

## NEW PLANT RECORDS FOR THE UPPER GANGETIC PLAIN

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### ABSTRACT

Although great advancement in researches in practically all other branches of botany has been made in India during recent years, floristic and vegetational studies have been greatly neglected since the publication of Hooker's Flora of British India and other regional floras in the latter part of nineteenth and early twentieth century. During the last two decades or so fortunately, some interest has again been revived in this subject and attempts have been made to study local vegetation of various parts of this great sub-continent. Concerted action on the part of foresters and botanists in various universities and other scientific organisations and research institutions is, however, necessary in the collection of fresh and adequate material for floristic studies and thereby help in the revision of the Flora of India.

The present paper is the fifth of the series dealing with the author's studies of the Flora of the Upper Gangetic Plain and the adjacent Siwalik and sub-Himalayan tracts, which cover an area of about 1,96,000 sq. miles (5,07,640 sq. Km.). Most of the materials on which this paper is based have been collected or scrutinized by the author within recent years and are deposited in the Dehra Dun Herbarium.

Modern nomenclature has been used throughout and 28 species referable to 20 genera and 10 families, hitherto not reported from the area by previous workers, have been listed. One new combination in the family *Convolvulaceae*, viz., *Argyria bella* (Clarke) Raizada has been made. For the benefit of Indian workers detailed descriptions with critical notes of species not described in Hooker's Flora of British India have been given.

Floristic and vegetational studies have generally been greatly neglected in India since the publication of the monumental 'Flora of British India' by Sir J. D. Hooker and other provincial floras in the latter part of the nineteenth and early twentieth century. During the last decade or so, fortunately interest has again been revived to a certain extent in this subject and attempts have been made to study the local vegetation of various parts of the country (J. Banerji, 1948 ; M. L. Banerji, 1952a, b, 1953 ; Chatterjee and Bharadwaja, 1955 ; Ghildyal, 1957 ; Govindu, 1949 ; Govindu and Thirmulachar, 1952 ; Gupta, 1956 ; Jain and Bharadwaja, 1949 ; Joshi, 1956 ; Kingdon-Ward, 1948, 1949 ; Krishnaswamy, 1952 ; Mooney, 1947, 1950 ; Mudaliar and Kamath, 1954 ; Mukerjee, Sushil, 1947, 1953, 1956 ; Mukherjee, Sunil, 1953 ; Nair and Nathawat, 1956, 1957 ; Nasir, 1957 ; Navalkar, 1956 ; Patil, 1956 ; Patnaik, 1956 ; Patnaik and Patnaik, 1956 ; Raizada, 1948a, b, 1949, 1951, 1952, 1954a, b, c, 1957 ; Sahni, 1953 ; Sahni and Raizada, 1955 ; Santapau, 1947, 1950, 1951, 1953a, b, c, d, 1955 ; Santapau and Raizada, 1956 ; Seshagiri Rao, 1953 ; Shanti Swarup, 1957 ; Srivastava, 1955a, b, 1956a, b ; Stewart, 1951 ; Thirumalachar, *et al.*, 1949 ; Watts, 1954 ; etc.). This will doubtless greatly help in the revision of the local floras and the flora of India, provided such interest is kept up by the various Indian universities and other scientific and research organisations and institutions and proper facilities are made available for this purpose.

The present paper is the fifth of the series dealing with the author's studies of the 'Flora of Upper Gangetic Plain and the adjacent Siwalik and sub-Himalayan Tracts'.\* Most of the materials on which this paper is based have been collected

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\* Recently introduced or otherwise imperfectly known plants from the Upper Gangetic Plain. Pt. I. *Journ. Ind. Bot. Sci.*, 14, 339-348, 1935. Pt. II. *Ibid.*, 15, 149-167, 1946. Pt. III. *Ind. For. Rec.* (N.S.) Botany, 1, 223-235, 1939. Pt. IV. *Ibid.*, 4, 65-72, 1950.

or scrutinized by the author within recent years and is lodged in the Dehra Dun Herbarium.

