

Appendix 1. Details of 243 herbarium specimens used for the phenetic analysis in this study

Drosera andersoniana Ewart ex. Fitzg.

W.A.: Roe: Rock outcrop c. 5 km SSE of Hyden Wave Rock, 32°27'S, 118°52.8'E, 04ix1999. R. Gibson 028 [AND1-7]

Drosera auriculata Back. Ex Planch.

N.S.W.: North Coast, Seal Rocks, 32° 28'S, 152° 30'E, 07vii1979, Fox 7907001 [NSW s.n.] (in bud), no det details. "Rare herb growing on sand dune under *Angophora costata* *Eucalyptus pilularis* open forest. Burnt 6 months previously." [au1]; 100 m east of Nugra Rd, c. 3.9 km SW of the Youth Hostel at Girvan, East bank of a creek, 32° 29' 25" S, 152° 05' 43.5" E, 35 m. alt., 05x2005, R. Gibson 173 & L. Kelly. [auGIRV1-3];

North Western Slopes: Ponderosa Park, 16 km E of Nundle, 31°27' S, 151° 03' E, - m alt, 30xi1986, M. B. Williams s.n., [det J. B. Williams 1987]."Habitat: swamp on creek. Flowers. Native at location." [NE043990]. [au16];

Central Coast. Sydney, 09viii1836, J. Backhouse s.n. (K) [au4]; Port Jackson, 1802, R. Brown 4847 (BM237) [au6, au7]; Central Coast. Nepean Lookout, Blue Mountains National Park. Approximately 10 km NW of Mulgoa, c. 33° 49' 13.2" S, 150° 37' 15.6"E, 07x2002, R. Gibson 069. [au_Mulgoa1]; Sclerophyll woodland in a park at Picnic Point, c. 33° 59' 06" S, 151° 00' 43.2" E, 30 m. alt., 27ix1998, R. Gibson 012 & R. Riles. [au PP]

Central Tablelands. Govett's Leap, Blackheath; 33° 38' S, 150° 17' E, no altitude. B. G. Briggs s.n. [UNE021787a]. No det. "Soil: sandstone. Community- Bare damp sandstone rock. Notes: Erect herb with pink flowers" [au20, au21, au22]; Blackheath, western side of the plateau on the path to Neat's Glen; c. 33 37' 38" S, 150 16' 33.12" E, 1019m alt., 15xi1998, R. Gibson 022. [au8]; Midslope of Rockley Mountain, 15 km South East of Bathurst, 33° 33' 52.26" S, 149° 32' 149.534" S, 885 m. alt., 14viii2004, R. Gibson 139, K. Hirsch & R. Sullivan.[au_Rockley1]

SOUTH AUSTRALIA: Southern Lofty, Cape Jervis to Victor Harbour road, 35° 34' 25" S, 138° 16' 27" E, 15 m altitude, 29ix1993, J. T. Hunter 1633 & V. H. Hunter [UNE059920a]. Det: J. T. Hunter, 1993."Habitat: on sandy clay on a gentle south slope in dry sclerophyll forest. Flowers. Native at location. Monopodial erect carnivorous herb in damp area of forest." [au17]

Mt. Lofty. Near the summit of Mount George in the Adelaide Hills, west of Hahndorf, 34° 59' 38.76" S, 138° 45' 12.72" E, alt. 498 m. alt., 25ix2003, R. Gibson 109 & M. Gibson. [auMG1-3]

VICTORIA: Melbourne, F. von Mueller s.n. (BRU) [au2]; 7 km North of Dunkeld in road reserve on a low sandstone hill, 37° 37' 31.62" S, 142° 19' 49.86" E, 303 m alt. 23ix2003. R. Gibson 106. [au15, au23, au24, au25]

TAS.: West Coast Region. c. 1 km E of Ocean Beach, 41° 55' S, 145° 20' E, no alt, 01xii1981, A. E. Orchard 5565. "Shaded bank alongside track through bracken heathland, locally abundant." [au26];

NEW ZEALAND: no loc., no date, Colenso s.n. (K) [au3]; Waikumete Cemetary, Auckland, North Island, 18x2001, B. Salmon s.n. [au9-14]; Waitakere Ranges. 1942. E. T. Giles s.n. [UNE021788a] [au18, au19]

AUSTRALIA: "*D. sieberiana*", no loc., no date, Sieber 176 (K) [au5]

***Drosera bicolor* A. Lowrie & S. Carlquist**

W.A.: Eyre: Upper headwaters of the Phillips River, c. 20 km W of the Merredin - Ravensthorpe Road, 33° 20' 40.92" S, 119° 49' 27.21" E, 237 m alt., 05ix1999, *R. Gibson* 029. [BIC1-5].

***Drosera binata* Labill.**

N.S.W. 'dichotoma', ex. Hort., 28xii2005, *R. Gibson* 175 & *K. Hirsch*. [binD]; 'multifida', Ex hort., 12i2006, *R. Gibson* 177 & *K. Hirsch*. [binM]

W.A.: Darling. 'T-form', peat swamp near the Shannon River, c. 20 km W of Walpole, 34°49'57"S, 116°23'06"E, 23 m. alt., 21x2003, *P. Mann s.n* & *R. Gibson*. [binT1-3]

***Drosera cistiflora* L.**

Red-petalled plant grown in cultivation, originally from South Africa. 28viii2005 *K. Hirsch s.n.* & *M. Whitten*. [CIST]

***Drosera 'foliosa'* Hook.**

S.A. Eyre Peninsula: 18 km North West of Tumby Bay; road reserve of a dirt road, 34° 17' 16.32" S, 136° 00' 21.12" E, 147 m. alt., 27ix2003, *R. Gibson* 120. SEM study of a sample from this collection. [fol3, fol4, fol5].

Mt. Lofty. Midslope of Mount George in the Adelaide Hills, west of Hahndorf, 34° 59' 58.08" S, 138° 45' 16.62" E, alt. 443 m. alt., 25ix2003, *R. Gibson* 110 & *M. Gibson*. [folMG1-2]

VICTORIA. 70 km East of Hamilton on the south side of Highway B180, 37° 40' 25.32"S, 142° 40' 36.18", 240 m. alt., 23ix2003, *R. Gibson* 102. [fol Ham1-3].

TAS. George Town, either side of the Tamnar River, 07xii1842, *R.C.Gunn* 1027 (K) [fol1]; Formosa, 07xii1842, *R.C Gunn* 1027(BM58) [fol2]; George Town, 16ix1843. *R.C.Gunn* 1037 [NSW146501]. [fol6, fol7, fol8]

***Drosera gigantea* Lindl. subsp. *gigantea* A. Lowrie**

W.A.: Avon. Salty clay wetland near Cranbrook, 34°17'19.08"S, 117°30'39.6"E, 273 m. alt., 25x2003, *P. Mann s.n.* & *R. Gibson*. [GIG2-3]
Ex hort. 19ix2005, *R. Gibson* 165 & *K. Hirsch*. [GIG1]

***Drosera graniticola* N. Marchant**

Ex. Hort., 21viii2005, *R. Gibson* 157 & *K. Hirsch*. [GRAN1-2]

***Drosera peltata* Thunb. 'gracilis' Hook.**

N.S.W.: Southern Tablelands. Beside a small creek in the road reserve, Shannons Flat, c. 35° 55' S, c. 148° 57' E, 23iJan 1999, *D. J. Mallison* 548, *R. Rowe* & *R. Gibson*. [gra_SF1-3]; Eucumbene River valley c. 3 km downstream of Kiandra, 35°

53' 47.76" S, 148°30' 29.88" E, 1371 m. alt., 03in2004, *R. Gibson* 122.[gra K1 1-3]; Kiandra - Tumut road, c. 2 km West of the road to the Selwyn ski fields, 35° 49' 5.88" S, 148° 29' 43.80" E, 1371 m. alt., 03i2004, *R. Gibson* 123. [graK2 1-3];

TAS.: Formosa, 04xi1843, *R. C. Gunn* 443 (K) [gra3]; Hampshire Hills, 08xii1837, *R. C. Gunn* 784 (K) [gra4]; Lake Arthur, 18ii1843, *R. C. Gunn* 784 (BM58) [gra5]; Lake St. Clair, 07i1841. *R. C. Gunn* 784 [NSW146503] [gra6];

***Drosera insolita* Taton**

CHINA: Kwang Si Prov., iv1911, *Homble* 169 (BR910) [INS]

Drosera lobbiana

INDIA: Nulgherry Hill, *Wight 938* (K) [lob1]

BURMA: Kola Mountains, *Lobb 354* (K) [lob2, lob3]; Moulmein, no date, *Lobb 364* (BM574) [lob4].

