

***Nemcia effusa* (Fabaceae: Mirbelieae), a new species from south-west
Western Australia, and a key to *Nemcia***

M.D. Crisp¹ and F.H. Mollemans²

¹Division of Botany and Zoology, The Australian National University, Canberra, Australian Capital Territory 0200
²76-6228 Plumeria Road, Kailua-Kona, Hawaii 96740 USA
[Current address: PO Box 734, Victoria Park, Western Australia 6100]

Abstract

Crisp, M.D. and Mollemans, F.H. *Nemcia effusa* (Fabaceae: Mirbelieae), a new species from south-west Western Australia, and a key to *Nemcia*. Nuytsia 9 (2): 223-232 (1993). A new species of *Nemcia*, *N. effusa* Crisp & Mollemans, is described from the north-west part of Lake Grace shire, south-west Western Australia. The species is quite distinct with no clear affinities. It is named for its habit with rigid, diffuse stems and branchlets. In some respects similar to *N. stipularis* (Meissner) Crisp, it differs in the leaves spreading widely and being broader (3-4 mm) and impressed-punctate below, and with stipules shorter (2-3 mm). It is also similar to *N. punctata* (Turcz.) Crisp in the leaves being impressed-punctate below, but differing in having conspicuous stipules and longer leaves (1-2.5 cm) that are spreading widely but scarcely recurved. Only two plants of *N. effusa* were found at the type locality, and the species was not observed elsewhere during surveys of remnant vegetation (by the second author) of c. 71,250 km² of the southern wheatbelt region of Western Australia. This suggests that *N. effusa* is neither widespread nor common.

Introduction

During the latter half of 1992, surveys of remnant vegetation were being carried out by the second author in the southern wheatbelt region of Western Australia, a total of c. 71,250 km² having been surveyed during 1991 and 1992. Late in the day on the 26th of August the second author was travelling along a road in the north-west corner of Lake Grace Shire, when the abundant growth of yellow, flowering specimens of *Asterolasia squamuligera* (Hook.) Benth. (a significant range extension - Paul G. Wilson, pers. comm.) caused a stop for collections and photographs. In the course of carrying out this work a *Nemcia* was observed, a collection made and photographs taken. Further research has since indicated that this *Nemcia* is a distinct, previously undescribed taxon. The new species is described here.

