A
	Butea monosperma (Pongiro)	Tree	B, A		*Meyna laxiflora*	Shrub	A
	Caesalpinia pulcherrima	Tree	B, A		*Mitragyna parvifolia* (kalamb)	Tree	A
	Cajanus goensis (Gonsia val)	Climber	A		*Neanotis foetida*	Herb	A
	Cajanus scarabaeoides	Climber	A		*Neanotis lancifolia*	Herb	A
	Cassia absus	Herb	A		*Neanotis rheedei*	Herb	A
	Cassia fistula (Bayo)	Tree	A		*Oldenlandia corymbosa* (Polpotto)	Herb	B, E
	Centrosema virginianum	Climber	B		*Mussaenda laxa*	Shrub	B, A
	Chamaecrista mimosoides	Herb	A		*Scleromitrion verticillatum*	Herb	B
	Clitoria ternatea	Climber	B		*Spermacoce articularis*	Herb	B
	Crotalaria filipes	Herb	A		*Spermacoce hispida*	Herb	B
	Crotalaria incana	Herb	B		*Spermacoce ocymoides* (Gonshea vokod)	Herb	B
	Crotalaria lutescens	Herb	A		*Spermacoce remota*	Herb	B
	Crotalaria pallida	Herb	B		*Tarenna asiatica*	Shrub	A
	Crotalaria retusa	Herb	B		*Xeromphis spinosa* (Makda peram)	Shrub	A
	Crotalaria verrucosa	Herb	B	Rutaceae	*Aegle marmelos* (Bael)	Tree	A
	Dalbergia horrida (Pita pit)	Climber	B, A		*Atalantia racemosa*	Tree	A
	Dalbergia latifolia (Sissum)	Tree	B, A		*Citrus aurantiifolia*	Tree	B
	Dalbergia lanceolaria	Tree	A		*Glycosmis pentaphylla* (Sorpachem vokod)	Shrub	A
	Dalbergia sissoo	Tree	A		*Murraya paniculata*	Shrub	A
	Delonix regia (Gulmohar)	Tree	B		*Paramignya monophylla*	Climber	A
	Dendrolobium triangulare	Herb	A		*Zanthoxylum rhetsa* (Chepdam)	Tree	B, A
	Derris heyneana	Climber	B, A		*Zanthoxylum limonella*	Tree	A
	Derris scandens	Climber	B, A	Salicaceae	*Flacourtia indica*	Tree	A
	Derris trifoliata	Climber	B		*Flacourtia jangomas* (Jagom)	Tree	B, A
	Desmodium heterocarpon	Herb	B, A	Salviniaceae	*Azolla pinnata*	Herb	B, D
	Desmodium incanum	Herb	A		*Salvinia cucullata*	Herb	B, D
	Desmodium laxiflorum	Herb	A		*Salvinia molesta*	Herb	B, D
	Desmodium scorpiurus	Herb	B, E	Sapindaceae	*Allophylus cobbe*	Shrub	A
	Desmodium triflorum	Herb	B		*Cupania glabra*	Tree	A
	Erythrina variegata	Tree	B, A		*Lepisanthes tetraphylla*	Tree	A
	Flemingia semialata	Shrub	A		*Schleichera oleosa* (Kusum)	Tree	A
	Geissaspis cristata	Herb	A		*Sapindus trifoliatus* (Ritho)	Tree	A
	Geissaspis tenella	Herb	A	Sapotaceae	*Mimusops elengi* (Onvlam)	Tree	B, A
	Gliricidia sepium	Tree	B		*Palaquium ellipticum*	Tree	A
	Grona triflora	Herb	B		*Xantolis tomentosa*	Tree	A
	Hultholia mimosoides	Shrub	A	Selaginellaceae	*Selaginella pilifera*	Herb	A
	Indigofera dalzellii	Herb	A		*Selaginella tenera*	Herb	A
	Indigofera linifolia	Herb	A	Simaroubaceae	*Ailanthus excelsa*	Tree	A
	Indigofera trifoliata	Herb	A	Smilacaceae	*Smilax ovalifolia*	Climber	B, A
	Leucaena leucocephala	Tree	A		*Smilax zeylanica*	Climber	B, A
	Macroptilium atropurpureum	Climber	B	Solanaceae	*Datura innoxia* (Dotro)	Shrub	B, A
	Millettia peguensis	Tree	B		*Physalis angulata* (Chiptam)	Herb	B
	Mimosa pudica (Loje okol)	Herb	B		*Physalis joe-diasii*	Herb	B
	Moullava spicata	Climber	A		*Physalis lagascae*	Herb	B
	Mucuna pruriens (Bottam)	Climber	A		*Physalis minima*	Herb	B
	Peltophorum pterocarpum	Tree	B	Sphenocleaceae	*Sphenoclea zeylanica* (Boti shar)	Herb	B
	Pithecellobium dulce	Tree	B	Symplocaceae	*Symplocos racemosa*	Tree	A
	Pongamia pinnata	Tree	B	Tetramelaceae	*Tetrameles nudiflora*	Tree	A
	Pterocarpus marsupium (Assan)	Tree	A	Ulmaceae	*Holoptelea integrifolia*	Tree	A
	Saraca indica (Asoka)	Tree	B, A	Urticaceae	*Elatostema cuneatum*	Herb	B
	Senna alata	Tree	B, A		*Girardinia zeylanica*	Shrub	A

	Senna obtusifolia	Herb	B, A		*Laportea interrupta*	Herb	B, A
	Senna occidentalis	Herb	B		*Pilea microphylla*	Herb	B
	Senna tora (Tadkiro)	Herb	B, A	Verbenaceae	*Lantana camara*	Shrub	B, A
	Sesbania grandiflora	Tree	B, A		*Stachytarpheta urticifolia*	Herb	B
	Smithia conferta	Herb	A	Vitaceae	*Ampelocissus latifolia*	Climber	B, A
	Smithia sensitiva	Herb	A		*Cayratia mollissima*	Climber	B, A
	Spatholobus purpureus	Climber	A		*Cayratia pedata*	Climber	B, A
	Tadehagi triquetrum	Shrub	A		*Cayratia trifolia*	Climber	B, A
	Vigna vexillata	Climber	A		*Cissus repanda*	Climber	A
	Xylia xylocarpa (Zamba)	Tree	A		*Leea indica* (Jheeno)	Shrub	B
	Zornia gibbosa	Herb	A		*Leea latifolia*	Shrub	A
Gentianaceae	*Canscora diffusa*	Herb	A	Zingiberaceae	*Curcuma aromatica*	Herb	B
	Canscora shrirangiana	Herb	A		*Curcuma karnatakensis*	Herb	B
	Enicostemma verticillatum	Herb	A	Boletaceae	*Boletus edulis* (Tell olmi)	Mushroom	B, A
	Exacum pumilum	Herb	A	Lyophyllaceae	*Termitomyces eurrhizus (Booyer)*	Mushroom	B, A
Gleicheniaceae	*Dicranopteris linearis*	Herb	B, A		*Termitomyces heimii (Rovan)*	Mushroom	B, A
Goodeniaceae	*Scaevola taccada*	Shrub	B		*Termitomyces microcarpus (Sit olmi)*	Mushroom	B, A

