

## THE NEED AND THE POSSIBILITY OF CULTIVATING RARE MEDICINAL PLANTS

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The climatological factors of East Pakistan are firstly, its geographical position in the globe determined by latitude and longitude which are 88 and 92°E and 21° and 26°N and secondly, its topographical feature which is mainly flat plain land, part of which goes under water during monsoon and is known as lowland. These lowlands become dry in winter after the monsoon is over except in the very lower reaches and natural depression which remain under water throughout the year. The other parts are known as high lands which in places are quite flat plain and in places rather undulating. There are hills of insignificant altitude towards the Eastern and South-eastern border of East Pakistan in the district of Sylhet, Mymensingh, Chittagong and Chittagong Hill Tracts. There are few ranges of Hills in Chittagong Hill Tracts district bordering Burma, the altitude of which reaches between 2000 to 3000 ft. above sea level.

The three great rivers, Ganges, Brahmaputra and Meghna of the Indo-Pakistan sub-continent meander through the flat plain of East Pakistan. Besides there are tributaries to the three rivers meeting them in the plain of East Pakistan. The confluences of all the three great rivers mentioned are also in the flat plain of East Pakistan. These rivers also send out numerous branches flowing towards the Bay of Bengal in South and South easterly direction. There are also numerous lagoons and creeks in the sea-board areas of East Pakistan when there is play of tide water from the sea. These are the swampy saline areas having the specialized natural vegetation of Mangrove flora.

The net-work of rivers furnishes humidity and deposition of large quantities of fertilizing silt. East Pakistan is subject to heavy monsoon rains with an annual average of 70 inches, the maximum reaching nearly 300 to 400 inches in the Eastern parts. The main characteristics of the seasons are therefore dry winter, dry spring and summer, wet summer and autumn. The dry period is from November to May and the wet period is from June to October. Although there is plenty of rainfall, yet it is not well distributed throughout the year, with the result that there is a protracted period of drought affecting the vegetation to a certain extent.

Edaphic characteristics of East Pakistan are

mainly alluvial and named after the name of the river deposition of the alluvial e.g. Gangetic alluvium, Tista silt and Brahmaputra alluvium. These are new alluvia besides which there are tracts of old alluvium whose origin is much older than that of the new alluvium.

The edaphic characteristics of the hills are still not known and they are termed as unclassified.

The richness of floristic composition of this part of the Indo-Pakistan sub-continent has been emphasised by such pioneer botanists, as Hooker, Prain, Duthei, Bedome, Kanjilal etc. Unfortunately, however, although the general floras of the vegetation of the area exist, yet a detailed floristic composition of different vegetations in different parts is still wanting. The result is that we do not have any detailed knowledge of vegetation and its floristic composition either on particular vegetation type basis, or on particular regional basis. The best method of study especially for the purpose of economic utilization, in my opinion, would be to study the vegetation on a regional basis from the view point of ecology.

The floristic composition of each ecological group should be determined both qualitatively and quantitatively. The technique recently developed including aerial photography and sample-section enumeration for studying ecological groups of natural vegetation should be adopted; and there cannot be two opinions about the adoption of a uniform technique in a world-wide study. With regard to taxonomic work, it may be pointed out that the work on the general flora of different parts of the sub-continent exists, as done by pioneer workers and in some cases work on flora of special areas also exist, as done by them. This was done more than half a century ago and in some cases more than a century ago. Although geographically the areas have remained the same, yet politically they are now different. Hence, it is very desirable that new floras should be worked out suited to the requirement of the present political boundaries; and in doing so attention should be paid to represent the floristic compositions both qualitatively and quantitatively in view of the requirement of the economic development of the country.

The richness of floristic compositions of East Pakistan is due to the fact that the Eastern and

South eastern part of the country is the meeting ground of the three main floristic regions e.g. Himalayan, Chinese and Malaya-Burman, in hills of Sylhet and Chittagong Hill tracts districts.

In a densely populated place like East Pakistan one has to look to the forests and the natural vegetation to get an idea of the richness of floristic composition, besides the artificial vegetation of field crops, gardens, and wastelands and fields. The main types of forests of East Pakistan are briefly described as follows :—

There are the evergreen, semi-evergreen and wet-deciduous forests occurring all along the Eastern and South-eastern boundaries of East Pakistan. They are very much like the Burma forests across the border, dipterocarpus spp. (Garjan) are typical trees of the belt, through the flora in all its story is extremely rich. The top story has civit (*Swietonia floribunda*), *Artocarpus*, *Chaplasa* and *Garjan*, below them *Amoora sterculia* spp. There are two more tiers below with a mass of vegetation, including bamboos. This type occurs in Chittagong Hill tracts and Chittagong districts and to a certain extent in Sylhet districts and cover about 1,30,000 acres.

The forests occur in the plains of Dacca, Mymensingh and to certain extent in Dinajpur districts on the old alluvium soil between the Brahmaputra and the Ganges in the upper half of East Pakistan, locally known as Madhupur jungles and borind respectively. This carries almost a pure crop of "Sal" (*shorea robusta*). The usual associates of "Sal" such as *Albiyza*, *Terminalia*, *Cassia* etc. occur here and there. There are about 2,60,000 acres of this forest.

