PHYTOSOCIOLOGICAL OBSERVATIONS ON ECONOMICALLY IMPORTANT PLANTS IN A DRY DECIDUOUS FOREST OF MARUTHAMALAI HILLS, COIMBATORE, TAMIL NADU

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ABSTRACT
The present investigation was carried out in a dry deciduous forest of Maruthamalai hills to know the changes in species composition according to altitude and ecology of economically important plants. A total number of 128 plant species were identified and 112 of them are recognized as economically important. Based on importance value index, the species like Acacia torta, Chloris barbata, Eragrostis viscosa, Erythroxylon monogynum Pterolobium indicum and Zizyphus oenoplia are ecologically well established plants in the study forest. On the other hand the spices such as Polygala Jacobi, Portulaca guadrifida, Ruellia patula, Sida rhomboidea, Waltheria indica, Calotropis gigantean, Solanum torvum, Accacia leucophloea, Accacia nilotica, Acacia trottis, Agave Americana, Bambusa arundinacea, Cassia fistula, Chloroxylon swietenia, Peltophorum pterocarpum, Pithecellobium dulce, Pongamia pinnata, Prosopis juliflora, Samanea saman, Thespesia populnea, Canavalia mollis, Leptadenia reticulata, Rivea hypocrateriformis etc., are considered as ecologically weaker species in the community. Hence priorities must be given to these species so as to protect the genetic stock and species as well.

Keywords: Psychological Observation, Maruthamalai hills, dry deciduous forest.

1. INTRODUCTION
Maruthamalai, the shrine of lord muruga, is situated in the Western Ghats of Coimbatore District, Tamil Nadu. It is also called as Karumalai, Maruthuvamalai and Marundhumalai. In the past 3 yugas of the age of the world, it is well known for its herbal wealth and for the history of Pambatti Siddhar, one of the 18 Siddhars who established the temple at a height of 1175 m above msl. According to Champion and Seth (1968) the vegetation of the Maruthamalai hills comes under the dry deciduous forest. Ramachandran and Nair (1981) documented nearly 66 medicinal plant species in this area. However since last few decades the floristic wealth of Maruthamalai hills is depleted at an alarming rate due to the influence of heavy biotic pressure. In this juncture, the present ecological investigation was aimed to determine the ecological position, the level of establishment and the fitness to the habitat for all component species.

2. MATERIALS AND METHODS
2.1. Study area
The present study was carried out in a dry deciduous forest of Maruthamalai hills, which is situated in the Western Ghats, 15 km away from Coimbatore city. The geographical location of Maruthamalai lies between 76°–45’ and 76°–55’ E longitude and 11°–0’ and 11°–5’ N latitude and forms the western boundary to Coimbatore district. The hill area raises up to 1699 m high, forms scrub jungle up to 700 m with dry rocky soil from the foot hill and evergreen vegetation with grasslands above 700 m height. The trees in this region are small with stunted growth.

2.2. Phytosociological analysis
Phytosociological studies were carried out during the dry month of March, 2011 in a dry deciduous forest of Maruthamalai hills to obtain the quantitative characters such as frequency, density, basal cover and their relative values and importance value index. A one ha plot was established in each of three study plots and it was divided into 20 x 20 m workable units (quadrat). The species and their individuals’ occurring in each quadrat were recorded. The basal areas at the point of emergence were measured for all the species. The quantitative characters of the constituent species were calculated as per the following formulae of Cottam and Curtis, (1956).

Frequency = \( \frac{\text{Number of quadrats in which the species present}}{\text{Total number of quadrats studied}} \) X 100

Density = \( \frac{\text{Total number of individuals of the species in all quadrats}}{\text{Total number of quadrats studied}} \)
Since most of the stems are cylindrical, the basal area was calculated by using the formulae:

\[
\text{Basal area} = \pi (r)^2
\]

Where, \(\pi = 3.14\) and \(r\) is the radius of the stem at the point of emergence.

Relative Frequency = \(\frac{\text{Number of occurrence of the species}}{\text{Number of occurrence of all species}} \times 100\)

Relative density = \(\frac{\text{Number of individuals of the species}}{\text{Number of individuals of all species}} \times 100\)

Relative dominance = \(\frac{\text{Total basal area of the species}}{\text{Total basal area of all species}} \times 100\)

3. RESULTS AND DISCUSSION

The vegetation of each study plot (1ha) sorted out into four compartments viz., herbs, shrubs, trees and climbers. In all the three studied plots, a total number of 128 species has been enlisted. Off which a high number of 119 species was recorded in the study plot II followed by 117 species in the study plot I and 88 species in the study plot III. Out of 128 species available in three studied plots, 112 species are recognized as medicinally and economically important. The utilization value of the studied plots in a dry deciduous forest of Maruthamalai hills was found to be higher because of the presence of large number of plant species (87.50% of the total flora) as economically important. Paulsamy (2005) also identified a great percentage of economically important species in the floristic list of Nilgiri sholas, adjacent mountain range to the present study area.

