8. ALTERNANTHERA, R. Br.

(Telanthera, *Moq.*)

Flowers hermaphrodite. Perianth divided to the base into 5 segments, all equal or the outer ones larger, ovate or lanceolate, scarious and coloured (usually white) glabrous or with long woolly hairs at the base. Stamens united at the base into a short exceedingly thin cup; filaments short with or without intervening teeth or lobes, unequal, 2 or 3 of them often without anthers and reduced to short teeth. Anthers small. Ovary uniovulate; style short sometimes scarcely any, with a capitate stigma. Fruit an indehiscent utricle usually compressed. Seed vertical. —Annual or perennial herbs, mostly prostrate, glabrous or softly hairy. Leaves opposite. Flowers small, in axillary sessile or pedunculate spikes (very rarely also terminal), usually short or oblong. Bracts and bracteoles scarious.

The genus is widely spread over the warmer regions of both the New and the Old World, including three of our common tropical weeds. Of the Australian species one is a common one in tropical Asia and Africa, another is closely allied to but perhaps not quite identical with a still more generally diffused species, the remaining six appear to be endemic, but the circumscription of the species as well as of the genus itself requires much further investigation. Moquin attributes to the whole genus (including *Telanthera*) 5 stamens with intervening staminodia (teeth or lobes of the staminal cup). In those species which he refers to *Alternanthera* proper, I can see no trace of these staminodia unless we consider as such the two or three out of the five filaments which are often reduced to small teeth. The extreme tenuity of the staminal cup renders it exceedingly difficult to ascertain its form, unless examined in the bud before the enlargement of the ovary.

Staminal cup without teeth between the filaments.
- Perianth perfectly glabrous.
  - Plant glabrous or slightly pubescent at the nodes or in two decurrent lines. Leaves narrow.
    - Perianth-segments and bracteoles (above 1½ lines long) with fine points. Spikes at length several together in dense globular clusters . . . . . 1. *A. nodiflora.*
    - Perianth-segments and bracteoles (1 line long or under) broad with short points. Spikes small, at length cylindrical and scarcely clustered . . . . . 2. *A. denticulata.*
  - Plant more or less hairy or rarely glabrous. Leaves mostly broad. Rhachis of the spike woolly . . . . . 3. *A. nana.*
- Perianth-segments enveloped in long woolly hairs proceeding from the base (often concealed in the young spike by the bracteoles).
  - Bracteoles shorter than the perianth. Perianth-segments all equal (about 1 line long) and glabrous inside . . . . . 4. *A. angustifolia.*
  - Bracteoles as long as the perianth. Perianth-segments 1½ to 2 lines long, the inner ones smaller and woolly inside at the base.
    - Spikes all axillary, ovoid. Bracteoles and perianth-segments very acute. Anthers 5 . . . . . 5. *A. decipiens.*
    - Spikes terminal and axillary, globular. Bracteoles and perianth-segments scarcely mucronate. Anthers usually 3 . . 6. *A. polycephala.*

Staminal cup with prominent teeth or lobes between the filaments.
- Perianth-segments hairy on the back to above the middle. Leaves linear.
  - Spikes axillary, shortly pedunculate, ovoid. Lobes of the staminal cup much shorter than the filaments . . . . . 7. *A. leptophylla.*
  - Spikes on long peduncles, globular. Lobes of the staminal cup rather longer than the filaments . . . . . 8. *A. longipes.*

4. **A. angustifolia,** *R. Br. Prod.* 417, *but not of Moq.* Prostrate, glabrous or slightly hoary-pubescent. Leaves linear in the typical form, above 1 in. long and much like those of *A. denticulata* or even narrower. Spikes sessile, solitary or rarely clustered, seldom above ¼ in. diameter and mostly smaller and very short, the rhachis more or less woolly. Bracts very acute, glabrous, shorter than the perianth.

Perianth-segments lanceolate, acute, 1 line long or a little more, with long woolly hairs outside; the inner ones narrower than the outer. Filaments short, only 3 bearing anthers, all dilated at the base. Stigma capitate, sessile in the flowers examined.—*Illecebrum angustifolium*, Spreng. Syst. i. 818.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* Sturt's Creek, *F. Mueller.*

Var. *lanata.* More woolly. Leaves narrow-oblong, under ½ in. long. Spikes more woolly.—Arnhem's Land, *F. Mueller.*

3. **A. nana,** *R. Br. Prod.* 417. Stems prostrate or ascending, loosely pubescent as well as the foliage, and often woolly at the nodes. Leaves oblong lanceolate or almost linear, obtuse or acute, tapering at the base and shortly petiolate, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long or in the broader leaved specimens under $\frac{3}{4}$ in. Spikes sessile in the axils, about $\frac{1}{4}$ in. diameter, at first depressed-globular but at length ovoid or shortly cylindrical, 4 to 5 lines long and very shining, the rhachis woolly. Perianth-segments oblong or lanceolate with a small point, thickened and hardened at the base when in fruit, $1\frac{1}{4}$ to above $1\frac{1}{3}$ lines long, glabrous as well as the short bracts and bracteoles. Stamens very short, the filaments filiform or slightly dilated at the base, usually 3 bearing anthers and 2 reduced to small teeth. Utricle scarcely half so long as the perianth.—Moq. in DC. Prod. xiii. ii. 360; *Illecebrum nanum,* Spreng. Syst. i. 819.

N. Australia. Nicholson river and Sturt's Creek, *F. Mueller.*
Queensland. Broad Sound, *R. Brown;* Brisbane river, *F. Mueller.*
N. S. Wales. "Near Mr. Scott's and everywhere in the dry bed of the river," *Leichhardt;* New England, *C. Stuart;* Ballandool river, *Lockhardt.*

Var. *major.* Larger and more hairy, leaves longer, perianth-segments acute.—Rockhampton, *O'Shanesy.*

The species is very variable, especially as to the size of the flowers, and some specimens come very near some forms of *A. sessilis,* but always with the utricle much shorter in proportion to the perianth. Brown's specimens as well as some of F. Mueller's and of Leichhardt's have the flowers much smaller than in the others.

1. **A. nodiflora,** *R. Br. Prod.* 417. Stems prostrate, decumbent or ascending, 6 in. to 1 or even 2 ft. long, glabrous or slightly pubescent in decurrent lines. Leaves linear or lanceolate, shortly contracted at the base, 1 to 2 in. long. Spikes globular, about 4 lines diameter when fully out, but often clustered many together into dense globular masses sometimes above 1 in. diameter, interspersed with a few small floral leaves. Bracts, bracteoles and perianth-segments narrow, acuminate with fine points, usually about $1\frac{1}{2}$ lines long or rather more. Stamens very short (about $\frac{1}{4}$ line), the filaments unequal, dilated at the base and united into a minute open cup, 2 or 3 bearing anthers, the others reduced to small teeth. Style distinct though very short. Utricle not half as long as the perianth, much compressed, broad, deeply notched with obtuse thickened margins.—Moq. in DC. Prod. xiii. ii. 356.

N. Australia. Sturt's Creek, *F. Mueller;* Victoria river, *Flood;* in the interior, *M'Douall Stuart's Expedition;* Albert river, *Henne.*
Queensland. Broad Sound, *R. Brown;* Armadilla, *Barton;* in the interior, *Mitchell.*
N. S. Wales. Gwydir river, *Leichhardt;* New England, *C. Stuart;* Ballandool river, *Locker;* Murray and Darling desert, *F. Mueller, Victorian Expedition.*
Victoria. Murray river, *F. Mueller;* Skipton, *Whan.*
S. Australia. S. of Wills' Creek, *Howitt's Expedition.*
W. Australia. *Drummond, n.* 220.

