

## New taxa of *Verticordia* (Myrtaceae: Chamelaucieae) from Western Australia

Elizabeth A. George<sup>1</sup> and Alex S. George<sup>2</sup>

<sup>1</sup>18 Halwest Way, Alexander Heights, Western Australia 6064

<sup>2</sup>'Four Gables', 18 Barclay Road, Kardinya, Western Australia 6163

### Abstract

Elizabeth A. George and Alex S. George. New taxa of *Verticordia* (Myrtaceae: Chamelaucieae) from Western Australia. Nuytsia 9 (3): 333-341 (1994). Four recently discovered new taxa are described and discussed: *Verticordia aereiflora*, *V. apecta*, *V. x eurardyensis* (a presumed hybrid between *V. dichroma* and *V. spicata*) and *V. luteola* var. *rosea*.

### Introduction

Following the publication of a review of *Verticordia* (A.S. George 1991), no further new taxa were recognised until the 1993-94 season, when the following were found by observers assisting the first author to prepare a book on the genus. All occur in the South-West Botanical Province of Western Australia and are restricted in distribution. Re-examination of material previously referred to *Verticordia dichroma* necessitated redetermination of two collections as the new species *V. aereiflora*. *Verticordia* now contains 100 species and 43 infraspecific taxa (autonyms excepted). These discoveries are further evidence of the need for continuing survey of this floristically rich region.

***Verticordia aereiflora*** E.A. George & A.S. George, sp. nov. (subg. *Eperephes*, sect. *Pennuligera*) (Figure 1)

Ad *Verticordiam chrysostachidem* Meisner affinis, sed foliis minoribus, floribus flavis et rufis minoribus in turmis 1-3, et petalis minoribus, differt; etiam ad *V. dichromam* A.S. George affinis, sed floribus turmis 1-3, pedunculis longioribus, petalis minoribus, staminibus brevioribus, et styli barbae pilis brevioribus, differt.

*Typus*: NE of Yuna, Western Australia, 11 Dec. 1993, E.A. George 527A-B & B. Moyle (holo: PERTH 03461254; iso: CANB).

Slender *shrub* to 1 m, without lignotuber. *Leaves* orbicular, obtuse, 2-2.5 mm long, ascending to spreading, concave, entire, prominently glandular, with dark brown petiole 0.3-0.4 mm long. *Flowers* solitary or in groups of 2 or 3, but often several groups along one branchlet; peduncles 2-3 mm long, thickened below flower; bracteoles very concave, 3.5 mm long, scarious, cuspidate, entire but margin

often broken at anthesis, persistent, yellow in lower half grading to deep red in upper half. *Hypanthium* broadly turbinate, 2.5 mm long, glabrous, prominently 5-ribbed; reflexed green appendages cuneate, obtusely rounded, 1 mm long, thick. *Sepals* greenish yellow to yellow with a deep red or reddish bronze fringe, horizontal, 4-4.5 mm long, the lamina transversely elliptic, 1 mm long, 2.5 mm wide; lobes 8-10, fimbriate; reflexed lobes pale yellow with red fringe, orbicular, auriculate on prominent concave stalk, scarious, fimbriate, c. 4 mm long, 5 mm wide, concealing hypanthium. *Petals* yellow with red spots, erect, concave, crown-like and closed around style after anthesis, ovate, 4.5-5 mm long, the lamina 2.5-3 mm long, 2-2.3 mm wide, fimbriate, deeply so across apex; auricles small. *Stamens* at first curved inwards but then recurved and the anthers opening outwards, 1.8-2 mm long, united with staminodes for c. 1/2 length; anthers 0.5-0.6 mm long; *staminodes* 2-2.3 mm long, linear, the free part prominently glandular, abruptly narrowed and acute. *Style* pink with red apex, curved to lower side of flower, then sigmoid towards apex, 6-7 mm long, thick; beard unilateral, dense, over c. 1 mm below apex on outside of curve; hairs c. 0.2 mm long. *Ovules* 8 or 9.

