Bentleya, a new genus of Pittosporaceae from southern Western Australia

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Abstract

Bennett, E.M. *Bentleya,* a new genus of Pittosporaceae from southern Western Australia. Nuytsia 5 (3): 401-406 (1986). A new genus and species in the family Pittosporaceae, *Bentleya spinescens* E.M. Bennett, is described and illustrated from Newdegate, Western Australia. A key to the genera of Pittosporaceae is provided.

Introduction

The plant described here was originally collected in September 1982 when the author was accompanying final year horticultural students from the Bentley Technical College, Perth. It proved difficult to identify with known families: it certainly represents a distinct new genus.

The genus is considered to belong to the family Pittosporaceae because it has the following characters: leaves alternate, often appearing clustered; flowers regular, 5-merous, sepals free, petals weakly united at the base to form a more or less definite corolla tube; stamens 5, alternating with the petals, anthers tetrasporangiate, opening by longitudinal slits; gynoecium of 2-3 carpels, united to form a compound ovary with simple style and capitate or slightly lobed stigma; numerous ovules in each carpel; fruit a loculicidal capsule. However the plant does show several differences from genera presently included in this family: a well developed fleshy gland at the base of the ovary; petals which remain fused in the middle of their length post-anthesis, (in other genera of the Pittosporaceae the petals remain fused until anthesis and then separate); free lobes of petals never spreading but always remaining imbricate and erect. The Pittosporaceae typically have 2 bracts, but this species has two whorls totalling about 10-12 bracts.

The new genus also has many characters in common with the family Rutaceae, including alternate leaves; flowers regular, 5-merous (although some of the Rutaceae have 4-merous flowers); anthers tetrasporangiate; nectary-disc intrastaminal, annular. However the new genus differs in that it lacks the major character of the Rutaceae, the presence of oil glands. Sectioned leaves showed schizogenous secretory glands which are also found in the Pittosporaceae, but no oil glands (H.T. Clifford, pers. comm.). Also in the Rutaceae the stamens are rarely a single antepetalous whorl, but often up to 3-4 times as many as the petals and the ovary is 4-5-celled, with usually 2, rarely several ovules.

There is a possibility that it may represent a new family, but for the purpose of describing the plant it is placed in the family Pittosporaceae.

Descriptions

Bentleya E.M. Bennett, gen. nov.

Frutices humiles, rhizomatibus subterraneis effusis, valde ramosi; rami spinis terminati. Folia exstipulata, alterna vel fasciculata, linearia, sessilia vel breviter petiolata; stomata

paracytica; margines integri, revoluti; foliorum fasciculi gemmarum squamis nonnullis deltoideis suffulti. Flores solitarii, perfecti, pedicellati, e basibus truncorum vel paulo supra oriundi, pedicelli basin verticillis 2 bractearum suffulti. Sepala 5, imbricata, libera, pubescentia. Petala 5, imbricata, in tertia parte mediana cohaerentia, basi leviter connata, corollae tubum ± distinctum formantia, utrinque sparse pilosa. Stamina 5, cum petalis alternantia, quam ea paulo breviora; filamenta linearia; antherae versatiles, sagittatae ad ovatae, tetrasporangiatae et dithecae, longitudinaliter dehiscentes. Discus intrastaminalis ad ovarii basin prominens, 5-lobus, annularis, viridis, crassus. Ovarium superum, integrum, 2-3-loculare, ovulis numerosis; placentatio axilis; styli petala excedentes, simplices; stigma capitatum vel bilobum. Fructus capsula 2-(3)-locularis, ad $^1/_2$-$^2/_3$ longitudinis septicida et usque ad dimidiam longitudinem loculicida. Semina lateraliter compressa, reniformia; embryo minutus, ad basin endospermii carnosi bene evoluti.