Drosera lunata

SRI LANKA. "Ind. Orient." iii1836, *Wight 117* (47). Det as *D. peltata* Smith and also *D. lunata* Ham. [lun1, lun2, lun3]

***Drosera microphylla* Endl.**

W.A.: Eyre, Mt. Le Grande, c. 20 km E of Esperance, 33°59' 12"S, 122°07' 42"E, 33m alt., 23x2003, *P. Mann s.n.* [MIC1-3]

***Drosera peltata* Thunb.**

AUSTRALIA: N.S.W. Central Coast. "Port Jackson", 1793, *J. White s.n.* [TYPE]

AUSTRALIA: "*D. petiolaris*", no. loc., no date, *anon. 176* (BRU) [P1]

AUSTRALIA: No loc., 1770, *J. Banks and D. Solander s.n.* (BM514) [P2]

TAS.: Penquite, 09x1841, *R. C. Gunn 448* [NSW146505] [P3]

***Drosera peltata* Thunb.** 'Black Mountain, A.C.T.'

N.S.W. North Coast. Drake, 11x1911, *R. A. Cambage 2913* [NSW949]. [pMB6]; Myall Lakes National Park. Area NE of the Bombah Point Ferry, 04ix1988, *W. Greuter 20530* [NSW s.n.] - "High dense wood of *Melaleuca* and *Eucalyptus* on blackish, marshy ground. Flowers pink or white, tubercles crimson." [pBM3, pBM4, pBM5]

Northern Tablelands: "Glenroy", Ayres Rock, 30 km E Guyra, Wards Mistake Road. 30° 09' S; 151° 53' E; no alt., "sandy soil on granite in swampy areas in open pasture. buds and flowers. locally occasional herb to 30 cm tall. sun dew. Fls lime green." 04xi1998. *N. D. Miller 21*. Det: L. M. Copeland (NE) 1999. [NE070118] [pBM17]; 35 km W of Guyra, (10 km W of Wandsworth on Loxton Road), "Loxton", near dam c. 400 m on right of road past entrance. 30° 04' S, 151° 26' E, 1000 m alt., gently undulating, above dam on W slope c. 2-5 degrees. Acid volcanics. Sandy loam on granite, often saturated. Open sedge/herbland. Herb to 25 cm tall. Light green stems, leaves and pale flowers. Localised and abundant in large patch. 08xi1999. *M. B. Henderson s.n.* Det.: L. M. Copeland xii1999. [NE074723]. [pBM18, pBM19, pBM20]; 15 km W of Uralla in Crown Road Reserve, 30° 36' 51.96" S, 151° 19' 42.9" E, 896 m. alt. Growing in moist soil in grassy woodland. In fruit. 27xi2004. *R. Gibson 151*. [pB36, pBM37, pBM38]; Flaggy Range, N. of Bendemeer, Woodville. 30° 45' 30" S, 151° 11' 21" E, 985m alt. On sandy soil on adamellite rocky outcrop in heath and herbland. Flowers. Native at location. Common shrub on wetter soils. 05viii1995, *J. T. Hunter 3427*. [NE063989]. Det. J. T. Hunter 1995. [pBM24];

North Western Slopes: Near Middle Creek, Goonoowigal Nature Reserve, 10 km south of Inverell. 29° 49' S, 151° 07' E, 660m altitude; on sandy granite soil in moist areas with open heath below rocky outcrops, 30xi1992, *G. J. White s.n.* [UNE056651A]. "Buds, flowers. Native at location. Scattered common sundews to 20 cm tall." Det: -. [pBM30];

North Western Plains: Kuhners Bore, Pilliga East State Forest No. 266, 30 km south west of Narrabri. On sandy loam, more common on moister sandy sites, in "Pilliga Scrub" community. 30°30' S, 149° 31' E, 350 m altitude. 03ix1988. *P. Merrottsy s.n.* [UNE048114A]. Det: P. Merrottsy, 1988 as *D. auriculata*! "Flowers. Native at

location. Herb to 30 cm tall. Note the presence of insects on leaves. Common name: sundew". [pBM31];

Central Coast. Dry sclerophyll woodland in a park at Picnic Point, c. 33° 58' 21" S, 151° 00' 45" E, 30 m. alt., 27ix1998, *R. Gibson 011 & R. Riles*. [pBM PP]; Wallaby Swamp, 10 km south of Putty on the Putty Road, 33° 04' 45.72" S, 150° 42' 19.68" E, 308 m. alt., 03ix2005, *R. Gibson 160, K. Hirsch & M. Whitten*. [pBM_WISwmp1-3]; Lot 59 Park River Close, Mulgoa. 33° 49' S, 150° 37' E, 01ix1990, *R. Gibson 001* [NSW413172]. "Notes: Clayey sandstone. Soil: Clay loam. S-facing rectilinear slope (c. 5 degrees). Vegetation: Mosses and grasses, pasture/lawn. Mown at irregular intervals. Disturbed short-lived soak, soil saturated at times. Small deciduous geophyte - winter growing carnivorous plant, tuber forming. Leaves emerge from late March flowering from mid-August. 5 to 23 cm tall. Green basal rosettes 2-3 cm diam., 1 mm diam. Stem, red in colour with green cauline peltate lamina. Hairy sepals; green. Pink petal form." [pBM1]; Menangle Park, 34° 06' S, 150°45' S, 05x1969, *E. J. McBarron18040* (NSW). [pBM2];

Central Tablelands. Roadside seep at Cherry Tree Hill between Ilford and Lithgow, 33° 00' 50.340" S, 149° 52' 10.74" E, 1006 m. alt, 05x2002, *R. Gibson 060*. DNA sample for pilot study [pBM Ilf1, pBM Ilf2, pBM Ilf3]; c. 33° 55' S, 149°20' E. Turnoff to Abercrombie Caves on the Bathurst - Goulburn Road. "flowers white turning red on drying". 02x1960, *B. K. Ingram 311.008* [NE008498a]. [pBM21]; Midslope of Rockley Mountain, 15 km South East of Bathurst, c. 33° 33' 52.26" S, 149° 32' 58.20" E, 894 m alt, 14viii2004, *R. Gibson 138, K. Hirsch & R. Sullivan*. [pBM29];

Central Western Slopes. "hill", Rankin Springs, c. 33° 51' S, 146°16' E. 16 ix 1963. *G. J. White s.n.* [NE021809a]. [pBM22, pBM35];

South Western Plains. Western slope of Wilmatha Hill, 71 km West of Albert, 32° 34' 56.22" S, 147° 04' 19.86" E, 295 m. alt, 22vii2004, *R. Gibson 141 & K. Hirsch*. [pBM Wlmtha1-3];

Southern Tablelands. 'Walwa' near Garrundah, between Goulburn and Crookwell, c. 34° 43' 05" E, 149° 27' 04" E, 800 m alt., 17x1998. *D. Gibson 001*. [pBM9, pBM10, pBM11]; 'Walwa' near Garrundah, between Goulburn and Crookwell, c. 34° 43' 01" S, 149° 26' 24" E, 800 m alt., 17x1998. *D. Gibson 003*. [pBM12, pBM13]; 'Walwa' near Garrundah, between Goulburn and Crookwell, 34 43' 05" S, 149 26' 20" E, 800 m, alt., 30xi1998. *D. Gibson 004*. [pBM14];

North Far Western Plains. "eroded plain, small herb", Mundi Mundi, 31°50' S, 141° 04' E, viii1948, *H. A. Edwards s.n.* [NE004036a] [pBM15, pBM16].