*Distribution and habitat.* Occurs north-east of Yuna (Figure 3). Grows in yellow sand on the lower slopes of sand dunes and in the intervening swale, in open shrubland with *Grevillea candelabroides*, *Grevillea gordoniana*, *Hakea bucculenta*, *Eucalyptus*, *Acacia*, *Scholtzia* etc.

*Flowering period.* November-December.

*Other collections examined.* WESTERN AUSTRALIA: near Yuna, 6 Dec. 1959, C.A. Gardner 12041 (PERTH); East Yuna Reserve, 15 Dec. 1968, A.C. Burns 128 (PERTH); type locality, E.A. George 522 A-D, 525, 526 & B. Moyle (PERTH).

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority Two - Poorly Known Taxa. The population at the type locality extends over c. 1 kilometre and contains c. 200 plants. It is on a farm but is protected by the owners. The two other localities have not been sought out.

*Etymology.* The specific epithet is from the Latin *aereus* - bronze and *flos* - a flower, in reference to the colour of the flowers. The combination of red and yellow gives an overall impression of bronze.

*Discussion.* *Verticordia aereiflora* is in subg. *Eperephes*, sect. *Pennuligera*, and is related on the one hand to *V. chrysostrachys* Meisner and on the other to *V. dichroma* A.S. George. It differs from both in the small groups of flowers (1-3) and smaller petals. It differs further from *V. chrysostrachys* in the yellow and red colour and the smaller leaves. From *V. dichroma* it also differs in the longer peduncles, shorter stamens and short hairs of the style beard. Neither relative has been found close to the locality where the new species occurs.

In the Key to species given in George (1991), this species and *V. x eurardyensis* (described below) would key out to couplet 93, which should be modified as follows:

- 93a Style hairs 0.2-0.5 mm long
- 94a Peduncles 2.5-4 mm long; flowers golden or pale yellow ..... *V. chrysostrachys*
- 94b Peduncles 0.5-2 mm long, sometimes to 3 mm; flowers cream to silvery pink, pink-maroon, maroon, magenta, or yellow and deep red to bronze
- 95a Leaves 1-4 mm long; flowers pink-maroon, maroon, magenta, or yellow and deep red to bronze; style curved, sigmoid or geniculate below apex

- 95aa Peduncles 0.5 mm long ..... *V. x eurardyensis*  
 95bb Peduncles 1.5-2 mm long  
   95aaa Flowers pink-maroon; ; stamens 3.5 mm long; style 5 mm long;  
     Perenjori to Wongan Hills and Bencubbin ..... *V. venusta*  
   95bbb Flowers yellow and deep red to bronze; stamens 1.8-2 mm long;  
     style 6-7 mm long; north of lower Murchison River. .... *V. aereiflora*  
 95b Leaves 4-7 mm long; flowers cream to silvery pink; style straight ..... *V. argentea*  
 93b Style hairs 0.7-1.2 mm long

***Verticordia apecta*** E.A. George & A.S. George, sp. nov. (subg. *Verticordia*, sect. *Catocalypta*) (Figure 1)

*Ab Verticordia inclusa* A.S. George hypanthio brevissime pubescente, sepalis auriculisque sparsiore fimbriatis, petalis profundiore fimbriatis, staminodiis minus fimbriatis, stylo breviter barbato, et laminis lobisque sepalorum et petalorum roseis, praecipue differt.

*Typus:* Sheepwash Reserve, off Spencer Road, SW of Mount Barker, Western Australia, 34° 47' S, 117° 34' E, 16 Nov. 1993, E.A. George 494A-D, T. Annel & C. Vellios (holo: PERTH 03461246; iso: CANB, K, MEL).