The species appears to be widely spread over E. India and Africa, but is not always easy to distinguish from *A. denticulata, A. sessilis,* and perhaps some others. The Australian specimens when first in flower are very much like those of *A. denticulata.* When fully developed the perianths and bracts are much longer and more acuminate, the fruit shorter in proportion and broader than in *A. denticulata,* and the notch, although variable, usually much deeper.

N38

AMARANTHACEAE

Alternanthera pungens

3. AMARANTUS, Linn.

(Sarratia, *Moq.*; Amblogyne *and* Euxolus, *Rafin.*)

Flowers usually monœcious. Perianth-segments 3 to 5, erect with scarious margins or (especially when in fruit) more or less dilated at the end into spreading scarious laminæ. Stamens 3 to 5, free, without intervening staminodia. Anthers 2-celled. Ovary uniovulate. Styles 2 or 3, free and stigmatic from the base. Fruit a membranous utricle, either circumsciss when ripe or indehiscent with the pericarp loose or adnate to the seed. Seed solitary.—Herbs mostly annual, glabrous or nearly so, green or red. Leaves alternate. Flowers small, in dense cymes or clusters, the clusters all axillary or collected in terminal spikes which are either simple or branching into dense panicles. Bracts and bracteoles small, green or scarious. The female flowers are usually much more numerous than the males, which are in the same clusters, chiefly in the upper parts of the inflorescence, with the same number or with fewer perianth-segments than the females.

The genus has a very extensive range over the New and the Old World, some of the larger species much cultivated for the seed and several others very common weeds of cultivation. Of the ten species here enumerated one is evidently an escape from cultivation, two others are common weeds of cultivation, one chiefly in the Old World, the other in the warmer regions of both the New and the Old World. The remaining seven are endemic, but two of them bear a remarkable resemblance to the West Indian and Central American group of *Amblogyne*.

The characters derived from the dehiscent or indehiscent pericarp or from the more or less spreading laminæ of the fruiting perianth, are so little in accord with habit or with any other character, that I have thought it better to retain the collective genus as a natural and very fairly defined one, than to adopt the purely artificial disseverances proposed by Moquin and others.

SECT. 1. **Euamarantus.**—*Pericarp circumsciss.*

Perianth-segments mostly 5, erect. Tall erect plant with an ample panicle, the points of the bracts very prominent . . .	1. *A. paniculatus.*
Perianth-segments mostly 3, erect or slightly dilated at the end. Clusters all axillary or the upper ones in a short dense terminal spike	2. *A. Blitum.*
Perianth-segments mostly 4 or 5, erect or slightly dilated at the end. Clusters axillary and in a long loose terminal shortly-branched spike	3. *A. leptostachyus.*
Perianth-segments mostly 5, with dilated scarious spreading laminæ (when in fruit). Terminal spikes usually paniculate .	4. *A. pallidiflorus.*

SECT. 2. **Euxolus.**—*Pericarp membranous, indehiscent or bursting irregularly.*

Pericarp separate from the seed, shorter than or not much longer than the perianth.	
Segments of the fruiting perianth 5, with dilated and scarious laminæ. Cymes axillary. Pericarp longitudinally ribbed .	5. *A. Mitchellii.*
Segments of the fruiting perianth erect or slightly dilated and spreading. Clusters axillary and in a terminal spike.	
Fruiting perianths mostly 5-merous	6. *A. interruptus.*
Fruiting perianths mostly 3-merous	7. *A. viridis.*
Pericarp separate from the seed, oblong, at least twice as long as the perianth. Clusters all axillary	8. *A. macrocarpus.*
Pericarp small, globular, very thin and not readily separable from the seed. Leaves narrow. Clusters all axillary. Perianth-segments mostly 4.	
Perianth-segments twice as long as the fruit	9. *A. tenuis.*
Perianth-segments about as long as the fruit	10. *A. enervis.*

NSB

AMARANTACEAE

Amaranthus cuspidifoli

N58

AMARANTHACEAE

Amaranthus induratus

6. **A. interruptus,** *R. Br. Prod.* 414. Erect or decumbent, from 6 in. to nearly 2 ft. high. Leaves petiolate, ovate or almost rhomboidal, obtuse, ½ in. to near 2 in. long. Cymes or clusters dense or at length rather loose, the lower ones axillary, the upper ones forming a long loose spike leafy at the base, either simple or rarely with a few short branches. Bracts and bracteoles shorter than the perianth or about as long, scarcely pointed. Segments of the fruiting perianth 5, narrow, erect, slightly spathulate, shortly but finely pointed, about ¾ line long, white and scarious on the margins, dark in the centre, those of the male flowers usually 3 only and not dilated upwards. Pericarp membranous, rugose, not ribbed, indehiscent or bursting irregularly, loose over the seed with a short thick summit about as long as the perianth. Styles 2 or rarely 3.—*A. undulatus*, *A. rhombeus*, and *A. lineatus*, R. Br. l.c.; *Euxolus undulatus*, *E. rhombeus* and *E. interruptus*, Moq. in DC. Prod. xiii. ii. 272 and 275; *E. lineatus*, Moq. l.c. 276 as to the Australian, but not the Sandwich Island plant.

N. Australia. Arnhem N. Bay and neighbouring parts of the N. coast, *R. Brown;* Sandy islands, Victoria river, *F. Mueller;* N. coast, *Landsborough.*

Queensland. Rockhampton, *O'Shanesy;* Brisbane river, *Leichhardt;* Port Mackay, *Nernst.*

This species has the aspect nearly of *A. Blitum*, with the fruit of *A. viridis*, and is readily distinguished from both by the segments of the fruiting perianth almost constantly 5, not 3; they fall off with the fruit as in most species of the section *Euxolus*. Brown's four species appear to me to be scarcely even varieties of a single one. The specimens of *A. undulatus* are young, with small broad leaves on long petioles slightly crisped on the margin, the terminal spike still dense and commencing flowering. Those of *A. interruptus* are older, the spike long and loose, and most of the fruits already fallen off; the leaves are narrower than in *A. undulatus*. *A. rhombeus* is, as it were, intermediate between the two. The specimens of *A. lineatus* appear to me to be old ones of *A. interruptus* which have been eaten down, or have otherwise lost the upper part of their main stem, which has shot up branches giving it a different aspect. All are from the same localities, probably sandy or arid. Nernst's specimens from Port Mackay are very luxuriant, with broad leaves twice the size of those of most others, but not otherwise different.

3. **A. leptostachyus,** *Benth.* An erect annual, from under 1 ft. to about 1½ ft. high. Leaves on rather long petioles, ovate, obtuse, under 1 in. long, with the primary veins often remarkably prominent. Clusters of flowers rather loose, very numerous, the lower ones axillary, the upper ones forming a long terminal interrupted spike leafy at the base only like that of *A. interruptus*. Perianth-segments erect or scarcely spreading and persistent with the lower portion of the circumsciss pericarp as in *A. Blitum*, but usually 4 or 5 instead of 3 only.

N. Australia. Port Darwin, *Schultz.*
Queensland. Islands off Cape Flattery, *M'Gillivray.*

5. **A. Mitchellii,** *Benth.* Apparently erect, rather stout and rigid, branching but not tall. Leaves on long petioles, ovate-lanceolate or oblong, obtuse, narrowed at the base, 1 to 2 in. long. Flowers all axillary and numerous, in sessile or shortly pedunculate cymes often ½ in. broad, rarely reduced to close clusters. Bracts scarious, nearly as long as the perianth, with a prominent midrib ending in a sharp point, the bracteoles similar but rather smaller. Segments of the fruiting perianth 5, with a rigid erect stipes of about ½ line, and a broad scarious spreading lamina at least as long, the midrib produced into a rigid point. Perianth globular, membranous, with 12 to 15 prominent undulate longitudinal ribs, indehiscent or bursting irregularly, with a thick summit projecting beyond the perianth, and 3 short subulate stigmatic styles.—*A. undulatus*, Lindl. in Mitch. Trop. Austr. 102, not of R. Br.

