

A taxonomic review of the yellow-flowered tuberous species of *Drosera* (Droseraceae) from south-west Western Australia

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Abstract

Lowrie, A. A taxonomic review of the yellow-flowered tuberous species of *Drosera* (Droseraceae) from south-west Western Australia. *Nuytsia* 13(1): 75-87 (1999). Five tuberous species of *Drosera* (Droseraceae) with yellow flowers are endemic in south-west Western Australia. They all belong in *Drosera* sect. *Ergaleium* (DC.) Planchon. Descriptions and illustrations are presented for four of these species: *Drosera subhirtella* Planchon, *D. moorei* (Diels) Lowrie *comb. nov.*, *D. zigzagia* Lowrie *sp. nov.*, and *D. intricata* Planchon, which is reinstated. These four species are closely related and are collectively referred to here as the *Drosera subhirtella* complex. The only other tuberous species to have yellow flowers is *Drosera sulphurea* Lehm., which is reinstated here as distinct from its closest relative, the pink-flowered *D. neesii* Lehm. Although not closely related to the *Drosera subhirtella* complex, *D. sulphurea* can be confused with members of that group and therefore a key to all five yellow-flowered species is provided.

Introduction

The taxonomy of five yellow-flowered species of *Drosera* (Droseraceae), including the four closely related species referred to here as the *Drosera subhirtella* complex, is reviewed. These five species are endemic to the south-west of Western Australia and form part of a larger group, known as tuberous sundews, that constitute sect. *Ergaleium* (DC.) Planchon (Planchon 1848: 94). A total of 26 species and 8 subspecies are now recognized in this section, which is characterized by the presence of tubers, peltate leaves, and lack of stipules.

It is principally the yellow-flowered inflorescences that distinguish the *Drosera subhirtella* complex from other members of sect. *Ergaleium* having a lax or climbing life form. Even though a new species described here has an erect growth habit, it qualifies as a member of the *D. subhirtella* complex because its closest relative is considered to be *D. moorei*. Yellow-flowered inflorescences are found on only one other tuberous sundew, *Drosera sulphurea* Lehm. This distantly related species is distinguished from the *D. subhirtella* complex principally by its crescent-shaped leaves with lobes at the angles.

Drosera sulphurea was synonymized under *D. neesii* Lehm. by Marchant *et al.* (1982), but is here reinstated as a distinct species. Since it may be mistaken (because it has yellow flowers) as a member of the *D. subhirtella* complex, *D. sulphurea* is included in the key, but it is not described in full.

Taxonomy

Key to the yellow-flowered tuberous *Drosera* species

- 1 Leaf lamina crescent-shaped, with lobes at the angles **D. sulphurea**
- 1. Leaf lamina broadly obovate, reniform or orbicular on most leaves,
without lobes 2
- 2 Plants erect. Leaves solitary **D. zigzagia**
- 2. Plants lax (often leaning on nearby herbs for support) or climbing.
Leaves in groups of 3 or more 3
- 3 Sepals glabrous **D. moorei**
- 3. Sepals glandular 4
- 4 All plant parts (excluding the sepals) glabrous **D. intricata**
- 4. All plant parts (excluding the lowermost section of stem, stamens,
styles and petals) glandular **D. subhirtella**

Reinstatement of *Drosera sulphurea*

Drosera sulphurea is restricted to the Denmark–Albany region in coastal regions of south-west Western Australia. Its closest relative, *D. neesii*, also occurs in this region but has a much greater range extending east to Cape Arid and north to Kalbarri. Specimens of *D. neesii* occurring in the Hill River–Mingenew–Kalbarri region are known as subsp. *borealis* N.G. Marchant. Other than having a white tuber, *D. neesii* subsp. *borealis* barely differs from *D. neesii* subsp. *neesii*. While the status of *D. neesii* subsp. *borealis* requires further study, *D. sulphurea* shows so many morphological differences from *D. neesii* that it is undoubtedly a distinct species.

Drosera sulphurea has a yellow or yellow-blushed pink tuber, stems 40–60 cm tall, yellow petals, sparsely glandular ovary, yellowish green styles c. 4.5 mm long, each divided into many branching filiform segments with the apex of each segment further divided into 3 short segments, and yellowish-green stigmas terminating the ultimate segments. In contrast, *D. neesii* has a dark maroon or white tuber, stems 15–40 cm tall, pink petals, glabrous ovary, white styles c. 2 mm long, each divided into a number of branching terete segments, and reddish-pink stigmas forming a slightly swollen emarginate projection at the apex of each segment.

The *Drosera subhirtella* complex

Each of the species belonging to the *Drosera subhirtella* complex can be identified by its unique seed morphology. There are also significant differences within the group in the morphology of their vegetative and floral organs. Many of the distinguishing characters of the four species are given in Table 1.

Table 1. Morphological comparison of the species in the *D. subhirtella* complex.

	<i>D. intricata</i>	<i>D. moorei</i>	<i>D. subhirtella</i>	<i>D. zigzagia</i>
habit	lax	lax	lax	erect
leaves	mostly in 3's	mostly in 3's	mostly in 3's	solitary
lamina	mostly broadly obovate	mostly reniform	mostly orbicular	mostly broadly obovate
stems, petioles & pedicels	glabrous	glabrous	glandular	glabrous
bracteoles	laciniate, glabrous	laciniate in distal half, glabrous	laciniate, glandular	laciniate at apex, glabrous
sepals	elliptic, glandular	elliptic, glabrous	narrowly ovate, glandular	obovate glabrous
petal length	8–11.5 mm	6.5–10 mm	8.5–12 mm	5–6 mm
style length	3–3.5 mm	2–3 mm	3–3.5 mm	1–1.2 mm
seed length	1.5–2.2 mm	1.2–1.5 mm	2.5–3.5 mm	1.1–1.3 mm

Drosera intricata Planchon (Planchon 1848: 293). *Type*: south-west Western Australia, *J. Drummond* 2nd coll. 7, in herb. Hook. (*holo*: K).

