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## **UGC Approved Journal**

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**Fimbristylis dichotoma subsp. dichotoma: A Polymorphism in Cyperaceae**  
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**Abstract:** The present report is an attempt to clear out a confused picture of specific and infraspecific delimitation from polymorphism and diagnosis of varieties and formae of subsp. *dichotoma*

**Key words:** Cyperaceae, *Fimbristylis dichotoma*, polymorphism

*Fimbristylis dichotoma* (L.) Vahl, Enum. 2:287.1806. Kern in Steenis Fl. Malesiana 1(7).3:575.1974; Koyama in contr. de Inst. Bot. Univ. Montreal 70: 39.1957. et in Dassan. & Fosb. Rev. Handb. Fl. Ceylon 5:307.1985; Cook, CDK. Aq. & wetl. Pl. India: 141.1996; Brahmam & Saxena in Fl. Orissa: 4. 2175.1996; L'narsimhn in Sharma et al Fl. Maharashtra (Monocots): 307.1996; Pullaiah & Hanumanth.Cypr. in Fl. Andhra Pradesh 3: 1080.1997; W. Khan in Naik Fl. Marathwada 2:950. 1998; *Scirpus dichotomus* L. Sp. Pl. 50.1753. *Fimbristylis diphylla* Vahl l.c. 289 Clarke in Hook. f. Fl. Brit. India. 6:637.1893. excl. var. *pluristriata* Clarke l.c. *F. diphylla* var. *annua* non R. & S. *Scirpus diphyllus* Retz. Obs. 5:15.1789. *Fimbristylis longispica* (non Steud. ) Clarke l.c. 639. 1893.

subsp. *dichotoma*:

Densely tufted annuals 10-80 cm tall. Stems trigonous, 2.5-3 mm wide, smooth glabrous. Leaves sheaths glabrous, or sparsely pubescent, blade linear, 0.5-1.5 mm wide, flat, brown dotted on the both surface, shorter than stems, scabrid in upper half, acute. Umbels compound or decomposed, involucre bracts 3-4, longer than umbels, the lowest often erect, rays 4-6, very unequal, 2-6 mm long, with few to many spikelets, glabrous or hairy. Spikelets solitary ovoid or oblong, 2-6 x 1.5-2 mm long peduncled, rarely subsessile or even sessile, ferruginous, rachilla distinctly winged. Glumes broadly ovate or ovate - oblong, 2-2.8 x 1.5-2 mm sides nerveless, brownish with narrow hyaline margins, obtuse at apex, apiculate. Stamens 1 or 2, anther linear, 0.5-1 mm long, apiculate. Style 2-fid, flat, linear with distinctly hairy-hyaline margins. Nut biconvex, obovoid or suborbicular, 1-1.5 x 0.5-1 mm, trabeculate with transversely oblong cells in between 8-12 vertical ridges, rarely brownish, shortly stipitate. Fls. & Frts:- September to November.

Specimens examined:- A.P. Chittoor Dist. Karvetnagar, Solanke S. N. 123; Krishna Dist. Kilespuram, *Shaikh R. I.* 717; Nellore Dist. Durgam-Udiyagiri, *P. Venu*, 110225(D.C.). T.N. Nagapatinam Dist. *Taur R. D.* 895.

Notes:- This is one of the most wide spread and highly polymorphic species. Earlier no attempt seems to have been made to work out its polymorphism. However, recently few attempts have been made to disentangle polymorphism by Koyama (1957, 1998), Ohwi (1957) for Japanese *F. dichotoma*, W. Khan (2009) for *F. dichotoma* of Peninsular India.

Key to subspecies of *F. dichotoma*

1. Inflorescence simple to compound; styles very narrow, slender, almost as wide as the staminal filaments or if wider then filaments conspicuously longer than nuts, often 1.5-2.8 mm long; glumes as long as or slightly to conspicuously longer than broad.subsp. *dichotoma*

1. Inflorescence compound or subdecompound; styles much, sometimes twice twice wider than staminal filaments, shorter to as long as nuts often 1-1.2 mm long; glumes almost as long as broad.subsp. *depauperata*

Key to the varieties and formae of subsp. *dichotoma*

1. Inflorescence compound contracted, sometimes of a single head; spikelets atleast partly sessile clustered or fascicled at the end of rays or raylets; some solitary ones often added; glumes longer than broad; styles wider than the staminal filaments, stamen 1 var. floribunda. (Miq.) Koyama

1. Inflorescence various open; spikelets all solitary; other characters not united:

2. Spikelets (4) 5-10 mm long, 3-4 mm broad, oblong to cylindrically oblong, terete or subangular; nuts often suborbicular obovate, not narrowed at base; nuts apiculate or almost beaked; stamen 1 var. dichotoma f. apiculata 2. Spikelets small, 3-5 x 1.5-2.5 mm, ovoid, or ellipsoid oblong, subangular; nuts often obovoid or oblong abovoid, conspicuously narrowed towards base; stamens 2 or 1:

3. Leaves distichous, crowded at the base ca 1/4 as long as stem; inflorescence dense, 4-8 x 4-5 cm; rays with up to 15 spikelets; peduncles of spikelets 3-8(10) mm long, slender but not filiform; involucre bracts shorter to as long as the inflorescence; styles very slender, narrower than the staminal filaments; nuts tuberculate var. disticha Koyama f. disticha 3. Leaves tristichous; 3/4 or more as long as the stems; inflorescence lax and diffuse, (8) 10-12 x 5-6 cm; rays with 3-6 (7), spikelets; peduncles of spikelets 10-20 mm long, filiform; involucre bracts longer (8-15 cm) than the inflorescence, styles almost as wide as the staminal filaments; nuts sparsely tuberculate at apex var. dichotoma f. paucispiculata var. dichotoma f. apiculata W. Khan, R. D. Taur & al. in J. Bioinfolet 6 (2) : 90. 2009.