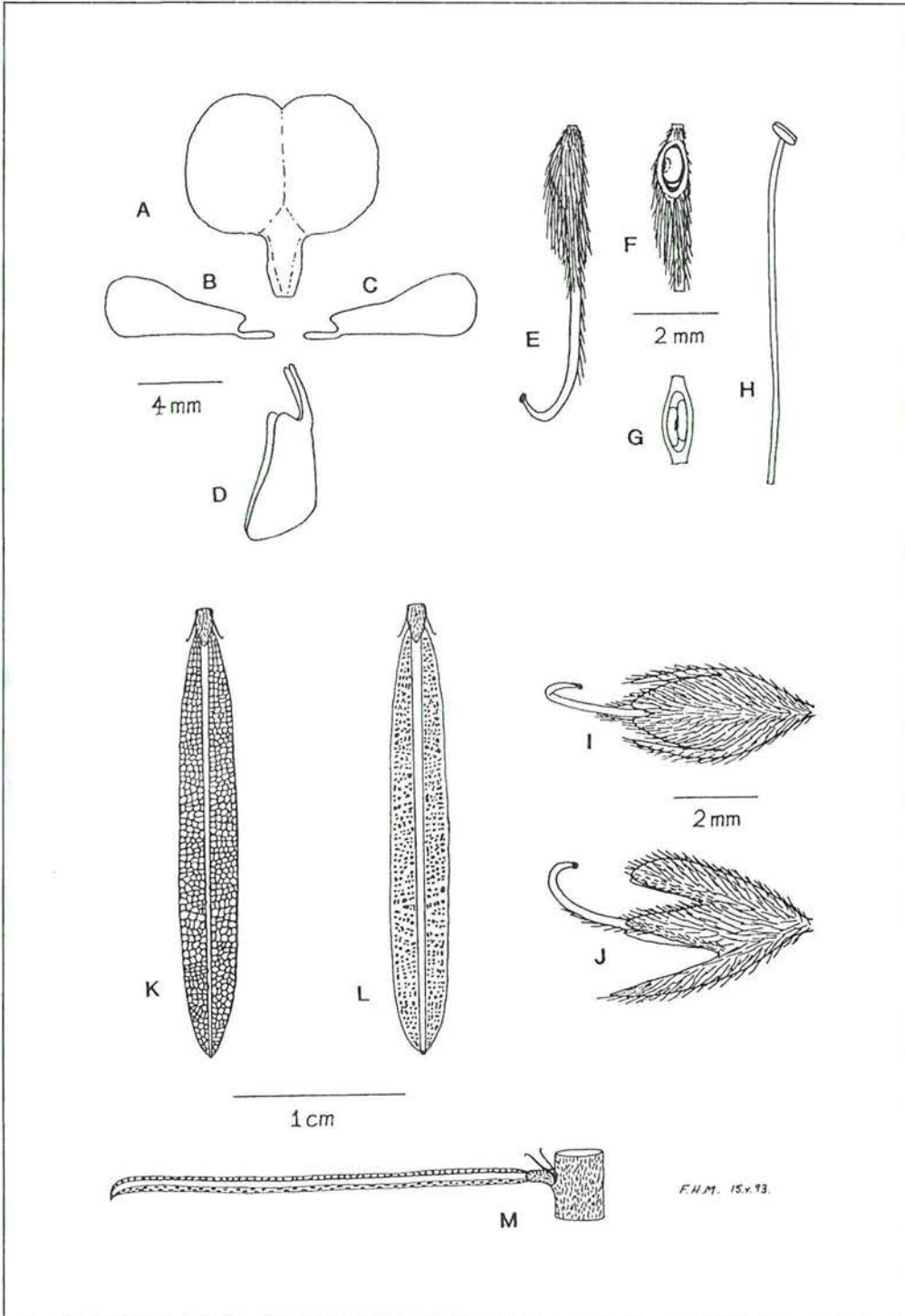


Figure 1. *Nemcia effusa*. A - standard; B, C - wings; D - keel; E - gynoeceium; F - sectioned ovary showing ovules; G - adaxial view of sectioned ovary showing ovule arrangement; H - stamen, lateral view; I - calyx, adaxial view; J - calyx, lateral view; K - leaf, adaxial view; L - leaf, abaxial view; M - leaf, lateral view with stipules and section of branchlet. Drawn from the type.

Taxonomy

Nemcia Domin

Nemcia effusa Crisp & Mollemans, sp. nov. (Figures 1-3)

Species propria caulibus ramulisque rigidis diffusus; *N. stipulari* (Meissner) Crisp similis sed foliis patentibus latoribus (3-4 mm latis) subtus impresso-punctata stipulis brevioribus (2-3 mm longis) differt; *N. punctatae* (Turcz.) Crisp similis foliis subtus impresso-punctatis sed stipulis conspicuis foliis longioribus (1-2.5 cm longis) patentibus autem vix recurvis differt.

A distinctive species with rigid, diffuse stems and branchlets. Similar to *N. stipularis* (Meissner) Crisp but differing in the leaves spreading widely and being broader (3-4 mm) and impressed-punctate below, and with stipules shorter (2-3 mm). Similar to *N. punctata* (Turcz.) Crisp in the leaves being impressed-punctate below, but differing in having conspicuous stipules and longer leaves (1-2.5 cm) that are spreading widely but scarcely recurved.

