THE FLORA OF THE INDUS DELTA

BY

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PART V.

(*Continued from p.* 43, Vol. VII, No. 1).

IV. A Comparison of the Vegetation of the Indus Delta with that of the Sundribuns.

We reproduced on the first page of this article a statement made by J. D. Hooker in his 'Sketch of the Flora of British India': "The Indus Delta repeats the vegetation of the Sundribuns of Bengal, with a greatly reduced number of species." Let us see how far this is correct.

1. Number of species.

If we consider the indigenous species only (and we shall do this throughout) we arrive at the following data for the two regions.[1]

Region	Families	Genera	Species	Ratio
Indus Delta	61	184	279	1 : 3 : 4·5
Sundribuns	72	230	304	1 : 3·1 : 4·2

The difference in the number of species in the two areas is only 25 in favour of the Sundribuns. When counting up the species of this area we considered all the entries made by Prain which were not marked with an asterisk. Prain distinguishes by this sign the plants which are planted or cultivated.

There are at least about a dozen plants in Prain's list which he did not mark with an asterisk, but which might be put under the introduced plants. But this is, in most cases, a difficult question to settle and scarcely two botanists would agree in individual instances. In addition, we must not forget that the Sundribuns are much better explored than the Indus Delta. Prain says in the Introduction that the investigation of the flora of the Sundribuns has occupied the attention of the officers in charge of the Royal Botanic Gardens

[1] All the information regarding the Sundribuns is based on D. Prain, Flora of the Sundribuns. In *Rec Bot. Surv. Ind.* II (1903) no. 4.

since 1796. Men like Griffith, Falconer, Thomson, Clarke, Gamble, Heinig, Gammie and Prain examined that area and what the latter offers us in his monograph is the combined result of over a hundred years' effort. Whilst systematic exploration was going on in the Sundribuns all the time, the vegetation of the Indus Delta was practically neglected, except for the meagre and very one-sided information we from time to time receive from the Forest, Agriculture and Revenue Departments. We have reason to believe that the flora of the Indus Delta as soon as better known will prove numerically richer in species and genera than that of the Sundribuns. We are not so sure that the same will be the case with regards to the number of families. According to our present knowledge the ratio of families, genera and species is about the same in both areas, *viz.* 1 : 3 : 4, roughly taken.

The following table shows the relation between the Dicotyledons and Monocotyledons in the two areas. The Monocotyledons are better represented in the Sundribuns than they are in the Indus Delta :

Region	Dicotyledons		Monocotyledons		Ratio of	
	Genera	Species	Genera	Species	Genera	Species
Indus Delta ...	139	211	44	67	3·1 : 1	3·1 : 1
Sundribuns ...	168	220	62	84	2·7 : 1	2·6 : 1

2. Composition of the floras of the Indus Delta and the Sundribuns.

A peculiar interest attaches to these two deltas : Both are situated in the N. corner of a sea, of the Arabian Sea and the Bay of Bengal respectively, both are near the Tropic of Cancer, the Indus Delta a little to the N. of it, and the Sundribuns slightly to the S., both are formed by large rivers taking their origin in close proximity in the Himalayas, both show more or less the same topographical features, the flowers of both are subject to similar ecological and physiological influences, both are open to the immigration of species from vast areas,— but here the difference comes in. It is the plant-geographical position of the two deltas that has produced the two vastly different floras. A glance at the map will at once show the great possibilities of immigration and transport by river and sea, and these possibilities are more numerous in the East than they are in the West. If, in spite of these advantages of the Sundribuns, its flora is comparatively poor, we can find an explanation only in the fact that the soil- and water-conditions

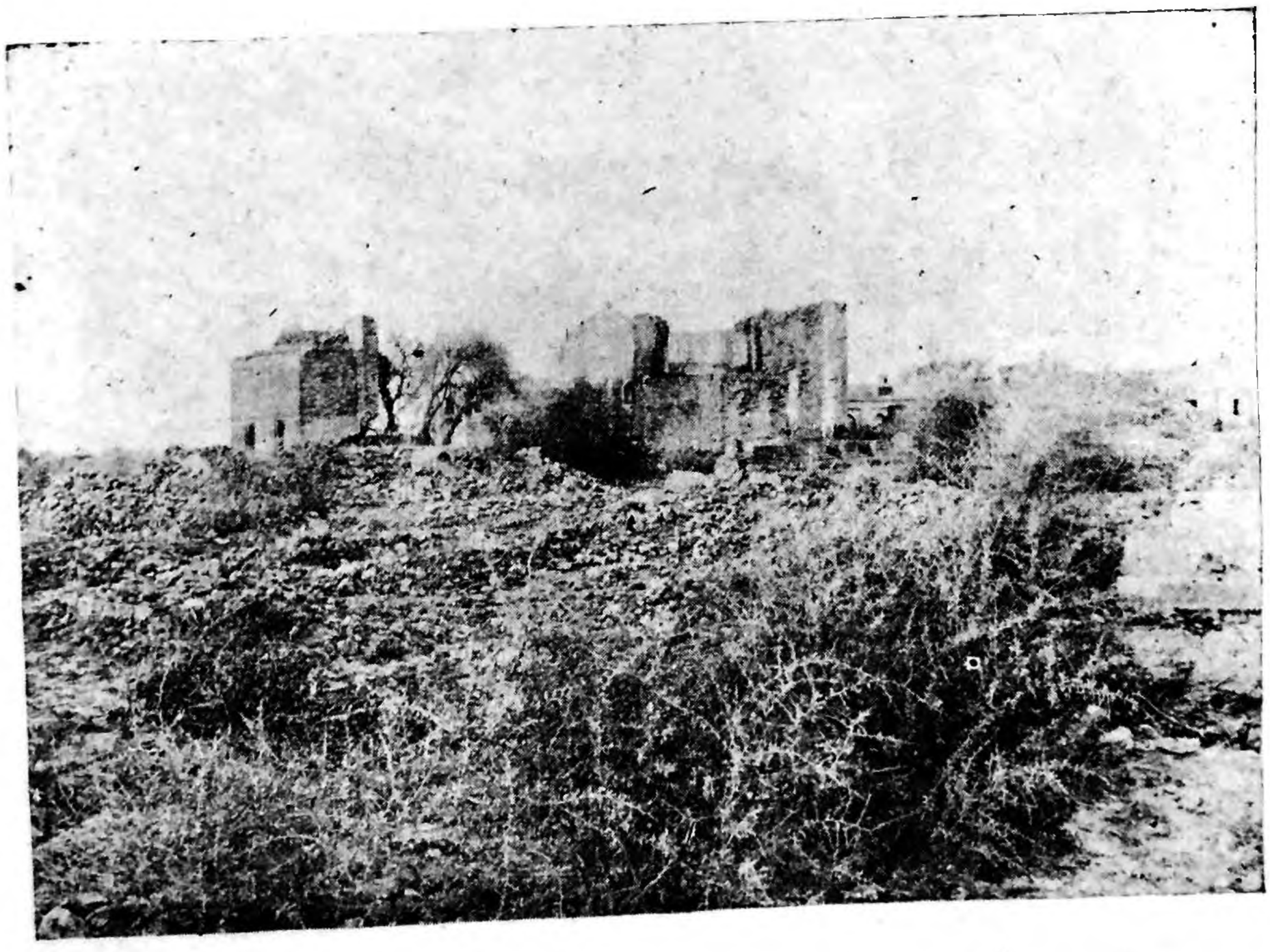
of the delta have not been favourable to most immigrants that must have tried, in the course of thousands and perhaps millions of years, to force an entrance into the savannahs and swamps of the Sundribuns. It would be a fascinating study to find out what seeds of plants have been carried down by the rivers and washed ashore by the sea without ever awakening to new life. It would certainly make a valuable contribution to plant-geography and ecology.

In order to get a more accurate insight into the relations of the two floras, and especially for the convenience of all those who feel inclined to tackle the innumerable botanical and biological problems that slumber in the waters and marshes of the two deltas, we subjoin a list of the indigenous plants that up to now have been discovered in the Indus Delta and the Sundribuns.

We add a column to the list which shows whether a species is a herb (H), an undershrub (U), a shrub (S) or a tree (T).

Family	Species	Habit	Indus Delta	Sundri-buns
Ranunculaceae.	*Naravelia zeylanica DC.* ...	S		*
Menispermaceae.	*Cocculus pendulus Diels.* ...	S	*	
	Tinospora malabarica Miers ...	S		*
Nymphaeaceae.	*Nymphaea rubra Roxb.* ...	H	*	
	,, *stellata Willd.* ...	H	*	
	Nelumbium speciosum Willd. ...	H	*	
Cruciferae.	*Farsetia Jacquemontii Hook. f. & Th.*	H	*	
	Senebiera pinnatifida DC. ...	H		*
Capparidaceae.	*Cleome brachycarpa Vahl* ...	H	*	
	,, *viscosa Linn.* ..	H	*	*
	Gynandropsis pentaphylla DC. .	H	*	*
	Maerua arenaria Hook. f. & Th. .	S	*	
	Cadaba indica Lam. ...	S	*	
	Capparis decidua Pax ...	S	*	
	,, *sepiaria Linn.* ...	S		*
Resedaceae.	*Ochradenus baccatus Del.* ...	H	*	
Bixaceae.	*Flacourtia sepiaria Roxb.* ...	S		*
Polygalaceae.	*Polygala irregularis Boiss.* ...	H	*	
Caryophyllaceae.	*Polycarpaea spicata Wight & Arn.*	H	*	
Portulacaceae.	*Portulaca oleracea Linn.* ...	H	*	*
	,, *quadrifida Linn.* ...	H	*	
Tamaricaceae.	*Tamarix Troupii Hole* ...	ST	*	
	,, *dioica Roxb.* ...	T	*	
	,, *articulata Vahl* ...	ST	*	
	,, *indica Roxb.* ...	ST		*

No. 29. A view of the country between Isakhan's Tomb and Tatta. Near the lake: *Euphorbia*, *Tamarix*, *Acacia* and some cultivated trees. Beyond the lake various Chenopods.



No. 30. Tatta—Tombs. Shrubs and trees of *Capparis decidua*.

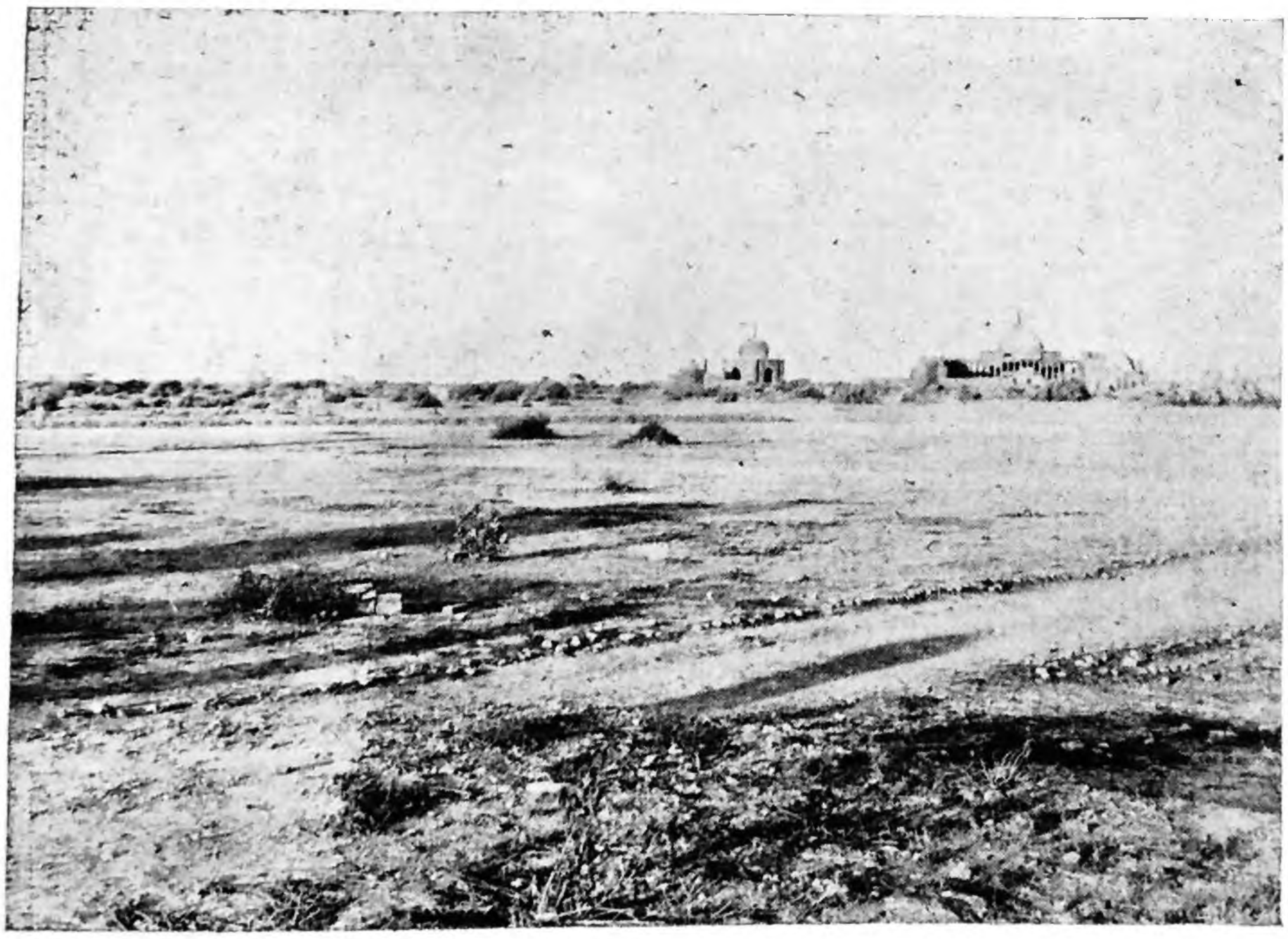
Family	Species	Habit	Indus Delta	Sundri-buns
Elatinaceae.	*Bergia odorata Edgew.* ...	H	*	
	,, *ammannioides Roxb.* ...	H	*	
Malvaceae.	*Sida spinosa Linn.* ...	H	*	
	,, *grewioides Guill. Perr. & A. Rich.*	H	*	
	Abutilon indicum Sw. ..	U	*	*
	,, *hirtum G. Don.* ...	U		*
	,, *polyandrum W. & A.*	U	*	
	,, *muticum Sw.* ...	U	*	
	,, *fruticosum Guill. Per. & A. Rich.*	U	*	
	Malachra capitata Linn. ...	H		*
	Senra incana Cav. ...	U	*	
	Hibiscus tortuosus Wall. ...	T		*
	,, *tiliaceus Linn.* ...	T		*
	Thespesia populnea Cor. ...	T	*	*
	Gossypium Stocksii Mast. ...	S	*	
	,, *Bakeri Watt.* ...	S	*	
Tiliaceae.	*Grewia populifolia Vahl* ...	S	*	
	,, *asiatica Linn.* ...	S	*	
	,, *villosa Willd.* ...	S	*	
	Triumfetta rotundifolia Lam. ...	H	*	
	,, *pentandra A. Rich.*...	H	*	
	Corchorus antichorus Raeusch.	H	*	
	,, *tridens Linn.* ...	H	*	
	,, *acutangulus Lam.* ...	H	*	*
	Brownlonia lanceolata Benth. ...	T		*
Sterculiaceae.	*Melhania Denhamii R. Br.* ...	S	*	
	Heritiera minor Roxb. ...	T		*
	Kleinhovia hospita Linn. ...	T		*
	Tribulus terrestris Linn. ...	H	*	
Zygophyllaceae.	,, *alatus Del.* ...	H	*	
	Zygophyllum simplex Linn. ...	H	*	
	Fagonia cretica Linn. ...	H	*	
	Erodium cicutarium L'Herit. ...	H		*
Geraniaceae.	*Oxalis corniculata Linn.* ...	S		*
	Glycosmis pentaphylla Corr. ...	T		*
Rutaceae.	*Micromelum pubescens Bl.* ...	U		*
	Paramignya longispina Hook. f.	T		*
	Aegle marmelos Corr. ...	S	*	
	Commiphora Mukul Engl. ...	T		*
Burseraceae.	*Amoora cucullata Roxb.* ...	T		*
Meliaceae.	*Carapa moluccensis Lam.* ...	T		*
	,, *obovata Bl.* ...	T		*

