The Flora of British India, Volume 7

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FLORA

OF

BRITISH INDIA.
PREFACE TO VOL. VII.

The length of time, upwards of a quarter of a century, occupied in the publication of the Flora of British India, has resulted in the later volumes containing a far more complete account of the families of plants to which they are devoted than do the earlier volumes of theirs.

For this there are two reasons, the extension of the area of British India in the interval, and the many collections that have been transmitted to Kew from wholly or imperfectly explored regions of India during the same interval.

The extension of area has been: on the East, Munnpore, and by far the greater part of Burma, adding many Indo-Chinese genera and species to the flora; on the West, British Beluchistan and other trans-Indus hills and valleys, adding Oriental genera and species. Neither of these extensions have, however, added so much to the Indian flora as might have been expected; for, as regards Burma, extensive materials were already available from Pegu, Martaban, Tenasserim, and the upper and lower Irrawaddy valleys; and as regards the West, the low country Oriental flora is represented in the plains of Sind and the Panjab, and the upland and alpine in the trans-Indus valleys, Western Tibet, and the Kashmir Himalaya.

On the other hand, the collections received from previously unexplored and partially explored regions of India proper have been numerous and full of novelty and interest. Of these the first in importance are Mr. C. B. Clarke’s, whether for their extent, the knowledge and judgment with which the specimens were selected, ticketed, and preserved, or for the valuable observations which accompany them. They were obtained over a greater extent of India than had been traversed by any other Indian botanist, and at all elevations, up to 18,500 ft., from the bend of the Indus at Gilgit, Kashmir, and Western
Tibet, in the extreme West; from Sikkim, Bengal, Assam, and Munne-
pore in the East; from Behar, Central India, and Chota Nagpur in the
centre; and from the Nilghiri Hills in the South. Next in importance
are the Malay Peninsula collections made by Father Scortechini, the
Messrs. Curtis, Wray, Hervey, Hullett, Merton, and Ridley, and by
collectors sent by Dr. King from the Botanic Gardens of Calcutta.
These latter have added several hundred species to the genera described
in the first volume alone of this Flora, and have been published by
Dr. King in the Journal of the Asiatic Society of Bengal. Thirdly
rank Mr. Duthie's copious and excellently preserved collections made in
Kashmir, Western Tibet, Garwhal, Kumaon, Rohilkund, Rajmahal,
and Central India, and Dr. Aitchison's from the Kurrum and other
valleys west of the Indus.

Of the works upon Indian Botany that have appeared during the pub-
lication of Flora of the British India, the more important are Mr. C. B.
Clarke's "Composite Indicae" (1876); Mr. Kurz's "Forest Flora of
Burma" (1876); Dr. Brandis' "Forest Flora of N.-W. and Central
India" (1874); Col. Beddome's "Flora Sylvatica of Southern India,"
vol. i. and ii. (1869-73), and his "Icones Plantarum Indiae Orientalis,"
vol. i. (1874); Dr. Trimen's "Handbook of the Ceylon Flora,"
Parts i.—iii. (1893-5); and Dr. King's "Annals of the Botanic Gardens,
Calcutta," vols. i.—vii. (1888-1897), which include illustrated mono-
graphs by himself and other Indian botanists of the Indian species of
Ficus, Quercus, Pedicularis, Magnoliaceae, Anonaceae, Bambuseae, &c.

In the Preface to the first volume of this work I have stated that it
was proposed to include in it the Ferns and their allies. This intention
has been abandoned, owing to the appearance of excellent available
works describing the Indian species, especially Hooker and Baker's
"Synopsis Filicum" (1874); Col. Beddome's "Review of the Ferns of
N.-W. India" (1880), and his "Handbook of the Ferns of British
India" (1883), with Supplement (1892).

Having regard to this "Flora of British India," I must remind those
who may use it that it has no pretensions to give full characters of the
genera and species contained in it. It aims at no more than being an
attempt to sweep together and systematize within a reasonable time and
compass, a century of hitherto undigested materials scattered through a
library of botanical books and monographs, and preserved in vast
collections, many of which latter had lain unexamined for half a
century in the cellars of the India House and in public and private herbaria. It is a pioneer work, which, besides enabling botanists to name with some accuracy a host of Indian plants, may, I hope, serve two higher purposes, to facilitate the compilation of local Indian floras and monographs of the large Indian genera; and to enable the phytographer to discuss the problems of the distribution of plants from the point of view of what is perhaps the richest, and is certainly the most varied botanical area on the surface of the globe, and one which, in a greater degree than any other, contains representatives of the floras of both the Eastern and Western Hemispheres.

J. D. Hooker.

November, 1897.
ADDENDUM.

Vol. vii. p. 416, under 2. *S. chilianthum*, insert habitats:

Singapore, Wallich; Malacca, Stevens. Distrib.: Java, Sumatra.
FLORA OF BRITISH INDIA.

ORDER CLXXIII. GRAMINEAE.