Typus: Western Australia: Wheatbelt (SE); Lake Grace Shire; SE of Kukerin [precise locality withheld], 26 August 1992, *F.H. Mollemans* 4260 (holo: PERTH; iso: CBG). (Figure 1)

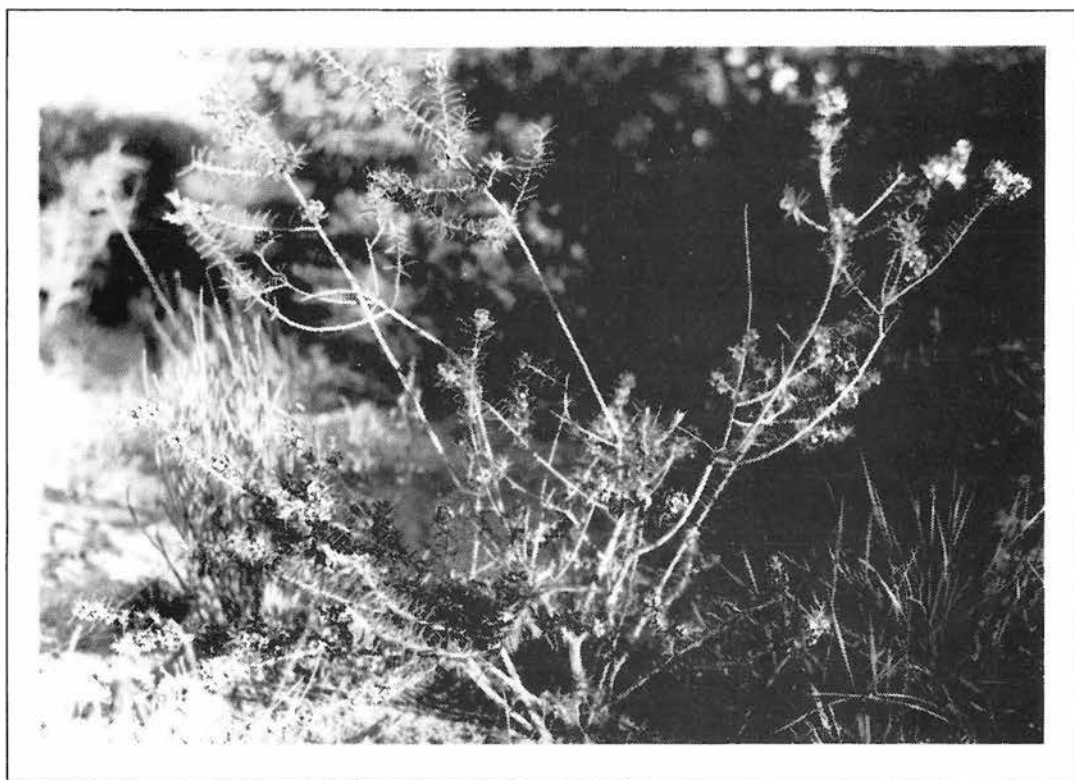


Figure 2. Habit of *Nemcia effusa* in mallee over mixed scrub 1-1.2 m high on gravelly soil in the north-west corner of Lake Grace Shire. (Photo: F.H. Mollemans).

Diffuse, open, spreading, straggling *shrubs* to c. 1 m tall and across. *Stems* and *branchlets* rigid, diffuse, grey-velutinous. *Leaves* widely spreading, ternate, simple, entire, narrowly oblong-elliptic, rigid, gently sigmoid, scarcely recurved at apex, mucronate, 1-2.5 cm long, 3-4 mm wide, glabrous; *mid-nerve* shallowly impressed above, thickened and prominent below; venation densely reticulate, very thick below with areoles impressed-punctate; *petiole* c. 2 mm long, grey-velutinous; *stipules* conspicuous, filiform, 2-3 mm long. *Flowers* 2-6 in very condensed, fascicle-like axillary racemes, subsessile on pedicels to 0.5 mm long, 10 mm long; *bracts* caducous, trifid, grey-sericeous, c. 4 mm long. *Calyx* 4-5 mm long, white-villous; lobes triangular, upper two united for 7/8 of length, broadly acute, lower three acute; *standard* strongly exerted from calyx, transversely broad-elliptic, retuse, 6 mm long (excluding 3.5 mm claw), 9 mm wide, adaxially apricot-coloured with red-maroon markings towards centre, abaxially red-maroon; *wings* obovate, 8 mm long, apricot-coloured in distal half, otherwise red-maroon; *keel* longitudinally half broad-obovate, 8 mm long, red-maroon. *Stamens* free, 8 mm long; *ovary* 2 mm long, shortly pubescent at base, otherwise covered with antrorse silky hairs to 2 mm long; ovules 2. *Pod* not seen.

