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A synopsis of the genus *Pteronia* (Compositae: Astereae) in Namibia including the resurrection of *Pteronia quadrifaria*

Herta Kolberg[1] & Michiel van Slageren[2]

Summary. An account of species of *Pteronia* occurring in Namibia is presented, together with an updated key. New material of *P. quadrifaria* Dinter confirmed that this is a valid species and not a synonym of *P. lucilioides* DC., and is resurrected. Species descriptions, global and Namibian distributions, conservation status, habitat and phenological information are presented for the 24 species recognised from Namibia. During this study it became clear that many species names have not been properly typified. As a result arguments are presented for the choice of 10 lectotypes, eight of which concern *Pteronia* with five of these for names of species accepted here. Four species of *Pteronia* that have been described from or are at least partly occurring in Namibia but that are no longer considered part of this genus are briefly discussed.

Key Words. Asteraceae, key, lectotypes, southern Africa, taxonomy.

Introduction

During fieldwork for the Millennium Seed Bank Project in the south-west of Namibia in 2009, a species of *Pteronia* L. (Compositae: Astereae) unknown to the first author was found on a white quartz hill near the small town of Aus. After initial investigation and consultation with various specialists, it seemed that this plant represented a new species of the genus. Since the only published account of the Compositae for the flora of Namibia (Merxmüller 1967) is outdated and needs to be revised, it was decided to combine description of this presumed new species with a synopsis and updated key of *Pteronia* in the country. During this process it was discovered that the new material was in fact of the little known species *P. quadrifaria* Dinter, which had been considered a synonym of *P. lucilioides* DC. by subsequent authors (Merxmüller 1955, 1967).

Pteronia is a mainly southern African genus comprising about 70 species. Within the tribe Astereae it is presently placed in the subtribe Solidagininae O. Hoffm. (which consists mostly of North American genera) and in turn into the *Engleria* group (Bremer 1994) of that subtribe. *Pteronia* is considered to be isolated among the African Compositae (Bremer 1994) and most closely related to *Engleria* O. Hoffm., which, however, has radiate capitula compared to the discoid capitula of *Pteronia*. Morphologically there exists similarity with *Chrysocoma* L. and other African genera of the *Amellus* group in the subtribe Asterinae (Bremer 1994). Characters that are rare in the Astereae are found in *Pteronia*, like a spiny habit, opposite and succulent leaves and beaked achenes (Bremer 1994). Bremer (1994) concluded that the placement of *Pteronia* in the subtribe Solidagininae must be considered very uncertain, a point of view discussed below. Pending a revision of the entire genus, its subtribal affiliation cannot be completely ascertained (Bremer 1994). The most recent comprehensive treatment (Hutchinson & Phillips 1917) is, however, over 90 years old. In Namibia, the genus was last revised by Merxmüller in 1967. Since then, one additional species (*P. anisata* B. Nord.) has been recorded for Namibia (Merxmüller & Roessler 1984). Hutchinson & Phillips's (1917) revision included the 63 species accepted by de Candolle (1836) that were grouped in three sections (sect. *Scepinia* (Neck. ex Cass.) DC., sect. *Pachyderis* (Cass.) DC., sect. *Pterophorus* (Vaill. ex Adans.) DC.). However, they regarded the difference between *Scepinia* and *Pachyderis* as indistinct and the distinguishing character of *Pterophorus* (a monospecific section according to Harvey 1865) as "trifling". The 61 species that they accepted were then divided into four new sections based mainly on leaf indumentum:

I. *Incanae* — leaves with woolly, whitish indumentum
II. *Papillatae* — entire leaf surface papillous or scabrid
III. *Ciliatae* — leaves ciliate mostly on margins or keels but otherwise glabrous
IV. *Glabratae* — leaves entirely glabrous and mostly fleshy

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[1] Millennium Seed Bank Partnership, National Botanical Research Institute, Windhoek, Namibia. email: hertak@nbri.org.na.
[2] Millennium Seed Bank Partnership, Seed Conservation Department, Royal Botanic Gardens, Kew, Wakehurst Place, Ardingly, nr Haywards Heath, West Sussex, RH17 6TN, UK. e-mail: m.vanslageren@kew.org

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Merxmüller (1952) noted that this division is not at all consistent and that, for instance, *Pteronia divaricata* Less. and *P. lucilioides* DC., which both were classified by Hutchinson & Phillips as belonging to sect. *Papillatae*, differ very much in the degree to which the leaves are papillate. On the other hand, *P. unguiculata* S. Moore and *P. mucronata* DC., which belong to sect. *Glabratae* and sect. *Ciliatae* respectively, are related more closely than would be expected from them being in different sections. (It should be noted that as section *Ciliatae* included the type of the genus, *P. camphorata* (L.) L., this name was not validly published and should be section *Pteronia*.) In view of this we have not further considered these sections.