A.C.T.: Southern Tablelands. Lower NE slopes of Mt. Tennant, Tennant District, 35° 32' S, 149° 02' E, 730 metres, in moss clump by creek, flowers white or pink, 25x1961, *P. J. Darbyshire 512* [NE021807a] duplicate from Herbarium Australiense, C.S.I.R.O. [pBM32, pBM33, pBM34].

SOUTH AUSTRALIA: Mt Lofty. vii1902. *Max Koch 857* [NSW146500]. [pBM7]

TAS. Punchbowl near Launceston. x1901. *Rev. H. M. R. Rupp 24*. [pB8]; Penquite. 09x1841. *R. C. Gunn 448/1842*. [NSW146505]. [p3, pBM39, pBM40, pBM41];

NEW ZEALAND: Kaimaumu, Far North, North Island, 18x2001, *B. Salmon s.n.* [pBM24-28]

***Drosera peltata* Thunb.** 'Isla Gorge, Qld.'

N.T.: Arnhem Land. c. 10 km SSE of Mt. Brockman, 280 m. alt., 12° 39' S, 132° 59' E, 27ii1973, *L. G. Adams 3126 & L. A. Craven* (K) [pIG1].

QLD. Wide Bay. 10 Riverpark Court, Riverview, c. 20 km S of Maryborough, in coastal sclerophyll open forest, c. 25° 43' 48" S, 152.56° E, 10 m. alt, 10iv1999, *R. Gibson 025 & B. Pierson*. [pIG4-10] SEM study and DNA sample from this collection.

Qld. Powerline easement beside a wood laminating factory, 28 km North East of Gympie, 26°01'S, 152°48'E, 45 m alt. 6iii2004, *R. Gibson 128 & K. Hirsch*. [2 DNA samples].

N.S.W. North Coast. Broadwater National Park, North of Evans Head and the Broadwater Road, 29° 03' S, 153° 26' E 30iv1977, *R. Coveny 9341*. (NSW s.n.) "Climbing herb to 30cm high with white flowers, common in damp sandy soil with *Xyris operculata*, *Selaginella uliginosa*, *Drosera spatulata*, *Epacris obtusifolia*, *Beackea linearis* etc in heath". [pIG2, pIG3, pIG11]. Cultivated plant reportedly collected at Red Rocks, 15iii2005, *K. Hirsch s.n.* [pIG RR1]

***Drosera peltata* Thunb.** 'nipponica'

SOUTH KOREA, Bogil Island, 34.3° N, 126.7° E, Grassland, 28v2004, *Gi-Won Jang s.n.* [pN13-17].

JAPAN: no loc., no date, *M. B. Fairne s.n.* (BR1192) [pN3]; Mt. Abuyama, Takatsuki City, 150 m alt., 03vii1964, *N. Fukuoka 6730*. [pN5]; Higashi-Hiroshima City, Saijyo-cho, Taguchi, 17vii2000, *K. Kondo s.n.* [pN7-12];

NEPAL. Govidgath. Byundar Valley, between Josimyja and Badrinath, path to the valley of the flowers, 1900m, 13ix1975, *F. Billet 6500 & J. Leonard* (BR7976). [pN2];

INDIA: Simbu. 19vii1802, *Buchanan s.n.* (BM58) [pN1]; Chumbi, Pinchinging, 22vii1877, *Dungboo 4281* (BM555). [pN6];

SRI LANKA. Horton Plains, Big World's End, footpath to Balongoda, 2400 m alt., 14iv1975, *L. H. Cramer 4453* (K). [pN4];

PHILIPPINES. Baguio, Province of Benguet, Luzon. vi1904. *A. D. E. Elmer 6511* [NSW s.n.]. From the Herbarium, Bureau of Government Laboratories, Manila, P. L. Det. *D. peltata* J. Sm. [pN18, pN19, pN20]

***Drosera peltata* Thunb.** 'Red Rosette'

NSW. Northern Tablelands. 28° 51' 12" S, 152° 09' 38" E, 965 m alt. Gutsa Track, Sth Boonoo Boonoo, 35 km NE of Tenterfield. On peaty humic silt on granite in wet heath/sedgeland. Flowers. Native at location. Common forb to 15 cm tall. 12xi1993, *J. J. Bruhl 1375 & D. M. Bell*. [NE 059297A] Det.: J. J. Bruhl, 1994. [pRR4, pRR5]; Point Lookout Road, 300 m West of Bullock Creek crossing, 700 m East of Waterfall Way, 30° 28' 49" 56' S, 152° 17' 50.58" E, 1245m. alt., 14xi2004. *R. Gibson 149*. DNA sample from this collection. [pRR9, pRR10, pRR11]; 5 km E of Backwater on Paddy's Gully Road. c. 30° 01'S, 151°57' E. Wet sandy soil near watercourse in gully. *Leptospermum* scrub overstorey. 20xi1967. *J. B. Williams s.n.* [NE021808a]. [pRR6, pRR7, pRR8];

Central Coast. Road side 15km North East of Mt White, East of the Newcastle-Sydney Freeway, 33° 26' 26.46" S, 151° 13' 6.72" E, 170 m. alt., 03x2005, *R. Gibson 164 & K. Hirsch*. [RR MtWht1-3]; Wallaby Swamp, 10 km south of Putty on the

Putty Road, 33° 04' 45.72" S, 150° 42' 19.68" E, 308 m. alt., 03ix2005, *R. Gibson 159*, *K. Hirsch & M. Whitten*. [pRR WISwmp1-3]; Seepage zone beside a creek, in a park at Picnic Point, adjacent to the Georges River, c. 33° 59' 2.4"S, 151° 00' 43.56"E, 30 m alt, 27ix1998, *R. Gibson 013 & R. Riles* [pRR PP1, pRR PP2, pRR PP3]; Seepage zone in clay beside a creek, Nepean Lookout, Blue Mountains National Park, Mulgoa, c. 33° 49'S, 150° 37' 20.58"E, c. 158 m. alt., 13x1998, *R. Gibson 019*. Live sample for DNA analysis. [pRR Mul1, Mul2, Mul3]; "sandstone", Jannali. 03v1955, *J. L. de Souza s.n.* [NE021803a]. [pRR3]; (?Royal) National Park, 20vii1929, *Joyce Vickery s.n.* (NSW146471) [pRR1]; Anise Falls, Royal National Park, 15ix1981, *R. Coveny 122 & T. James 122* [NSW s.n.] Erect herb 15 cm high, white flowers in terminal racemes, growing in wet sandy soil. No det info. [pRR2];
Central Tablelands. Roadside seep at Cherry Tree Hill between Ilford and Lithgow, 33° 00' 50.340"S, 149° 52' 10.74"E, 1006 m. alt, 05x2002, *R. Gibson 061*. DNA sample for pilot study. [pRR Ilf1, pRR Ilf2, pRR ILF3]

***Drosera peltata* Thunb.** 'New Guinea'

Indonesia: West Papua: Mt. Sensenemes, Anggi Gigi Lake, 133.8833° E, -1.3667° S, alt. 2550m. Habitat: In Sphagnum in small pool. Observation: Scarce; flower buds light violet, tubers red. 20i1962, *Sleumer and Vink, No BW 14225*. Name: *Drosera peltata* J. E. Smith, no determinativit. [NG1];

New Guinea: Slopes of Mt. Giluwa, c. 3200 m. alt., 6deg05'S, 143deg52'E, 16vi1967, *M. Coode 32526* (K) [NG2]; Pilike Kula Swamp near Kondo Valley, 8 miles (c. 13 km) south of Tambul, c. 2500 m alt., 6° 05'S, 143° 55'E, 13iv1969, *J. S. Womersley 43534* (K, NGA, L, CANB, A) [NG3].