Family	Species	Habit	Indus Delta	Sundri-buns
Olacaceae.	*Olax scandens Roxb.* ...	S		*
Celastraceae.	*Gymnosporia montana Benth.* ...	T	*	
	Salacia prinoides DC. ...	ST		*
Rhamnaceae.	*Zizyphus oenoplia Mill.* ...	S		*
	,, *rotundifolia Lam.* ...	S	*	
Ampelidaceae.	*Vitis quadrangularis Wall.* ...	S		*
	,, *latifolia Roxb.* ...	S		*
	,, *trifolia Linn.* ...	S		*
	Leea sambucina Willd. ...	S		*
Sapindaceae.	*Cardiospermum Halicacabum Linn.*	H		*
	Allophylus Cobbe Bl. ...	S		*
	Aphania Danura Radlk. ...	S		*
Anacardiaceae.	*Bouea burmanica Griff.* ..	T		*
	Odina Wodier Roxb. ...	T		*
Legumin.—Papil.	*Crotalaria verrucosa Linn.* ...	U		*
	,, *retusa Linn.* ...	U		*
	,, *Saltiana Andr.* ...	U		*
	,, *Burhia Hamilt.* ...	U	*	
	,, *juncea Linn.* ...	H		*
	,, *medicaginea Lam.* ...	H		*
	Indigofera cordifolia Heyne. ...	H		*
	,, *uniflora Buch.* ...	H		*
	,, *anabaptista Steud.* ...	H		*
	,, *paucifolia Del.* ...	S		*
	,, *viscosa Lam.* ...	H		*
	Tephrosia tenuis Wall. ...	H		*
	,, *petrosa Blatt. & Hall.* ...	H		*
	Sesbania aculeata Poir. ...	H		*
	Taverniera cuneifolia Arn. ...	U		*
	Alhagi camelorum Fisch. ...	S		*
	Aeschynomene indica Linn. ...	U		*
	,, *aspera Linn.* ...	S	*	
	Alysicarpus vaginalis DC. ...	U	*	
	Desmodium umbellatum DC. ...	ST		*
	Abrus precatorius Linn. ...	S		*
	Teramnus flexilis Benth. ...	S		*
	Mucuna gigantea DC. ...	S		*
	Erythrina indica Lam. ...	T		*
	Canavalia lineata DC. ...	H		*
	,, *turgida Grah.* ...	H		*
	Phaseolus adenanthus Mey. ...	H		*
	,, *trilobus Ait.* ...	H		*
	Vigna luteola Benth. ...	H		*

Family	Species	Habit	Indus Delta	Sundri-buns
Legumin.—Papil.	*Atylosia scarabaeoides Benth.* ...	H		*
	Flemingia congesta Roxb. ...	S		*
	Dalbergia spinosa Roxb. ...	S		*
	„ *torta Grah.* ...	S		*
	Rhynchosia minima DC. ...	H	*	
	Pongamia glabra Vent. ...	T	*	*
	Derris sinuata Thw. ...	S		*
	„ *scandens Benth.* ...	S		*
	„ *uliginosa Benth.* ...	S		*
Legum.—Caesalp.	*Caesalpinia Bonducella Flem.* ...	S		*
	„ *Nuga Ait.* ...	S		*
	Mezoneuron cucullatum W. & A.	S		*
	Cassia Sophera Linn. ...	U		*
	„ *Tora Linn.* ...	H		*
	Cynometra mimosoides Wall. ...	T		*
	Intsia bijuga O. Kuntze. ...	T		*
	Entada scandens, Benth. ...	S		*
Legum —Mim.	*Prosopis spicigera Linn.* ...	H	*	*
	Mimosa hamata Willd. ...	S	*	
	Acacia arabica Willd. ...	T	*	
	„ *Farnesiana Willd.* ...	T	*	
	„ *Senegal Willd.* ...	T	*	
	„ *tomentosa Willd.* ...	T		
	„ *concinna DC.* ..	T		*
	„ *Intsia Willd.* ...	T		*
Droseraceae.	*Aldrovanda vesiculosa Linn.* ...	H		*
Rhizophoraceae.	*Rhizophora mucronata Lam.* ...	T	*	*
	„ *conjugata Linn.* ...	T	*	*
	Ceriops Roxburghiana Arn. ...	T	*	*
	„ *Candolleana Arn.* ...	T	*	
	Kandelia Rheedei W. & A. ...	T		*
	Bruguiera gymnorhiza Lam. ...	T	*	*
	„ *parviflora W. & A.* ...	T		*
Combretaceae.	*Lumnitzera racemosa Willd.* ...	T		*
Myrtaceae.	*Eugenia fruticosa Roxb.* ...	ST		*
	Barringtonia racemosa Bl. ..	T		*
	„ *acutangula Gaertn.*	T		*
Lythraceae.	*Ammannia baccifera Linn.* ...	H	*	
	„ *sp.* ...	H		*
	Sonneratia apetala Ham. ...	T		*
	„ *acida Linn. f.* ...	T	*	*
Turneraceae.	*Turnera ulmifolia Linn.* ..	U		*
Passifloraceae.	*Passiflora suberosa Linn.* ...	H		*
Cucurbitaceae.	*Momordica Charantia Linn.* ...	H	*	

Family	Species	Habit	Indus Delta	Sundri-buns.
Cucurbitaceae.	*Momordica dioica Roxb.* ...	H		*
	Trichosanthes cucumerina Linn.	H		*
	„ *palmata Roxb.* ...	H		*
	Luffa graveolens Roxb. ...	H		*
	Cucumis trigonus Roxb. ...	H		*
	„ *prophetarum Linn.* ...	H	*	
	Citrullus Colocynthis Schrad. ...	H	*	
	Coccinia indica W. & A. ...	H	*	
	Melothria maderaspatana Cogn.	H	*	
	Kedrostis rostrata Cogn. ...	H	*	
	Corallocarpus epigaeus C.B. Clarke	H	*	
Ficoidaceae.	*Cephalandra indica Naud.* ...	H		*
	Zehneria umbellata Thw. ...	H		*
	Sesuvium Portulacastrum Linn.	H		*
	Trianthema monogyna Linn. ...	H	*	*
	„ *pentandra Linn.* ...	H	*	
	Orygia decumbens Forsk. ...	H	*	
	Mollugo hirta Thunb. ...	H	*	
Rubiaceae.	*Oldenlandia diffusa Roxb.* ...	H		*
	Petunga Roxburghii DC. ...	ST		*
	Vangueria spinosa Roxb. ...	S		*
	Ixora parviflora Vahl. ..	T		*
	„ *coccinea Linn.* ...	S		*
	Morinda bracteata Roxb. ...	T		*
Compositae.	*Vernonia cinerea Less.* ...	H	*	*
	„ *cinerascens Schultz* ...	H	*	
	Ageratum conyzoides Linn. ...	H		*
	Grangea maderaspatana Poir. ...	H	*	*
	Conyza semi-pinnatifida Wall. ...	H		*
	Blumea amplectens DC. ...	H		*
	Pluchea tomentosa DC. ...	H	*	
	„ *lanceolata C. B. Clarke.*	H	*	
	„ *indica Less.* ...	H		*
	Sphaeranthus africanus Linn. ...	H		*
	Gnaphalium pulvinatum Del. ...	H	*	
	Inula grantioides Boiss. ...	H	*	
	Vicoa cernua Dalz. & Gibs. ...	H	*	
	Pulicaria angustifolia DC. ...	H	*	
	„ *Stocksii Hook. f.* ...	H	*	
	Eclipta erecta Linn. ...	H	*	
	Xanthium spinosum Linn. ...	H		*
	Blainvillea rhomboidea Cass. ...	H	*	
	Wedelia scandens C. B. Clarke. ..	H		*

No. 31. Limestone-conglomerate near Tatta: *Commiphora Mukul, Euphorbia caducifolia, Acacia arabica.*



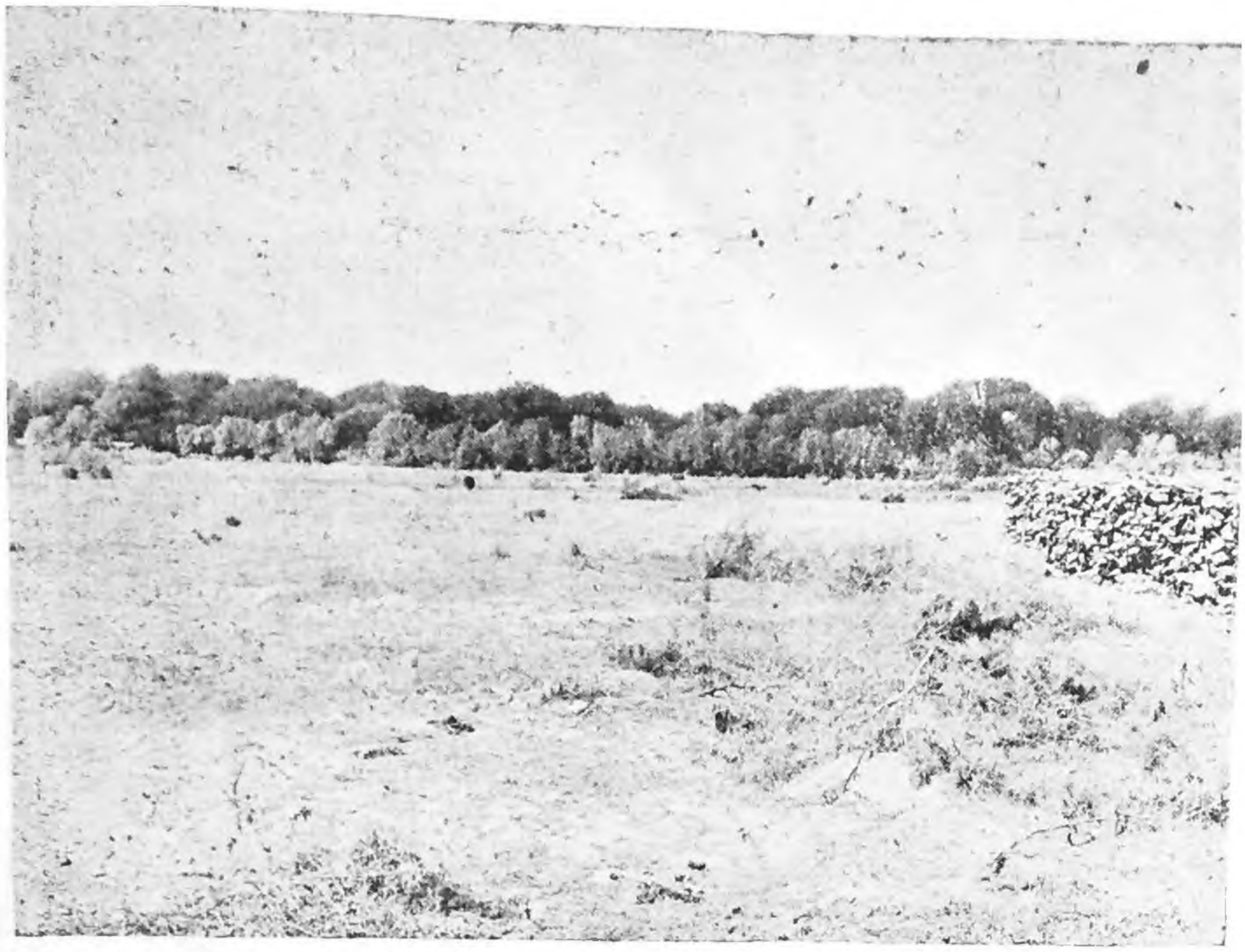
No. 32. Gravelly and sandy plain between the tombs near Tatta. *Commiphora Mukul, Zizyphus, Capparis, Calotropis.*