There are typical mangrove forests of the Sunderbans occurring in the detoid formation in the districts of Khulna, Barisal and Chittagong. There are thick masses of stems and pneumatophores over a compact area of about 650,000 acres. The species are met with a *Sundri* (*Heitera minor*) *Rhizophora mucronata*, *Ceriops* spp., *Excaceria agalocha*, *Carapa* spp. etc.

From the viewpoint of richness of the floristic composition no less stress is to be laid on artificial vegetation. Hence, mention may be made of artificial vegetation (the agricultural crops) like rice, wheat, sugarcane, pulses and oilseeds, the main food crops, and the outstanding cash crop the jute. The weeds of these field crops are also rich contributing factors towards the floristic composition of the country.

So are also the trees, shrubs, herbs of waste-

land areas and fallow lands. besides, there are tropical and sub-tropical fruits like mango, litchies, jack, jambolan, wood-apple and citrus fruits. Coconuts and betelnuts are also grown round the villages. Additionally fruits like banana, pineapple, papaya and many kinds of vegetables are also grown as annual plants.

The types of forests already described and the gardens of fruit trees have undergrowths and lianes, which are also very rich in floristic composition.

Obviously, the richness of floristic composition offers an immense source of raw materials for the preparation of medicines and antidotes by Ayurvedic system which has been in vogue from the very early history of Indo-Pakistan civilization. The aborigines have been using the plant resources for medicinal purpose to cure their diseases and ailments from pre-historic times. Then in the middle ages when the Unani (Greek) or Hekimi system came into practice for the cure of diseases and ailments, they too found their raw materials for preparation of medicines and antidotes in the rich plant resources of the country. In this way, this area gained an importance as a rich source of medicinal plants. Thus we find that quite a number of plants are included in the British pharmacopoeia which are plants of East Pakistan.

The question regarding the medicinal plants, which are sparsely or scarcely available in natural growth, is becoming serious day by day. Sometime in 1940 before Independence, the then Imperial Council of Agriculture Research became concerned itself about the problem and appointed a committee to find out ways and means for the cultivation of such medicinal plants. I understand that since then, India has gone much ahead with projects for the cultivation of medicinal plants.

A new situation, however, was created after the independence of India and Pakistan in 1947, which required a fresh appraisal of our resources of medicinal plants. This fresh appraisal was necessary firstly to become self-sufficient as far as possible in the matter of preparation of medicine locally from medicinal plants under the various systems :—Ayurvedic, Hekimi, Allopathic and Homeopathic etc., and secondly to earn foreign exchange by exporting raw materials for the preparation of medicine in foreign countries.

Accordingly as per the proceedings of 4th meeting of the Committee on Food, Pharmaceutical and Chemical Industries of the Provincial Industries Advisory Council, East Pakistan, held on 2-11-54, a sub-committee was constituted under the Chairmanship of the author for the necessary appraisal

and report. The sub-committee consisted of one Professor of Pharmacology, Medical College, Dacca, one representative of Ayurvedic system of medicine and another of the Hekimi system of medicine and the other representing pharmaceutics.

As a result of the appraisal a list of the medicinal plants was prepared which are usually required for preparing medicines in East Pakistan. In appraising the various plants it was found that there exists a degree of importance of the medicinal plants. So it was decided that the names of the medicinal plants should be marked according to their importance as a source of medicines in the following manner against their names.

- (i) R+++.....Most essential.
- (ii) R++.....More essential.
- (iii) R+.....Essential.
- (iv) R.....Less essential.

The list of the plants thus marked is given in Appendix.

Ever since the use of plants for medicine under various systems of medicine, the collection has been made of the required plants from wild growth in most cases. In some cases, however, the required plants were encouraged to grow in their natural habitat. It is only in a few cases that the necessary plants are cultivated under garden conditions.

The present manner of collection of medicinal plants from wild growth is nothing but a continuation of the age old practice of collection of medicinal plants. The collectors are the poorest of the poor and illiterate, come into contact with either an Ayurvedic or a Hekimi practitioner, who employs him on very paucity daily wages to collect the required medicinal plants. This sort of collector cannot be reliable, does not gain good experience due to the fact that the requirement of individual practitioner cannot be large enough to keep the collector in employment for long.

There are shops who deal with medicinal plants. These shop-keepers engage plant collectors for collecting medicinal plants they sell. These collectors have good scope of employment, but they sell their collection by weight, so there is always a tendency of adulterating the genuine.

Besides, there are large scale manufacturers of pharamaceutics of Ayurvedic, Hekimi and modern medicines. They have also their collectors. These collectors have good employment with the manufacturers, hence become quite experienced and reliable. There is also some export business of the raw materials of medicinal plants. The collections

of these are also done by collectors. As these collectors have to deal with only a limited number of species, they become trained in course of time and become quite useful for collecting the required species for the export business. But sometime they become unscrupulous and try to adulterate the genuine.