Distribution. Endemic to the Stirling Botanical District of south-west Western Australia, with one known locality in the north-west corner of Lake Grace Shire. (Figure 3)

Habitat. Grows in mallee over mixed scrub 1-1.2 m high on gravelly soil. Vegetation is typical (for the region), diverse natural scrub with mixed species composition including *Dryandra* spp., *Allocasuarina humilis* (Otto & Dietr.) L. Johnson, *Lambertia*, *Daviesia*, and *Leptospermum*.

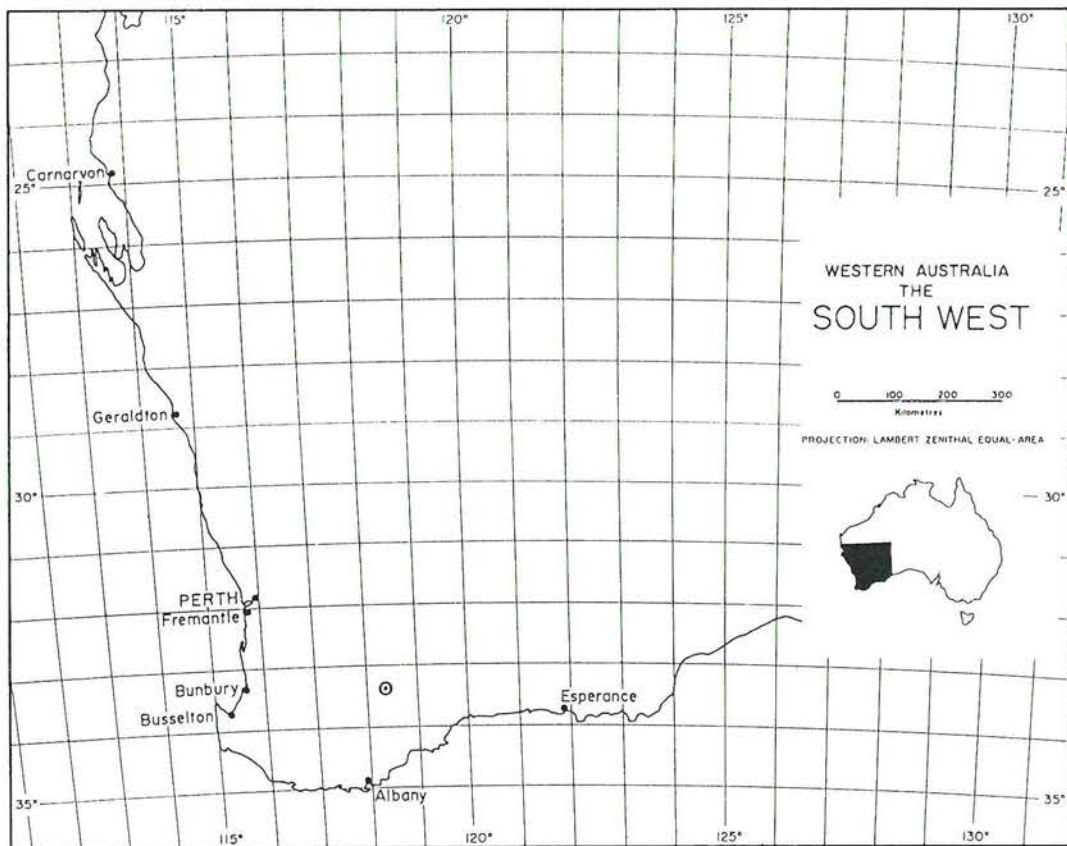


Figure 3. Distribution of *Nemcia effusa*.