The prominent tree species distinctive of the plateau areas include *Alseodaphne semecarpifolia, Acacia catechu, Artocarpus gomezianus, Adenanthera pavonina, Alstonia scholaris, Aporosa cardiosperma, Adina cordifolia, Buchanania lanzan, Butea monosperma, Bridelia retusa, Bombax ceiba, Breynia retusa, Caryota urens, Cassia fistula, Careya arborea, Callicarpa tomentosa, Chukrasia tabularis, Ceiba pentandra, Calophyllum inophyllum, Dalbergia lanceolaria, latifolia, Diospyros Montana, Dillenia pentagyna, Elaeocarpus tuberculatus, Euphorbia neriifolia, Eucalyptus tereticornis, Flacourtia indica, Falconeria insignis, Ficus arnottiana, callosa, exasperata, hispida, talbotii, Glycosmis pentaphylla, Garcinia xanthochymus, Gmelina arborea, Grewia optiva, tiliifolia, Garcinia indica, Holoptelea integrifolia, Holigarna arnottiana, ferrugiana, grahamii, Helicteres isora, Hopea ponga, Hydnocarpus pentandrus, Leucaena leucocephala, Litsea coriacea, Lagerstroemia microcarpa, parviflora, Lannea coromandelica, Miliusa tomentosa, Macaranga peltata, Mammea suriga, Mimusops elengi, Mallotus philippensis, Millingtonia hortensis, Memecylon talbotianum, umbellatum, Moullava spicata, Oroxylum indicum, Pongamia pinnata, Phoenix sylvestris, Persea macrantha, Sapindus trifoliatus, Sterculia foetida, guttata, urens, Semecarpus anacardium, Syzygium cumini, Strychnos nux-vomica, Schleichera oleosa, Stereospermum tetragonum, Tetrameles nudiflora, Terminalia arjuna, bellirica, elliptica, paniculata, Trema orientale, Trewia nudiflora, Vitex altissima, Xylia xylocarpa, Xeromphis spinosa, Zanthoxylum limonella, rhetsa,* and *Ziziphus mauritiana*.

The plateau areas support a diverse assemblage of reported species, with widespread occurrence of shrubs such as *Carissa carandas, Ixora brachiata, Memecylon talbotianum, Microcos paniculata, Tabernaemontana alternifolia,* and *Ziziphus rugosa,* while the distribution of *Ixora coccinea* is more variable. Among the tree species *Lannea coromandelica* is most widespread throughout the village. Many species that occur in close association, which constitute the open scrub forest found on the higher flat plateau areas are such as *Acacia catechu, Antidesma ghaesembilla, Aporosa cardiosperma, Bridelia retusa, stipularis, Butea monosperma, Buchanania lanzan, Bombax ceiba, Carissa carandas, Cassia fistula, Celastrus paniculatus, Calycopteris floribunda, Careya arborea, Dalbergia horrida, Euphorbia neriifolia, Falconeria insignis, Flacourtia indica, Ficus arnottiana, exasperata, racemosa, Grewia tiliifolia, serrulata, Garcinia indica, Holarrhena antidysenterica, Helicteres isora, Ichnocarpus frutescens, Ixora brachiate, coccinea, Jasminum malabaricum, Lagerstroemia microcarpa, parviflora, Lannea coromandelica, Microcos paniculata, Memecylon talbotianum, umbellatum, Moullava spicata, Ochna serrulata, Phoenix sylvestris, Rauvolfia serpentina, Sphenoclea zeylanica, Sterculia urens, Syzygium caryophyllatum, Terminalia bellirica, paniculata, Trema orientale, Thespesia lampas, Vitex altissima, Xeromphis spinosa, Ziziphus oenopolia* and *rugosa*. The species *Terminalia bellirica, paniculata,* and *Lagerstroemia microcarpa, parviflora* are closely associated species, with *Terminalia paniculata* being particularly dominant in open scrub forest, but they are more scattered on slopes.

The plateau slopes are characterized by species such as *Allophylus cobbe, Alstonia scholaris, Alseodaphne semecarpifolia, Bombax ceiba, Bridelia retusa, Callicarpa tomentosa, Clerodendrum infortunatum, Combretum latifolium, Carallia brachiata, Caryota urens, Carissa carandas, Dalbergia horrida, Ficus callosa, Garcinia indica, Grewia tiliifolia, Holigarna arnottiana, ferrugiana, grahamii, Ixora brachiata, Lagerstroemia microcarpa, parviflora, Lannea coromandelica, Lantana camara, Macaranga peltata, Microcos paniculata, Mammea suriga, Mimusops elengi, Moullava spicata, Mallotus philippensis, Mackenziea integrifolia, Schleichera oleosa, Stereospermum tetragonum, Sterculia urens, Sterculia guttata, Strychnos nux-vomica, Sphenoclea zeylanica, Tetrameles nudiflora, Terminalia bellirica, paniculata, Trema orientale, Trewia nudiflora,* and *Tabernaemontana alternifolia*. Other species that are less common include *Artocarpus gomezianus, Adina cordifolia, Dalbergia latifolia, Dillenia pentagyna, Diospyros Montana, Gmelina arborea, Garcinia xanthochymus, Hydnocarpus pentandrus, Hopea ponga, Litsea coriacea, Miliusa tomentosa, Pongamia pinnata, Persea macrantha, Sapindus trifoliatus, Terminalia arjuna, elliptica,* and *Xylia xylocarpa,* which show scattered distribution. Among these species *Artocarpus gomezianus, Dalbergia latifolia, Diospyros Montana,*

Hydnocarpus pentandrus, and *Pongamia pinnata*, are found mainly in streams and moist areas.

The Sal River originates in the plateau areas of this village, and the findings of this study indicate that many of the plant species found in the riparian areas are derived from the higher plateau areas. However, *Barringtonia acutangula* and *Pandanus tectorius* do not occur on higher plateau areas. The *Calophyllum inophyllum* is typically coastal specie, known to occur along the Sal areas, which suggests a broader past distribution and ecological continuity. Majority of the herb species can be recorded during and following the monsoon season and they depend on rainfall for growth and survival. These herbs dry out during the dry season. The grass species in plateau areas particularly, *Eriocaulon dalzellii*, *redactum*, *Drosera indica*, *Heteropogon contortus*, *Ischaemum dalzellii*, *jayachandranii*, *semisagittatum*, *Oryzopsis hymenoides*, *Rotala indica*, *Rhynchospora wightiana*, and *Themeda quadrivalvis* are dominant during monsoon season. However, *Ischaemum semisagittatum* is most widespread during the dry season, shed seeds in open plateau rocky outcrops. One of the specie, *Ichnocarpus frutescens*, is a very robust climber often observed throughout the season widely distributed around the village. The distinct soil distribution in the region is also a major factor influencing the variety of plant specie to adapt to these particular habitats (Fernandes *et al*., 2024) [6]. The mushroom species such as *Boletus edulis*, *Termitomyces eurrhizus*, *heimii*, and *microcarpus* appear only at the onset of monsoon rains, with *Boletus edulis* more common under the canopy of *Ficus benghalensis*, *Syzygium caryophyllatum and Syzygium cumini*, while *Termitomyces eurrhizus*, *heimii*, grow out of the termite mounds.

