

# **STUDY AREA**

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### Phytogeographical Aspects of Study Area:

All the genera endemic to Peninsular India are restricted to Western Ghats and costal region. Each of the genus is very specific in its environmental and edaphic requirements. Most of them are found on lateratic plateaus of low and high altitude. Some of them grow on hanging rocks while other on slopes and still others on flat plateaus. Some of them viz. *Bhidea*, *Glyphochloa* and *Lophopogon* have more than one species and have comparatively wide distribution. But most of them are restricted to their ecological niche. Therefore, it is though worthwhile to provide details of study area including habitat, soil and climate.

The Western Ghats is the mountain ranges in the western part of Peninsular India that separates the Deccan plateau from a narrow costal strip along the Arabian Sea. Western Ghats starts from Tapi River and run parallel to the West Coast of India traversing the states of Maharashtra, Goa, Karnataka, Tamil Nadu and Kerala ending at Kanyakumari in the south. Western Ghats is sub-divided into Agasthyamalai, Periyar, Anamalai, Nilgiri, Talacauvery, Kudremukh and Sahyadri sub-clusters. These hills cover 60,000 km<sup>2</sup> and form catchment area for a complex of river systems that drain almost 40% of India. Western Ghats forms one of the three watersheds of India, feeding the perennial rivers of the Peninsular India. Important rivers viz, the Godavari, the Krishna and the Cauvery flow eastward and drain into the Bay of Bengal. Rivers viz. the Mondovi, the Zuari and the Periyar drain into the Arabian Sea. The smaller rivers include the Chittar, Bhima, Malaprabha, Manimuthar, Kabini, Kundali, Pachaiyar, Pennar and the Tambaraparani River. The Western Ghats has an average elevation of 1200 meters; however, in certain places, it rises abruptly to a height of over 2440 meters.

The Western Ghats in Maharashtra, locally known as Sahyadris lie roughly between 15° 60' and 20° 75'N and between 72° 60' and 74° 40' E covers about 1600 km<sup>2</sup> area. They are also referred as Northern Western Ghats which extended from river Tapi in the north to Goa-Karnataka in south. The important hill station viz. Mahableshwar-Panchgani and highest peak Kalsubai has a height of 1646 meters while Salher has height of 1567 meters.

The unique feature of the Sahydri and Konkan region are the lateratic plateaus which support growth of idiosyncratic grasses many of which are endemic

to these plateaus. Most of the herbaceous endemics are found restricted to these lateritic plateaus. The lower costal plateaus support growth of species belonging to *Ischaemum*, *Glyphochloa*, *Bhidea*, *Danthonidium* etc. while other genera show altitudinal stratification. The tablelands of higher altitude in Maharashtra enjoy cloudy misty climate from May end to October and possess very characteristic herbaceous ephemeral vegetation. Number of herbaceous species are found to be endemic to these plateaus. More or less cool pleasant temperature prevails over these plateaus almost throughout year.

**Geology:**

The Western Ghats is not mountains, but the faulted edge of the Deccan plateau. They are believed to have been formed during the break-up of the super continent of Gondwana some 150 million years ago. Basalt is the predominant rock found in the hills reaching a depth of 3 km. Other rock types found are charnockites, granite gneiss, khondalites, leptynites, and metamorphic gneisses with detached occurrence of crystalline limestone, iron ore, dolerites and anorthosites. Residual laterite and bauxite ores are found in the southern hills.

**Climate:**

Climate in the Western Ghats varies with altitudinal gradation and distance from the equator. The lower parts of the Western Ghats have humid and tropical type of climate. The elevated regions (1500 m and above in north and 2,000 m and above in the south) have a more temperate climate. Average annual temperature here is around 15°C. Mean temperature varies from 24°C in the north to 20°C in the south. In the Western Ghats the climate is largely modified by the winds as they play a major role in the seasonal cycle. During the monsoon season between June and September, the unbroken, Western Ghats chain acts as a barrier to the moisture laden clouds. Rainfall in this region averages 3,000 – 4,000 mm with localized extremes touching 9,000 mm. The eastern region of the Western Ghats which lie in the rain shadow receive far less rainfall averaging about 1,000 mm bringing the average rainfall figure to 2,500 mm. The northern part of Western Ghats in Maharashtra receive heavy rainfall, but are followed by long dry spells. The climate over higher plateaus remains pleasant almost throughout year.

**Soil:**

The soil mainly consists of the derivatives of the ancient metamorphic rocks in India, rich in iron and manganese. There are exposed lateritic rocks along the coastal hills which appear black and are barren and mostly unfit for plant growth. The soil of Western Ghats is gravelly type. The lateritic plateaus possess very peculiar monsoon vegetation adapted to the region and shows high endemism.

**Herbaceous Vegetation of lateritic plateaus:**

The lateritic plateaus of lower altitude in Konkan region consist of herbaceous monsoon vegetation. The plant communities mainly consist of species of *Utricularia*, *Eriocaulon*, *Murdania*, *Drosera*, *Dimeria*, *Xyris*, *Danthonidium*, *Bhidea*, *Glyphochloa*, *Ischemum*, *Ophioglossum*, *Lepidagathis*, *Striga*, *Trithuria*, *Euphorbia*, *Smithia*, *Gigaspsis*, *Senecio* etc. The ponds and puddles of these lateritic plateaus possess *Rotala* species, *Oryza rufipogon*, *Wiesneria triandra* etc. Many of the species are endemic and adapted to these lateritic plateaus. The grass genera endemic to these plateaus include *Bhidea*, *Danthonidium* and *Glyphochloa*.

The lateritic plateaus of higher altitude possess peculiar monsoon vegetation composed of species of *Utricularia*, *Impatiens*, *Eriocaulon*, *Murdania*, *Drosera*, *Dimeria*, *Danthonidium*, *Bhidea*, *Glyphochloa*, *Ischaemum*, *Ophioglossum*, *Lepidagathis*, *Habenaria*, *Peristylis*, *Scillia*, *Drimys*, *Iphigenia*, *Dipcadi*, *Senecio*, *Smithia*, *Gigaspsis*, *Aponogeton*, *Flemingia*, *Curcuma*, *Euphorbia*, *Ceropegia*, *Rotala* etc. The ponds and puddles of higher plateaus possess *Rotala densiflora*, *Pogostemon decanensis*, *Mnesithea veldcampii*, *Aponogeton satarensis* etc. Number of the species are endemic and adapted to these plateaus. Grass genera endemic to these plateaus include species of *Glyphochloa*, *Bhidea*, *Pseudodichanthium* and rarely *Danthonidium*.

Certain grass genera viz. *Hubbardia*, *Pseudodichanthium*, *Pogonachne* and *Trilobachne* are adapted to grow on hanging vertical rocks and on westward slopes of Western Ghats. They are associated with species of *Utricularia*, *Ischemum*, *Arundinella* and *Arthraxon*. Many of which are endemic. Thus grass genera endemic to Western Ghats are mainly restricted to plateaus and hanging rocks.