In addition to the species not previously described by Duthie in his flora or noted and recorded by the author as occurring in the Upper Gangetic Plain, Sunil Mukherjee mentions the following species as having been collected on the Delhi Ridge: *Atylosia elongata*, *Blepharis asperrima*, *Leucas diffusa* and *Opuntia dillenii*. In addition Srivastava (1956) mentions the species listed below as having been collected by him, but so far these have not been reported from any part of Uttar Pradesh: *Athroisma laciniatum*, *Bulbostylis capillaris*, *Convolvulus microphyllus*, *Luffa graveolens* and *Vicoa cernua*.

The woody flora of the area under consideration is now practically completely known but it is probable that some species, particularly of herbaceous and weedy plants, still remain to be collected and that, future intensive and careful botanizing in the region will add a few more to the present list. Furthermore, a number of species, especially of recently introduced exotics, which are commonly cultivated in gardens have begun to run wild and will doubtlessly become sufficiently common to deserve a place in the flora as much as the indigenous species.

As in previous parts the sequence of families and genera is that adopted by Sir J. D. Hooker in the Flora of British India and with few exceptions the families are enumerated without change in nomenclature and terminology. The generic and specific names have, however, been amended in accordance with the latest International Code of Botanical Nomenclature, but where changes have occurred the synonym as it appears in the Flora of British India is given. For the benefit of Indian workers detailed descriptions of those plants which do not find a place in Hooker's flora and of which it may, therefore, be difficult or inconvenient to find descriptions, are also added.

It has been found necessary to make one new combination, *Argyrea bella* (Clarke) in the family *Convolvulaceae*.

#### CRUCIFERAE

*Lepidium ruderalis* Linn. Sp. Pl. 645, 1753; Hk. f. Fl. Br. Ind. 1: 160, 1872.

'New Forest, Dehra Dun, 15-5-1953, M. B. Raizada Dehra Dun Herb. No. 113072 and 113073! An abundant weed in waste land'.

An annual foetid herb with slender tap-root and a single, more or less erect, stem 10-30 cm. high. Flowers inconspicuous, greenish-white. Pods (siliculae) 2-2.5 mm. by 1.5-2 mm., retuse or notched at the tip.

This is a temperate Himalayan herb which is common in the hills, 2,000-4,000 m. Its occurrence in Dehra Dun is presumably due to its seeds having been brought down in the streams.

*Lepidium perfoliatum* Linn. Sp. Pl. 643, 1753.

'Laxmi Road, Dalanwala, Dehra Dun, 20-2-1953, M. B. Raizada Dehra Dun Herb. No. 112790! A herb near water channel, not common'.

An annual (or biennial?) herb with single erect stem 20-40 cm., sparsely hairy, usually branched above. Basal leaves upto 10 cm., long-stalked, bipinnate, the ultimate segments less than 1 mm. wide; middle and upper stem leaves 1-1.5 by 1-1.5 cm., broadly ovate, or deeply heart-shaped, acute, entire, clasping the stem with large basal lobes, strikingly different from the basal leaves. Flowers small, inconspicuous, in dense terminal ebracteate racemes. Petals pale-yellow, half as long as the sepals. Stamens 6. Fruiting-stalks ascending, glabrous, almost equalling the fruit; siliculae variable in shape but usually about as broad as long, 3-4 mm.; valves keeled below, very narrowly winged above; style usually projecting beyond the apical notch of the fruit. Seeds 4-6 in a cell, pale, smooth,

This species is a native of E. Europe and W. Asia and is now introduced throughout the rest of Europe and in N. Africa and N. America. It is not mentioned in the Flora of British India, although it has been collected from Baluchistan (Stocks 1008 in Herb. Dehra Dun) and Afghanistan (J. E. T. Aitchison 284 and S. A. Akhtar both in Herb. Dehra Dun). Its occurrence in Dehra Dun is, therefore, a mystery to me, although I have collected and observed it on several occasions. In all probability it has been introduced within recent times.

## FRANKENIACEAE

*Frankenia pulverulenta* Linn. Sp. Pl. 332, 1753 ; Hk.f. Fl. Br. Ind. 1 : 212, 1874.

'Sahibabad Daulatpur, Delhi, Feb. 1950, M. B. Raizada Dehra Dun Herb. No. 113649 ! A small spreading herb with deposit of salt crystals on all parts of the plant'

'Delhi, Feb. 1951, Harbhajan Singh Dehra Dun Herb. No. 115559 !

A slender, exceedingly branched, diffuse herb with articulate branches and small opposite leaves. Flowers inconspicuous, small, solitary in the forks of the branches.