Many animal species directly dependent on these plant species for food and shelter are provided in Table 2. Among these animal species, avifauna is the dominant taxonomic group, many of which are migratory birds. However, some native birds commonly observed in the village area identified include *Argya striata*, *Anthus rufulus*, *Anhinga melanogaster*, *Amaurornis phoenicurus*, *Alcedo atthis*, *Acridotheres fuscus*, *Accipiter badius*, *Aquila pomarina*, *Anthracoceros coronatus*, *Aethopyga vigorsii*, *Ardeola grayii*, *Ardea purpurea*, *Bubulcus ibis*, *Ceryle rudis*, *Clanga hastate*, *Corvus splendens*, *Cyornis tickelliae*, *Columba livia*, *Centropus sinensis*, *Copsychus saularis*, *Dinopium benghalense*, *Dicrurus macrocercus*, *paradiseus*, *Dendrocitta vagabunda*, *Eudynamys scolopaceus*, *Egretta garzetta*, *Glaucidium radiatum*, *Galloperdix spadicea*, *Hirundo concolor*, *Hypothymis azurea*, *Hirundo smithii*, *Hemipus picatus*, *Haliastur indus*, *Halcyon pileata*, *smyrnensis*, *Lonchura striata*, *Loriculus vernalis*, *Muscicapa dauurica*, *Merops orientalis*, *Myophonus horsfieldii*, *Motacilla maderaspatensis*, *Nectarinia asiatica*, *zeylonica*, *Nycticorax nycticorax*, *Otus bakkamoena*, *Orthotomus sutorius*, *Oriolus oriolus*, *Ocyceros griseus*, *Pavo cristatus*, *Pycnonotus jocosus*, *Psittacula eupatria*, *Phalacrocorax fuscicollis*, *Pitta brachyuran*, *Pelargopsis capensis*, *Porzana fusca*, *Psilopogon viridis*, *Prinia inornata*, *Ploceus philippinus*, *Spilornis cheela*, *Spilopelia chinensis*, *Tachybaptus ruficollis*, *Terpsiphone paradise*, *Vanellus malabaricus*, and *Zoothera citrina*. Both *Corvus splendens* and *Haliastur indus* are closely associated species that are most common among the native birds, and prefer to nest on *Cocos nucifera* plantations. The *Corvus splendens* is also observed for its unusual seasonal feeding habits on the fruit of *Acacia auriculiformis* and *Lannea coromandelica*. However, one specie, *Columba livia*, is also known for its pest nature, which feeds on early paddy sowings but also on potential rabi crops, such as *Vigna unguiculata*, which are prominent crops cultivated in this village. Bird species such as *Aethopyga vigorsii, Arachnothera longirostra, Leptocoma zeylonica, Nectarinia asiatica, and zeylonica*, are nectarivorous and are commonly observed feeding on flowering tree species, such as *Butea monosperma*, *Bombax ceiba*, *Cocos nucifera*, *Musa paradisiaca etc. Spilopelia chinensis* and *Zoothera citrina* are two most common ground foraging, species of birds, with *Zoothera citrina* being dominant along the riparian Sal forest. Bird species such as *Anthus rufulus*, *Hemipus picatus*, *Merops orientalis*, and *Dicrurus macrocercus* are more common in cultivated areas in this village. Other common speices of birds that feed in the canopy of trees include *Acridotheres fuscus*, *Argya striata*, *Copsychus saularis*, *Cyornis tickelliae*, *Centropus sinensis*, *Dinopium benghalense*, *Dendrocitta vagabunda*, *Dicrurus paradiseus*, *Eudynamys scolopaceus*, *Loriculus vernalis*, *Muscicapa dauurica*, *Orthotomus sutorius*, *Oriolus oriolus*, *Ploceus philippinus*, *Pycnonotus jocosus*, *Prinia inornata*, *Psilopogon viridis*, *Psittacula eupatria* and *Terpsiphone paradise*. Species such as *Argya striata*, *Dinopium benghalense*, *Dendrocitta vagabunda*, *Eudynamys scolopaceus*, *Pycnonotus jocosus*, and *Psilopogon viridis* are more common in the canopy of *Cocos nucifera*, with *Dinopium benghalense* in particular that shows usual habit of climbing trees. The *Pavo cristatus* has a wide range of habitats, moving seasonally between the higher plateaus and lower Sal marsh and cultivated areas. However, species such as *Galloperdix spadicea*, *Myophonus horsfieldii* and *Perdicula asiatica*, which do not occur in the lower village areas, are found in the higher plateau areas. These species are rare and poorly understood and their distribution, population in this village is not known and efforts are needed to study these bird species.

The marsh areas of the Sal, particularly those dominated by *Barringtonia acutangula* are a habitat for several piscivorous bird species, including *Amaurornis phoenicurus*, *Anhinga melanogaster*, *Alcedo atthis*, *Ardeola grayii*, *Ardea purpurea*, *Bubulcus ibis*, *Ceryle rudis*, *Egretta garzetta*, *Halcyon pileata*, *Halcyon smyrnensis*, *Motacilla maderaspatensis*, *Nycticorax nycticorax*, *Porzana fusca*, *Pelargopsis capensis*, *Phalacrocorax fuscicollis*, *Tachybaptus ruficollis*, and *Vanellus malabaricus*. The *Amaurornis phoenicurus*, is the most common native species, while *Alcedo atthis*, *Ardeola grayii*, *Halcyon smyrnensis*, *Pelargopsis capensis*, and *Vanellus malabaricus* are also native in this village particularly in the lower areas. The species *Porzana fusca* and *Tachybaptus ruficollis* which are found around Sal and in cultivated areas have become increasingly rare.

The mammals most commonly found in the village are *Bandicota indica*, *Canis aureus*, *Cuon alpinus*, *Felis chaus*,

Funambulus palmarum, Herpestes edwardsii, Lutrogale perspicillata, Paradoxurus hermaphrodites, Pteropus giganteus, and *Suncus murinus.* The Sal River riparian zone is a main habitat for *Herpestes edwardsii and Lutrogale perspicillata,* with *Lutrogale perspicillata* often observed fishing on the river banks. This Sal riparian zone, which originates in higher plateau areas, also acts as a wildlife corridor, allowing the migration of predator species such as *Felis chaus, Canis aureus,* and *Cuon alpinus* to lower cultivated areas to prey on marsh birds and small mammals. Primarily, some of these apex predators *Canis aureus* and *Cuon alpinus* have established burrows in embarkments of the cultivated areas, and use them as breeding grounds. Another common arboreal mammal specie *Paradoxurus hermaphrodites* shelters on *Caryota urens* during the day and has a unique behaviour of nocturnal feeding on its fruit. The *Funambulus palmarum* is a major pest and has a major impact on the *Cocos nucifera* harvest and *Pteropus giganteus,* which are largely dependent on fruit trees for their deit. *Bandicota indica,* and *Suncus murinus* are some common nocturnal burrowing mammals in this village. Species such as *Sus scrofa* and *Panthera pardus* are very rare in these areas, particularly found in the deep forested plateau areas. Mammal species which were once observed in the village, such as *Manis crassicaudata,* and *Moschiola indica* are now extinct.

