NOTES ON TWO SPECIES OF CENCHRUS (GRAMINEAE) IN AUSTRALIA

by

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SUMMARY

The genus *Cenchrus* comprises about 21 species of grasses extending from tropical to temperate regions in both hemispheres. Many species are regarded as pestiferous weeds because of the spiny burrs enclosing their spikelets; others have been sown as forage grasses. Within Australia seven species are currently recorded as naturalized, and there are two native members of the genus.

METHODS

The identification of the introduced weeds *C. incertus* M. A. Curtis (*C. pauciflorus* Benth.) and *C. longispinus* (Hack.) Fern., has often been confused both in Australian and overseas literature. In this study an attempt has been made to distinguish between these species and to determine their distribution in Australia. Field collections were made during 1970 and 1971, and specimens from the Botanic Museum and Herbarium, Brisbane (BRI), National Herbarium of Victoria, Melbourne (MEL), National Herbarium of New South Wales, Sydney (NSW), and the Western Australian Herbarium, Perth (PERTH) were examined. Descriptions have been compiled from the author's observations on the Australian populations of the species. Spine number was counted under 10 magnification and all spines, irrespective of size, were included in the count. Measurements of floral parts were made on the upper spikelet within each burr. This spikelet is larger than the rest and tends to occupy a central position.

KEY TO THE SPECIES

Spine number usually <40, florets $<5{\cdot}8$mm long *C. incertus*
Spine number usually >40, florets $>5{\cdot}8$mm long *C. longispinus*

DESCRIPTIONS OF THE TWO SPECIES

Cenchrus incertus M. A. Curtis in *Boston J. Nat. Hist.* 1 :135 (1837).
C. pauciflorus Benth. *Bot. Voy. H.M.S. Sulphur* 56 (1844).

Plants annual or overwintering; *culms* ascending or erect from a decumbent base, freely branching, up to 100cm tall; *ligule* ciliate, 0·6–1·9mm long; *leaves* spreading, keeled, up to 18cm long and 2–6mm wide; *inflorescence* compact, 2–6cm long and 0·5–1·5cm wide including spines; *burrs* ovoid to globose with short to medium pubescence, 2·5–8mm wide excluding spines; *peduncle* glabrous or

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shortly pubescent, 0·7–3mm long ; *spines* (including bristles) 11–43, spreading and flat, 2–5·6mm long and 0·5–2·5mm wide ; *spikelets* 1 to 4 per burr, 4·3–5·8mm long (rarely up to 6mm long) and 1·3–2·8mm wide ; *outer glume* 1-nerved, 1–3·8mm long ; *inner glume* 3 to 7-nerved, 2·8–4·9mm long ; *sterile lemma and palea* 3·5–5·4mm long ; *fertile floret* 4·4–5·9mm long and 1·4–2·3mm wide ; *fruit* 1·2–3mm long, 0·5–2·1mm wide.

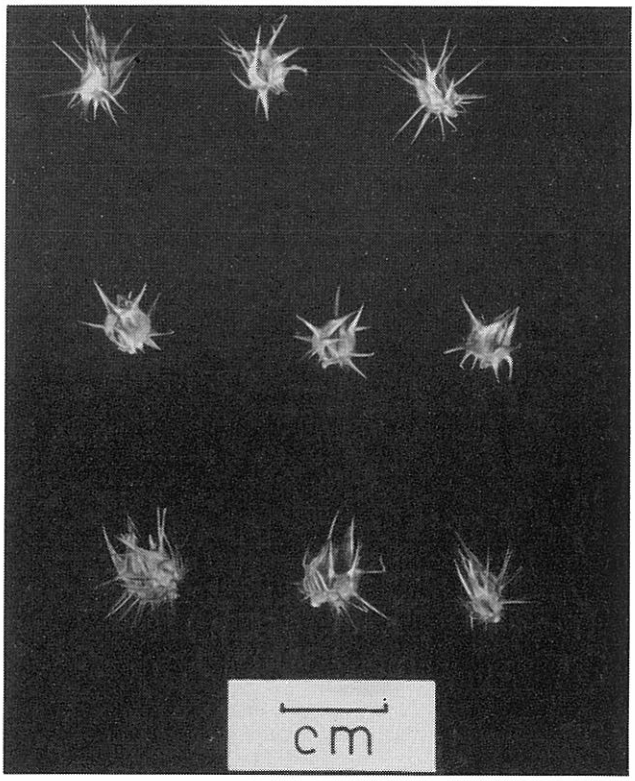

Fig. 51—Top, *Cenchrus incertus,* Freebairn, 4.ii.1970; centre, *C. incertus,* BRI 092029; bottom, *C. longispinus,* from Meringur, Victoria.

