1. PIMELEA, Banks and Soland.

(Thecanthes, Wikstr.; Gymnococca, Fisch. et Meyer; Heterolæna and Calyptrostegia, C. A. Mey.; Macrostegia, Turcz.).

Perianth tubular, with a spreading or rarely erect 4-lobed limb, without scales but often slightly thickened or folded round the throat-Stamens 2, inserted in the throat opposite the 2 outer perianth-lobes.

No hypogynous scales. Ovary 1-celled, with 1 pendulous ovule. Style elongated, attached to one side of the ovary immediately below the apex. Fruit a small drupe, with a membranous or succulent epicarp, the endocarp nut-like, crustaceous, often hooked at the top. Seed pendulous with a membranous testa; albumen scanty or copious; cotyledons broad or narrow, rather thick, longer than the radicle.—Shrubs undershrubs or herbs. Leaves opposite or alternate. Inflorescence varied within the limits of the Order, but never umbellate. Perianth white pink or yellowish, often silky-villous.

The genus is limited to Australasia, comprising, besides the Australian species, one of which is also from New Zealand, nine others confined to New Zealand.

Sect. 1. **Thecanthes.**—Involucral bracts united into a 4-lobed cup. Perianth-tube glubrous, not circumsciss.—Glabrous annuals.

Involucral lobes very broad, shorter than the entire part, usually 1. P. punicea.

alone prominent. Involucral lobes very broad. Filaments twice as long as the perianth-lobes. Flowers white

Involucral lobes acute. Filaments much shorter than the perianth-lobes. Flowers red

Involucral lobes reaching nearly to the base, several-nerved and longer than the flowers. Filaments much shorter than the perianth-lobes. Flowers red

2. P. concreta. 3. P. cornucopiæ.

Sect. 2. Eupimelea. — Involucral bracts free, like the stem-leaves or rather broader. Perianth-tube silky-villous, not circumsciss. — Prostrate or much branched shrubs, with flat or concave leaves usually opposite. Tasmanian or mountain species.

Stem and leaves glabrous. Involucral bracts rather broader than the stem-leaves.

5. P. alpina. 6. P. longifolia.

Leaves under \(\frac{1}{2}\) in. long. Perianth-tube 2 to 3 lines.

Leaves mostly above \(\frac{3}{2}\) in. Perianth-tube about \(\frac{1}{2}\) in.

Stem and under-side of the leaves silky-villous, upper side glabrous. Involucral bracts like the stem-leaves . Stem and leaves on both sides densely silvery-silky. Involucral bracts like the stem leaves 7. P. cinerea. bracts like the stem-leaves

8. P. Milligani.

(43. P. leptostachya has the perianth not circumsciss, but the flowers in spikes, without bracts and the leaves alternate.)

Sect. 3. Heterolæna. - Involucial bracts free, much broader than the leaves. Perianth-tube not circumsciss — Shrubs. Leaves opposite, glabrous, flat (not concave) or with the margins recurved or revolute. Species all Western.

Leaves oblong or lanceolate, acute or mucronate, a to above 1 in. long. Perianth-tube above in long, with long spreading hairs, the upper part with short appressed hairs.

Leaves of P. spectabilis but shorter and less acute. Perianthtube with only a few scattered hairs above the long spreading

10. P. Lehmanniana.

9. P. spectabilis.

Leaves flatter shorter broader and more obtuse. Involucral bracts often with coloured margins. Perianth-tube 4 to 6 lines long

11. P. hispida.

Leaves obleng-linear or lanceolate, mostly acute, the margins much recurved. Perianth-tube under 1 in long.

Leaves ovate or oblong, obtuse, under 1 in long, the margins much recurved. Perianth-tube under 1 in long.

. 13. P. ferruginea.

Leaves narrow, 2 to 3 lines long, the margins much recurved. Perianth-tube 2 to $2\frac{1}{2}$ lines long. . . . 14. P. brachyphylla. (16. P. brevifoliæ, with small concave leaves seems also to have

the periauth-tube scarcely circumsciss.) Sect. 4. Calyptrostegia.—Flowers hermaphrodite or in some specimens female by abortion. Perianth-tube after flowering (except in P. leptostachya) circumsciss above the ovary, leaving the lower portion only persistent round the fruit. Anthers with a narrow connective, the cells very distinct and after they open placed back to

Subsect. 1. Calyptridium.—Flower-heads terminal, with 4-6 broad persistent involucial bracts.—Shrubs (or one species a hard annual?) with opposite leaves.