The Sal River aquatic ecosystem also supports a variety of freshwater fish in this village including species such as *Aplocheilus lineatus, parvus, Clarias batrachus, gariepinus, magur, Channa gachua, orientalis, marulius, punctate, striata, Devario aequipinnatus, Esomus danrica, Glossogobius giuris, Garra mullya, Hypselobarbus jerdoni, Heteropneustes fossilis, Lepidocephalichthys guntea, thermalis, Monopterus cuchia, Macrobrachium idella, rosenbergii, Mystus gulio, Macrognathus pancalus, Mastacembelus armatus, Ompok pabda, Osteochilus vittatus. Oreochromis mossambicus, Pterygoplichthys pardalis, Pethia ticto, Pseudosphromenus cupanus, Puntius dorsalis, filamentous, sarana, vittatus, Rasbora dandia, labiosa, Tor khudree,* and *Xenentodon cancila.* In recent years, the introduction of the predatory specie *Clarias gariepinus* into the Sal aquatic system has caused a significant decline in the native fish population, including for the reptiles. This *Clarias gariepinus* has become dominant by preying on smaller native species, replacing the native *Clarias batrachus* and *magur*. A similar trend is observed among the smaller *Channa* species such as *Channa gachua, orientalis,* and *punctata,* which are largely replaced by larger predator species such as *Channa marulius* and *striata*. Also *Macrobrachium idella* is largely replaced by the much larger specie *Macrobrachium rosenbergii*. One of the fish specie *Heteropneustes fossilis* is experiencing an alarming decline, while species such as *Mystus gulio, Oreochromis mossambicus,* and *Pterygoplichthys pardalis* continue to dominate the Sal aquatic ecosystem. The fish specie *Glossogobius giuris* is more common in the meandering sections of the Sal, particularly around the curved sandbars, while *Garra mullya* is often found in rocky areas, where it primarily feeds on algae. This suggests a habitat-specific distribution of fish species in the Sal waters. At the beginning of the monsoon season, many fish speices including *Clarias batrachus, gariepinus, magur, Osteochilus vittatus* and *Puntius sarana,* show a distinctive migratory behavior, climbing upstreams to spawn and breed in flooded marsh and cultivated areas. *Chanda nama* and *Megalops cyprinoides* are seasonal fish that only show up during high monsoon rainflows. In addition the Sal aquatic ecosystem also supports crustaceans and mollusks, including *Indochinamon edwardsi,* which habitat in burrows of the rock crevices, and thier numbers are delicling increasingly in recent years. While *Pila virens* another common crustacean is highly seasonal appearing in large numbers at the beginning of the monsoon season because of the abundance of decaying plant material, particularly in temporarily flooded shallow marsh areas and in cultivated areas.

The most commonly encountered reptilian species in the Sal riparian forest are *Fowlea piscator, Hoplobatrachus tigerinus, Lissemys punctate,* and *Ptyas mucosa* which are found in close association. The *Fowlea piscator* is the most common Sal water snake, while the *Ptyas mucosa* commonly spotted on river banks and in riparian forests. Other prominent snake species include *Ahaetulla nasuta, Bungarus caeruleus, Dendrelaphis tristis, Daboia russelii, Eryx johnii, Grypotyphlops acutus,* and *Naja naja*. *Naja naja* also shows a fair distribution found throughout the village. Although *Python molurus* is more common in plateau areas, it can be also found in the Sal water areas. The snake specie *Echis carinatus* is only found in higher plateau areas and is less common in lower areas. Another reptile specie, *Lissemys punctata* predominates in the Sal waters. During the dry season, when the Sal water recedes, these turtles are found burrowing into the dry river bed mud. Other common reptiles are *Calotes versicolor, Eutropis carinata, Varanus bengalensis and salvator*. Species such as *Calotes versicolor* and *Eutropis carinata* are common throughout the village, while *Varanus bengalensis* and *salvator* are observed in the riparian forest, often in search for burrowing eggs.

The higher plateau areas support a distinct assemblage of animal species, including *Felis chaus, Canis aureus, Cuon alpinus, Hystrix indica, Lepus nigricollis* and *Semnopithecus hypoleucos*. Among the most prominent, are *Hystrix indica* and *Lepus nigricollis. Lepus nigricollis* which is largely dependent on open grasslands for its deit and inhabits open scrub forest areas and *Hystrix indica* which inhabits rocky caves are norcturnal mammals that feed on various ground tubers on this plateau. The main predators in this area are the *Felis chaus,* but also the *Canis aureus* and *Cuon alpinus,* which prey mostly on birds and small mammals. Whereas, the *Semnopithecus hypoleucos* is largely dependent on the forest canopy of the plateau slopes for food and shelter. These species avoid humans, and their population status in this village is largely unknown and needs to be studied. Since these species are mainly found in areas near the industrial zone of this village, the ongoing industrial activity have affected their natural habitat, and has resulted in a sharp decline in their sightings. With shifting annual weather patterns, the effects of climate

change, are becoming increasingly severe. A detailed plan for conserving water in the higher plateau areas is essential in order to sustain the plateau ecosystems. The Sal River, found in the lower part of the village, and recieves water from a network of tributaries originating from the higher plateau areas, is particularly vulnerable to pollution from the discharge of industrial effluents from higher areas. One of the most important steps in addressing this challenge is to assess the Sal River and other nearby water bodies and their water quality.

The decline in the sighting of certain important native animal and plant species in the village, particularly in higher plateau areas may be due to forest encroachment and deforestation, through settlement and industrial expansion, forest clearance for introducing productive domestic species such as *Cocos nucifera* and *Anacardium occidentale*, which have led to the loss of their habitat. Poaching is another cause of continued threat to these many native animal species. However, the introduction of invasive predator species into natural water bodies had an impact on fish species. The conservation of wetlands, native tree species, and the plateau ecosystem is essential for maintaining the village ecosystems and biodiversity in Goa. Another threat to the village ecosystem is the depletion of water bodies in higher plateau areas. The findings of this study emphasis the need to manage the village habitats in Goa, a precausionary measure before they become irreversibly damaged and to develop strategies for restoring the native plant and animal diversity in order to maintain the biodiversity of Goa. In this study we have emphasised the ecological importance of the Sal River and its surrounding areas that support a diverse variety of plant and animal species. The delicate relationship between these plant and animal species in this village is evident, as many bird species depend on particular plant species for their survival. Similarly, the plateau forest and open grasslands accommodates several important mammalian native species like *Canis aureus*, *Felis chaus*, *Hystrix indica*, *Lepus nigricollis*, and *Semnopithecus hypoleucos*, as well as birds such as *Galloperdix spadicea* and *Perdicula asiatica*. This village ecology and the interaction of the various plant and animal species in its different habitats can help in the long term biodiversity management as well as in the development of conservation strategies to protect vulnerable plant and animal species discussed above in this study.

The Verna Plateau in Goa, a region characterized by its distinctive lateritic ecosystems, is facing increasing pressures due to industrialization and human encroachment. These ecosystems, which include microhabitats such as mat vegetation and rock crevices, play a pivotal role in maintaining the region's biodiversity, hydrology and soil health. However, with rapid urbanization and industrial expansion, these ecosystems are at risk of degradation. The unique flora and fauna of Goa's lateritic landscapes, adapted to the specific edaphic conditions of the laterite-rich soils, are especially vulnerable to environmental perturbations caused by industrial activity. To conserve Goa's lateritic ecosystems, establishing protected areas (PAs) and buffer zones around critical microhabitats is crucial. Identifying the key conservation areas through ecological surveys, focusing on regions with high species richness and unique plant communities can help to combat this environmental problem. Improving water quality affected by industrial activities requires reducing pollution and putting in place water treatment facilities. Managing invasive species is essential to protect native biodiversity. Promoting sustainable land-use practices in industrial and agricultural activities will minimize environmental impact. Agroforestry and ecologically sensitive agriculture should be integrated to improve soil fertility and reduce erosion. Empowering local communities through training and resources for sustainable practices is vital. Industries should adopt sustainable practices, including emission reduction and waste management, with pollution control technologies.