Family	Species	Habit	Indus Delta	Sundri-buns
Compositae.	*Wedelia calendulacea Less.* ...	H		*
	Echinops echinatus DC. ...	H	*	
	Volutarella divaricata Benth. & Hook. f. ...	H	*	
	Dicoma tomentosa Cass. ...	H	*	
	Cnicus arvensis Hoffm. ...	H		*
	Sonchus oleraceus Linn. ...	H	*	
	Launaea chondrilloides Hook. f.	H	*	
	,, *nudicaulis Hook. f.* ...	H	*	
	,, *pinnatifida Cass.* ...	H		*
Goodeniaceae	*Scaevola frutescens K. Krause*...	S	*	
	,, *Plumierii Vahl* ...	S	*	
Plumbaginaceae.	*Statice Stocksii Boiss.* ...	H	*	
	Aegialitis rotundifolia Roxb. ...	ST		*
Myrsinaceae.	*Aegiceras majus Gaertn.* ...	T	*	*
Ebenaceae.	*Diospyros montana Roxb.* ...	T		*
	,, *Embryopteris Pers.*...	T		*
Salvadoraceae.	*Salvadora persica Linn.* ...	T	*	
	,, *oleoides Dcne.* ...	T	*	
	Azima tetracantha Lam. ...	S		*
Apocynaceae.	*Cerbera Odollam Gaertn.* ...	T		*
	Parsonsia spiralis Wall. ...	S		*
	Nerium odorum Soland. ...	S	*	
Asclepiadaceae.	*Hemidesmus indicus R. Br.* ...	S		*
	Finlaysonia obovata Wall. ...	S		*
	Periploca aphylla Dcne. ...	S	*	
	,, *sp.* ...	S	*	
	Oxystelma esculentum R. Br. ...	U	*	*
	Calotropis procera R. Br. ...	S	*	
	,, *gigantea R. Br.* ...	S		*
	Pentatropis cynanchoides R. Br.	U	*	
	,, *microphylla W. & A.*...	H		*
	Daemia extensa R. Br. ...	U	*	*
	Sarcostemma Stocksii Hook. f. ...	S	*	
	Sarcolobus globosus Wall ...	S		*
	,, *carinatus Wall.* ...	S		*
	Dregea volubilis Benth. ...	S		*
	Leptadenia Spartium Wight ...	S	*	
	Tylophora tenuis Bl. ...	H		*
	Dischidia nummularia R. Br. ...	H		*
	Hoya parasitica Wall. ...	S		*
Gentianaceae.	*Enicostemma littorale Bl.* ...	H	*	
	Hoppea dichotoma Willd. ...	H		*
	Limnanthemum cristatum Griseb.	H		*

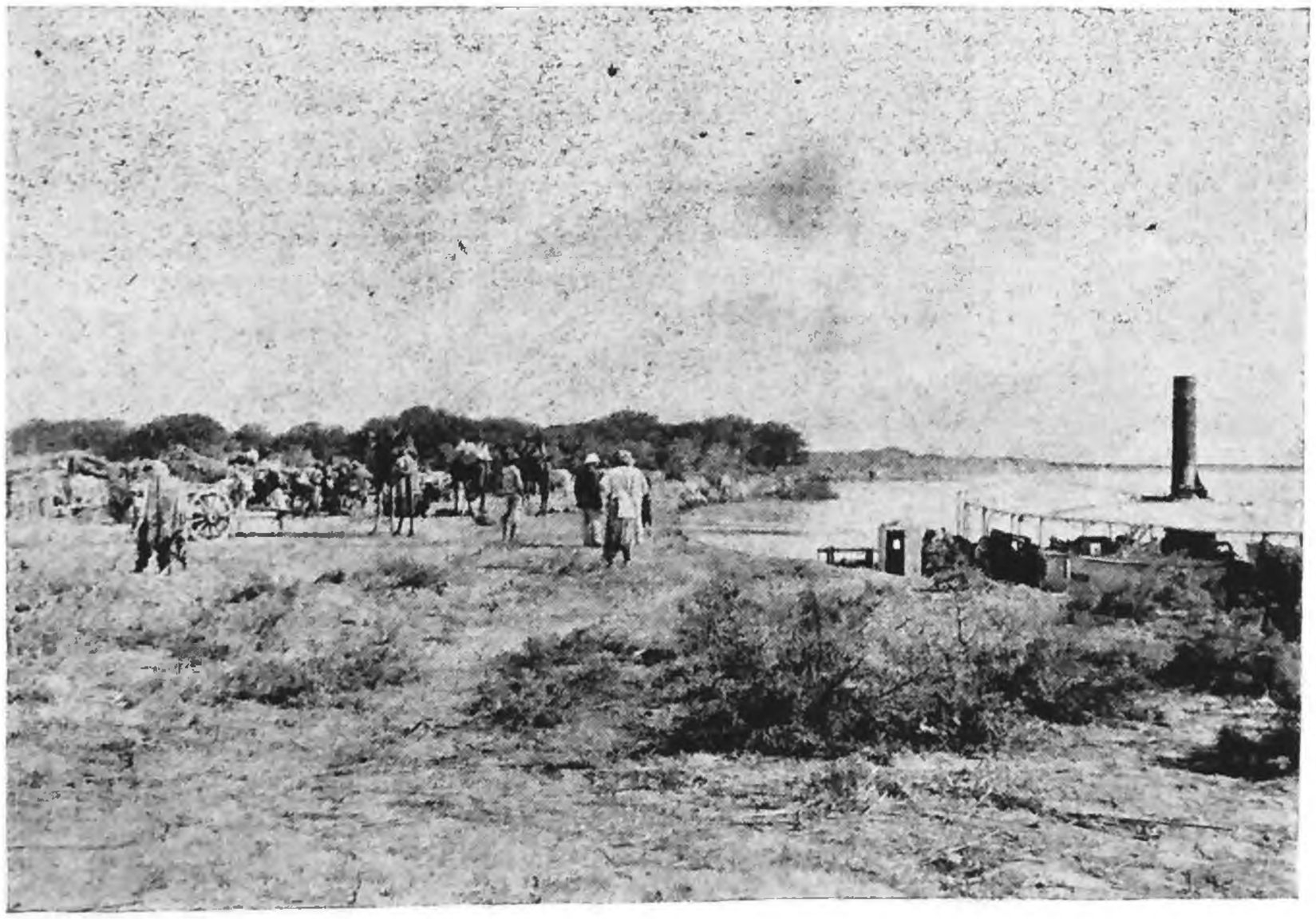
Family	Species	Habit	Indus Delta	Sundri-buns
Hydrophyllaceae.	*Hydrolea zeylanica Vahl* ...	H		*
Boraginaceae.	*Cordia Myxa Linn.* ...	T	*	*
	„ *Rothii Roem. & Schult.*...	T	*	
	Coldenia procumbens Linn. ...	H		*
	Heliotropium indicum Linn. ...	H		*
	„ *ophioglossum Stocks*	H	*	
	„ *calcareum Stocks*...	H	*	
	„ *ovalifolium Forsk.*	H	*	
	„ *undulatum Vahl* ...	H	*	
	„ *paniculatum R. Br.*	H	*	
	„ *rariflorum Stocks*...	H	*	
	Trichodesma indicum R. Br. ...	H	*	
Convolvulaceae.	*Stictocardia tiliaefolia Hallier f.*	S		*
	Cressa cretica Linn. ...	H	*	
	Convolvulus scindicus Stocks ...	U	*	
	„ *Rottlerianus Choisy*..	U	*	
	„ *microphyllus Sieb.* ...	U	*	
	„ *rhyniospermus Hochst.*	U	*	
	„ *arvensis Linn.* ...	H	*	
	„ *sp.* ...	H	*	
	Merremia chryseides Hallier f....	H	*	
	„ *aegyptia Linn.* ...	H	*	
	„ *hederacea Hallier f.*...	S		*
	Ipomoea longiflora R. Br. ...	S		*
	„ *paniculata R. Br.* ...	S		*
	„ *biloba Forsk.* ...	H	*	*
	„ *aquatica Forsk.* ...	H	*	*
	„ *illustris Prain* ...	S		*
	„ *sepiaria Koen.* ...	H		*
	„ *eriocarpa R. Br.* ...	H	*	
	Rivea hypocrateriformis Choisy	S	*	
	Cuscuta reflexa Roxb. ...	H		*
Solanaceae.	*Solanum nigrum Linn.* ...	HU	*	*
	„ *xanthocarpum Schrad. & Wendl.* ...	H	*	*
	Solanum albicaule Kotschy ...	H	*	
	„ *argenteum Dun.* ...	S		*
	„ *trilobatum Linn.* ...	U		*
	Physalis minima Linn. ...	H	*	
	Withania somnifera Dun. ...	H	*	
	Lycium barbarum Linn. ...	S	*	
	Datura fastuosa Linn. ...	H	*	
Scrophulariaceae.	*Angelonia grandiflora C. Morr.*	H		*
	Linaria ramosissima Wall. ...	H	*	

Family	Species	Habit	Indus Delta	Sundri-buns
Scrophulariaceae.	*Schweinfurthia sphaerocarpa A. Braun* ..	H	*	
	Limnophila gratioloides R. Br ...	H	*	
	„ *gratissima Bl.* ...	H		*
	Herpestis Monnieria H.B. & K...	H		*
	Vandellia crustacea Benth. ...	H		*
	Bonnaya veronicaefolia Spreng	H	*	
	Peplidium humifusum Del. ...	H	*	
	Lindenbergia abyssinica Hochst.	H	*	
	„ *urticaefolia Link*....	H	*	
	Scoparia dulcis Linn. ...	H		*
Orobanchaceae.	*Cistanche tubulosa Wight* ...	H	*	
Lentibulariaceae.	*Utricularia stellaris Linn. f.* ...	H		*
	„ *flexuosa Vahl* ...	H		*
Bignoniaceae.	*Tecomella undulata Seem.* ...	T	*	
	Dolichandrone Rheedei Seem. ...	T		*
Acanthaceae.	*Blepharis sindica T. Anders.* ...	S	*	
	Ruellia patula Jacq. ...	S	*	
	„ *prostrata Poir.* ...	H	*	
	Barleria Prionitis Linn. ...	S	*	
	„ *acanthoides Vahl* ...	U	*	
	„ *Hochstetteri Nees* ...	S	*	
	Justicia heterocarpa T. Anders...	H	*	
	Hygrophila quadrivalvis Nees ...	H		*
	„ *phlomidis Nees* ...	H		*
	„ *spinosa T. Anders*....	H		*
	Hemigraphis hirta T. Anders. ...	H		*
	Acanthus ilicifolius Linn. ...	U		*
	„ *volubilis Wall.* ...	U		*
Verbenaceae.	*Lantana indica Roxb.* ...	S		*
	„ *trifolia Linn.* ...	S		*
	Lippia geminata H. B. & K. ...	S		*
	„ *nodiflora Rich.* ...	H	*	*
	Premna integrifolia Linn. ...	ST		*
	Vitex trifolia Linn. f. ...	ST		*
	„ *Negundo Linn.* ...	ST		*
	Clerodendron Phlomidis Linn. f.	S	*	
	„ *inerme Gaertn.* ..	U		*
	„ *neriifolium Wall*....	U		*
	„ *Siphonanthus R. Br.*	S		*
	Avicennia officinalis Linn. ...	T	*	*
	„ *alba Bl.*	S		*
Labiatae.	*Ocimum sanctum Linn.* ...	HU	*	*
	„ *canum Sims* ...	HU	*	

Family	Species	Habit	Indus Delta	Sundri-buns
Labiatae.	*Ocimum basilicum Linn.* ...	H		*
	Anisomeles ovata R. Br. ...	H		*
	Leucas urticaefolia R. Br. ...	H	*	
	„ *linifolia Spreng.* ...	H		*
	Salvia aegyptiaca Linn. ...	H	*	
Nyctaginaceae.	*Boerhaavia diffusa Linn.* ...	H	*	
	„ *verticillata Poir.* ...	H	*	
Amarantaceae.	*Celosia argentea Linn.* ...	H	*	
	Digera arvensis Forsk. ...	H	*	
	Amarantus viridis Linn. ...	H	*	*
	„ *polygamus Linn.* ...	H	*	
	Aerua tomentosa Forsk. ...	H	*	
	„ *pseudo-tomentosa Blatt. & Hall.*	H	*	
	Achyranthes aspera Linn ...	H	*	
	Nothosaerua brachiata Wight ...	H	*	
	Pupalia lappacea Moq. ...	H	*	
	Psilotrichum ferrugineum Moq.	H		*
	Alternanthera triandra Lam. ...	H	*	*
	„ *nodiflora Br.* ...	H	*	
Chenopodiaceae.	*Chenopodium murale Linn.* ...	H	*	
	Atriplex Stocksii Boiss. ...	H	*	
	Arthrocnemum indicum Moq. ...	U	*	*
	Salicornia brachiata Roxb. ...	U		*
	Suaeda fruticosa Forsk. ...	S	*	
	„ *nudiflora Moq.* ...	U	*	
	„ *monoica Forsk.* ...	U	*	
	„ *Maritima Dumort.* ...	H		*
	Haloxylon recurvum Bunge. ...	S	*	
	Salsola foetida Del. ..	S	*	
	Basella rubra Linn. ...	H		*
Polygonaceae.	*Polygonum plebejum R.Br.* ...	H	*	
Aristolochiaceae.	*Aristolochia bracteata Retz.* ...	H	*	
	„ *indica Linn.* ...	U		*
Lauraceae.	*Cassytha filiformis Linn.* ...	H		*
Loranthaceae.	*Loranthus Scurrula Linn.* ...	S		*
	„ *longiflorus Desr.* ...	S		*
	„ *globosus Roxb.* ...	S		*
	Viscum monoicum Roxb. ...	S		*
Euphorbiaceae,	*Euphorbia caducifolia Ham.* ...	S	*	
	„ *hypericifolia Linn.* ...	H	*	*
	„ *hirta Linn.* ...	H	*	
	„ *pilulifera Linn.* ...	H	*	*
	„ *granulata Forsk.* ...	H	*	