Drosera menziesii var. *flavescens* Benth. (Bentham 1864: 468). *Type*: *p.p.* as to south-west Western Australia, *J. Drummond* 2nd coll. 7, in herb. Hook. (*syn*: K).

A golden green glabrous *perennial herb*, lax, often tangled when found in colonies, scrambling or climbing, the stem of flowering specimens usually 25–40 cm long, with tuber-producing stolons (dropper roots) produced from the leaf axils. *Tuber* white, globose, covered in black papery sheaths c. 5 mm diam.; vertical stolon below ground, 1.5–3 cm long. *Leaves* in alternate groups of 3 (sometimes with additional lateral pairs present), the central leaf with a petiole 10–30 mm long, the lateral leaves with a petiole 5–12 mm long. *Lamina* peltate, broadly obovate on most leaves but reniform and orbicular with truncate apex on others, 1–2.5 mm long, 1.2–2 mm wide; marginal insect-catching glands 1.5–3.5 mm long; abaxial surface glabrous. *Inflorescence* paniculate, terminal, 3–12-flowered; pedicels 7–18 mm long, glabrous; bracteoles golden green, black-dotted, lanceolate, 2.5–3 mm long, margins and apex irregularly laciniate, glabrous. *Sepals* golden green, finely black-dotted, elliptic,

3.5–5 mm long, 1.5–3 mm wide, margins and apex irregularly laciniate, lacinae c. 1.5 mm long and tipped with a minute apical gland; abaxial surface covered with stalked glands c. 0.3 mm long. *Petals* yellow, obovate, 8–11.5 mm long, 5.5–7 mm wide, apex slightly crenate. *Stamens* 5–7 mm long, filaments white, anthers and pollen yellow. *Ovary* green, ellipsoid, 1.5–1.6 mm long, 1–1.5 mm diam. at anthesis; carpels 3, glabrous. *Styles* 3, golden green, 3–3.5 mm long, each branched into many filiform segments, each segment divided near apex into a number of short segments, each terminated by a simple stigma. Capsule obovoid, c. 3 mm long, c. 4 mm diam. *Seeds* black, nail-like, 1.5–2.2 mm long; base obovoid, concave, 0.5–0.6 mm diam.; shaft c. 0.25 mm diam. tapering towards the apex, slightly falcate, longitudinally winged on one side and apex, c. 0.15 mm wide. (Figure 1)

Other specimens examined. WESTERN AUSTRALIA: Wamballup Nature Reserve, 23 km NW of Mount Barker, 22 Sep. 1993, A.R. Annels 3773 (PERTH); Near Katanning, 56 km S of Wagin, 27 Sep. 1933, W.E. Blackall 3121 (PERTH); c. 9 miles [14.4 km] E of Cranbrook along road to Borden, 10 Sep. 1974, L. DeBuhr 3560 (PERTH); c. 5 miles [8 km] E of Kendenup along the Red Gum Pass Rd, 10 Sep. 1974, L. DeBuhr 3588 (PERTH); c. 21 miles [33.6 km] E of Jerramungup along road to Ravensthorpe, 21 Sep. 1974, L. DeBuhr 3714 (PERTH); New Norcia road, 11 Sep. 1980, H. Demarz 8185 (PERTH); Kendenup, c. 60 km N of Albany, 18 Oct. 1957, R. Erickson s.n. (PERTH); c. 8.5 miles [13.6 km] E of Jerramungup, 11 Oct. 1973, R. Garraty 254 (PERTH); Near Creek W of Fisher Rd, 33° 50' S, 117° 10' E, 10 Oct. 1994, C. Lewis 83 (PERTH); Fish Road Reserve, Busselton, 16 Sep. 1994, A. Lowrie 1067 (PERTH, MEL); North East Rd near Mount Cooke, 2 Oct. 1997, A. Lowrie 1896 (PERTH, MEL); Serpentine River Crossing on Albany Highway, 2 Oct. 1997, A. Lowrie 1898 (PERTH, MEL); Beaufort River Reserve, 2 Oct. 1997, A. Lowrie 1904 (PERTH, MEL); junction of Great Southern Highway and Newton Rd, Cranbrook, 19 Oct. 1997, A. Lowrie 1938 (PERTH, MEL); Bowelling, 28 Sep. 1954, A.R. Main s.n. (PERTH); Harvey, 26 Sep. 1950, R.D. Royce 3342 (PERTH).

Distribution. Known from Busselton, Cranbrook, Jerramungup, Bowelling, Katanning, Mt Cooke area and New Norcia.

Habitat. *Drosera intricata* grows in grey or brown clayey sand in the beds of fast-flowing seasonal creeks, floodways, watersheds, and in shrubland with paperbarks (*Melaleuca* sp.) on the margins of winter-wet watercourses and swamps.

Flowering period. September to October.

Conservation status. *Drosera intricata* is a common species and currently not under threat.

Etymology. *Drosera intricata* is named from the Latin *intricatus* – entangled, in reference to the tangled life form of the species.

Typification. Bentham's type citation under *Drosera menziesii* var. *flavescens* consists of three collections. The Drummond collection is also the holotype of *D. intricata*. The Hill River, and Vasse River collections of Oldfield are of *D. subhirtella*.