***Drosera peltata* Thunb.** 'Western Australian Form'

W.A.: Roe: Northern slopes and footslope of Holt Rock, beside the Merredin - Ravensthorpe Rd., 32° 40' 35.22" S, 119°24' 43.08" E, 320 m. alt., 05ix1999. *R. Gibson 030*. Two DNA samples from this collection. [pWA3-9]; Northern slopes of Mount Madden, east of the Merredin - Ravensthorpe Road, 33°14'20.4"S, 119°50'25.62"E, 331 m. alt. , 23x2003, *P. Mann s.n.* [pWAMM1-3]; Edge of granite outcrop near the summit of Lily McCarthy Rock, c. 10 km west of Holt Rock, 32°41'10.38"S, 119°20'23.76"E, 334 m. alt., 23x2003, *P. Mann s.n.* [pWALMcR1-3] Cowcowing, viii1904, *M. Koch 1106* (BM s.n.) [pWA1] Bullabulling, 1895, *S. Moore 95* (K). [pWA2]

***Drosera peltata* Thunb.** 'Western Sydney'

N.S.W. Central Coast. Agnes Banks, near Richmond. 33° 38'S, 151° 42'E, 40 m alt., 22ix1976, *D. H. Benson 1287*. [NSW407703]. [no det . info]. *Eucalyptus parramatensis* open woodland. Sandy soil. Herb.[pWS3]; Devlin Road, Londonderry, 33° 40'S, 150° 43'E, 30m alt., 12i1989, *T. James 1049* (NSW) Roadside. Plain with open dry sclerophyll woodland of *Angophora bakeri*, *Eucalyptus sclerophylla*, *Melaleuca decora*. Growing with *Pratia purpurascens*, *Brunoniella pumila*, *Drosera peltata* and *Entolasia stricta*. Alluvial sand. Locally frequent. Herb to 20cm. Area burnt 2 months earlier. Basal rosette absent; flowers white. Specimen identified as *D. auriculata*. [pWS1, pWS2]; Castlereagh State Forest, near Richmond, c. 33° 40'S, 150° 44'E, 40 m. alt., 13x1998. *R. Gibson 021*. [pWS4-8].

***Drosera regia* Stephens**

Ex. Hort, 27xii2005, *R. Gibson 174 & K. Hirsch*. [regia1]

***Drosera salina* N. Marchant**

W.A.: Eyre, 'beside a tributary of the Hammersley River', 33°20' 44.52"S, 119°49'02.7"E, 289 m. alt., 21x2003, *P. Mann s.n. & R. Gibson*. [SAL1-3]

***Drosera purpurascens* Schlott.**

Ex. Hort, 19ix2005, *R. Gibson 166 & K. Hirsch*. [stoC1-2]

***Drosera porrecta* Lehm.**

Ex. Hort, 19ix2005, *R. Gibson 167 & K. Hirsch*. [stoP]

Appendix 2. List of 294 characters, and their codes, used in phenetic analysis and exported from DELTA

<p>#1. Root system <type>/ 1. a tuber/ 2. of several thick roots/</p>	<p>“ROOT”</p>
<p>#2. tuber <diameter>/ mm diameter/</p>	<p>“TUB_D”</p>
<p>#3. adventitious stolons <whether present>/ 1. present/ 2. absent/</p>	<p>“Stol_P”</p>
<p>#4. plants <habit>/ 1. self-supporting/ 2. scrambling or climbing/</p>	<p>“HABIT”</p>
<p>#5. plant specimen <height>/ mm tall/</p>	<p>“HEIGHT”</p>
<p>#6. stipules <whether present>/ 1. present/ 2. absent/</p>	<p>“Stip_P”</p>
<p>#7. vertical stem <whether present>/ 1. present/ 2. absent/</p>	<p>“Vert_Stem”</p>
<p>#8. stem bracts <whether present>/ 1. present/ 2. absent/</p>	<p>“Stem_Brcts”</p>
<p>#9. axillary stems emerging from the lower third of the stem <whether present>/ 1. present/ 2. absent/</p>	<p>“AxStL3”</p>
<p>#10. axillary stems emerging from the upper third of the stem <whether present>/ 1. present/ 2. absent/</p>	<p>“AxStU3”</p>
<p>#11. cauline leaves abaxially <whether glandular hairy>/ 1. glabrous/ 2. glandular hairy/</p>	<p>“ClabxH”</p>
<p>#12. basal rosette <whether present>/ 1. present/</p>	<p>“BR_P”</p>

2. absent/	
#13. rosette leaves <number>/	“Rlno”
#14. basal rosette <diameter>/ mm diameter/	“BR_D”
#15. basal rosette leaf minimum length <length; shortest mature leaf>/ mm/	“BR_Ln”
#16. basal rosette leaf maximum length <length of mature leaves>/ mm/	“BR_Lx”
#17. basal rosette leaf average length <length of mature leaves>/ mm long/	“BR_Lav”
#18. basal leaf petiole minimum width <width on a mature leaf>/ mm wide/	“BRpetWn”
#19. basal leaf petiole maximum width <width on a mature leaf>/ mm wide/	“BRpetWx”
#20. basal leaf petiole average width <width on a mature leaf>/ mm wide/	“BRpetWav”
#21. basal leaf petiole minimum length <length; from mature leaves>/ mm long/	“BRpetLn”
#22. basal leaf petiole maximum length <length; range from mature leaves>/ mm long/	“BRpetLx”
#23. basal leaf petiole average length <length; average from mature leaves>/ mm long/	“BRpetLav”
#24. basal rosette with D-shaped leaves <whether present>/ 1. present/ 2. absent/	“BRLshp_D”
#25. basal rosette with ovate leaves <whether present>/ 1. present/ 2. absent/	“BRLshp_ov”
#26. basal rosette with transversely elliptic leaves <whether present>/ 1. present/ 2. absent/	“BRLshp_tell”
#27. basal rosette with flabellate-shaped leaves	“BRLshp_flab”

- <whether present>/
 1. present/
 2. absent/
- #28. basal rosette with orbicular leaves <whether present>/ “BRshp_orb”
 1. present/
 2. absent/
- #29. basal rosette with hatchet-shaped leaves “BRLshp_hat”
 <whether present>/
 1. present/
 2. absent/
- #30. basal rosette with reniform leaves <whether present>/ “BRLshp_ren”
 1. present/
 2. absent/
- #31. basal rosette with narrowly triangular leaves “BRLshp_tell”
 <whether present>/
 1. present/
 2. absent/
- #32. basal rosette with linear leaves <whether present>/ “BRLshp_lin”
 1. present/
 2. absent/
- #33. leaves <whether dichotomously divided>/ “L_dich”
 1. dichotomously divided at base/
 2. not dichotomously divided at base/
- #34. once-forked leaves <whether present>/ “L_dich_2”
 1. present/
 2. absent/
- #35. multiply-divided leaves with 3 or 4 terminal lobes “L_dich_3_4”
 <whether present>/
 1. present/
 2. absent/
- #36. multiply-divided leaves with 5 or more terminal lobes “L_dich_5”
 <whether present>/
 1. present/
 2. absent/
- #37. lamina widest in the <location along axis>/
 1. middle, so the leaf is ovate or transversely elliptic/ “BRLw3_1”
 2. lower third so the leaf is ovate/ “BRLw3_2”
 3. upper third so the leaf is obovate/ “BRLw3_3”
- #38. lower leaf margin <shape>/