It is common in Sind and the plains of the Punjab. Although not recorded by Kashyap and Joshi in their 'Flora of Lahore district' it was collected by Dr. J. L. Stewart from Lahore as early as April 1864 (Stewart 2900 in Herb. Dehra Dun).

## CAESALPINIACEAE

*Caesalpinia digyna* Rottler in Ges. Naturf. Freunde Neue. Schr. 4 : 200, 1803 ; Hk. f. Fl. Br. Ind. 2 : 256, 1878.

'Domakhand, Gorakhpur, 25-2-1918, Sri Ram 937 ! A large climber, rare'

A large scandent shrub, armed with hooked prickles. Flowers in racemes, pale-yellow. Pods shortly stalked, glabrous, fleshy, oblong, with a short recurved beak, 1-4 seeded, rich in tannin.

## COMPOSITEAE

*Artemisia parviflora* Buch. Ham. ex Roxb. Hort. Beng. 61, 1814 ; Hk. f. Fl. Br. Ind. 3 : 322, 1881.

'Dehra Dun, 12th Sept., 1870, Dr. King', in Herb. Dehra Dun.

'New Forest, Dehra Dun, 6-10-1955, M. B. Raizada Dehra Dun Herb. No. 123198. A tall herb with greenish-white flower heads in racemes.'

'Soil Conservation Farm, Bainkhala, Dehra Dun, Sept. 1957, S. S. Mehta, Dehra Dun Herb. No. 1123200.'

An erect, more or less aromatic, shrub-like herb. Lower leaves sessile, wedge-shaped or obovate-oblong, with generally a pair of stipule-like narrow lobes at the base.

This temperate Himalayan species which usually occurs between 1,500-3,500 m., is common in hilly districts throughout India. Its occurrence in Dehra Dun is apparently due to its seeds having been washed down by the streams.

## CONVOLVULACEAE

*Argyreia bella* (Clarke) Raizada com. nov.; *Lettsomia bella* Clarke in Hk. f. Fl. Br. Ind. 4 : 192, 1883.

'Songarh, Nepal border of Gonda, 1-1-1922, Sis Ram (Kanjilal's collector), Dehra Dun Herb. No. 116419 !

A pretty climber with milky juice and white tomentose branches. Leaves ovate-cordate, large ; softly hairy above, white tomentose beneath. Flowers pink, campanulate. Fruit scarlet, dry when ripe,

## SCROPHULARIACEAE

*Alectra thomsoni* Hk. f. in Fl. Br. Ind. 4 : 297, 1884.

'Banda, U.P., Nov., 1921, Sri Ram Dehra Dun Herb., No. 90375. An erect leafless herb, flowers yellow. Reputed to be medicinal and a potent tonic. Local name 'Nirgundi, apparently parasitic'.

An erect almost leafless herb, often with several erect branches from near the base. Leaves scale-like ; flowers in racemes, yellow.

## ACANTHACEAE

*Staurogyne polybotrya* (Nees) O. Kuntze Rev. Gen. 1 : 407, 1891.; *Ebermaiera polybotrya* Nees ; HK. f. Fl. Brit. Ind. 4 : 396, 1884.

'Gorakhpur, Feb., 1956, S. K. Seth, Dehra Dun Herb. No. 113553. A herb'.

A small diffuse herb with opposite leaves and small purplish flowers, mostly in spikes, terminating the stems or on axillary branchlets almost bare of leaves at the base.

## POLYGONACEAE

*Polygonum chinense* Linn. Sp. Pl. 363, 1753 var. *ovalifolia* Meissn. in DC. Prod. 14 : 130, 1856 ; Hk. f. Fl. Br. Ind. 5 : 45, 1886.

'New Forest, Dehra Dun, 6-1-1955, M. B. Raizada Dehra Dun Herb. No. 123199. An undershrub about 3 ft. high and with white flowers. It has now escaped from cultivation and is running wild in our plantations'.

An erect or rambling shrub with ovate, or ovate-oblong leaves which are often subcordate at the base and white flowers.

This shrub which is frequently grown in gardens in Dehra Dun has now started to run wild and will very soon deserve a place in our flora like other indigenous species.