Materials and Methods

Herbarium specimens at K, NBG, SAM and WIND and high resolution images of herbarium specimens at the herbaria of B, BM, BOL, G, G-DC, GH, GRA, HAL, HBG, K, KW, LD, M, NBG, NY, P, PRE, S, SAM, TUB, W (including W-Rchb.), Z were studied. Except for type specimens, these were Namibian specimens only because this study was not intended to be a full revision of the genus but merely a summary of what is known about *Pteronia* in Namibia. Species descriptions and the key were compiled from a combination of published information and characters observed on Namibian herbarium specimens. Global distributions were obtained from literature and online databases, mainly the African Plant Database (http://www.ville-ge.ch/musinfo/bd/cjb/africa/index.php?langue=an). The habitat of species was derived from a summary of Namibian specimen label information only. Altitude ranges therefore are only those stated in the collection information and relate to Namibia only. Where there is only one altitude, either only one specimen contained altitude information or several specimens had exactly the same altitude. Similarly, phenology of species is that derived from Namibian specimens only. This obviously has limitations as the number of specimens with the required information may be very few. The information given should not be seen as applicable to the species in their entire distribution range. Conservation status was assessed using *Guidelines for Using the IUCN Red List Categories and Criteria. Version 10* (IUCN 2013). Since mainly Namibian specimens were examined and no fieldwork was done in other countries besides Namibia, the assessments were made for Namibia only (for the endemic species this is obviously a global assessment). Where available, South African assessments were obtained from literature and online databases (SANBI 2011).

Pteronia *L.* (Linnaeus 1763b: 1176; 1764: 414); de Candolle (1836: 356); Harvey in Harvey & Sonder (1865: 95); Hutchinson & Phillips (1917: 278); Merxmüller (1967: 150); Bremer (1994: 408). Type: *Pteronia camphorata* (L.) L.

Shrubs with opposite, alternate or fascicled *leaves*, these glabrous, papillate, glandular or with conspicuous bristles and entire margins. *Capitula* solitary or corymbose, homogamous, discoid. *Receptacle* convex, flat or concave, often honeycombed, fimbriate, setate or lacerate. *Phyllaries* multiseriate, gradate, imbricate; apex often mucronate; margins often membranous. *Florets* hermaphrodite; *corollas* tubular, actinomorphic, 5-lobed, yellow or white. *Stamens* 5. *Anthers* more or less obtuse, rarely acute, at base. *Style* with two deltoid-tipped, flattened branches bearing short to long stigmatic papillae near apex. *Achenes* obconical, obovoid or turbinate, sometimes flattened or contracted into a neck apically, glabrous, glandular or variously hairy; *carpopodium* a slightly asymmetrical ring with a narrow interruption. *Pappus* of unequal, scabrid to barbellate setae, sometimes basally connate or scale-like and broadened.

Diagnostic characters of *Pteronia* are discoid capitula with multiseriate, gradate and densely imbricate phyllaries, bi- or multiseriate pappus consisting of bristles only (some bristles may be scale-like broadened at the base), achenes that are sometimes narrowed into an apical neck and mostly opposite leaves (Bremer 1994; Herman *et al.* 2000).

Updated key to *Pteronia* in Namibia

1. Leaves with dense, white to grey, felty indumentum 2
   Leaves glabrous, papillose, glandular, bristly, ciliate or pectinate but never felty 4
2. Phyllaries acute, midrib broader towards apex but never mucronate; pappus yellowish-brown . . . **9. P. glauca**
   Phyllaries mucronate; pappus maroon-purple or yellow 3
3. Pappus maroon-purple; phyllaries reddish-purple . . . . . **7. P. eenii**
   Pappus yellow; phyllaries yellow . . . . . **2. P. acuta**
4. Leaves, at least those at branch tips surrounding capitula, ciliate to pectinate or bristly, papillose or glandular on surface 5
   Leaves glabrous to minutely puberulous or minutely papillate, may appear warty when dried 13
5. Leaf margins ciliate-pectinate or bristly, leaf surface glabrous, bristly or minutely papillose, leaves alternate, alternate to almost opposite, opposite or decussate 6