Very similar to forma *dichotoma* in many respects and distinguished from the latter in having compound inflorescence, the single stamen, shortly but distinctly beaked nuts and very slender styles.

Rare in open grasslands, on margins of water courses

Fls. & Frts.: - October to November.

Specimens examined: - A.P. Nellore Dist. Akarpaka, *Shaikh R. I.* 874.

f. paucispiculata V. I. Kahalkar, in J. Bioinfolet 6 (2) : 91. fig. 2. 2009.

It differs from other infraspecific taxa of sub. sp. *dichotoma* by the lax and diffuse inflorescence with fewer spikelets (3-6) on each ray, much more (10-20 mm) long, filiform peduncles of spikelets and series of few tubercles around the apex.

Rare in wet open grasslands. Fls. & Frts.: - October to November.

Specimens examined: - A.P. Vishakhapatnam Dist. Anantgiri forest, *Shaikh R. I.* 1085.

Notes:- It is a distinct taxon in features as shown in the key. The nuts in *F. dichotoma* are always tuberculate but f. nov. is exceptional and with fewer tubercles near apex. The nature of glumes, styles and epidermal rows of cells pointing its relation with *F. dichotoma*.

var. disticha Koyama in Cont. Inst. Bot. Univ. Montreal 70 : 40 . 1957.

forma disticha:

Perennials with short rhizome not creeping, stems 1-1.25 mm wide, rigid, strongly ribbed, glabrous, slightly vubosely thickened at base, subcompressed below the inflorescence. Leaves ligulate, basal distichous and crowded at base often shorter, almost 1/2 as long as stems blades flat, 1.5 - 2.5 mm wide up to 20 cm long, scabrous in upper half, acutish, glabrous sometimes flat, 1.5 - 2.5 mm wide up to 20 cm long, scabrous in upper half, acutish, glabrous sometimes falcate, and incurved margined. Inflorescence subcompound to compound, with several to many spikelets, 6-9 x 5-6 cm; rays 8-10, smooth, glabrous, the longest up to 9 cm long; involucre bracts up to 8, scabrous on margins, foliaceous, others setiform, the longest one shorter to as long as inflorescence, densely ciliate at broad base rarely glabrous. Spikelets all solitary, ovoid to ellipsoid oblong, acutish, 5-8 x 1.8-2 mm, dull or pale-brownish, terete, densely many flowered, pedicels oblong, acutish, 5-8 x 1.8-2 mm, dull or pale-brownish, terete, densely many flowered, pedicels 5-8 mm long, filiform; rachilla broadly winged, often blackish,. Glumes spiral, ovate, slightly

longer than broad, 2-2.3 x 1.5-1.8, 5-nerved keeled, slightly keeled not or narrowly hyaline margined, obscurely several nerved on each side, mucicous, stamen(s) 1 or 2, anthers linear, 0.6-0.8 mm long, mucicous. Nuts biconvex. Obovate-oblong, narrowed to wards base, transversely oblong cells in between 7-8 vertical ridges whitish, shortly stipitate, sometimes slightly depressed at apex, apiculate. Style 2-fid, flat-slender, almost as wide as staminal filament hairy throughout the length, gradually slightly dilated at base, hyaline margined, stigmas almost as long as style, hairy.

Occasional in wet open grasslands, on margins of water courses.

Fls. & Frts.: - October to November.

Specimens examined : - A.P. Visakhapatnam Dist. Chintapalli forest, along road sides, *S.N. Solanke*, 701, Botawara, along the road side, *Solanke Sudhir*, 731.

Notes:- The trabeculate nuts with 7-8 (9) vertical ridges, the nature of styles and glumes show its close association with *F. dichotoma* subsp. *dichotoma* and differ from the latter as shown in the key. The characters provided by Koyama (l. c.) well agree with those of our plants, however, little deviate from var. *disticha* in the having dense compound inflorescence with many spikelets. var. *floribunda* (Miq.) Chavan D.P. comb. nov. *Fimbristylis diphylla* Vahl var. *floribunda* Miq. Ann. Mus. Bot. Lugduno-Batavum 2: 144. 1865. from *floribunda* (Miq.) Ohwi J. Jap. Bot. 14: 577. 1938. Koyama in Dassan. & Fosb. Rev. Handb. Fl. Ceylon 5:309. 1985. W. Khan, R. D. Taur & al. in J. Bioinfolet 6 (2): 90. 2009.

Perennial upto 40 cm tall; stems 0.5-1.5 mm wide, leaves ligulate, 2-2.5 mm wide, shorter than the stems with sheaths more or less hairy; spikelets ovoid, ca 2 x 1.5 mm, boat-shaped, not keeled, apiculate. Styles fimbriate throughout, hyaline margined, longer than the nuts. Nuts obovate, 0.8-0.9 x 0.5-0.6 mm with 6-7 vertical ridges, mucicous, and epidermal cells not impressed. Common along the margins of water courses, wet open grass-lands, marshes along road sides. Fls. & Frts.: - September to November.

Specimens examined:- T.N. Coimbatore Dist. Annamalai to Pollachi, *Taur R. D.* 712.

Notes:- A distinct taxon appears to be new record for India. It is distinguishable in field by the contracted umbels and partially clustered spikelets, otherwise very similar to var. *dichotoma* in many respects. The nut is also smaller like that of *F. oblonga* Koyama. The variety is common and abundantly found, often forming dense thicket in the localities of occurrence.

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