The distribution of some of the economically important plants like, Acacia torta, Erythroxylon monogynum, Fluggea leucopyrus and Zizyphus oenoplia was even in all three studied plots. It may be explained that the factors like suitability of microhabitat, dispersal mechanism of seeds, germination efficiency, degree of survivability of seedlings and many other intrinsic characters are playing major role for their successful distribution. Many species in three studied plots like Calotropis gigantea, Solanum torvum, Acacia nilotica, Acacia torta, Delonix regia, Eucalyptus globules, Peltophorum pterocarpum, Samanea saman, Tectona grandis etc., have showed restricted distribution. The external factors like topography, soil conditions and biotic disturbances and some intrinsic factors like dispersal mechanism, seed longevity, dormancy period and germination efficiency are some of the environmental variables generally determine the degree of distribution of many plant species (Belsky, 1988).

The density of economically important plants was higher in all three studied plots. The species such as Acacia torta, Eragrostis hirta, Zizyphus oenoplia etc., were showed high density during the time of sampling. Tansley (2003) stated that in the slopes of mountains where the subtropical and temperate vegetations are available, many local climates are existing which result the variation in the population size of many plant species in the communities. On the other hand, many species like Calotropis gigantea, Solanum torvum, Acacia torta, Agave americana, Cassia fistula, Eucalyptus globulus, Pithecellobium dulce, Pongamia pinnata, Samanea saman, Tectona grandis, Terminalia arjuna, Thespesia populnea, Leptadenia reticulata etc., were present with low densities in all studied plots may also be due to their poor reproductive potential with less seed output and weaker competitive ability (Chandrasekaran and Swamy, 1995).

Similarly, a high number of economically important plants occupied higher basal area in three studied plots. This may be due to the presence of suitable climate and soil conditions for the growth of such economically important plants in Maruthamalai hills. In addition, the shade provided by the trees also enhancing the growth of these species which naturally being a shade tolerance. Padmavathy (2005) reported in a similar fashion that the forest understories of Nilgiri contained more number of economically important plants with greater density and basal area.

In all the three studied plots of Maruthamalai hills, the ecological picture of economically important plants is highly notable. Among the 112 species of economically important plants, many species like Acacia torta, Chromolaena odorata, Euphorbia hirta, Erythroxylon monogynum, Fluggea leucopyrus, Mollugo pentaphylla, Pterolobium indicum, Tarenna asiatica, Zizyphus oenoplia etc., were determined as well established species on basis of their higher IVI values in comparison to other species. Suitability of habitat, dispersal mechanism of seeds, seed output, reproductive efficiency, longer viability, less demand, rapid regeneration and development of adaptive features according to seasons are accounted to be the reasons for their success in the environmental of present study area (Ramakrishnan, 1991; Paulsamy, 2005).
Table 1. The presence of constituent species in a dry deciduous forest of Maruthamalai hills with their economic importance.