No. 33. Bughar on the banks of the Indus. In the foreground: *Tamarix dioica.* In the background: *Tamarix Troupii* and behind it a forest of *Acacia arabica.*



No. 34. Bughar on the right bank of the Indus. Background: a forest of *Acacia arabica, Phyllanthus reticulata.* In foreground: scrub of *Tamarix dioica.*

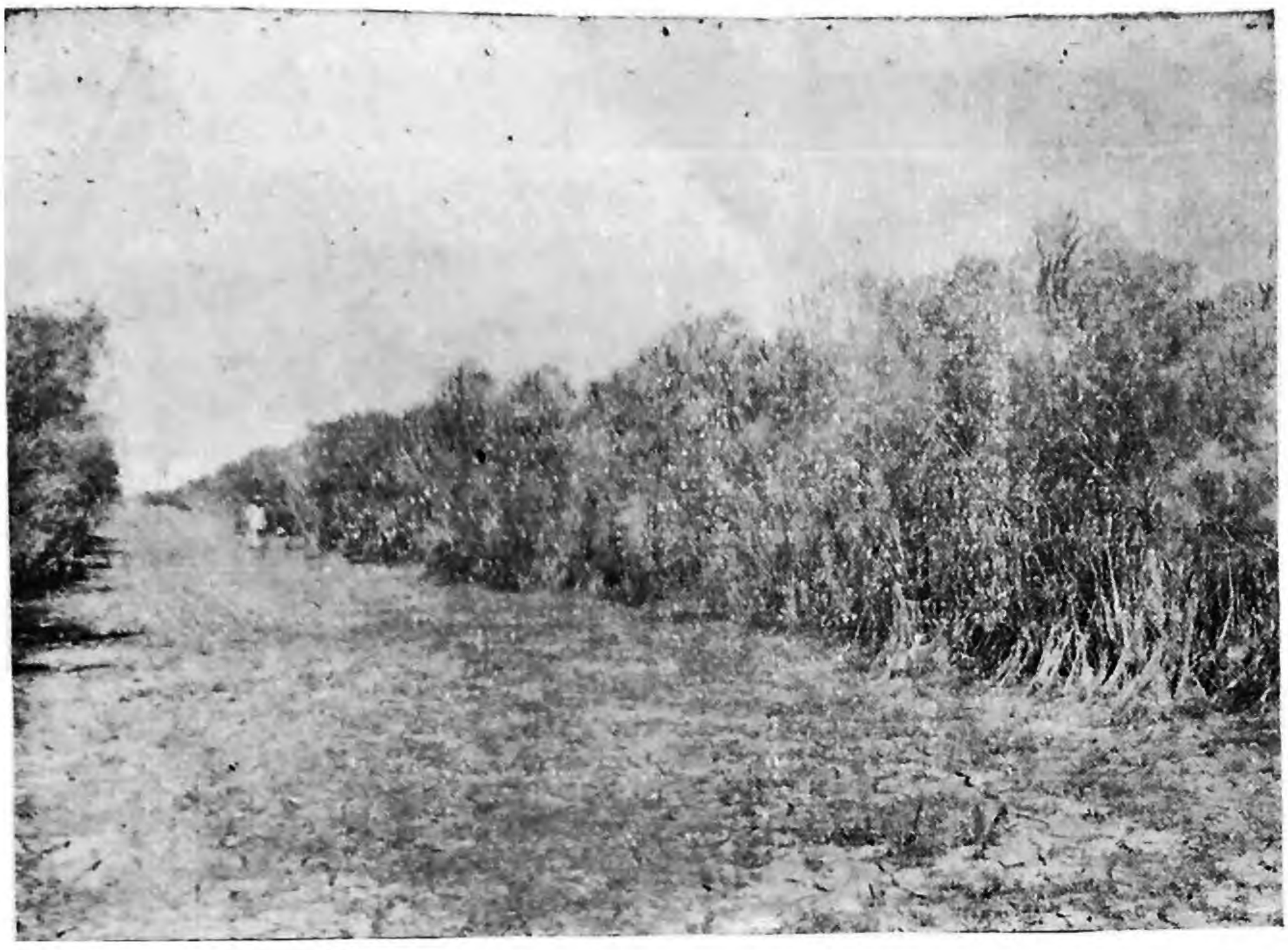
Family	Species	Habit	Indus Delta	Sundri-buns
Euphorbiaceae.	*Euphorbia Clarkeana Hook. f.* ...	H	*	
	,, *jodhpurensis Blatt. & Hall.*	H	*	
	,, *thymifolia Burm.* ...	H		*
	Andrachne aspera Spreng. ...	H	*	
	,, *sp. nov.* ...	H	*	
	Bridelia stipularis Bl. ...	S		*
	Agyneia bacciformis A. Juss. ...	HU		*
	Phyllanthus reticulatus Poir. ...	S	*	
	,, *Niruri Linn.* ...	H	*	*
	Breynea rhamnoides Muell.-Arg.	ST		*
	Cyclostemon assamicus Hook. f.	T		*
	Antidesma Ghaesembilla Gaertn.	T		*
	Croton oblongifolius Roxb. ...	T		*
	Chrozophora plicata A. Juss. ...	HU		*
	Acalypha indica Linn. ...	H		*
	Trewia nudiflora Linn. ...	T		*
	Mallotus repandus Muell.-Arg....	S		*
	Sapium indicum Willd. ...	T		*
	Excoecaria Agallocha Linn. ...	T		*
Urticaceae.	*Trema orientalis Bl.* ...	T		*
	Streblus asper Lour. ...	ST		*
	Ficus retusa Linn. ...	T		*
	,, *infectoria Roxb.* ...	T		*
	,, *Rumphii Bl.* ...	T		*
	,, *religiosa Linn.* ...	T		*
	,, *glomerata Roxb.* ...	T	*	
Casuarinaceae.	*Casuarina equisetifolia Forst.*...	T		*
Salicaceae.	*Populus euphratica Oliv.* ...	T	*	
Ceratophyllaceae.	*Ceratophyllum demersum Linn.*	H		*
Gnetaceae.	*Ephedra foliata Boiss.* ...	S	*	
Hydrocharitaceae.	*Hydrilla verticillata Casp.* ...	H		*
	Vallisneria spiralis Linn. ...	H	*	*
	Lagarosiphon Roxburghii Benth.	H		*
	Ottelia alismoides Pers. ...	H		*
Orchidaceae.	*Oberonia Gammiei King & Pantling*	H		*
	Dendrobium anceps Sw. ...	H		*
	,, *Pierardi Roxb.* ...	H		*
	Cirrhopetalum Roxburghii Lindl.	H		*
	Trias oblonga Lindl. ...	H		*
	Luisia teretifolia Gaud. ...	H		*
	,, *brachystachys Bl.* ...	H		*
	Saccolabium ochraceum Lindl....	H		*

Family	Species	Habit	Indus Delta	Sundri-bans
Orchidaceae.	*Saccolabium longifolium Hook. f.*	H		*
	" *papillosum Lindl.* ...	H		*
	Sarcanthus appendiculatus Hook. f.	H		*
	Sarcanthus insectifer Reichb. ...	H		*
	Cleisostoma ramosum Hook. f. ...	H		*
Scitaminaceae.	*Alpinia Allughas Roscoe* ...	H		*
	Zingiber Casumunar Roxb. ...	H		*
Amaryllidaceae.	*Crinum asiaticum Linn.* ...	H	*	*
Dioscoriaceae.	*Dioscorea pentaphylla Linn.* ...	H		*
Liliaceae.	*Asphodelus tenuifolius Cav.* ...	H		*
	Asparagus gharoensis Blatter ...	S	*	
	" *dumosus Baker* ...	S	*	
	" *deltae Blatter* ...	S	*	
Commelinaceae.	*Commelina benghalensis Linn.* ...	H		*
	" *albescens Hassk.* ...	H	*	
	Aneilema nudiflorum R. Br. ...	H		*
Flagellariaceae.	*Flagellaria indica Linn.* ...	S		*
Palmae.	*Nipa fruticans Wurmb.* ...	T		*
	Phoenix paludosa Roxb. ...	T		*
	Calamus tenuis Roxb. ...	S		*
	Dacmonorops Jenkinsianus Mart.	S		*
	Cocos nucifera Linn. ...	T	*	*
Pandanaceae.	*Pandanus tectorius Soland.* ...	S	*	*
	" *foetidus Roxb.* ...	S		*
Typhaceae.	*Typha angustata Bory & Chaub.*	H	*	*
	" *elephantina Roxb.* ...	H	*	*
Araceae.	*Cryptocoryne ciliata Fisch.* ...	H		*
	Pistia stratiotes Linn. ...	H		*
Lemnaceae.	*Lemna sp.* ...	H	*	
Alismaceae.	*Sagittaria sagittifolia Linn.* ...	H	*	
Naiadaceae.	*Ruppia rostellata Koch* ..	H		*
	Zanichellia palustris Linn. ...	H	*	
	Naias minor All. ...	H		*
	" *sp.* ...	H	*	
	" *sp.* ...	H	*	
	Aponogeton monostachyum Linn.	H	*	
Cyperaceae.	*Kyllingia triceps Rottb.* ...	H		*
	Pycreus polystachus Beauv. ...	H		*
	Cyperus inundatus Roxb. ...	H		*
	" *malaccensis Lam.* ...	H		*
	" *tegetiformis Roxb.* ...	H		*
	" *scariosus R. Br.* ...	H		*
	" *exaltatus Retz.* ...	H		*

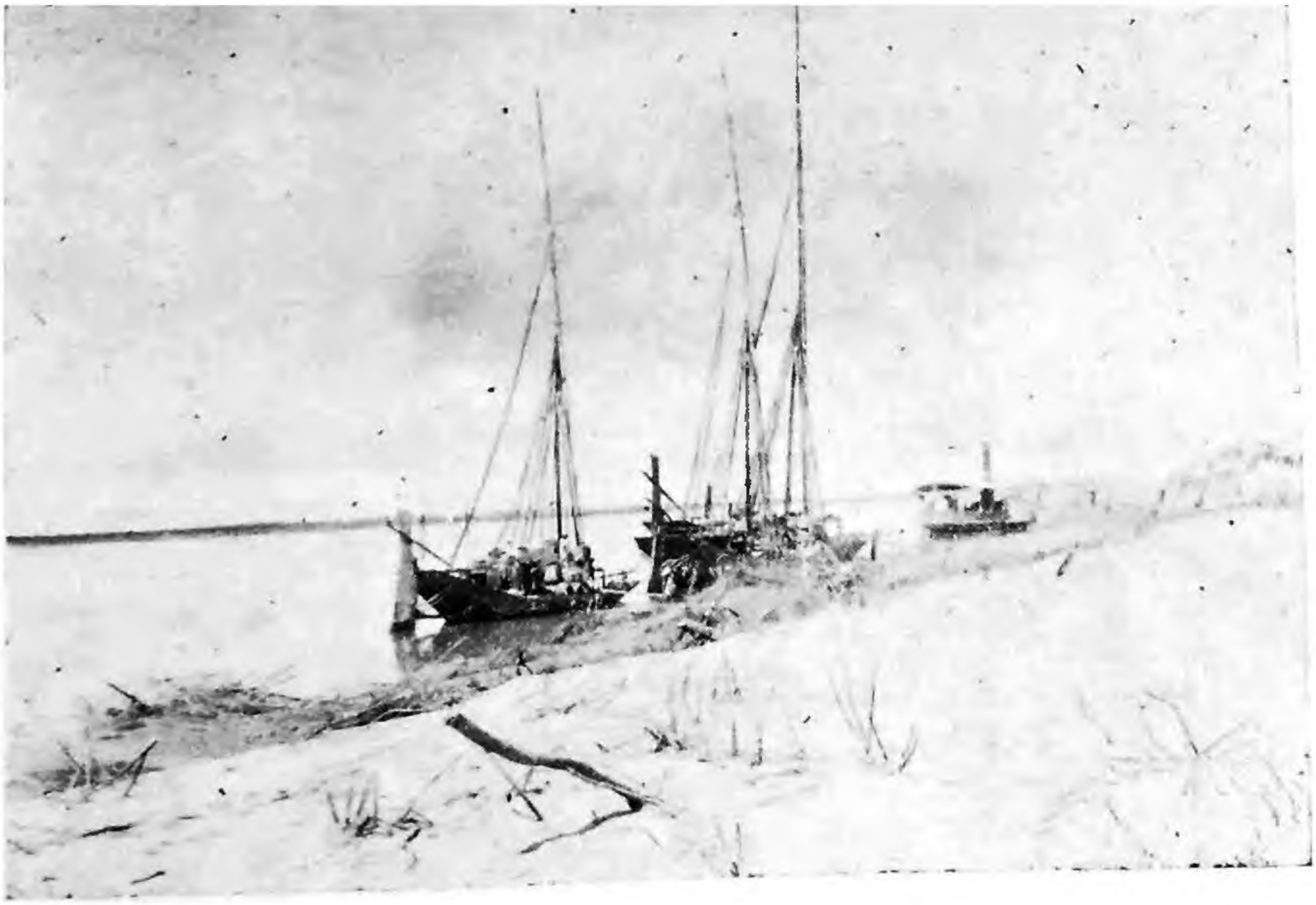
Family	Species	Habit	Indus Delta	Sundri-buns
Cyperaceae.	*Cyperus stoloniferus Retz.* ...	H	*	
	,, *alopecuroides Rottb.* ...	H	*	
	,, *Haspan Linn.* ...	H	*	
	,, *arenarius Retz.* ...	H	*	
	,, *tegetum Roxb.* ...	H	*	
	,, *rotundus Linn.* ..	H	*	
	Mariscus albescens Gaud. ...	H		*
	Eleocharis spiralis R. Br. ...	H		*
	,, *atropurpurcus Kunth.*	H	*	
	Fimbristylis ferruginea Vahl ...	H	*	*
	Fimbristylis polytrichoides Vahl	H		*
	,, *sub-bispicata Nees & Meyen* ...	H		*
	,, *monostachya Hassk.*	H		*
	,, *dichotoma Vahl* ...	H	*	
	Scirpus quinquefarius Ham. ...	H	*	
	,, *maritimus Linn.* ...	H	*	
	,, *grossus Linn. f.* ...	H		*
	,, *littoralis Schrad.* ...	H		*
	,, *triqueter Linn.* ...	H		*
	,, *articulatus Linn.* ...	H		*
	Cladium riparium Benth. ...	H		*
	Scirpodendron costatum Kurz....	H		*
Gramineae.	*Imperata arundinacea Cyrill.* ...	H		*
	Coix Lachryma-Jobi Linn. ...	H	*	
	Hemarthria compressa R. Br. ...	H	*	
	Saccharum spontaneum Linn. ...	H	*	*
	,, *Griffithii Munro* ...	H	*	
	,, *Ravennae Linn.* ...	H	*	
	Vetiveria zizanoides Stapf ...	H		*
	Amphilophis glabra Stapf ...	H		*
	Chrysopogon aciculatus Trin. ...	H		*
	Dichanthium annulatum Stapf...	H	*	
	Cymbopogon Jwarancusa Schult.	H	*	
	Digitaria sanguinalis Scop. ...	H	*	
	,, *pennata Chiov.* ...	H	*	
	Eriochloa ramosa Kuntze ...	H	*	*
	Paspalum scrobiculatum Linn....	H	*	*
	,, *vaginatum Sw.* ...	H		*
	Urochloa reptans Stapf ...	H		*
	,, *setigera Stapf* ...	H	*	
	Paspalidium geminatum Stapf...	H	*	
	Echinochloa colona Link. ...	H	*	*
	,, *Crus-Galli P. Beauv*	H	*	*

