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STUDIES ON THE FLORA OF AGASTYAMALAI AND SURROUNDING REGIONS IN TIRUNELVELI DISTRICT, TAMIL NADU

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The Agastyamalai Hills, the fabled abode of the sage-Agasthiar, the legendary father of Tamil Language, are situated on the Western Ghats in Tirunelveli District, Tamil Nadu (Madras State); the peak of Agastyamalai (1868 m) lies on the state boundary between Tamil Nadu and Kerala. These hills form a very compact block in Papanasam Reserve Forest of the Ambasamudrum Range, and lie between 77° 12′ and 77° 22′ E and 8° 34′ and 8° 40′ N. The entire forest area is hilly, characterized by numerous folds and extensions with small narrow valleys. The elevation varies from 762 to 1868 m.

This area is traversed by a network of rivers and streams. The important rivers are *Peiyar, Chittar* and *Pambar,* the main tributaries (in the hills) of the chief river (of the district), *Thambaraparni.*

In these forests, the underlying rocks belong to the granitoid or gneissic series studded with numerous small puik garnets of inferior type. The soil shows no great difference in colour and texture, though variations in depth are common. In the ghat it is a red soil varying according to the edaphic factors. In evergreen forests, though the soil is shallow and poor with numerous rocky and boundary outcrops, the adverse factors are nullified by the heavy rainfall and rich collection of humus.

This area generally gets the full force of the South-west monsoon as well as heavy showers during North-east monsoon, so that it is exceedingly damp during the greater part of the year. The average annual rainfall is 388.77 cm.

The temperature varies between 18.3° C and 26.7° C.

GENERAL PATTERN OF VEGETATION

The vegetation broadly falls into two fairly distinct types. These types merge on their common confines, so that it is not possible to fix their limits rigidly.

1. **Southern tropical wet evergreen type** (Southern evergreen type) :

Otherwise called *Shola* Forest, this is the most highly developed type of vegetation in the Tirunelveli District, occurring roughly between 762 and 1524 m.

The canopy is extremely dense, and with reference to the heights attained by the mature trees of various species, the following layers or tiers can be recognised :

(i) *Top layer or the Emergent layer (30-40 m in height)* : This layer is characterised by gigantic trees like *Artocarpus hirsutus* Lam., *Canarium strictum* Roxb., *Cullenia exarillata* Robyns, *Diospyros ebenum* Koen., *Elaeocarpus tuberculatus* Roxb., *Gluta travancorica* Bedd., *Hopea utilis* (Bedd.), Bole, *Mesua ferrea* L., *Palaquium ellipticum* Engl. and *Strombosia ceylanica* Gardn.

(ii) *Second layer or the Ecodominant layer (15-25 m in height)* : This layer comprises medium-sized trees which adapt themselves to the more shady condition, forming a second storey. Of these, the most characteristic are : *Decussocarpus wallichianus* (Presl) de Lauben., *Eugenia mundagam* Bourd., *Garcinia echinocarpa* Thw., *G. morella* (Gaertn.) Desr., *Kingiodendron pinnatum* (DC.) Harms, *Knema attenuata* (Hk. & Th.) Warb., *Lansium anamallayanum* Bedd. and *Myristica dactyloides* Gaertn.

(iii) *Third layer* or *Subcanopy layer (3-10 m in height)* : Innumerable woody shrubs and small trees form this layer, such as : *Agrostistachys indica* Dalz., *Antidesma menasu* Tul., *Boehmeria platyphylla* Don var. *longissima* Hk. f., *Callicarpa tomentosa* (L.) Murr., *Dimorphocalyx lawianus* Hk. f., *Diotacanthus grandis* Benth., *Elaeocarpus munronii* (Wt.) Masters, *Euonymus dichotomus* Heyne, ex Roxb., *Eurya nitida* Korth., *Goniothalamus wightii* Hk. f., *Leea indica* (Burm.) Murr., *Lepisanthes tetraphylla* (Vahl) Radlk., *Litsea deccanensis* Gamble, L. *venulosa* Hk. f., *Mallotus distans* Muell.-Arg., *Polygala arillata* Ham., *Symplocos macrocarpa* Wight ex Clarke, *Tabernaemontana gamblei* Subr. & Henry and *Xanthophyllum flavescens* Roxb. Climbers are comparatively few in these forests.