Affinities. At a casual glance *Drosera intricata* can be mistaken for its close relative *D. subhirtella*. However, *D. subhirtella* is clearly distinguished by its yellow tuber, more widespread glandular indumentum, mostly orbicular leaves, and longer seeds with a distinctive shape. Planchon (1848) clearly described the two species in the same publication. Bentham (1864) reduced *D. intricata* to a

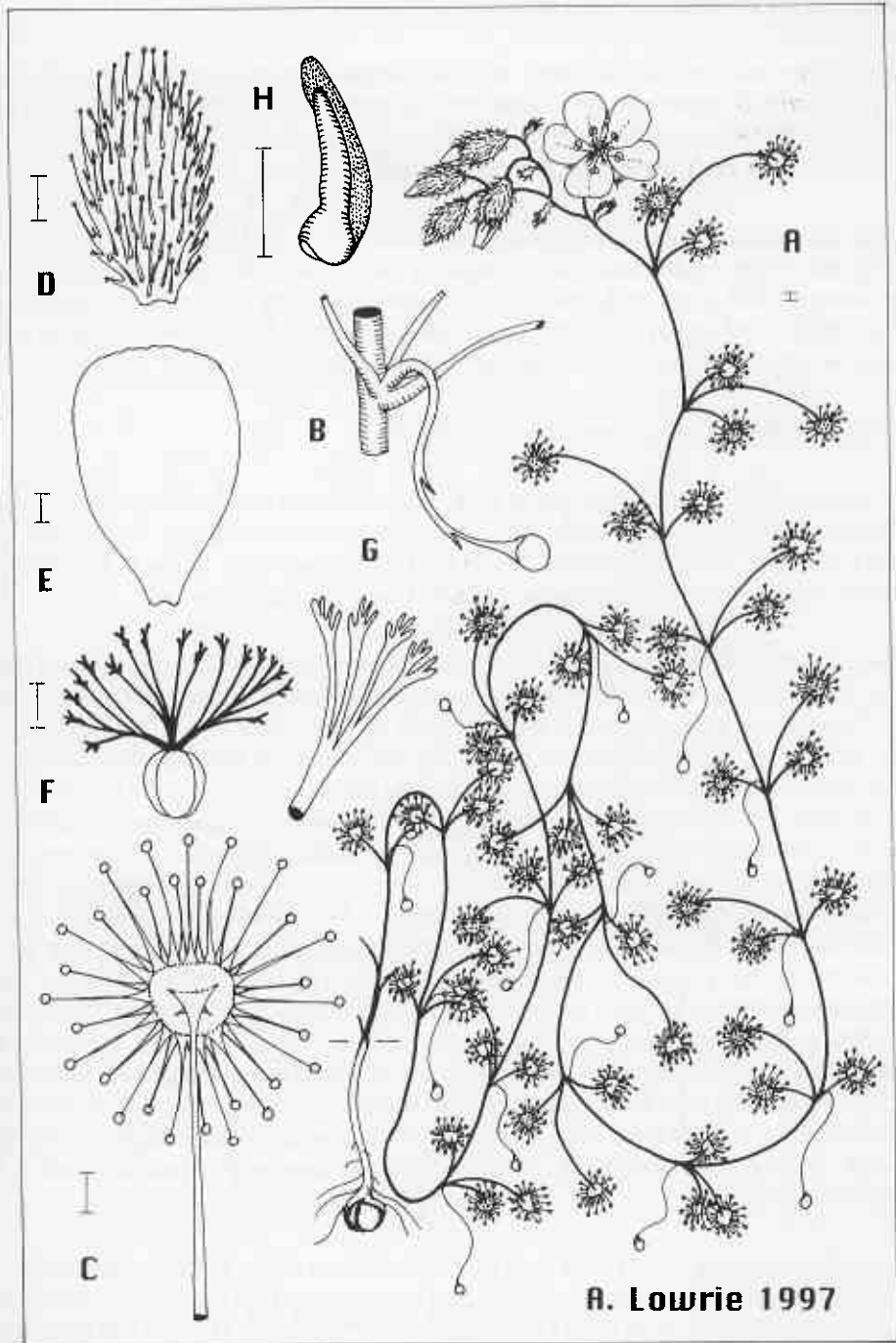


Figure 1. *Drosera intricata*. A - habit of plant; B - stem and leaf petioles section with dropper root and developing tuber; C - leaf; D - sepal, abaxial surface; E - petal; F - ovary and styles; G - style, enlarged; H - seed. Scale bars = 1 mm. Drawn from A. Lowrie 1896.

variety of *D. menziesii* R. Br. and *D. subhirtella* to a variety of *D. macrantha* Endl. Diels (1906) reinstated *D. subhirtella* but reduced *D. intricata* to a synonym of it. All subsequent authors have followed Diels, but *D. intricata* is now reinstated.

Drosera intricata (A. Lowrie 1904) was discovered growing side by side and flowering simultaneously with *D. subhirtella* (A. Lowrie 1905) at Beaufort River. No intermediates or apparent hybrids between the two taxa were found at the location, so they appear to be genetically isolated. This observation is further evidence that the two taxa are distinct species.

Notes. Like other climbing tuberous members of the genus, *Drosera intricata* plants use the marginal retentive glands of their lamina in two ways. Primarily these glands are used for the capture of insect prey but, when needed, a few of them become cemented to nearby vegetation for support. Glands providing support occur mainly on the longer central leaves in each group of three. Most of the glands of the attached lamina remain free and continue to capture and process prey.

Drosera moorei* (Diels) Lowrie, *comb. nov.

