

NOTES ON THE DISTRIBUTION OF SOME GRASSES IN INDIA

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ABSTRACT

The range of distribution in India, of 14 grasses, namely *Arundinella holcooides* (Kunth) Trin., *A. villosa* Arn. ex Steud., *Bromus macrostachys* Desf., *B. ramosus* Huds., *Catabrosa sikkimensis* Stapf ex Hook. f., *Chloris quinquesetica* Bhide, *C. roxburghiana* Schult., *Festuca cumminsii* Stapf, *Garnotia elata* (Arn. et Miq.) Janowsky, *Isachne elegans* Dalzell ex Hook. f., *Oryzopsis molinioides* (Boiss.) Hack. ex Paulsen, *Panicum turgidum* Forssk., *Poa sikkimensis* Bor and *Secale afghanicum* (Vavilov) Roshev. is discussed. *Secale afghanicum* is an injurious weed of grain fields, and it is suggested that a watch should be kept on its spread in India.

Bor's book (1960) on grasses of Burma, Ceylon, India and Pakistan is a good summary of the work done on the family Poaceae during the last about 70 years; that is, since the publication of Hooker's (1896) comprehensive account.

For each taxon treated in his book, Bor has given a brief note on distribution and also made a mention of the sheets studied by him. More recent publications on grasses and general floristic accounts of different regions in India have modified our knowledge of the distribution of several grass species in India.

A scrutiny of over one hundred floristic lists (chiefly those published after Bor's work of 1960) has brought to light interesting cases of widening range of distribution and even of discontinuous distribution. In some cases the discontinuous distribution seems to be so marked as to warrant the necessity of verification of the identity.

In some cases there has obviously been a misinterpretation of taxonomic status of the species. Critical notes have been provided for these.

Notes on the distribution of such grasses as occur as weeds can be of much economic importance. The instance of the spread of the injurious grass—*Secale afghanicum* (Vavilov) Roshev. is one such example treated in this paper.

The purpose of this note, therefore, is to give a revised account of the present distribution of fourteen species of grasses.

The genera and species are arranged alphabetically. For convenience of locating synonymy, soon after the name of the species, reference of Bor's book is given. Necessary references to the floristic lists or other publications, on which our conclusions are based, are added at relevant places. Wherever pos-

sible, the original voucher specimens on which the occurrence was based, are cited.

ARUNDINELLA Raddi

Arundinella holcooides (Kunth) Trin. Bor, 1960: 422.

In his revision of the Indian species of the genus *Arundinella*, Bor (1955) had explained that *Arundinella agrostoides* of Flora of British India (Hooker l.c.) was based on materials of two different species; namely, (1) *Arundinella holcooides* (Kunth) Trin. (Syn. *Arundinella agrostoides* Trin.) which is distributed from Burma eastwards; and (2) *Arundinella ciliata* (Roxb.) Nees, which is the common Indian species. The respective length of the arista at the tip of the lower glumes and lower lemma is the chief character distinguishing these two taxa.

Some workers on Indian flora [Arora 1968 (based on *Panigrahi & Arora BSA*: 1044); Sebastine 1960 (based on *Sebastine MH*: 4817) and Subramanyam 1959 (based on *MH*: 1526, 1801)] have reported *Arundinella holcooides* from peninsular India. Only one of the specimens quoted in the above papers, namely, *Subramanyam* 1801 is available in Calcutta herbarium; this is *Arundinella ciliata* (Roxb.) Nees. It will be of interest to verify the identity of the other specimens. If any of them is true *Arundinella holcooides*, its occurrence in India is of phytogeographical interest.

A. villosa Arn. ex Steud. Bor, 1960: 426.

In his above noted account of the genus *Arundinella*, Bor (1955) had shown that *Arundinella villosa* of Flora of British India (Hooker l.c.) should be treated under three distinct species. *Arundinella villosa* var. *wightii* Hack. is the true *Arundinella villosa*; that is, *Arundinella villosa* var. *villosa*. It is so far known to be endemic to Ceylon, Matthew

(1966) has included *Arundinella villosa* Arn. ex Steud. in his list of plants from Kurseong, Darjeeling. This species has never been collected from the Himalayas, and, therefore, the identity of Matthew's gathering needs to be verified.

BROMUS L.

Bromus macrostachys Desf. Bor, 1960: 456.

