INDIAN SPECIES OF COMMELINACEAE
MISCELLANEOUS NOTES II

ROLLA SESHAGIRI RAO

Botanical Survey of India, Poona (India)

While checking up a few doubtful points on the following Indian species of *Commelinaceae* in different herbaria in the United Kingdom, with the background of the data gathered from the herbaria in the Continent and in India, some interesting details have been made out by the writer during August, 1964 for clarifying the status of those species. He is thankful to the authorities of the herbaria at the Royal Botanic Gardens of Edinburgh and Kew, Department of Botany, University of Glasgow, and the British Museum (Natural History) and the Linnean Society of London, and also the Rijksherbarium, Leiden, Institute of Systematic Botany, Utrecht, Naturhistorisches Museum, Wien, and Botanisches Institut, Wien for their kind help and co-operation in allowing the writer to study the species and to provide him with photos and necessary information on this subject; also to Mr. B. L. Burtt, Royal Botanic Gardens, Edinburgh and to Mr. J. P. M. Brenan and Mr. A. Smith, Royal Botanic Gardens, Kew for their critical suggestions during discussion and correspondence, and to Dr. H. Santapau, Director, Botanical Survey of India for his kind encouragement in the study of this family and for his Latin translation of the diagnosis.

I. CYANOTIS D. Don (*sensu stricto*)

1. Cyanotis arcotensis Rolla Rao, *sp. nov.* — *C. papilionacea* auct., *pro parte;* C. B. Clarke *in* DC. Mon. Phan. 3 (1881) 246, *pro parte, non* (Linn.) Roem. & Schult. — **Fig. 1.**

Proxime affinis *C. burmannianae* et *C. vaginatae*, ita ut saepissime cum his speciebus confusa sit, ab utraque tamen differt distincte habitu erecto, radicibus sparsis ad nodos, pilis per totam plantam dispersis, foliis maturis longis angustisque, cymis majoribus pedunculo crassiori insidentibus.

Typus *Joseph 89886A* lectus in silva Tippukadu ad altit. 160 m. in distr. Arcot septentrionali, in Statu Madrasensi, die 10 novembris 1963 et positus in CAL; isotypi *89886B—F* positi in variis mundi herbariis.

Annual, hirsute herb; densely flocculose-hairy if under cultivation in a shady, protected place. *Roots* slender, fibrous. *Stem* 15—30 cm, mostly erect or slightly decumbent, branched from the base, branches either growing in all directions without rooting at nodes on hard soil or rarely crawling and rooting sparsely at nodes on loose soil; internodes finely hairy, 3—9 cm long, nodes thin with leaf sheaths densely hairy, dull green, leaf sheath crisp, somewhat bell-shaped, 0.5—0.8 cm long, hirsute. *Lamina* sparsely hairy, sessile, 3—10 cm long, 0.4—1.0 cm broad, thin, lanceolate to linear, acute, base pointed or rounded, hirsute, margin entire and finely hairy. *Cymes* mostly terminal, single or in branches of two or three, peduncle 1.5—6 cm, bract leafy; bracteoles biseriate, imbricate, prominently curved at maturity, foliaceous, finely hairy along margin, each 1 cm long, 0.8 cm broad, finely veined. Flowers in scorpioid cyme, concealed within the bracteoles,

0.5 cm long. *Sepals* 3, greyish-white, hairy. *Petals* 3, fused below into a tube, pinkish. *Stamens* 6, fertile, filaments bluish, bearded; anthers yellow. *Style* slender, naked; stigma swollen; ovary 3 celled. *Capsule* 0.3 cm long, 0.15 cm broad, slightly hairy in upper half, 3 celled, each cell with 2 seeds. *Seeds* 0.15 cm long, shining dark brown, very finely warty.

Type specimen: Joseph 89886A (CAL), India, Madras State, North Arcot District, Tippukadu reserve forest, alt. 160 m, 10 November 1963, fl., fr.

Isotype specimens: Joseph 89886B (BSI); *89886C* (K); *89886D* (L); *89886E* (E); *89886F* (BM).