* Western species.—Leaves flat or concave, glabrous as well as the branches. Cotyledons usually narrow.

Cotyledons usuamy narrow.

Involucial bracts all glabrous.

Perianth perfectly glabrous

Perianth more or less hairy.

Leaves penniveined, elliptical or lanceolate. Hairs of the perianth all spreading, few only in the upper part.

Leaves narrow without lateral veins. Hairs of the perianth short and appressed in the upper part, with or without long spreading ones lower down

Inner involucial bracts silky-villous inside.

Leaves linear or lanceolate. Short persistent portion of the

. 17. P. Maxwelli.

ves linear or lanceolate. Short persistent portion of the perianth very densely hispid, deciduous portion villous with appressed hairs. Bracts scarcely acuminate, much shorter than the perianth.

. 18. P. angustifolia.

Leaves ovate oblong or broadly lanceolate. Flower-heads
rodding.
Perianth silky-villous throughout, hairs of the lower part
Bracts scarcely acuminate
villous
large, obtuse, thin and coloured, but not concealing the flowers
lobes hairy. Bracts very large, obtuse, coloured, com- pletely enclosing the flowers
** Eastern species.—Leaves more or less concave, glabrous as well as the stem. Cotyledons usually broad.
Perianth nearly glabrous at the base, hairy upwards. Hairs of
the receptacle very long
minate
with a prominent midrib
Bud thin
*** Eastern species.—Glabrous silky-hairy or tomentose. Leaves flat or with the margins more or less recurved. Cotyledons usually broad.
Branches and leaves glabrous. Leaves narrow, under 1 in. long
Subsect. 2. Phyllolena.—Flower-heads with numerous involucral bracts not
broader than the leaves.—Western species. Leaves mostly alternate, glabrous or loosely silky-villous. Pe-
rianth-lobes short Leaves mostly opposite, villous. Perianth very hispid, the lobes longer than the tube
Subsect. 3. Choristachys.—Flowers in clusters spikes or racemes, without involucres, or the bracts not broader than the leaves and very deciduous. Leaves flat or
with slightly recurved margins.—Eastern or tropical species.
with slightly recurved margins.—Eastern or tropical species. Leaves opposite. Flower-clusters mostly axillary, small. Fruit usually suc-
Leaves opposite. Flower-clusters mostly axillary, small. Fruit usually succulent
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Leaves opposite. Flower-clusters mostly axillary, small. Fruit usually succellent. Flowers large, red, in a terminal dense spike

Flower-clusters terminal, or in the forks. Leaves linear-lanceolate, mostly ½ to 1 in. long.
The state of the s
Flowers mire of less sinky narry
Flowers oblight many and margine 2 to 4 line land 19. P. pauciflora.
Flowers more or less silky hairy
Leaves small, dvate, corraceous, more or less concave.
Diffuse or very much branched low shrubs. Flowers
glabrous, or sparingly ciliate.
Flowers mostly solitary, upper leaves and perianths ciliate
with a few long hairs
Thowers clustered, quite glabrous as well as the leaves 52 P sernallifolia
Erect, shortly dichotomous shrubs. Flowers silky-villous.
Leaves mostly obtuse. Female perianth tube not produced
above the ovary
above the cream of several perianti-tuoe produced
above the ovary and sometimes tardily circumsciss 54. P. petrophila.
SECT. 7. Epallage. Flowers hermaphrodite or more or less discious. Perianth-
tube usually circumsciss after flowering, leaving the lower portion persistent round the
fruit. Anthers rather flat, with a broad dorsal connective, the cells closely parallel on
the inner face, the whole anther usually rolled back after flowering. Flowers in clusters
or heads, rarely solitary, or in dense oblong spikes.
The state of the dense outong spines.
Flowers strictly diecious. Leaves alternate, softly silky-villous.
Flowers solitary in the upper axils. Kemale perianth shortly
and equally silky-villous
Flowers in clusters. Female perianth with the persistent
portion clothed with very long spreading hairs. Male
perianth shortly and equally silky-villous
Flowers hermaphrodite, or on some specimens female.
Softly villous plants. Flowers small, bracts 2 or rarely 4,
unequal and deciduous.
Hairs appressed. Leaves mostly oblong, rarely 1 in. long . 57. P. curviflora.
1 in. long
Leaves ovate or oblong, \(\frac{1}{2} \)
Solution Ing. Flowers rather larger
several, not much broader than the leaves.
Leaves flat, the midrib scarcely conspicuous. Bracts usually
numerous.
Filaments shorter than the corolla 60. P. octophylla.
and the corona of the corona of the corona
200 ci ci, concave, with the midrio prominent under-
neath. Bracts usually about 6.
Leaves small (under \(\) in.) oblong, rather broad 62. P. phylicoides.
Leaves to near tin. long, narrow oblong 63. P. Eyrei.
Leaves linear, mostly about \(\frac{1}{2}\) in long 64. P. longiftora. Stem and leaves glabrous, leaves concave. Bracts (4 to 6)
much broader than the leaves.
Leaves narrow, coriaceous, acute. Perianth circumsciss
above the ovary.
Flower-heads usually nodding. Perianth equally silky-
villous
villous Flower-heads usually erect. Perianth with long more
Spreading hairs in the lower part
spreading hairs in the lower part
Bracts very deciduous. Perianth not circumsciss 67. P. Holroydi.
D
P. grandiflora, Don. Hort. Cantab., and P. prinifolia Nois. quoted in Steudel's
Nomenclator, are garden names which cannot now be identified.