From the above it will be clear that amateurs are the collectors of medicinal plants from wild growth, and there is no organisation to produce trained collectors. The result is that a sort of loot is going on, on our resources of medicinal plants. No thought is being given for their re-generation in nature. This fact has come out in our appraisal of medicinal plants of East Pakistan under two broad heads :—

- (a) Amply available in natural growth.
- (b) Scarcely available in natural growth.

In West Pakistan, the Ministry of Agriculture have a scheme under which the Forest Institute at Abotabad has a section for the survey, study and culture of medicinal plants. Similarly, there is one for the cultivation of medicinal plants in Chittagong in East Pakistan. A good amount of useful work is going on in these places on medicinal plants. Besides, under the auspices of Pakistan Council of Scientific and Industrial Research a scheme on the cultivation of *Rauwolfia serpentina* Benth for which thanks are due to Dr. Salimuz-zaman Siddiqui, Director, P.C.S.I.R. is being carried out. A paper on the cultivation of the species done under the scheme is already published in the journal of the Council.

Fortunately, Pakistan within her boundaries has suitable climatic, soil and altitudinal conditions to cultivate quite a number of highly valuable medicinal plants. What is needed is a bold attitude and right procedure to start the work as soon as possible.

The following are the steps of the right procedure I like to suggest.

- (1) The study of pharmacognosy should be started with the help of systematic botanists and pharmacologists; and more proper training should be arranged for producing trained collectors of medicinal plants.
- (2) To establish gardens of medicinal plants, where specimens of the various plants should be grown, not only to serve as living museum of medicinal plants, but also as an established and perma-

nent source of obtaining plant materials (seeds, cuttings, etc.) for the cultivation of medicinal plants in the country.

- (3) Agronomical experimental works should be undertaken by the appropriate authority to investigate and find out the most economic method of

cultivating medicinal plants having active principles for commercial exploitation.

- (4) A herbarium of medicinal plants should be established and maintained.

All the four steps can be worked out in the proposed Drug Research Institute under P.C.S.I.R.

### Appendix

#### LIST OF MEDICINAL PLANTS

\* R+++ , Most essential; R++ , More essential; R+ , Essential; R- Less essential; w, wild; c, cultivated.

S.No.	Botanical name		Local name	Parts of the plant	wild or cultivated
1.	<i>Abies webbiana</i>	R—*	Talispatra	Leaves and plants	
2.	<i>Abroma augusta</i>	R+	Olotkambal	Root bark	w.
3.	<i>Abrus precatorius</i>	R+	Kunch	.. Roots, seeds & barks	w.
4.	<i>Abutilon indicum</i>	R—	Potari	.. Bark, root, leaves, seeds.	w.