| Sl. No. | Species                   | Family          | Parts used | Medicinal/other economic importance                                                                 | Mode of administration               |
|---------|---------------------------|-----------------|------------|------------------------------------------------------------------------------------------------------|-------------------------------------|
| 1       | **HERBS**                 |                 |            |                                                                                                      |                                     |
| 1       | Acalypha indica           | Euphorbiaceae   | Whole plant| Anti-diabetic activity, Ulcers, bronchitis                                                             | Leaf juice, paste, powder            |
| 2       | Acanthospermum hispidum   | Asteraceae      | Leaves     | Cure yellow fever                                                                                     | Leaf juice                          |
| 3       | Achyranthes aspera        | Amaranthaceae   | Whole plant| Antidote, piles, asthma, hydrophobia                                                                    | leaf paste, root paste              |
| 4       | Aerva lanata              | Amaranthaceae   | Whole plant| Diuretic, diabetics applied on fresh cuts-burns                                                        | Decoction of plant,                 |
| 5       | Alternanthera pungens     | Amaranthaceae   | Whole plant|                                                                                                      |                                     |
| 6       | Amaranthus viridis        | Amaranthaceae   | Whole plant| Antidote, snakebite, diuretic, inflammations,                                                          | Juice, paste                        |
| 7       | Barleria buxifolia        | Acanthaceae     | Leaves, roots|                                                                                                      | Leaf powder                         |
| 8       | Barleria prionitis        | Acanthaceae     | Leaves, roots|                                                                                                      | Leaf powder                         |
| 9       | Blepharis mederaspatisiens| Acanthaceae     | Entire plant| Venereal diseases                                                                                      | power                               |
| 10      | Boerhaavia diffusa        | Nyctaginaceae   | Whole plant| Asthma, jaundice, antidote, abdominal pain                                                              | Leaf juice, paste                   |
| 11      | Borleria ocmoides         | Rubiaceae       | Roots      |                                                                                                      | Decoction of root                   |
| 12      | Borleria hispida          | Rubiaceae       | Leaves, roots|                                                                                                      | Decoction of root                   |
| 13      | Cassia occidentalis       | Caesalpinaceae  | Leaves, roots, fruits | Rhematism, digestive, diabetes, wheezing, ringworm, saliva secretion, scorpion sting | Decoction of leaves, leaf paste, root power |
| 14      | Cenchrus ciliaris          | Poaceae         | -          |                                                                                                      | -                                   |
| 15      | Chloris barbata           | Poaceae         | -          |                                                                                                      | -                                   |
| 16      | Chloris roxburghiana      | Poaceae         | -          |                                                                                                      | -                                   |
| 17      | Cleome viscosa            | Capparidaceae   | Whole plant| Diarrhea, stimulant, cardiac disorders                                                                 | Leaf juice, powder                  |
| 18      | Corchorus tridens         | Tiliaceae       | -          |                                                                                                      | -                                   |
| 19      | Croton sparciflorus       | Euphorbiaceae   | Seeds      | Blood impurities, fever, dyspepsia scabies                                                            | Leaf juice, Leaf paste              |
| 20      | Cynodon dactylon triflorum| Poaceae         | Whole plant| Diuretic, antidote, stomach trouble                                                                   | Leaf juice, paste                   |
| 21      | Desmodium eragrostis      | Poaceae         | Whole plant|                                                                                                      | -                                   |
| 22      | Eragrostis viscosa        | Poaceae         | -          | Cough, antidote, dysentery, diarrhea                                                                  | Leaf juice, paste                   |
| 23      | Euphorbia hirta           | Euphorbiaceae   | Whole plant| Antidote, asthma, diarrhea, kidney disorders                                                            | Plant extract, paste                |
| 24      | Evolvulus alsinoides      | Convolvulaceae  | Whole plant| Asthma, anthelmintic, bronchitis                                                                      | Plant juice, power                  |
| 25      | Gomphrena decumbens       | Amaranthaceae   | -          |                                                                                                      | -                                   |
| 26      | Heteropogon               | Poaceae         | Culms of grass| Thatching, stimulant, diuretic, rheumatism                                                             | Powder                             |
| No. | Plant Name                      | Family   | Part Used    | Uses                                                                 | Form   |
|-----|---------------------------------|----------|--------------|----------------------------------------------------------------------|--------|
| 27  | Hibiscus micranthus             | Malvaceae| Fruits       | Vomiting, urinary disorders, asthma                                  | Powder |
| 28  | Indigofera emeaphylla           | Fabaceae | Whole plant  | Diuretic, anti scorbutic, boiled                                     | Plant juice, powder |
| 29  | Indigofera viscosa              | Fabaceae | -            | -                                                                    | -      |
| 30  | Justicia tranquibariensis       | Acanthaceae| Leaves | Cooling aspirant, small pox in children                              | Leaf juice |