## LILIACEAE

*Lilium wallichianum* Schultes f. Syst. Pl. 7 : 1689 ; Hk. f. Fl. Br. Ind. 6 : 349, 1892.

'Songarh, Tulsipur Range, Gonda, 19-9-1921, Sis Ram Dehra Dun Herb. No. 118192 ! A herb'.

A perennial herb about 1-2 m. high and with large, narrowly linear leaves. Flowers subsolitary, large, funnel-shaped, white, sweet-scented.

## CYPERACEAE

*Cyperus atkinsoni* C. B. Clarke in Journ. Linn. Soc. 21 : 109, 1884 ; Hk. f. Fl. Br. Ind. 6 : 603, 1893.

'Delhi, 20-8-1952, M. B. Raizada Dehra Dun Herb No. 113198 !'

A perennial, rhizome creeping, stem 5-20 cm. long, trigonous below, terete above. Umbels simple often contracted into a head.

*Cyperus alulatus* Kern in Reinwardtia 1 : 463, 1952 ; *Cyperus iria* var. *rectangularis* Kukenth. in Engl. Pflanzenr., Heft 101 : 152, 1935 ; *Cyperus iria* ((non-Linn.) *Sensu* Clarke. Cyper. pl. 14 f. 1 : 1909, non al.

'Moradabad, Aug. 1843, Thomson 280' !

'Nalapani road, 2000 ft., Oct. 1891, J. S. Gamble 23192'.

'Dehra Dun, 2000 ft. Aug. 1891, Gamble 23852'.

'Gwalior, C. Maries 356'.

Annual. Stems erect, slender, triangular, smooth, 1-7 cm. long, 1-2 mm. broad, few foliate below. Leaves shorter than or as long as the stem, entire, soft,

long-acuminate, scabrous on the upper surface, 1.5 mm. broad. Inflorescence simple or somewhat compound, lax. Bracts obliquely patent, 2-4, elongated, similar to leaves, very prominent. Inflorescence (umbel) 3-9 radiate, bracteoles tubular, somewhat obliquely truncate, posteriorly cuspidate or bidentate, base brownish, 0.5-1.5 cm. long, emarginate, unequal, obliquely patent, slender, compressed, smooth, or with hirsute apex; umbels up to 16 cm. long sometimes longer, apex few-branched, rays short, pale-yellow with a tail like support (appendage). Spikes ovate or oblong-ovate, lax or somewhat dense, 1-3 cm. long, 8-25 (30) mm. broad with 5-20 spikelets; rachis flexuose, angular, somewhat hairy. Spikelets compressed, rectangularly divaricate or somewhat reflexed, ovate to oblong-linear, 3-12 mm. long, 2-2.5 mm. broad, 4-18-flowered, base enclosed and supported by a subulate seta. Rachilla obscurely brown, straight, somewhat wingless, internodes 0.6-1 mm. long. Glumes membranaceous,  $\frac{3}{4}$ - $\frac{1}{2}$  partly imbricate, somewhat spreading, concave, almost orbicular, (1.75)-2 mm. long and broad, emarginate below the apex, mucronulate, dorsal surface with 7 greenish nerves with one orange-yellow purplish nerve on one side; keel acute, bow-shaped, narrowed on the upper surface, wings spinulose-ciliate. Stamens 2, anthers small, oblong, sometimes linear, connective without an appendage and slightly prolonged. Style almost absent, stigmas 3; fruits many, small. Fruit circular in outline, obovate, three-angled, laterally concave, base broadly stipitate, apex mucronate, dark-brown, smooth and shining, densely pectinate, 1.5 mm. long, 0.8-0.9 mm. broad.

This species is close to *C. iria* L. which differs in glabrous rachis. Spikelets are 1.5-2 mm. broad, erect and then become spreading; small glumes are 1.25-1.5 mm. long. It is dorsally 3-5 nerved with keel wingless and smooth; and fruits small being 1-1.25 mm. long.

#### GRAMINEAE

*Setaria megaphylla* (Steud.) Dur. et Schinz. Consp. Fl. Africa 5 : 773, 1895; Bo<sup>r</sup> in Kew Bull. 550, 1954; *Panicum megaphyllum* Steud. Syn. Pl. Glum. 530, 1854.

'Dehra Dun, Oct. 1890, Duthie 10755 and 10756'.