Flowering period. Plants were in full flower in late August 1992. That year was, however, an exceptional one in which flowering of many wheatbelt taxa was delayed for up to 4 weeks by an extended, cold, wet winter. Under the circumstances, it is considered that the flowering period for *N. effusa* in an average season would be July-August.

Conservation status. Poorly known, CALM Priority 1. Only two plants of *N. effusa* were observed at the type locality, and the species has not been observed elsewhere during surveys of remnant vegetation (by the second author) of c. 71,250 km² of the southern wheatbelt region of Western Australia. This suggests that *N. effusa* is not widespread or common.

Etymology. The specific epithet *effusa*, from Latin, means straggling or spreading, and refers to the growth habit of this species.

Affinity. *Nemcia* is an endemic genus in south-west Western Australia with c. 40 known species, ten of which are undescribed. One, *N. lehmannii*, is presumed extinct, and several others, including *N. effusa*, are very restricted in distribution. The following key includes all known species, the undescribed ones being referred to by a specimen number.

The present circumscription of *Nemcia* was defined by Crisp & Weston (1987), who resurrected the genus from synonymy and expanded it to include species of *Gastrolobium* with obviously trifid bracts, no fluoro-acetate, erect calyx-lobes and condensed inflorescences. Members of the latter group all have two ovules, whereas in its original circumscription, *Nemcia* was characterised by more than two ovules (Domin 1923). *Nemcia* is now diagnosed by its distinctive inflorescence which is a condensed raceme (often head-like or cluster-like) with a short stout rachis and few flowers (generally <10). The bracts are distinctive too, being obviously trifid, silky, caducous, and often enclosing the inflorescence in a globular bud. *Nemcia* is closely related to *Brachysema* and *Jansonia*. Both differ in having large, red and/or green bird-pollinated flowers, and *Brachysema* has more openly racemose inflorescences. However, a recent cladistic analysis by Crisp (in press) has indicated that *Jansonia* and *Nemcia* may be congeneric. Both have the same type of inflorescence, and some species of *Nemcia* have large red bird-pollinated flowers, viz. *N. leakeana*, *N. rubra* and *N. vestita*, albeit with different floral morphology from *Jansonia*. If these genera are combined, then the name *Jansonia* has priority. The first author is carrying out molecular studies in an attempt to resolve the relationship of these genera; meanwhile it seems sensible to maintain their distinction. A key to all the genera of the tribe Mirbelieae, including *Nemcia*, is provided by Crisp & Taylor (1993).

No attempt has been made to resolve relationships within *Nemcia*, and no infrageneric classification exists. *Nemcia effusa* belongs to the group with two ovules, yet is very distinctive. It shows some similarity to *N. stipularis* by virtue of the conspicuous stipules and narrow leaves, but the latter differs in having erect, linear (c. 2 mm wide) leaves with craspedodromous venation which lacks deeply impressed areoles beneath, and the stipules are longer (up to 12 mm). *Nemcia punctata* also is similar, especially in having impressed-punctate leaf venation below, but its leaves are much shorter (c. 5 mm long) and more strongly recurved, and there are no stipules.

