

**A SKETCH OF THE  
FLORA OF  
BRITISH INDIA**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649320950

A Sketch of the Flora of British India by Joseph D. Hooker

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Cover @ 2017

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BY

SIR JOSEPH D. HOOKER, G.C.S.I.

(Under Revision.)



LONDON:  
PRINTED BY EYRE AND SPOTTISWOODE,  
PRINTERS TO THE KING'S MOST EXCELLENT MAJESTY.

1904.

## P R E F A T O R Y   N O T E .

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THE accompanying sketch of the Flora of British India has been written as a chapter in the Descriptive volume of "The Indian Empire," to be published with the forthcoming new edition of the Imperial Gazetteer of India.

It is now issued, in an advanced form (subject to revision), with the authority of the Secretary of State, and in response to representations from distinguished botanists in Europe and India, in order that, with as little delay as possible, it may be in the hands not only of Indian botanists and foresters, but of all who take an interest in the vegetable productions of our vast Imperial possessions in the East.

With the special object of encouraging investigation of the large areas indicated in the sketch as still botanically unknown, a certain number of copies have been sent for distribution to the editor of the *Records of the Botanical Survey of India*.

J. D. H.

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INTRODUCTION.

THE term British India as employed in this chapter embraces, over and above the vast territory controlled by the Government of India, some wholly independent countries, of which Nepāl, and the Himālaya east of Sikkim are the chief; together with Ceylon and the Malayan Peninsula, which are in great part under the Colonial Government.

The Geographical and Climatal features of India, upon which the distribution of its Flora so much depends, can be here introduced only incidentally. They will be found to be fully discussed in an earlier chapter of this volume of the Imperial Gazetteer.†

The term Flora applies in this sketch to native Flowering plants, Ferns, and their allies. Collected materials do not exist for discussing the distribution of Mosses, Hepaticæ, Lichens and Fungi, which abound in most parts of India, or of the Algæ in its seas and fresh waters. On the other hand such extensive herbaria of the higher Orders of plants have, during the last century especially, been made over most parts of British India, that the study of their contents may be assumed to provide sufficient materials for a review of its Flora.

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\* In compiling this sketch I have had the advantage of receiving valuable facts and suggestions from Sir G. King, K.C.I.E., F.R.S., late Director of the Royal Botanic Gardens, Calcutta, and J. S. Gamble, M.A., C.I.E., F.R.S., late of the Indian Forest Department.

† See also "Introductory Essay to the Flora Indica," by J. D. Hooker and Thomas Thomson, pp. 280, with 2 maps, London: Pauplin & Co., 1855.



The Flora of British India is more varied than that of any other country of equal area in the Eastern hemisphere, if not in the globe. This is due to its geographical extension, embracing so many degrees of latitude, temperate and tropical; to its surface rising from the level of the sea to heights above the limits of vegetation; to its climates varying from torrid to arctic, and from almost absolute aridity to a maximum of humidity; and to the immigration of plants from widely different bordering countries, notably of Chinese and Malayan on the east and south, of Oriental,\* European and African on the west, and of Tibetan and Siberian on the north. Whether India is richer in number of genera and species than any other area on the globe of equal dimensions is doubtful; it is certainly far poorer in endemic genera and species than many others, especially China, Australia, and South Africa.

Of the elements of the Indian Flora the Malayan is the dominant, but until the Floras of Sumatra, Tonkin and South China are better known, it is not possible to estimate its comparative strength. The Oriental and European elements can be approximately estimated. About 570 European genera and 760 species are indigenous in India, of which about 430 genera and over 400 species are British; and if the Oriental genera and species be added to the European, these figures would probably be doubled. The African element, which includes the Arabian, is third in amount, and it will no doubt be augmented as the Flora of Equatorial Africa becomes better known. The Tibetan and Siberian elements, which include an Arctic, are all but confined to the alpine regions of the Himālaya. Lastly, the Chinese and Japanese Floras are strongly represented throughout the temperate Himālaya and in Burma.

Of the Natural Orders of flowering plants, Ferns and their allies comprised in the Flora of British India, not one is peculiar to it; and if the genera common to it and to one or more of the adjacent countries be excluded, few endemic genera remain, and such of them as are endemic are local, and with few exceptions are

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\* The term "Oriental" is unfortunately used in a very different sense by Botanists and Zoologists. In 1755 it was adopted by Gronovius as the title "Flora Orientalis" of his work on the plants of the Levant and Mesopotamia; and it is the title of Boissier's great Flora of the East from Greece to Afghanistan inclusive. This meaning has long been accepted by botanists. In zoological literature, "Oriental" is more synonymous with Eastern India.

restricted to one or few species.\* It may hence be affirmed that in a large sense there is no Indian Flora proper.†