5.	<i>Acacia arabica</i>	R++	Babla	.. Bark, gum	w.
6.	<i>Areca catechu</i>	R+	Khayer	.. Extract from the wood	w. & c.
7.	<i>Acalypha indica</i>	R+	Muktajhari	.. Leaves, stems & roots	w.
8.	<i>Acanthus ilicifolius</i>	R+	Hargoza	.. whole plant	w.
9.	<i>Achras sapota</i>	R—	Sapeda	.. Fruit, seed & bark	w.
10.	<i>Achyranthes aspera</i>	R+	Apang	.. Leaves, stems, seeds & roots.	w.
11.	<i>Aconitum ferox</i>	R+	Mithabish	.. Dried roots	w.
12.	<i>Aconitum heterophyllum</i>	R+	Attees	.. Roots	w.
13.	<i>Acorus calamus</i>	R+	Bach	.. The dried rhizome.	w.
14.	<i>Adhatoda vasica</i>	R++	Basaka	.. Leaves, roots, flowers & bark.	w. & c.
15.	<i>Aegle marmelos</i>	R++	Bel	.. Leaves, and fruits	w.
16.	<i>Ageratum conyzoides</i>	R—	Dochunty	.. Leaf, stem	w. & c.
17.	<i>Allium cepa</i>	R+	Pyanj	.. Bulb	c.
18.	<i>Allium sativum</i>	R+	Rasun	.. Bulb	c.
19.	<i>Alocasia indica</i>	R—	Mankachu	.. Roots	c.
20.	<i>Aloe vera</i>	R+	Ghritakumari	.. Dried juice of leaves & pulp	w.
21.	<i>Alstonia scholaris</i>	R+	Chhatim	.. Bark	w.
22.	<i>Amaranthus spinosa</i>	R—	Kantanate	.. Roots, seeds	w.
23.	<i>Amorphophallus campanulatus</i>	01 R+	Corm	..	w. & c.
24.	<i>Ananas sativus</i>	R++	Anaras	.. Fruit	w. & c.
25.	<i>Anisomeles ovata</i>		Gabura	.. Whole plant and essential oil	w.
26.	<i>Andropogon muricatus</i>	R+	Bena or Khaskhas	—	w.
27.	<i>Anona squamosa</i>	R—	Atta	.. Seeds	w. & c.
28.	<i>Anthocephalus cadamba</i>	R—	Kadam	.. Bark, leaves	w. & c.
29.	<i>Andrographis paniculata</i>	R++	Kalmegh	.. Whole plant	w.
30.	<i>Argemone mexicana</i>	R—	Shealkanta	.. Roots, seeds & leaves	w.
31.	<i>Artemisia vulgaris</i>	R—	Lanagach or nagdana	.. Plant, plant-juice & leaves	w.
32.	<i>Aristolochia indica</i>	R+	Ishermul	.. Leaves, roots & seeds	w.
33.	<i>Argyrea speciosa</i>	R+	Bishtarak	.. Roots and seeds	w.
34.	<i>Asclepias curassavica</i>	R—	Kaktundi	.. Roots	w.
35.	<i>Asparagus racemosus</i>	R+	Satamuli	.. Roots & seeds	w. & c.
36.	<i>Atropa belladonna</i>	R+	Yebruj	.. Leaves & roots	w.
37.	<i>Azadirachta indica</i>	R+	Neem	.. Leaves, seeds & gum	w.
38.	<i>Bambusa aurandinacea</i>	R—	Roots & Bans	.. Roots tender bark of young pulp	w. & c.
39.	<i>Barleria prionitis</i>	R—	Kantajati	.. Bark, roots, leaf, whole plant.	w.
40.	<i>Barringtonia acutanula</i>	R—	Hijal	.. Leaf, fruit, root, bark.	w.
41.	<i>Basella rubra</i>	R—	Puin	.. Whole herb, juice of leaves.	w. & c.
42.	<i>Bauhinia variegata</i>	R+	Raktakanchan	.. Bark, root	w.
43.	<i>Balsamodendron agallocha</i>	R+	Coogul	.. Gum	w.
44.	<i>Berberis asiatica</i>	R+	Daruharidra	.. Root bark	w.
45.	<i>Berberis vulgaris</i>	R—	Bedana	.. Root bark	c.
46.	<i>Benincasa carifera</i>	R—	Chalkumra	.. Fruit and fruit juice	c.
47.	<i>Biophytum sensitivum</i>	R+	Jhalai	.. Leaf and seed	w.
48.	<i>Bixa orellana</i>	R—	Latkan	.. Plant, roots bark seed, pulp.	w.
49.	<i>Blumea lacera</i>	R+	Kukursunka	.. Plant, leaf juice and roots	w.

