

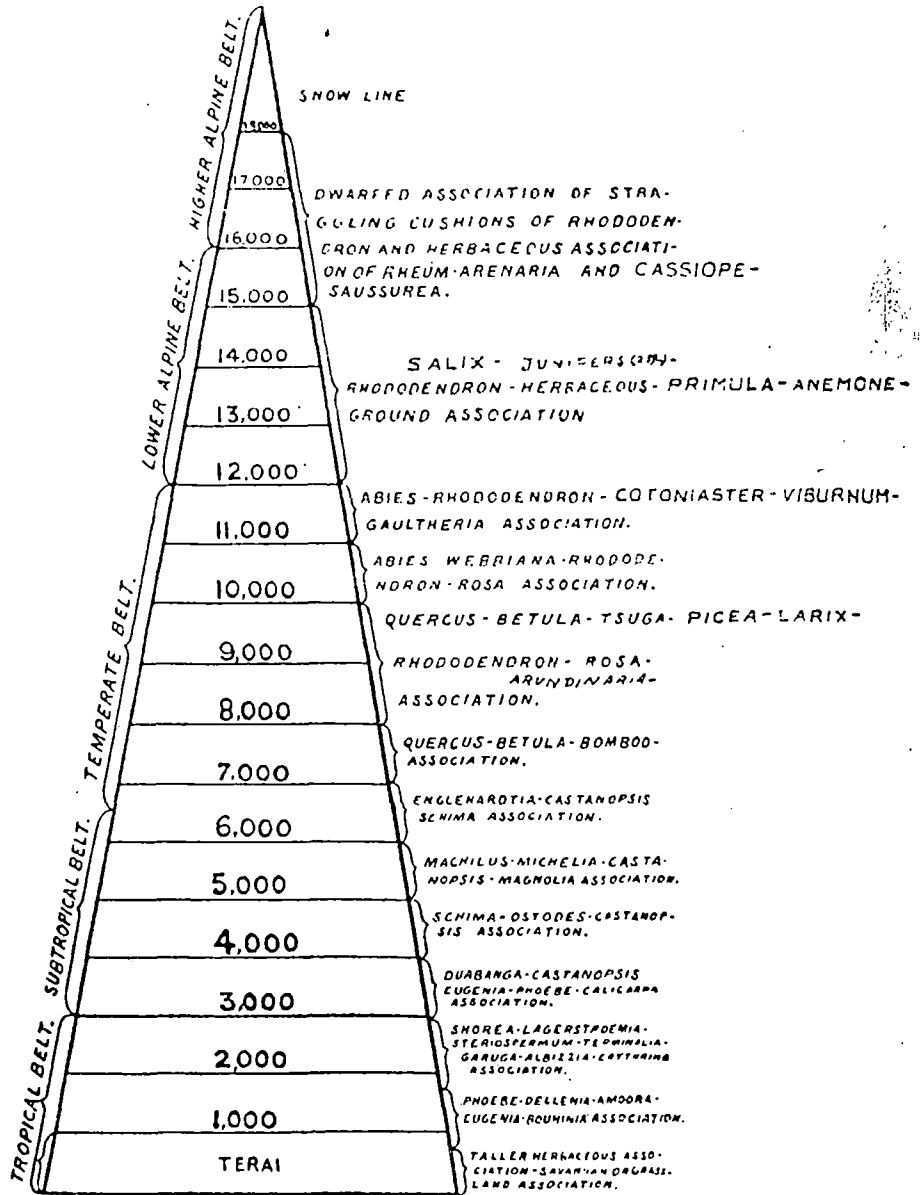
FLORAL DISTRIBUTION IN DARJEELING DISTRICT

That the flora of India is both abundant and rich in every kind and description of plants is well known. On account of the tremendous variability in climate and general features, the country is a veritable emporium of medicinal plants. This particularly the case with the great chain of Himalaya mountains which stretches from the north-western to the north-eastern boundaries of the Indian peninsula. At the north-western end, this range gradually merges with the Karakorum mountains described as the roof of the world, where the temperatures at higher altitudes resemble those of the arctic regions. On the north-eastern side the climate is dry and cold at higher altitudes which are beyond the range of the monsoon and which adjoin Tibet. At lower altitudes, the climate is damp and warm such as encountered in the tropical regions. It is not surprising, therefore, that vegetation practically from all parts of the world is represented along this vast range of mountain. In fact, these mountainous regions have always been considered to be the repository of a vast variety of plants with potent medicinal properties<sup>117</sup>.

Application of various recipes of herbs and herbal charms which are most interesting and in some cases highly effective for curing many diseases seemed to have been in practice accompanied with chanting of spells as early a period as 4000 B.C. The mysticism of the herbal charms is also mentioned in the Atharva and Rig Veda<sup>117</sup>.

The district of Darjeeling lies between 26° 31' and 27° 13' North latitude and 87° 59' and 88° 53' East longitude. Its total area is about 3000 sq.km.<sup>118</sup>. Floristically<sup>119</sup>, Darjeeling is one of the richest districts in India with its various areas still due to be scientifically explored. The high amount of annual rainfall and other climatic, physiographic and aedaphic conditions combine themselves to provide the most conducive environment for richness in diversity of plant species. Even as far back as 1907, Sir Joseph Dalton Hooker, who was the first naturalist to study the botany of the Eastern Himalayas, had recorded 4000 different species of flowering plants, under 160 families, 280 species of ferns and their allies of which 8 were tree-ferns, 20 palms, 23 species of bamboo and 440 species of orchids. The diversity of species is always on the increase as a result of natural hybridization and immigration from neighbouring countries.