Drosera subhirtella var. *moorei* Diels (Diels 1906: 119). – *Drosera subhirtella* subsp. *moorei* (Diels) N.G. Marchant (Marchant *et al.* 1982: 385). *Type:* Nine-mile Rocks near Coolgardie, Western Australian Goldfields, Western Australia, September 1895, *S. Moore s.n. (lecto: K, here designated);* Bullabulling, Western Australia, September 1895, *S. Moore s.n. (paralecto: K).*

A tuberous rather fine glabrous *perennial herb*, lax, scrambling or climbing, the stem of flowering specimens 12–35 cm long, sometimes with tuber-producing stolons (dropper roots) produced from the leaf axils. *Tuber* white, globose, covered in black papery sheaths *c.* 8 mm diam.; vertical stolon below ground, *c.* 15 cm long. *Leaves* in alternate groups of 3, the central leaf with a petiole 10–25 mm long, the lateral leaves with a petiole 2–10 mm long. *Lamina* peltate, almost reniform in outline on most leaves but broadly obovate on others, 1–2 mm long, 1.5–2.5 mm wide; marginal insect-catching glands 1–2.2 mm long; abaxial surface glabrous. *Inflorescence* paniculate, terminal, 2–10-flowered; pedicels 4–15 mm long, glabrous; bracteoles linear, 2–3.2 mm long, margins entire, apex irregularly lacinate, glabrous. *Sepals* golden green, finely black-dotted, ovate, 3.5–5 mm long, 1.5–2.5 mm wide, margins entire in the lower third, remainder and apex irregularly lacinate, laciniae 0.5–2 mm long and tipped with a minute apical gland; abaxial surface glabrous. *Petals* yellow, broadly obovate, 6.5–10 mm long, 4–8 mm wide, apex irregularly crenate. *Stamens* 3.5–4.5 mm long, filaments white, anthers yellow, pollen pale yellow. *Ovary* golden green, globose, 1.5–2.5 mm diam. at anthesis; carpels 3, glabrous. *Styles* 3, golden green, 2–3 mm long, each branched into many filiform segments, each segment divided near the apex into a number of short segments, each terminated by a simple stigma. *Capsule* obovoid, *c.* 2.2 mm long, *c.* 2.2 mm diam. *Seeds* black, nail-like, 1.2–1.5 mm long; base subspherical, concave, 0.3–0.4 mm diam.; shaft 0.15–0.2 mm diam.; apex a rounded, flattened wing, 0.2–0.3 mm long. (Figure 2)

Other specimens examined. WESTERN AUSTRALIA: 65.2 km NE of Muckinwobert Rock, 7 Sep. 1983, *M.A. Burgman* 2218 & *S. McNee* (PERTH); Gnarlbine Rock, 28 km S of Coolgardie, 15 Sep. 1989, *B.J. Conn* 3145 & *J.A. Scott* (PERTH, MEL, NSW); *c.* 72 miles [115.2 km] E of Southern Cross along Great Eastern Highway, 17 Aug. 1974, *L. DeBuhr* 3215 (PERTH); near Howick Hill, *c.* 100 km E of Esperance, 23 Sep. 1968, *H. Eichler* 19932 (PERTH); Victoria Rocks, SW of Coolgardie, 22 Sep. 1962, *A.S. George* 4187 (PERTH); between 297 [475.2 km] – 298 [476.8 km] mile pegs Great Eastern Highway, 15 Sep. 1964, *N.G. Marchant* 64227 (PERTH); *c.* 100 km E of Southern Cross, 16 Sep. 1983, *A. Lowrie s.n.* (PERTH); Scadden road near Greens Road Nature Reserve, 11 Oct. 1997, *D.E. Murfet*