50.	<i>Boerhaavia diffusa</i>	R+	Punanava	..	Whole plant with roots	w.
51.	<i>Bombax malabaricum</i>	R++	Shimul	..	Gum, seed, flower, bark	w.
52.	<i>Bonnaya serrata</i>			..		
53.	<i>Bryophyllum calycinum</i>	R-	Patharkunchi	..	Leaf	w.
54.	<i>Butea frondosa</i>	R-	Palash	..	Leaves, bark, gum and seeds	w.
55.	<i>Caesalpinia bonducella</i>	R+	Hata	..	Seeds	w.
56.	<i>Calophyllum inophyllum</i>	R+	Punalpunnag	..	Bark, seed, leaf	w.
57.	<i>Calotropis gigantea</i>	R-	Akanda	..	Leaves	w.
58.	<i>Cannabis sativum</i>	R+	Ganja	..	Stem, leaf & flower.	w.
59.	<i>Capsicum minimum</i>	R-	Lankamarich	..	Fruit	c.
60.	<i>Capparis sepiaria</i>	R-	Kulekhara	..	Plant	w.
61.	<i>Careya arborea</i>	R+	Kumbhi	..	Bark, flower, root	w.
62.	<i>Carica papaya</i>	R++	Pepay	..	Fruit & exudation	c.
63.	<i>Cassia carandas</i>	R+	Buiche, karamcha	..	Root & fruit	w.
64.	<i>Carum copticum</i>	R++	Jowan	..	Seeds	c.
65.	<i>Carum carui</i>	R+	Sheajira	..	Seeds	c.
66.	<i>Cardiospermum halicacabum</i>	R-	Hataphatkari, Shibjhul	..	Roots, leaf, whole plant & seed	w.
67.	<i>Cassia fistula</i>	R++	Sondhalu	..	Leaves, fruits & barks	w.
68.	<i>Cassia angustifolia</i>	R++	Shonamukhi	..	Leaves	w.
69.	<i>Cassia oxidenyalis</i>	R+	Aswara	..	Leaves, fruits & roots	w.
70.	<i>Cassia tora</i>	R+	Chakunda	..	Roots, seeds & leaves	w.
71.	<i>Cassia sophera</i>	R+	Kalkasunda	..	Roots, leaves & seeds	w.
72.	<i>Cedrus deodara</i>	R+	Debdaru	..	Bark	w.
73.	<i>Cicer arietinum</i>	R+	Chhola	..	Seed	c.
74.	<i>Cinchona cortex</i>	R++	Chinchona	..	Bark	c.
75.	<i>Cissampelos parvira</i>	R-	Akanda	..	Roots & leaves	w.
76.	<i>Cinnamomum tamala</i>	R++	Tejpat	..	Leaf & bark	c.
77.	<i>Citrus medica</i>	R++	Lebu	..	The fruits	w. & c.
78.	<i>Citrullus colocynthis</i>	R-	Makal	..	-do-	w.
79.	<i>Clerodendron infortunatum</i>	R-	Vant	..	Leaves	w.
80.	<i>Clerodendron siphonanthus</i>	R-	Bamunlati	..	Leaves & roots	w.
81.	<i>Cleome viscosa</i>	R-	Hurhuria	..	Leaf, root, seed	w.
82.	<i>Clitoria ternatea</i>	R-	Aparajita	..	Roots, flowers & seeds	w.
83.	<i>Coccinia indica</i>	R+	Telakucha	..	Leaves, flowers	c.
84.	<i>Cocculus villosus</i>	R+	Huyer	..	Roots & leaf	w.
85.	<i>Coffea arabica</i>	R+	Coffee	..	Leaves	c.
86.	<i>Corchorus capsularis</i>	R+	Tita pat	..	Leaves	c.
87.	<i>Coriandrum sativum</i>	R+	Dhania	..	Seeds, leaves	c.
88.	<i>Croton tiglium</i>	R-	Jaypal	..	Seeds.	w. & c.
89.	<i>Cuminum cyminum</i>	R++	Jeera	..	Seeds	c.
90.	<i>Cucumis sativus</i>	R+	Sasa	..	Seeds	c.
91.	<i>Curculigo orchioides</i>	R+	Talamuli	..	Roots	w.
92.	<i>Curcuma longa</i>	R+	Amada	..	Rhizome	w.
93.	<i>Curcuma amada</i>	R+	Haldi	..	Rhizome	c.
94.	<i>Curcuma aromatica</i>	R-	Banhalud	..	Rhizome	w.
95.	<i>Curcuma zedoaria</i>	R+	Shati	..	Rhizome	w.
96.	<i>Cuscuta reflexa</i>	R-	Algusi	..	Plant, stem & seeds	w.
97.	<i>Cynodon dactylon</i>	R-	Dub	..	Whole plant	w.
98.	<i>Cyperus rotundus</i>	R+	Mutha	..	Tuber (in the roots)	w.
99.	<i>Daemia extensa</i>	R-	Chhagal bati	..	Plant, root bark, leaf & leaf juice	w.
100.	<i>Datura fastosa</i>	R++	Kaladhutra	..	Leaves, stems & roots	w.
101.	<i>Datura stramonium</i>	R++	Sadadhatura	..	Leaves, stems & roots	w.
102.	<i>Daucus carota</i>	R+	Gajar	..	Conical roots	c.
103.	<i>Desmodium gangeticum</i>	R+	Salpani	..	Root, plant	w.
104.	<i>Dillenia indica</i>	R-	Chalta	..	Fruit, bark	w.
105.	<i>Dipterocarpus turbinatus</i>	R-	Garjan	..	Wood oil & resin	w.
106.	<i>Dioscorea bulbifera</i>	R++	Meteealu	..	Tuber, skin & juice of yam	w. & c.
107.	<i>Diospyros embryopteris</i>	R-	Gab	..	Fruit, seed, bark	w.
108.	<i>Dregea volubilis</i>	R-	Titakunga	..	Leaf, plant	w.
109.	<i>Eclipta alba</i>	R+	Kesori	..	Leaves	w.
110.	<i>Elephantopus scaber</i>	R-	Gajjalata	..	Plant, roots & leaf	w.
111.	<i>Enhydra fluctuans</i>	R-	Higgeca	..	Leaf	w.
112.	<i>Embelia ribes</i>	R+	Biranga	..	Fruits	w.
113.	<i>Ephedra vulgaris</i>	R++	Samakalpalata	..	Leaves	w.
114.	<i>Erythrina indica</i>	R-	Paltemadar	..	Bark	w.
115.	<i>Eugenia jambolana</i>	R+	Jam	..	Seeds	w. & c.
116.	<i>Euphorbia nerifolia</i>	R-	Hidjaaona	..	Plant, plant juice & roots	w.
117.	<i>Euphorbia pilulifera</i>	R-	Berakuru	..	Plant, root	w.
118.	<i>Eupatorium ayapana</i>	R+	Ayapana	..	Plant, root	w.
119.	<i>Euryale ferox</i>	R+	Makhana	..	Leaf, seed	w.