Key to *Nemcia* species

- 1 Flowers large (calyx >8 mm long); petals predominantly red (bird-pollinated group) 2
- 2 Expanded leaves velvety beneath, with recurved margins *N. vestita* Domin
- 2* Expanded leaves glabrate beneath, never velvety; margins not or scarcely recurved 3
- 3 Calyx villous, tube ventricose at base; wing- and keel-petals ovate; leaves narrowly oblong-elliptic, scarcely emarginate *N. rubra* Crisp
- 3* Calyx sericeous, tube not ventricose; wing- and keel-petals elliptic; leaves elliptic to broad-elliptic, emarginate to obtusate *N. leakeana* (Drumm.) Crisp
- 1* Flowers smaller (calyx <8 mm long); petals predominantly yellow or orange with dark red markings 4
- 4 Leaves all alternate, scattered, ovate; flowers 1-3 per axil; calyx 7-8 mm long *N. sp.* [Crisp 6727]
- 4* Leaves opposite (a few may be alternate), whorled or very crowded, variously shaped; flowers usually >3 per axillary unit inflorescence; calyx usually <7 mm long 5
- 5 Stipules absent or minute 6
- 6 Leaves spreading from the base, 10-15 mm long; apex with a long pungent point *N. epacridoides* (Meissner) Crisp
- 6* Leaves very crowded, appressed (at least at the base), imbricate, <7 mm long 7
- 7 Leaves opposite and decussate *N. sp.* [Crisp 6496]
- 7* Leaves ternate (in whorls of three) 8
- 8 Venation of lower leaf surface very thick, with areoles reduced to pin-pricks; leaves broadest towards the base *N. punctata* (Turcz.) Crisp
- 8* Venation of lower leaf surface openly reticulate; leaves broadest near or slightly below the middle *N. carinata* Crisp
- 5* Stipules present, setaceous or filiform, usually conspicuous 9
- 9 Calyx indumentum two-toned: at least partly golden or rust-coloured; with silver hairs present also, especially towards base of calyx 10
- 10 Leaves cuneate or obtusate, or narrowly so 11
- 11 Leaves with margins recurved, especially towards the bilobed apex; upper surface darker than lower, rugose with obscure venation; lower surface silver- or grey-sericeous and scarcely glabrescent *N. emarginata* (S. Moore) Crisp
- 11* Leaf margins not recurved, sometimes undulate or crisped; surfaces similar in colour, glabrous or soon glabrescent; venation conspicuous, finely reticulate 12
- 12 Leaves obtusate, trilobed; middle lobe equal to or longer than lateral lobes *N. sp.* [*Oxylobium dilatatum* Benth. var. *trilobum* Meissner]

- 12*Leaves obovate or cuneate, usually narrow, never
obtrullate; apex variable, rarely sub-trilobed and if so,
middle lobe much shorter than lateral lobes 13
- 13 Leaf margins crisped *N. sp.* [Patrick 458]
- 13*Leaf margins not crisped 14
- 14 Leaves 30-50 x 10-20 mm; margins evenly tapered to
the base; apex very variable: emarginate, bilobed,
trilobed, rounded, obtuse or acuminate *N. dilatata* (Benth.) Crisp
- 14*Leaves 5-40 x 3-11 mm, mostly <25 x 8 mm;
rounded at base; apex strictly emarginate *N. retusa* (Lindley) Domin
- 10*Leaves orbicular, ovate, elliptic, oblong, or narrowly so 15
- 15 Inflorescences, young stems and sometimes young
leaves densely hirsute with rust-coloured hairs *N. pyramidalis* (T. Moore) Crisp
- 15*Inflorescences and young stems sericeous to villous,
usually silvery 16
- 16 Leaves silvery sericeous below, very tardily glabrescent 17
- 17 Leaf-margins strongly recurved to revolute; flowers
4-6 per unit-inflorescence; leaves narrowly
oblong-elliptic *N. sp.* [Keighery, PERTH 01041126]
- 17*Leaf-margins not or slightly recurved; flowers
8-many per unit-inflorescence; leaf shape very
variable: orbicular, ovate, oblong, elliptic, or
narrowly so *N. coriacea* (Smith) Domin
- 16*Leaves glabrate below 18
- 18 Unit-inflorescences forming dense clusters in
leaf-axils, or on very short (1-2 mm) peduncles;
leaves narrow-oblong to -cuneate *N. retusa* (Lindley) Domin
- 18*Axillary unit-inflorescences head-like on distinct
peduncles 5-15 mm long; leaves obovate-oblong,
usually broad *N. crenulata* (Turcz.) Crisp
- 9* Calyx indumentum uniform in colour: usually silver,
sometimes buff-coloured 19
- 19 Leaves with 3 or more prickly lobes or teeth 20
- 20 At least some leaves per specimen with >3 prickly
lobes or teeth; leaf margins recurved; lamina tending
to undulate between depressed main veins *N. ilicifolia* (Meissner) Crisp
- 20*All leaves with 3 pungent apices; leaf margins not
recurved; lamina somewhat plicate (folded up
lengthwise) but otherwise flat *N. tricuspidata* (Meissner) Crisp
- 19*Leaves either entire or with not more than 1 pungent apex 21
- 21 Leaves crowded, linear, 1-2 mm broad; stipules
5-10 mm long *N. stipularis* (Meissner) Crisp
- 21*Leaves scarcely or not crowded, >2 mm broad;
stipules <5 mm long 22