'Forest School Garden, Dehra Dun, Oct. 1892, Gamble'.

A perennial grass from a stout rhizome. Culms 1-3.5 m. tall, very robust, erect from the base, simple or branched, terete, smooth and glabrous or rather rough below the inflorescence. Leaf-blades elliptic-linear, tapering to the base, drawn out gradually to a long acuminate tip, glabrous or loosely hairy on the upper surface, coarsely and extremely scabrid on the margins and on the outer nerves on the upper surface, scabrid but less so on the under surface and in the centre on the upper surface, rigid, flat, pleated and somewhat crinkled towards the base; sheaths terete, striate, tightly clasping, glabrous and smooth below, pilose towards the collar and densely ciliate on both margins with tubercle-based hairs; ligule a dense fringe of hairs.

Inflorescence a linear to linear-lanceolate panicle, dense or loose, up to 30 cm. long by 10 cm. wide; axis angled, striate, very scabrid to shortly hirsute on the angles, carrying branches which are single or more often in groups or false whorls; branches similar to the axis up to 6 cm. long, branching or rebranching, the uppermost gradually shorter. Spikelets solitary on the ultimate branchlets, seated on scabrid pedicels, the lateral sometimes without a supporting bristle, the terminal always with one, about 3 mm. long. Lower glume broadly ovate to rotundate, membranous, smooth and glabrous about 1-1.5 mm. long, 3-nerved; upper glume broadly ovate-oblong, 2-2.4 mm. long, 5-nerved. Lower floret empty; lemma membranous, elliptic-acute or apiculate, smooth and glabrous, 5-nerved; palea a short hyaline membrane. Upper floret hermaphrodite; lemma elliptic-apiculate, chartaceous to crustaceous, smooth or very obscurely rugulose, turning coffee brown

at maturity ; palea of the same texture ; stamens 3 ; anthers 1.25 mm. ; styles 2, distinct ; stigmas plumose, as long as the styles.

A native of Africa, introduced in India. Probably an escape within the area, but not yet naturalized.

*Arundinella setosa* Trin. Gram. Panic. 63, 1826 var. *setosa* Bor in Kew Bull. 391, 1955 ; *Arundinella capillaris* Hk. f. Fl. Br. Ind. 7 : 74, 1896.

'Mohan Pass, Saharanpur Siwaliks, Oct. 1898, Duthie'.

A perennial grass up to 1 m. tall with a densely tufted hard rootstock but without a rhizome ; base glabrous. Inflorescence a drooping panicle which is extremely variable in size and density. Spikelets 6.5-7.5 mm. long.

*Leersia hexandra* Sw. Prod. Veg. Ind. Occ. 21, 1788 ; Hk. f. Fl. Br. Ind. 7 : 94, 1896.

'Saharanpur, 20th August, 1851, Jameson'.

'Mala, Pilibhit district, 1-2-1918, Sri Ram Dehra Dun Herb. No. 60088' !

'Gorakhpur, Nichaut road side, near paddy fields, 5-11-1950, M. B. Roizada 133/1950' !

An aquatic perennial grass, common in swamps. It is said to provide good fodder.

*Aristida depressa* Retz. Obs. 4 : 22, 1786 ; *A. adscensionis* Linn. Sp. Pl. 82, 1753 ; Hk. f. Fl. Br. Ind. 7 : 224, 1896 in part.

'Ajmer, 1883, Lowrie 4935'.

'Baghat, Meerut district, 11-12-1885, Duthie 4934'.

'Etawah, 26-11-1886, Duthie 6574'.

'Aligarh, 7-11-1887, Duthie 6771'.

A xerophytic grass of arid and semi-arid regions, preferring dry and sandy localities. It is common throughout the area.

This species differs from *A. adscensionis* Linn. mainly in the very unequal length of the glumes, the lower glume is about  $\frac{2}{3}$  as long as the upper and both are moreover very acute, the lower distinctly being awned, while the upper is without a bifid apex and is slightly pointed.

*Alopecurus geniculatus* Linn. Sp. Pl. 60, 1753 ; Hk. f. Fl. Br. Ind. 7 : 239, 1896.

'Dehra Dun, Umrao Singh 316'.