A slender, erect *shrub* with 1 stem to 45 cm tall, ?with lignotuber. *Lower leaves* linear, triquetrous, obtuse, often minutely mucronate, 3-9 mm long; stem leaves narrowly elliptic, obtuse but minutely mucronate, c. 7 mm long; floral leaves elliptic to obovate, triquetrous, obtuse. *Flowers* few, in upper axils. *Peduncles* 9-19 mm long, ascending, thickened upwards. *Bracteoles* not cuspidate. *Hypanthium* broadly turbinate, 1.5 mm long, 10-ribbed, shortly and finely pubescent; top of hypanthium finely pitted. *Sepals* deep pink including main lobes, the finer fringe segments white, widely spreading but main lobes upturned, 4 mm long overall; lamina semi-elliptic, c. 1 mm long, 2 mm wide; fringe finely scabrid; auricles on broad claw, the upturned lamina semi-orbicular, deeply fimbriate, exceeding hypanthium. *Petals* deep pink, the finer fringe lobes white, 4 mm long overall, spreading with upturned fringe; lamina transversely semi-orbicular, deeply lacerate with 4-6 main lobes and many smaller ones; lamina 1 mm long, 1.8 mm wide. *Stamens and staminodes* united for c. 0.5 mm; stamens 0.8-1 mm long, glabrous; anthers 0.5-0.7 mm long, strongly incurved, depressed-globular with lateral shallow vertical grooves, and with small obtuse umbonate apical appendage; staminodes 3.5 mm long, irregularly lacerate, otherwise glabrous. *Style* erect, 0.3 mm long, with short hairs around stigma; stigma slightly enlarged. *Ovules* 2, laterally attached at base of ovary.

*Distribution and habitat.* Known only from the type locality (Figure 3). Grows in sandy clay with loam and broken granite, on an upper west-facing slope in *Eucalyptus wandoo* low open woodland and low open shrubland.

*Flowering period.* November.

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority Two - Poorly Known Taxa. Known only from the type collection which is from a population of c. 30 plants.

*Etymology.* The specific epithet is taken from the Greek *apektos* - uncombed, unkempt, in reference to the somewhat untidy appearance of the flowers.