Typus: B. spinescens E.M. Bennett

Low growing shrubs with spreading underground rhizomes, from which above ground stems arise. *Stems* much branched, at first pubescent, becoming glabrous, terminating in spines. *Leaves* exstipulate, alternate or clustered, linear, sessile or shortly petiolate, subtended by a few deltoid bud scales; margins entire, revolute; stomates paracytic. *Flowers* solitary, perfect, pedicellate, occurring on stems at or just above ground level, occasionally along branches; subtended by two whorls of bracts at base of pedicel. *Sepals* 5, imbricate, free, pubescent. *Petals* 5, imbricate, coherent in middle third, at first weakly united at base to form a more or less definite corolla tube, both surfaces with scattered hairs. *Stamens* 5, alternate with and slightly shorter than petals; filaments linear; anthers versatile, sagittate to ovate, tetrasporangiate and dithecal, longitudinally dehiscent. *Intrastaminal disc* prominent at base of ovary, five-lobed, annular, green, fleshy, thick. *Ovary* superior, entire, 2- or 3-celled; ovules numerous; placentation axile; style exceeding the petals, simple; stigma capitate or 2-lobed. *Fruit* a 2-(3)-celled capsule, splitting septicidally for half to three quarters of its length and loculicidally for up to half of its length. *Seeds* laterally compressed, reniform; embryo tiny, at base of well-developed, fleshy endosperm.

Relationships. There are two genera, *Billardiera* and *Citriobatus,* which share several characters with *Bentleya. Billardiera* and *Bentleya* both have the petals united in the young flower but separating with age, versatile anthers, filaments free from the petals, typically 2 cells in the ovary and capsular fruits (sometimes a berry in *Billardiera*). *Bentleya* differs from *Billardiera* most conspicuously in possessing a disc. *Citriobatus* and *Bentleya* both have an intrastaminal disc although it is less well developed in *Citriobatus,* solitary flowers and petals coherent in the lower part to form a tube. *Bentleya* differs from *Citriobatus* in having 2 or sometimes 3 cells in the ovary rather than 1, a dehiscent fruit, not indehiscent, seeds not immersed in sticky pulp, anthers versatile instead of basifixed, and filaments free from rather than adnate to the petals. The spinescence character of *Bentleya* is also to be seen in other genera including *Billardiera* and *Citriobatus.* Suckering from underground rhizomes, found in *Bentleya,* is unusual in the Pittosporaceae but is known to occur also in *Pittosporum phylliraeoides.*

Etymology. It is to commemorate the students of Bentley Technical College, particularly those in their final year in 1982, one of whom located this new genus, that the generic name of *Bentleya* has been given.

Bentleya spinescens E.M. Bennett, sp. nov. (Figures 1 and 2)

Frutex 5-20 cm altus, 2-20 cm diametro. Folia usque ad 7-na fasciculata, 2-6 x c. 0.5 mm, supra glabra vel disperse albo-pilosa, subtus pubescentia; squamae deltoideae 1-1.5 mm longae. Bracteae exteriores 5-6, 0.5-1 mm longae cum aliis 0.25-0.5 x 0.3 mm, pallide