Other specimens: Joseph 17799 (BSI), India, Kerala, Palghat District, hill near Malampuzha, 18 Oct. 1963, fl., fr.; *Joseph 87187* (BSI) cultivated in BSI Experimental Garden, Poona (India) from stem cuttings collected from Tippukadu reserve forest, North Arcot District (Madras State, India) on 25 Oct. 1964, fl.; *Joseph 81299* (BSI) India, Madras State, North Arcot District, Tippukadu reserve forest, 10 Oct. 1960, fl.

After the publication of the note on the so-called '*Cyanotis papilionacea* (Linn.) Roem. & Schult.' in Notes of Roy. Bot. Gard. Edinburgh 25 (1964) 185, the author had the opportunity of studying more material of this taxon, the allied species *Cyanotis vaginata* Wight and *Cyanotis burmanniana* Wight and also the type material of *Cyanotis hirtella* Miq. and *Cyanotis hispida* Dalz. Both *C. hirtella* and *C. hispida* have now been found out to be *C. burmanniana* Wight only. The author considered in 1957 *C. hirtella* Miq. as synonymous to *C. papilionacea* (Linn.) Roem. & Schult. — the correct identity of *C. burmanniana* being by then not quite clear — and hence put a label as such on the type sheet of *C. hirtella, Hohenacker 130,* (U).

After further scrutiny of the taxon in question, both of the recent herbarium collections from Peninsular India and of the living material cultivated in the experimental garden, Botanical Survey of India, Poona (India) from the root-stock and stem cuttings collected from Norh Arcot area, Madras State *(Joseph 87187)*, and also of the chromosome number, it is evident that three species involved in this study, i.e. the taxon in question, *C. burmanniana*, and *C. vaginata* are quite distinct species with distinct habitat requirements. The chromosome pattern is similar for the taxon in question and *C. burmanniana* (n = 12), confirming further their close affinity. The chromosome number of *C. vaginata* is still to be found out. (The report of Shetty and Subramanyam in Nucleus 5, 1962, as n = 8 under the name of *C. papilionacea*, a population from the Gingee hill, near Madras, needs further re-examination and this will be undertaken by the author shortly.)

With sufficient evidence gathered so far it is now clear that the taxon in question is a distinct species. As the only available synonym cited in all publications is *pro parte*, not providing an accurate description which can serve to validate the new name, *Cyanotis arcotensis* is now described as a new species with a Latin diagnosis and a picture.

Cyanotis arcotensis has always been confused with *C. burmanniana* and *C. vaginata* and all the floras on Peninsular India present confused descriptions. All three species grow in Peninsular India and until recently it is considered that they grow mixed under the same habitat conditions. During the studies by the author for the last 5 years with the assistance of his associate worker, R. V. Kammathy, it has been found out that they grow in distinct pattern, each with a characteristic habitat condition. A few characters to distinguish *C. arcotensis* from *C. burmanniana* and *C. vaginata* are given below:

Fig. 1. *Cyanotis arcotensis* Rolla Rao. Habit, natural size.

Distinguishing characters of three closely allied species of *Cyanotis*

Characters	*C. arcotensis*	*C. burmanniana*	*C. vaginata*
Habit	A tufted, less spreading, more erect annual rarely rooting at nodes.	A turfted annual rarely rooting at lower nodes	A much spreading annual rooting at almost all nodes.
Habitat	Alluvial and laterite soil	In loose sandy areas of West coast	Spreading on rocks.
Root	Slender, fibrous, loose and long, thicker than that of *C. burmanniana*	Slender, fibrous, many forming loose matrix.	Slender, fibrous, conspicuously few.
Hairiness	Plant hairy all over	Less hairy	Distinctly glabrous
Leaves	Long, narrow, hairy	Short, succulent, hairy	Slightly broader, glabrous.
Cyme	Big with few rather stout peduncles	Small with thin short peduncles	Moderate with fewer bracteoles and slender, stiff, longer peduncles
Bracteoles	Hairy, ovate, acute	Mostly glabrous or slightly hairy, ovate, acute	Glabrous, falcate

Distribution: The species appears to be restricted to a few areas in Peninsular India particularly the North Arcot District and the Palghat area. It is very likely that the species may grow in other areas adjoining to these regions and more collections are necessary before a proper picture of distribution can be presented.