Leaf margins not ciliate-pectinate or bristly, leaf surface papillose, with short bristles or glandular, leaves opposite 10
6. Only leaves at branch tips surrounding capitula, with ciliate margins, others glabrous to glabrescent . . **17. P. pomonae**
All leaf margins ciliate 7
7. Capitula 20 × 7 mm at most, narrowly cylindrical, apex of phyllaries truncate. 8
Capitula to 35 × 25 mm, ovoid-obconical, apex of phyllaries rounded or acute. 9
8. Pappus yellowish; apex of phyllaries truncate, mucronulate, not reflexed; leaves opposite, connate at base, clustered along branches; achenes densely villous . . . . . **13. P. mucronata**
Pappus maroon-purple; apex of phyllaries reflexed, margins undulate; leaves sessile, imbricate-decussate, mostly only towards branch tips, lower leaves soon dehiscent; achenes glandular . . . . . **18. P. quadrifaria**
9. Leaves alternate, margins white bristly, to 20 × 5 mm; phyllaries coriaceous, apex rounded; achenes glandular . . . . . **14. P. onobromoides**
Leaves opposite, margins and keel ciliate, 8 – 10 × 4 mm; phyllaries membranous, apex acute; achenes glabrous or with a few hairs on ribs. . . . . **24. P. viscosa**
10. Phyllaries yellowish, without membranous margin; capitula acute in bud . . . . . **12. P. lucilioides**
Phyllaries with conspicuous membranous margin; capitula not markedly acute in bud 11
11. Capitula ovoid-campanulate, 15 – 20 × 6 – 10 mm; phyllaries ovate to orbicular; leaves sessile, oblong to narrowly ovate, apex rounded, 5 – 15 × 4 mm . . . . . **10. P. inflexa**
Capitula cylindrical, 15 × 3 – 9 mm; phyllaries lanceolate-oblong, linear-oblong, the outer sometimes ovate; leaves narrowing into a short petiole, obovate, spathulate or orbicular, 10 – 25 × 8 – 15 mm 12
12. Capitula solitary on branch tips, 10 – 12-flowered . . . . . **16. P. polygalifolia**
Capitula in terminal corymbs, each 5-flowered . . . . . **6. P. divaricata**
13. Leaves alternate (may be almost opposite in *P. acuminata*). 14
Leaves opposite 18
14. Phyllaries rounded, ciliate . . . . . **4. P. ciliata**
Phyllaries tapering, acute, not ciliate 15
15. Phyllaries with thickened, glandular midrib; apex somewhat acute, reflexed; margins narrow, white. . . . . **19. P. rangei**
Phyllaries without thickened midrib but tapering into a sharp, long tip or if a shorter tip, then margins broad membranous 16
16. Phyllaries broadly lanceolate; midrib narrow, brown; remainder of phyllaries transparent, membranous; apex acute . . . . . **20. P. scariosa**
Phyllaries lanceolate; broad opaque centre brownish; margins membranous, transparent 17
17. Leaves to 7 × 1.5 mm, oblong to narrowly obovate, narrowed into base, apex rounded, glabrous; phyllaries glabrous, lanceolate, 2 – 3 mm long acuminate, keeled; inner phyllaries to 2.5 mm broad; margins membranous; young branches white . . . . . **11. P. leucoclada**
Leaves to 20 × 8 mm, ovate-obovate to oblanceolate, sessile or short petiolate, apex acute; phyllaries silvery-grey puberulous, linear to lanceolate, apex acutely mucronate; inner phyllaries to 2 mm broad; margins membranous; young branches white, grey or brown . . . . . **1. P. acuminata**
18. More than one capitulum at branch tips . . . . . **15. P. paniculata**
Capitula solitary at branch tips 19
19. Opposite leaves connate at base but not sheathing, the connecting part persistent when leaves dehisce, forming rows of spinules on branches . . . . . **22. P. spinulosa**
Leaves without clear connecting part and therefore without spinules on branches (leaf bases of *P. sordida* may be slightly fused, but do no form spinules after dehiscence) 20
20. Capitula cylindrical, to 8 mm in diam.; phyllaries yellowish 21
Capitula broadly ovoid or obconical, to 15 mm in diam.; phyllaries brownish or dark green. 23
21. Phyllaries broadest at apex, somewhat constricted below apex, mucronate, bright yellow; apex truncate, often somewhat emarginate . . . . . **23. P. unguiculata**
Phyllaries obovate-roundish, mucronulate or without mucro 22
22. Phyllaries obovate to linear-oblong, very shortly mucronate, pale yellow; margins lacerate . . **5. P. cylindracea**
Phyllaries ovate, not mucronate, green with dark brown, glandular, longitudinal lines; margins hyaline . . . . . **3. P. anisata**
23. Phyllaries broadly ovate to almost circular; apex rounded; margins narrow membranous all around . . . **8. P. glabrata**
Phyllaries oblong-oblanceolate; apex acute to obtuse; margins membranous laterally only . . . . **21. P. sordida**