Queensland. Narran river, *Mitchell;* Flinders river, *Sutherland;* Charlesville, *Giles;* Armadilla, *Barton.* Used as a vegetable, *Sutherland, Giles.*

N. S. Wales. Between the Darling and Cooper's Creek, *Neilson;* Ballandool river, *Locker.*

With the radiating fruiting perianth of *A. pallidiflorus*, this has the habit of *A. Blitum* or almost of *A. crassipes* (*Scleropus*, Schrad.), with the pericarp indehiscent as in *Euxolus*, but differing in its prominent ribs from all *Amaranti* known to me.

4. **A. pallidiflorus,** *F. Muell. Fragm.* i. 140. An erect or decumbent annual of 1 to 2 ft. Leaves on long petioles, ovate, obtuse, 1 to 3 in. long, rather thin and of a pale green. Lower cymes or clusters of flowers axillary, the upper ones in dense spikes forming a terminal panicle of $\frac{1}{2}$ ft. or more, the central spike very long, the lateral ones short. Bracts and bracteoles scarious, lanceolate or ovate-lanceolate, very acute, about as long as the claws of the perianth-segments or rarely as long as the whole perianth. Perianth-segments 5, lanceolate at the time of flowering, those of the females, when in fruit with broad erect claws of about $\frac{1}{2}$ line and expanded into broadly ovate mucronate-acute spreading and scarious laminæ, rather longer than the claws. Pericarp very rugose, membranous, circumsciss, with a thick apex and 3 fine styles.

N. Australia. Nichol Bay, *Walcott;* Victoria river, *F. Mueller.*
W. Australia. Port Walcott, *Harper.*

This species has precisely the aspect of and is closely allied to *A. scariosus*, Benth., from Central America, and with that species would be referred to *Sarratia* as defined by Moquin, or to *Ambiogyne* as defined by A. Gray, Proc. Amer. Acad. Sc. v. 168. The American plant is indeed only to be distinguished from the Australian by the longer points to the bracts and by the retuse or emarginate laminæ of the fruiting perianth.

7. **A. viridis,** *Linn.* An erect or decumbent annual of 1 to 2 ft. Leaves petiolate, ovate or ovate-lanceolate, obtuse, rather thin but the pinnate veins usually prominent underneath, 1 to 2 in. long. Flowers small, green with an obtuse appearance, the lower ones in small axillary sessile cymes or close clusters, the upper ones in rather loose or interrupted spikes, forming a short terminal panicle, the central spike 1 to 3 in. long, the lateral ones few and short. Bracts and bracteoles narrow, not exceeding the perianth. Perianth-segments 3, narrow, erect, scarcely ¾ line long, falling off with the fruit. Pericarp rugose, indehiscent, free from the seed, about as long as the perianth. Styles usually 3.—*Euxolus viridis,* Moq. in DC. Prod. xiii. ii. 273.

Queensland. Brisbane river, Moreton Bay, *F. Mueller;* Rockhampton, *Dallachy* and others; Nerkool Creek, *Bowman.*
N. S. Wales. Glendon, Cassilis, *Leichhardt.*
W. Australia, *Drummond, n.* 105.

Common in waste and cultivated places in the warmer regions of Europe, Asia, and Africa, and now frequent in several parts of America. Possibly introduced only into Australia.

1. DEERINGIA, R. Br.

Flowers hermaphrodite or dicecious. Perianth of 5 equal glabrous segments spreading under the fruit. Stamens 5, shortly united in a ring at the base, without intervening staminodia. Anthers 2-celled. Ovary with several ovules. Styles 3, rarely 4, few and stigmatic from the base. Fruit enlarged, succulent, indehiscent. Seeds several.—Tall woody climbers, glabrous or rusty-pubescent. Leaves alternate. Flowers numerous, loosely spicate, the spikes in axillary or terminal panicles. Bracts and bracteoles small, scarious or petal-like.

The genus is widely spread over tropical Asia, more sparingly extending into Africa. Of the two Australian species one is the same as the commonest Asiatic one, the other is endemic.

Quite glabrous. Flowers hermaphrodite . . . . . 1. *D. celosioides*
Branches and young leaves pubescent. Flowers dicecious (the ovaries of the males without ovules) . . . . . 2. *D. altissima.*

9. GOMPHRENA, Linn.

(Philoxerus, *R. Br.*)

Flowers hermaphrodite. Perianth divided to the base into 5 segments, all equal or the outer ones rather larger, linear, scarious and coloured with the centre green at least at the base, woolly outside below the middle or glabrous. Stamens united at the base in a long or short tube, the free part of the filaments short, with or without intervening teeth or scale-like lobes; anthers 1-celled. Ovary uniovulate; style short or filiform, with 2 short, often minute, linear stigmatic lobes. Fruit an indehiscent utricle. Seed vertical.—Annual or perennial herbs, glabrous or with more or less of soft woolly hairs. Leaves opposite. Flowers in terminal or rarely axillary spikes usually dense, either shortened into globular or hemispherical heads or more or less lengthened ovoid-oblong or cylindrical. Bracts and bracteoles scarious, glabrous, the bracteoles more or less complicate and keeled. Ovary glabrous.

The genus comprises a considerable number of species, the extra-Australian ones all from the warmer regions of America, one of which, of early cultivation in gardens, is now a common weed in E. India. The Australian species appear to be all endemic.

The circumscription of the genus is in a very unsatisfactory state. If Moquin's technical characters were strictly followed, the Australian species would be distributed among at least four of his genera. It appears to me, however, that the presence or absence of the teeth or lobes of the staminal tube between the filaments is of no more value here than in the case of *Tricinium*, and I have followed Brown in distinguishing *Gomphrena* from *Alternanthera* chiefly by the 2-lobed stigma. Moreover, the shortness of the staminal tube, by which Brown separated *Philoxerus*, can scarcely hold if *G. lanata*, Br. (*G. Brownii*, Moq.) is to be retained in *Gomphrena*, and is at the best rather a sectional than a generic character.

Staminal tube longer than the ovary. Spikes globular or ovoid, usually large. Filaments flat. Leaves linear.
- Staminal tube with filiform teeth between the filaments. Spikes globular. Perianth-segments acute. Annual . . . . . 1. *G. canescens.*
- Staminal tube without teeth or lobes between the filaments.
  - Annual of 1 to 2 ft. Spikes at length ovoid or oblong. Perianth-segments obtuse . . . . . 2. *G. flaccida.*
  - Annual under 1 ft. Spikes hemispherical or globular. Perianth-segments acute . . . . . 3. *G. affinis.*
  - Perennial under 1 ft. Spikes hemispherical or globular. Perianth-segments rather obtuse . . . . . 4. *G. humilis.*

Staminal tube shorter than the ovary. Spikes rarely above ¼ in. diameter.
- Spikes hemispherical or globular. Perianth very woolly outside below the middle.
  - Staminal tube with teeth or lobes between the filaments.
    - Leaves linear. Bracts much shorter than the bracteoles . 5. *G. Brownii.*
    - Leaves lanceolate. Bracts nearly as long as the bracteoles 6. *G. brachystylis.*
  - Staminal tube without teeth or lobes between the filaments.
    - Leaves broadly lanceolate. Filaments with a minute tooth at the top on each side . . . . . 7. *G. leptoclada.*
    - Leaves narrow-lanceolate. Filaments filiform at the top without lateral teeth.
      - Spikes ½ in. diameter or more. Perianth woolly to above the middle. Bracteoles shorter than the perianth . . 8. *G. Maitlandi.*
      - Spikes 4 to 5 lines diameter. Perianth woolly only below the middle. Bracteoles longer than the perianth 9. *G. pusilla.*
    - Leaves filiform. Spikes and perianth of *G. pusilla* . . 10. *G. tenella.*
- Spikes ovoid or oblong-cylindrical. Perianth woolly below the middle.
  - Spikes 5 lines diameter. Leaves all linear. Filaments broad and 2- or 3-toothed at the end . . . . . 11. *G. conica.*
  - Spikes 3 or 4 lines diameter, densely crowded with broadly-lanceolate floral leaves. Filaments tapering at the end . 12. *G. conferta.*
- Spikes at length narrow-cylindrical. Perianth small, quite glabrous.
  - Leaves hairy, lanceolate or oblong . . . . . 13. *G. diffusa.*
  - Leaves glabrous or nearly so, narrow-linear . . . . . 14. *G. parviflora.*