Chase (1920) separated *C. pauciflorus* from *C. incertus* by the taller culms, erect or ascending growth form, and the perennial habit of the latter species. DeLisle (1963) found that it was difficult to separate these two species, and included *C. pauciflorus* as a synonym under the earlier name *C. incertus* but his treatment was rejected by Caro and Sanchez (1967), mainly because of the annual habit of *C. pauciflorus* and the perennial habit of *C. incertus.*

Australian plants from this taxa have in the past been referred to *C. pauciflorus*, but an exception to this treatment was two identical sheets from Bega (New South Wales) held in the National Herbarium

of New South Wales. These plants are robust with taller and more erect culms than other collections from that State. However in experiments conducted by the author on *C. longispinus,* culm length and habit were dependent on the day-length under which the plants were grown (unpublished data). The ability of this species to overwinter also depends on the environment in which the plants are growing. The author feels these characters may not be very useful taxonomically and accepts DeLisle's treatment of *C. incertus* because it is the most thorough study that has been made up to date. On the other hand it is recognised that specimens of *C. incertus* from different regions show considerable variation in burr shape and depth of clefts, spine number and spine width as well as the degree of pigmentation of the burrs and spines. *C. incertus* is aptly described by DeLisle as " a highly variable taxa with a wide geographic range ".

DISTRIBUTION :

Southern U.S.A., Mexico, Central and South America, also introduced into South Africa. *Cenchrus incertus* has been introduced to New South Wales, particularly northern slopes and plains, and in south-east Queensland ; on sandy and sandy-loam soils.

SPECIMENS EXAMINED :

WESTERN AUSTRALIA—Shenton Park, *K. Ryan,* 8.v.1956 (PERTH) ; South Bunbury, *H. Moore,* ii.1927 (PERTH).

QUEENSLAND—Noondoo Siding, Dirranbandi, *H. Stone,* 20.xi.1961 (BRI 031029) ; Bungunya, *C. Hayes,* i.1947 (BRI) ; Miles, *H. B. Ford, date?* (BRI 018269) ; Chinchilla, *J. P. Ryan,* 17.xii.1958 (BRI 013462) ; Chinchilla, *J. P. Ryan,* 3.i.1961 (BRI 026366) ; Chinchilla, *W. Cutmore,* 11.i.1962 (BRI 037859) ; Tara, *S. Lester,* ii.1956 (BRI) ; Tara, *R. J. Haddock,* 3.ii.1964 (BRI 048248) ; Kapunn, Tara Line, *Henry Cunnington,* xii.1937 (BRI) ; Kapunn, via Dalby, *J. P. Ulemm,* x.1960 (BRI) ; Broadwater Road, 2 miles east of Moonie Highway, *L. Wilson,* 11.iv.1960 (BRI 025639) ; Broadwater, *W. Bott,* 27.i.1970 (BRI 092029) ; Cecil Plains, *W. H. Becktel,* 1.iii.1940 (BRI) ; Cecil Plains, *J. E. Barker,* 3.iii.1953 (BRI) ; Cecil Plains, *R. W. Wilson,* 12.vi.1957 (BRI) ; Cecil Plains, *W. Bott,* 19.i.1970 (BRI 092028) ; Southbrook, *J. H. Stower,* xii.1958 (BRI 018100) ; Pittsworth, *D. Stapleton,* iv.1956 (BRI) ; Cambooya, *H. Y. Partridge,* xi.1946 (BRI) ; Millmerran, *H. Hodges,* 1.ii.1950 (BRI) ; Millmerran, *A. Bliss,* 25.iii.1955 (BRI) ; Millmerran, *E. B. Winston,* 31.iii.1960 (BRI 025697) ; Talgai West Estate, Allora Shire, *Coll?,* 1930 (BRI) ; Inglewood, *E. W. Baird,* 15.i.1953 (BRI) ; Ellangowan, *M. R. Stevenson,* 5.iv.1963 (BRI 037680).