- 22 Leaves pungent, usually tapered to base; standard
<12 mm broad; ovules 2 23
- 23 Leaves in whorls of 3 or 4, broadest at or below middle,
tapered to apex *N. acuta* (Benth.) Domin
- 23*Leaves decussate or ternate (rarely some scattered),
broadest at or above middle, tapered to base
(in *N. obovata*, tapered to apex as well) 24
- 24 Leaves bluish, cuneate, more or less truncate at apex *N. sp.*
- 24*Leaves sometimes glaucous but never bluish, variously shaped 25
- 25 Leaves obtusate or rhombic, plicate;
flowers per axillary unit-inflorescence 6 or more *N. obovata* (Benth.) Crisp
- 25*Leaves obovate, spatulate or linear, usually
plicate but occasionally nearly flat; flowers per
unit-inflorescence 1-4 26
- 26 Leaves yellow-green, not glaucous, strongly plicate,
falcate overall and hooked at apex; accessory
shoots in axils *N. sp.* [*Cranfield* 4538; may in fact be *plicata*]
- 26*Leaves more or less glaucous, strongly to
scarcely plicate, straight or scarcely falcate
and with the apex at most slightly recurved;
accessory shoots lacking 27
- 27 Calyx 4.5-7 mm long, sericeous to villous or
tomentose; leaves obovate or spatulate,
often narrow, sometimes nearly flat;
broadest part of leaf 3-9 mm from midrib
to margin *N. plicata* (Turcz.) Crisp [syn. *N. pauciflora* (C. Gardner) Crisp]
- 27*Calyx 3.8-4.2 mm long, more or less
sericeous; leaves linear, strongly plicate;
broadest part of leaf 1.9-4.1 mm from
midrib to margin *N. sp.* [*Groves*, PERTH 01052160]
- 22*Leaves not pungent, or if tending to be so,
then leaves rounded at base (*N. hookeri*) or
ovules >3 and standard 14-15 mm broad (*N. reticulata*) 28
- 28 Branchlets angular with yellow ribs; leaves as
broad as long or broader, rounded-cuneate
or -rhombic, orbicular or ovate *N. sp.* [*Braine*, PERTH 01052683]
- 28*Branchlets terete, or if angular, then lacking
distinct yellow ribs; leaves longer than broad,
variously shaped 29
- 29 Venation of lower leaf surface very thick, with
areoles reduced to pin-pricks *N. effusa* Crisp & Mollemans
- 29*Venation of lower leaf surface openly reticulate 30
- 30 Ovules 4 or more; calyx >5 mm long 31
- 31 Standard 14-15 mm broad; indumentum
tomentose (to villous); leaves glabrate; leaves
basically obovate, broad to linear *N. reticulata* (Meissner) Domin