Table 2: List of fauna recorded in the village

Family	Specie name	Family	Specie name
Mammals			*Dicrurus macrocercus* (Vieillot, 1817) (Kotakoi)
Canidae	*Canis aureus* (Linnaeus, 1758) (Kolo)		*Dicrurus paradiseus* (Linnaeus, 1766) (Kotakir)
	Cuon alpinus (Pallas, 1811)	Estrildidae	*Leptoptilos javanicus* (Horsfield, 1821)
Cercopithecidae	*Macaca radiata* (É. Geoffroy, 1812) (Hetem)		*Lonchura malacca* (Linnaeus, 1766)
	Semnopithecus entellus (Dufresne, 1797)		*Lonchura striata* (Linnaeus, 1766) (Birboj)
	Semnopithecus hypoleucos (Blyth, 1841) (Makod)	Falconidae	*Falco chicquera* (Daudin, 1800)
Felidae	*Felis chaus* (Schreber, 1777) (Bilmazor)		*Falco tinnunculus* (Linnaeus, 1758) (Sanvlem)
	Panthera pardus (Linnaeus, 1758) (Bibtto)	Glareolidae	*Glareola lactea* (Temminck, 1820)
	Prionailurus bengalensis (Kerr, 1792)	Hemiprocnidae	*Hemiprocne longipennis* (Rafinesque, 1802)
Herpestidae	*Herpestes edwardsi* (É. Geoffroy Saint-Hilaire, 1818) (Mongus)	Hirundinidae	*Hirundo concolor* (Sykes, 1832)
	Herpestes smithii (Gray, 1837)		*Hirundo daurica* (Laxmann, 1769)
Heterocephalidae	*Heterocephalus glaber* (Rüppell, 1842)		*Hirundo smithii* (Leach, 1818)
Hystricidae	*Hystrix indica* (Kerr, 1792) (Sal)	Irenidae	*Irena puella* (Latham, 1790)
Leporidae	*Lepus nigricollis* (F. Cuvier, 1823) (Sohnso)	Jacanidae	*Metopidius indicus* (Latham, 1790)
Manidae	*Manis crassicaudata* (E. Geoffroy, 1803) (Thiryo)	Laniidae	*Lanius schach* (Linnaeus, 1758)
Megadermatidae	*Megaderma spasma* (Linnaeus, 1758)	Laridae	*Sterna aurantia* (Gray, JE, 1831)
Molossidae	*Otomops wroughtoni* (Thomas, 1913)		*Sterna bengalensis* (R. Lesson, 1831)
Muridae	*Tatera indica* (Hardwicke, 1807)		*Sterna nilotica* (J.F. Gmelin, 1789)
	Bandicota indica (Bechstein, 1800) (Kol undir)	Leiothrichidae	*Turdoides striatus* (Dumont, 1823) (Potrali)
	Golunda ellioti (Gray, 1837)	Megalaimidae	*Megalaima haemacephala* (P.L.S.Müller, 1776) (Posko)
	Mus booduga (Gray, 1837)		*Megalaima viridis* (Boddaert, 1783) (Kukroo)