1. truncate, but the leaf is ovate to obovate in outline/	“BLlm_1”
2. emarginate, so that the leaf is reniform to cordate in outline/	“BLlm_2”
3. attenuate, so that the leaf is 'hatchet-shaped' or lunate in outline/	“BLlm_3”
4. obtuse, so that the leaf is ovate or obovate in outline/	“BLlm_4”
#39. basal rosette leaf lamina minimum length <length; shortest mature leaf>/” mm long/	“BLn”
#40. basal rosette leaf lamina maximum length <length; longest mature leaf>/ mm long/	“BLx”
#41. basal rosette leaf lamina average length <length; average from mature leaves>/ mm long/	“BLav”
#42. basal rosette lamina minimum width <width>/ mm/	“BLWn”
#43. basal rosette lamina maximum width <width>/ mm/	“BLWx”
#44. basal rosette lamina average width <width>/ mm /	“BLWav”
#45. basal rosette lamina minimum width: length <ratio>/	“BL_LWn”
#46. basal rosette lamina maximum width: length <ratio>/	“BL_LWx”
#47. leaves intermediate in shape between the rosette and stem <whether present>/ 1. present/ 2. absent/	“INTshpP”
#48. prophylls <whether present>/ 1. present/ 2. absent/	“PROP_P”
#49. cauline leaves <number>/	“CLno”
#50. internodes <minimum internode length between mature leaves>/ mm/	“INTn”
#51. internodes <maximum internode length between mature leaves>/ mm/	“INTx”
#52. internodes <average internode length between mature leaves>/ mm/	“INTav”

#53. stem <whether glabrous>/ 1. glabrous/ 2. with glandular hairs over the full length/ 3. with glandular hairs in the upper third to half/ 4. with scattered sessile glands along the length/	“STEMglab”
#54. cauline leaves <attachment of petiole>/ 1. always peltate/ 2. variable/	“CLpetAT”
#55. cauline leaves <whether flat or cupped>/ 1. weakly cupped/ 2. distinctly cupped/	“CL_cup”
#56. lowest cauline leaf petiole <minimum length from mature leaves>/ mm/	“LCLpet_n”
#57. lowest cauline leaf petiole <maximum length from mature leaves>/ mm/	“LCLpet_x”
#58. lowest cauline leaf petiole <average length from mature leaves>/ mm/	“LCLpet_av”
#59. crescent-shaped leaves <whether present> on the lower third of the stem/ 1. present/ 2. absent/	“LCLshp_cre”
#60. ovate-shaped leaves <whether present> on the lower third of the stem/ 1. present/ 2. absent/	“LCLshp_ov”
#61. triangular-shaped leaves <whether present> on the lower third of the stem/ 1. present/ 2. absent/	“LCLshp_tri”
#62. lunate-shaped leaves <whether present> on the lower third of the stem/ 1. present/ 2. absent/	“LCLshp_lun”
#63. flabellate-shaped leaves <whether present> on the lower third of the stem/ 1. present/ 2. absent/	“LCLshp_flab”

#64. orbicular leaves <whether present> on the lower third of the stem/ 1. present/ 2. absent/	“LCLshp_orb”
#65. reniform-shaped leaves <whether present> on the lower third of the stem/ 1. present/ 2. absent/	“LCLshp_ren”
#66. transversely-elliptic leaves <whether present> on the lower third of the stem/ 1. present/ 2. absent/	“LCLshp_tell”
#67. lowest cauline leaf minimum angle-class/ degrees/	“LCLang_n”
#68. lowest cauline leaf maximum angle-class/ degrees/	“LCLang_x”
#69. lowest cauline leaf average angle-class/ degrees/	“LCLang_av”
#70. lowest cauline leaves upper leaf margin/ 1. flat/ 2. obtuse/ 3. broadly emarginate/	“LCLulm1” “LCLulm2” “LCLulm3”
#71. lowest cauline leaf general shape <orbicular or crescent-shaped>/ 1. crescent-shaped/ 2. orbicular/	“LCLgshp1” “LCLgshp2”
#72. lowest cauline leaves widest <with respect the to axis>/ 1. in the middle/ 2. in the upper third/ 3. in the lower third/	“LCLW3_1” “LCLW3_2” “LCLW3_3”
#73. lowest cauline leaf lamina <minimum length of mature leaves>/ mm long/	“LCL_Ln”
#74. lowest cauline leaf lamina <maximum length from mature leaves>/ mm long/	“LCL_Lx”
#75. lowest cauline leaf lamina <average length from mature leaves>/ mm/	“LCL_Lav”

#76. lowest cauline leaf lamina <minimum width from mature leaves>/ mm wide/	“LCL_Wn”
#77. lowest cauline leaf lamina <maximum width from mature leaves>/ mm wide/	“LCL_Wx”
#78. lowest cauline leaf lamina <average width of mature leaves>/ mm/	“LCL_Wav”
#79. lowest cauline leaf length: width <minimum ratio>/	“LCL_LWn”
#80. lowest cauline leaf length: width <maximum ratio>/	“LCL_LWx”
#81. lowest cauline leaves auricles <whether present>/ 1. present/ 2. absent/	“LCLaurP_1” “LCLaurP_2”
#82. auricles <minimum length; from mature leaves>/ mm long/	“LCLaurLn”
#83. auricles <maximum length; from mature leaves>/ mm long/	“LCLaurLx”
#84. auricles <average length; from mature leaves>/ mm/	“LCLaurLav”
#85. middle cauline leaf petiole <minimum length; from mature leaves>/ mm long/	“MCLpetLn”
#86. middle cauline leaf petiole <maximum length; from mature leaves>/ mm long/	“MCLpetLx”
#87. middle cauline leaf petiole <average length; from mature leaves>/ mm/	“MCLpetLav”
#88. crescent-shaped middle cauline leaves <whether present>/ 1. present/ 2. absent/	“MCLshp_cre”
#89. ovate middle cauline leaves <whether present>/ 1. present/ 2. absent/	“MCLshp_ov”

#90. lunate middle cauline leaves <whether present>/ 1. present/ 2. absent/	“MCLshp_lun”
#91. triangular middle cauline leaves <whether present>/ 1. present/ 2. absent/	“MCLshp_tri”
#92. orbicular middle cauline leaves <whether present>/ 1. present/ 2. absent/	“MCLshp_orb”
#93. reniform middle cauline leaves <whether present>/ 1. present/ 2. absent/	“MCLshp_ren”
#94. middle cauline leaf minimum angle-class/ degrees/	“MCLang_n”
#95. middle cauline maximum leaf angle-class/ degrees/	“MCLang_x”
#96. middle cauline leaf average upper leaf margin angle <degrees> degrees/	“MCLang_av”
#97. middle cauline leaf upper leaf margin <shape>/ 1. flat/ 2. ovate/ 3. broadly emarginate/	“MCLum_1” “MCLum_2” “MCLum_3”
#98. middle cauline leaf general shape <orbicular or crescent-shaped>/ 1. crescent-shaped/ 2. orbicular/	“MCLgshp”
#99. middle cauline leaves widest <with respect to the axis>/ 1. in the middle/ 2. in the upper third/ 3. in the lower third/	“MCLW3_1” “MCLW3_2” “MCLW3_3”
#100. middle cauline leaf lamina <minimum length; from mature leaves>/ mm long/	“MCL_Ln”
#101. middle cauline leaf lamina <maximum length; from mature leaves>/ mm long/	“MCL_Lx”
#102. middle cauline leaf lamina <average length;	“MCL_Lav”

from mature leaves>/ mm/	
#103. middle cauline leaf lamina <minimum width ; from mature leaves>/ mm wide/	“MCL_Wn”
#104. middle cauline leaf lamina <maximum width; from mature leaves>/ mm wide/	“MCL_Wx”
#105. middle cauline leaf lamina <average width; range on mature leaves>/ mm /	“MCL_Wav”
#106. middle cauline leaf minimum length to width ratio/	“MCL_LWn”
#107. middle cauline leaf maximum length to width ratio/	“MCL_LWx”
#108. middle cauline leaf auricles <whether present>/ 1. present/ 2. absent/	“MCLaurP”
#109. middle cauline leaf auricle <minimum length; from mature leaves>/ mm long/	“MCL_aurLn”
#110. middle cauline leaf auricle <maximum length; from mature leaves>/ mm long/	“MCL_aurLx”
#111. middle cauline leaf auricle <average length; from mature leaves>/ mm/	“MCL_aurLav”
#112. upper cauline leaf petiole <minimum length; from mature leaves>/ mm long/	“UCLpetLn”
#113. upper cauline leaf petiole <maximum length; from mature leaves>/ mm long/	“UCLpetLx”
#114. upper cauline leaf petiole <average length; from mature leaves>/ mm/	“UCLpetLav”
#115. crescent-shaped leaves <whether present> in the apical third of the stem/ 1. present/	“UCLshp_cre”