| 31  | Leucasaspera                    | Lamiaceae| Whole plant  | Head ache, cough, cold, chronic rheumatism                           | Leaf juice, paste |
| 32  | Malvastrum coromandelianum      | Malvaceae| Leaves, flowers| Dysentery, inflamed, scores, antidote,                               | Decoction of plant |
| 33  | Mariscus cyperinus              | Cyperaceae| -            | -                                                                    | -      |
| 34  | Mariscus paniceus               | Cyperaceae| -            | -                                                                    | -      |
| 35  | Mollugo pentaphylla             | Aizoaceae| Leaves       | Antiseptic, stomachach, ant periodic, earache                        | Leaf juice |
| 36  | Oldenlandia umbellata           | Rubiaceae| Leaves, roots| Asthma, bronchitis, respiratory tract                                | Leaf juice, paste |
| 37  | Parthenium hysterophorus        | Asteraceae| Whole plant| Dysentery, scabies, antidote, ulcer, fever                           | Decoction of root |
| 38  | Pavonia zeylanica               | Malvaceae| roots        | Hernia, febrifuge, anthelmintic                                      | Powder |
| 39  | Peristrophe bicalyculata         | Acanthaceae| Whole plant| Eye ailments, bone fracture- sprains                                  | Leaf juice, powder |
| 40  | Phyllanthus medrapsatensis       | Euphorbiaceae| Infusion of leaves| Head ache, diuretic, dysentery, jaundice                             | Leaf juice |
| 41  | Polygala bulbothrix             | Polygalaceae| Leaves, roots| Asthma, chronic, bronchitis, fever                                   | Decoction of root |
| 42  | Polygala jacobi                 | Polygalaceae| Roots       | Purgative, cold, cough, head ache                                    | Decoction of root |
| 43  | Portulaca guadrifida            | Portulaceae| Leaves      | Antiscorbutic, ulcer, gonorrhea                                      | Decoction of leaves |
| 44  | Rothia indica                   | Fabaceae | Leaves, pods | Scarcity                                                              | Boiled leaves |
| 45  | Ruellia patula                  | Acanthaceae| Whole plant  | Psoriasis                                                             | Powder |
| 46  | Sida acuta                      | Malvaceae | Whole plant  | Demulcent, diuretic, rheumatism swellings, chest pain, diaphoretic, ulcer, antidote | Leaf juice, root juice, decoction of root, paste |
| 47  | Sida cordata                    | Malvaceae | Whole plant  | Fever, arthritis, hyper dieresis, diarrhea                           | Powder |
| 48  | Sida cordifolia                 | Malvaceae | Leaves, roots, stem| Antidote, elephantiasis, dysentery, piles                           | Plant juice, root powder |
| 49  | Sida rhomboidea                 | Malvaceae | Leaves, roots, stem| Rheumatism, emollient, diuretic, febrifuge                           | Powder |
| 50  | Tephrosia purpurea              | Fabaceae | Whole plant  | Liver diseases, diarrhea, rheumatism, vomiting, urinary disorders, asthma | Decoction of whole plant, paste, tonic |
| 51  | Tephrosia villosa               | Fabaceae | Leaves, fresh roots| Drosy, hypoglycemic properties                                      | Paste |
| 52  | Tridax procumbens               | Asteraceae| Leaves      | Dysentery, diarrhea, antidote                                        | Paste |
| 53  | Vernonia cinerea                | Asteraceae| Whole plant  | Indigestion, piles, malaria, fever,                                  | Leaf juice, paste |
| No. | Genus                  | Family         | Parts Used                                                                 | Uses                                                                                     | Preparation                        |
|-----|-----------------------|----------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------|
| 55  | Waltheria indica      | Sterculiaceae  | Leaves, root                                                                | Skin eruption, cleaning wounds, cough                                                    | Leaf juice, root powder           |
| 56  | Acacia torta          | Mimosaceae     | Fresh leaves, bark                                                          | Menstrual disorders                                                                      | Decoction of plant                |
| 57  | Acalypha fruticosa    | Euphorbiaceae  | Leaves, roots                                                               | Antidote, stomachic, gonorrhea                                                           | Leaf juice, powder                |
| 58  | Bougainvillea spectabilis | Nyctaginaceae | -                                                                           | -                                                                                        | -                                  |
| 59  | Calotropis gigantea   | Asclepiadaceae | Whole plant                                                                  | Bite of dog, snake and rat, cough, asthma, healing of wounds and boils, scorpion sting | Powder and paste                  |
| 60  | Capparis brevissima   | Capparidaceae  | Fruits                                                                      | To reduce body temperature                                                               | Decoction of fruit                |
| 61  | Capparis roxburghii   | Capparidaceae  | -                                                                           | -                                                                                        | Paste of root bark                |
| 62  | Capparis zeylanica    | Capparidaceae  | Leaves, roots, bark                                                         | Stomachic, fever, body ache, piles                                                       | Paste and powder                  |
| 63  | Carissa carandas      | Apocynaceae    | Fruits, roots                                                               | Stomachic, anti scorbatic, digestive                                                     | Extract of leaves, tonic          |
| 64  | Carissa spinarum      | Apocynaceae    | Whole plant                                                                 | Purgative, cardiotonic activity                                                          | Leaf juice, flour powder          |
| 65  | Cassia auriculata     | Caesalpiniaceae| Whole plant                                                                  | -                                                                                        |                                    |
| 66  | Chromolaena odorata   | Asteraceae     | Leaves                                                                      | Antiseptic agent, cure deep cuts and wounds                                              | Leaf juice, leaf paste            |
