PHYTO-GEOGRAPHICAL AFFINITIES

PHYTOGEOGRAPHICAL AFFINITIES OF FLORA OF CHHOTA-UDEPUR FOREST DIVISION

The area surveyed falls in the category of Dry mixed deciduous forests and Dry deciduous teak forests with the plains or even the low hill slopes supporting various degraded stages of it. Larger areas on the plains have been brought into cultivation. In the present discussion, a phytogeographical analysis of the flora of Chhota-udepur forest division has been given in order to understand the composition of flora and vegetation in context to its origin. The vegetation and flora have been compared with the floras of adjoining areas.

The Chhota-udepur forest division and other forests all along the Eastern boundary of the state are meeting points of various Indian elements. Meher-Homji (1970) on the basis of his analysis of forest types has concluded that the teak forests or of miscellaneous species/mixed species located on the hilly slopes have more Indo-Malayan elements; while, the scaterred scruby vegetation composed of xerophytic and desert species found within the sandy alluvial plains of North Gujarat, Saurashtra and Rajasthan is dominated by Western elements.

THE EASTERN ELEMENTS

The Eastern elements include the East Indian, Indo-Malayan and Australian element.

East Indian

Tamarix ericoides Rottl., Abelmoschus manihot (Linn.) Medic., Eriolaena hookeriana Wt. and Arn., Ailanthus excelsa Roxb., Boswellia serrata Colebr., Ventilago denticulata Willd., Leea macrophylla Roxb., Leea edgeworthii Santapau., Lannea coromendelica (Houtt.) Merr.

Indo-Malayan

Miliusa tomentosa (Roxb.) Sinclair., Tinospora cordifolia Miers., Capparis grandis L. f., Bombax ceiba Linn., Sterculia urens Roxb., Helicteres isora Linn., Celastrus paniculatus Willd., Cassine glauca (Rottb.) Kuntze., Butea monosperma (Lamk.) Taub., Bauhinia racemosa Lamk., Cassia fistula Linn., Hymenodictyon excelsum (Roxb.) Wall., Wrightia tinctoria R. Br., Holarrhena pubescens Wall., Tectona grandis L. f., Bridelia squamosa (Lam.) Gaertn., Mallotus philippensis (Koen.) MacBr., Holoptelea integrifolia (Roxb.) Planch., and Coix larchyma-jobi Linn.

Australian Elements

Polygala chinensis Linn., Polycarpaea corymbosa (Linn.) Link., Crotalaria juncea Linn., Physalis minima Linn., and Apluda mutica Linn.

WESTERN ELEMENTS

The Western elements comprise of the Indus plain, the Saharo-sindh, the Sudano-Rajasthan, Tropical and North African elements.

Indus Plain

Hibiscus spp., Buchanania lanzan Spr., Crotalaria hirsuta Willd., and Prosopis cineraria Linn.

Saharo-Sindh

Grewia tiliaefolia Vahl., Zizyphus nummularia Linn., Citrullus colocynthis (Linn.) Schrad., and Indigofera tinctoria Linn.

Sudano-Rajasthan

Capparis decidua (Forsk.) Edgew., Acacia nilotica Linn., ssp. indica (Bth.) Brenan., Salvadora persica Linn., and Convolvulus microphyllus (Roth.) Sieb. ex Spr.

Tropical and North African

Argemone mexicana Linn., Cleome monophylla Linn., Bergia odorata Edgew., Hibiscus lobatus (Murr.) O. Kuntze., Cymbopogon martinii (Roxb.) Wats., and Themeda quadrivalvis (Linn.) O. Kuntze.

Mediterranean

Cocculus hirsutus (Linn.) Diels., Polygala spp., Indigofera cordifolia Heyne ex. Roth., Alhagi pseudalhagi (Bieb.) Deav., and Leucas urticaefolia R. Br.