Family	Species	Habit	Indus Delta	Sundri-buns
Gramineae.	*Echinochloa stagnina P. Beauv...*	H	*	
	Setaria lutescens Hubb. ...	H		
	„ verticillata Beauv. ...	H	*	*
	Chamaeraphis spinescens Poir. ..	H		*
	Panicum antidotale Retz. ...	H	*	
	„ proliferum Lam. ...	H		*
	„ repens Linn. ...	H		*
	„ Myurus H. B. & K. ...	H		*
	Pennisetum cenchroides Rich. ...	H	*	
	Cenchrus biflorus Roxb. ...	H	*	
	„ catharticus Del. ...	H	*	
	Phragmites karka Trin. ...	H	*	*
	Sporobolus arabicus Boiss. ...	H	*	
	„ tremulus Kunth ...	H		*
	Heleochloa dura Boiss. ...	H	*	
	Aristida Adscensionis Linn. ...	H	*	
	„ funiculata Trin. ...	H	*	
	Tragus racemosus Scop. ...	H	*	
	Desmostachya cynosuroides Stapf	H	*	
	Eragrostis ciliaris Link. ...	H	*	
	„ interrupta Beauv. ...	H	*	
	„ amabilis Wight & Arn.	H	*	
	„ tenella P. & S. ...	H		*
	Diplachne fusca Beauv. ...	H	*	*
	Chloris villosa Pers. ...	H	*	
	„ barbata Sw. ...	H	*	*
	Cynodon dactylon Pers. ...	H	*	
	Eleusine flagellifera Nees ...	H	*	
	„ aristata Ehrenb. ...	H	*	
	„ aegyptiaca Desf. ...	H	*	*
	„ indica Gaertn. ...	H		*
	Oryza coarctata Roxb. ...	H	*	*
	Leersia hexandra Sw. ...	H		*
	Zoysia pungens Willd. ...	H		*
	Aeluropus villosus Trin. ...	H	*	
	Myriostachya Wightiana Hook. f.	H		*

An analysis of the above catalogue will reveal some interesting facts.



No. 35. A forest of *Tamarix Troupii* Hole, near Sujawal on the Indus, with a broad clearing through it, parallel to the river.



No. 36. At Sujawal on the Indus. Blown sand covering up *Tamarix* scrub.

We give first a list of the 72 families of the Sundribuns plants arranged according to number of species belonging to each:

	Species	Genera		Species	Genera
Leguminosae ...	32	21	Apocynaceae ...	2	2
Gramineae ...	27	22	Gentianaceae ...	2	2
Cyperaceae ...	19	9	Lentibulariaceae...	2	1
Euphorbiaceae ...	16	14	Scitaminaceae ...	2	2
Orchidaceae ...	13	8	Commelinaceae ...	2	2
Compositae ...	12	11	Pandanaceae ...	2	1
Asclepiadaceae ...	12	11	Typhaceae ...	2	1
Verbenaceae ...	12	6	Araceae ...	2	2
Convolvulaceae ...	9	4	Naiadaceae ...	2	2
Cucurbitaceae ...	7	6	Ranunculaceae ...	1	1
Malvaceae ...	6	4	Menispermaceae ...	1	1
Rhizophoraceae ...	6	4	Cruciferae ...	1	1
Rubiaceae ...	6	5	Bixaceae ...	1	1
Acanthaceae ...	6	3	Portulacaceae ...	1	1
Urticaceae ...	6	3	Tamaricaceae ...	1	1
Scrophulariaceae...	5	5	Geraniaceae ...	1	1
Palmae ...	5	5	Olacaceae ...	1	1
Rutaceae ...	4	4	Celastraceae ...	1	1
Ampelidaceae ...	4	2	Rhamnaceae ...	1	1
Solanaceae ...	4	1	Droseraceae ...	1	1
Labiatae ...	4	3	Combretaceae ...	1	1
Chenopodiaceae ...	4	4	Turneraceae ...	1	1
Loranthaceae ...	4	2	Passifloraceae ...	1	1
Hydrocharitaceae..	4	4	Plumbaginaceae ...	1	1
Capparidaceae ...	3	3	Myrsinaceae ...	1	1
Meliaceae ...	3	2	Salvadoraceae ...	1	1
Sapindaceae ...	3	3	Hydrophyllaceae...	1	1
Myrtaceae ...	3	2	Bignoniaceae ...	1	1
Lythraceae ...	3	2	Aristolochiaceae...	1	1
Boraginaceae ...	3	3	Lauraceae ...	1	1
Amarantaceae ...	3	3	Casuarinaceae ...	1	1
Tiliaceae ...	2	2	Ceratophyllaceae ..	1	1
Sterculiaceae ...	2	2	Amaryllidaceae ...	1	1
Anacardiaceae ...	2	2	Dioscoreaceae ...	1	1
Ficoidaceae ...	2	2	Liliaceae ...	1	1
Ebenaceae ...	2	1	Flagellariaceae ...	1	1

Of the 87 families found in both deltas taken together, the following families are represented

Only in the Indus Delta

Nymphaeaceae
Resedaceae
Polygalaceae
Caryophyllaceae

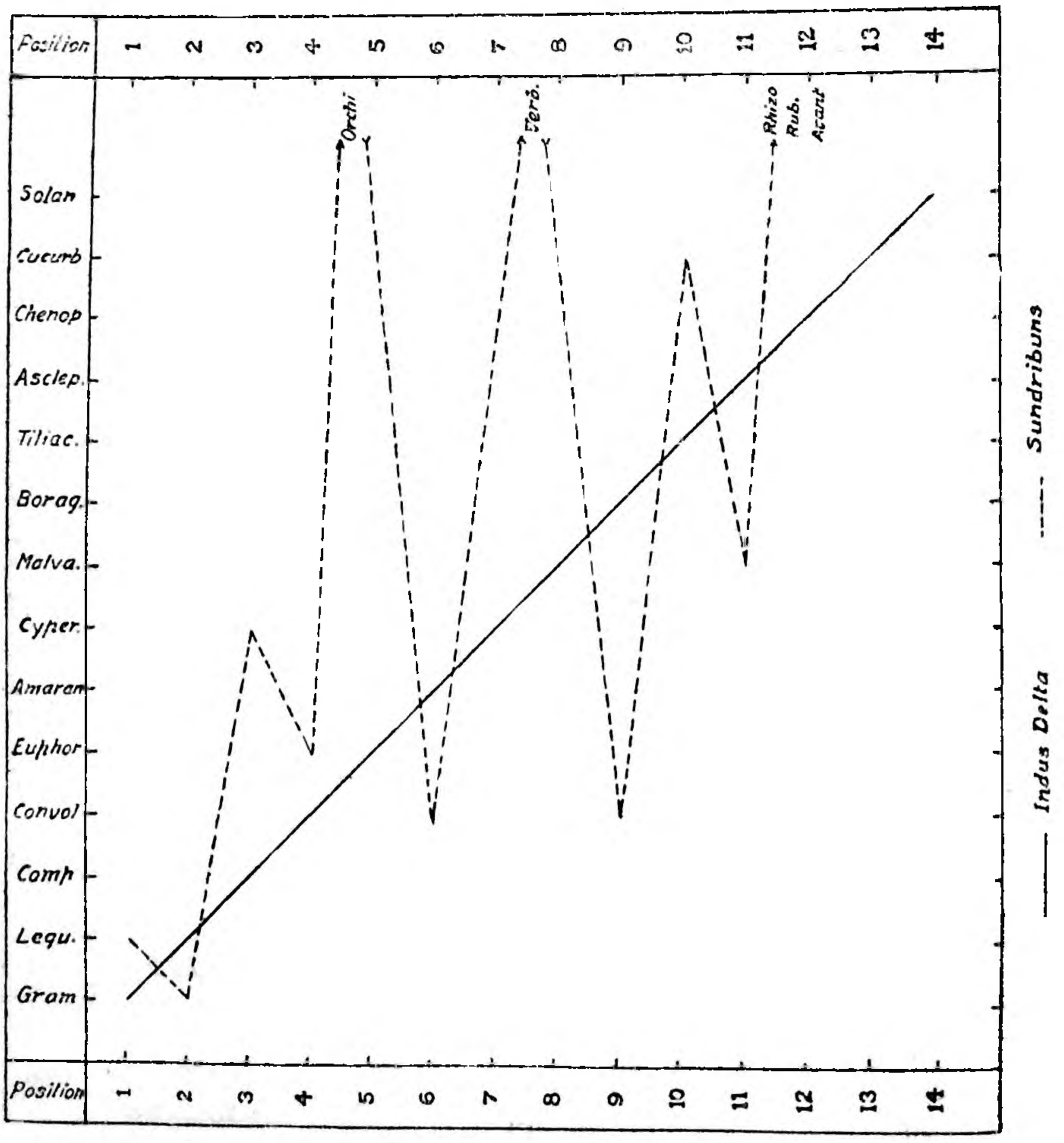
Only in the Sundribuns

Ranunculaceae
Bixaceae
Rutaceae
Meliaceae
Hydrophyllaceae
Lentibulariaceae
Lauraceae
Loranthaceae

Only in the Indus Delta	Only in the Sundribuns	
Elatinaceae	Olacaceae	Casuarinaceae
Zygophyllaceae	Ampelidaceae	Ceratophyllaceae
Burseraceae	Sapindaceae	Orchidaceae
Goodeniaceae	Anacardiaceae	Scitaminaceae
Orobanchaceae	Droseraceae	Dioscoreaceae
Nyctaginaceae	Combretaceae	Flagellariaceae
Polygonaceae	Myrtaceae	Araceae
Salicaceae	Turneraceae	
Gnetaceae	Passifloraceae	
Lemnaceae	Rubiaceae	
Alismaceae	Ebenaceae	

Dominant families.

The following graph shows the 14 dominant orders of the two deltas. It is interesting to note that the Orchids, an order not represented at all in the Indus Delta, take the 5th place in the Sundribuns.



Graph 15.—The dominant families in the Indus Delta and the Sundribuns

Regarding the genera, we observe in both deltas 336 genera. Of these 67 ($\frac{1}{5}$) are common to both areas, 113 (out of 184) have been found in the Indus Delta only, and 156 (out of 230) in the Sundribuns only.

Genera common to both areas.