| 67  | Diodona viscosa       | Sapindaceae    | Aerial part, leaves, roots, bark, seeds                                     | Rheumatism, swellings, cough, backache, sprain, fish poison, wounds and swelling         | Boiled leaves, root paste, powder |
| 68  | Erythroxylon monogynum| Erythroxylaceae | Wood, bark                                                                  | Fever, dysentery, skin diseases                                                          | Ash of the plant                  |
| 69  | Fluggea leucopyrus    | Euphorbiaceae  | Leaves                                                                      | To destroy worms                                                                         | Leaf juice                        |
| 70  | Jatropha glandulifera | Euphorbiaceae  | Roots, fresh bark                                                           | Skin diseases, cold, rheumatism, purgative                                              | Paste, oil                        |
| 71  | Lantana camara        | Verbinaceae    | Whole plant                                                                 | Diaphoretic, dysentery, tumors, piles and rheumatism, fever, ulcers, swellings           | Decoction of root, root juice, paste|
| 72  | Phyllanthus reticulates| Euphorbiaceae | Whole plant                                                                  | Diuretic, diarrhea, stomachic, burns                                                     | Leaf juice, paste                 |
| 73  | Pterolobium indicum   | Mimosaceae     | Dried flower                                                                | Fever                                                                                    | Powder                            |
| 74  | Randia dumetorum      | Rubiaceae      | Internal bark, roots, fruits                                                | Dysentery, rheumatism, borne-ache, fever, diaphoretic, asthma ulcers, tumors             | Extractions of root and bark, paste|
| 75  | Solanum torvum        | Solanaceae     | Leaves, fruits, roots                                                       | Digestive, cold, cough, liver diuretic, blood pressure                                   | Decoction of fruit, leaf extract, root paste |
| 76  | Strobulanthus sp.     | Acanthaceae    | -                                                                           | -                                                                                        | Paste                             |
| 77  | Tarenna asiatica      | Rubiaceae      | Fruits, leaves                                                              | Skin diseases                                                                            | Powder and paste                  |
| 78  | Tecoma stans          | Bignoniaceae   | Roots                                                                       | Diuretic, antidote, vermifuge                                                             | Leaf juice, paste, flower, juice  |
| 79  | Toddalia asiatica     | Rutaceae       | Whole plant                                                                 | Digestive, stimulant, intermittent fever, cough, cold, malaria, diarrhea, bronchitis, wounds, ulcers | Decoction of root, paste          |
| 80  | Zizyphus oenopia      | Rhamnaceae     | Root bark, fruits                                                           | Digestive, antiseptic, healing of wounds                                                  |                                    |
| No. | Species                    | Family       | Parts                  | Diseases/Conditions                                                                 | Uses                                                                                     |
|-----|---------------------------|--------------|------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| 81  | Pongamia pinnata          | Mimosaceae   | Whole plant            | Stomach ache, fever, anthelmintic, dental caries, oral ulcers, skin diseases, wounds, dysentery, diarrhea | Leaf juice, decoction of bark                                                               |
| 82  | Acacia leucophloea        | Mimosaceae   | Leaves, bark, gum      | Skin diseases, oral ulcers, liver tonic                                                | Bark paste                                                                               |
| 83  | Acacia nilotica           | Mimosaceae   | Bark, gum              | -                                                                                    | -                                                                                         |
| 84  | Agave americana           | Agavaceae    | -                      | Laxative, diuretic, diaphoretic, antiseptic, dysentery, malaria, other fevers, fish poison | Root juice, paste                                                                         |
| 85  | Albizzia amara            | Mimosaceae   | Leaves, flowers, seeds | Eye diseases, ulcers, swellings, piles, diarrhea, leprosy, leucoderma                  | Powder                                                                                   |
| 86  | Albizzia lebbeck          | Mimosaceae   | Flowers, pods, root    | Anti cancer, ophthalmic, wounds, sprains, inflammations, hypoglycemic                  | Powder                                                                                   |
| 87  | Azadirachta indica        | Meliaceae    | All parts              | Blood purity, skin diseases, ophthalmic, cough, asthma, ulcers, tumors, liver tonic    | Root tonic, bark paste, seeds powder, tonic                                               |
| 88  | Bambusa arundinacea       | Poaceae      | Leaves, roots          | Diuretic, skin diseases, general debility, nausea, wounds, sprouts                     | Decoctions of root, leaf bud, paste                                                       |
| 89  | Bauhinia variegata         | Caesalpiniace | Leaves, flower buds,   | Cough dysentery, tumors, inflammations, diabetes, piles, skin disease                  | Decoction of root, bark is boiled, paste.                                                  |
| 90  | Cassia fistula             | Caesalpiniace | Root bark.             | Diuretics, ulcers, diuretics, jaundice, cough                                        | Leaf juice, bark powder, root paste                                                       |
| 91  | Cassia siamea              | Caesalpiniace | Aerial parts, root     | Diuretics, to remove intestinal worms                                                  | Powder                                                                                   |
| 92  | Chloroxylon swietenia      | Rutaceae     | Leaves, root, bark     | Rheumatism, wounds, malaria                                                           | leaf Juice, bark decoction                                                                |