An annual or semi-perennial grass ; culms erect or geniculate at the base, rooting at the nodes, 20-60 cm. tall, stout or slender. Inflorescence a cylindrical or oblong, spiciform panicle 2.5-7.5 cm. long. Spikelets strongly compressed, 2.75 mm. long.

*Garnotia elata* (Arn. ex Miq.) Janowski in Fedde, Rep. Spec. Nov. 17 : 86, 1921 ;

*Berghausia elata* Arn. ex Miq. Analect. Bot. 2 : 20 ; *Garnotia scoparia* Stapf ex Hk. f. in Fl. Br. Ind. 7 : 242, 1896.

Gomti Bandha, Lucknow, Nanheram Dehra Dun Herb. No. 42695. A tall grass growing in tufts of culms'.

A tall grass up to 1 m. high ; leaves straight rigid with scabrid margins ; sheaths with woolly margins. Panicles long upto 1 m., very narrow.

This grass is so far known to occur in South India (Madras State) only. Its find in Lucknow is therefore inexplicable and a puzzle to the author as it has not been reported to occur in between.

\**Sporobolus stocksii* Bor in Kew Bull. 45, 1948 ; *Sporobolus ioclados* Hk. f. Fl. Br. Ind. 7 : 249, 1896, non Nees Fl. Afr. Austral. 161.

'Merwara, 1884, A. E. Lowrie 5239'

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\*While this paper was going through the press I got an opportunity to examine a fragment of the type (J. E. Stocks) of *Sporobolus stocksii* Bor, supplied to me through the courtesy of the Director, Royal Botanic Gardens, Kew. This revealed that Lowrie's specimen is not *S. Stocksii*. Consequently it was sent to Dr. Bor of Kew for his opinion who just informs me in his letter dated 17.4.58 that "it is not *S. Stocksii* but I have not matched it well ; it is like *S. minutiflorus* with longer spikelets and may prove to be a distinct species."

A densely tufted rather stout grass with densely tufted narrow leaves. Panicle branches flexuous, opposite and alternate; upper lemma constantly shorter than the lemma. In the true *Sporobolus ioclados* Nees which is a native of South Africa, the panicle branches are straight and verticillate and the upper glume is equal to or slightly longer than the lemma.

*Sporobolus helvolus* (Trin.) Th. Dur & Schinz. Consp. Fl. Afric. 5 : 820, 1895; *Vulfia helvola* Trin. in Mem. Acad. Petersb. Ser. VI Se. Nat. v. II. 52, 1840;

*Sporobolus glaucifolius* Hk. f. Fl. Br. Ind. 7 : 247, 1896 non Hochst.

'Ajmer, B. Tiagi, Dehra Dun Herb No. 15/101560'

A perennial grass.

*Sporobolus violascens* Mez.\* in Fedde, Rep. Sp. Nov. 17 : 298, 1921.

'Gwalior', Fide Mez.

Apparently an annual, about half metre long, slender. Leaf-sheath much shorter than the culm internode, not at all keeled, with glabrous margins; ligule hairy, short, variable, not barbate on the sides; lamina totally longitudinally convolute on drying up, margins thickened a little and somewhat serrate near the base, not conspicuously ciliate. Inflorescence, more or less, many flowered, lax, tri-pinnately paniculate, sub-pyramidal in shape, about 0.14 m. long and 55 mm. broad; all branches remarkably verticillate, about  $\frac{1}{3}$  or  $\frac{1}{2}$  arrow pointed in shape. Spikelets very long-pedicelled, about 2 mm. long. Glume I elliptic-rotundate, without nerves, scarcely more than  $\frac{1}{5}$  the length of the spikelet; glume II nearly as long as the spikelet, broadly rotundate, thinly 1-nerved. Lower palea (lemma) as long as the spikelet, apex obtusely denticulate, 1-nerved; upper lemma (palea proper) much above and a little smaller than the lemma, laterally truncate, apex denticulate as in the lemma.

*Eragrostis tremula* Hochst. ex Steud. Syn Gram 269, 1854; Hk. f. Fl. Br. Ind. 7 : 323, 1896.

'Shahjahanpur, 10-10-1885, Duthie 5111'

'Ajmer, Lowrie'

'Etawah, 26-11-1886, Duthie 6597'

'Mailani, South Kheri, 12-11-1920, Sri Ram'

'Banda, 22-10-1921, Sri Ram'

'Jaipur, 2-2-1957, Raizada's collector 25392'

This grass is fairly common throughout the Upper Gangetic Plain, Behar, Bengal, Assam, Kathiawar and the Western Ghats; also in Afghanistan and tropical Africa.