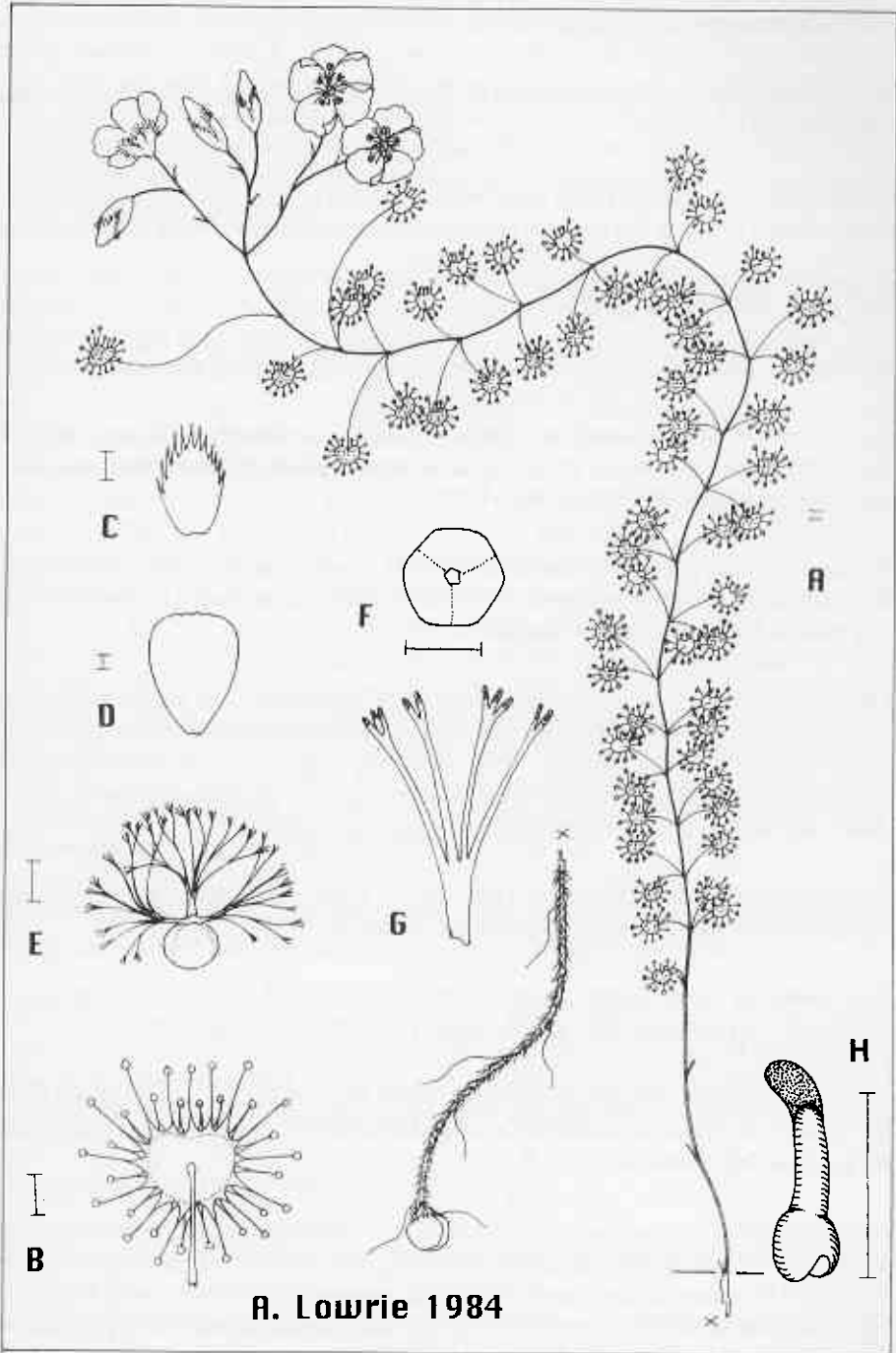


Figure 2. *Drosera moorei*. A - habit of plant; B - leaf; C - sepal, abaxial surface; D - petal; E - ovary and styles; F - ovary, base view; G - style, enlarged; H - seed. Scale bars = 1 mm. Drawn from E of Southern Cross, A. Lowrie s.n., 16 Sep. 1983.

2925 (PERTH); 3.8 km NW of Seal Creek, Cape Arid, 14 Oct. 1997, *D.E. Murfet* 2949 (PERTH); 2.6 km NW of Seal Creek, Cape Arid, 14 Oct. 1997, *D.E. Murfet* 2952 (PERTH); Musson Soak, c. 110 km NNW of Coolgardie, 22 Aug. 1981, *K. Newbey* 8675 (PERTH); Nine Mile Rock, c. 93 km ENE of Southern Cross, 16 Sep. 1981, *K. Newbey* 8919A (PERTH).

Distribution. Known from Southern Cross east to Musson Soak (north-north-west of Coolgardie) and south to Scadden and Cape Arid.

Habitat. *Drosera moorei* grows in sandy loam on the aprons of granite outcrops where the water runoff is greatest. It also grows in the shade of small shrubs a short distance from granite outcrops.

Flowering period. September-October.

Conservation status. *Drosera moorei* is a common species and currently not under threat.

Etymology. *Drosera moorei* is named in honour of Spencer Le Marchant Moore (1850–1931), a scientific worker for the Department of Botany at the British Museum, who collected in the eastern Goldfields of Western Australia during 1894–1896.

Affinities. *Drosera moorei* is easily distinguished from *D. intricata* and *D. subhirtella* by its glabrous sepals. *D. zigzagia* also has glabrous sepals but is easily distinguished from *D. moorei* by its short, erect zigzag growth habit and solitary alternate leaves.

Notes. Like *Drosera intricata*, *D. moorei* is capable of additional tuber production by means of adventitious stolons known as dropper roots, which are commonly produced from the axils of the leaves on specimens found in very wet habitats. These additional tubers increase the number of plants in the colony the following season. *D. radicans* Marchant regularly produces additional tubers in the same manner, and this has also been observed in *D. gigantea* Lindley.

Drosera subhirtella Planchon (Planchon 1848: 292). *Type:* Swan River [Colony], south-west Western Australia, *J. Drummond s.n.*, in herb. Hook. (*holo:* K).

Drosera macrantha var. *minor* Benth. (Bentham 1864: 468). *Type:* Swan River [Colony], south-west Western Australia, *J. Drummond s.n.*, in herb. Hook. (*lecto:* K, here designated).

Drosera menziesii var. *flavescens* Benth. (Bentham 1864: 468). *Type:* *p.p.* as to Oldfield collections: Hill River, Western Australia, *A. Oldfield s.n.* (*syn:* MEL 96906); Vasse River, Western Australia, *A. Oldfield s.n.* (*syn:* MEL 96904).

A tuberous glandular *perennial herb*, lax, scrambling or climbing, the stem of flowering specimens 20–40 cm long. *Tuber* yellow, globose, covered in black papery sheaths c. 8 mm diam.; vertical stolon below ground 10–15 cm long. *Leaves* mostly in alternate groups of 3 (sometimes with additional lateral pairs present), the central leaf with a petiole 12–40 mm long, the lateral leaves with a petiole 4–5 mm long. *Lamina* peltate, orbicular on most leaves but broadly obovate on others, 2–3 mm diam.; marginal insect-catching glands 1.5–3.5 mm long; abaxial surface glandular. *Inflorescence* paniculate, terminal, 3–25-flowered; pedicels 4–15 mm long, glandular; bracteoles linear-lanceolate, 2–3.5 mm long, margins entire, apex irregularly laciniate, glandular. *Sepals* green, black-dotted, narrowly ovate, 3.5–6 mm long, 1.5–3 mm wide, margins fringed with subulate stalked glands, 0.2–0.3 mm long, apex

irregularly lacinate, laciniae 0.3–0.5 mm long and tipped with a minute apical gland; abaxial surface covered with subulate stalked glands. *Petals* yellow, broadly obovate, 8.5–12 mm long, 6–8 mm wide, apex truncate, irregularly crenate. *Stamens* 5.5–6 mm long, filaments golden green, anthers pale yellow, pollen yellow. *Ovary* green, obovoid, 1.3–2 mm long, 1.3–2 mm diam. at anthesis; carpels 3, sparsely glandular. *Styles* 3, golden green, 3–3.5 mm long, each branched into many filiform segments, each segment divided near apex into a number of short, slightly swollen and flattened segments, each terminated by an emarginate stigma. Capsule obovoid, 3–5.5 mm long, 4.5–6 mm diam. *Seeds* black, tack-like, straight, 2.5–3.5 mm long; base conic with a rounded summit, concave, 0.6–0.7 mm diam.; shaft terete 0.15–0.2 mm diam.; apex flat and pointed, falcate, resembling a knife blade, 0.7–1 mm long. (Figure 3)