2. absent/	
#116. ovate leaves <whether present> in the apical third of the stem/ 1. present/ 2. absent/	“UCLshp_ov”
#117. lunate-shaped leaves <whether present> in the apical third of the stem/ 1. present/ 2. absent/	“UCLshp_lun”
#118. orbicular leaves <whether present> in the apical third of the stem/ 1. present/ 2. absent/	“UCLshp_orb”
#119. triangular leaves <whether present> in the apical third of the stem/ 1. present/ 2. absent/	“UCLshp_tri”
#120. reniform leaves <whether present> in the apical third of the stem/ 1. present/ 2. absent/	“UCLshp_ren”
#121. upper cauline leaf minimal angle-class <degrees>/ degrees/	“UCLang_n”
#122. upper cauline leaf maximum angle-class <degrees>/ degrees/	“UCLang_x”
#123. upper cauline leaf margin average angle <degrees> / degrees/	“UCLang_av”
#124. upper cauline leaf upper margin <shape>/ 1. flat/ 2. obtuse/ 3. broadly emarginate/	“UCLum_1” “UCLum_2” “UCLum_3”
#125. upper cauline leaf general shape <orbicular or crescent-shaped>/ 1. crescent-shaped/ 2. orbicular/	“UCL_gshp”
#126. upper cauline leaves widest <with respect to the axis>/ 1. in the middle/ 2. in the upper third/ 3. in the lower third/	“UCLW3_1” “UCLW3_2” “UCLW3_3”

- #127. upper cauline leaf lamina <minimum length; from mature leaves>/ “UCL_Ln”
mm long/
- #128. upper cauline leaf lamina <maximum length; from mature leaves>/ “UCL_Lx”
mm long/
- #129. upper cauline leaf lamina <average length;
from mature leaves>/ “UCL_Lav”
mm/
- #130. upper cauline leaf lamina <minimum width;
from mature leaves>/ “UCL_Wn”
mm wide/
- #131. upper cauline leaf lamina <maximum width,
from mature leaves>/ “UCL_Wx”
mm wide/
- #132. upper cauline leaf lamina <average width,
from mature leaves>/ “UCL_Wav”
mm/
- #133. upper cauline leaf minimum length:width ratios/ “UCL_LWn”
- #134. upper cauline leaf maximum length:width ratio/ “UCL_LWx”
- #135. upper cauline leaf auricles <whether present>/ “UCLaurP”
1. present/
2. absent/
- #136. upper cauline leaf auricles <minimum length;
from mature leaves>/ “UCLaurLn”
mm long/
- #137. upper cauline leaf auricles <maximum length;
from mature leaves>/ “UCLaurLx”
- #138. upper cauline leaf auricles <average length;
from mature leaves>/ “UCLaurLav”
mm/
- #139. mature leaves in axils of cauline leaves, or axillary leaves AXL_P
<whether present>/
1. present/
2. absent/
- #140. axillary leaf petiole <minimum length; from mature leaves>/ “AXLpetLn”
mm long/

- #141. axillary leaf petiole <maximum length; from mature leaves>/“AXLpetLx”
mm long/
- #142. axillary leaf petiole <average length; from mature leaves>/ “AXLpetLav”
mm/
- #143. crescent-shaped axillary leaves <whether present>/ “AXLshp_cre”
1. present/
2. absent/
- #144. ovate axillary leaves <whether present>/ “AXLshp_ov”
1. present/
2. absent/
- #145. lunate axillary leaves <whether present>/ “AXLshp_lun”
1. present/
2. absent/
- #146. orbicular axillary leaves <whether present>/ “AXLshp_orb”
1. present/
2. absent/
- #147. reniform axillary leaves <whether present>/ “AXLshp_ren”
1. present/
2. absent/
- #148. axillary leaf minimum angle-class <degrees>/ “AXLang_n”
degrees/
- #149. axillary leaf maximum angle-class <degrees>/ “AXLang_x”
degrees/
- #150. axillary leaf upper margin angle <degrees>/ “AXLang_av”
degrees/
- #151. axillary cauline leaf general shape “AXLgshp”
<orbicular or crescent-shaped>/
1. crescent-shaped/
2. orbicular/
- #152. axillary cauline leaves widest <with respect to the axis>/
1. in the middle/ “AXLw3_1”
2. in the upper third/ “AXLw3_2”
3. in the lower third/ “AXLw3_3”
- #153. axillary leaf lamina <minimum length; from mature leaves>/ “AXL_Ln”
- #154. axillary leaf lamina <maximum length; from mature leaves>/ “AXL_Lx”
mm long/

- #155. axillary leaf lamina <average length; from mature leaves>/ “AXL_Lav”
mm/
- #156. axillary leaf lamina <minimum width; from mature leaves>/ “AXL_Wn”
mm wide/
- #157. axillary leaf lamina <maximum width; from mature leaves>/ “AXL_Wx”
mm wide/
- #158. axillary leaf lamina <average width; from mature leaves>/“ AXL_Wav”
mm/
- #159. axillary cauline leaf minimum length: width ratios/ “AXL_LWn”
- #160. axillary cauline leaf maximum length: width ratio/ “AXL_LWx”
- #161. axillary leaf auricles <whether present>/
1. present/ “AXLaurP1”
2. absent/ “AXLaurP2”
- #162. axillary leaf auricle <minimum length;
from mature leaves>/ “AXLaurLn”
mm long/
- #163. axillary leaf auricle <maximum length;
from mature leaves>/ “AXLaurLx”
mm long/
- #164. axillary leaf auricle <average length; from mature leaves>/ “AXLaurLav”
mm/
- #165. primary inflorescence <total length>/ “1inflorL”
mm long/
- #166. flowers <number per primary inflorescence>/ “1FlowNo”
per primary inflorescence/
- #167. peduncle <length>/ “PedL”
mm long/
- #168. average peduncle length <length>/ “PedavL”
mm long/
- #169. lower bract <shape>/ “LBshp”
1. subulate/
2. narrowly obovate/
3. linear/
4. obovate/
5. oblong/
6. narrowly ovate/

7. ovate/
8. obcuneate/
9. elliptic/
- #170. lower bract <length>/ “LBL”
mm long/
- #171. lower bract <width>/ “LBW”
mm wide/
- #172. lower bract lower margin <whether entire or dentate>/ “LBLM_ent”
1. entire/
2. dentate/
- #173. lower bract lower marginal hairs <whether present>/ “LBLM_mh”
1. present/
2. absent/
- #174. lower bract lower margin hairs <spacing relative to length>/ “LBLM_hsp”
1. fimbriate/
2. ciliate/
- #175. lower bract upper apex <whether entire or dentate>/ “LBuapx_ent”
1. entire/
2. dentate/
3. serrate/
4. lacciniate/
- #176. lower bract upper apex <whether erose or not>/ “LBupax_er”
1. erose/
2. not erose/
- #177. lower bract upper apex hairs <whether present>/ “LBuapx_H”
1. present/
2. absent/
- #178. lower bract <whether hirsute>/ “LBhirs”
1. glabrous/
2. hirsute/
- #179. lower bract <whether black dotted>/ “LBbkdts”
1. black dotted/
2. without black dots/
- #180. lower bract margin glandular hairs <whether present>/ “LBmgh”
1. present/
2. absent/
- #181. lower bract surface <whether glandular hairs are present>/ “LBsurf”
1. glandular hairs present/