| 93  | Commiphora berryi         | Bursaraceae  | latex                  | Cracks of feet                                                                       | Latex                                                                                     |
| 94  | Commiphora caudata        | Bursaraceae  | fruits                 | pickles                                                                               | Cooked                                                                                   |
| 95  | Delonix regia             | Caesalpiniace | Flowers, seeds         | Rheumatism, anthelmintic                                                               | Powder                                                                                   |
| 96  | Eucalyptus globulus       | Myrtaceae    | Leaves, oil            | Powerful antiseptic, asthma, diarrhea, vomiting, head ache, cough, cold               | leaf oil                                                                                 |
| 97  | Euphorbia antiquorum      | Euphorbiaceae | Roots                  | Cough, wounds ulcers, rheumatisms                                                     | Root juice, powder                                                                        |
| 98  | Ficus bengalensis         | Moraceae     | Whole plant            | Diabetes, skin diseases, antidote, toothache, cough, ulcers, dysentery, rheumatism    | Bark juice, milky juice, extract of aerial root                                           |
| 99  | Ficus tomentosa           | Moraceae     | -                      | Dysentery, muscular pains, sores, anti inflammatory                                    | -                                                                                         |
| 100 | Peltophorum pterocarpum   | Caesalpiniace | Barks, seed            | Inflammation of the eyes, blood clotting, dysentery, febrifuge                         | powder                                                                                   |
| 101 | Pithecellobium dulce      | Mimosaceae   | Leaves, bark, seeds    | Dyspepsia, antiseptic, cough, leprosy, rheumatic pains, foul ulcers cleaning, bleeding | Extract of seed, powder                                                                  |
| 102 | Pongamia pinnata          | Fabaceae     | Whole plant            |                                                                                       | Leaf juice, root paste, decoction of bark and flowers,                                     |
| Page | Common Name          | Family        | Plant Part(s) | Conditions                                      | Preparation                  |
|------|----------------------|---------------|---------------|------------------------------------------------|------------------------------|
| 103  | *Prosopis juliflora* | Mimosaceae    | Mesquite gum  | Intermittent fever, skin diseases, diabetes      | As raw                       |
| 104  | *Prosopis spicigera* | Mimosaceae    | Barks, leaves, seeds | Dysentery, leprosy, bronchitis, asthma, piles | Paste and powder             |
| 105  | *Samanea saman*      | Mimosaceae    | -             | Piles, diabetes, fish poison                      | As raw                       |
| 106  | *Santalum album*     | Santalaceae   | Heart wood    | Cough, bronchitis, dysentery, jaundice           | Paste of heart wood          |
| 107  | *Tamarindus indica*  | Caesalpiniaeae | Leaves, fruits, roots, seeds | Sore throat, ulcer, wounds, cough, eye disorder, dysentery, disorders, swellings | Leaf paste, seeds powder     |
| 108  | *Tectona grandis*    | Verbinaceae   | Whole plant   | Antiseptic, diabetes, leprosy, bronchitis, piles | Paste, powder                |
| 109  | *Terminalia arjuna*  | Combretaceae  | Twig, leaf, fruit, bark | Ulcer, asthma, bronchitis, tumors, dysentery | Leaf juice, paste, bark powder |
| 110  | *Zizyphus rugosa*    | Rhamnaceae    | Whole plant   | Cough, asthma, diabetes, ulcer, scabies          | Fruit juice, decoction of bark |
| 111  | *Zizyphus tinifolia* | Rhamnaceae    | Leaves        | Diarrhea, swellings, infection of teeth          | Powder                      |
| 112  | *CLIMBERS*           | Fabaceae      | Leaves, fruits, roots, seeds | Purify the blood, venereal affections, | Decoction of leaves          |
| 113  | *Abrus precatorius*  | Fabaceae      | Seeds, leaves | Cough, cold, colic leucoderma, skin disease, wounds, asthma, ulcers, tonic, jaundice | Leaf juice, root powder seed paste |
| 114  | *Canavalia mollis*   | Fabaceae      | Whole plant   | Rheumatism, asthma, diuretic, fever, lumbago    | Paste                       |
| 115  | *Cardiospermum halicacabum* | Sapindaceae | Roots, leaves, seeds | Bone fracture, asthma, scurvy, wounds digestive, menstrual disorders | Leaf juice, root and stem paste |
| 116  | *Cissus quadrangularis* | Vitaceae     | Whole plant   | Diuretic, asthma, ulcers, fever, rheumatism      | Leaf juice, root paste       |
| 117  | *Clitoria ternatea*  | Fabaceae      | Leaves, seeds | Sores, scabies skin disease, Chronic rheumatism, inflammation of urinary passages, diabetes, skin disease | Paste and powder             |
| 118  | *Coccinia indica*    | Cucurbitaceae | Whole plant   | Extract of leaves                                | Leaf juice leaf paste root paste |
| 119  | *Coccus hirsutus*    | Menspermaceae | Root and leaves | Noise bleeding, anti tumor, anticancer           | Leaf juice, leaf paste       |
| 120  | *Cocculus pendulous* | Menspermaceae | Leaves        | Cold, Cough, fever, asthma, digestive           | Extract of seeds             |
| 121  | *Daemia extensa*     | Asclepiadaceae| Whole plant   | Anti-inflammatory, purgative, skin diseases, dyspepsia, bronchitis, fever | Extract of seeds             |
| 122  | *Ipomoea nil*        | Convolvulaceae| Seeds         | Leprosy, tonic and stimulant                     | Plant extract                |
| 123  | *Leptadenia reticulata* | Asclepiadaceae | Whole plant   | Anticancer, memory power, asthma, biliousness, hysteria, itches | Decoction of fruit and root, paste, powder |
| 125  | *Passiflora foetida* | Passifloraceae| Aerial part, fruits, roots | Emetic, antidote, hemorrhage                     | Powder                       |
| 126  | *Rivea hypocrateriformis* | Convolvulaceae | Leaves, shoots | Emetic, antidote, hemorrhage                     | Paste                        |
| 127  | *Sarcostemma intermedium* | Asclepiadaceae | Dried stem, root | Antidote                                       | Root juice                   |
| 128  | *Tiliacora acuminata* | Menispermaceae| Roots         | Antidote                                       | Root juice                   |
Table 2. Importance value index for the ecologically stronger and weaker, economically important plants in a dry deciduous forest of Maruthamalai hills.