56. P. ammocharis, F. Muell. in Hook. Kew Journ. ix. 24, and Fragm. vii. 5. A shrub of 2 or 3 ft., usually much branched, the foliage densely silky-villous with soft silvery hairs. Leaves alternate, sessile, crowded or imbricate, oblong or elliptical, 3 or 4 lines long. Flower-heads depressed-globular, often nodding, closely sessile, surrounded by numerous bracts not differing from the stem-leaves, shorter than the male flowers but often longer than the female. Flowers diœcious. Male perianth-tube slender, silky-villous, 3 to fully 4 lines long, the lobes 1 to 1½ lines. Filaments short; anthers with a broad dorsal connective, the cells closely parallel on the inner face. Female perianth with a shorter tube, slender at the time of flowering but covered with silky hairs almost as long as the tube itself and spreading like a pappus on

the fruiting perianth, which is entirely nerveless, the lobes shorter than in the males and the anthers abortive.—Meissn. in DC. Prod. xiv. 507.

M. Australia. Upper Victoria river and Sturt's Creek, F. Mueller; twenty miles south of Port Nichol, N.W. coast, Mailland. The latter specimens are considered as a var. Mailland, by F. Mueller, I can find no difference except that the flowers are larger. The specimens from Roebuck Bay, Martin, quoted by F. Mueller, are doubtful, being in leaf only.

2. **P. concreta,** F. Muell. Fragm. v. 73. A glabrous annual, with the habit and foliage of P. punicea, but the peduncle in the only specimen seen shorter than the last leaves and the flowers white. Involucre broad, divided to about the middle into 4 very broad obtuse or scarcely acuminate lobes, veinless except the slightly conspicuous midrib. Perianths much exserted, the tube nearly 3 lines long, the lobes short and obtuse, scarcely \(\frac{3}{4}\) line long. Filaments at least twice as long as the lobes, with small oblong anthers.

N. Australia. Camden Harbour, N. W. Coast (Herb. F. Mueller).

3. P. cornucopiæ, Vahl. Enum. i. 305. An erect glabrous rather stiff annual of about 1 ft. Leaves alternate or the lower ones opposite, sessile or nearly so, lanceolate or oblong-linear, obtuse or nearly acute, mostly \(^3\) to 1\(^1\) in. long. Flower-heads on a terminal peduncle. Involucre turbinate with a long tapering base, about \(^1\) in. diameter, divided to near the middle into broad acute lobes, with the midribs alone conspicuous. Flowers numerous, usually whitish, on short flattened pedicels within the involucre at or near its base. Perianths scarcely protruding beyond the involucral lobes, the slender tube about 2 lines long, circumsciss after flowering shortly above the ovary, the lobes small and obtuse. Filaments very short; anthers ovate, with a narrow connective. Epicarp membranous. Seed with a scanty albumen and broad cotyledons.—R. Br. Prod. 359; Meissn. in DC. Prod. xiv. 496; Thecanthes cornucopiæ, Wikstr. in Trans. R. Acad. Stockh. 1818, 271; Calyptrostegia cornucopiæ, Endl. Gen. Pl. Suppl. iv. part 2. 60.