2. Cyanotis adscendens Dalz. *in* Hook. Journ. Bot. (1852) 343. — *C. sarmentosa* Wight, Ic. Pl. (1853) t. 2087. — *C. tuberosa* (Roxb.) Schult. var. *adscendens* (Dalz.) C. B. Clarke *in* DC. Mon. Phan. 3 (1881) 249.

Cyanotis adscendens grows on moist tracts of the Deccan plateau and also in localities where *C. tuberosa* (a diploid, n = 12) also grows. *C. adscendens* is tetraploid (n = 24) and is possibly an autotetraploid in the process of stabilization. While considering the status of this taxon, autotetraploidy has been viewed as one of the aspects of variation but the main factor is the characteristic proliferating habit, rooting at nodes and thus producing runners, which is predominant only in this taxon. It, therefore, appears that this autotetraploid has diverged clearly and consistantly from its supposed diploid progenitors.

3. Cyanotis concanensis Hassk. Com. Ind. (1870) 114. — *C. stocksii* Hassk. l.c. (1870) 118. — *C. sahyadrica* Blatter, Bomb. Nat. Hist. Soc. 33 (1928) 77; Rolla S. Rao, Notes R. B. G. Edinb. 25 (1965) 189.

Cyanotis concanensis Hassk. is now found to be the valid name. Hasskarl (l.c.) described *C. concanensis* and *C. stocksii* as distinct species citing the type '*Herb. Ind. Or. Hook. f. & Thomson, Cyanotis no. 9, Stocks, Law etc.* Malabar, Concan etc. *ex parte*' for both the species. A few dissected flowers of this taxon preserved at the Rijksherbarium, Leiden, labelled *C. stocksii* by Hasskarl, might belong to '*Cyanotis no. 9*' possibly obtained from Kew. On scrutiny, it is evident that there are three sheets under '*Cyanotis no. 9*' at Kew, one of them collected by Law from Concan, being the type of '*C. concanensis*', with regular, strongly curved cymes, the other two identical specimens collected by Stocks from Concan, being the type of *C. stocksii*, with somewhat irregular and slightly curved cymes. There is a sheet at the Central National Herbarium, Calcutta, with regular, strongly

curved cymes, possibly collected by Law. Due to considerable variation in the size and hairiness of the plant and the leaf and the compactness of bracteoles in the inflorescence, Hasskarl described one taxon under two different names, *C. concanensis* and *C. stocksii*. In view of a better representative specimen as the type and also in view of its characteristic distribution restricted to the Concan region, *Cyanotis concanensis* is preferred by the author out of the two names. This gigantic hexaploid (n = 36) grows only on high hill tops above 1000 m along the Concan Ghats from the Goa area to the Igatpuri Ghats as verified by the author during the last five years. This is a very clear species which can be easily identified even in the seedling stage in which it can be seen covering the grassy meadows at the high altitudes of the Western Ghats during the mid monsoon season, July-August. Blatter is really correct in considering this species as distinct. He named it *Cyanotis sahyadrica*, possibly with the opinion that this is restricted to the high ranges of Sahyadris. Unfortunately, in view of the earlier name available for this taxon, Blatter's name could not stand. More details on this species both on cytology and experimental cultivation at Poona altitude (though not successful beyond one season) have been worked out.

4. Cyanotis obtusa Trimen, Handb. Fl. Ceylon 4 (1898) 312, pl. 94. — *C. arachnoidea* C. B. Clarke var. *obtusa* Trimen, Jour. Bot. 23 (1885) 266. — *C. arachnoidea* C. B. Clarke: Hook. *f.* Fl. Br. Ind. 6 (1892) 386 *pro parte*, excl. type.

The taxon was first collected by Trimen from the hill tops of Ceylon. Possibly due to insufficient data, he first considered it as a variety *obtusa* of *Cyanotis arachnoidea*. Hooker (1892) though recording the specimens of this taxon from Ceylon as robust forms of *C. arachnoidea*, did not mention var. *obtusa* Trimen. Further, though Trimen records (1898) on the basis of his further observations that this taxon is a distinct species, published by him as *C. obtusa* with a good coloured plate, Hooker, after his scrutiny of Ceylon material comments (Fl. Ceylon, 1898, 312) that it may be referable as a very large form to *C. arachnoidea* as expressed by Clarke.