Synopsis of Namibian species

1. Pteronia acuminata *DC.* (de Candolle 1836: 361); Harvey in Harvey & Sonder (1865: 105); Hutchinson & Phillips (1917: 315); Merxmüller (1967: 154); Merxmüller & Roessler (1984: 89); Herman (2003: 276). Type: South Africa, Northern Cape Prov., between Zack and Gariep rivers, 11 Sept. 1811, *Burchell* 1587 (holotype G-DC!; isotypes GH-00011510!, K-000273485!, PRE).

Dicoma ramosissima Klatt (1896: 843); Dinter (1921: 186). Syntypes: Namibia, Aob bei Keetmanshoop, 1892, *Fleck* 116 (GH-00006368 (fragment), Z-000003295!); Namibia, Aob bei Keetmanshoop, 1891, *Fenchel* 51 (GH-00006368 (fragment), Z-000003294!).

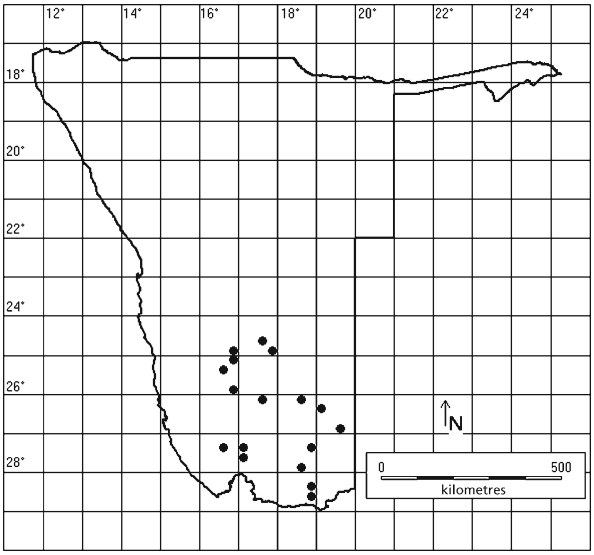
Pteronia carnosa Muschl. (Muschler 1911a: 97), **nom. illegit.**, non *P. carnosa* Muschl. (Muschler 1911a: 95). Type: Namibia, Bezirk des Damaralandes, Berseba, *Schultze* 406 (lectotype K-000273487!, selected here).

Pteronia feddeana Muschl. (Muschler 1911b: 384, "*Feddeana*"), Range (1935: 275, "Feddeana"), *nom. nov.* for *P. carnosa* Muschl. (1911a: 97). Type: as for *Pteronia carnosa* Muschl. (1911a: 97).

Shrub, 30 – 80 cm high, to 100 cm in diam. *Stems* terete, glabrous, brittle, bark white, grey to pale brown. *Leaves* alternate to almost opposite, somewhat succulent, glaucous, glabrous, flat, ovate-obovate to oblanceolate, 10 – 20 × 5 – 8 mm; apex acute, mucronate; base cuneate, sessile or short petiolate. *Capitula* solitary, terminal, elongate-ovoid, to 25 mm long; apex pointed in bud. *Receptacle* slightly convex, honeycombed, to 4 mm in diam. *Phyllaries* multiseriate, gradate, outer broadly lanceolate, to 4 × 2 mm, inner linear to narrowly lanceolate, to 20 × 2 mm, silvery-grey puberulous; apex acutely mucronate; margins membranous. *Florets* 10 – 12; *corollas* to 2 mm long, yellow; lobes lanceolate, subacute. *Achenes* compressed, densely appressed villous, to 5 mm long. *Pappus* to 15 mm long, golden to straw-coloured.

DISTRIBUTION. Africa: Botswana, Namibia, South Africa. Map 1.