	Mus musculus (Linnaeus, 1758)	Meropidae	*Merops leschenaulti* (Vieillot, 1817)
	Rattus blanfordi (Thomas, 1881)		*Merops orientalis* (Latham, 1801)
	Rattus rattus (Linnaeus, 1758) (Undir)		*Merops philippinus* (Linnaeus, 1767)
	Vandeleuria oleracea (Bennett, 1832) (Bal undir)		*Nyctyornis athertoni* (Jardine & Selby, 1828)
Mustelidae	*Lutrogale perspicillata* (I. Geoffroy Saint-Hilaire, 1826) (Udh)	Monarchidae	*Hypothymis azurea* (Boddaert, 1783)
Pteropodidae	*Cynopterus brachyotis* (Müller, 1838)		*Terpsiphone paradisi* (Linnaeus, 1758)
	Pteropus medius (Temminck, 1825) (Paako)	Motacillidae	*Anthus richardi* (Vieillot, 1818)
	Rousettus leschenaultii (Desmarest, 1820)		*Anthus rufulus* (Vieillot, 1818)
Rhinolophidae	*Rhinolophus beddomei* (Andersen, 1905)		*Motacilla citreola* (Pallas, 1776)
	Rhinolophus lepidus (Blyth, 1844)		*Motacilla maderaspatensis* (Gmelin, JF, 1789)
	Rhinolophus rouxii (Temminck, 1835)	Muscicapidae	*Copsychus malabaricus* (Scopoli, 1786)
Sciuridae	*Funambulus palmarum* (Linnaeus, 1766) (Channi)		*Copsychus saularis* (Linnaeus, 1758) (Modvon)
	Ratufa indica (Erxleben, 1777) (Shenkro)		*Cyornis tickelliae* (Blyth, 1843)
Soricidae	*Suncus murinus* (Linnaeus, 1766) (Chuchandor)		*Eumyias thalassinus* (Swainson, 1838)
Suidae	*Sus scrofa* (Linnaeus, 1758) (Ran dukor)		*Muscicapa dauurica* (Pallas, 1811)
Tragulidae	*Moschiola indica* (Gray, 1852)		*Myophonus horsfieldii* (Vigors, 1831)
Vespertilionidae	*Pipistrellus dormeri* (Dobson, 1875)		*Saxicola caprata* (Linnaeus, 1766)
Viverridae	*Paradoxurus hermaphroditus* (Pallas, 1777) (Katanor)		*Saxicoloides fulicata* (Linnaeus, 1766)
	Paradoxurus jerdoni (Blanford, 1885)	Nectariniidae	*Arachnothera longirostra* (Latham, 1790)
	Viverricula indica (Geoffroy Saint-Hilaire, 1803)		*Aethopyga vigorsii* (Sykes, 1832)
Reptiles and Amphibians			*Leptocoma zeylonica* (Linnaeus, 1766)
Boidae	*Eryx conicus* (Schneider, 1801) (Malun)		*Nectarinia asiatica* (Latham, 1790)
	Eryx johnii (Russell, 1801)		*Nectarinia lotenia* (Linnaeus, 1766)
Colubridae	*Ahaetulla nasuta* (Lacépède, 1789)		*Nectarinia zeylonica* (Linnaeus, 1766)
	Ahaetulla prasina (Boie, 1827) (Erbel)	Oriolidae	*Oriolus kundoo* (Sykes, 1832) (Odulo)
	Amphiesma stolatum (Linnaeus, 1758) (Levane)		*Oriolus xanthornus* (Linnaeus, 1758)
	Boiga forsteni (A.M.C. Duméril, Bibron & A.H.A. Duméril, 1854)	Pandionidae	*Pandion haliaetus* (Linnaeus, 1758)
	Dendrelaphis tristis (Daudin, 1803) (Pasko/Nanato)	Paridae	*Machlolophus spilonotus* (Bonaparte, 1850)
	Fowlea piscator (Schneider, 1799)	Passeridae	*Passer domesticus* (Linnaeus, 1758)
	Macropisthodon plumbicolor (Cantor, 1839)	Pellorneidae	*Pellorneum ruficeps* (Swainson, 1832)
	Oligodon arnensis (Shaw, 1802) (Sankoll)	Phalacrocoracidae	*Phalacrocorax fuscicollis* (Stephens, 1826)
	Oligodon taeniolatus (Jerdon, 1853)	Phasianidae	*Gallus sonneratii* (Temminck, 1813)
	Ptyas mucosa (Linnaeus, 1758) (Divod)		*Galloperdix spadicea* (Gmelin, JF, 1789) (Ran Kombi)
Elapidae	*Bungarus caeruleus* (Schneider, 1801) (Kaner)		*Perdicula asiatica* (Latham, 1790) (Loyo)
	Bungarus ceylonicus (Günther, 1864)		*Pavo cristatus* (Linnaeus, 1758) (Mor)
	Naja naja (Linnaeus, 1758) (Parro)	Phylloscopidae	*Phylloscopus trochiloides* (Sundevall, 1837)
	Ophiophagus hannah (Cantor, 1836)	Picidae	*Celeus brachyurus* (Vieillot, 1818)
Pythonidae	*Python molurus* (Linnaeus, 1758) (Aar)		*Dendrocopos mahrattensis* (Latham, 1801)
Typhlopidae	*Grypotyphlops acutus* (A.M.C. Duméril & Bibron, 1844)		*Dinopium benghalense* (Linnaeus, 1758) (Padekar)
	Indotyphlops porrectus (Stoliczka, 1871)		*Dryocopus javensis* (Horsfield, 1821)
	Ramphotyphlops braminus (Daudin, 1803)		*Picumnus innominatus* (Burton, 1836)
Viperidae	*Daboia russelii* (Shaw & Nodder, 1797) (Kusdo Mandol)	Pittidae	*Pitta brachyura* (Linnaeus, 1766)
	Echis carinatus (Schneider, 1801) (Pirshe)	Ploceidae	*Ploceus manyar* (Horsfield, 1821)
Trionychidae	*Lissemys punctata* (Lacépède, 1788) (Tupo Kasov)		*Ploceus philippinus* (Linnaeus, 1766) (Sheruk)
	Melanochelys trijuga (Schweigger, 1812) (Zoddo Kasov)	Podicipedidae	*Tachybaptus ruficollis* (Pallas, 1764) (Boody)
Crocodylidae	*Crocodylus palustris* (Lesson, 1831) (Mange)	Psittaculidae	*Loriculus vernalis* (Sparrman, 1787) (Kiranti)
Agamidae	*Calotes versicolor* (Daudin, 1802) (Topyo)		*Psittacula columboides* (Vigors, 1830)
	Monilesaurus rouxii (A.M.C. Duméril & Bibron, 1837)		*Psittacula cyanocephala* (Linnaeus, 1766)
Gekkonidae	*Cnemaspis goaensis* (Sharma, 1976)		*Psittacula eupatria* (Linnaeus, 1766) (Kir)
	Hemidactylus brookii (Gray, 1845) (Pal/ Shekni/ Shirli)		*Psittacula krameri* (Scopoli, 1769)
	Hemiphyllodactylus goaensis (Khandekar, Parmar, N *Sawant, & Agarwal, 2021)*	Pycnonotidae	*Brachypodius priocephalus* (Jerdon, 1839)
			Iole indica (Jerdon, 1839)
	Hemidactylus frenatus (Duméril & Bibron, 1836)		*Pycnonotus cafer* (Linnaeus, 1766)
Scincidae	*Eutropis carinata* (Schneider, 1801) (Roc Shirli)		*Pycnonotus gularis* (Gould, 1836)
	Eutropis macularia (Blyth, 1853)		*Pycnonotus jocosus* (Linnaeus, 1758) (Pitolli)
	Lygosoma goaensis (Sharma, 1976)		*Pycnonotus luteolus* (Lesson, 1841)
	Lygosoma guentheri (Peters, 1879)	Rallidae	*Amaurornis phoenicurus* (Pennant, 1769) (Kohnkari)
Varanidae	*Varanus bengalensis* (Daudin, 1802) (Gar/Saap)		*Fulica atra* (Linnaeus, 1758)
	Varanus salvator (Laurenti, 1768)		*Gallinula chloropus* (Linnaeus, 1758)
Bufonidae	*Duttaphrynus melanostictus* (Schneider, 1799)		*Gallicrex cinerea* (Gmelin, JF, 1789)
Dicroglossidae	*Euphlyctis aloysii* (Joshy, Alam, Kurabayashi, Sumida, and Kuramoto, 2009)		*Porzana fusca* (Linnaeus, 1766) (Tambuk)
			Porphyrio porphyrio (Linnaeus, 1758)
	Euphlyctis cyanophlyctis (Schneider, 1799)	Recurvirostridae	*Himantopus himantopus* (Linnaeus, 1758)
	Euphlyctis hexadactylus (Lesson, 1834)	Rhipiduridae	*Rhipidura albicollis* (Vieillot, 1818)
	Hoplobatrachus crassus (Jerdon, 1854)	Scolopacidae	*Calidris temminckii* (Leisler, 1812)
	Hoplobatrachus tigerinus (Daudin, 1802) (Bebo)		*Tringa cinerea* (Güldenstädt, 1775)