Other specimens examined. WESTERN AUSTRALIA: 5 miles [8 km] E of Piawaning, 9 Sep. 1959, T.E.H. Aplin s.n. (PERTH); Carnamah, between Midland and Walkaway, 23 Aug. 1940, W.E. Blackall 4352 (PERTH); 1 km W of Great Northern Highway along Hay Flat Rd, 18 Sep. 1983, R.J. Cranfield 4216 (PERTH); along Hill River road c. 13 miles [20.8 km] W of Junction with Eneabba–Badgingarra road, 30 Aug. 1974, L. DeBuhr 3439 (PERTH); 2 km S of Brookton, 11 Oct. 1983, H. Demarz 9724 (PERTH); Bolgart, 100 km N of Toodyay, 7 Sep. 1963, R. Erickson s.n. (PERTH); Tammin, 8 Sep. 1942, C.A. Gardner 6436 (PERTH); North Bunqueen, Aug. 1953, C.A. Gardner 12141 (PERTH); 8.2 miles [13.2 km] E of Newdegate, 27 Sep. 1975, J.W. Green 4468 (PERTH); E of Northam, 16 Sep. 1983, A. Lowrie s.n. (PERTH); Richardson Rd, E of Miling, 6 Sep. 1997, A. Lowrie 1835 (PERTH, MEL); W of Agriculture Dept, Wongan Hills, 13 Sep. 1997, A. Lowrie 1859 (PERTH, MEL); Beaufort River Reserve, 2 Oct. 1997, A. Lowrie 1905 (PERTH, MEL); on road to Woodanilling c. 17 km E of Albany Highway, 2 Oct. 1997, A. Lowrie 1907 (PERTH, MEL); Woorkakanin Rock, 2 miles [3.2 km] E of Kondinin, 18 Sep. 1972, N.G. Marchant 72/648 (PERTH); 19 km due E Yornaning Siding, 12 Sep. 1975, B.G. Muir 5/9 (5.1) (PERTH); 10 km W of Varley, 3 Oct. 1997, D.E. Murfet 2849 (PERTH, MEL); Heathland Nature Reserve [E of Lake Grace], 5 Oct. 1997, D.E. Murfet 2872 (PERTH, MEL); Holland Tank [SE of Newdegate], 5 Oct. 1997, D.E. Murfet 2876 (PERTH, MEL); North Rd [E of Mt Madden], 6 Oct. 1997, D.E. Murfet 2889 (PERTH, MEL); Wongan Hills, 13 Sep. 1947, R.D. Royce 2179 (PERTH); Tutanning Reserve 17 miles [27.2 km] E of Pingelly, 6 Oct. 1963, R.D. Royce 7941 (PERTH); 2 km SW of Manmanning, 7 Sep. 1978, B. & M. Smith s.n. (PERTH).

Distribution. Known from Northam to Merredin, south to Beaufort River, Katanning, Newdegate and Lake King, north to Hill River region, Wongan Hills, Carnamah and Miling.

Habitat. *Drosera subhirtella* grows in white sand heath with *Banksia* species; yellow sand on heathland; quartzite sandplains; white lateritic sand or mallee sandplains; on heathland in ironstone gravels or light brown loam with ironstone with *Allocasuarina* species and *Leptospermum* species woodland; and in loam soils on the aprons of granite outcrops where the water run-off is greatest.

Flowering period. August–October.

Conservation status. *Drosera subhirtella* is a common species and currently not under threat.

Etymology. *Drosera subhirtella* is named from the Latin *sub* – somewhat and *hirtellus* – hairy, but less than hirsute in reference to its all-over glandular indumentum.

Affinities. *D. subhirtella* is easily distinguished from all other members of the *subhirtella* complex by its all-over glandular indumentum.