(iv) *Ground layer (Undergrowth)* : The vegetation here is rather thick formed by the following herbs and undershrubs, including ferns : *Acranthera grandiflora* Bedd., *Adenostemma lavenia* (L.) Kuntze, *Apama siliquosa* Lamk., *Begonia malabarica* Lamk., *Carex filicina* Nees, *Cassia mimosoides* L., *Cyathula prostrata* (L.) Bl., *Cyperus melanospermus* (Nees) Suringar, *Cyrtococcum patens* (L.) Camus, *Desmodium heterocarpon* (L.) DC., *Dracaena terniflora* Roxb., *Elatostema lineolatum* Wt., *Hybanthus travancoricus* (Bedd.) Melch., *Hydrocotyle nepalensis* Hook., *Imperata cylindrica* (L.) Beauv., *Leptostachya wallichii* Nees, *Lophatherum gracile* Brongn., *Molineria trichocarpa* (Wight) Balak., *Ophiorrhiza eriantha* Wt., *Pellionia heyneana* Wedd., *Phyllanthus rheedii* Wt., *Psychotria curviflora* Wall., *Rhynchospora corymbosa* (L.) Britt., *Rungia pectinata* (L.) Nees, *Saprosma corymbosum* Bedd. and *Selaginella inaequalifolia* (Hook. & Grev.) Spring. In gaps created by fallen trees and over-fellings, *Elettaria cardamomum* (L.) Maton comes up naturally.

Under the shade of large trees and along streams, a number of ferns grow luxuriantly ; the commonest are the following : *Adiantum cuneipinnulum* Nair & Ghosh, *Angiopteris evecta* (Forst.) Hoffm., *Arachnoides aristata* (Forst.) Tindale, *Araiostegia hymenophylloides* (Bl.) Copel. *Asplenium inaequilaterale* Willd., *Cythea gigantea* (Hk.) Holtt., *C. nilgiriensis* Holtt., *Cyclosorus parastiticus* (L.) Farwell, *Diplazium bantamense* Bl., *Microlepia strigosa* (Thunb.) Presl, *Nephrolepis falcata* (Cav.) C. Chr., *Phymatodes lucida* (Roxb.) Ching., *Polystichum aculeatum* (L.) Schott., *Pteris quadriaurita* Retz. and *Sphenomeris chinensis* (L.) Maxon ex Maxon.

Orchids are fairly common in these forests. The common ground orchids are the following : *Calanthe masuca* Lindl., *Chrysoglossum maculatum* Hk. f., *Disperis zeylanica* Trimen, *Hetaeria ovalifolia* Benth., *Liparis wightiana* Thw. and *Peristylus aristatus* Lindl.

The dense tracts of *Ochlandra travancorica* Gamble covering extensive areas, often to the exclusion of all other vegetation, are quite characteristic of these hills.

2. **Subtropical montane forest type interspersed with grassy swards:**

This type occurs as continuous expanses of the evergreen forests above 1524 m. The inhospitable, exposed, precipitous rocks and rocky ground are covered by grasses and other herbaceous plants, while the sheltered faces and moist depressions of peaks offer a foothold for shola species characterised by the following : *Byrsophyllum tetrandrum* Hk. f., *Canthium neilgherrense* Wt., *Clausena heptaphylla* W. & A., *Eugenia mabaeoides* Wt., *Euphorbia santapaui* Henry, *Glochidion arboreum* Hk. f., *Hedychium flavescens* Carey ex Rosc., *Hedyotis purpurascens* Hk. f., *Impatiens leschenaultii* Wall., *Ligustrum decaisnei* Cl., *Moonia heterophylla* Arn., *Olea polygama* Wt., *Polyscias acuminata* Seem. and *Rapanea wightiana* Mez. The rocky slopes are often colonised by the endemic palm *Bentinckia condapanna* Berry ex Roxb.

Grassy downs so characteristic of the higher elevations of the Palni and Nilgiri mountains do not occur in these hills. There are, however, grassy swards of smaller dimensions with the usual hill grasses such as *Arundinella purpurea Steud.* var. *laxa* Bor., *Chrysopogon zeylanicus* Thw., *Eulalia phaeothrix* (Hack.) O. Ktze., *Isachne walkeri* W. & A., *Themeda cymbaria* Hack., *T. triandra* Forsk. and *Tripogon bromoides* R. & S.