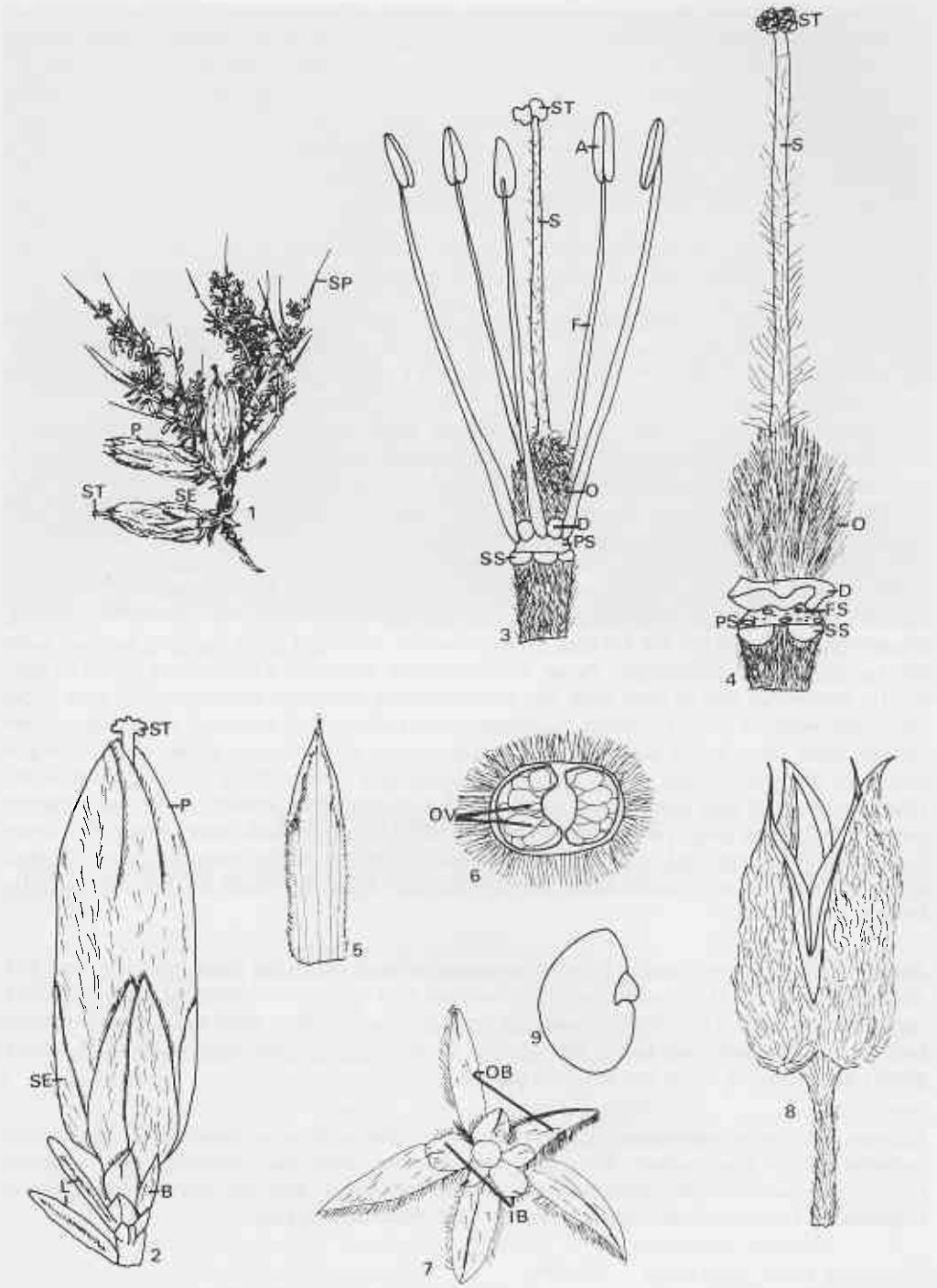

Figure 1. *Bentleya spinescens* E.M. Bennett. 1-Habitat x0. 2-Flower x0. 3-Flower with petals removed x0. 4-Flower with petals and stamens removed x0. 5-Petal x0. 6-Ovary x0. 7-Bracteoles x0. 8-Capsule x0. 9-Seed x0. A-anthers. B-bracteoles. D-fleshy disc. F-filament. FS-filament scar. IB-inner bracteoles. L-leaf. O-ovary. OB-outer bracteoles. OV-ovules. P-petals. PS-petal scar. S-style. SE-sepal. Sp-spinescent branch. SS-sepal scar. ST-stigma. 1-from *E.M. Bennett* 81083, illustrated by S. Bird. 2-7 from plants collected at the type locality. 8-9 from *E.M. Bennett* 291282. 2-9-illustrated by E.M. Bennett.

brunneis, densissime longe pilosis, margine ciliatis, alternantes; bracteae interiores 5, pallide brunneae, secus costam medianam saepe purpurascentes, margine dense ciliatis, 1-3.5 mm longis. Sepala 6-7 x 1.5-2 mm, virescenti-alba, parce albo-pilosa. Petala 1.2-2 cm longa, albido-viridia ad cremea; antherae 2-3 mm longae, pallide malvaceae; pollen pallide malvaceus. Ovarium 1.5-2.5 mm longum. Stylus 1-1.9 mm longus, pallide roseus, per maximan partem longitudinis parce pilosus; stigma purpureo-rubrum, bilobum, in flore maturo prominenter exsertum. Fructus 10-14 x 5-8 mm, brunneus, albo-velutinus. Semina 1.75-2.25 x 1.5-2 mm, rubescenti-brunneus, rugosus.

Typus: 0.5 km west of the Newdegate township (lat. 33° 06'S; long. 119° 01'E), Western Australia, *E.M. Bennett* 81083 (holo: PERTH; iso: B, CANB, K, MEL, MO, NSW.)