Erect decumbent or creeping herbs, or in Tribe Bambuseae shrubs or trees. Stem terete or compressed, jointed; internodes solid or hollow. Leaves simple, usually long and narrow, entire, parallel-nerved, with a sheathing base distinct from the blade; sheath split to the base (very rarely entire) with often a transverse hyaline erect appendage (ligula) at the union with the blade, facing the latter. Inflorescence terminal, rarely also from the upper sheaths, consisting of spicate racemose capitulate or panicked spikelets. Spikelets of three or more alternate distichous bracts (glumes), of which the two lowest are normally empty, and the succeeding, if more than one, are arranged on an axis (rachilla), and are all or some of them flowering; within each flowering glume and opposite to it is an erect narrow 2-nerved scale (palea), the margins of which are infolded towards the glume and enclose at the base the true flower. Flowers uni- or bisexual, consisting of 2, rarely 3 or 6 microscopic scales (lodicules) representing a perianth, and stamens or a pistil, or both. Stamens 3, rarely 1, 2, 6, or very rarely many, hypogynous; filaments capillary; anthers versatile, fusiglumis, of two parallel cells, with no apparent connective; pollen globose. Ovary entire, 1-celled; styles 2, rarely 3, free or united at the base, usually elongate, and exserted from the sides or top of the spikelets, clothed with simple or branched stigmatic hairs; ovule erect, anatropous. Fruit a seed-like utricule (grain) free within the flgl. glume and palea, or adherent to either or both; pericarp very thin, rarely thick or separable from the seed. Seed erect; albumen copious, mealy; embryo minute, at the base of and outside the albumen; cotyledon scutelliform, bearing on its face an erect conical plumule, and descending conical radicle.

Genera about 300; species estimated at about 3000, but many are doubtful, and more mere varieties; natives of all climates and regions.

In working up the grasses for this Flora, I find the multiplication of species to have passed all bounds, and their nomenclature to be involved in a corresponding degree. This has arisen from two principal causes, from authors not taking into account the wide area over which the individual species of grasses range, and from the imperfection of the descriptions of the earlier and many later authors. It is sixty-two years since Kunth published his “Agrostographia Synoptica (Tubingen, 1833), which is an uncriticized sweeping up of all previously known supposed genera and species, with imperfect descriptions and synonyms. It was succeeded (in 1835) by a second volume, in which a few hundred species of the first volume are very fully and accurately described, and valuable notes upon others are added. In 1855 Steudel’s “Synopsis Graminum” appeared. It in no respect advances, and in many ways retards the student of the Order. Of more recent works on Gramineae, three only are of great mark, namely, Munro’s very able Monograph of the Bambuseae (Trans. Linn. Soc. vol. xxvi. (1868); Bentham’s revision of the genera, Gen. Plant. vol. iii.

* It is a fact familiar to every one who examines collections of plants from hitherto unexplored countries, that novelties amongst the grasses are very few indeed, compared with what occurs in other natural families.
(1883), a work of remarkable completeness and accuracy, considering the chaotic condition in which the author found the Order; and Hackel's admirable monograph of the *Andropogoneae* in A. de Candolle "Monogr. Phanerog." vol. vi. (1880), the largest and most difficult Tribe of grasses.

I have cited synonyms to a much greater extent in this than in any other Order described in the "Flora of British India" (except the "Cyperaceae" by Clarke) with the view of aiding the researches of future authors. Many of these synonyms had never been fixed with any approach to exactness, and many were for the first time identified during Mr. Jackson's and my labours on the "Index Kewensis." I cannot expect that all will prove to have been satisfactorily reduced, and still less that all have been brought to light.

Referring to the classification of the Indian genera, I have been compelled to diverge somewhat from Bentham's arrangement, and to abandon some of his Tribes and Subtribes, in many cases following Hackel's more recent and well-considered views. These divisions throughout the Order are of very unequal value, and are as difficult of delimitation as of definition upon any fixed principles. They are, indeed, in some cases arbitrary, and in others more or less artificial. In this matter, and in the description or revision of some of the very difficult genera, I have derived great aid from Dr. Stapf, Assistant in the Herbarium of the Royal Gardens, who has lately been instructed by the Director of Kew to study and name the materials in that Herbarium critically. As Dr. Stapf shares my views as to the wide ranges of the species, and the undue multiplication of their synonyms, his labours may be expected to yield far-reaching results, taxonomic, morphological and geographical, and to modify some of the conclusions arrived at in the following attempt to methodize the Indian *Gramineae*. As affecting the numbers and synonyms taken from "Wallich's List," I have to observe that for some of them I have had to depend on the ticketed duplicates in Herb. Hook. and Benth., the types being wanting in the Wallachian collection in the rooms of the Linnean Society.

Series A. *Panicaceae*. Spikelets articulate on their pedicels, or deciduous with them, 1-2-fl., upper fl. alone (if 2) fruiting.

*Exceptions.* Spikelets inarticulate on their pedicels in *Aruninella* and *Isachne.* Spikelets articulate on their pedicels, or with articulate pedicels occur in *Poaeeae* in *Alopecurus*, *Cynathurus*, *Polypogon*, *Fingerkühnia*, and *Lophatherum*. Upper flower alone fertile in Tribe *Phalarideae* of *Poaeeae*, and in *Tristachya*.

I. Rachis of infl. inarticulate, or subarticulate in *Stenotaphrum*. Fl. gl. usually coriaceous or herbaceous.

Tribe I. *Panicae*. Spikelets 2-fl., upper fl. bisexual, lower male or neuter, rarely both fertile. (*Spinifex* is dioecious.)

* Spikelets articulate on their pedicels, except *Isachne* and *Aruninella*.

† Spikelets not involucellate by bristles.

§ Spikelets not awned (gl. II and III beaked or awned in *Pan. Grus-galli*).

(See also *Trichololena* and *Aruninella*.)

Spikelets dorsally flattened, base not thickened; gls. 3, with very rarely a minute fourth (lowest).

Spikelets of *Paspalum*, but with a thickened basal callus.

Spikelets subglobose, paniced; gls. 4, I and II separately deciduous, subequal.

Spikelets paucied or spicate, gls. 4 (2 in *P. subgenile*)

1. Paspalum.

2. *Enicchiooa*.

3. *Isachne*.

4. *Panicum*.

5. *Ichnanthus*.