It prefers light soils and is said to be a good fodder, but the foliage yield is small.

*Eragrostis poaeoides* Beauv. Ess. Agrost. 162, 1812; Hubbard in Kew Bull. 17, 1933; *E. minor* Host. Gram. Austr. 4 : 15, 1809 (in nota) et in Fl. Austr. 1 : 135, 1827; Stapf in Hk. f. Fl. Br. Ind. 7 : 321, 1896.

'Saharanpur, Royle 109'

'Dehra Dun, July 1894, Gamble 24664'

'Gonda, 20-5-1918, Sri Ram'

'Ajmer, Lawrie 4958'

It is an annual grass common in fields during the rains and winter throughout the area.

The name *Eragrostis minor* Host. is untenable since the genus was not validly published until 1812.

\* Mez., l.c., mentions that the type is in the Calcutta Herbarium. In spite of prolonged search by me and by the Keeper, Dr. S. K. Mukerjee, the type, however, could not be traced. Dr. N. L. Bor, Assistant Director, Royal Botanic Gardens, Kew to whom I referred this matter just informs me in his letter dated 13-3-58 that "about 8 years ago I wrote to Biswas for *Sporobolus violascens* Mez and it could not be traced in the Calcutta herbarium. I have tried to run it down in Berlin and in other herbaria in Germany also without success".

In absence of the type, although it is rather difficult to comment on the status of this species which, no doubt, is distinct, it appears to me from its description that this may be the same as *Sporobolus tetragonus* Bor, subsequently described in the Kew Bull. 1949, p. 251.

*Poa infirma* H. B. K. Nov. Gen. et Sp. 1 : 158 (1815) 27 ; Bor in Journ. Bom. Nat. Hist. Soc. 50 : 818, 1952 ; *Poa annua* Linn. ssp. *exilis* Tomm. apud Freyn. Zool. Bot. Ges. 27 ; 469, 1877 ; *Catabrosa thomsoni* Stapf ex Hk. f. Fl. Br. Ind. 7 : 311, 1896.

'Robber's Cave, 780 m., 29th Feb. 1928, Umrao Singh 317'

A strictly annual grass. Culms rather slender and weak, smooth and glabrous, up to 10 cm. tall, occasionally twice as tall, sheathed almost to the inflorescence. Leaf-blades soft, flaccid, linear, abruptly contracted to a blunt point, up to 6 cm. long, 5 mm. broad, scabrid on the margins and on the midrib below, very scabrid at the tip, very thin. Sheaths rather loose, herbaceous, smooth and glabrous, somewhat inflated at the base of the plant. Ligule membranous, entire, 1-2 mm. long, rounded or obtuse at the tip.

Inflorescence a narrow, oblong, rather open panicle with branches ascending, rarely horizontal, and never deflexed ; axis smooth and glabrous, angled ; branches smooth and glabrous, in pairs, often a longer accompanied by a shorter, up to 2 cm. long, carrying rather remote spikelets at anthesis. Spikelets 4-4.5 mm. long, 3-5 flowered, oblong-obtuse in shape, with remote florets which occasionally hide the joints of the rhachilla, seated, except the terminal, on very short pedicels. Lower glume 1.25 mm. long, 0.6 mm. wide, oblong-acute in shape, slightly curved on the back, broadly hyaline on the margins, smooth and glabrous. Upper glume 1.5 mm. long, 1 mm. wide, broadly elliptic-obtuse in shape when flattened, very broadly hyaline on the margins and at the tip, 3-nerved, smooth and glabrous. Lemma 2.5 mm. long, 1.5 mm. wide, widest above the middle, oblong-ovate-obtuse or almost round at the tip, herbaceous in texture, faintly 5-nerved, very broadly hyaline at the tip and along the margins, almost straight on the back thickly ciliate on all nerves or occasionally thinly ciliate. Wool absent. Rhachilla produced and carrying a rudimentary spikelet, smooth and glabrous. Anthers minute, 0.22-0.33 mm. long. Palea shorter than the lemma, long ciliate on the keels.