Though the herbarium material of the two species makes such false impression, in the living state, either in the field or under cultivation, the smaller, annual *C. arachnoidea* and the robust, perennial *C. obtusa* are clearly distinguishable. *C. obtusa* has not only larger, fleshy, grooved leaves of a different construction, but it grows also exclusively in rocky crevices along exposed, grassy hill tops of Peninsular India and Ceylon above 1200 m altitude where *C. arachnoidea* does not grow. The chromosome number is, however, constant with n = 12 which is characteristic of the genus *Cyanotis*.

2. COMMELINA Linn.

1. Commelina kotschyi Hassk. *in* Schweinf. Aethiop. (1867) 207. — *C. heterosperma* Blatter & Hallb. in Jour. Ind. Bot. Soc. 2 (1921) 54.

Commelina kotschyi was first described by Hasskarl on the basis of African material collected from Cordofan, Aethiopia. This is a good species. While studying some interesting collections by the author from the Western Ghat area which are comparable to *C. kotschyi*, the various specimens cited by C. B. Clarke in his monograph on *Commelinaceae* (DC. Mon. Phan. 3, 1881, 173) under *Kotschy no. 34* and obtained from the herbaria of Glasgow, Kew, and Leiden, have been examined and the considerable confusion found therein is presented below:

Kotschy 34, collected from Cordofan, upper Egypt is cited by Clarke (l.c.) as well under *Commelina kotschyi* as *partim* under *C. subulata* Roth var. *macrosperma* C. B. Clarke. The Kew sheet, though considered as *C. kotschyi* Hassk. and bearing the locality and

collector's name in Kotschy's handwriting consists only of two larger forms of *Commelina subulata* Roth. While writing on the sheet 'this is surely distinct from *Kotschy 59*', Clarke named the two specimens on the sheet as *C. subulata* var. *macrosperma*. In view of another sheet of *Kotschy 34* at Kew which contains true *C. kotschyi*, it may be considered that the label *Kotschy 34* is wrongly attached to the sheet of *C. subulata*. Further discussion on this sheet is given under *C. subulata*.

The two old sheets from Leiden, *Hasskarl 64* and *Kotschy 34*, show how the labels got mixed up in some of the earlier herbarium sheets.

Hasskarl 64 (L. 899.258—428) bears the stamps of Hasskarl Herbarium and three hand written labels with the name *Commelina kotschyi* and was considered the Holotype of *C. kotschyi* Hassk. This sheet bears three specimens, one *C. forskalaei* Vahl and the other two *C. undulata* R. Br. (= *C. kurzii* C. B. Clarke).

Kotschy 34 (L. 899.258—418) bears a printed label 'Cordofan in planite, Flor. Aethiopica, *Th. Kotschy* 1837 & 1838'; though labelled as an Isotype of *C. kotschyi* Hassk. it is nothing but *Commelina forskalaei* Vahl.

H. Wild 4726 (L) from Game reserve, Shapi road, Wankia, Southern Rhodesia, identified as *C. kotschyi*, also represents *C. forskalaei* Vahl.

The Glasgow sheet of *Kotschy 34* (B. H. 183/4 now preserved at E) is interesting. The printed label already known from one of the Leiden sheets, is also attached to this sheet, but the number, put on this as 88 is struck off and noted as 34, with the identification *C. forskalaei* Vahl. This specimen represents the real *Commelina kotschyi* Hassk. and may be considered as an Isotype as this can be only a duplicate of the type which is available in Kew. The type at Kew, *Kotschy 34*, is partly cut up and the name of the species is written by C. B. Clarke, whereas there is no handwriting of Hasskarl on the sheet. Possibly, Hasskarl, while describing this species as new on the basis of this sheet *Kotschy 34*, might have cut a part of it and kept it in his herbarium, now at Leiden. There is no indication or evidence easily available at Kew as to prove this presumption, however. Hence, as *Kotschy 34* at K is the type of *Commelina kotschyi*, the labels with *Hasskarl 64* and *Kotschy 34* on the Leiden sheets should be considered as wrongly attached to these specimens.