120.	<i>Feronia elephantum</i>	R—	Kathbel	.. Fruits, leaves & gum	w. & c.
121.	<i>Ficus bengalensis</i>	R—	Bal	.. Bark, milky juice, all parts of plant	w.
122.	<i>Ficus glomerata</i>	R+	Jaggadumur	.. Roots, leaves & fruits	w.
123.	„ <i>hispida</i>	R+	Dumur	.. -do-	w.
124.	„ <i>infectoria</i>	R—	Pakur	.. Fruit, bark, all parts	w.
125.	„ <i>religiosa</i>	R—	Aswatha	.. Exudation, bark, dried fruit	w.
126.	<i>Flacourtia cataphracta</i>	R—	Paniala	.. Leaf, bark, fruit	w.
127.	<i>Foeniculum vulgare</i>	R+	Mauri	.. Seeds	c.
128.	<i>Gloriosa superba</i>	R++	Bishalanguli	.. Tubers	w.
129.	<i>Glycyrrhiza glabra</i>	R++	Jasthamadhu	.. Roots, and bark	w.
130.	<i>Gmelina arborea</i>	R—	Gameri	.. Roots, leaves and fruits	w.
131.	<i>Gynocardia odorata</i>	R+	Chalmugra	.. Seed, fruit & oil from seed	w.
132.	<i>Heliotropium indicum</i>	R—	Hatisura	.. Leaves	w.
133.	<i>Hemidesmus indicus</i>	R+	Anantamul	.. Roots	w.
134.	<i>Herpestis monnieia</i>	R+	Brahmisak	.. Leaves	w. & c.
135.	<i>Hibiscus rosa sinensis</i>	R+	Jaba	.. Roots, leaf, flower, buds.	c.
136.	<i>Holarrhena antidyenterica</i>	R++	Kuchi bark	.. Bark	w.
137.	<i>Hydnocarpur wightiana</i>	R+	Angligadan	.. Seeds & fatty oil from seeds	w.
138.	<i>Hydnocarpus castanea</i>	R+	Chalmugra	.. Seed, fruit & oil from seeds	w.
139.	<i>Hydrocotyle asiatica</i>	R++	Thankni	.. Leaves, & flower	w.
140.	<i>Hygrophyllus spinosa</i>	R—	Kuliakhura	.. Whole plant	w.
141.	<i>Ipomoea coccinea</i>	R—	Tarulata	.. Leaves	c.
142.	<i>Hyacinthus orientalis</i>	R—	Waterhyacinth	.. Root & juice	w.
143.	<i>Ichnocarpus frutescens</i>	R—	Shamlata	.. Creeper & leaves	w.
144.	<i>Ipomoea hederacea</i>	R—	Nilkalmi	.. Dried seeds, roots	w.
145.	<i>Ipomoea pescaprae</i>	R—	Chogalkuri	.. Leaves	w.
146.	„ <i>reptans</i>	R—	Kalmisak	.. Leaves	w.
147.	„ <i>turpethum</i>	R—	Teori	.. Root, stem & root bark	w.
148.	<i>Ixora parviflora</i>	R—	Rangan	.. Root, fruit	w.
149.	<i>Jatropha gossypifolia</i>	R—	Lalverenda	.. Bark, leaf	w.
150.	<i>Justicia gendarussa</i>	R—	Jagatmadan	.. Leaf & plant	w.
151.	<i>Lagenaria vulgaris</i>	R+	Kadu	.. Seeds	c.
152.	<i>Lantana camara</i>	R—	Sage	.. Flowers & seeds (oil)	w.
153.	<i>Lathyrus sativus</i>	R—	Khesari	.. Leaves & grains	c.
154.	<i>Lawsonia alba</i>	R++	Mendi	.. Leaf, bark	w.
155.	<i>Leucas aspera</i>	R—	Chhotohalkusa	.. Leaf & plant	w.
156.	<i>Leucas linifolia</i>	R—	Halkusa	.. Leaf	w.
157.	<i>Linum usitatissimum</i>	R+	Tisi	.. Seeds	c.
158.	<i>Lippia nodiflora</i>	R—	Bheyokra	.. Plant, tender stalks leaves	w.
159.	<i>Luffa acutangula</i>	R+	Jinga	.. Fruit, seed, leaf	w.
160.	<i>Mangifera indica</i>	R+	Am	.. Root, bark, fruit	c.
161.	<i>Mallotus philippinensis</i>	R—	Kamli	.. Leaf, fruit	w.
162.	<i>Michelia champaca</i>	R—	Champa	.. Leaf, seed, oil bark flower fruit	w.
163.	<i>Mimosa pudica</i>	R+	Lajjabati	.. Root leaf, stem	c.
164.	<i>Mimusops elengi</i>	R+*	Bakul	.. Bark	w. & c.
165.	<i>Mentha arvensis</i>	R++	Padmina	.. Leaves	w.
166.	<i>Momorndica cochinehsis</i>	R+	Kakrol	.. Fruits & seeds	w. & c.
167.	<i>Momoridica charantia</i>	R+	Cchhe	.. Leaves, fruits & seeds	c.
168.	<i>Monochoria vaginlis</i>	R—	Nanka	.. Root & bark	w.
169.	<i>Moniera cumeifolia</i>	R+	Brajmisak	.. Leaves	w. & c.
170.	<i>Moringa pterygospermum</i>	R+	Saina	.. Bark, flower, seeds	w. & c.
171.	<i>Mucuna pruriens</i>	R—	Alkusi	.. Seeds & roots	w.
172.	<i>Mollugo pentaphylla</i>	R—	Julpupra	.. Leaf	w.
173.	<i>Mollugo hirta</i>	R—	Userasag	.. Plant, dried plant	w.
174.	<i>Musa pardisiaca</i>	R—	Kala	.. Leaves, stems & roots	c.
175.	<i>Nelumbium speciosum</i>	R+	Padmapadu	.. Seeds, roots	w.
176.	<i>Nerium odorum</i>	R—	Karachi	.. Roots, flowers & seeds	w. & c.
177.	<i>Nyctanthes arbortristis</i>	R++	Sheuli	.. Leaves	w. & c.
178.	<i>Nymphaea rubra</i>	R+	Raktapadma	.. Seeds, flowers	w.
179.	„ <i>stellata</i>	R+	Saluk	.. Seeds, flower	w.
180.	<i>Nardostachys jatamansi</i>	R+	Jatamangsi	.. Root, rehizoma, plant.	w.
181.	<i>Ocimum sanctum</i>	R+	Tulsi	.. Leaves, roots & seeds	w. & c.
182.	<i>Ocimum basilicum</i>	R+	Bayitulsi	.. The whole plant	w. & c.
183.	<i>Oldenlandia corymbosa</i>	R+	Khetpapra	.. The whole plant	w.
184.	<i>Opuntia dillenii Fanimanasa</i>	R—	Sanpatti	.. Plant, leaf, fruit	w.
185.	<i>Oroxylum indicum</i>	R—	Amrulsak	.. Root, bark, fruit seeds.	w.
186.	<i>Oxalis corniculata</i>	R++	Dudhiala	.. Leaves	w.