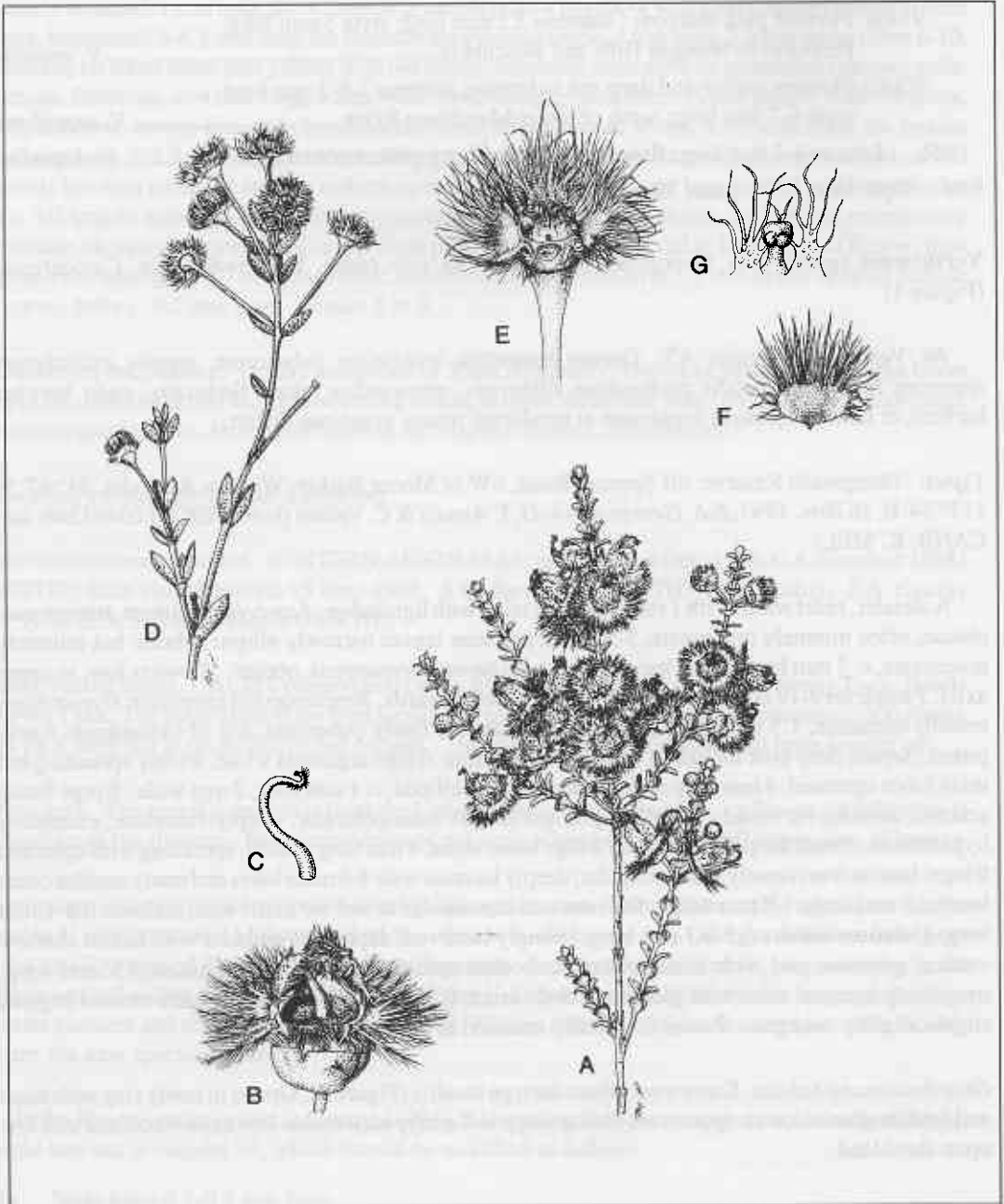


Figure 1. A-C *Verticordia aereiflora*. A - flowering branchlet (x1); B - flower with 2 sepals and petals removed, bracteoles intact (x3); C - style (x3). D-G *Verticordia apecta*. D - flowering branchlet (x1); E - flower with 2 sepals and petals and part of hypanthium removed (x3); F - petal (x4); G - a stamen and 2 staminodes (x6). Drawn by Margaret Pieroni.

*Discussion.* *Verticordia apecta* is in subg. *Verticordia*, sect. *Catocalypta*, and is related most closely to *V. inclusa* A.S. George. It differs from that species in its spindly habit, its very shortly pubescent hypanthium, its shortly bearded style, its more sparsely fimbriate sepals (and their auricles), its more deeply fimbriate petals, its less fimbriate staminodes, and the pink colouration of the sepals and petals. It grows some distance (c. 200 km) WSW of the nearest population of *V. inclusa* (near Fitzgerald). There is a strong superficial resemblance to *V. habrantha* (which occurs at the type locality) in habit, leaves and floral arrangement, but the shortly bearded style and fimbriate, pink petals readily distinguish it from that species. It is likely that there are further populations in appropriate habitats, especially to the west and north-west.

In the Key to species given in George (1991), this species would key out to couplet 47, which should be modified as follows:

- 47a Style with lateral beard or with a ring of short hairs just below stigma  
 48a Style 0.3 mm long, with ring of hairs below stigma ..... *V. apecta*  
 48b Style 4.5-7 mm long, with a lateral beard ..... *V. pritzelii*, *V. lehmannii*  
 47b Style glabrous or very shortly pubescent at base ..... *V. habrantha* etc.

***Verticordia xeurardyensis*** E.A. George & A.S. George, sp. nov. (subg. *Eperephes*, sect. *Pennuligera*) (Figure 2)

Species nova, verosimiliter originis hybridae inter *Verticordiam dichromam* A.S. George var. *dichromam* et *V. spicatum* F. Muell. subsp. *spicatum*, ab ambobus floribus magentis vel atro-rubris distinguibilis. Ab *V. dichroma* foliis angustioribus confertioribus, pedunculis brevioribus, hypanthii appendiculis longioribus acutis, sepalorum lobis angustioribus acutis, petalis latoribus etiam differt. Ab *V. spicata* foliis minus confertis, hypanthio majore, et styli pilis longioribus, etiam differt.

*Typus:* Eurardy Station, 28 km N of Galena Bridge [North West Coastal Hwy], Western Australia, 22 Nov. 1992, E.A. George 437 with N. & P. Moyle and M. Quicke (holo: PERTH 02838893).