3. **G. affinis,** *F. Muell. Herb.* An erect rigid much-branched annual, under 1 ft. high, hoary with silky-woolly hairs. Leaves linear or linear-lanceolate, with recurved margins, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long. Spikes sessile within the last pair of leaves, hemispherical or at length globular, $\frac{3}{4}$ in. diameter or rather more. Bracts and bracteoles very acute or almost aristate, nearly as long as the perianth. Perianth-segments acute, 4 to 5 lines long, very woolly to above the middle. Staminal tube longer than the ovary, the filaments broad, obtuse or truncate, with the anther on a minute central tooth, without any teeth between the filaments.

N. Australia. Upper Victoria river, *F. Mueller.*

NIB.

AMARANTACEAE

Gomphrena alba

6. **G. brachystylis,** *F. Muell. Fragm.* iii. 124. Stems branching, above 1 ft. long, clothed as well as the foliage with soft woolly hairs. Leaves sessile, lanceolate or linear-lanceolate, acute, soft, the margins undulate or flat and not recurved, ½ to 1 in. long. Spikes globular, about ½ in. diameter, sessile between the last leaves or here and there on long peduncles without floral leaves. Bracteoles mucronate-acute, rather longer than the perianth; bracts but little shorter. Perianth-segments 2 to 2½ lines long, densely covered outside with long woolly hairs, the glabrous tips very pale pink. Staminal tube shorter than the ovary, the filaments flat but narrow, acuminate, with long anthers; the intervening teeth or lobes as long as the filaments but broader and denticulate at the end. Style rather short.

N. Australia. Hooker's Creek, *F. Mueller.*

1. **G. canescens,** *R. Br. Prod.* 416. An erect more or less branching annual, usually stout and hard, 1 to nearly 2 ft. high, more or less hoary with long soft hairs, the older parts rarely glabrous. Leaves linear or linear-lanceolate, acute, the larger ones 2 to 3 in. long, the margins usually recurved. Spikes globular, sessile between the last leaves, about 1 in. diameter, the rhachis thick, ovoid or globular, woolly. Bracts and bracteoles thinly scarious, lanceolate, acute, about 3 lines long. Perianth-segments about 5 lines long, narrow, acute, 1-nerved, slightly woolly on the back below the middle, glabrous inside. Filaments united in a tube variable in length but always much longer than the ovary, the free portion short, flattened, with intervening filiform teeth or lobes, sometimes as long as the anthers, but often shorter. Style filiform.—Moq. in DC. Prod. xiii. ii. 398; *Philoxerus canescens*, Poir. Dict. Suppl. iv. 393.

N. Australia. Mainland of the Gulf of Carpentaria, *R. Brown, Henne;* Depuech island, N.W. coast, *Bynoe;* Nichol Bay, *Gregory's and Ridley's Expeditions;* Victoria river and Sturt's Creek, *F. Mueller;* Goulburn islands, *A. Cunningham;* Port Darwin and several other points along the coast, *Schultz* and others; Attack Creek in the interior, *M'Douall Stuart's Expedition.*

12. **G. conferta,** *Benth.* Erect hard stout and probably tall, but apparently annual, the specimens very imperfect, the branches bearing a few white woolly hairs and linear or linear-lanceolate leaves of 1 to 2 in. Spikes ovoid or cylindrical, 3 to 4 lines diameter and some of them above ½ in. long, sessile and crowded on very short axillary branchlets and surrounded by broadly lanceolate herbaceous softly villous floral leaves about as long as the spikes. Bracteoles very broad and obtuse, rather longer than the perianth; bracts shorter and more acute. Perianth-segments scarcely 1½ lines long, woolly outside to above the middle, the glabrous white tips very obtuse in the outer ones, less so and narrower in the inner. Staminal tube short; filaments dilated at the base, acuminate, without intervening teeth or lobes. Style short.—*Iresine macrocephala,* Moq. in DC. Prod. xiii. ii. 342.

N. Australia? Victoria river? *Bynoe.*
Queensland. Cape Flinders, *A. Cunningham.*

11. **G. conica,** *Spreng. Syst.* i. 824. An erect branching annual of 1 to 1½ ft. with the aspect of *G. flaccida*, slightly hoary woolly or glabrous. Leaves linear, with recurved margins, 1 to 2 in. long. Spikes at first ovoid, at length cylindrical, about 5 lines diameter and attaining nearly 1 in. in length, pedunculate and solitary, or (in R. Brown's specimens) frequently in clusters of 2 or 3 and more conical. Bracts and bracteoles acute, scarcely half as long as the perianth. Perianth-segments 2½ to 3 lines long, covered outside with long dense wool, with white obtuse glabrous tips. Staminal tube or cup shorter than the ovary; filaments broad, 2-toothed with the anther sessile between the teeth, without intervening lobes or teeth to the cup. Style short.—*Philoxerus conicus*, R. Br. Prod. 416; *Iresine conica*, Moq. in DC. Prod. xiii. ii. 342; *Gomphrena breviflora*, F. Muell. Fragm. iii. 125.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* Upper Victoria river and Sturt's Creek, *F. Mueller;* Lara station, *Kennedy.*

NIB.

AMARANTACEAE

Gomphrena cunningham

13. **G. diffusa,** *Spreng. Syst.* i. 824. Stems from a perennial often woody stock procumbent, branching, slender, 1 to 2 ft. long, the branches and foliage softly pubescent. Leaves lanceolate, acute, contracted into a very short petiole, ½ to 1 in. long. Spikes axillary, shortly pedunculate, at first ovoid or oblong but lengthening to ½ or ¾ in. and not ¼ in. diameter, the rhachis pubescent. Bracts and bracteoles obtuse, as long as the perianth, the bracteoles broad and readily splitting. Perianth-segments about 1 line long, quite glabrous, obtuse, scarious with a narrow opaque centre not reaching either to the summit or to the base. Staminal tube rather shorter than the ovary; filaments short, much dilated, tapering to a point, without intervening teeth or lobes.—*Philoxerus diffusus*, R. Br. Prod. 416; *Iresine Brownii*, Moq. in DC. Prod. xiii. ii. 341.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown.*

This and the following species have the habit almost as much of *Alternanthera* as of *Gomphrena*, but the style is decidedly lobed.

2. **G. flaccida,** *R. Br. Prod.* 416. An erect annual of 1 to 1½ ft., simple or branched, usually more slender than *G. canescens*, but sometimes as stout, the young parts woolly, becoming at length nearly glabrous. Leaves linear or linear-lanceolate, 1 to 2 in. or rarely longer, those under the spike much smaller. Spikes at first globular but soon becoming ovoid, solitary or 2 or 3 in a close cluster at the ends of the branches, about ¾ in. diameter and sometimes at length nearly 1 in. long, the rhachis woolly. Bracts 2½ to 3 lines long, the bracteoles much complicate and keeled. Perianth about 4 lines long, much flattened when old, the segments rather obtuse, slightly woolly outside near the base. Staminal tube varying in length as in *G. canescens*, and always longer than the ovary, the filaments shortly free and flattened but without the intervening teeth of that species.—Moq. in DC. Prod. xiii. ii. 398; *Philoxerus flaccidus*, Poir. Dict. Suppl. iv. 392; *G. firma*, F. Muell. Fragm. iii. 123.