At the request of the author, careful search was made at the herbaria of the Natural history museum and Botanical Institute, Vienna to trace *Kotschy 88* and other sheets of Kotschy under the family *Commelinaceae* but none are available. As a major part of the monocot section of the herbarium of the Natural history museum in Vienna was destroyed during World War II, on the authority of the information supplied by these institutes it is now evident that Kotschy's collections of the *Commelinaceae* deposited in this herbarium were lost to science. It appears that Kew also does not have a specimen of *Kotschy 88*.

Blatter and Hallberg described *Commelina heterosperma* on the basis of the collection from Igatpuri, 600 m. by McCann in September, 1917. Though the type is recorded as '*St. Xavier College no. 12786*', it is not available anywhere in India. Blatter's types are supposed to have been lost or have been taken away by McCann to New Zealand. However, a scrutiny of the description particularly with reference to the capsule indicates that *C. heterosperma* is conspecific to *C. kotschyi* Hassk.

C. kotschyi is a distinct species which grows in a restricted habitat with gravelly and sandy river beds in very small isolated patches as observed recently by the author. In some places it is observed that this species grows producing fruits on small sandy mounds which are exposed after the level of mountain streams goes down along the Western Ghat slopes during the early September.

In view of the decision now taken about *Commelina heterosperma*, it should be considered that Blatter and Hallberg have recorded this species for India as early as 1921 but rather

under a different name. In view of its very scarce availability it may be possible that this has entered in to the Western Ghat area of India from East Africa rather recently.

The leaf, the spathe, and particularly the capsule with distinct loculi and the seeds, are characteristic of this species. Due to the fine wavy margin of the leaf it is often confused with *C. forskalaei* Vahl but *C. kotschyi* is quite distinct from *C. forskalaei* in several characters.

Maharashtra: Minna river bank, Nirgudi, Junnar, alt. 700 m, *Rolla Rao 83610*; Ganwat Wadi, Khed taluka, alt. 800 m, *Janardhanan 78011*; river bed along foot of Shamboo Hill, near Bibi village, Khed taluka, alt. 800 m, *Rolla Rao 81650*; *Janardhanan & Kammathy 78222*; Ambavada, Poona District, alt. 1000 m, *Vartak 9511*.

2. Commelina undulata R. Br. Prodr. (1810) 270; C. B. Clarke *in* DC. Mon. Phan. 3 (1881) 179, excl. var. *setosa*. — *C. striata* Edgew. in Trans. Linn. Soc. 20 (1846) 80. — *C. obliqua* Buch. Ham. var. *mathewii* C. B. Clarke *in* DC. Mon. Phan. 3 (1881) 178. — *C. kurzii* C. B. Clarke, Journ. Linn. Soc. 11 (1869) 144; DC. Mon. Phan. l.c. 185 incl. var. — *C. sphaerosperma* C. B. Clarke *in* Dyer, Fl. Trop. Afr. 8 (1901) 58. — *C. vogelii* C. B. Clarke *in* DC. Mon. Phan., l.c., 189. — *C. livingstonii* C.B. Clarke *in* DC. Mon. Phan., l.c., 190. — *C. paludosa* Bl. var. *mathewii* (C. B. Clarke) Rolla Rao et Kammathy in Bull. Bot. Surv. Ind. 3 (1961) 168.

After scrutiny of the type material at the British Museum of *Commelina undulata* R. Br. i.e. *R. Brown 5736*, collected from Island U.I., Carpentaria, North Australia and reported to be frequent, and also *R. Brown 5735* and the other sheets noted below, the writer is convinced that this extremely variable species, comprising both glabrous and slightly hairy forms, has been described by C. B. Clarke under different names i.e. *C. kurzii* from India and *C. sphaerosperma*, *C. vogelii*, and *C. livingstonii* from Africa. Even *C. striata* described by Edgeworth from the lower NW. Himalaya region belongs to the same taxon and the type of this is a rather small incomplete specimen but with distinct characteristic spathe and capsule.

While trying to distinguish between *C. undulata* var. *setosa* C.B. Clarke and *C. ensifolia* R. Br. from the Peninsular India material, which has become rather difficult due to the undependability of the character: capsule 2-celled or 3-celled, as given by Clarke, a set of specimens supposed to be *C. undulata* were obtained from Mr. R. D. Royce who collected them on the banks of Fitzeroy River, a place about 1000 km south-west from the type locality of *C. undulata* R. Br. It is reported to be common in that area. They are indentical with *C. kurzii* C. B. Clarke.