187.	<i>Oxystelma esculentum</i>	R+	Endhabhadali	.. Plant fruit, fresh root	w.
188.	<i>Poederia foetida</i>	R+	Postadana	.. Skin, roots & leaves	w.
189.	<i>Papaver somniferum</i>	R++	Salpa or sowa	.. Juice of unripe capsules	c.
190.	<i>Peucedanum graveolens</i>	R+	Isband	.. Seed, fruit	w.
191.	<i>Peganum harmala</i>	R-	Golmarich	.. Root, seed	w.
192.	<i>Piper nigrum</i>	R++	Pan	.. Fruit	c.
193.	.. betle	R+	Kanabchini	.. Leaves	c.
194.	.. cubeba	R+	Peeul	.. Fruit	c.
195.	.. longum	R++	Kati	.. Root, fruit	w.
196.	<i>Picrorhiza kurrooa</i>	R+	Isapgul	.. Rhizome	w.
197.	<i>Plantago isphngul</i>	R++	Lalchita	.. Seeds	w.
198.	<i>Plumbago rosea</i>	R-	Chita	.. Roots & leaves	w.
199.	.. zeylanica	R-	Papri	.. -do-	w.
200.	<i>Podophyllum emodi</i>	R-	Gorurchampa	.. Roots	w.
201.	<i>Plumeria acutifolia</i>	R-	Amlaki	.. Fruit, seed flower.	c.
202.	<i>Phyllanthus emblica</i>	R++	Panjuli	.. Fruit and leaf	w. & c.
203.	<i>Phyllanthus reticulatus</i>	R-	Bhuiamla	.. Fruit and plant	w.
204.	.. niruri	R-	Dhanrkar	.. Fruit and plant	w.
205.	<i>Pongamia glabra</i>	R-	Rajna	.. Root, bark, seed, leaf	w.
206.	<i>Premna integrifolia Ganian</i>	R-	Ganian	.. Root, leaf	w.
207.	<i>Psoralea corylifolia latakas</i>	R+	Latakasturi	.. Seeds	w.
208.	<i>Polygala chinensis</i>	R-	Gaighora (Santali)	.. Root	w.
209.	<i>Portulaca oleracea Chno-talunia</i>	R+		.. Leaf, root	w. & c.
210.	<i>Pterospermum acerifolium</i>	R-	Kanakchapa	.. Flower, fruit seed	w. & c.
211.	<i>Ptychotis ajowan</i>	R+	Joan	.. Seeds	w. & c.
212.	<i>Punica granatum</i>	R+	Dalim	.. Bark, leaves	w. & c.
213.	<i>Quamoclit pinnata</i>	R	Tarulata	.. Leaf	w. & c.
214.	<i>Quisqualis indica</i>	R-	Madhabilata	.. Leaf, affix	w. & c.
215.	<i>Randia dumetorum</i>	R+	Menphal	.. Fruits, bark	w. & c.
216.	<i>Rauwolfia serpentina</i>	R+++	Sarpagandha	.. Root & stems	w. & c.
217.	<i>Ricinus communis</i>	R++	Verenda	.. Seed	w. & c.
218.	<i>Rubia cordifolia</i>	R	Manjisttha.	.. Stem	w. & c.
219.	<i>Rhus succedanea</i>	R+	Kankrasriggi	.. Fruit	w. & c.
220.	<i>Sacharum officinarum</i>	R+	Ankh	..	w. & c.
221.	<i>Saraca Indica</i>	R+	Asoka	..	w. & c.
222.	<i>Scilla indica</i>	R+	Sephadiekhus	.. Bulb	w. & c.
223.	<i>Scindapsus officinalis</i>	R++	Gajpipul	.. Stem, root, seed, fruit	w. & c.
224.	<i>Scoparia dulcis</i>	R-	Sweet broom weed	.. Whole plant leaves	w. & c.
225.	<i>Santalum album</i>	R+	Chandum	.. Wood	w. & c.
226.	<i>Sesamum indicum</i>	R+	Til	.. Seed	w. & c.
227.	<i>Semecarpus anacardium</i>	R+	Bheta	.. Fruits	w. & c.
228.	<i>Sida cordifolia</i>	R-	Berela	.. Roots leaves & seeds	w. & c.
229.	<i>Smilax glabra</i>	R-	Topchini	.. Root	w. & c.
230.	<i>Solanum xanthocarpum</i>	R-	Kantakari	.. Root, Fruit	w. & c.
231.	<i>Sesbania grandiflora</i>	R+	Agasthi	.. Root, leaf	w. & c.
232.	<i>Sesbania picta</i>	R-	Hayanti	.. Root, leaf, seed	w. & c.
233.	<i>Stereospermum Suaveolens</i>	R+	Parul	.. Root, flower	w. & c.
234.	<i>Strychnos nuxvomica</i>	R+++	Kunchila	.. Seeds	w. & c.
235.	.. Potatorium	R+	Nirmali	.. Seeds, fruits	w. & c.
236.	<i>Sida rhombifolia</i>	R-	Lalberela	.. Roots, leaf, plant	w.
237.	<i>Shorea rosvata</i>	R-	Sal	.. Bark, leaf, realn	w.
238.	<i>Smilax macrophylla</i>	R-	Kumarika	.. leaf	w.
239.	<i>Solanum indicum</i>	R-	Gurkamai	.. Root, leaf, fruit	w.
240.	.. melongena	R-	Begum	.. Root, fruit, leaf seed	c.
241.	<i>Swertia chirata</i>	R+	Chirata	.. Stem, leaves	w. & c.
242.	<i>Tamarindus indica</i>	R++	Tentul	.. Leaves, seeds, fruits	
243.	<i>Terminalia arjuna</i>	R-	Arjun	.. Bark	w. & c.
244.	<i>Terminalia belerica</i>	R+	Bahera	.. Fruits	w. & c.
245.	<i>Tiwospora cordifolia</i>	R++	Gulanha	.. Creeper	w. & c.
246.	<i>Terminalia chebula</i>	R+	Haritaki	..	w. & c.
247.	<i>Tribulus terrestris</i>	R-	Gokkhur	.. Fruits and seeds	w.
248.	<i>Trichosanthes cordata</i>	R++	Bhuikumra	.. Root	w.
249.	<i>Trichosanthes dioica</i>	R+	Patal	.. Roots and leaves	c.
250.	<i>Trigonella foenum graecum</i>	R+	Methi	.. Seeds	c.
251.	<i>Thevetia nerifolia</i>	R-	Kakephul	.. flower, root, leaf seed, oil from seeds	w.
252.	<i>Toddalia asiatica</i>	R-	Kadatodali	.. Plant root bark	w.
253.	<i>Thespesia populnea</i>	R-	Palashpipul	.. Root, flower, bark	w.