N. Australia. Arnhem N. Bay, *R. Brown;* Regent's river and Cambridge Gulf, N.W. coast, *A. Cunningham;* Usborne harbour, *Voyage of the Beagle;* Victoria river, *Bynoe, F. Mueller;* Glenelg river, *Martin;* Port Essington, *Armstrong;* Port Darwin, *Schultz.*

Queensland. Cape York, *Daemel.*

The filaments are often broad and sometimes irregularly jagged or toothed towards the end, but different in different flowers of the same specimen, and not regularly 3-toothed as described by Moquin in the genus generally, and in this and other species specially.

7. **G. leptoclada,** *Benth.* A slender much-branched annual, of 6 in. to 1 ft., the young plants densely clothed with white woolly hairs, the older stems glabrous and red. Leaves sessile, broadly or narrow lanceolate, acute, green above with rather long straight hairs, white underneath with woolly hairs, the lower ones ½ to 1 in. long, the upper ones smaller. Spikes globular or depressed, 4 to 5 lines diameter, sessile between the last pair of leaves or here and there on long peduncles without floral leaves. Bracteoles white, very acute, about as long as the perianth, the bracts rather shorter. Perianth-segments scarcely 2 lines long, with long woolly hairs outside at the base, the upper half glabrous and bright pink. Staminal tube shorter than the ovary, the filaments rather broad, minutely 3-toothed at the apex, the anther borne on the rather larger central tooth; no teeth or lobes to the tube between the filaments. Style short.

N. Australia. Glenelg district, N.W. coast, *Martin.*

14. **G. parviflora,** *Benth.* Stems long and slender, probably diffuse, turning red, the whole plant quite glabrous or with a few long hairs on the young shoots. Leaves sessile, linear or linear-lanceolate, acute, with recurved margins, ½ to 1 in. long. Spikes pedunculate, axillary and terminal, quite glabrous, about 2 lines diameter, at first short and conical, at length cylindrical and ½ in. long. Bracts short broad and persistent, bracteoles erect, more than half as long as the perianth and deciduous with it. Perianth-segments quite glabrous, scarcely 1 line long, obtuse, white, shortly green at the base. Staminal tube shorter than the ovary, truncate; filaments but slightly dilated, without intervening teeth or lobes. Style very short.

N. Australia. Regent river, N.W. coast, *A. Cunningham;* Port Darwin, *Schulz.*

NIB

AMARANTACEAE

Gomphrena platandra.

9. **G. pusilla,** *Benth.* A slender branching annual, under 6 in. high, with the loose wool, linear-lanceolate leaves and globular sessile spikes 4 to 5 lines in diameter of *G. Brownii.* Bracteoles acute, longer than the perianth, bracts rather shorter. Perianth-segments scarcely above 1½ lines long, woolly outside below the middle, the upper half scarious and white, the outer ones very obtuse, the inner ones narrower. Staminal tube very short and truncate, the filaments slightly dilated, not toothed at the end, and without intervening teeth or lobes.

N. Australia. Foul Point, N.W. coast, *Voyage of the Beagle.*

10. **G. tenella,** *Benth.* A very slender branching annual of ½ to 1 ft., glabrous or slightly woolly under the spikes. Leaves filiform, acute, 1 to 2 in. long. Spikes globular, 4 to 5 lines diameter, on slender peduncles. Bracteoles acute, about as long as the perianth, bracts shorter. Perianth-segments 1½ lines long, with long woolly hairs outside near the base, the upper half glabrous white and scarious, the green centres reaching to about ⅔ of the segment, the inner segments smaller and narrower. Staminal tube or cup very short; truncate, the filaments rather short, scarcely dilated, without intervening teeth or lobes. Style very short.—*Iresine tenella,* Moq. in DC. Prod. xiii. ii. 343.

N. Australia. Cygnet Bay, *A. Cunningham;* Foul Point, N.W. coast, *Voyage of the Beagle.*

2. HEMICHROA, R. Br.

Flowers hermaphrodite. Perianth-segments 5, free, erect, glabrous, rigid, white at least inside. Stamens 5 or fewer, the filaments united in a short cup at the base, without intervening teeth or scales. Ovary uniovulate. Style with 2 very short or rather long stigmatic branches. Fruit an indehiscent utricle. Seed vertical.—Maritime prostrate herbs or low spreading shrubs. Leaves alternate, linear, fleshy. Flowers sessile and solitary in the axils, between 2 rigid scarious bracteoles.

The genus is limited to Australia, but is scarcely distinct from the European and Asiatic genus *Polycnemum*, differing indeed only in the thick succulent leaves and longer style.

Prostrate herb. Stamens 5. Style bifid . . . . . 1. *H. pentandra.*
Small divaricate shrub. Stamens 2, unilateral. Style with a very short bifid stigma . . . . . 2. *H. diandra.*

2. **H. diandra,** *R. Br. Prod.* 409. A small glabrous much-branched spreading plant, evidently shrubby and apparently less prostrate than *H. pentandra.* Leaves linear and succulent as in that species but not so thick and the floral ones more dilated at the base. Flowers rather larger and more scarious. Perianth about 2 lines long, and the bracteoles not much shorter, segments rather obtuse, 1-nerved, the inner ones not much narrower than the outer. Stamens 2, not much shorter than the perianth, the filaments much dilated below the middle, and united at the base on the gibbous side of the ovary, the staminal cup interrupted on the other side, without any rudimentary stamens. Ovary very gibbous on the side next the stamens. Style undivided, with a small 2-lobed stigma. Fruit not seen ripe.—Moq. in DC. Prod. xiii. ii. 334.

N. Australia? A fragment from Nichol Bay, N.W. coast, in herb. F. Muell., appears to belong rather to this species than to *H. pentandra,* but is insufficient for determination.

S. Australia. Fowler's Bay, *R. Brown;* hills near Lake Hamilton, *Wilhelmi;* head of Spencer's Gulf, *F. Mueller, Warburton.*

W. Australia. Salt marshes, Sharks Bay, *Milne.*

5. PTILOTUS, R. Br.

Flowers hermaphrodite. Perianth-segments 5, linear, free or united in a very short tube at the base, rigid, the lower portion usually 3-ribbed and glabrous, or covered outside with articulate hairs or intricate wool, the upper moiety a glabrous coloured lamina, all glabrous inside, or the inner ones with woolly hairs below the lamina. Stamens 5, one or two of them sometimes small without anthers, all united in a short cup or ring at the base, without intervening teeth or lobes; anthers 2-celled. Ovary uniovulate; style central or slightly excentrical. Fruit an indehiscent utricle. Seed vertical.—Herbs mostly (or always?) annual and glabrous except the inflorescence. Flowers in globular conical or cylindrical spikes, with a woolly rhachis. Bracts and bracteoles scarious.

Like *Trichinium*, the genus is probably limited to Australia. *P. corymbosus* is indeed said to be found also in the island of Flores in the Moluccas, but from Blume's short character it is doubtful whether it be the same as the Australian plant of that name, or even a congener. *P. amabilis*, Span., from Timor, has never been described; *P. ovatus*, Moq., from E. India, with opposite leaves, is a *Psilotrichum*, *P. Sandwicensis*, A. Gray, from the Sandwich Islands, is an *Achyranthes*.

The genus only differs from some of the smaller flowered *Trichinia*, in the absence of the dorsal hairs which, in the latter genus, give the laminæ of the perianth-segments a plumose appearance.