A shrub to c. 1 m tall, with lignotuber, much-branched. *Stem leaves* spatulate or obovate to elliptic, concave, 1-4 mm long; margins narrow, translucent, erose to minutely ciliate. *Floral leaves* similar to stem leaves but wider. *Flowers* spreading, crowded in spike-like groups, faintly scented. *Peduncles* c. 0.5 mm long. *Bracteoles* obscurely keeled, cuspidate, persistent. *Hypanthium* turbinate, c. 3 mm long, prominently 5-ribbed, rugose, glabrous; reflexed appendages present, very thick, one- to two-thirds the length of the hypanthium. *Sepals* 4.5-5 mm long, spreading, dark magenta to maroon; lobes 8-11, plumose, the midribs 0.1-0.3 mm wide, acuminate; auricles present, broad, deeply fringed, as long as hypanthium. *Petals* 2.5-3 mm long, 2.5-3 mm wide, orbicular, scarcely auriculate, erect, similar to sepals in colour or slightly paler; fringe c. 2 mm long, the segments acute. *Stamens and staminodes* united; *stamens* uniform, incurved, 2 mm long; filaments terete, swollen below anthers, smooth, glabrous; anthers oblong, opening by slits, 0.5 mm long; appendage none; *staminodes* terete, acute, incurved, as long as stamens, sparsely glandular-verrucose. *Style* 5.5-6.5 mm long, geniculate below apex, bearded all round, sometimes more densely so on one side, with hairs to 0.5 mm long; stigma slightly enlarged. *Ovules* 7 or 8.

*Distribution and habitat.* Known only from the type locality on Eurardy [pastoral] Station, N of Northampton (Figure 3). Grows in yellow sand over clay overlying rock, along shallow drainage line with *Actinostrobos arenarius* and low heath.