2. glandular hairs absent/	
#182. upper bract <shape>/	“UB_shp”
1. subulate/	
2. ovate/	
3. obovate/	
4. linear/	
5. narrowly obovate/	
6. narrowly ovate/	
7. oblong/	
#183. upper bract <length>/	“UBL”
mm long/	
#184. upper bract <width>/	“UBW”
mm wide/	
#185. upper bract lower margin hairs <whether present>/	“UBlmh”
1. present/	
2. absent/	
#186. upper bract apex <whether acute or truncate>/	“UBap”
1. acute/	
2. truncate/	
3. obtuse/	
#187. upper bract lower margin hairs <spacing>/	“UBlmHsp”
1. fimbriate/	
2. ciliate/	
#188. upper bract apex <margin>/	“UBapx_ent”
1. entire/	
2. dentate/	
3. lacciniate/	
#189. upper bract apex <whether erose>/	“UBapx_ero”
1. erose/	
2. not erose/	
#190. upper bract apex hairs <whether present>/	“UBapx_H”
1. present/	
2. absent/	
#191. upper bract <whether hirsute>/	“UBhirs”
1. glabrous/	
2. hirsute/	
#192. upper bract <whether black dots present>/	“UBbkdts”
1. black dotted/	
2. without black dots/	

#193. upper bract proximal surface with <whether glandular hairs are present>/ 1. glandular hairs present/ 2. glandular hairs absent/	“UBpsGH”
#194. upper bract distal surface with <whether glandular hairs are present>/ 1. glandular hairs present/ 2. glandular hairs absent/	“UBdsGH”
#195. pedicel length <minimum length for open flowers or those in fruit>/ mm long/	“Ped1Ln”
#196. pedicel length <maximum length for open flowers or those in fruit>/ mm long/	“Ped1Lx”
#197. pedicel length <average length for open flowers or those in fruit>/ mm/	“Ped1Lav”
#198. pedicels <minimum length on inflorescence>/ mm long/	“Ped2Ln”
#199. pedicels <maximum length on inflorescence>/ mm long/	“Ped2Lx”
#200. pedicels <average length on inflorescence>/ mm/	“Ped2Lav”
#201. pedicel base <whether glabrous or with hairs>/ 1. hirsute/ 2. glabrous/	“PedBhirs1” “PedBhirs2”
#202. pedicel apex <whether glabrous or hirsute>/ 1. hirsute/ 2. glabrous/	“PedAhirs”
#203. ovate sepals <whether present>/ 1. present/ 2. absent/	“SEPshp_ov”
#204. elliptic sepals <whether present>/ 1. present/ 2. absent/	“SEPshp_ell”
#205. narrow-ovate sepals <whether present>/ 1. present/	“SEPshp_nov”

2. absent/	
#206. narrow elliptic sepals <whether present>/ 1. present/ 2. absent/	“SEPshp_nell”
#207. rhombic sepals <whether present>/ 1. present/ 2. absent/	“SEPshp_rho”
#208. obovate sepals <whether present>/ 1. present/ 2. absent/	“SEPshp_obo”
#209. sepal widest point <with respect to the sepal axis>/ 1. widest in the lower third/ 2. widest in the middle/ 3. widest in the upper third/	“SEPW3_1” “SEPW3_2” “SEPW3_3”
#210. sepals <minimum length; from mature flowers>/ mm long/	“SEP_Ln”
#211. sepals <maximum length; from mature flowers>/ mm long/	“SEP_Lx”
#212. sepals <average length; from mature flowers>/ mm/	“SEP_Lav
#213. sepals <minimum width; from mature flowers>/ mm wide/	“SEP_Wn”
#214. sepals <maximum width; from mature flowers>/ mm wide/	“SEP_Wx”
#215. sepals <average width; from mature flowers>/ mm/	“SEP_Wav”
#216. sepal lower margin <whether entire or not>/ 1. entire/ 2. dentate/	“SEPlm_ent”
#217. sepal marginal hairs <whether present on full margin>/ 1. present/ 2. absent/	“SEPmH”
#218. sepal lower margin hairs <whether present>/ 1. present/ 2. absent/	“SEPlm_H”
#219. sepal lower marginal hairs <whether glandular hairy>/	

1. glandular/	“SEPlm_GH1”
2. eglandular/	“SEPlm_GH2”
#220. sepal lower margin hairs <spacing>/	
1. fimbriate/	“SEPlm_Hcil1”
2. ciliate/	“SEPlm_Hcil2”
3. scattered/	“SEPlm_Hcil3”
#221. minimum length of hairs on lower sepal margin <length>/ mm long/	“SEP_HLn”
#222. maximum length of hairs on lower sepal margin <length>/ mm long/	“SEP_Hlx”
#223. average length of hairs on lower sepal margin <length>/ mm/	“SEP_HLav”
#224. minimum spacing of hairs on lower sepal margin <spacing>/ mm apart/	“SEPlm_HWn”
#225. maximum spacing of hairs on lower sepal margin <spacing>/ mm apart/	“SEPlm_HWn”
#226. average spacing of hairs on lower sepal margin <spacing>/ mm/	“SEPlm_HWav”
#227. sepal apex margin hairs <whether present>/	“SEPapxH”
1. present/	
2. absent/	
#228. sepal marginal hairs <fimbriate or ciliate>/	
1. fimbriate/	“SEPapx_Hcil1”
2. ciliate/	“SEPapx_Hcil2”
3. scattered/	“SEPapx_Hcil3”
#229. sepal marginal hairs <whether glandular or not>/	
1. glandular/	“SEPapx_GH1”
2. eglandular/	“SEPapx_GH2”
#230. glandular sepal marginal hairs <whether present>/	“SEPapx_GHP”
1. present/	
2. absent/	
#231. eglandular sepal marginal hairs <whether present>/	“SEPapx_EH”
1. present/	
2. absent/	
#232. minimum length of hairs on upper sepal margin/	“SEPum_HLn”

mm long/	
#233. maximum length of hairs on upper sepal margin/ mm long/	“SEPum_HLx”
#234. average length of hairs on upper sepal margin/ mm/	“SEPum_HLav”
#235. minimum spacing of hairs on upper sepal margin / mm apart/	“SEPum_HWn”
#236. maximum spacing of hairs on upper sepal margin / mm apart/	“SEPum_HWx”
#237. average spacing of hairs on upper sepal margin / mm/	“SEPum_HWav”
#238. sepal apex surface <whether glabrous or hirsute>/ 1. glabrous/ 2. hirsute/	“SEPapHirs”
#239. sepal surface hair density/ 1. glabrous/ 2. sparse/ 3. dense/	“SEP_HD”
#240. sepal surface hairs <location>/ 1. on proximal basal surface only/ 2. on distal surface only/ 3. on whole sepal/	“SEP_Hloc”
#241. minimum length of hairs on sepal surface/ mm long/	“SEPsurfHLn”
#242. maximum length of hairs on sepal surface/ mm long/	“SEPsurfHLx”
#243. average length of hairs on sepal surface/ mm long/	“SEPsurfHLav”
#244. average number of hairs per square mm on the lower sepal surface/	“SEPlsHno_av”
#245. average number of hairs on the upper sepal surface/	“SEPusHno_av”
#246. sepal apex margin <whether erose or not>/ 1. erose/ 2. not erose/	“SEPapx_ero”
#247. sepal apex margin <morphology>/	“SEPapx_morph”

1. serrate/ 2. dentate/ 3. entire/ 4. both serrate and dentate/	
#248. sepals <whether black dotted>/ 1. black dotted/ 2. not black dotted/	“SEPblkdts”
#249. sepals <maximum length in fruit>/ mm long in fruit/	“SEPxLfrt”
#250. cuneate petals <whether present>/ 1. present/ 2. absent/	“PETshp_cun”
#251. obovate petals <whether present>/ 1. present/ 2. absent/	“PETshp_obo”
#252. petals <minimum length; from open flowers>/ mm long/	“PET_Ln”
#253. petals <maximum length; from open flowers>/ mm long/	“PET_Lx”
#254. petals <average length; from open flowers>/ mm/	“PET_Lav”
#255. petals <minimum width; from open flowers>/ mm wide/	“PET_Wn”
#256. petals <maximum width; from open flowers>/ mm wide/	“PET_Wx”
#257. petals <average width; from open flowers>/ mm/	“PET_Wav”
#258. obtuse petal apex <whether present>/ 1. present/ 2. absent/	“PETapx_obt”
#259. emarginate petal apex <whether present>/ 1. present/ 2. absent/	“PETapx_em”
#260. truncate petal apex <whether present>/ 1. present/ 2. absent/	“PETapx_tru”