SPECIMENS EXAMINED.[1] **NAMIBIA.** Hardap Region, Maltahöhe Distr.: Grootfonteiner Fläche, 29 Sept. 1959, *Giess* 2286 (PRE, WIND!); 3 km from Maltahöhe on road to Helmeringhausen, on road verge, 19 Oct. 1987, *Kolberg & Maggs* HK94 (PRE, WIND!); Farm Grootfontein (Lisbon) MAL 9, 5 Sept. 1972, *Merxmüller & Giess* 28243 (M, PRE, WIND!); Farm Lisbon MAL 9, 8 April 1980, *Müller* 1274 (WIND!); Farm Naudaus/Duwisib MAL 76/84, 20 May 1956, *Volk* 12557 (WIND!); Mariental Distr.: Farm Haribes GIB 18/19, 30 May 1963, *Leippert* 4734 (WIND!); Torro plain at station Ebenerde, 10 Sept. 1963, *Merxmüller*; *Giess* 3602 (M, PRE, WIND!); Karas Region, Bethanie Distr.: N of Helmeringhausen, 7 Sept. 2002, *Burke* 02074 (WIND!); Farm Goais 21 km (13.3 miles) S of Helmeringhausen, 19 May 1965, *Giess* 8811 (PRE, WIND!); Farm Huns, BET 106, 12 Aug. 1976, *Giess* 14601 (PRE, WIND!); Karasburg Distr.: Klein Karas, 7 Aug. 1923, *Dinter* 4862 (SAM, Z!); Farm Windkraal WAR 34, 20 May 1963, *Giess, Volk & Bleissner* 7120 (WIND!); Farm Vrede, S of house, 10 Sept. 2005, *Kolberg & Tholkes* HK1688 (K!, WIND!); Farm Mooiplaats WAR 97, 6 Oct. 1977, *Merxmüller & Giess* 32521 (M, PRE, WIND!); Klein Karas, April 1890, *Schäfer* 222 (K!); Farm Rishon, Karasberge, Graberberg. Near Post Office tower, 23 June 1989, *Van Wyk* 8696 (PRE, WIND!); Keetmanshoop Distr.: 7 miles W of Aroab on road to Keetmanshoop, 3 May 1955, *De Winter* 3381 (PRE, WIND!); Aob bei Keetmanshoop, 1891, *Fenchel* 51 (*Dicoma ramosissima* syntype GH-00006368 (fragment), Z-000003294!); Aob bei Keetmanshoop, 1892, *Fleck* 116 (*Dicoma ramosissima* syntype GH-00006368 (fragment), Z-000003295!); Berseba Reservat KEE 170, 13 May 1963, *Giess, Volk & Bleissner* 6864 (WIND!); Berseba, Aug. 1905, *Schultze* 406 (*P. feddeana* lectotype K-000273487!); Farm Springboktrek South 223, on S end of pan N of homestead, 12 Feb. 1997, *Strohbach, Kubirske & Sheuyange* 2786 (WIND!); Farm Springboktrek South 223, on S end of pan N of homestead, 18 Feb. 1998, *Strohbach* 3650 (WIND!); Lüderitz Distr.: State land, Nuobrivier, Huns Mts, S of Farm Uitsig LU 82, 9 June 1976, *Giess & Müller* 14327 (WIND!); State land, 3 km S of border of Farm Uitsig, 25 Sept. 1976, *Giess & Wendt* 14702 (WIND!); Aus – Rosh Pinah road in



Map 1. Known distribution of *Pteronia acuminata* in Namibia.

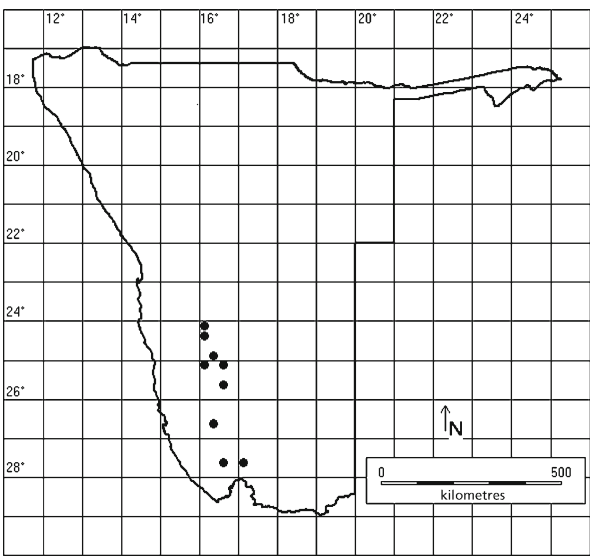
[1] With Specimens Examined we list inspected sheets from herbaria (marked with "!") and other herbaria which are known to hold a duplicate specimen.