The presence of two chromosome numbers, $n = 45$ and $n = 60$, in the Indian forms of *C. undulata* and the record of $n = 30$ for the African species *C. livingstonii* [Lewis in Sida (1965)] which is now considered as representing an African population of *C. undulata*, indicate the necessity of the study of chromosome numbers of other African species, *C. sphaerosperma* and *C. vogelii* which are now treated as synonyms to *C. undulata*, as well as of the Australian population of *C. undulata* for proper understanding of the range of variation in the chromozome number of this species so widely distributed along the tropics of the old world.

Keeping in view of the two forms (one of the three cells warty and indehiscent or all the three cells smooth and dehiscent resp.) both showing $n = 45$ and 60, as explained by Rolla Rao and Kammathy (Jour. Bomb. Nat. His. Soc. 59, 1962, 61) all the following sheets have been examind and found to be representing both the forms in the various populations.

Treating both the forms into one distinct species, it can be stated that this species has a very wide distribution covering the areas from North Australia to Africa through Malesia and India.

With this understanding of *C. undulata* R. Br., it is evident that *C. undulata* var. *setosa* C. B. Clarke is nothing but a smaller form of *Commelina ensifolia* R. Br. which is a distinct species and has a wide distribution similar to that of *C. undulata* from North Australia to Africa (see under *C. ensifolia*).

AUSTRALIA. Island UI, Carpentaria, *R. Brown 5736*, Feb. 10, 1803 (*Type* BM); north coast, *R. Brown 5735* (BM); Rockingham Bay, Queensland, *s.n.* (BM) (capsule with indehiscent, warty cell); Queensland, *G. Podenzama* in 1891—1893 *pro parte* (BM).

INDIA. Sukkworn Himalayas, 3—4000 ft., *Edgeworth 153*, 1844 (*Type* of *C. striata* Edgew., capsule with 3 equal cells, K); Ceylon, *Thwaites 3224* (*Type* of *C. kurzii*, K; there is another sheet at Kew with a specimen of *C. ensifolia* R. Br. mixed); Nilgiris, *Thomson 35* (*Type* of *C. kurzii* var. *glochidea* C. B. Clarke, K; capsule with warty, indehiscent cell).

AFRICA:

Commelina livingstonii:

Near foot of Moramhalla, *Dr. J. Kirk, s.n.*, Dec. 1858, Livingston's South African expedition (*Type* of *Commelina livingstonii*, K); Namanganga and Kajiado, Kenya Dist., *Pollhill and Paulo 1010* (K); Britbridge, Southern Rhodesia, *Drummond 6014* (K); Risamu, East Africa, *Tweedie 1693* (K).

Commelina sphaerosperma:

Tette?, South Africa, *Dr. J. Kirk, s.n.*, 1859, Livingston's South African expedition (possibly *Type* of *Commelina sphaerosperma* with the original label of Clarke, K); Chisumbanhe, Sabi Valley, southern Rhodesia, *Plowes 2067* (K); River Melambe, Zambesi, Portuguese East Africa, Livingston's Zambesi expedition (K); Blemtyre District, *Jackson 1812* (K).

Commelina vogelii:

Niger expedition, *Dr. Vogel, Fernando Po 261* (*Type* of *Commelina vogelii*, K.).

3. Commelina ensifolia R. Br. Prodr. (1810) 269; C. B. Clarke *in* DC. Mon. Phan. 3 (1881) 188, incl. var. *pubescens* R. Br. *ex* C. B. Clarke — *C. undulata* var. *setosa* C. B. Clarke, l.c. 179.

From the study of type material of both *C. ensifolia* and *C. undulata* var. *setosa*, it is evident that they are the same. This species produces both 3-celled and 2-celled capsules and is quite variable, producing glabrous and hairy leaves. The hairy forms from North Australia noted by Brown and separately described by Clarke as *C. ensifolia* var. *pubescens* have been observed growing in a mixed population studied in Peninsular India with considerable range as to hairiness.

The species is very widely distributed from North Australia to India through Malesia and Ceylon. A few specimens from Africa studied at Kew recently seem to be similar to this species, but this needs further verification.