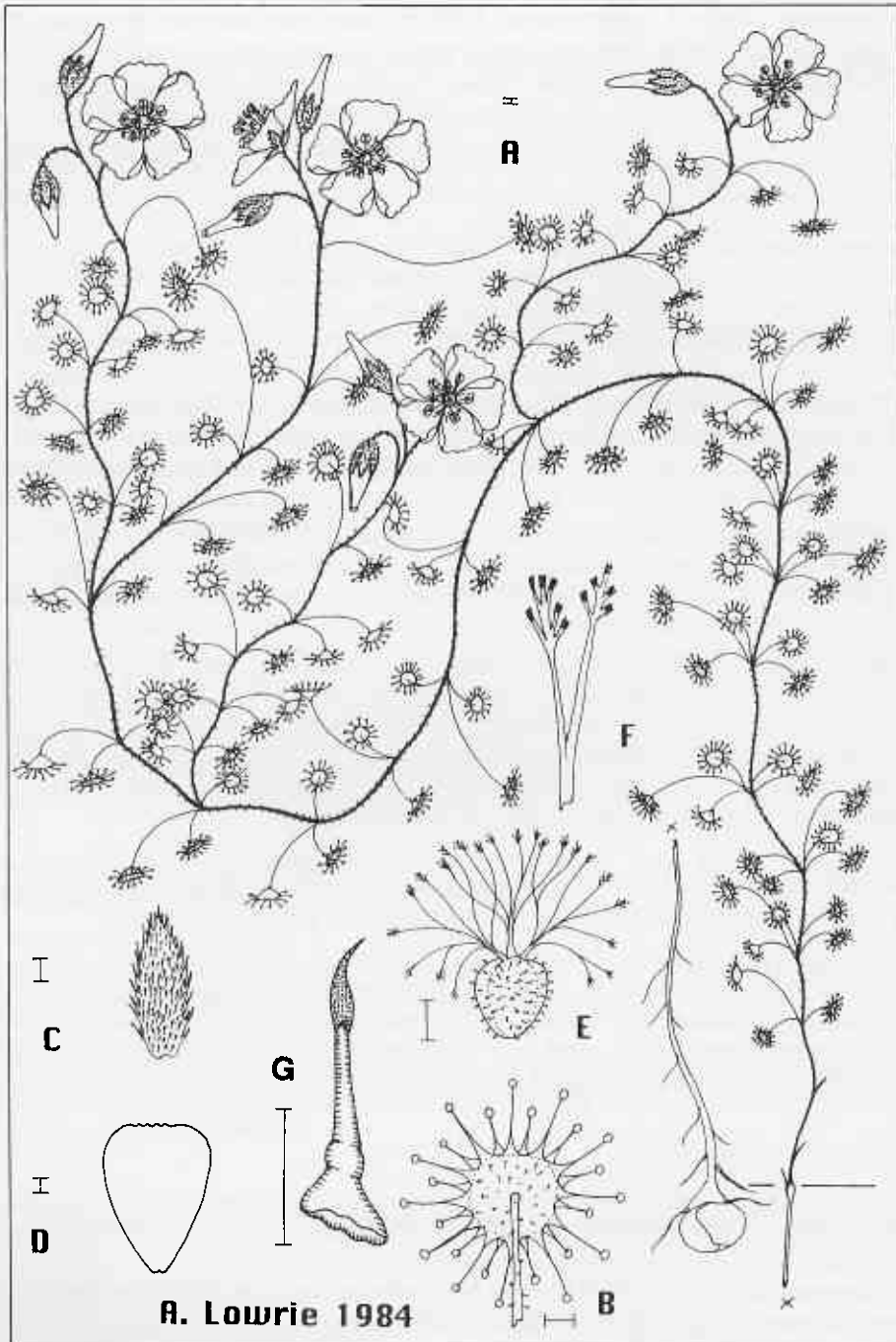


Figure 3. *Drosera subhirtella*. A - habit of plant; B - leaf; C - sepal, abaxial surface; D - petal; E - ovary and styles; F - style, enlarged; G - seed. Scale bars = 1 mm. Drawn from E of Northam, A. Lowrie s.n., 16 Sep. 1983.

Notes. *Drosera subhirtella* is a widespread species and is often found growing with another tuberous sundew, *Drosera macrantha*, which has white or pink flowers.

Drosera zigzagia* Lowrie, *sp. nov.

Drosera moorei affinis sed planta 5–7 cm alta, caule erecto flexuoso, foliis solitariis alternatis.

Typus: Lake Seabrook, c. 40 km north-east of Southern Cross, Western Australia, [30° 56' 30" S, 119° 35' 30" E], 21 August 1979, K. Newbey 5750 (*holo:* PERTH 0066960; *iso:* MEL).

A tuberous glabrous *perennial herb*, erect, the stem of flowering specimens 5–7 cm long. *Tuber* white, globose, covered in black papery sheaths c. 5 mm diam.; vertical stolon below ground, 5–10 cm long. *Leaves* solitary, alternate, arising semi-erect from each bend along a zigzag stem. *Lamina* peltate, broadly obovate on most leaves but almost crescent-shaped on others, 1.5–2 mm diam.; marginal insect-catching glands 0.8–2.5 mm long; abaxial surface glabrous. *Inflorescence* paniculate, terminal, 4–9-flowered; pedicels 2–8 mm long, glabrous; bracteoles golden green, black-dotted, lanceolate, 1.5–2.5 mm long, margins entire, apex irregularly laciniate, glabrous. *Sepals* golden green, finely black-dotted, obovate, 3.5–4 mm long, 1.5–2 mm wide, margins entire, apex irregularly laciniate, lacinae 0.5–1.5 mm long and tipped with a minute apical gland; abaxial surface glabrous. *Petals* yellow, obovate, 5–6 mm long, 3.5–4 mm wide, apex entire. *Stamens* 1.7–2.2 mm long, filaments and anthers golden green, pollen yellow. *Ovary* golden green, subglobose, 1–1.2 mm diam. at anthesis; carpels 3, glabrous. *Styles* 3, golden green, 1–1.2 mm long, each branched into many filiform segments, each segment divided into a number of short segments, each terminated by a simple stigma. Capsule obovoid, 1.8–2 mm long, 1.8–2 mm diam. *Seeds* black, nail-like, slightly falcate, 1.1–1.3 mm long; base longitudinally 8-shaped, concave, 0.2–0.25 mm diam.; shaft terete, 0.1–0.15 mm diam.; apex flat, rounded, c. 0.1 mm long. (Figure 4)

Other specimens examined. WESTERN AUSTRALIA: Russmussen Rd, Lake Altham, 20 Oct. 1993, A. Lowrie 824 (PERTH, MEL); Russmussen Rd, Lake Altham, 30 July 1994, A. Lowrie 1062 (PERTH, MEL); E shore of Lake Hurlstone, 8 Sep. 1998, A. Lowrie 2096 (PERTH, MEL); South Kuender Nature Reserve, 5 Oct. 1997, D.E. Murfet 2868 (PERTH, MEL).