Perianths glabrous outside except a few hairs round the base.
- Leaves linear.
  - Spikes globular or scarcely ovate.
    - Filaments dilated under the anthers . . . . . 1. *P. conicus.*
    - Filaments filiform except at the base.
      - Perianth not exceeding 2 lines. Bracts mostly acute and appressed . . . . . 2. *P. corymbosus.*
      - Perianth 3 to 4 lines long. Bracts broad, mostly obtuse and loose . . . . . 3. *P. grandiflorus.*
  - Spikes at first conical, at length cylindrical . . . . . 4. *P. spicatus.*

Perianths enveloped in dense white cottony wool proceeding from the lower half. Leaves oblong-lanceolate or obovate.
- Spikes cylindrical. Leaves oblong.
  - Spikes sessile . . . . . 5. *P. Murrayi*
  - Spikes pedunculate . . . . . 6. *P. gomphrenoides.*
- Spikes globular. Leaves obovate . . . . . 7. *P. latifolius.*

Perianths enveloped in long dense articulate hairs proceeding from the lower half. Leaves narrow.
- Spikes globular or ovoid. Leaves lanceolate or oblong.
  - Stout plant. Spikes ½ in. diameter . . . . . 8. *P. macrotrichus.*
  - Small slender plant. Spikes ¼ in. diameter . . . . . 9. *P. villosiflorus.*
- Spikes cylindrical. Leaves linear . . . . . 10. *P. humilis.*

NIB

AMARANTACEAE

Ptilotus appendiculatus

NIB

Amaranthaceae
Ptilotus arthrolasius

NIB

AMARANTACEAE

Ptilotus astrolasius

NIB

AMARANTACEAE

Ptilotus auriculifolius

NIB

AMARANTACEAE

Pilotus axillaris

NIB

AMARANTACEAE

Pilotus brachyanthus

NIB

AMARANTHACEAE

P. lotus calostachyus

NIB

AMARANTACEAE

Ptilotus capitatus

NIB

AMARANTHACEAE

Ptilotus carinatus

NIB

AMARANTHACEAE

Ptilotus clementii

1. **P. conicus,** *R. Br. Prod.* 415. An erect glabrous annual, closely resembling *P. corymbosus*, but usually more rigid, 1 to 2 feet high, with elongated branches. Leaves very narrow-linear as in that species. Spikes few on long peduncles, larger than in *P. corymbosus*, globular and 5 lines diameter, or at length ovoid and 7 or 8 lines long. Bracts narrow, acute or aristate, shorter than the perianth. Perianth-segments all scarious, or the inner ones more rigid and slightly ribbed at the base, 2½ to nearly 3 lines long. Filaments much dilated towards the base, and again shortly dilated and obcordate under the anthers.—Moq. in DC. Prod. xiii. ii. 282; *Trichinium conicum*, Spreng. Syst. i. 816.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* Goulburn islands, *A. Cunningham;* Port Essington, *Armstrong.*

2. **P. corymbosus,** *R. Br. Prod.* 415. An erect slender glabrous annual of about 1 ft. or rather more, loosely and corymbosely branched at the top or nearly from the base. Leaves very narrow-linear, acute, the lower ones often nearly 2 in. long, those of the branches very small. Spikes small, at first hemispherical, at length globular or almost ovoid, glabrous outside. Bracts and bracteoles ovate, scarious, minutely mucronate, much shorter than the perianth. Perianth-segments all equal, about 2 to 2½ lines long, acute, the two outer ones scarious almost from the base, glabrous inside as well as out, the three inner ones more rigid, ribbed, and woolly inside in the lower half or claw. Filaments filiform to the top, slightly dilated at the base and united in a very short cup.—Moq. in DC. Prod. xiii. ii. 282; *Trichinium corymbosum*, Spreng. Syst. i. 816 not of Gaudich.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*: N.W. Coast, *Bynoe*; Victoria river and Sturt's Creek, *F. Mueller*.

Var. *acutiflorus*. Perianth-segments more acute; bracts and bracteoles almost aristate.—Arnhem's Land, *M'Kinlay*.

NEB

AMARANTHACEAE

Ptilotus distans

NIB

AMARANTHACEAE

Ptilotus exaltatus

NID

Amaranthaceae

Ptilotus exaltatus

NIB

AMARANTHACEAE

Ptilotus forresti

NIB

AMARANTHACEAE

Ptilotus fusiformis

N28

AMARANTHACEAE

Ptilotus gaudichaudii

NIB

AMARANTHACEAE

Ptilotus incanum

N3B

AMARANTHACEAE

Ptilotus johnstonianus

NIB

AMARANTHACEAE

Ptilotus lanatus

7. **P. latifolius,** *R. Br. App. Sturt's Exped.* 25. Stems erect, much branched, herbaceous (annual? or from a thick rhizome?) "attaining 2 ft." the branches and young foliage covered with an intricate white cottony wool, the older leaves becoming glabrous. Leaves obovate, very obtuse, rather thick, with slightly crisped margins, contracted into a rather long petiole, the largest leaves in the specimens scarcely 1 in. long, the upper ones much smaller. Spikes nearly globular, fully $\frac{1}{2}$ in. diameter, numerous, sessile or shortly pedunculate, terminal or in the upper axils, usually with one or two small herbaceous leaves close under them. Bracts and bracteoles thinly scarious, white and shining, very broadly ovate or almost orbicular, obtuse, loose or spreading, $2\frac{1}{2}$ to 3 lines long. Perianth not 2 lines long, the base a very short open disk, the segments with a narrow base densely clothed outside with long woolly hairs, glabrous inside, the lamina or upper half rather broader obtuse (pink?) and glabrous. Stamens all perfect and nearly equal in the flowers examined. Ovary glabrous.—F. Muell. Fragm. vi. 232.

S. Australia. Sand ridges, Wills' Creek, *Howitt's Expedition.* I have not seen Sturt's specimens described by R. Brown.

NIB

AMARANTHACEAE

Ptilotus longistachyu

NIB

AMARANTHACEAE

Ptilotus macrocepha

5. **P. Murrayi,** *F. Muell. Fragm.* iii. 145. A small apparently prostrate branching annual (or perennial?) our specimens not exceeding 2 or 3 in. but not the entire plant. Leaves oblong, obtuse, under ½ in. long, contracted into a petiole, glabrous as well as the branches. Spikes axillary and terminal, sessile, at first globose, at length oblong or cylindrical and about ½ in. long and 2½ to 3 lines diameter, the pink tips of the perianths just appearing above the white wool. Bracts and bracteoles ovate, obtuse, scarious, glabrous, scarcely above ½ line long. Perianth about 1¼ lines long, with a very short turbinate base, the segments thinly scarious with a red centre, glabrous in the upper half, the lower half covered outside with a long dense intricate white wool. Filaments slender, nearly as long as the perianth, united at the base in a truncate ring, slightly prominent from the perianth-tube; anthers all 5 perfect (or one sometimes abortive?). Fruit glabrous; style rather excentrical.

S. Australia. Flooded tracts of Wills' Creek, *Howitt's Expedition.*

NIB

AMARANTHACEAE

Ptilotus obovatus

NIB

AMARANTHACEAE

Ptilotus petiolatus

NID.

AMARANTHACEAE

Ptilotus polakii

NIB

AMARANTHACEAE

Philotus polystachy

4. **P. spicatus,** *F. Muell. Herb.* An erect glabrous annual (or with a perennial rhizome ?) of 1 to 2 ft., with long branches bearing usually each a single spike as in *P. conicus*. Leaves narrow linear or rarely linear-lanceolate acute, the larger ones 2 in. long. Spikes at first shortly conical, at length cylindrical and above 1 in. long. Bracts and bracteoles narrow, acute or aristate, shorter than the perianth. Perianth about 2½ lines long, surrounded at the base by a dense ring of rigid hairs some of which are also on the lower portion or claws of the segments; segments free from the base, the upper half scarious coloured (pink or red), obtuse and quite glabrous, the 3 inner ones woolly inside below the middle. Staminal cup very short, the filaments not very unequal, filiform, scarcely dilated at the base.