AUSTRALIA. Opposite Grooto Island, Carpentaria Island, *R. Brown 5733* (*Type*, BM); Carpentaria Island, *R. Brown 5734*, Nov. 21, 1802, (*Type* of *C. ensifolia* var. *pubescens*, K); North Goolburn Island, Australia, *Allan Cunningham s.n.*, Voyage of Mermaid (BM); Groove Island, North Australia, *G. H. Walkers 141*, 1st March, 1925 (BM); Port Essington, *Capt. Home s.n.*, 1846 (BM); Port Darwin, *Dr. Schomburgh s.n.*, 1874 (E); Lennard River, Western Australia, *J. Staer s.n.*, August 1905 (E).

INDIA. Several collections from Kew and Indian Herbaria.

4. Commelina imberbis Ehrenb. *ex* Hassk. *in* Schweinf. Aethiop. (1867) 206. — *C. persicariaefolia* Wight *ex* C. B. Clarke *in* Mon. Phan. 3 (1881) 171, *non* DC. (1816). — *C. jacobii* Fischer, Kew Bull. (1928) 277. — *C. alisagarensis* Kumar & Deodikar, Proc. Ind. Acad. Sci. 13 (1941) 168.

A few authentic specimens of *Commelina imberbis* collected from Africa (Kenya and other areas) and available at Kew clearly indicate that this is conspecific with *C. jacobii* described from Peninsular India. Several populations of *C. jacobii* from Peninsular India, though invariably showing the chromosome number of $n = 15$, present extreme variation in the size of the plant and in the size, shape, and apex of the leaf. They are, however, distinctly uniform in the various characters of the roots, spathe, capsules, and

mature seeds. The immature seeds are less prominently ridged and their colour varies from greyish to brownish. All these characters match very well with those of *C. imberbis* which also shows the chromosome number n = 15 [Lewis in Sida (1964)]. A tetraploid of this species with n = 30 has also been recorded in Africa [Lewis & Taddesse, Kirkia (1964)]. It would be of interest to find out whether the diploid or the tetraploid shows the wider distribution in Africa. In India, only the diploid has been so far recorded.

C. jacobii has so far been found to be growing in very limited localities in Peninsular India. More data on the distribution of *C. imberbis* in East Africa is necessary to indicate the possible line of distribution of this species from Africa to Peninsular India.

Though C. B. Clarke in DC. Mon. Phan. 3 (1881), 173, considered *C. imberbis* as synonymous with *C. latifolia* Hochst *ex* A. Rich. (Voy. Abys. 2 (1850) 340), on scrutiny of the relevant type material at Kew it is evident that *C. latifolia* is quite distinct from *C. imberbis* with its characteristic spathes and their arrangement and the subspherical-ovoid and quite smooth seeds.

5. Commelina subulata Roth; C. B. Clarke *in* DC. Mon. Phan. 3 (1881) 148, incl. var. *macrosperma*.

In continuation to the discussion on the specimen *Kotschy 34* given under *Commelina kotschyi* Hassk., a few more points are presented here.

The specimens of *Kotschy 59* collected from Nubia, Cordofan, are distinctly *Commelina subulata*. The same holds for two specimens of *Kotschy 34* at Kew, though they represent a slightly larger form. As discussed already under *C. kotschyi*, the number *Kotschy 34* is probably erroneously attached to these specimens.

Study of considerable material of *Commelina subulata* collected from different parts of Peninsular India reveals that the species grows quite robust on good, well-tilled soils; the range of growth and the size of the seed vary considerably depending on the water-content, fertility, and texture of the soil. Even under cultivation at Poona, plants grow to large size due to the constant care given to the pot plants by way of water supply and maintaining loose soil. Some of those larger forms are quite similar to *C. subulata* var. *macrosperma*. It is, therefore, not quite appropriate to consider such robust forms as a separate variety. Further, several populations of *C. subulata* in India, irrespective of the size, are invariably tetraploids with n = 30 whereas the African forms of *C. subulata* are found to be diploids (Lewis & Taddesse, Kirkia 4, 1964, with n = 15).

The species, as understood at present, is widely distributed in Peninsular India as noted by the author in Jour. Bomb. Nat. His. Soc. 50 (1962) 68, and now, on the study of some more collections at Edinburgh, a few more localities like Cuddapah area, Chittore area, Horsleykonda, and Bangalore are added.