washes near Aus Marble turnoff, 29 Sept. 2004, *Mannheimer, Maggs-Kölling & Loots* CM2656 (WIND!).
SOUTH AFRICA. Northern Cape Prov., Carnarvon Distr.: at Karel Kriegers grave, between the Karmee Bergen [Kareeberge] and Buffels Bout, between Zack and Gariep rivers, 11 Sept. 1811, *Burchell* 1587 (*P. acuminata* holotype G-DC!; isotypes GH-00011510, K-00273485!, PRE).
HABITAT. Mostly on calcareous soil in dwarf shrub savanna; altitude c. 950 m; summer or summer-winter transition rainfall areas of south-central and south-eastern Namibia (Map 1).
CONSERVATION STATUS. In Namibia this species does not qualify for any of the threatened categories according to the five IUCN criteria. No threats to populations were identified and both the estimated Extent Of Occurrence (EOO) and Area Of Occupancy (AOO) of this fairly widespread species are well above the maxima for the threatened categories (IUCN 2001, 2013). The Namibian status therefore is Least Concern (LC). The South African threat status is cited as LC (SANBI 2011).
PHENOLOGY. Flowering: April to October. Fruiting: August to February.
NOTES. Muschler (1911a) caused some confusion by publishing two species under the name *Pteronia carnosa*, one of which (1911a: 97) he corrected in the same year to *P. feddeana* Muschl. (Muschler 1911b). Hutchinson & Phillips (1917) considered this taxon to be conspecific with *P. acuminata*, which was followed by more recent authors (Merxmüller 1952, 1967; Herman 2003), an opinion with which we agree. The second *P. carnosa* (Muschler 1911a: 95), an illegitimate name, is now considered a synonym of *P. glabrata* L. f. (q.v.). In his description of *P. carnosa* Muschler (1911a: 97) cited *Schultze* 406 and *von Trotha* 129. *Schultze* 406 was traced in K, but the *von Trotha* specimen was not found in any herbarium where it was likely to be housed. Muschler worked from B and the specimen was most likely preserved there and destroyed during World War II. *Schultze* 406 at K is therefore selected as the lectotype.

2. Pteronia acuta *Muschl.* (Muschler 1911a: 99); Hutchinson & Phillips (1917: 286); Dinter (1926: 131); Range (1935: 275); Merxmüller (1967: 154); Merxmüller & Roessler (1984: 89); Herman (2003: 276). Type: Namibia, Bezirk des Damaralandes, Chamis, Sept. 1905, *Schultze* 433 (lectotype K-00273412!, selected here).

Shrub, 15 – 50 cm high, to 30 cm in diam. *Stems* appressed pubescent, pale grey, *Leaves* opposite, usually clustered along stems, pale grey, densely felty to woolly pubescent, linear to linear-lanceolate, trigonous, 4 – 10 × 1 – 1.5 mm; apex acute to subobtuse; connate at base. *Capitula* solitary, terminal, campanulate-obconic, 10 – 15 × 10 mm, surrounded at its base by short leaves; apex rounded in bud. *Phyllaries* multiseriate, gradate, outer linear lanceolate, to 5 mm long, inner linear-oblong, to 10 mm long, yellow, woolly pubescent on outside; apex acute, mucronate; margins very narrow, membranous. *Florets* c. 14; *corollas* to 6 mm long, pubescent on outside, yellow; lobes linear, subacute; tube ribbed at base. *Achenes* obconic, long sericeous, c. 3 mm long. *Pappus* setae barbellate, to 7 mm long, yellow to straw-coloured.

DISTRIBUTION. Africa: Namibia, South Africa. Map 2.
SPECIMENS EXAMINED. NAMIBIA. Hardap Region, Maltahöhe Distr.: Naukluft plateau, 6 July 1993, *Bridgeford* 142 (WIND!); Naukluft, Kapokvlakte, on plateau, Nov. 1995, *Bridgeford* 95360 (WIND!); Naukluft Plateau, Kapokvlakte, March 1994, *Günster* 9452 (WIND!); Farm Zaris MAL 103, at peak of pass, 4 Sept. 1972, *Merxmüller & Giess* 28202 (M, WIND!); Farm Rooiberg-Süd, 1935, *Steyn* 9960 (WIND!); Farm Wereldend 115, Helmeringhausen, 17 May 1956, *Volk* 12798 (WIND!); Karas Region, Bethanie Distr.: Farm Aruab 23, plains on S part, April 1998, *Miller* MIL1/065 (WIND!); Lüderitz Distr.: Farm Witpütz Nord LU 22, 1 km E of police station, 30 Sept. 1975, *Giess* 13779 (WIND!); State land 3 km S of border to Farm Uitsig, 26 Sept. 1976, *Giess & Wendt* 14706 (WIND!); Farm Plateau LU 38, not far from the farmhouse, Aus, 8 Sept. 1963, *Kräusel & Wiss* 2016 (WIND!); Chamis, Sept. 1905, *Schultze* 433 (lectotype K-00273412!).
HABITAT. Rocky areas in desert-dwarf shrub savanna transition zone; c. 1600 m.
CONSERVATION STATUS. In Namibia this species is evaluated LC (IUCN 2001, 2013) as no threats to populations could be identified and the estimated EOO and AOO are above those that would qualify it for the



Map 2. Known distribution of *Pteronia acuta* in Namibia.

threatened categories. The South African threat status is recorded as Least Concern (LC) (SANBI 2011).