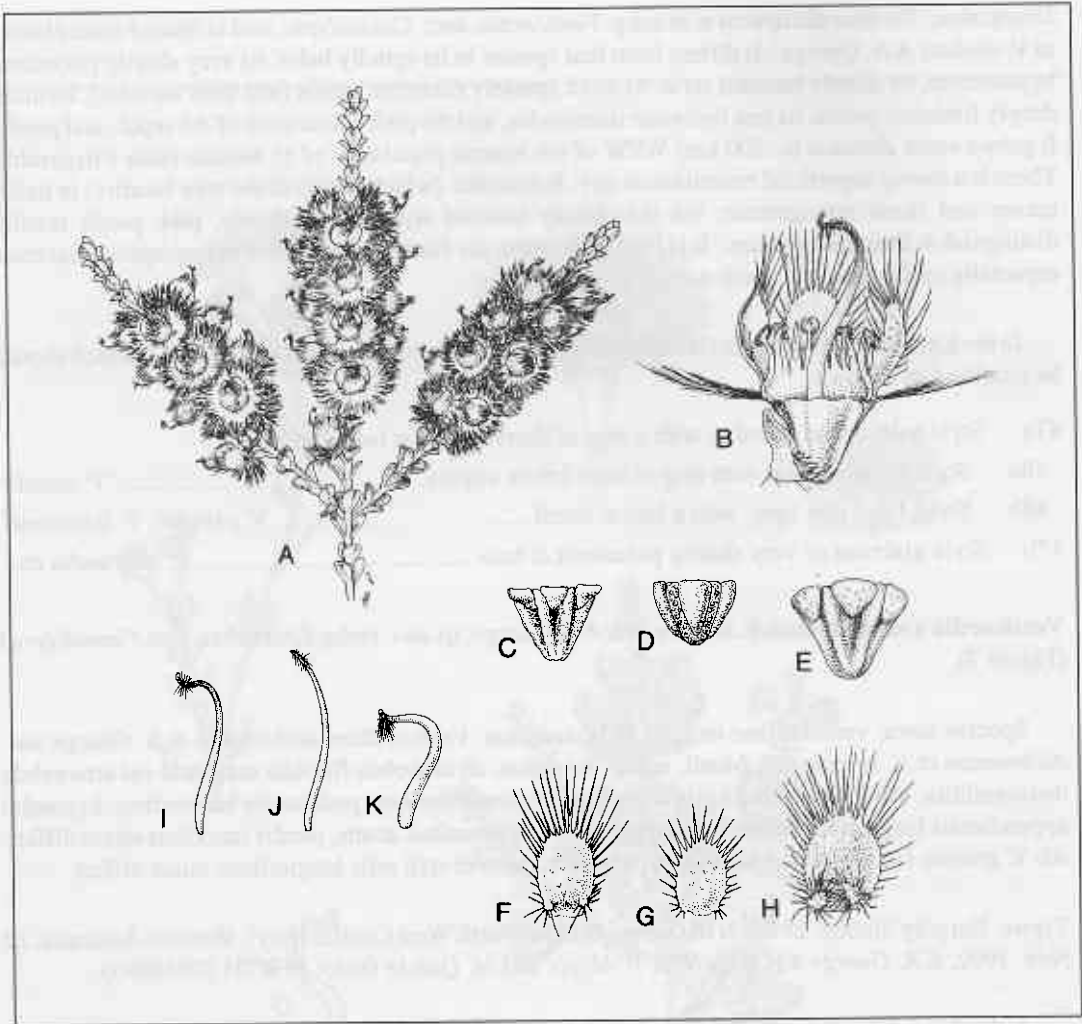


Figure 2. A, B, C, F, I - *Verticordia x eurardyensis*. D, G, J - *V. spicata* subsp. *spicata*. E, H, K - *V. dichroma* var. *dichroma*. A - flowering branchlet (x1); B - flower, with 2 sepals and petals and half the androecium removed (x3); C-E - hypanthium (x3); F-H - petal (x3); I-K - style (x3). Drawn by Margaret Pieroni.

*Flowering period.* October-November.

*Other collections examined.* WESTERN AUSTRALIA: Type locality, 30 Nov. 1992, Margaret Quicke 6-10 (PERTH).

*Conservation status.* CALM Conservation Codes for Western Australian Flora: Priority One - Poorly Known Taxa. There are 30 plants over a distance of 3-4 km. The location is on a pastoral lease but is protected by the present lessees.

*Etymology.* Epithet formed from the name of the pastoral station on which the species occurs, with the Latin suffix *-ensis* indicating origin or place.

*Discussion.* This new plant was discovered by Margaret and Bruce Quicke in November 1992. Searches have located 27 plants, of which two occur in undisturbed vegetation about 30 m apart and some 30 m from a firebreak. The remainder occur in an area adjacent to the firebreak that was cleared in 1985-86 but then left to regenerate. Both presumed parents - *V. dichroma* var. *dichroma* and *V. spicata* subsp. *spicata* - occur with the hybrids. The hybrid plants are morphologically intermediate between the parents, are relatively uniform, and show no indication of back-crossing with either parent. The magenta to maroon flowers are distinctive (deep red or deep red and yellow in *V. dichroma*, pale to dark pink in *V. spicata*).

From *V. dichroma* the new species differs in having more crowded, narrower leaves, shorter peduncles, a smaller hypanthium with more acute appendages, sepals with narrower acute lobes, and smaller, broader petals. From *V. spicata* it may be distinguished by the less crowded leaves, larger hypanthium, longer fringe to the petals and differently coloured flowers, *V. spicata* having flowers that usually open pale pink to almost white and become deeper pink with age.

Both presumed parents are in subg. *Eperephes* but *V. spicata* is in sect. *Verticordella* and *V. dichroma* in sect. *Pennuligera*. For both species,  $n = 11$  (Tyagi *et al.* 1991).

Many non-lignotuberos species of the genus germinate prolifically in burnt or once-disturbed sites but tend to die out after some years and persist as soil-borne seed awaiting the next disturbance event. Since *V. x euradyensis* has a lignotuber it should persist now that it is established in the firebreak area.

Presumed hybrids previously recorded in the genus have been either single plants or hybrid swarms showing great variation indicating probable backcrossing (George 1991).

In the Key to species given in George (1991), this species would key out to couplet 93; for the required modification, see above under *V. aereiflora*.