254.	<i>Trapa bispinosa</i>	R+	Paniphal	..	Fruit	w.
255.	<i>Trianthema monogyna</i>	R—	Sabuni	..	Root	w.
256.	<i>Triumfetta rhomboidea</i>	R—	Bonkra	..	Root, bark, leaf	w.
257.	<i>Tylophora asthmatica</i>	R—	Antomul	..	Leaf	w.
258.	<i>Typhonium trilobatum</i>	R+	Ghetkachu	..	Tuber	w.
259.	<i>Urena lobata</i>	R—	Benochra	..	Root, stem, flower	w.
260.	<i>Vernonia antheimintica</i>	R—	Somraj	..	Seeds	w.
261.	<i>Vernonia cinerea</i>	R+	Kaljira	..	Seeds	c.
262.	<i>Vitex negundo</i>	R+	Nishinda	..	Leaves & roots	w.
263.	<i>Vitex peduncularis</i>	R++	Baruna	..	Bark	w.
264.	<i>Valeriana hardwickii</i>	R—	Balchur	..	Root	w.
265.	<i>Vitis vinifera</i>	R+	Kismis	..	Fruit, raisen, leaf, branchesap	c.
266.	<i>quadrangularis</i>	R++	Harjora	..	Stem, leaf	w.
267.	<i>Wedelia calandulacea</i>	R++	Kesharaja	..	Whole plant	w.
268.	<i>Withania somnifera</i>	R++	Aswagandha	..	Root, Leaves	w. & c.
269.	<i>Woodfordia floribunda</i>	R—	Dhaiphal	..	Bark, flower, leaf	w.
270.	<i>Zingiber officinale</i>	R+	Ada	..	Rhizome	c.
271.	<i>Zizyphus jujuba</i>	R+	Kul	..	Bark, root, fruit, leaf seed	w. & c.