This is a grass of the Mediterranean region and was so far known to extend up to Southern Russia. Stewart (1967) discovered the occurrence of this grass in Kashmir. He has listed it under the name *Bromus lanceolatus* Roth, and gives *Bromus macrostachys* Desf. as a synonym. Stewart has however indicated some doubt about the identity of his specimen. Stewart also mentioned of an earlier collection of this species by Lance from Spiti. Bor (1960) had already forecast the probability of its occurrence in northwestern Himalayas.

B. ramosus Huds. Bor, 1960: 456.

The distribution of this species is not confined to northern India alone, but extends to the mountainous regions of peninsular India. Fischer (1934) and Sebastine [(l.c.) (based on *Sebastine* MH: 4136)] have recorded this grass under the name *Bromus asper* Murr. from Nilgiri and Pulney hills.

CATABROSA P. Beauv.

Catabrosa sikkimensis Stapf ex Hook. f. Bor, 1960: 529.

This species was described from Alpine Sikkim and was believed to be endemic to that region. Stewart [(l.c.) (based on *Koelz* 24141)] reported its occurrence in Ladakh in Kashmir. The range of distribution of this species seems to extend from Eastern Himalayas to Western Himalayas.

CHLORIS Sw.

Chloris quinquesetica Bhide. Bor, 1960: 466.

This grass was first discovered in Bombay State and was, for sometime, believed to be endemic to that state. Several workers have now reported it from Rajasthan [Rolla and Kanodia 1963 (based on *Rolla BSI*: 66745); Puri *et al.* 1964; Blatter and Hallberg 1920 (based on *Blatter & Hallberg BLAT*: 8748)]. The distribution of this species seems to extend over whole of Western India.

C. roxburghiana Schult. Bor, 1960: 468.

This grass was first described in India under the name *C. polystachya* by Roxburgh. Bor (1960) reduced *C. polystachya* Roxb. to synonymy of

C. roxburghiana Schult. This grass was considered to be confined to peninsular India. Recent workers (Puri *et al.* l.c.) have reported this grass in Rajasthan. The distribution of this species of *Chloris* also seems to extend over whole of Western India.

FESTUCA L.

Festuca cumminsii Stapf Bor, 1960: 538.

While interpreting the distribution of this species, we have to recognize the fact that it is synonymous with *Festuca rubra* L. subsp. *schlagintweitii* St. Yves (Bor 1960, Chase & Niles 1962). *Festuca rubra* subsp. *schlagintweitii* is already reported to occur in Leh in Tibet, and Ladakh in Kashmir. Recently Stewart [(l.c.) (based on *Schlagintweit* K: 5914; *Koelz* 5905, *MICH*: 5951)] also reported the grass from several places in Kashmir. The grass, therefore, is not endemic to Sikkim or even India, but its distribution extends throughout the Himalayan ranges and mountains of Central Asia (Chase & Niles l.c.).

GARNOTIA Brongn.

Garnotia elata (Arn. et Miq.) Janowsky. Bor, 1960: 567.

This species has, so far, been considered to be confined to southern India (Hooker l.c., Fischer l.c., Bor 1960). Kapoor (1962) reported it from Lucknow in northern India. The grass is likely to be found in the intervening region also.

ISACHNE R. Br.

Isachne elegans Dalzell ex Hook. f. Bor, 1960: 580.

This grass was originally considered to be endemic to Bombay (Hook. f. l.c.; and Blatter and McCann 1935). Its recent reports from Mount Abu (Kanodia & Rolla 1966, based on *Jain BSI*: 60167), Madhya Pradesh (Tiwari, 1955) and Orissa (Panigrahi *et al.* 1964, based on *Panigrahi BSA*: 20554) suggest that its range of distribution extends to far north in the plains and hills of India.

ORYZOPSIS Michx.

Oryzopsis molinioides (Boiss.) Hack. ex Paulsen. Bor, 1960: 640.

This grass was believed to be distributed in Western Asia in Iran, Iraq and Afghanistan (Bor 1960). Stewart [(l.c.) (based on *Koelz MICH*: 5884, *MICH*: 6231, *K*: 6898)] has reported its occurrence as far east as Kashmir (in Ladakh) and other places in mountains of the region.

PANICUM L.

Panicum turgidum Forssk. Bor, 1960: 331.

It is a grass of the arid regions. It has been reported in India from Gujarat (Blatter and McCann l.c.), Central India (Hooker l.c.) and Rajasthan (Puri *et al.* l.c.). Nair and Nathawat (1957) reported it from Harshnath in Aravalli ranges. The distribution of this grass therefore, extends well within Indian boundaries.