***Verticordia luteola*** A.S. George var. ***rosea*** E.A. George & A.S. George, var. nov.

Ab *Verticordia luteola* sensu typico floribus roseis; foliis, petalorum fimbriis et androecio parum majoribus; et florescentia serotiniore, differt.

*Typus:* W of Brand Hwy, S of Arrowsmith R., Western Australia, 8 Jan. 1994, E.A. George 542G, M. Pieroni & A. Tinker (holo: PERTH 03461130).

Slender shrub to 2 m, without lignotuber. Stem leaves obovate on broad base, shortly cuspidate,  $\pm$  erect, 3-4 mm long, shortly ciliate; leaves of lateral branchlets similar but crowded and more spreading, 2-2.5 mm long; floral leaves similar to stem leaves but wider. *Flowers* in elongating racemes. *Peduncles* 1-2 mm long. *Bracteoles* cuspidate, falling before anthesis. *Hypanthium* turbinate, 2.5-3 mm long, deeply 5-ribbed, scarcely rugose; reflexed green appendages obtuse to almost acute, c. 1-1.5 mm long. *Sepals* greenish pink with silver fringe, turning lemon-cream and brown, spreading, 4.5-5.5 mm long; lamina transversely elliptic, 1 mm long, 2 mm wide; main lobes 7 or 8, deeply fimbriate. *Petals* bright pink with pale pink to white fringe, turning cream or brownish, erect, obovate, 6-6.5 mm long; lamina 3-3.5 mm long, 2.5 mm wide, fimbriate, the apical fringe itself finely fringed. *Stamens* 1.5-2 mm long; anthers 0.5 mm long; *staminodes* 1-1.5 mm long, with prominent oil glands, acute. *Style* 5-6 mm long, densely bearded over c. 1 mm, the longest (lowest) hairs 0.4-0.5 mm long. *Ovules* 5 or 6.