Cleome
Gynandropsis
Capparis
Portulaca
Tamarix
Abutilon
Thespesia
Corchorus
Crotalaria
Pongamia
Acacia
Rhizophora
Ceriops
Bruguiera
Ammannia
Sonneratia
Momordica
Trianthema
Vernonia
Pluchea
Launaea
Aegiceras
Oxystelma
Calotropis
Pentatropis
Daemia
Cordia
Merremia
Ipomoea
Solanum
Limnophila
Lippia
Clerodendron
Avicennia
Ocimum
Amarantus
Alternanthera
Arthrocnemum
Suaeda
Aristolochia
Euphorbia
Phyllanthus
Ficus
Vallisneria
Crinum
Commelina
Cocos
Pandanus
Typha
Naias
Cyperus
Eleocharis
Fimbristylis
Scirpus
Saccharum
Eriochloa
Paspalum
Urochloa
Echinochloa
Setaria
Panicum
Phragmites
Sporobolus
Diplachne
Chloris
Eleusine
Oryza

The following 113 genera are represented only in the Indus Delta :—

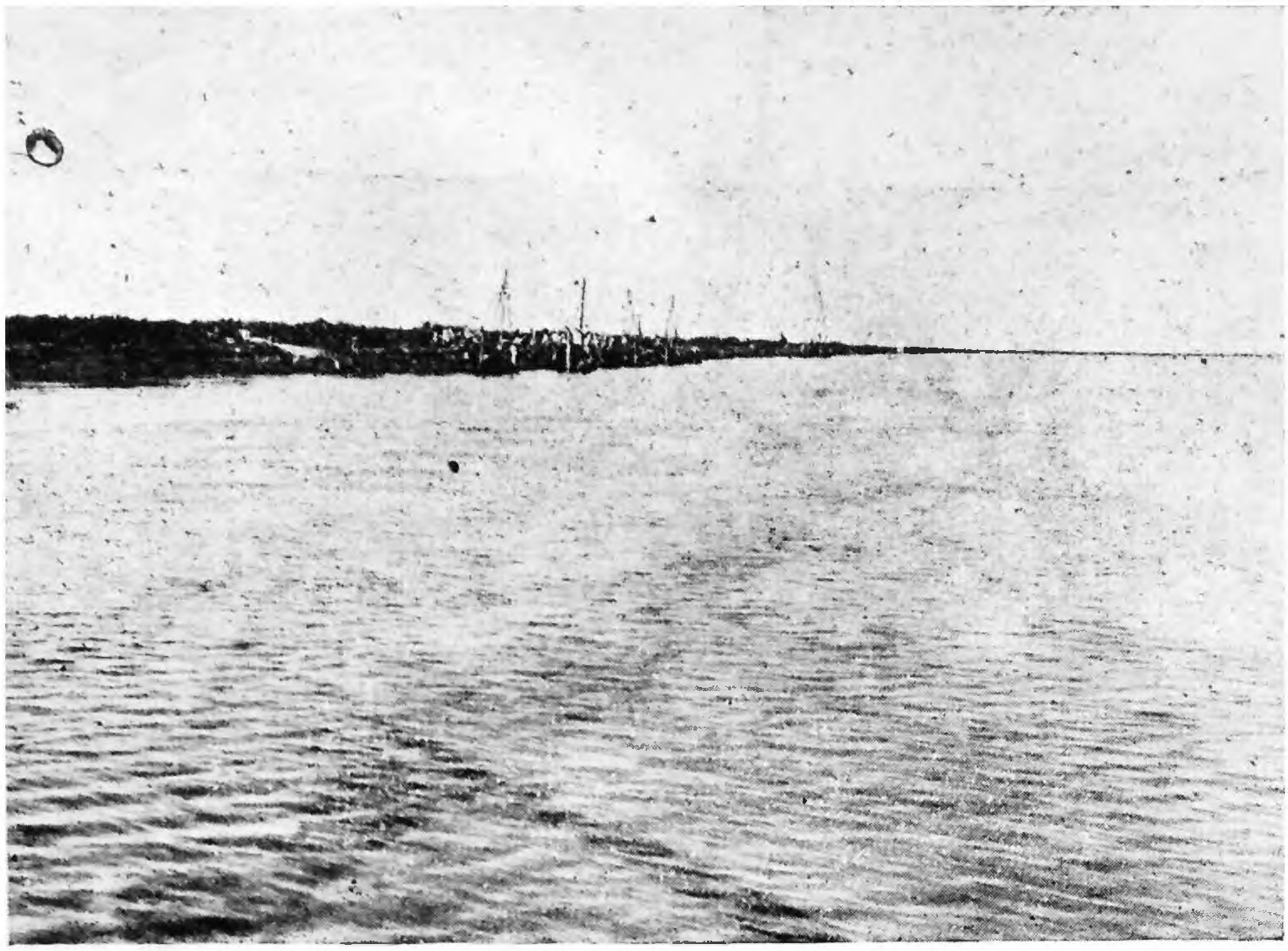
Cocculus
Nymphaea
Nelumbium
Farsetia
Maerua
Cadaba
Ochradenus
Polygala
Polycarpaea
Bergia
Sida
Senra
Gossypium
Grewia
Triumfetta
Melhania
Tribulus
Zygophyllum
Fagonia
Erodium
Commiphora
Gymnosporia
Crotalaria
Indigofera
Tephrosia
Sesbania
Taverniera
Alhagi
Aeschynomene
Alysicarpus
Rhynchosia
Prosopis
Mimosa
Trichosanthes
Citrullus
Coccinia
Melothria
Kedrostis
Corallocarpus
Orygia
Mollugo
Gnaphalium
Inula
Vicoa
Pulicaria
Eclipta
Blainvillea
Echinops
Volutarella
Dicoma
Sonchus
Scaevola
Statice
Salvadora
Nerium
Periploca
Sarcostemma
Leptadenia
Enicostemma
Trichodesma
Oressa
Convolvulus
Rivea
Physalis
Withania
Lycium
Datura
Linaria
Schweinfurthia
Bonnaya
Peplidium
Lindenbergia
Cistanche
Tecomella
Blepharis
Ruellia
Barleria
Justicia
Salvia
Boerhaavia
Celosia
Digera
Aerua
Achyranthes

Nothosaerua
Pupalia
Chenopodium
Atriplea
Haloxylon
Salsola
Polygonum
Andrachne
Populus
Ephedra
Asparagus
Lemna
Sagittaria
Aponogeton
Zanichellia
Coix
Hemarthria
Cymbopogon
Dichanthium
Digitaria
Paspalidium
Penniscum
Cenchrus
Heleochloa
Aristida
Tragus
Desmostachya
Cynodon
Acluropus

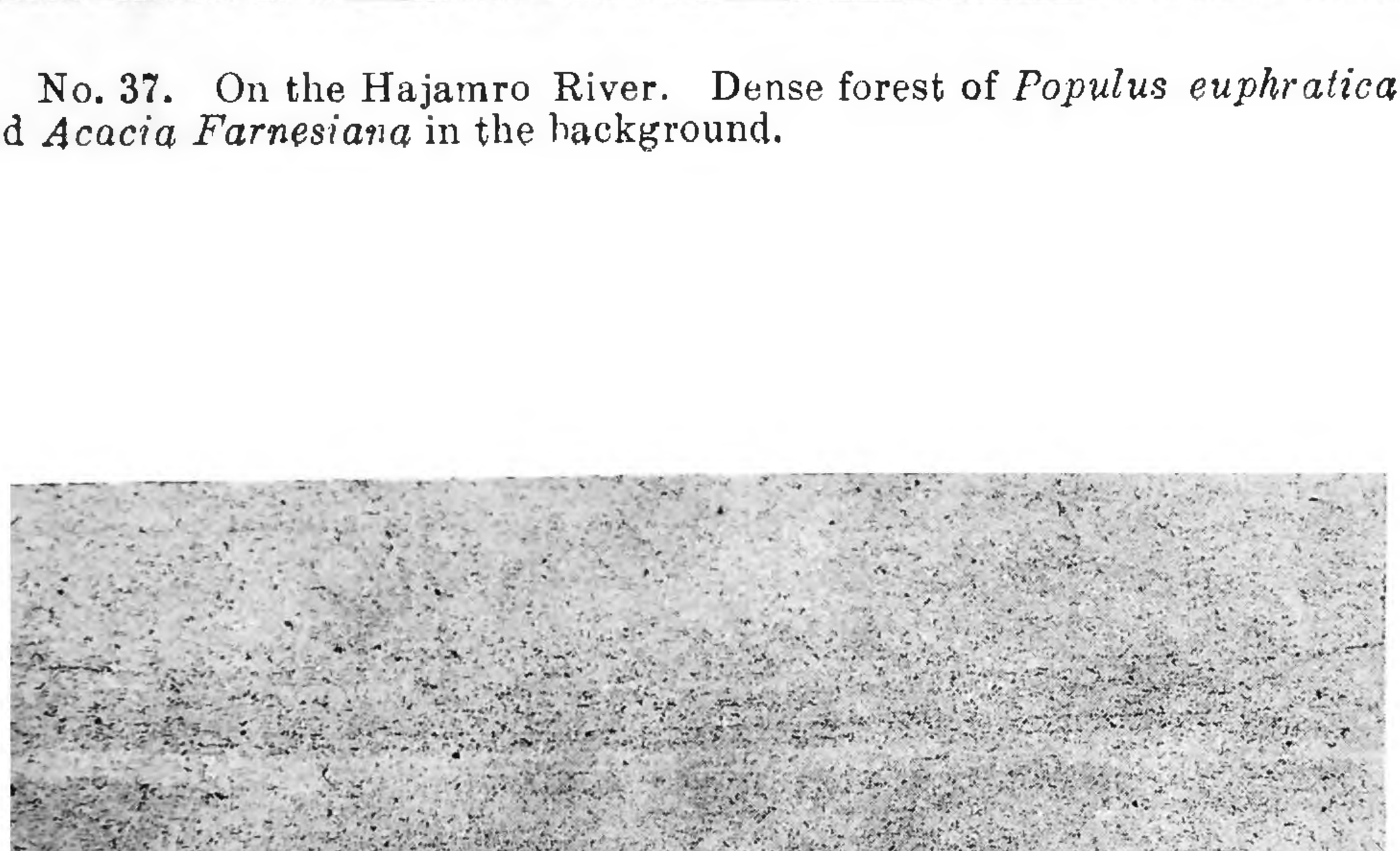
Nearly all these genera are characteristic of the tropical and N. African-Indian Desert.

The following 156 genera are represented in the Sundribuns only :—

Naravelia
Tinospora
Senebiera
Flacourtia
Malachra
Hibiscus
Brownlowia
Heritiera
Kleinhovia
Oxalis
Glycosmis
Microlemum
Paramignya
Aegle
Amoora
Carapa
Olax
Salacia
Vitis
Leea
Cardiospermum
Allophylus
Aphania
Bouea
Odina
Desmodium
Abrus
Teramnus
Mucuna
Erythrina
Canavalia
Phaseolus
Vigna
Atylosia
Flemingia
Dalbergia
Derris
Caesalpinia
Mezoneuron
Cassia
Cynometra
Intsia
Entada
Aldrovanda
Kandelia
Lumnitzera
Eugenia
Barringtonia
Turnera
Passiflora
Trichosanthes
Luffa
Cephalandra
Zehneria
Sesuvium
Oldenlandia
Petunga
Vangueria
Ixora
Morinda
Ageratum
Conyza
Blumea
Sphaeranthus
Xanthium
Wedelia
Cnicus
Aegialitis
Diospyros
Azima
Cerbera
Parsonsia
Hemidesmus
Finlaysonia
Sarcolobus
Tylophora
Dischidia
Hoya
Hoppea
Limnanthemum
Hydrolea
Coldenia
Stictocardia
Cuscuta
Angelonia
Herpestis
Vandellia
Scoparia
Utricularia
Dolichandrone
Hygrophila
Hemigraphis
Acanthus
Lantana
Premna
Vitex
Anisomeles
Psilotrichum
Salicornia
Basella
Cassytha
Loranthus
Viscum
Bridelia
Agyneia
Breynea
Cyclostemon
Antidesma
Croton
Chrozophora
Acalypha
Trewia
Mallotus
Sapium
Excoccaria
Trema
Streblus
Casuarina
Ceratophyllum
Hydrilla
Lagarosiphon
Ottelia
Oberonia
Dendrobium
Cirrhopetalum
Trias
Luisia
Saccolabium
Sarcanthus
Cleisostoma
Alpinia
Zingiber
Dioscorea
Asphodelus
Aneilema
Flagellaria
Nipa
Phoenix
Calamus
Daemonorops
Cryptocoryne
Pistia
Ruppia
Kyllingia
Pycreus
Mariscus
Cladium
Scirpodendron
Imperata
Vetiveria
Amphilophis
Chrysopogon
Chamaeraphis
Leersia
Zoysia
Myriostachya



No. 37. On the Hajamro River. Dense forest of *Populus euphratica* and *Acacia Farnesiana* in the background.



No. 38. Doreen, a little village on the Hajamro River, built on sandy alluvium. Scanty growth of *Tamarix dioica*.

The dominant genera in both areas, considering the number of species in each, are :—

In the Indus Delta.	No. of species.	In the Sundribuns.
Euphorbia	7	
Heliotropium, Convolvulus, Cyperus	6	*Ipomoea.*
Abutilon, Indigofera ...	5	
	4	*Solanum, Ficus, Fimbristylis, Scirpus.*
Tamarix, Grewia, Corchorus, Crotalaria, Acacia, Ipomoea, Solanum, Barleria, Suaeda, Asparagus, Saccharum, Echinochloa, Eragrostis, Eleusine.	3	*Vitis, Crotalaria, Derris, Acacia, Hygrophila, Clerodendron, Loranthus, Euphorbia, Saccolabium.*

The other genera are represented by 2 or 1 species.

That the Indus Delta does not repeat the vegetation of the Sundribuns is evident from the following list which gives only 48 species as common to both areas.