PHENOLOGY. Flowering: March to September. Fruiting: July to November.

NOTES. In Namibia the species occurs along the south-western escarpment between the coastal Namib desert and the inland plateau (Map 2) and prefers altitudes above 1500 m. When capitula are immature and the yellowish pappus is not visible, this species could be mistaken for *Pteronia eenii* but the known distributions of these species do not overlap (compare Maps 2 and 7).

In his description Muschler (1911a: 100) cited *Schultze* 433 and *von Trotha* 147a, both with exactly the same locality and date. *Schultze* 433 could be traced in K, but *von Trotha* 147a was not found in any herbarium where it was likely to be housed. As Muschler worked from B any original specimen was most likely destroyed during World War II. *Schultze* 433 at K is thus selected as the lectotype.

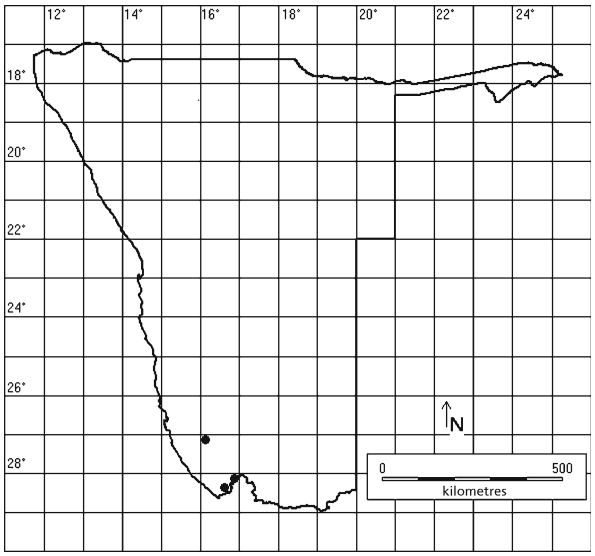
3. Pteronia anisata *B. Nord.* (Nordenstam 1971: 10); Roessler & Merxmüller (1982: 192); Merxmüller & Roessler (1984: 89); Herman (2003: 276). Type: South Africa, Northern Cape Prov., Namaqualand Div., Richtersveld, Cornell's Kop, N slopes, 31 Oct. 1962, *Nordenstam* 1694 (holotype S-G-5140!; isotypes M-0104529!, PRE, SAM).

Aromatic *shrub*, to 40 cm high. *Stems* brown when young, dark grey when older. *Leaves* opposite, clustered along stems, succulent, green with brown resin dots, surface minutely papillate, terete to trigonous to somewhat flattened, to 20 × 1.5 mm, base somewhat clasping with tuft of hairs in axil. *Capitula* solitary, terminal, cylindrical, to 10 × 6 mm; apex rounded in bud. *Receptacle* with lobed and fringed scales. *Phyllaries* 3 – 4-seriate, ovate to oblong, outer 3 × 1.5 mm, inner 10 × 4 mm, green with dark, resinous striations; apex obtuse; margins membranous white. *Florets* to 8; *corollas* 7 – 7.5 mm long, yellow; lobes triangular with few resin glands on outside; tube puberulous at base. *Achenes* obovoid with constricted apical neck, densely off-white sericeous, 3 – 4 × 2 mm. *Pappus* of numerous setae united into an annulus at base, 5 – 6 mm long, pale red-brown. Fig. 1.

DISTRIBUTION. Africa: Namibia, South Africa. Map 3.

SPECIMENS EXAMINED. NAMIBIA. Karas Region, Lüderitz Distr.: Lorelei, fountain with "waterfall" in dune area

Fig. 1. *Pteronia anisata* showing the bead-like veins on the phyllaries. PHOTO: H. KOLBERG.



Map 3. Known distribution of *Pteronia anisata* in Namibia.