The British Indian Flora, though so various as to its elements, presents few anomalies in a phytogeographic point of view. The most remarkable instances of such anomalies are the presence in it of one or a few species of what are very large and all but endemic genera in Australia, namely *Bæchia*, *Leptospermum*, *Melaleuca*, *Leucopogon*, *Stylidium*, *Helicia* and *Casuarina*. Others are *Orybaphus himalaicus*, the solitary extra-American species of the genus; *Pyrularia edulis*, the only congeners of which are a Javan and a North American; and *Vogelia*, which is limited to three species, an Indian, South African and Socotran. Of absentee Natural Orders of the Old World, the most notable are *Myoporineæ*, which, though mainly Australian, has Chinese, Japanese, and Mascarene species; *Empetraceæ*, one species of which girdles the globe in the north temperate hemisphere and re-appears in Chili (the rarity of bog land in the Himālaya must be the cause of its absence); and *Cistineæ*, an Order containing upwards of 100 European and Oriental species, of which one only (a Persian) reaches independent Baluchistan. The absence of any indigenous Lime (*Tilia*) or Beech (*Fagus*) or Chestnut (*Castanea*) in the temperate Himālaya is remarkable, all three being European, Oriental, and Japanese genera. The Chestnut, which has been introduced into N.W. India from Europe, ripens its fruit there.

With the exception of the Rhododendron belt in the high Eastern Himālaya, there are in India few assemblages of species of peculiar or conspicuous plants giving a character to the landscape over wide areas, as do the Heaths in Britain, the Heaths and succulent plants in South Africa, the *Eucalypti*, *Epacrideæ* and *Proteaceæ* in Australia, the *Cacti* in America, or the great Aloes and Euphorbias in East Tropical and South Africa; nor are there representatives of the Pampas, Catingas, Savannas, or Prairie

\* Of these exceptions perhaps the most notable one is that of two genera of *Dipterocarpeæ*, *Doona* with 11 species, and *Stemonoporus* with 15, which are both confined to Ceylon.

† Mr. C. B. Clarke, in a most instructive essay "On the Botanical Sub-areas of British India," has speculated on the successive periods at which the component elements of the Flora were introduced, and has arrived at the following division: (1) The Deccan or Indo-African, (2) the Malayan, (3) the Central Asian, (4) the European. Mr. Clarke's sub areas approximately correspond with the Provinces of this sketch. See *Journal of the Linnean Society, Botany*, vol. xxxiv. (1898), p. 142.

vegetation of America. The Coniferous forests of the Himālaya resemble those of other northern countries and the great Teak forests have no peculiar features.\* The wood-oil trees (*Dipterocarpi*) in Burma form an exception, towering over the forests of Arakan and Tenasserim. Of gregarious trees, some of the most conspicuous are the Sal (*Shorea robusta*), Eng (*Dipterocarpus turbinatus*), Sissoo (*Dalbergia Sissoo*), Khair (*Acacia Catechu*) and Babul (*A. arabica*).

Indigenous Palms are few compared with many regions in tropical America, and are comparatively unobtrusive. The Talipot Palms (species of *Corypha*) are the most majestic Palms in India, in stature, foliage and inflorescence, but they are exceedingly rare and local. The Indian Date (*Phoenix sylvestris*), the Fan-Palm or Palmyra (*Borassus flabellifer*) and the Coco-nut near the sea, are the only palms that may be said to be conspicuous in the landscape of the plains of India. On the other hand, graceful, erect or climbing Palms with pinnate or fan-shaped leaves frequent the humid evergreen forests, where the rattans (*Calami*) ascend the trees by their hooked spines and expose their feathery crowns to the light. Bamboos, of which there are more than 120 kinds in India, are, as elsewhere in the tropics, important features, whether as clumps growing in the open, or forming in association all but impenetrable jungles; the taller kinds monopolise large areas in the hot lower regions, and the smaller clothe mountain slopes up to 10,000 feet in the Himālaya. Tree-ferns, of which there are about 20 (?) species, frequent the deepest forests of the Eastern Himālaya, Burma, Malabar, the Malay Peninsula and Ceylon.

Of shrubs that form a feature in the landscape from their gregarious habits, the most conspicuous examples are the Rhododendrons of the temperate regions of the Himālaya, and the genus *Strobilanthes* in the Western hills of the Peninsula; many species of the latter genus do not flower till they have arrived at a certain period of growth, and then, after simultaneously flowering, seed profusely and die. Some Bamboos, also gregarious, display the same habit, which they retain under cultivation in Europe. Three local, all but stemless Palms are

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\* For an account of the Indian forests reference must be made to the chapter on Forestry in this Gazetteer, and for details to Gamble's *Manual of Indian Timbers* (London, 1902). In the latter invaluable work, 4,749 woody plants are recorded for British India (exclusive of those of the Malayan Peninsula), and of these 2,513 are trees, 1,429 shrubs, and 807 climbers.