Queensland. Endeavour river, Banks and Solander, A. Cunningham; Port Curtis, Keppel Bay, Shoalwater Bay, Broad Sound, R. Brown; Cape York, Daemel; Port Denison, Fitzalan; Burdekin river, Bowman; Rockhampton and Rockingham Bay, There's and others.

67. P. Holroydi, F. Muell. Fragm. vi. 159, t. 59. An erect perennial or shrub, glabrous and glaucous except the inflorescence as in *P. hæmatostachya*. Leaves opposite, sessile or nearly so, from almost orbicular to oval-oblong, 1 to $1\frac{1}{2}$ in. long. Flower-heads at first depressed globular, but lengthening into an ovoid or oblong spike; involucre of 4 to 6 bracts, glabrous and glaucous like the stem-leaves, but shorter than the flowers, very broad and falling off before the fruit ripens. Perianth villous with long spreading silky hairs, which also cover the rhachis; the tube about ½ in. long, swelling round the fruit at the base after flowering but not circumsciss, the lobes about 1½ lines long. Filements nearly as long as the lobes, anthers exert as allong. long. Filaments nearly as long as the lobes; anthers ovate or oblong, with a rather broad dorsal connective and recurved when old, the cells parallel on the inner face, but more distinct than in most *Epallages*. Ovary tipped with a few long hairs. Fruit acuminate, the style less lateral than in most species, the epicarp membranous. Seed with a scentification and broad actividence. scanty albumen and broad cotyledons.

N. Australia. Gorges of the Hammersley Range, N. W. Coast, C. Harper. (Herb. F. Mueller.)—This is a remarkable species, approaching P. hæmatostachya in foliage and inflorescence, but with the broad involucral bracts and persistent perianth of Heterolæna and the anthers of Epallage.

1. P. punicea, R. Br. Prod. 359. An erect glabrous slightly branched annual of ½ to 1 ft. Leaves mostly opposite, lanceolate, very acute or mucronate, about 1 in. long. Flower-heads on a rather long erect terminal peduncle; thickened at the end. Involucre broadly turbinate, 6 to 8 lines diameter, divided to below the middle into 4 broad obtuse lobes, marked with forked veins, the two outer ones often slightly dilated and overlapping the others at the base. Flowers red, much exserted. Perianths on very short conical pedicels within the involucre at or near its base, the tube about 3 lines long, the lobes about 1 line. Filaments about half the length of the lobes; anthers oblong, with a narrow connective. Epicarp membranous. Seed with a scanty albumen and broad cotyledons.—Meissn. in DC. Prod. xiv. 497; Endl. Iconogr. t. 11. Thecanthes punicea, Wikstr. in Trans. R. Acad. Stockh. 1818, 272.

N. Australia. Arnhem N. and S. Bays, R. Brown; Arnhem land, M'Kinlay; Sims' Island, A. Cunningham. In R. Brown's specimens the leaves are slightly mucronate and the forked veins of the involucre are not so prominent as in the others.

Var. breviloba, F. Muell. Involucres \(^3\) in diam., the flowers exceedingly numerous.
—Sandstone tableland, Upper Victoria river and Hooker's and Sturt's Creeks, F. Mueller; Purdie's Ponds, M. Douall Stuart.

4. **P. sanguinea,** F. Muell. Fragm. i. 84. A glabrous annual, at first simple, but soon branching from the base into numerous decumbent or ascending simple or slightly branched stems, seldom exceeding 6 in. Leaves more crowded than in the allied species, oblong-linear or lanceolate, obtuse or rather acute, $\frac{1}{2}$ to $\frac{2}{4}$ or rarely 1 in. long. Flower-heads shortly pedunculate or almost sessile above the last leaves. Involucre rather broad, divided nearly to the base into ovate acute lobes of about $\frac{1}{2}$ in., the midrib prominent and a few faint lateral veins at the base. Perianths red, much shorter than the involucre, the tube not 2 lines long, the lobes scarcely above $\frac{1}{2}$ line and obtuse. Stamens shorter than the lobes, with the short anthers of P. cornucopiæ.