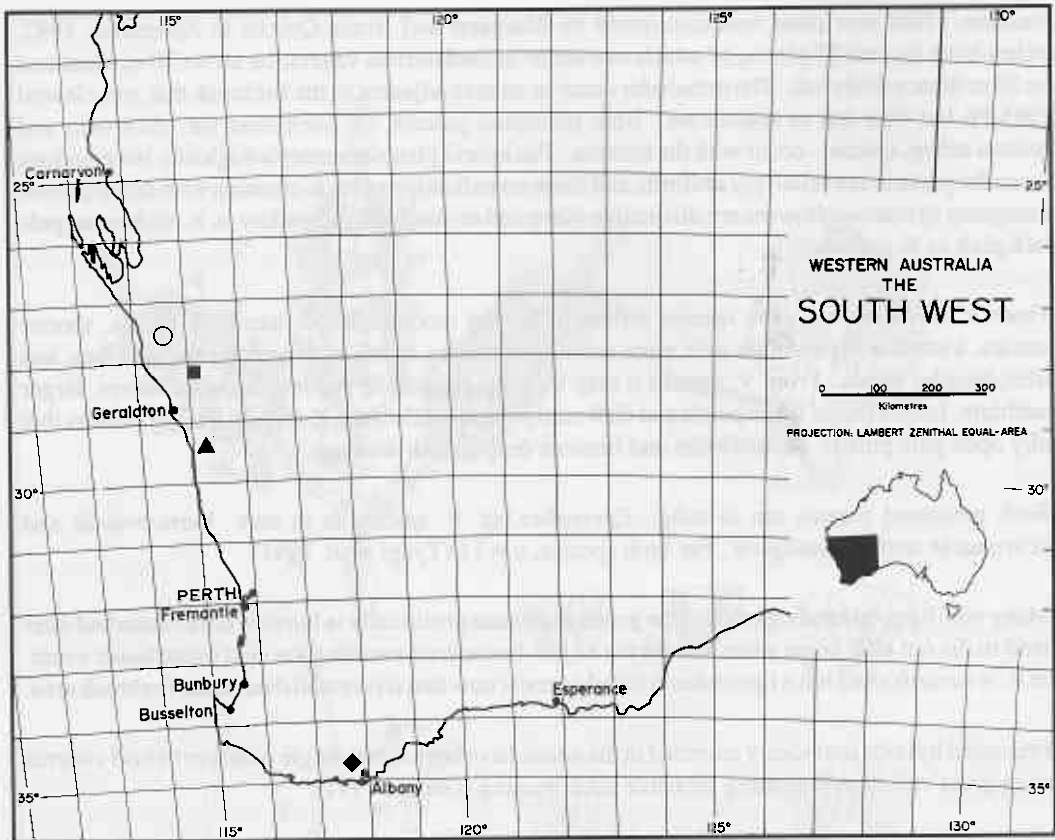


Figure 3. Distribution of *Verticordia aereiflora* (■), *V. apecta* (◆), *V. x eurardyensis* (○) and *V. luteola* var. *rosea* (▲).

**Distribution and habitat.** Occurs to the north and south of Eneabba (Figure 3). Grows on plain in deep white sand, in shrubland with *Eucalyptus todtiana*, *Banksia attenuata*, *Banksia menziesii*, *Xylomelum angustifolium*, *Calothamnus* etc.

**Flowering period.** December-January.

**Other collection examined.** WESTERN AUSTRALIA: Type locality, 12 Dec. 1993, E.A. George 529, 542A-F, H, I, M. Pieroni & A. Tinker (PERTH).

**Conservation status.** CALM Conservation Codes for Western Australian Flora: Priority One - Poorly Known Taxa The population extends over c. 6 km.

**Etymology.** The varietal epithet is taken from the Latin *roseus* - pink, in reference to the flower colour.

**Discussion.** The publication of this taxon creates the autonym *V. luteola* A.S. George var. *luteola*. Var. *rosea* differs from typical var. *luteola* essentially in its pink flowers that open about a month later than those of var. *luteola*. The leaves are slightly larger (2.5-3.5 mm in var. *luteola*), the petal fringe longer (2-2.5 mm in var. *luteola*) and the stamens and staminodes longer (1.5 mm and 1 mm respectively in var. *luteola*). The locality is to the west and south-west of the distribution of var. *luteola*.



In the Key to species given in George (1991), this taxon would key out to couplet 78, which should be modified as follows:

- 78a Sepals auriculate; stamens 3 mm long ..... *V. bifimbriata*  
 78b Sepals not auriculate; stamens 1.5-2 mm long  
     79a Hypanthium 2 mm long; reflexed appendages merging into hypanthium;  
         sepals and style 4 mm long; Mogumber-Regans Ford area ..... *V. paludosa*  
     79b Hypanthium 2.5-3 mm long; reflexed appendages distinct, flap-like;  
         sepals 4.5-5.5 mm long; style 5-6 mm long; Eneabba-Three Springs area ..... *V. luteola*

### Acknowledgments

Margaret and Bruce Quicke of Eurardy Station kindly brought *V. x eurardyensis* to our attention and assisted with field work. Jan and Norm Tunbridge of Caratti Farm near Yuna discovered the population of *V. aereiflora* and allowed access to their property on several occasions. Alan Tinker, of Western Flora Caravan Park, near Eneabba, brought *V. luteola* var. *rosea* to our attention and assisted with field work. Tony Annels and Chris Velios, Department of Conservation and Land Management, Manjimup, kindly provided transport to the population of *V. apecta* and assisted with field work. Pat and Norm Moyle and Brian Moyle also assisted with field work and transport. The illustrations were skilfully prepared by Margaret Pieroni. Constructive comments were received from two referees.

### References

- Briggs, J.D. & Leigh, J.H. (1988). "Rare or Threatened Australian Plants." Revised edn. (Australian National Parks and Wildlife Service, Canberra.)  
 George, A.S. (1991). New taxa, combinations and typifications in *Verticordia* (Myrtaceae Chamelaucieae). *Nuytsia* 7: 231-394.  
 Tyagi, A.P., McComb, J. & Considine, J. (1991). Cytogenetic and pollination studies in the genus *Verticordia* DC. *Austral. J. Bot.* 39: 261-272.