Shrub 5-20 cm tall, 2-20 cm across. *Stems* much branched, lower and older part of stem with grey, fissured bark, younger branches reddish-brown, with scattered white hairs, becoming glabrous with age, ending in spines; spiny branches often arising from prominent protuberances. *Leaves* in fascicles of up to 7, linear to narrowly obovate, 2-6 x c. 0.5 mm, minutely mucronate, glabrous or with scattered white hairs on upper surface, pubescent on lower surface, midrib prominent on lower surface, bearing several white hairs; margins revolute; *leaf clusters* subtended by deciduous, deltoid scales c. 1-1.5 mm long. *Flowers* mainly on stems at or just above ground level, occasionally a few along the stems; each flower subtended by two whorls of bracts; *outer bracts* 5-6, of two sizes, some 0.5 x 1 mm, alternating with others 0.25-0.5 x 0.3 mm, pale brown, very densely hairy with long hairs, ciliate on margins; *inner bracts* 5, pale brown, 2-3.5 x 1-1.5 mm, often purplish along midrib, abaxial surface with scattered hairs; margins densely ciliate; pedicel 3 mm long, densely hairy. *Sepals* 6-7 x 1.5-2 mm, greenish-white, scattered white hairy on surface, hairs shorter and denser on margin. *Petals* 1.2-2 cm long, coherent when young for $^2/_3$ of their length, becoming free at base with age but remaining joined in middle for 2-3 mm, lobes imbricate, whitish-green to cream, 3-nerved, outer surface with scattered white hairs, inner surface with white hairs scattered along veins, more abundant in upper third, margins incurved, distinctly ciliate along margins of lobes and inner surface of tube; apex acute. *Filaments* 0.9-1.5 mm long, white; *anthers* 2-3 mm long, pale mauve; pollen pale mauve. *Ovary* 1.5-2.5 mm long, velutinous; style 1-1.9 mm long, pale pink, hairy except for upper 2 mm; stigma purple-red, papillate, prominently exserted in the mature flower. *Capsule* brown, velutinous with white hairs, 10-14 x 5-8 mm. *Seeds* 1.75-2.25 x 1.5-2 mm, reddish-brown, rugose.

Distribution. The type locality is the only one so far from which the plant has been recorded. Although several other locations of similar soil and species complement were searched, cursorily, no further plants were seen. At the type locality there were many plants present but, due to the suckering habit, the number of actual genotypes may be small as several plants are probably from one original parent.

Habitat. Bentleya spinescens grows in sandy clay soil associated with *Eucalyptus occidentalis, E. flocktoniae, Santalum acuminatum, Melaleuca violacea, M. uncinata, Oxylobium parviflorum, Olearia revoluta, Daviesia* affin. *aphylla, Grevillea pauciflora, G. pritzelii, Lasiopetalum rosmarinifolium* and *Westringia rigida.*

Flowering time. September — October.

Fruiting time. December — January.

Etymology. The specific epithet refers to the spinescent habit of the plant, all the short branchlets ending in distinct spines.

Figure 2. Habit of *Bentleya spinescens*.

Key to the genera of Pittosporaceae

Below is provided a key to the world's genera of Pittosporaceae which incorporates *Bentleya*.

1. Anthers linear, equal in length to the filaments.
   2. Flowers irregular, anthers turned to one side ..... *Cheiranthera*
   2. Flowers regular.
      3. Anthers free becoming prominently recurved with age ..... *Pronaya*
      3. Anthers cohering by apical tips, not becoming recurved with age ..... *Sollya*
1. Anthers ovate, much shorter than the filaments.
      4. Filaments adnate to petals; fruit globular, not dehiscent ..... *Citriobatus*
      4. Filaments free from petals; fruit a berry or dehiscent capsule.
         5. Seeds winged; petals up to 44 mm long ..... *Hymenosporum*
         5. Seeds not winged; petals less than 25 mm long.
            6. Ovary and capsule distinctly stipitate; seeds flat ..... *Bursaria*
            6. Ovary sessile or shortly stipitate; seeds irregularly shaped, compressed, but not flat.
               7. Shrubs or trees; fruit a coriaceous or woody capsule ..... *Pittosporum*
               7. Climbers or small shrubs; fruit a membranous or slightly coriaceous capsule, or a berry.
                  8. Prominent intrastaminal disc present ..... *Bentleya*
                  8. No intrastaminal disc present ..... *Billardiera*

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