- 31*Standard 10-12 mm broad; indumentum sericeous or calyces tending to be villous; leaves more or less persistently sericeous beneath; leaves basically ovate to elliptic (rarely obovate), broad to linear 32
- 32 Nodes per axillary unit-inflorescence 2, buds 4 (terminal inflorescences may have more nodes and buds); calyces sericeous; leaves narrow to linear *N. capitata* (Benth.) Domin
- 32*Nodes per axillary unit-inflorescence 3(4), buds 6(8); calyces villous; leaves usually broad, rarely narrow *N. axillaris* (Meissner) Crisp
- 30*Ovules 2; calyx not >5 mm long 33
- 33 Leaves neither plicate nor with apices recurved; outlines oblong-elliptic (or tending to ovate, obovate, orbicular or slightly cuneate); apices rounded or truncate, usually retuse, never pungent 33
- 34 Mature leaves sericeous beneath *N. lehmannii* (Meissner) Crisp
- 34*Mature leaves glabrate 35
- 35 Leaves cordate, 11-35 x 8-22 mm; calyces somewhat villous *N. sp.* [Dilkes, PERTH 01052705]
- 35*Leaves rounded at base, 6-22 x 4-14 mm; calyces sericeous *N. pulchella* (Turcz.) Crisp
- 33*Leaves either plicate or with apices manifestly recurved, usually both; outlines cuneate, spatulate or oblong-elliptic (the last with recurved, semi-pungent apices) 36
- 36 Leaves rounded at base, oblong-elliptic to somewhat cuneate in outline, apices semi-pungent *N. hookeri* (Meissner) Crisp
- 36*Leaves with tapered or cuneate bases; outlines cuneate or spatulate; apices mucronate but not pungent 37
- 37 Leaves spatulate, ternate *N. spathulata* (Benth.) Crisp
- 37*Leaves cuneate, decussate *N. sp. A* (aff. *hookeri*)

Notes on key

1. *Contra* Crisp & Weston (1987: 124), *Nemcia brownii* (Meissner) Crisp should be treated as *Gastrolobium brownii* Meissner. Its morphology is closer to *Gastrolobium*, and it contains fluoroacetate (T. Aplin, unpublished data; S. Patrick, pers. comm.).

2. Similarly, *N. truncata* (Benth.) Crisp proves on closer investigation to have the bracts, inflorescence and calyx of *Gastrolobium*, whence it came and to which it now should return, as *G. truncata* Benth. We do not know whether it has been tested for toxicity.

3. *N. pauciflora* is probably a taxonomic synonym of *N. plicata*, although this question needs more investigation.
4. *N. sp.* A aff. *hookeri* is variable and needs detailed study. It includes the types of *Gastrolobium stowardii* S. Moore, *G. spathulatum* Benth. var. *latifolium* Benth. and *G. tricuspidatum* Meissner var. *subinerme* Meissner, any of which may be distinct species.

Acknowledgements

The second author made the only collection, the type, of *Nemcia effusa* while employed on contract by the Western Australian Department of Agriculture to survey remnant vegetation in the southern wheatbelt, a project funded by the Australian National Parks and Wildlife Service "Save the Bush" Program. F. Mollemans wishes to acknowledge the funding body.

References

- Crisp, M.D. (in press). Evolution of bird-pollination in some Australian legumes (Fabaceae). In P. Eggleton & R. Vane-Wright (eds) "Phylogenetics and Ecology." (Academic Press: London.)
- Crisp, M.D. & Taylor, J.M. (1993). *Chorizema*. Australian Plants 17: 100-126.
- Crisp, M.D. & Weston, P.H. (1987). Cladistics and legume systematics, with an analysis of the Bossiaceae, Brongniartiacae and Mirbeliaceae. In C.H. Stirton (ed.) "Advances in Legumes Systematics, Part 3," pp. 65-130. (Royal Botanic Gardens: Kew.)
- Domin, K. (1923). *Nemcia*, a new genus of the Leguminosae. Preslia 2: 26-31.