NEW SOUTH WALES—Murray River, near Barham, *G. A. Crawford,* 8.v.1950 (NSW 120903) ; Tullibigeal, *J. Scott,* 21.iii.1969 (NSW 124732) ; Narrandera, *H. M. Ware,* 3.xii.1956 (NSW 120909) ; Narrandera, *R. H. Done,* 6.i.1970 (MEL) ; Yetman, *E. G. Jacobs,* 17.ii.1949 (NSW) ; Warialda, per *Glenfield Vet. Res. Station,* 13.ii.1940 (NSW) ; Warialda, *T. Forans,* 10.xii.1935 (NSW) ; Warialda, *A. Johnson,* 26.ii.1951 (NSW) ; Narrabri, *Rigg,* 6.xii.1921 (NSW 120905) ; Bohena Creek, *J. L. Sutherland,* 15.xi.1939 (NSW 120904) ; Bohena Creek, *H. G. Kelso,* 12.xii.1970 (MEL) ; Baan Baan, *Anderson & Co.,* 19.v.1939 (NSW) ; Boggabri, *E. L. Ryder,* 22.ii.1943 (NSW) ; Gunnedah, *Shire Clerk,* v.1925 (NSW 120899) ; Tamworth, *W. B. Harding,* 5.i.1951 (NSW 120898) ; 12 miles east of Coonabarabran, *R. D. Freebairn,* 4.ii.1970 (MEL) ; Rylstone, *P. H. Koshemakin & Co.,* 12.i.1968 (NSW 98528) ; Newcastle, *S. Millington,* 22.i.1970 (NSW 120901) ; Glen Davis, *K. Green,* 6.ii.1956 (NSW) ; Bega District, *K. Flemons,* v.1954 (NSW 120895).

Cenchrus longispinus (Hack.) Fern. in *Rhodora* 45 : 388 (1943).

Plants annual, rarely overwintering; *culms* ascending from a decumbent base, freely branching, up to 55cm tall ; *ligule* ciliate, 0·5–2·2mm long ; *leaves* spreading, sometimes keeled, up to 19cm long and 2·8–6·8mm wide ; *inflorescence* compact, 2·5–8cm long and 1–2cm wide including spines ; *burrs* ovoid to globose, short to medium pubescent, 3·1–6·6mm wide excluding spines ; *peduncle* shortly pubescent, 0·8–3·0mm long ; *spines* numerous, slender, often purple, basal spines and bristles spreading or recurved, upper spines spreading, 2·7–6·8mm long and 0·7–1·5mm wide ; *spikelets* sessile, 1 to 3 (4) per burr, 6–7·2mm long and 1·9–2·8mm wide ; *outer glume* 1-nerved, 1·9–3·4mm long ; *inner glume* 4 to 7-nerved, 4·2–5·8mm long ; *sterile lemma and palea* 3·7–6·6mm long ; *fertile floret* 5·9–7·5mm long, 1·5–4·6mm wide ; *fruit* 2·1–3·2mm long, 1·3–2·3mm wide.

Until the beginning of this century *C. longispinus* had been incorrectly identified as *C. tribuloides* L. The first Australian collection in 1895 from Colac, Victoria was under this name[1]. However, Hitchcock (1908) showed that the Linnaean species was a coastal plant with large densely pubescent burrs, and since that time *C. longispinus* has been usually included in *C. pauciflorus*. DeLisle (1963) separated *C. longispinus* from *C. incertus* by the length of florets and the number of spines on the burr and the author has no difficulty distinguishing between these two species. Several specimens of *C. longispinus* examined had burrs with few spines (as low as 30), but they could be easily separated from *C. incertus* by their longer spikelets and florets. Other morphological characters which can be used are the broader leaves and culms, and the longer, narrower spines in *C. longispinus*. These characters are highly variable however, and show considerable overlap between the species.

DISTRIBUTION :

Native to eastern and central U.S.A. from where it has spread to western and northern U.S.A., central America, and south-east Canada. It has been introduced into Australia where it is a common weed on sandy soils in South Australia, Victoria, and New South Wales.