#261. flower buds <colour>/ 1. white/ 2. pink/	“COL1”
#262. petals at anthesis <colour>/ 1. white/ 2. pink/	“COL2”
#263. petals in fruit <colour>/ 1. white/ 2. pink/	“COL3”
#264. ovary <colour at maturity>/ 1. green/ 2. orange/ 3. red/	“OVcol”
#265. ovary <shape>/ 1. ovoid/ 2. ellipsoid/ 3. subglobose/ 4. obovoid/	“OVshp”
#266. ovary <average length>/ mm/	“OV_Lav”
#267. ovary <diameter>/ mm diameter/	“OV_D”
#268. filaments <colour>/ 1. white/ 2. white and pink/	“FILcol”
#269. stamens <average length>/ mm/	“STA_Lav”
#270. anthers <average length>/ mm/	“ANT_Lav”
#271. pollen <colour>/ 1. white/ 2. yellow/	“POLcol”
#272. styles <number>/	“STYno”
#273. styles <whether divided into numerous style segments>/ 1. divided/ 2. undivided/	“STYdiv”
#274. styles <length including stigmas>/	“STY_L”

mm long/	
#275. style base: style length <ratio of division type>/	“STY_BL”
#276. styles <colour>/	
1. white/	“STYcol1”
2. orange/	“STYcol2”
3. yellow/	“STYcol3”
4. white with a distinct orange base/	“STYcol4”
5. red/	
#277. cylindrical stigma apices <whether present>/	“STYapx_cyl”
1. present/	
2. absent/	
#278. ovoid stigma apices <whether present>/	“STYapx_ovo”
1. present/	
2. absent/	
#279. narrowly obtuse stigma apices <whether present>/	“STYapx_nob”
1. present/	
2. absent/	
#280. crassiform stigmas <whether present>/	“STYapx_cra”
1. present/	
2. absent/	
#281. stigmas <number>/	“STIGno”
#282. undivided stigmas <whether present>/	“STIGundiv”
1. present/	
2. absent/	
#283. bifid stigmas <whether present>/	“STIGbifid”
1. present/	
2. absent/	
#284. multiply divided stigmas <whether present>/	“STIGmul”
1. present/	
2. absent/	
#285. seeds <shape>/	
1. spheroid/	“SEEDshp1”
2. ovoid/	“SEEDshp2”
3. cylindrical/	“SEEDshp3”
#286. seeds <minimum length>/	“SEED_Ln”
mm long/	
#287. seeds <maximum length>/	“SEED_Lx”

mm long/	
#288. seeds <average length>/ mm/	“SEED_Lav”
#289. seeds <maximum diameter>/ mm wide/	“SEED_Dx”
#290. seeds <surface texture>/ 1. reticulate/ 2. smooth/	“SEED_srf”
#291. seed pits <relative depth>/ 1. shallow/ 2. deep/	“SEED_pits”
#292. seeds <colour>/ 1. black/ 2. grey/ 3. brown/	“SEED_col”
#293. seeds <reflectivity>/ 1. glossy/ 2. dull/	“SEED_refl”
#294. plant colour/ 1. red/ 2. yellow-green/ 3. green/	“PLNTcol”

Appendix 3. The primary phenetic data set

The full phenetic data set is presented on CD. The dataset is in Microsoft Excel format and was imported into PATN for Windows Version 3.1 (Belbin and Collins 2006) for phenetic and ordination analyses.

Appendix 4. DNA extraction, amplification, purification and sequencing techniques used by Dr. Mark Whitten, University of Florida

DNA extraction

1.2 mL of cetyl trimethylammonium bromide (CTAB) buffer (Doyle and Doyle 1987) was poured into a small mortar & pestle; about 3 leaves were added and ground with the CTAB buffer. About 1.0 mL of the slurry was transferred to a 1.5 mL Eppendorf tube and incubated at 65° C for two hours. 500 µL of chloroform/isoamyl alcohol (24:1) was added and the mix was vortexed lightly. The mix was then centrifuged at low speed for 3-4 minutes. 750 µL of the upper layer was transferred to a clean 1.5 mL tube. 30 µL of 3M sodium acetate and 540 µL of isopropanol were added and the mix was shaken thoroughly. This was chilled in a freezer for 1-2 hours. The mixture was then centrifuged at 13,000 rpm for 20 minutes. The supernatant was poured off and the DNA pellet was carefully rinsed twice with 70% ethanol. Any excess ethanol was removed with a pipette. The DNA pellet was resuspended in 75-100 µL of TE (10 mM tris-hydroxy-methyl-amino methane pH 7.5/ 1mM ethylene diamine tetra-acetic acid buffer). A 3-5 µL aliquot of the DNA suspension was run on a gel to check the quantity and quality of DNA based on any resulting bands.

Prior to amplifying the DNA sample by Polymerase Chain Reaction (PCR) the DNA samples were cleaned with a Qiagen Qiaquick column to remove impurities and secondary compounds that might interfere with PCR.

PCR of the samples was accomplished using the following method: 100 µL of DNA sample was mixed with 500 µL of Qiagen Buffer PB. The mixture was placed in a purple Qiaquick column and spun at low speed for 1 minute. The flow through was discarded (the DNA was now bound to the column). The empty column was replaced in the collection tube, and this was spun at high speed for 1 minute. The purple Qiaquick column was placed into a clean 1.5 mL tube; 100 µL of TE buffer pH 8 was added to the column. This was spun at 4000 rpm for 1 minute so that the cleaned DNA solution was at the bottom of the tube. The Qiagen column was discarded and the DNA sample was labeled.

ITS PCR amplification

The thirty-five DNA extractions, from the pilot study and the main study, were amplified for the ITS region by PCR by Dr. Whitten at the University of Florida (Table 26). The methodology used was based on Sun *et al.* (1994). Betaine was used in the reaction to relax secondary structure and increase PCR efficiency (Frackman *et al.* 1998).

Table 26. PCR mix for ITS samples.

1 μ L DNA sample	21 μ L of water	1 μ L dNTP mix
	5 μ L Sigma 10x PCR buffer	15 μ L betaine; saturated solution (c. 5M)
	7 μ L MgCl ₂ (25mM)	0.4 μ L Taq polymerase

The primers used were 17SE (Forward primer) and 26SE (Reverse primer) as outlined by Sun *et al.* (1994). The selected molecular region was then amplified by PCR (Table 27).

Table 27. Thermocycle program for PCR amplification for ITS.

Step	Temperature	Time	Notes
1	94°C	3 minutes	Initial dissociation
2	94°C	45 seconds	Dissociation step
3	65°C	1 minute	Annealing step
4	72°C	1 minute	Extension step; Repeat steps 2 to 4 for 32 cycles
5	72°C	3 minutes	Final extension
6	4°C	Hold	

***trnL* PCR amplifications**

The thirty-five DNA extractions were amplified for *trnL* by Dr. Whitten at the University of Florida, using the primers described by Taberlet *et al.* (1991). The selected molecular region was then amplified by PCR (Table 28).

Table 28. Thermocycle program for *trnL*.

Step	Temperature	Time	Notes
1	94°C	3 minutes	Initial dissociation
2	94°C	30 seconds	Dissociation step
3	94°C	1 minute	Annealing step
4	72°C	1 minute	Extension step; Repeat steps 2 to 4 for 32 cycles
5	72°C	3 minutes	Final extension
6	4°C	Hold	

DNA sequencing

The PCR products were cycle sequenced at the University of Florida Core Sequencing Facility using Applied Biosystems (ABI) Big Dye reagent. The cycle sequencing products were purified by ethanol precipitation and analysed on an ABI 3130 capillary sequencer.