Family.	Species.	Remarks regarding distribution.
Capparidac. ...	*Cleome viscosa.*	Throughout the trop. regions of the world.
	Gynandropsis pentaphylla.	Throughout the trop. regions of the world.
Portulacac. ...	*Portalaca oleracea.*	All warm countries.
Malvac. ...	*Abutilon indicum.*	Throughout the tropics.
	Thespesia populnea.	Maritime in trop. Africa and Asia.
Tiliac. ...	*Corchorus acutangulus.*	Tropics of nearly the whole world.
Leguminos - Papil.	*Pongamia glabra.*	Throughout trop. Asia.
Rhizophorac. ...	*Rhizophora mucronata.*	Maritime in tropics of Old World.
	,, *conjugata.*	Maritime in tropics of Old World.
	Ceriops Roxburghiana.	Tidal from Sundribuns to Malacca.
Lythrac. ...	*Sonneratia acida.*	Tidal in India, Ceylon, etc.
Ficoidac. ...	*Trianthema monogyna.*	Most tropical countries.
Composit. ...	*Vernonia cinerea.*	Tropics of Old World.
	Grangea maderaspatana	Trop. and subtrop. Africa and Asia.

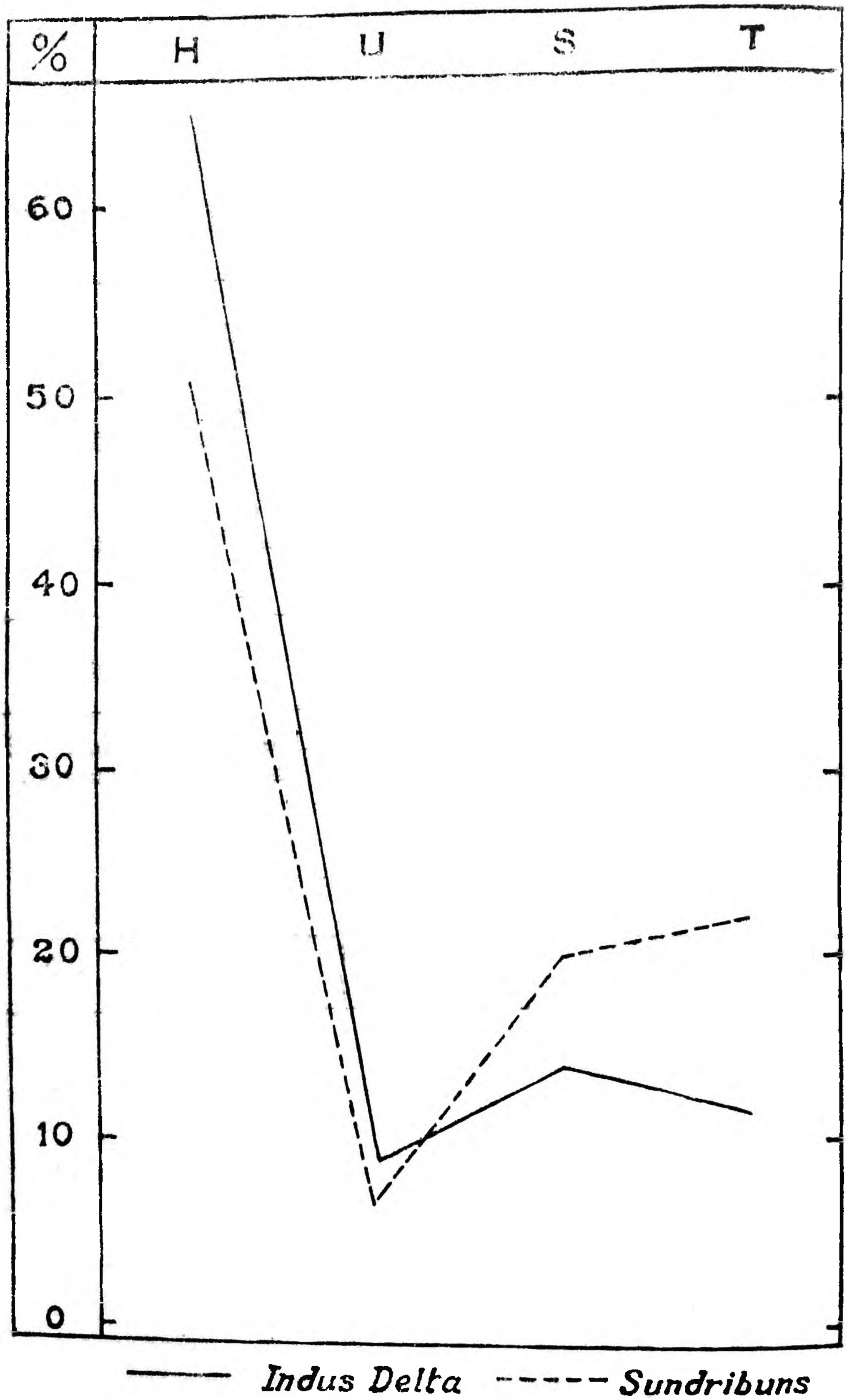
Family	Species	Remarks Regarding Distribution
Myrsinac. ...	*Aegiceras majus.*	Nearly all tropical coasts.
Asclepiadac. ...	*Oxystelma esculentum.*	Indo-Malayan.
	Daemia extensa.	Afghanistan, India, Ceylon.
Boraginac. ...	*Cordia Myxa.*	Egypt, trop. Asia and Australia.
Convolvulac. ...	*Ipomoea biloba.*	Sea-shores throughout tropics.
	,, *aquatica.*	Trop. Africa, Asia, Australia.
Solanac. ...	*Solanum nigrum.*	Cosmopolitan.
	,, *xanthocarpum.*	Indo-Malaya, Australia.
Verbenac. ...	*Lippia nodiflora.*	Most tropical and subtrop. regions.
	Avicennia officinalis.	Shores of Indian and Pacific oceans.
Labiat. ...	*Ocimum sanctun.*	From Arabia through India to Australia.
Amarantac. ...	*Amarantus viridis.*	All trop. countries.
	Alternanthera triandra.	All warm countries.
Chenopodiac. ...	*Arthrocnemum indicum.*	Trop. Africa, India, Ceylon.
Euphorbiac. ...	*Euphorbia hypericifolia.*	Almost throughout the tropics.
	,, *pilulifera.*	Most trop. and subtrop. countries.
	Phyllanthus Niruri.	Tropics generally, not in Australia.
Hydrocharitac.	*Vallisneria spiralis.*	Warm regions generally
Amaryllidac. ...	*Crinum asiaticum.*	Throughout trop. India, wild or cultivated.
Palmae ...	*Cocos nucifera.*	All tropical shores.
Pandanac. ...	*Pandanus tectorius.*	Sea-coast of India and Burma.
Typhac. ...	*Typha angustata.*	N. Africa, Asia, throughout India.
	,, *elephantina.*	N. Africa, N. W. India to Assam and southwards.
Cyperac. ...	*Fimbristylis ferruginea.*	Indo-Malaya to Australia.
Gramin. ...	*Saccharum spontaneum.*	Tropics of Old World.
	Eriochloa ramosa.	Most hot countries.
	Paspalum scrobiculatum.	Tropics of Old World.
	Echinochloa colona.	Most warm countries.
	,, *Crus-Galli.*	Almost cosmopolitan.
	Setaria verticillata.	Temp. and trop. regions.
	Phragmites karka.	Almost throughout tropics of Old World.

Family	Species	Remarks Regarding Distribution
Gramin. ...	*Diplachne fusca.*	Tropics of Old World.
	Chloris barbata.	Tropics generally.
	Elcusine aegyptiaca.	Warm regions of Old World.
	Oryza coarctata.	Only Indian.

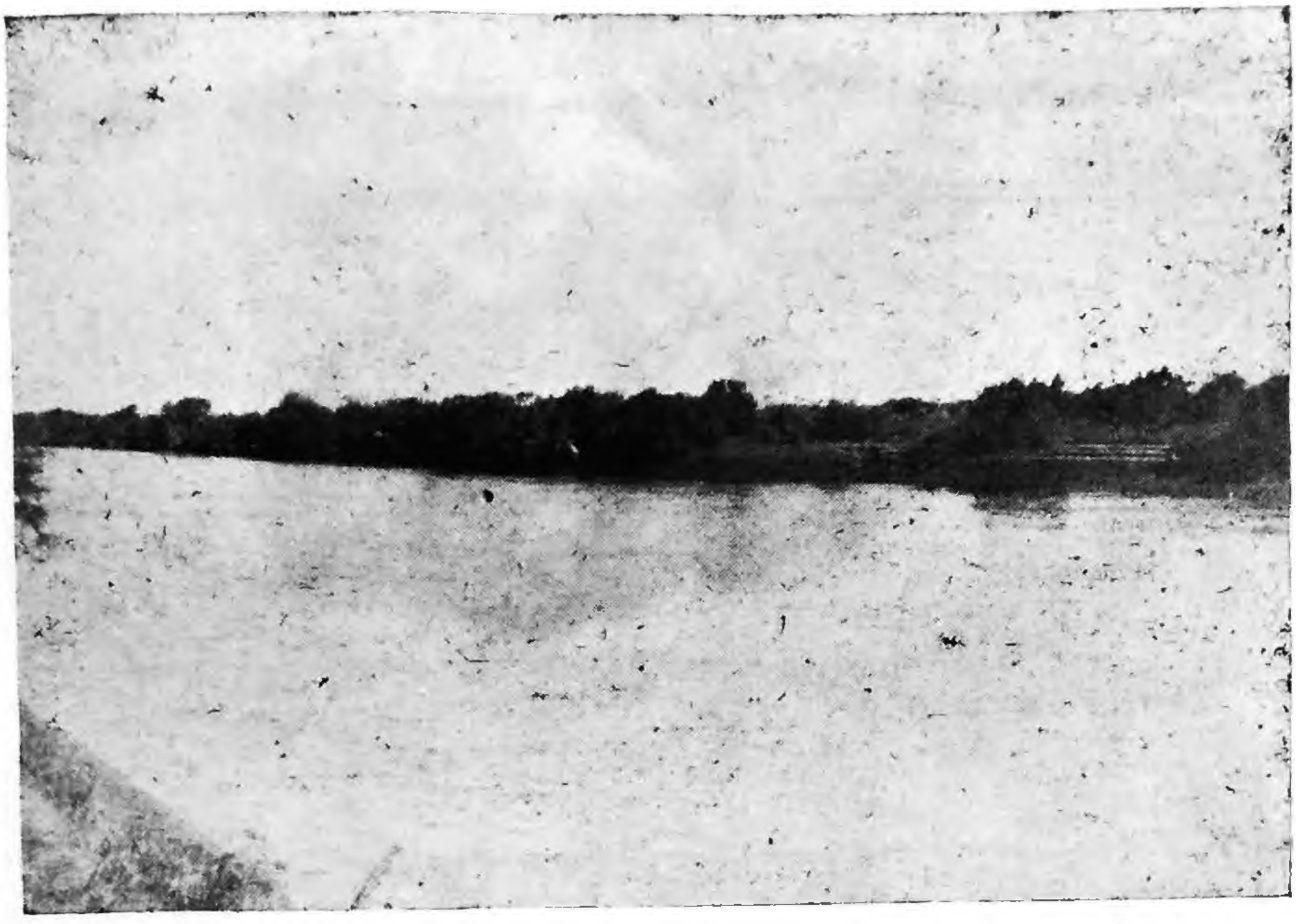
These 48 species occurring in both deltas belong to 26 families. A glance at the notes on distribution shows that all, with the exception of *Ceriops Roxburghiana*, *Daemia extensa*, *Crinum asiaticum*, *Pandanus tectorius* and *Oryza coarctata*, have a very wide distribution.

If we consider the habit of the plants *i.e.* whether they are herbs, undershrubs, shrubs or trees, we arrive at the following results which we also represent graphically :

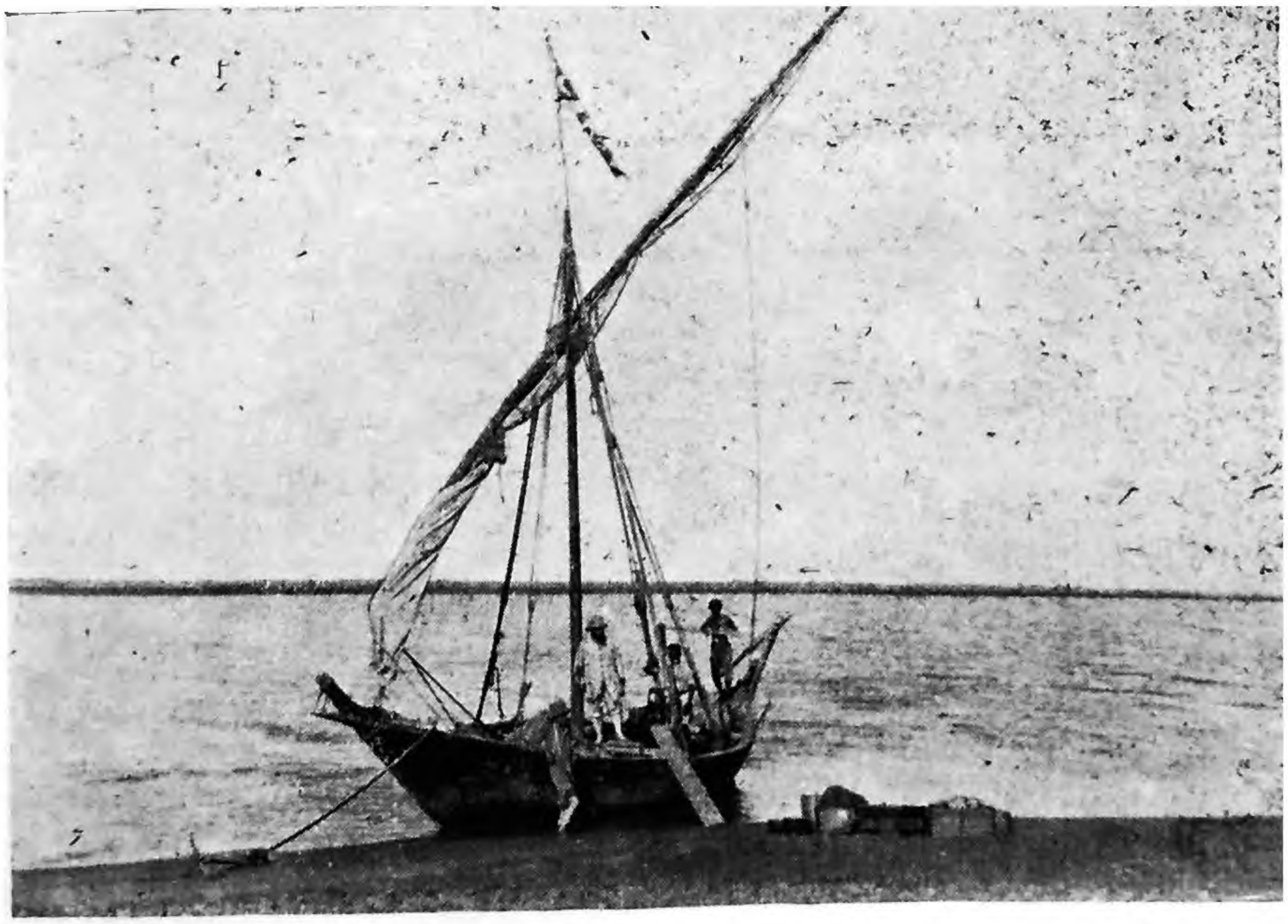
	Indus Delta		Sundribuns	
	Absolute number	% in round numbers	Absolute number	% in round numbers
H.	179	65	156	51
U.	26	9	22	7
S.	40	14	60	20
T.	34	12	66	22
Total	279	100	304	100



Graph 16.—The relative prevalence of herbs (H), undershrubs (U) shrubs (S) and trees (T) in the two areas.