SPECIMENS EXAMINED :

WESTERN AUSTRALIA—Boscabel, *A. A. Norrish,* 5.ii.1929 (PERTH) ; South Caroling, *A. K. Thompson,* 11.i.1924 (PERTH).

SOUTH AUSTRALIA—Yamda, *J. D. Twentyman,* 25.ii.1970 (MEL) ; Blanchtown, *P. Kloot,* 5.iii.1970 (MEL) ; Dorrien, *P. Kloot,* 5.iii.1970 (MEL) ; 6 miles north-east of Adelaide, *P. Kloot,* 23.ii.1970. (MEL).

QUEENSLAND—Murgon, *Berlin & Davidson,* i.1941 (BRI).

1. Ewart (1907) in *Vict. Nat.* 24:15.

NEW SOUTH WALES—shore of Lake Menindie, south-east of Broken Hill, *C. M. Piggin,* 31.i.1971 (MEL); Dareton, *D. L. W. Henderson,* 27.iv.1954, (NSW); Wakool Shire (Moulamein), *Shire Clerk,* 19.ii.1963 (NSW); Nevertire, *A. H. Robards,* 8.ii.1944 (NSW); Tharbogang, near Griffith, *G. R. Sainty,* i.1966 (NSW); Griffith district, *T. S. Butt,* 21.ii.1945 (NSW); Griffith district, *D. E. Wallin,* 11.i.1956 (NSW); Murray River, 14 miles west of Corowa, *G. C. Bartlett,* 25.vi.1938 (NSW); Woolbrook, *J. W. Boyle,* 24.iii.1950 (NSW 120900); on roadside from Coonabarabran to Timor Rock, *H. Salasoo* 2201, 4.i.1962 (NSW 120896); Coonabarabran, per *Glenfield Vet. Res. Station,* 13.v.1938 (NSW 120897); Orange, *W. J. Hudson,* 17.iii.1954 (NSW 120910); Armatree, *J. Hodgson,* 21.xii.1929 (NSW); Binnaway, *B. Hoet,* iv.1948 (NSW); Gilgandra, *R. Harris,* 23.vi.1938 (NSW); Gilgandra, *C. R. Horwood,* 14.ii.1941 (NSW); Gilgandra Shire, *J. B. Sword,* 6.xii.1948 (NSW 120908); Cobbera Shire (Guirie), *Shire Clerk,* 10.vi.1938 (NSW); Dubbo, per *Glenfield Vet. Res. Station,* 13.i.1937 (NSW 120906); Dubbo, per *Glenfield Vet. Res. Station,* 2.iii.1938 (NSW 120907); Dubbo, *N. S. Tincker,* 3.iii.1959 (NSW); Glenridding, *D. Mcleod,* 7.xii.1937 (NSW 120902); Mudgee district, *Shire Clerk,* 5.vi.1936 (NSW); Manildra district, *H. H. T. Shirwin,* iii.1922 (NSW); Forbes district, *Shire Clerk,* xi.1936 (NSW); Forbes, *G. Charles,* 9.xii.1958 (NSW); Kelso, *G. Ray,* iv.1922 (NSW 120911); Gundagai, *S. Wilson,* iii.1923 (NSW).

VICTORIA—Sunny Cliffs, *J. D. Twentyman,* 24.ii.1970 (MEL); Meringur, *J. D. Twentyman,* 24.ii.1970 (MEL); Red Cliffs, *Gwyneth Claringbull,* 1937 (MEL); Red Cliffs, *E. Ramsay 92,* iii.1950 (MEL); Kiamil, north of Ouyen, *J. D. Twentyman,* 24.ii.1970 (MEL); Nandalay, *J. D. Twentyman,* 16.ii.1971 (MEL); Noradjuha, Shire of Arapiles, *A. Sinclair,* date? (MEL); Nagambie, *D. McAlpine,* 3.i.1901 (MEL); Angustown, *G. Cameron,* iii.1907 (MEL); Lake Colac, *Marriner,* 1895 (MEL).

ACKNOWLEDGEMENTS

The author wishes to thank the staff of the various State Herbaria for helpful advice, and officers of the New South Wales and South Australia Departments of Agriculture for assistance with the field collections. The technical assistance of Mr. T. Suckling is gratefully acknowledged.

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