Distribution. Known from Lake Altham north of Pingrup and south of Kuender, c. 40 km to the north-north-east, Lake Hurlstone c. 100 km further north-east and at Lake Seabrook 190 km further north.

Habitat. *Drosera zigzagia* occurs in salt-free light brown (white on the surface) loamy sand on the slightly higher shore margins above the flood level of lakes and salt pans. It is often associated with *Drosera salina* N.G. Marchant & Lowrie, *Stylidium insensitivum* Carlquist, *S. pulviniforme* Kenneally & Lowrie, *Levenhookia leptantha* Benth. and *Frankenia* sp., growing near the Samphire zone as well as near and under *Melaleuca* shrubland.

Flowering period. August–September.

Conservation status. *Drosera zigzagia* is a common species at its known locations and is currently not under threat.

Etymology. The Latinized specific epithet—*zigzagia*, is derived from the name for the flexuose manner of the plant's stem which is called "zigzag" in French and English.

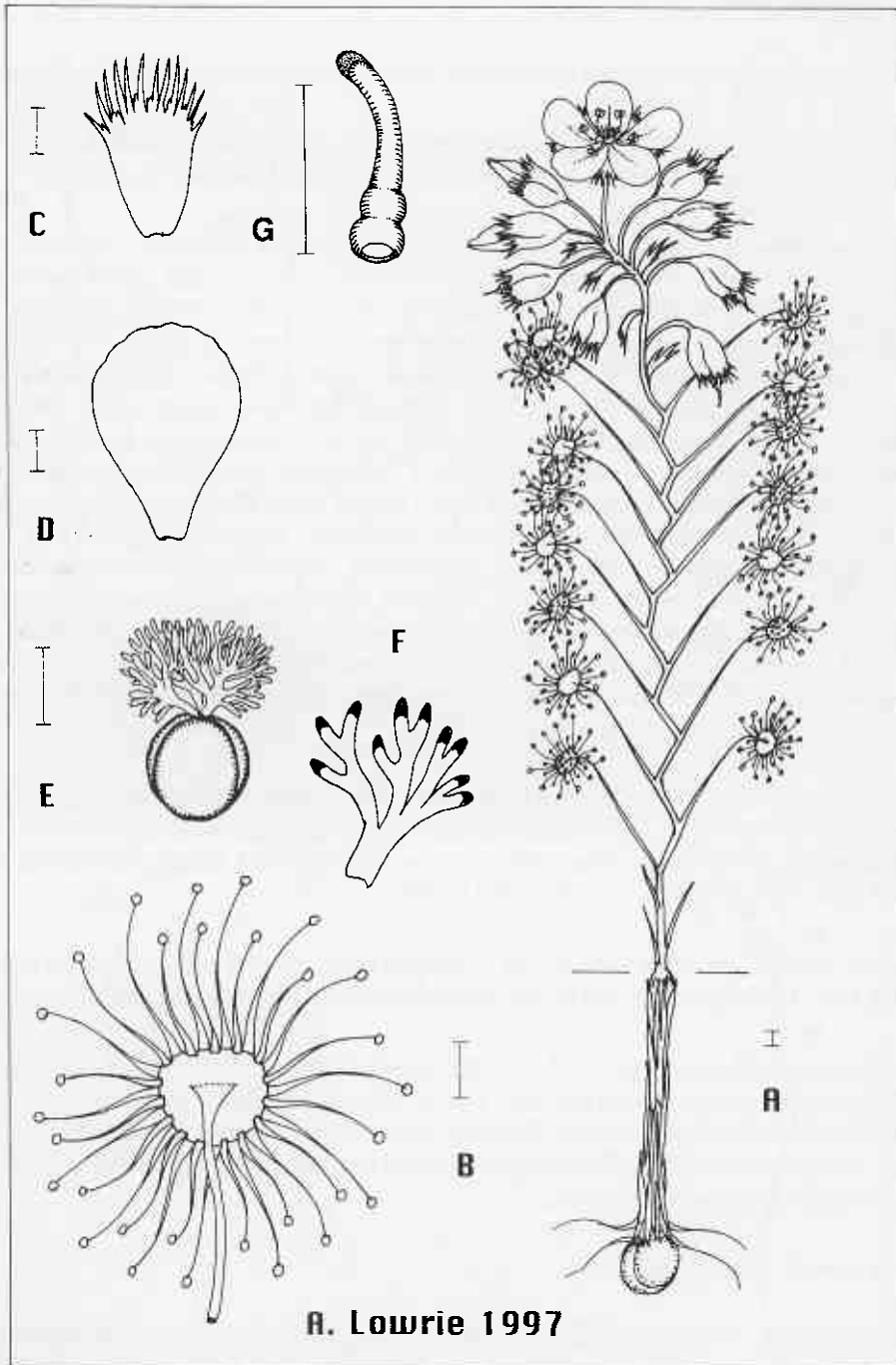


Figure 4. *Drosera zigzagia*. A – habit of plant; B – leaf; C – sepal, abaxial surface; D – petal; E – ovary and styles; F – style, enlarged; G – seed. Scale bars = 1 mm. Drawn from A. Lowrie 824.

Affinities. *Drosera zigzagia* and its closest relative *D. moorei* are glabrous plants in all their parts. *D. zigzagia* has a short and erect zigzagged stem with solitary alternate leaves, whereas *D. moorei* has a lax, scrambling, leaning and/or climbing growth habit with alternate leaves in groups of 3.

Notes. *Drosera zigzagia* is known only from a few widely scattered locations. It has been found growing in association either with *D. salina* or *Stylidium pulviniforme*, both of which are restricted to the margins of salt lakes. These two taxa are currently known from a number of other locations situated within the known growing range of *D. zigzagia*. It is therefore possible that *D. zigzagia* may be found at these locations when the shoreline habitats of these salt lake systems are further botanically explored.

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