No. 39. Bughar Canal not far from Mirpur Sakro. *Saccharum Ravennæ* Linn., low shrubs of *Tamarix dioica*, and *Acacia arabica*.



No. 40. On the Indus below Keti Bandar. In front of the boat, *Oryza coarctata*.

3. Distribution of species.

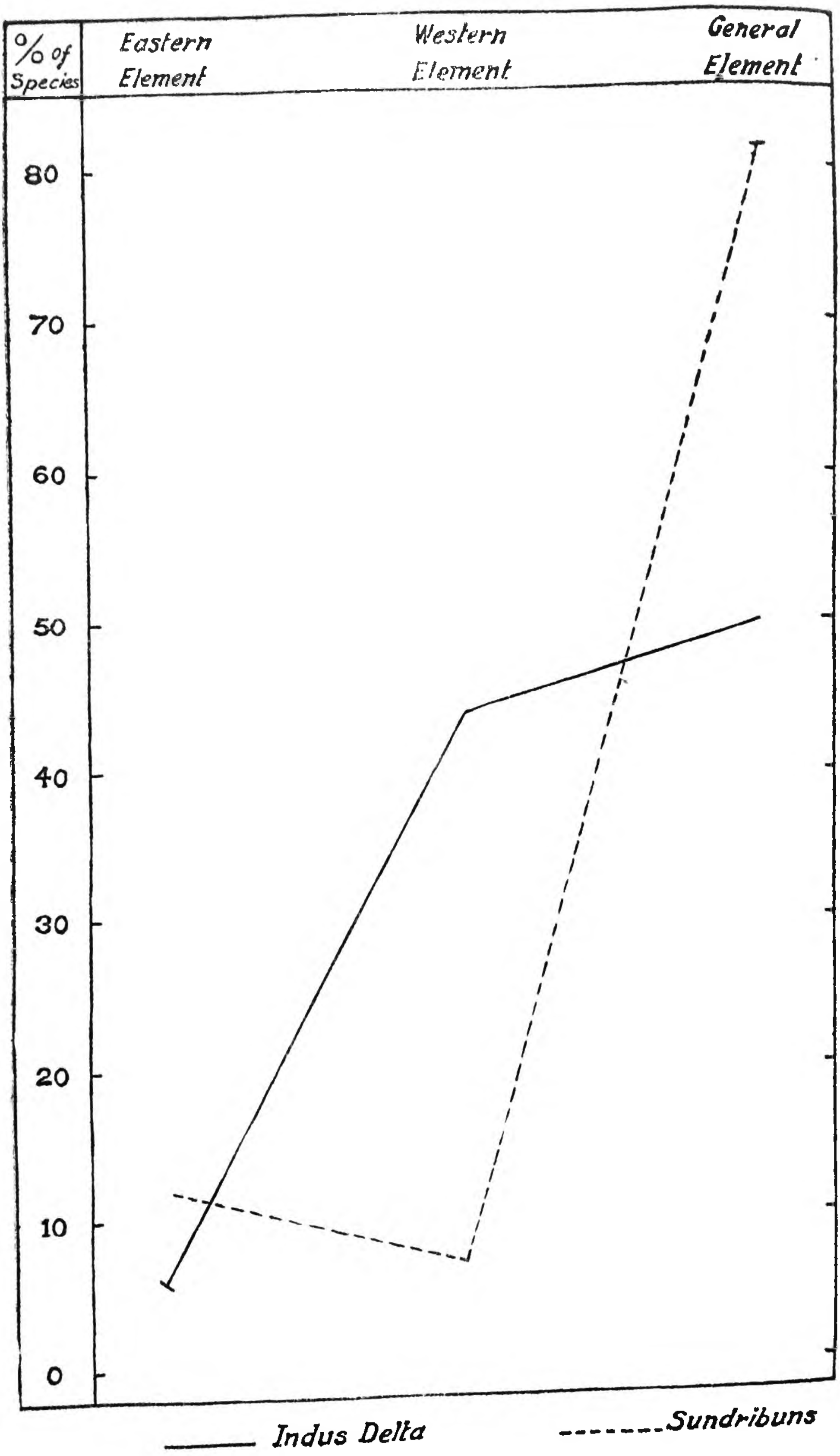
When discussing about the geographical distribution of the plants of the Indus Delta we distinguished an Eastern, Western and General element, and we found that the composition of the flora excluding some unclassed species is as follows:

The Eastern Element	16	species.	(6 % in round numbers).
The Western Element	118	„	(44 % „ „ „).
The General Element	131	„	(50 % „ „ „).
Total	265	species	

Prain, too, has made 3 divisions of the Sundribuns plants which practically coincide with ours. He distinguishes 3 groups (after excluding some species).

1. Species distributed only eastward (our Eastern Element)	34	species	(12 %)
2. Species distributed only westward (our Western Element)	21	„	(7 %)
3. Species distributed westward and eastward (our General Element)	228	„	(81 %)
Total ...	283	species.	

We show the same relations between the two areas graphically.



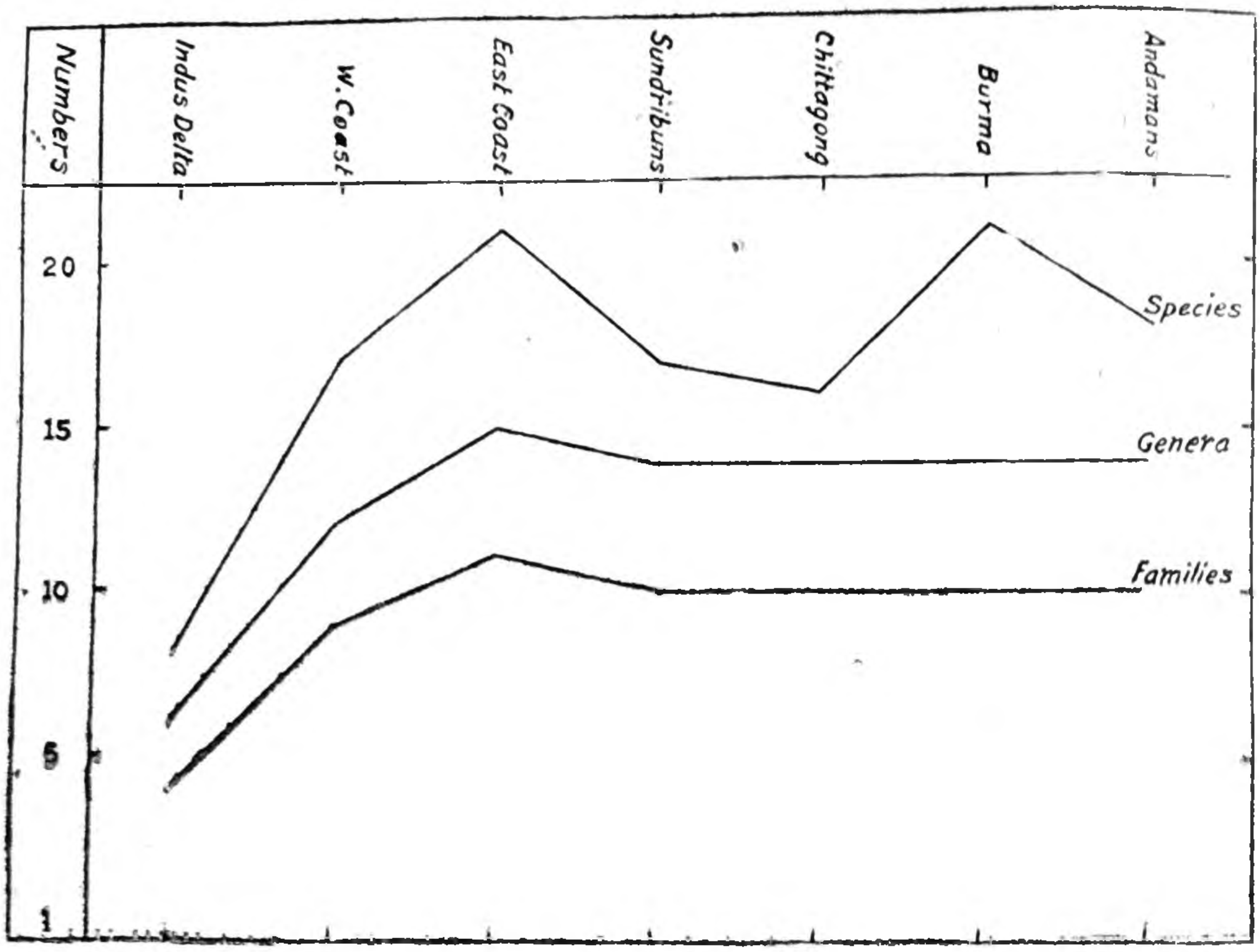
Graph 17.—Geographical distribution of the vegetation of the Indus Delta and the Sundribuns.

The purely E. element is small in both, whilst the Indus Delta receives a distinct character from the W. element.

There is one important class of plants, the so-called Mangroves, which we should like to consider separately. Many data of the following list are taken from Troup, Silviculture of Indian Trees, the rest from Gamble's and Haines' Floras.

Family.	Species.	Indus Delta.	W. Coast.	E. Coast.	Sundribuns.	Chittagong.	Burma.	Andamans.
Rhizophor. ...	*Rhizophora mucronata Lam.* ...	*	*	*	*	*	*	*
	„ *conjugata Linn.* ...	*	*	*	...	*	*	*
	Ceriops Candolleana Arn. ...	*	*	...	*	...	...	*
	„ *Roxburghiana Arn.* ...	*	*	*	*	*	*	...
	Khandelia Rheedei W. & A. ...	...	*	*	*	*	*	*
	Bruguiera gymnorhiza Lam. ...	*	*	*	*	*	*	*
	„ *eriopetala W. & A.* ...	...	*	*	...	...	...	...
	„ *caryophylloides Bl.* ...	...	*	*	...	...	*	...
	„ *parviflora W. & A.* ...	...	...	...	...	...	*	...
Meliac. ...	*Carapa obovata Bl.* ...	...	*	*	*	*	*	*
	„ *moluccensis Lam.* ...	...	...	...	*	...	...	*
Leguminos. ...	*Cynometra ramiflora Linn.* ...	...	*	*	*	*	*	*
Combretac. ...	*Lumnitzera racemosa Willd.* ...	...	*	*	*	*	*	*
	„ *coccinea W. & A.* ...	...	...	...	...	...	*	*
Lythrac. ...	*Sonneratia acida Linn. f.* ...	*	*	*	*	*	*	*
	„ *apetala Ham.* ...	...	...	...	*	*	*	...
	„ *alba Sm.* ...	...	*	...	...	...	*	*
	„ *Griffithii Kurz.* ...	...	...	...	...	...	*	...
Rubiac. ...	*Scyphiphora hydrophyllacea Gaertn.* ...	...	...	*	...	...	...	*
Myrsinac. ...	*Aegiceras majus Gaertn.* ...	*	*	*	*	*	*	*
Acanthac. ...	*Acanthus ilicifolius Linn.* ...	...	*	*	*	*	*	...
Verbenac. ...	*Avicennia officinalis Linn.* ...	*	*	*	*	*	*	*
	„ *alba BC.* ...	...	...	*	...	...	...	...
	„ *marina Vierh.* ...	...	...	*	...	...	...	...
Euphorbiac. ...	*Excoecaria agallocha Linn.* ...	...	*	*	*	*	*	*
Palmae ...	*Nipa fruticans Wurmb.* ...	...	...	*	*	*	*	*
	Phoenix paludosa Roxb. ...	...	...	*	*	*	*	*
		8	17	21	17	16	21	18

The subjoined graph gives the number of species, genera and families observed in the various regions.



Graph 18.—Distribution of the families, genera and species of the Mangrove-group in the Indo-Burmese region.

The fact that from the Indus Delta only 8 species of Mangroves are recorded, whilst all the other regions are represented by 16—21 species, confirm our suspicion that we have overlooked quite a number of plants in the lower part of the Delta. Sea-sickness, heat, hunger, and thirst had produced that feeling in us under whose influence even enthusiastic men lose all scientific interest.

(To be continued.)