6. Commelina maculata Edgeworth, Trans. Linn. Soc. 20 (1846) 89 — *C. obliqua* Buch. Ham. *ex* D. Don var. *viscida* C. B. Clarke *in* DC. Mon. Phan. 3 (1881) 178. — — *C. paludosa* Bl. var. *viscida* (C. B. Clarke) Rolla Rao & Kammathy, Bull. Bot. Surv. India, 3 (1961) 168; Rolla Rao, Notes R. B. G. Edinb. 25 (1966) 181, excl. syn. *C. obliqua* var. *mathewii* and *C. paludosa* var. *mathewii*.

Edgeworth was correct in describing *C. maculata* as a distinct species. But Clarke in his monograph on the *Commelinaceae* considered this and the other species of Edgeworth, *C. striata*, as varieties of *C. paludosa* Bl. (= *C. obliqua* Buch. Ham. *ex* D. Don), viz. var. *viscida* and var. *mathewii* resp. Scrutiny of the various type specimens and a proper understanding of *C. paludosa* and *C. kurzii* C. B. Clarke, their range of variation and distribution, revealed that *C. striata* Edgew. is *C. kurzii* (see under *C. undulata* R. Br.), whereas *C.*

paludosa is a much larger form with a distinct habit and is completely different from *C. maculata* Edgew. The indumentum of *C. maculata* is quite variable ranging from almost glabrous to viscid hairy. The confusion while explaining this variation by the author in Notes Roy. Bot. Garden, Edinburgh 25 (1964) 181, is due to the misunderstanding — rather misidentification — of the type of *C. striata* Edgew.

The chromosome number of both the glabrous and viscid forms of *C. maculata* has been found to be n = 30.

With the collections now available to the author, it is considered that the species grows mostly on hilly tracts of India from the lower slopes of the Himalayas to Peninsular India along the South and also in Khasia and Jaintia Hills of Assam and further east.

7. Commelina albescens Hassk.

In India, the species has so far been recorded from the Rajasthan desert area only. The author has recently collected this species from the rocky crevices of the creek of Diu Island (former Portuguese colony of the Saurashtra coast) projecting into sea and with a thin layer of sand. It is interesting to record that the species can grow, though rather weakly, and survive on a thin layer of sand moistened by the rain drops only. This record extends the distribution of the species further south to Saurashtra.

The chromosome number of this species has been worked out by Lewis (Kirkia 4, 1964, 215) from the African population as n = 30. The species has been tried twice for cultivation in Poona (India) but it did not survive after a little vegetative growth. The chromosome number of the Indian population of this species from Jodhpur, Rajasthan, is n=15; the details will be published elsewhere.

8. Commelina virginica Linn.

This is an American species growing commonly in warmer parts of America, Mexico and West Indies. It produces quite large, blue flowers which are attractive and is cultivated in gardens. It is quite possible that this species is also cultivated in Indian gardens but so far there is no record of it. A few specimens, however, have been collected from the Malabar Hill Park area, Bombay, in 1962 and since then the plants are growing quite well in Poona (Experimental Garden of the Botanical Survey of India), producing large flowers year after year. It is observed that the size of the flowers is slowly decreasing as the years pass by.

9. Commelina avenaefolia Graham and **Commelina nimmoniana** Graham

Graham in his Catalogue of Plants of Bombay, gives a very meagre diagnosis for these two species. It is rather difficult to make out what these species are. But one thing is quite clear: these two names do not represent any unknown species. The former was collected from Khandala and the latter from Bombay and other places and with the data now available for these localities, all species are known and these two names by Graham can only represent already known species. Graham's collections are recorded to have been sent to Baron van Hugel who deposited them in the Natural History Museum Herbarium, Wien. A thorough search, sheet by sheet, with the kind co-operation of Dr. K. H. Rechinger, Director of the Herbarium, was made, but no sheets of Graham for *Commelinaceae* could be traced out. It may now be taken for certain that with the destruction of part of the monocot herbarium during the IInd World War, these sheets have also been lost to science once and for all. As such, there is no point in keeping these two names under *nomina ambigua* and it is suggested that the names be rejected in the ensuing revision of the Indian species of *Commelinaceae*.