Queensland. Upper Roper river, F. Mueller; Cape river, Bowman.

A specimen from alluvial flats, Mount King, Glenelg district, Martin, referred by F. Mueller, Fragm., vii. 3, to P. sanguinea, with the evidently red flowers of that species, has the habit and involucres of P. cornusopiæ; but it is insufficient to determine absolutely its affinities.

3. WIKSTRŒMIA, Endl.

THYMELAEACEA

Perianth tubular, with a spreading 4-lobed limb without scales in the Perianth tubular, with a spreading 4-lobed limb without scales in the throat. Stamens 8, the anthers sessile, those opposite the perianth-lobes inserted in the throat, the alternate ones in the tube. Hypogynous scales 4, free or more or less united in pairs. Ovary with 1 pendulous ovule; style very short. Fruit a berry-like drupe, the epicarp succulent sometimes thin, the endocarp coriaceous or crustaceous. Seed without albumen.—Shrubs or trees. Leaves opposite or rarely here and there alternate. Flowers in short terminal or axillary racemes spikes or heads, without involucral bracts.

The genus extends over a great part of trapical Asia and the islands of the A-rich

The genus extends over a great part of tropical Asia and the islands of the Archipelago and the Pacific. The only Australian species has a wide range over the area of the genus.

1. W. indica, C. A. Mey. in Bull. Acad. Sc. Petersb. i. (1843) 357. A shrub, sometimes low and spreading, sometimes almost arborescent, glabrous or the slender branches slightly silky-hairy. Leaves from ovate and obtuse to ovate-lanceolate and acute or oblong-lanceolate and tapering at both ends, rarely above 2 in. long and sometimes all under 1 in., usually rather thin and glabrous. Flowers few together, very shortly pedicellate in small terminal heads sometimes growing out into short spikes, the common peduncle usually under 4 lines long, erect or slightly recurved. Perianth of a greenish yellow, glabrous or sprinkled with a few hairs, the tube scarcely 3 lines long, the lobes about sprinkled with a few hairs, the tube scarcely 3 lines long, the lobes about 1 line. Hypogynous scales 4, small and narrow, approximate in opposite pairs and sometimes the two connate at the base. Drupe red, about \(\frac{1}{4} \) in. diam., the endocarp rather hard.—Meissn. in DC. Prod. xiv. 543; Daphne indica, Linn. Sp. Pl. i. 511; R. Br. Prod. 362; Hook. and Arn. Bot. Beech. t. 15; F. Muell. Fragm. vii. 1; W. fætida, A. Gray in Seem. Journ. Bot. iii. 302; Seem. Fl. Vit. 207; W. Shuttleworthii, Meissn. in Denkschr. Regensb. Bot. Ges. iii. 287; W. Shuttleworthiana, Meissn. in DC. Prod. xiv. 544; W. wiridiflora, Meissn. in Denkschr. Regensb. Bot. Ges. iii. 286 and in DC. Prod. xiv. 546. Repth. Fl. Honek. 297. Bot. Ges. iii. 286 and in DC. Prod. xiv. 546; Benth. Fl. Hongk. 297.

N. Australia. Arnhem N. bay, R. Brown; Cleveland Bay, N. W. coast, A. Cunningham.

Queensland. Shoal Bay passage, R. Brown; Port Denison, Fitzalan; Edge-combe and Rockingham bays, Dallachy; Rockhampton, Thozet; Logan river, A. Cunningham, Frazer; Burnett and Brisbane rivers, F. Mueller.

N. S. Wales. Port Jackson to the Blue Mountains, R. Brown, A. & R. Cunningham, and others; northward to Hastings and Clarence rivers, Beckler; New England, C. Stuart, and numerous stations in Leichhardt's collection; southward to Illawarra, Herb. F. Mueller (without the collector's name).

The species appears to be also in the Indian Archipelago, in S. China, Sikkim, and the islands of the N. and S. Pacific. It is, however, not always easy to determine the limits to be assigned to it. The character derived from the periect freedom or the union in pairs of the hypogynous scales appears to be of little or no value.