POA L.

Poa sikkimensis (Stapf) Bor. Bor, 1960: 560.

Till recent, this species was reported only from Sikkim in Eastern Himalayas (Bor 1960, Rolla 1963). Stewart (l.c. based on Thomson's collection from Ladakh in K) however, discovered the occurrence of this grass in the Western Himalayas. This is also to be noted that this taxon was originally described as a variety of *Poa annua* L. (Stapf in Hook. f. l.c.). Bor (1952) changed its status to rank of species. The correct citation for the taxon, therefore, will be *Poa sikkimensis* (Stapf) Bor, and not *Poa sikkimensis* Bor (as given by Rolla l.c. and Stewart l.c.).

SECALE L.

Secale afghanicum (Vavilov) Roshev. Bor, 1960: 677.

This taxon was described by Vavilov from Afghanistan. It is a harmful weed of wheat fields. Stewart [(l.c.) (based on Stewart RAW: 26701)] has found it growing in grain fields in Gilgit area of Kashmir. A statement in Bor's book (1960) shows that the admixture of this grain in wheat flour is injurious. The Agriculture Department of Kashmir will do well in keeping an eye on the spread of this weed in agricultural lands of that State.

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REFERENCES

- ARORA, C. M. The Botany of Bailadilla, Bastar State, M. P. *Bull. bot. Surv. India* 10: 61-66, 1968.
- BLATTER, E. J. AND F. HALLBERG. The Flora of the Indian desert (Jodhpur & Jaisalmer). *J. Bombay nat. Hist. Soc.* 26: 977-987, 1920.
- AND C. McCANN. *The Bombay Grasses*. 1935.
- BOR, N. L. Notes on Asiatic Grasses. III. New names in *Poa* L. *Kew Bull.* 1952: 130, 1952.
- Notes on Asiatic Grasses. XXIV. The genus *Arundinella* Raddi in India, Burma and Ceylon. *Ibid.* 1955: 377-414, 1955.
- The Grasses of Burma, Ceylon, India and Pakistan*. 1960.
- CHASE, A. AND C. D. NILES. *Index to Grass species* 2, 1962.
- FISCHER, C. E. C. *Flora of Madras* 10, *Gramineae*, 1934.
- HOOKEE, J. D. *Flora of British India* 7. *Gramineae*, 1896.
- KANODIA, K. C. AND R. S. ROLLA. Grasses of Mt. Abu. *Ann. Arid Zone* 5: 49-62, 1966.
- KAPOOR, S. L. On the botany of Lucknow District. *J. Bombay nat. Hist. Soc.* 59: 862-896, 1962.
- MATTHEW, K. M. A preliminary list of plants from Kurseong. *Bull. bot. Surv. India* 8: 158-168, 1966.
- NAIR, N. C. AND G. S. NATHAWAT. Vegetation of Harshnath, Aravalli hills. *J. Bombay nat. Hist. Soc.* 54: 281-301, 1957.
- PANIGRAHI, G., S. CHOWDHURY, D. C. S. RAJU AND G. K. DEKA. A contribution to the botany of Orissa. *Bull. bot. Surv. India* 6: 237-266, 1964.
- PURI, G. S., S. K. JAIN, S. K. MUKERJEE, N. N. KOTWAL AND S. SARUP. Flora of Rajasthan. *Rec. bot. Surv. India* 19: 1-159, 1964.
- ROLLA, R. S. A botanical tour in the Sikkim State, Eastern Himalayas. *Bull. bot. Surv. India* 5: 165-205, 1963.
- AND K. C. KANODIA. Studies on the vegetation and flora of Jodhpur Division, Rajasthan State. *Ann. Arid Zone* 2: 35-60, 1963.
- SEBASTINE, K. M. Studies on the flora of Pakasura hills (Hulical Durg R. F.) in the Nilgiri district, Madras State. *Bull. bot. Surv. India* 2: 1-7, 1960.
- STEWART, R. R. The Grasses of Kashmir. *Ibid.* 9: 114-133, 1967.
- SUBRAMANYAM, K. Observation on the flora of Boluvampatti forest, Coimbatore Taluk. *Ibid.* 1: 127-137, 1959.
- TIWARI, S. D. N. The Grasses of Madhya Pradesh. *Indian For.* 81: 107-115, 1955.