Darjeeling can be divided into two altitudinal zones, tropical and temperate. The former extends from the tarsi (200m) to an elevation of 1700 m, while the latter extends from 1700 to 3700 m at Sandakphu. Some of the dominant tree species of the tropical zone are; Shorea robusta, Albizia lebbek, Dillenia pentagyna, Bombax ceiba, Tectona grandis etc. At a little higher elevation, the above species are replaced by species of Castanopsis, Duabanga, Schima, Magnolia etc. The temperate zone is roughly divided into a lower non-coniferous and an upper coniferous and Rhododendron belts that constitute a conspicuous vegetation between 2700 and 3700 m elevations. There are at least 25 species of Rhododendron in this belt.



ALTITUDINAL SUCCESSION OF VEGETATION IN DARJEELING DISTRICT, WEST BENGAL

Conifers are represented by Abies densa, Picea morinda, Larix griffithii etc. and junipers. Other conspicuous trees are the species of Quercus, Acar, Betula, Alnus, Symplocos etc.

Though the district is rich in various kinds of medicinally important plants, continuous collection of these plants from the forest will ultimately destroy the resources and hence, the scientific cultivation of these plants should be undertaken for steady availability of the plants.

One of the primitive traits in the culture of the people of Darjeeling is the existence of spirituelists who also practised herbalism. Herbalism is now fast on the decline as there is no scientific system to collect and record information on the various medicinal uses of the plants by the native herbalists and for continuance of this knowledge from one generation to the other. It is strongly felt that the phytochemical and pharmaceutical evaluation of all these herbal medicine should be undertaken and the active principles of such medicines vis-a-vis their various interactions with the biological system should be critically studied. It is with this goal in view a local plant (Leucas aspera) was taken for phytochemical study and correlate any active principle therein for the plant's reported activity within the scope of work that was possible in our laboratory.

Leucas aspera<sup>120</sup> which is called "Chotehalukusa" in Hindi belongs to Labiateae family. The plant is fragrant and used as a pot herb. It is eaten in times of scarcity. It is commonly used as an antipyretic<sup>121</sup> in villages

of South India. The juice of the leaves is used as an external application for psoriasis, chronic skin eruptions and painful swellings<sup>121</sup>. In North Bengal, flowers are given with honey for cough and cold in children. An alcoholic extract of leaves shows anti bacterial activity against *Micrococcus pygeus* var *aureus* and *Escherichia*<sup>122</sup> *colli*. It is found that the tribal of North Bengal (Rajbanshis) use the root of the plant as oral contraceptive. It has also been observed that the aglycone part of glycoside isolated from the plant has paralyzing effect on heart.

#### MORPHOLOGICAL CHARACTERS OF LABIATAE

The plants included in this family have been classified into 180 genera and 3500 species<sup>123</sup>. This large family (also called lamiales) is of cosmopolitan distribution, with greatest representation in the Mediterranean region. The plants are of various types including shrubs, trees, herbaceous plants, bog plants and a few climbers. Many are xerophytic, the leaves protected by tucked-under margins, hairiness, waxy cuticles or reduced foliage, they are often aromatic. Stems very often 4-angular or 4-sided (with rounded corners). Leaves opposite and decussate or sometimes whorled, simple or very rarely pinnatisect exstipulate. Flowers more or less zygomorphic, often evidently 2-lipped, often small, solitary or in contracted cymes in the axils of leaves or bracts forming false 'whorls', which sometimes are crowded into heads or spikes, rarely cymes effuse. Calyx more or less tubular, persistent. Corolla with tubular base and 4-5 subequal lobes or 2-lipped, lobes imbricate in bud. Stamens inserted in the corolla tube, 2 or 4 perfect, subequal or

didynamous; anther cells sometimes confluent. Disc prominent, often irregular. Ovary free 4-lobbed or 4-partite, consisting of 2,3-celled and lobbed carpels, style arising from between the lobes, 2-fid or one arm suppressed. Ovules 1 in each cell, erect, anatropous. Fruit of 4 dry indehiscent "nutlets" attached by a small basal or oblique or a larger ventral areole. Seeds erect albumen scanty or 0, radicle inferior.

Many commercially important plants have been identified within this family e.g. *Ocimum* sp., *Mentha* sp., *Levondula* sp., *Pogostemon* etc.

Plants belonging to the genus *Leucas* are woolly, villous, rarely glabrate herbs, or undershrubs. Whorls axillary, usually distant. Calyx 10 nerved, striate, mouth equal or oblique, equally or unequally 6-10 toothed. Corolla tube included, annulate or not within; upper lip erect, concave, crown villous; lower spreading, 3-fid, middle lobe very large. Stamens 4, ascending, anthers conniving, cells divergicte at length confluent. Style subulate, posterior lobe obsolete. Nutlets ovoid, triquetrous, obtuse. There are 50 species available in Asia and Africa <sup>124</sup>.

*Leucas aspera* Spreng <sup>125</sup> :

Annual, erect or diffuse, stem stout hispid or scabrid, leaves 1-3 in. linear or oblong obtuse entire or crenate, whorls large terminal and axillary, bracts long linear and filiform, Calyx 1/3 - 2/3 in. tubular

curved smooth below green and ribbed and scabrid above contracted above the outlets. mouth small globose very oblique shortly irregularly toothed.

Distribution : From Sikkim and Bihar to the Punjab and Southward to Kenya Kuseri in India. These are also found in Mauritius, Java, Philippine islands.

Very variable. Stem erect, usually much diffusely branched from below, the branches 4-6 in., rather leafy, sometimes taller with erect branches and larger leaves 2/3 in. broad. Whorls often 1 in. diameter, very dense flowered and hispid. Calyx variable with short triangular teeth. Corolla small - whole plant fragrant.