	Minervarya syhadrensis (Annandale, 1919) (Bebuk)		*Tringa glareola* (Linnaeus, 1758)
	Sphaerotheca breviceps (Schneider, 1799)		*Tringa hypoleucos* (Linnaeus, 1758)
Microhylidae	*Uperodon montanus* (Jerdon, 1859)		*Tringa nebularia* (Gunnerus, 1767)
Ranidae	*Hydrophylax malabaricus* (Tschudi, 1838) (Bebki)	Sittidae	*Sitta frontalis* (Swainson, 1820)
Ranixalidae	*Indirana chiravasi* (Padhye, Modak, and Dahanukar)	Strigidae	*Athene brama* (Temminck, 1821) (Natuk)
Rhacophoridae	*Rhacophorus malabaricus* (Jerdon, 1870)		*Bubo bengalensis* (Franklin, 1831)
	Polypedates maculatus (J.E.Gray, 1830)		*Glaucidium radiatum* (Tickell, 1833)
	Polypedates leucomystax (Gravenhorst, 1829)		*Otus bakkamoena* (Pennant, 1769)
	Polypedates bengalensis (Purkayastha, Das, Mondal, Mitra, *Chaudhuri & Das, 2019)*	Sturnidae	*Acridotheres fuscus* (Wagler, 1827) (Sallori)
			Sturnia pagodarum (Gmelin, JF, 1789)
Birds			*Sturnus roseus* (Linnaeus, 1758)
Accipitridae	*Accipiter badius* (J.F. Gmelin, 1788)	Threskiornithidae	*Threskiornis melanocephalus* (Latham, 1790)
	Aquila pomarina (Brehm, 1831)	Timaliidae	*Dumetia hyperythra* (Franklin, 1831)
	Butastur teesa (Franklin, 1831)		*Pomatorhinus horsfieldii* (Sykes, 1832)
	Elanus caeruleus (Desfontaines, 1789)	Trogonidae	*Harpactes fasciatus* (Pennant, 1769)
	Circus aeruginosus (Linnaeus, 1758)	Turdidae	*Zoothera citrina* (Latham, 1790)
	Circaetus gallicus (Gmelin, JF, 1788)		*Turdus simillimus* (Jerdon, 1839)
	Clanga hastata (Lesson, RP, 1831)	Tytonidae	*Tyto alba* (Scopoli, 1769) (Googoom)
	Haliastur indus (Boddaert, 1783)	Upupidae	*Upupa epops* (Linnaeus, 1758)
	Haliaeetus leucogaster (Gmelin, 1788)	Vangidae	*Hemipus picatus* (Sykes, 1832)
	Ictinaetus malaiensis (Temminck, 1822)	**Fish, Crustaceans, mollusks**	
	Milvus migrans (Boddaert, 1783)	Ambassidae	*Chanda nama* (F. Hamilton, 1822) (Paka buranto)
	Pernis ptilorhynchus (Temminck, 1821)		*Parambassis ranga* (F. Hamilton, 1822)
	Spilornis cheela (Latham, 1790)	Aplocheilidae	*Aplocheilus kirchmayeri* (Berkenkamp and Etzel, 1986)
	Spizaetus cirrhatus (Gmelin, 1788)		*Aplocheilus lineatus* (Valenciennes, 1846) (Kanaro)
Acrocephalidae	*Acrocephalus agricola* (Jerdon, 1845)		*Aplocheilus parvus* (Sundara Raj, 1916)
	Arundinax aedon (Pallas, 1776)	Artemiidae	*Artemia salina* (Linnaeus, 1758)
Aegithinidae	*Aegithina tiphia* (Linnaeus, 1758)	Bagridae	*Mystus gulio* (Hamilton, 1822) (Sangot)
Alaudidae	*Alauda gulgula* (Franklin, 1831)		*Mystus malabaricus* (Jerdon, 1849)
	Ammomanes phoenicura (Franklin, 1831)	Belonidae	*Xenentodon cancila* (F. Hamilton, 1822) (Tonki)
	Calandrella brachydactyla (Leisler, 1814)	Channidae	*Channa gachua* (F. Hamilton, 1822) (Chikalo)
	Eremopterix griseus (Scopoli, 1786)		*Channa marulius* (F. Hamilton, 1822)
	Galerida malabarica (Scopoli, 1786)		*Channa orientalis* (Bloch & J. G. Schneider, 1801)
	Mirafra erythroptera (Blyth, 1845)		*Channa punctata* (Bloch, 1793)
Alcedinidae	*Alcedo atthis* (Linnaeus, 1758) (Kirkiro)		*Channa striata* (Bloch, 1793)
	Ceryle rudis (Linnaeus, 1758)	Chirocentridae	*Chirocentrus dorab* (Forsskal, 1775)
	Halcyon pileata (Boddaert, 1783)	Cichlidae	*Etroplus suratensis* (Bloch, 1790) (Cardo)
	Halcyon smyrnensis (Linnaeus, 1758)		*Oreochromis mossambicus* (W. K. H. Peters, 1852) (Kilapi)
	Pelargopsis capensis (Linnaeus, 1766)		*Pseudetroplus maculatus* (Bloch, 1795)
Anatidae	*Anas acuta* (Linnaeus, 1758)	Clariidae	*Clarias batrachus* (Linnaeus, 1758) (Tygoor)
	Anas clypeata (Linnaeus, 1758)		*Clarias gariepinus* (Burchell, 1822)
	Anas crecca (Linnaeus, 1758)		*Clarias magur* (Hamilton, 1822)
	Anas poecilorhyncha (Forster, 1781)	Cobitidae	*Lepidocephalichthys guntea* (F. Hamilton, 1822) (Lallukam)
	Anas querquedula (Linnaeus, 1758)		*Lepidocephalichthys thermalis* (Valenciennes, 1846)
	Dendrocygna javanica (Horsfield, 1821) (Vollo/ Oddo)		*Pangio goaensis* (Tilak, 1972)
Anhingidae	*Anhinga melanogaster* (Pennant, 1769) (Pan kanvlo)	Cyprinidae	*Garra mullya* (Sykes, 1839) (Modvoll)
Apodidae	*Apus apus* (Linnaeus, 1758)		*Hypselobarbus jerdoni* (F. Day, 1870)
	Cypsiurus parvus (Lichtenstein, MHC, 1823)		*Haludaria pradhani* (Tilak, 1973)
Ardeidae	*Ardea alba* (Linnaeus, 1758)		*Labeo calbasu* (F. Hamilton, 1822)
	Ardea cinerea (Linnaeus, 1758)		*Labeo catla* (F. Hamilton, 1822)
	Ardeola grayii (Sykes, 1832)		*Osteochilus vittatus* (Valenciennes, 1842) (Daddi)
	Ardea purpurea (Linnaeus, 1766) (Kehnsar)		*Pethia phutunio* (F. Hamilton, 1822)
	Bubulcus ibis (Linnaeus, 1758) (Bokem)		*Pethia ticto* (F. Hamilton, 1822)
	Butorides striata (Linnaeus, 1758)		*Pethia setnai* (Chhapgar & Sane, 1992)
	Egretta garzetta (Linnaeus, 1766)		*Puntius amphibious* (Valenciennes, 1842)
	Egretta gularis (Bosc, 1792)		*Puntius chola* (F. Hamilton, 1822)
	Gorsachius melanolophus (Raffles, 1822)		*Puntius dorsalis* (Jerdon, 1849)
	Mesophoyx intermedia (Wagler, 1829)		*Puntius filamentous* (Valenciennes, 1844) (Suner kaldu)
	Nycticorax nycticorax (Linnaeus, 1758)		*Puntius mahecola* (Valenciennes, 1844)
Bucerotidae	*Anthracoceros coronatus* (Boddaert, 1783)		*Puntius sarana* (Hamilton 1822) (Pitol)
	Ocyceros griseus (Latham, 1790)		*Puntius vittatus* (Day, 1865) (Kaldu)
Campephagidae	*Coracina macei* (Lesson, 1831)		*Tor khudree* (Sykes, 1839)
	Coracina melanoptera (Rüppell, 1839)	Danionidae	*Devario aequipinnatus* (McClelland, 1839) (Patroshi)
	Pericrocotus cinnamomeus (Linnaeus, 1766)		*Devario malabaricus* (Jerdon, 1849)
	Pericrocotus flammeus (Forster, 1781)		*Devario regina* (Fowler, 1934)
Caprimulgidae	*Caprimulgus affinis* (Horsfield, 1821)		*Esomus danrica* (F. Hamilton, 1822) (Kelo)