N. Australia. Victoria river, *F. Mueller.* Included in *P. corymbosus* by F. Mueller, Fragm. iii. 125.

Var. *leianthus*. Claws or lower portion of the perianth-segments without any or scarcely any dorsal hairs.

N. Australia. Gulf of Carpentaria, *Leichhardt*; Attack Creek, *M'Douall Stuart's Expedition.*

Queensland. Flinders' river, *Bowman, Sutherland.*

Amaranthaceae

4. TRICHINIUM, R. Br.

(Goniotriche, *Turcz.*; Hemisteirus *and* Arthrotrichum, *F. Muell.*)

Flowers hermaphrodite. Perianth with a short turbinate hard tube, reduced sometimes to a slight expansion of the peduncle; segments 5, all equal or the three inner ones rather smaller, linear, rigid, usually 3-ribbed at the base, scarious at the tips or also along the margins of the upper portion, covered outside either entirely or rarely along the centre only with straight more or less distinctly articulate (several-celled) hairs giving them a plumose appearance, the short tips alone glabrous. Stamens normally 5, but usually 1, 2, or 3 of them small and without anthers, or entirely abortive, and all the filaments unequal, or more rarely all equal and antheriferous, united at the base in a membranous cup adnate to the perianth-tube or shortly free from it, without or rarely with intervening scale-like teeth or lobes, which, when present, are very thin and transparent; anthers 2-celled. Ovary uniovulate. Style simple, rigid, with a small capitate stigma. Fruit an indehiscent utricle, usually obovoid or contracted into a stipes at the base and oblique at the top, with the persistent style more or less excentrical. Seed vertical.—Herbs undershrubs or rarely shrubs, glabrous or hairy with crisped articulate woolly or stellate hairs. Leaves alternate, narrow or rarely obovate. Flowers in dense globular ovoid or cylindrical spikes, very rarely elongated and interrupted. Bracts and bracteoles scarious and shining, nerveless or with a more or less prominent midrib produced into a fine or short point. Perianths usually pink or straw-colour. Stamens and ovary often enveloped in dense wool or long hairs proceeding either from the lower part or claws of the inner perianth-segments or from the outside of the staminal cups.

The genus is limited to Australia, for the opposite-leaved *T. Zeyheri* from S. Africa, admitted by Moquin, must be referred to *Sericocoma*, the presence or absence of scales between the stamens being by no means of absolute generic importance.

This and the following genus have been united by Poiret and F. Mueller under the name of *Ptilotus*, by Sprengel under that of *Trichinium*, and they might perhaps be really better considered as sections of one genus than as two distinct ones, were it not for the useless confusion which would result in the nomenclature of species. At any rate, if the union be adopted it would be better to follow Sprengel in preferring the name of *Trichinium* for the united genus, as being that which belongs to four-fifths of the species, and entails therefore the least change, besides that it is the most familiar of the two from the number of species that have been cultivated or figured. Neither name has the right of priority, both being of the same date, and both are equally apposite for the groups they designate, and equally inappropriate for the combined species, for *Trichinium* means "a clothing of hairs," *Ptilotus* "having featherless wings."

In the subdivision of the genus I have been unable to establish any natural well-characterized sections. Even the presence of the teeth or lobes of the staminal cup, considered by Moquin as at least a generic if not a tribual character, separates species which in other respects are almost identical. The groups here adopted as the best which have hitherto been suggested are founded chiefly upon the nature and position of the different kinds of hairs. With the exception of the short stellate tomentum of the foliage in the first series, the hairs are all so-called articulate, that is, consisting of several cells, sometimes very conspicuously so, with more or less prominent denticulations at the joints or almost plumose, sometimes very fine with the articulations visible only under a very high power. These hairs are sometimes (always so on the backs of the laminæ of the perianth) straight, at first appressed afterwards spreading, sometimes, on the backs of the lower part of the perianth-segments or inside the inner ones, long and intricate forming masses of white wool, sometimes, especially on the branches, short and crisped.

SERIES 1. **Astrotricha.**—*Foliage hoary or white with a stellate tomentum (glabrous or with crisped or woolly or silky hairs in all the other series).*

Spikes dense, globular ovoid or shortly cylindrical, not exceeding 1 in.
- Spikes ¼ to 1 in. diameter. Laminæ of perianth-segments linear.
  - Leaves mostly broad, rather thick and densely tomentose. Spikes globular or at length ovoid. Bracts glabrous or nearly so . . . . . 1. *T. obovatum.*
  - Leaves mostly narrow, thick and densely tomentose. Spikes ovoid, at length cylindrical. Bracts woolly . . . . . 2. *T. incanum.*
  - Leaves mostly narrow, rather thin, less densely tomentose. Spikes ovoid, at length cylindrical. Bracts glabrous or slightly woolly . . . . . 3. *T. parviflorum.*
- Spikes not above ¼ in. diameter. Laminæ of perianth-segments almost ovate . . . . . 4. *T. astrolasium.*

Spikes cylindrical, above 2 in. long and 1½ in. diameter. Leaves orbicular, very densely woolly . . . . . 5. *T. rotundifolium.*

Spikes elongated with distant flowers. Leaves oblong or lanceolate, the stellate hairs short and scattered . . . . . 6. *T. dissitiflorum.*

(The foliage is also very densely silky-woolly in 46, *T. helichrysoides*, but the hairs not stellate.)

SERIES 2. **Straminea.**—*Spikes cylindrical or elongated or rarely globular, 1 to 2 in. diameter. Flowers more or less yellow or greenish, not red. Inner segments without internal dense wool, but the stamens usually surrounded by a few long hairs.*

Spikes elongated with distant flowers. Leaves filiform . . . 7. *T. distans.*

Spikes dense, at length long and cylindrical.
- Leaves linear. Bracts wholly transparent. Bracteoles broad without prominent midribs. Perianth under ¾ in. . . . . 8. *T. alopecuroideum.*
- Leaves obovate or oblong. Bracts opaque in the centre. Bracteoles oblong or lanceolate with prominent keels.
  - Perianth above ¾ in. long . . . . . 9. *T. nobile.*
  - Perianth not exceeding ¾ in. . . . . 10. *T. polystachyum.*

Spikes ovoid or shortly cylindrical, 2 in. diameter. Bracts transparent. Leaves linear . . . . . 11. *T. macrocephalum.*

Spikes globular or rarely ovoid. Perianth-segments rather broad, the dorsal hairs very short . . . . . 12. *T. corymbosum.*

cont'd

SERIES 3. **Rhodostachya.**—*Spikes globular ovoid or rarely cylindrical, 1 to 2 in. diameter, terminating simple or rarely branched stems. Perianth straight, pink or red (white in* T. esquamatum*), the inner segments woolly inside towards the base.*

Spikes 1½ to 2 in. diameter.
Perianth-segments very rigid with short narrow tips. Stems erect. Spikes about 1¼ in. diameter.
Spikes at length elongated and cylindrical . . . . . 13. *T. exaltatum.*

Spikes globular or shorter than broad . . . . . 14. *T. semilanatum.*
Perianth-segments with conspicuous coloured obtuse glabrous tips. Spikes about 2 in. diameter.
Stems short, decumbent. Radical leaves spathulate, the others linear . . . . . 15. *T. Manglesii.*
Stems short erect. Leaves spathulate, all crowded at the base of the stem . . . . . 16. *T. Beckerianum.*
Spikes about 1 in. diameter. Stems erect, simple, with small narrow leaves.
Radical leaves oblong-spathulate. Bracts ovate-lanceolate, brown. Perianth pale pink . . . . . 17. *T. gomphrenoides.*
Leaves all small. Bracts broad, transparent, pale-coloured. (Perianth white?) . . . . . 18. *T. esquamatum.*