| Sl. No. | Species                  | Plot I | Plot II | Plot III |
|---------|--------------------------|--------|---------|----------|
| 1       | Acalypha indica          | 2.53   | 2.24    | -        |
| 2       | Acanthospermum hispidum  | 1.68   | -       | -        |
| 3       | Achryanthem aspera       | 1.76   | 1.65    | 2.00     |
| 4       | Aerva lanata             | 1.19   | -       | -        |
| 5       | Alternanthera pungens    | 1.35   | 1.21    | 1.96     |
| 6       | Amaranthus viridis       | 2.06   | 1.59    | 2.30     |
| 7       | Barleria buxifolia       | 1.71   | 1.60    | -        |
| 8       | Barleria prionitis       | -      | 1.64    | -        |
| 9       | mederaspaspatensis       | 2.09   | 2.68    | 2.62     |
| 10      | Boerhaavia diffusa      | 3.49   | 1.96    | -        |
| 11      | Boreria acypoides        | 2.41   | 3.08    | -        |
| 12      | Boreria hispida          | 2.32   | 1.77    | -        |
| 13      | Cassia occidentalis      | 3.23   | -       | -        |
| 14      | Cenchrus ciliaris         | 3.26   | 3.40    | 3.64     |
| 15      | Choris barbata           | 9.64   | 10.19   | 10.85    |
| 16      | Chloris roxburghiana     | -      | 6.12    | -        |
| 17      | Cleome viscosa           | 1.74   | 1.76    | -        |
| 18      | Corchorus tridens        | 2.21   | 3.60    | 2.92     |
| 19      | Crotalaria verrucosa     | 1.60   | 1.79    | -        |
| 20      | Croton sparciflorus      | 1.47   | 1.04    | -        |
| 21      | Cynodon dactylon         | 3.40   | 1.72    | -        |
| 22      | Desmodium triflorum      | 3.64   | 3.88    | 4.42     |
| 23      | Eragrostis viscosa       | 10.21  | 9.82    | 12.99    |
| 24      | Euphorbia nirta          | 5.34   | 5.06    | 15.93    |
| 25      | Evolulus alsinoides      | 3.98   | 3.73    | -        |
| 26      | Gomphrena decumbens      | 1.30   | 0.95    | 1.55     |
| 27      | Haportus                 | 4.86   | 4.72    | 6.80     |
| 28      | Hibiscus micranthus      | 4.24   | 4.46    | 5.06     |
| 29      | Indigofera               | 1.23   | 1.30    | 1.59     |
| 30      | enneaphylla              | 1.88   | -       | -        |
| 31      | Justicia                 | -      | 1.80    | 2.85     |
| 32      | Leucas aspera            | 3.24   | 3.27    | 2.32     |
| 33      | Malvastrum               | 1.08   | 1.34    | -        |
| 34      | coromandelianum          | 2.02   | 2.15    | -        |
| 35      | Mariscuspanicus          | 2.02   | 2.15    | -        |
| 36      | Mollugo pentaphylla      | 4.91   | 5.07    | 2.68     |
| 37      | Oldenlandia umbellata     | 2.95   | 3.13    | 2.68     |
|         | Parthenium hystrophorus  | 1.66   | 1.11    | 1.60     |
| 39      | Paviola zeylanica        | 2.95   | 2.59    | 3.81     |
| 40      | Peristrophe              | 2.44   | 2.31    | 2.95     |
| 41      | Perotis indica           | 1.44   | 4.29    | 5.59     |
| 42      | Phyllanthus maderaspatensis | 4.24   | 4.01    | 4.33     |
| 43      | Polygala bulbiflora      | 1.45   | 1.64    | 1.99     |
| 44      | Polygala jacobi          | 0.88   | 1.22    | 1.27     |
| 45      | Portulaca guadrifida     | 0.77   | 0.81    | -        |
| 46      | Rothis indica            | 1.04   | 0.93    | -        |
| 47      | Raelia pataula           | 0.86   | 0.95    | -        |
| 48      | Sida acuta               | 2.15   | 2.23    | 2.83     |
| 49      | Sida cordata             | 2.52   | 2.37    | 2.68     |
| 50      | Sida cordifolia          | 2.03   | 1.77    | -        |
| 51      | Sida rhomboidea          | 0.67   | 0.70    | -        |
| 52      | Tephrosia purpurea       | 3.99   | 3.73    | -        |
| 53      | Tephrosia villosa        | 2.27   | 2.37    | 3.13     |
| 54      | Tridax procumbens        | 4.38   | 3.94    | 4.84     |
| 55      | Vernonia cinerea         | 2.71   | 2.53    | 3.45     |
| 56      | Waltheria indica         | 0.93   | 0.98    | 1.22     |
|         | SHRUBS                   |        |         |          |
| 57      | Acacia torta             | 13.52  | 12.63   | 15.56    |
| 58      | Acalypha fruiticosa      | 4.77   | 4.36    | 4.96     |
| 59      | Bougainvillea spectabilis| 0.71   | 0.49    | -        |
| 60      | Calotropis gigantea      | 0.48   | 0.40    | -        |
| 61      | Capparis brevispina      | 1.56   | 2.02    | -        |
| 62      | Capparis roxburghii      | -      | 1.51    | -        |
| 63      | Capparis zeylanca        | 2.08   | 2.26    | 2.93     |
| 64      | Carissa carandas         | 2.22   | 2.34    | 2.60     |
| 65      | Carissa spinarum         | 2.02   | 1.83    | 2.42     |
| 66      | Cassia auricula          | 2.61   | 2.49    | -        |
| 67      | Chromolaena odorata      | 5.40   | 5.05    | 6.59     |
| 68      | Dodonaea viscosa         | 1.92   | 1.77    | 2.60     |
| 69      | Erythroxylon monogynum   | 10.82  | 10.90   | 13.66    |
| 70      | Fluggea leucopyrus       | 8.58   | 8.00    | 9.17     |
| 71      | Jatropha glandulifera    | 2.11   | 1.92    | 2.43     |
| 72      | Lantana camara           | 4.84   | 4.73    | 6.08     |
| 73      | Phyllanthus reticulatus | 3.17   | 3.12    | 3.95     |
| 74      | Pterolobium indicum      | 10.52  | 9.87    | -        |
| 75      | Randia dumetorum         | 3.44   | 3.26    | 5.44     |
| 76      | Solanum torvum           | 0.34   | 0.40    | 0.49     |
| 77      | Strobilanthes sp.        | -      | 5.48    | -        |
| 78      | Tarenna asiatica         | 6.09   | -       | -        |
| 79      | Tecoma stans             | 0.76   | 0.68    | 0.41     |
| 80      | Toddalia asiatica       | 4.17   | 3.88    | 7.28     |
| 81      | Zizephus oenoplia        | 9.97   | 9.26    | 15.70    |
|         | TREES                    |        |         |          |
| 82      | Acacia leucophloea       | 0.79   | 0.74    | 0.62     |
| 83      | Acacia nilotica          | 0.81   | 0.58    | -        |
On the other hand many species such as *Gomphrena decumbens*, *Polygala Jacobi*, *Portulaca guadrifida*, *Ruella patula*, *Sida rhomboidea*, *Waltheria indica*, *Bougainvillea spectabilis*, *Calotropis gigantean*, *Solanum torvum*, *Tecomastans*, *Acacia leucophloea*, *Acacia nilotica*, *Acacia tortilis*, *Agave Americana*, *Bambusa arundinacea*, *Cassia fistula*, *Chloroxylon swietenia*, *Delonix regia*, *Eucalyptus globules*, *Ficus bengalensis*, *Peltophorum pterocarpum*, *Pithecellobium dulce*, *Pongamia pinnata*, *Prosopis juliflora*, *Samanea saman*, *Tamarindus indica*, *Tectona grandis*, *Terminalia arjuna*, *Thespesia populnea*, *Canavalia mollis*, *Leptadenia reticulata*, *Rivea hypocrateriformis* etc., were poorly establishment in the community because of their lower IVI values (less than 1). This may be due to the presence of many intrinsic factors like lower seed output, shorter dormancy, less germination percentage and vigour and poor competitive ability make the species of ecologically weaker category, less available in the communities of shola forests (Padmavathy, 2005).