THE GENERAL ELEMENTS

Cleome gynandra Linn., Cleome viscosa Linn., Sida alba Linn., Triumfetta rhomboidea Jacq., Tephrosia hirta Linn., Crotalaria retusa Willd., Cassia tora Linn., Heliotropium ovalifolium Forsk., Enicostema hyssopifolium (Willd.) Verd., Polygonum glabrum Willd., Commelina benghalensis Linn., Justicia diffusa Willd., Cynodon dactylon (Linn.) Pers., and Eragrostis ciliaris (Linn.) R. Br.

TABLE 8 (A): COMPARISON OF VARIOUS FLORISTIC ELEMENTS OF THE STUDY AREA WITH THE SURROUNDING AREAS

Name of the Forest Area	Eastern element		Western element		General element		Indian element		Total flora
	#	%	#	%	#	%	#	%	
Chhota-udepur	140	29	67	14	164	34	111	23	**483**
Pavagadh	197	35	73	13	203	36	90	16	**563**
Ratanmahal	198	31	83	13	205	32	154	24	**640**

INDIAN ELEMENTS

Triumfetta rotundifolia Lam., Zizyphus xylopyra (Retz.) Willd., Dalbergia sissoo Roxb., Caesalpinia crista Linn., Haldinia cordifolia (Roxb.) Rids., Hemidesmus indicus (Linn.) R. Br., Tylophora fasciculata Ham., and Crotalaria spp.

TABLE 8 (B): AFFINITIES OF FLORA OF CHHOTA-UDEPUR FORESTS WITH OTHER FLORAS

No.	Floras	Total no. Of species	No. Of sp. Common to c-udepur flora	Affinity percentage (%)
1.	Khandala (Santapau, 1967).	1124	218	45.04
2.	Dangs (Suryanarayan, 1969).	698	215	44.42
3.	Pavagadh (Oza, 1966).	563	269	**55.57**
4.	Ratanmahal (Bedi, 1968).	640	372	**76.85**
5.	Saurashtra (Menon, 1979).	1074	265	54.75
6.	SWLS (Rajpipla east) (PradeepKumar, 1993).	604	203	41.94

The above table reveals that the floral elements of Chhota-udepur forest division show more affinity to the flora of Ratanmahal and Pavagadh.

$$\text{Affinity \%} = \frac{\text{No. of Chhota-udepur plants common With other floras}}{\text{Total No. of Chhota-udepur plants}} \times 100$$

DISCUSSION

It has been revealed that the principle factor that interferes with the natural development of vegetation is the biotic interference that not only alters the natural composition of vegetation and flora, but also facilitates the entry and establishment of Western element consisting of various xerophytic species (Meher-Homji, 1970). From the table # 8 (A), it is clear that the Eastern elements dominate over the Western elements in the study area as also in its adjoining forest areas. However, the percentage of general elements is almost same in all the areas.

The flora of Chhota-udepur forest division comprises mainly of the general elements and the Eastern elements, which represents 34 % and 29 % respectively. As the entire forest area is mainly a deciduous forest, the dominance of the Eastern over the Western one can be expected (Meher-Homji, 1970). The Western elements comprise of 14 % of the total flora and this pattern is likely to increase as more and more forest areas are cleared and degraded. The Indian elements account for 23 % of the total flora of the region. Out of nearly 1500 plants, that are endemic to or that have a restricted distribution in the Western Ghats or South Indian hills and reported to grow in the hilly forests of Gujarat, 47 are reported growing in Pavagadh hills and 32 in Ratanmahal forests. Some of them, if not all are also found in the Chhota-udepur forest division. They are Blumea mollis (Don.) Merill., Leucas biflora R. Br., and Curcuma inodora Blatter.

The plants belonging to Northwestern or North Indian elements such as Anagallis arvensis Linn., Ipomoea spp., Kickxia incana (Wall.) Pennell., Arthraxon spp., and Cymbopogon martinii (Roxb.) Watts., spread through the Corridor of forests of Central Gujarat and gets distributed further Southwards (Nayar, 1999). At the end it is evident that the flora of Chhota-udepur forests consists of general, Eastern and Western elements. Of the Indian elements, it has the peninsular mountain elements having their northern limit upto Mount Abu in Rajasthan or rather distributed along the Aravalli mountain ranges. The flora has Northwestern elements and the North-indian elements that are migrating Eastwards or Southwards.