SERIES 4. **Incurva.**—*Spikes globular, ¾ to 1½ in. diameter, terminating simple stems. Perianths curved upwards (straight or curved downwards in all other series), the inner segments woolly inside at the base. Leaves linear.*

Spikes sessile within the last leaves . . . . . 19. *T. declinatum.*
Upper leaves distant, usually reduced to scarious scales . . . 20. *T. erubescens.*

SERIES 5. **Polycephala.**—*Stems mostly branched or rarely some of them long decumbent and simple, glabrous or with crisped woolly hairs. Spikes mostly globular, ¾ to 1 in. diameter.*

Inner perianth-segments very woolly inside towards the base (less so in *T. helipteroides*). Bracts rather loose.
Shrubby with divaricate branches. Leaves linear, rigid. Spikes about 1 in. diameter . . . . . 21. *T. divaricatum.*
Herbaceous with decumbent, ascending or erect stems. Spikes about ¾ in. diameter.
Leaves narrow. Stems more or less silky or woolly.
Bracts and bracteoles very thin, nearly as long as the perianth . . . . . 22. *T. helipteroides.*
Bracts and bracteoles rather rigid, not half as long as the perianth . . . . . 23. *T. Stirlingii.*
Leaves broad. Stems glabrous or nearly so except the young shoots.
Stamens 2, long, dilated and connate at the base on one side of the ovary . . . . . 24. *T. laxum.*
Stamens 3 or 4 perfect, the filaments all dilated at the base forming a complete ring or cup . . . . . 25. *T. axillare.*
Inner perianth-segments nearly glabrous inside, the wool proceeding chiefly from the staminal cup. Bracteoles closely embracing the perianth.
Undershrub with divaricate branches. Leaves few, narrow and small. Panicle divaricate . . . . . 26. *T. striatum.*
Herb with large obovate or oblong leaves chiefly radical. Stem simple at the base with a compact panicle . . . . 27. *T. auriculifolium.*
Inner perianth-segments nearly glabrous inside. Staminal cup surrounded by long straight hairs.
Leaves obovate oblong or lanceolate, usually glabrous. Perianth straight. Stamens 3 or 4 perfect, connate at the base, in a complete cup or ring . . . . . 28. *T. sericostachyum.*
Leaves oblong or lanceolate, loosely villous underneath. Perianth recurved. Stamens 2, the filaments dilated and connate on one side of the ovary . . . . . 29. *T. roseum.*
Leaves linear-filiform. Perianth straight. Stamens 3 or 4 perfect, the filaments forming at the base a complete cup or ring.
Perennial with a thick rootstock. Spikes about 1 in. diameter . . . . . 30. *T. fusiforme.*
Annual. Spikes about ¾ in. diameter . . . . . 31. *T. gracile.*

SERIES 6. **Squamigera.**—*Spikes globular or cylindrical, ½ to 1 in. diameter. Staminal cup with transparent scale-like teeth or lobes between the filaments (wanting in all the other series). Leaves narrow.*

Perennial with simple stems of 1 ft. or more. Spikes globular, about ¾ to 1 in. diameter . . . . . 32. *T. Drummondii.*
Annual with slender branching stems of 1 ft. or more. Spikes cylindrical, about ½ in. diameter . . . . . 33. *T. calostachyum.*
Perennial with a branching stock and slender stems of about 6 in. Spikes globular, under ½ in. diameter . . . . . 34. *T. Fraseri.*

SERIES 7. **Spathulata.**—*Perennials with short decumbent stems leafy to the spike. Spikes sessile, within the last leaves, globular ovoid or cylindrical, ¾ in. diameter or more. Leaves mostly spathulate.*

Spikes ovoid, at length cylindrical, the hairs round the base of the perianth shorter than the segments.
Bracteoles acute, half concealed by the very plumose perianths. Perianth-tube ½ to ¾ line long . . . . . 35. *T. spathulatum.*
Bracteoles broad, obtuse, conspicuous. Perianth-segments free to the base . . . . . 36. *T. pyramidatum.*
Spikes globular, at length ovoid, the bracteoles and the hairs surrounding the perianths nearly as long as the segments . . 37. *T. holosericeum.*

cont'd | . . .

SERIES 8. **Parviflora.**—*Spikes globular, ovoid or cylindrical,* ¼ *to* ½ *in. diameter.*

Stems erect, branching, glabrous or slightly hairy. Annual.
- Leaves linear. Spikes conical or cylindrical, 2 or 3 together, sessile on a terminal peduncle . . . . . 38. *T. Cunninghamii.*
- Leaves linear. Spikes globular or ovoid, solitary on a terminal peduncle. Perianth hairs short . . . . . 39. *T. leucocoma.*

Prostrate woolly-hairy annual. Leaves lanceolate. Spikes solitary, ovate-conical. Perianth very woolly . . . . . 40. *T. villosum.*

Perennials. Branches woolly or villous, at least when young. Spikes numerous, sessile or shortly pedunculate.
- Perianth surrounded by long wool concealing the bracts and segments. Spikes cylindrical . . . . . 41. *T. brachyanthum.*
- Bracts and bracteoles nearly as long as the perianth and very conspicuous.
  - Branches and foliage villous. Spikes narrow-cylindrical . 42. *T. arthrolasium.*
  - Young shoots woolly. Leaves glabrous, broad. Spikes ovoid. Perianth-segments glabrous inside . . . . . 43. *T. œrvoides.*
  - Branches closely woolly. Leaves broad, obtuse. Spikes ovoid. Inner perianth-segments woolly inside . . . . 44. *T. Roei.*

Glabrous undershrub, with a densely tufted leaf-stock. Leaves small, nearly terete. Spike very short. Bracts conspicuous 45. *T. cæspitulosum.*

SERIES 9. **Helichrysoidea.**—*Low densely tufted thick perennial, closely covered with thick silky-woolly leaves. Spikes nearly globular, sessile,* ¾ *in. diameter.*

Single species . . . . . 46. *T. helichrysoides.*

Species insufficiently known.

Stem slender, branching. Leaves ovate, about 1 line long. (Spikes globular?) . . . . . 47. *T. parvifolium.*

NIB

AMARANTHACEAE

Trichinium elder.

31. **T. gracile,** *R. Br. Prod.* 415. Very near *T. fusiforme*, and the structure of the flowers the same, but an annual with still more slender branching stems, the leaves filiform, the spikes globular not above $\frac{3}{4}$ in. diameter, and the perianth only about 4 lines long with much shorter glabrous tips.—Moq. in DC. Prod. xiii. ii. 294; *Ptilotus gracilis*, Poir. Dict. Suppl. iv. 620.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* N.W. coast, *Bynoe.*

5. **T. rotundifolium,** *F. Muell. Fragm.* iii. 122. An erect shrub of 2 or 3 ft., the branches and foliage covered with a stellate tomentum very soft and dense, almost woolly. Leaves on short petioles, nearly orbicular, very obtuse, soft and thick, about 1 to 1½ in. diameter. Spikes at first conical, becoming cylindrical, 2 or 3 in. long, and at least 1½ in. diameter. Bracts broad, acute and mucronate, scarious with dark tips, woolly outside, shorter than the bracteoles. Bracteoles at least 4 lines long, very broad and thin, shortly mucronate, glabrous or with very few woolly hairs at the base. Perianth nearly ¾ in. long, the dorsal hairs long fine and almost silky, the tube about ¾ line long, the segments narrow, scarious, obtuse, the tips not at all or very shortly glabrous outside; the three inner ones rather shorter and very densely woolly inside near the base. Stamens all antheriferous and equal or nearly so.—*Ptilotus rotundifolius,* F. Muell. Fragm. vi. 230.

N. Australia. Near Hammersley range, N. W. coast, *F. Gregory's Expedition.*