The floristic composition and ecological studies on various plant species in the study area of Maruthamalai hills indicate that it is an ideal habitat for the growth of many kinds of economically important plants. Further it is known that the population size, density and ecological fitness of the economically important plants in general and medicinal plants in particular are also highly appreciable. Hence the local environment of Maruthamalai is found to suitable for the cultivation of medicinal plants. Therefore it is suggested that the fragile parts of Maruthamalai can be used for the growing of economically and medicinally important plants.

**REFERENCES**

Anonymous, (1940-1976). The wealth of India; A dictionary of Indian Raw Materials and Industrial Products Raw Materials. Vols. 1-11/ C.S.I.R., New Delhi.

Belsky, A.J. (1988). Regional influence on small scale vegetational heterogeneity within grasslands in the Serengeti National Park, Tanzania. *Vegetatio* **74**: 7-10.

Champion, H.G. and S.K. Seth, (1968). *A revised survey of the forests of India*. Govt. of India Press.

Chandrasekaran, S. and P.S. Swamy, (1995). Changes in the herbaceous vegetation following disturbance due to biotic interference in nature and manmade ecosystems, Western Ghats. *Trop. Ecol* **36**: 213-220.
Cottam, G. and J.T. Curtis, (1956). The use of distance measures in phytosociological sampling. *Ecology* **37**: 451-460.

Jain, S.K. (1996). *Ethnobiology in relation to human welfare*. Deep Publications, New Delhi.

Maheshwari, J.K. (2000). *Ethnobiology and Medicinal Plants of Indian Subcontinent*. Scientific Publications, Jodhpur.

Padmavathy, S. (2005). Ecological investigations for the identification of plants of conservation importance in the understories of certain shola forests at Manjur, the Nilgiris, Western Ghats, India. Ph.D., thesis, Bharathiar Univ., Coimbatore, India.

Paulsamy, S. (2005). *Annual Progress Report of the project*, Evaluation of conservation strategies for the sustainable utilization of herbaceous bioresources in the sholas of Nilgiris, the Western Ghats sponsored by Ministry of Environment and Forests, Govt. of India, New Delhi.

Ramachandran, V.S. and N.C. Nair, (1981). Ethnobotanical observations on Irulas of Tamil Nadu, India. *J. Econ. Tax. Bot* **2**: 183-190.

Ramakrishnan, P.S. (1991). Biological invasion in the Tropics: an overview. In: P.S. Ramakrishnan (eds.). *Ecology of Biological invasion in the tropics*. International Scientific publications, New Delhi, pp. 1-19.

Singh, S.K. (2004). Ethnomedicinal plants of Kullu Valley, Himachalpradesh. *J. Non. Timb. For. Prods* **11**(1): 74-79.

Tansley, A.G. (2003). *An Introduction to Plant Ecology*. Discovery Publishing House, New Delhi, p.248.

Viswanathan, M.B. (2004). Ethnobotanically important plants. In; R. Annamalai (eds.). *Tamil Nadu Biodiversity Strategy and Plan-Wild plants Diversity*. Tamil Nadu Forest Department, Govt. of Tamil Nadu, Chennai.