	Caprimulgus indicus (Latham, 1790)		*Rasbora dandia* (Valenciennes, 1844)
Charadriidae	*Charadrius alexandrinus* (Linnaeus, 1758)		*Rasbora daniconius* (F. Hamilton, 1822)
	Charadrius dubius (Scopoli, 1786)		*Rasbora labiosa* (Mukerji, 1935)
	Vanellus indicus (Boddaert, 1783)	Gobiidae	*Glossogobius giuris* (F. Hamilton, 1822) (Horsanty)
	Vanellus malabaricus (Boddaert, 1783) (Ity ity taunv)	Heteropneustidae	*Heteropneustes fossilis* (Bloch, 1794) (Inzul)
Chloropseidae	*Chloropsis aurifrons* (Temminck, 1829)	Loricariidae	*Pterygoplichthys pardalis* (Castelnau, 1855) (Saker)
Ciconiidae	*Anastomus oscitans* (Boddaert, 1783)	Mastacembelidae	*Mastacembelus armatus* (Lacepède, 1800) (Ainsollam)
	Ciconia episcopus (Boddaert, 1783)		*Macrognathus guentheri* (Day, 1865)
	Leptoptilos javanicus (Horsfield, 1821)		*Macrognathus pancalus* (F. Hamilton, 1822)
	Mycteria leucocephala (Pennant, 1769)	Megalopidae	*Megalops cyprinoides (Broussonet, 1782)* (Kher)
Cisticolidae	*Orthotomus sutorius* (Pennant, 1769)	Osphronemidae	*Pseudosphromenus cupanus* (G. Cuvier, 1831) (Kumbaruk)
	Prinia hodgsonii (Blyth, 1844)	Oxudercidae	*Pseudogobiopsis oligactis* (Bleeker, 1875) (Horso)
	Prinia inornata (Sykes, 1832)		*Redigobius bikolanus* (Herre, 1927)
	Prinia socialis (Sykes, 1832)	Palaemonidae	*Macrobrachium gracilirostre* (Miers, 1875)
Columbidae	*Columba elphinstonii* (Sykes, 1832)		*Macrobrachium idella* (Hilgendorf, 1898) (Poting)
	Chalcophaps indica (Linnaeus, 1758)		*Macrobrachium malcolmsonii* (Milne-Edwards, 1844)
	Columba livia (Gmelin, JF, 1789) (Paaryo)		*Macrobrachium rosenbergii* (De Man, 1879) (Chingud)
	Ducula badia (Raffles, 1822)	Siluridae	*Ompok pabda* (F. Hamilton, 1822) (Valoi)
	Spilopelia chinensis (Scopoli, 1786) (Kowlo)	Sisoridae	*Glyptothorax lonah* (Sykes, 1839)
	Treron pompadora (Gmelin, JF, 1789)	Synbranchidae	*Monopterus cuchia* (Hamilton, 1822) (Ainsoll)
Coraciidae	*Coracias benghalensis* (Linnaeus, 1758)		*Ophichthys indicus* (Silas & E. Dawson, 1961)
Corvidae	*Dendrocitta vagabunda* (Latham, 1790)	Ampullariidae	*Pila virens* (Lamarck, 1822) (Kongo)
	Corvus macrorhynchos (Wagler, 1827) (Mar Kanvlo)	Ariophantidae	*Mariaella dussumieri* (L. Pfeiffer, 1855)
	Corvus splendens (Vieillot, 1817) (Kanvlo)	Helicarionidae	*Helicarion perfragilis* (Möllendorff, 1897)
Cuculidae	*Clamator jacobinus* (Boddaert, 1783)	Planorbidae	*Indoplanorbis exustus* (Deshayes, 1834)
	Cacomantis passerinus (Vahl, 1797)	Succineidae	*Succinea putris* (Linnaeus, 1758)
	Centropus sinensis (Stephens, 1815) (Koopantor)	Viviparidae	*Angulyagra oxytropis* (Benson, 1836)
	Cuculus varius (Vahl, 1797)		*Filopaludina bengalensis* (Lamarck, 1822)
	Eudynamys scolopaceus (Linnaeus, 1758) (Kogud)	Gecarcinucidae	*Barytelphusa cunicularis* (Westwood in Sykes, 1836)
Dicaeidae	*Dicaeum agile* (Tickell, 1833)		*Gubernatoriana gubernatoris* (Alcock, 1909) (Shet Kulli)
	Dicaeum erythrorhynchos (Latham, 1790)		*Gubernatoriana pilosipes* (Alcock, 1909)
Dicruridae	*Dicrurus aeneus* (Vieillot, 1817)		*Sartoriana spinigera* (Wood-Mason, 1871)
	Dicrurus caerulescens (Linnaeus, 1758)	Potamidae	*Indochinamon edwardsi* (Wood-Mason, 1871) (Kulli)
	Dicrurus hottentottus (Linnaeus, 1766)		

4. Conclusion

This study provides a list of plant and animal species many of which are found in the village of Verna. The type of plant species is determined by the soil type, altitude variation and slope of the locality. The majority of the plant species on the plateau are comparable to those found in the Western Ghats rainforest. The village wildlife depends directly on the plant and forest ecosystems for food and shelter. Urbanisation and industrialisation have led to a decline in the number of native species which are endemic to the Verna plateau. The full-fledged expansion of industries in the Verna region has led to disturbances in the groundwater table and soil health. These industries plan on taking up the entire plateau for industrial development in Goa. Apart from the endemic plant species, the plateau is a peripheral part of the Western Ghats rainforest. This area has unique springs which are sources of fresh water, Ambulor Lake which is proposed to be declared a wetland by Goa State Wetland Authority (GSWA) and ecologically sensitive area. The encroachment and rapid digging up of lands for industrial development has affected one of the caves present in the plateau area, causing the bats from that cave to move into the village. However, the native species diversity is affected due to the rampant industrialisation. The list of plants and animals provided in this study can be used to develop an appropriate strategy for the effective management of the natural biological resources of village ecosystems in Goa.

References

1. Ahmedullah M, Nayar MP. Endemic plants of the Indian region. Vol. 1. Peninsular India. Calcutta: Botanical Survey of India, 1986.
2. Blasco F. Aspect of the flora and ecology of savannas of the South Indian hills. J Bombay Nat Hist Soc. 1970;67:522–34.
3. Braganza A. Studies on seasonal dynamics of herbaceous vegetation of Taleigao Plateau [MSc dissertation]. Goa: Goa University, 1998.
4. Chatterjee D. Studies on the endemic flora of India and Burma. J Asiat Soc Bengal Sci. 1939;5:19–68.
5. Fernandes D. A preliminary study of moth species of Verna. J Appl Entomol. 2024;4(1):29–42.
6. Fernandes D, Gama NSC, Cardozo F. Spatial diversity of Lepidoptera and Odonata species of Village Verna. J Appl Entomol. 2024;4(3):19–27.
7. Gopalan R, Henry AN. Endemic plants of India: camp for the strict endemics of Agasthiyamalai Hills, SW Ghats. Dehra Dun: Bishen Singh Mahendra Pal Singh, 2000.
8. Gune VT, editor. Gazetteer of the Union Territory: Goa, Daman and Diu. Panaji: Gazetteer of India, 1979.
9. Janarthanam MK, Joshi VC, Rajkumar S. Survey, study, collection and documentation of plant diversity of Goa (Project report). Goa: Goa State Council for Science and Technology, 1999.

10. Joshi VC, Janarthanam MK. The diversity of life-form type, habitat preference and phenology of the endemics in the Goa region of the Western Ghats, India. J Biogeogr. 2004;31(8):1227–37.
11. Joshi VC, Janarthanam MK. Neglected Lateritic Plateau and the need for their conservation. In: National Symposium on Natural Resource Management System. Trichirapalli: Department of Botany, St Joseph College, 1997, p28.
12. Krishnan RM. Reproductive phenology of the wet forest understorey in the Western Ghats, South India. J Biogeogr. 2002;11:179–82.
13. Mishra DK, Singh NP. Endemic and threatened flowering plants of Maharashtra. Calcutta: Botanical Survey of India, 2001.
14. Nayar MP. Hot Spots of endemic plants of India, Nepal and Bhutan. Thiruvananthapuram: TBGRI, 1996.
15. Ramesh BR, Pascal JP. Atlas of endemics of the Western Ghats (India): Distribution of tree species in the evergreen and semi-evergreen forests. Pondicherry: French Institute, 1997.
16. Rao RS. Flora of Goa, Diu, Daman, Dadra and Nagarhaveli. Vols. 1 and 2. Calcutta: Botanical Survey of India, 1985–86.
17. Suprit K, Kalla A, Vijith V. A GRASS-GIS-based methodology for flash flood risk assessment in Goa. Dona Paula, Goa: National Institute of Oceanography (CSIR), 2010, p1–74.
18. Widdowson M. Evolution of laterite in Goa. In: Proceedings of Natural Resources of Goa: A Geological Perspective. Miramar, Goa: Geological Society of Goa, 2009, p35–68.