The other herbaceous plants conspicuous amidst grasses are the following : *Anaphalis leptophylla* DC., *Coleus malabaricus* Benth., *Cyanotis arachnoides* Cl. var. *thwaitesii* (Hassk.) Rao & Kammathy, *C. pilosa* Schult. f., *Cyperus esculentus* L., *Eriocaulon melaleucum* Mast., *Exacum travancoricum* Bedd., *Fimbristylis consanguinea* Kunth, *Heracleum sprengelianum* W. & A., *Impatiens tomentosa* Heyne, *Knoxia heyneana* DC., *Laurembergia agastyamalayana* Henry, *Neanotis indica* (DC.) Lewis, *Orthosiphon comosus* Wt., *Phyllanthus gardnerianus* (Wt.) Baill., *P. macraei* Muell.-Arg. *Polygala heyneana* W. & A., *Rostellularia simplex* Wt. and *Senecio ludens* Cl.

One striking peculiarity of the vegetation of these hills lies in the preponderance of several typical Sri Lanka plants.

There is also a very appreciable endemic element in the flora of Tirunelveli Hills and the adjoining portion of Travancore hills (Kerala). *Acranthera grandiflora* Bedd., *Actinodaphne campanulata* Hk. f., *Apama barberi* Gamble, *Bentinckia condapanna* Berry ex Roxb., *Centratherum rangacharii* Gamble, *Didymocarpus ovalifolia* Wt., *D. repens* Bedd., *Dimorphocalyx beddomei* (Benth.) Airy Shaw, *Dioscorea wightii* Hk. f., *Diospyros barberi* Ram., *Diotacanthus albiflorus* Benth., *D. grandis* Benth., *Gluta travancorica* Bedd., *Grewia pandaica* Drumm., *Hedyotis albo-nervia* Bedd., *H. barberi* (Gamble) Henry & Subr., *H. purpurescens* Hk. f., *H. viscida* Bedd., *Hetaeria ovalifolia* Benth., *Hybanthus travancoricus* (Bedd.) Melch., *Impatiens auriculata* Wt., *I. travancorica* Bedd., *Lasianthus blumeanus* Wt., *L. cinereus* Gamble, *Litsea venulosa* Hk. f., *Ophiorrhiza grandiflora* Wt., *Piper barberi* Gamble, *Popowia beddomeana* Hk. f. & Th., *Psychotria nudiflora* W. & A., *Pterospermum obtusifolium* Wt., *Reidia singampattiana* Seb. & Henry, *Saprosma corymbosum* Bedd., *Sonerila tinnevelliensis* Fisch. and *Vernonia ramaswamii* Hutch., are some of the common endemics.

About 600 vascular taxa have been recorded from this under-explored region. The intensive studies have resulted in the discovery of several new taxa like *Elatostema lineolatum* Wt. var. *setosum* Henry, *Euodia lunuankenda* (Gaertn.) Merr. var. *tirunelvelica* Henry & Chandrab., *Euphorbia santapaui* Henry, *Hedyotis eualata* Bedd. var. *agastyamalayana* Henry & Subr., *Hedyotis gamblei* Henry & Subr., *Laurembergia agastyamalayana* Henry, *Marsdenia tirunelvelica* Henry & Subr., *Neanotis monosperma* (W. & A.) Lewis var. *tirunelvelica* Henry & Chandrab., *Ophiorrhiza tirunelvelica*

Henry & Subr., *Tylophora subramanii* Henry and *Zenkeria sebastinei* Henry & Chandrab., *Andrographis ceylanica* Wt., *Antidesma walkeri* (Tul.) Pax & Hoffm., *Eugenia mabaeoides* Wt. and *Neanotis nummularia* (Arn.) Lewis form new records for India. Many rare and imperfectly known species have been collected after a lapse of several years and based on these, descriptions of taxa like *Apama barberi* Gamble, *Dioscorea wightii* Hk. f., *Glycosmis macrocarpa* Wt., *Memecylon subcordatum* Cogn., *Piper barberi* Gamble, and *Rostellularia simplex* Wt., have been amended. The flora of Agastyamalai as observed, is therefore, very striking and extremely varied for so small an area.

All the herbarium specimens are incorporated in MH.

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