This delicate little species is comparatively rare and is strictly annual. It bears only a superficial resemblance to *Poa annua*. The panicle is oblong in shape. All lemmal nerves are hairy, but there is no wool at the base of lemma. The anthers are hermaphrodite. The leaves are remarkably thin and are almost translucent.

*Aeluropus lagopoides* (L.) Druce in Rep. Bot. Ex. Club. Br. Is. 15 : 603, 1917 ; *Dactylis lagopoides* Linn. Mant. 33, 1767 ; *Aeluropus villosus* Trin. ex C. A. Mey-Verz. Pfl. Cauc. 18, 1831 ; Hk. f. Fl. Br. Ind. 7 : 334, 1896.

'Model Town, Delhi, August 1953, M. B. Raizada 129/1953, growing on sandy bank of a stagnant water canal'

A low much branched perennial grass. Distributed throughout the Punjab, Sind and Western Peninsula in salt ground, also on alkaline soil.

*Vulpia megalura* (Nutt.) Rydb. in Bull. Torrey Bot. Club. 36 : 538, 1909 ; Bor in Journ. Bom. Nat. Hist. Soc. 50 : 342, 1951 ; *Festuca megalura* Nutt. in Jour. Acad. Philad. n.s. 1 : 188, 1848.

'Saharanpur, March 1891, G. Wingate'

An annual grass. Culms up to 60 cm. tall, slender to somewhat robust, smooth and glabrous, leafy almost to the panicle, striatulate, terete, glabrous on the nodes. Leaf-blades linear, long acuminate, soft to rather stiff, flat or plicate, rolled or involute, up to 20 cm. long, 1.5-3 mm. wide, puberulous on the upper surface with short, soft, white hairs, glabrous on the lower surface, scabrid along the nerves on the upper surface and also on the margins, smooth on the lower surface ; leaf-sheaths tight or loose, the upper somewhat inflated and containing the inflorescence, markedly striate, smooth and glabrous with hyaline margins which are continuous with the ligule, often longer than the internodes ; ligule a hyaline membrane, 0.5-1 mm. long.



Inflorescence a strict, narrow panicle, nodding or erect, with short appressed branches, bearing few spikelets which are secund, 6–25 cm. long, at the most 2 cm. broad; rachis triangular in cross section, winged on the angles, scabrid on the wings, pale with greenish wings, glabrous, branched; branches short, angled and scabrid on the angles, inflated above just below the spikelet, fascicled, binate or solitary. Spikelets about 15 mm. long, without the awns, 3–6-flowered, secund. Lower glume 2–2.5 mm. long, subulate, acicular, 1-nerved, hyaline on the margins, smooth or glabrous or minutely scabrid, nerve green. Upper glume 3.5–5.5 mm. long, acicular, 1-nerved, subulate in outline, setaceously acuminate, smooth and glabrous, or slightly scabrid on the dorsal surface towards the tip. Lemma 6.5–7.5 mm. long, narrowly elliptic-acute, 5-nerved, the central nerve passing out into a scabrid awn 10–20 mm. long or more, coarsely scabrid on the dorsal surface especially towards the tip, furnished with white hairs on the upper half of the margins of the upper lemmas (hairs often missing from the lowest lemma): palea shorter, 2-keeled, coarsely scabrid on the keels; stamen I; anther I mm. long: mature caryopsis not seen.

This American species has been frequently confused with *Vulpia myuros* (Linn.) Gmel. (*Festuca myuros* Linn.) in various collections. The former however, differs from the latter in that the lower glume is almost 1.5 mm. long and the furnished lemmas are with long hairs on the margins while in *Vulpia myuros* the lower glume is 2.5–3 mm. long and the lemmas are hyaline on the margins.

Apparently this grass, because of its fodder value, was cultivated at Saharanpur, along with others and has really not acclimatised or naturalized in our area.

N.B. While this paper was in the press I got further opportunity to critically examine the material of the genus *Tripogon* lodged in the Dehra Dun Herbarium. In addition to *T. lisboae* Stapf already recorded from the Upper Gangetic Plain, *T. filiformis* Nees ex Steud. (Dehra Dun, Duthie 6862, 7761 & 10774) and *T. roxburghianus* (Steud.) Bhide (Gwalior, C. Maries 77) are also found with in the area.

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