(NE), 12 Oct. 2007, *Kolberg & Tholkes* HK2381 (K!, WIND!); Sperrgebiet. Daberas Vley, W of dunes, E of Schakalsberge, 16 Oct. 2008, *Kolberg & Tholkes* HK2660 (K!, WIND!); Sperrgebiet, 19 km S of Obib Fountain, track turns E and leads over hill, 24 Oct. 2008, *Kolberg & Tholkes* HK2695 (K!, WIND!); Diamond Area 1, Tsaus Spinnenberg, Oct. 1977, *Wendt* 15/3 (M, WIND!). **SOUTH AFRICA.** Northern Cape Prov.: Namaqualand Div., Richtersveld, Cornell's Kop (near Annisfontein), N slopes, 31 Oct. 1962, *Nordenstam* 1694 (holotype S (coll. S-G-5140)!; isotypes M-0104529!, PRE, SAM).

HABITAT. On blue dolomite or white quartz outcrops in steppe dominated by succulent species; 200 – 450 m.

CONSERVATION STATUS. *Pteronia anisata* occurs in the protected diamond mining area of Namibia where human access and activities are strictly controlled and limited. Mining occurs in very restricted localities and mostly along the coast, outside the distribution area of this species. Although the estimated EOO and AOO would qualify the species as VU under criterion B, the required two criteria of fragmentation, decline or fluctuation of populations have not been observed. Similarly, under criterion D2 *P. anisata* is known from fewer than 5 localities but this is not coupled with the required plausible future threat. The species therefore is evaluated as LC in Namibia (IUCN 2001, 2013), but the scarcity of herbarium specimens and information from recent collections suggests that it is rare in Namibia.

PHENOLOGY. Flowering: October.

ETYMOLOGY. The specific epithet denotes that the plant smells of aniseed (Nordenstam 1971).

NOTES. Described in 1971 from the Richtersveld in South Africa (Nordenstam 1971), Roessler & Merxmüller (1982) reported that this species was also recorded in southern Namibia in 1977, some 170 km NNW of the type locality. Only 30 years later the species was found again just north of the Namibian – South African border (Map 3 & Fig. 1). The known distribution of *Pteronia anisata* suggests that it is near-endemic to Namibia and rare.

4. Pteronia ciliata *Thunb.* (Thunberg 1800: 144); de Candolle (1836: 359); Harvey in Harvey & Sonder (1865: 102); Hutchinson & Phillips (1917: 317); Merxmüller (1967: 155); Merxmüller & Roessler (1984: 89); Herman (2003: 277). Type: South Africa, Western Cape Prov., Cape of Good Hope, *Thunberg* s.n. (holotype UPS-THUNB; isotype S-07-7225!).

Pteronia ciliata Thunb. var. ["β"] *subtrigona* DC. (de Candolle 1836: 360). Type: South Africa, Western Cape Prov., Olifantrivier, W. F., *Drège* s.n. [5664 — see Notes] (holotype G-DC; isotypes HBG-505132!, P-027011!).

Pteronia ciliata Thunb. var. *ecklonis* Harv. (Harvey in Harvey & Sonder 1865: 102, "*Ecklonis*"). Type: South Africa, Northern Cape Prov., Namaqualand, Nov. 1837, *Ecklon & Zeyher* 238 (holotype PRE). — see Notes.

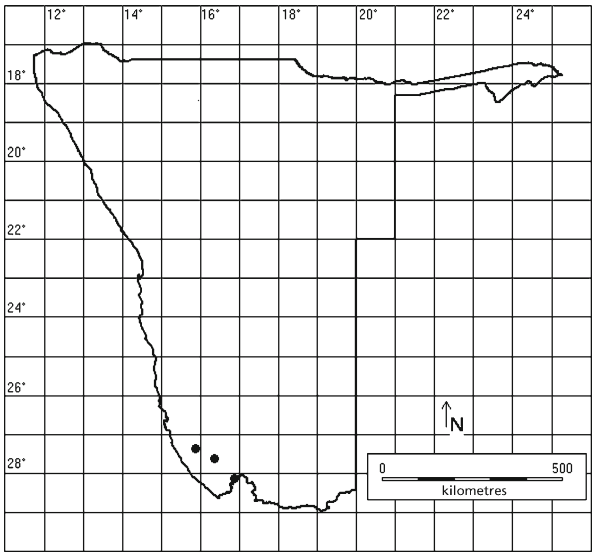
Pteronia ciliata Thunb. var. *thunbergii* Harv. (Harvey in Harvey & Sonder 1865: 102, "*Thunbergii*"), **nom. illegit.** Type: as for *P. ciliata*.

Pteronia turbinata DC. (de Candolle 1836: 362); Harvey in Harvey & Sonder (1865: 106). Type: South Africa, Northern Cape Prov., Gariep, Klein-Namaqualand, *Drège* s.n. [5665] (holotype G-DC; isotypes HAL-0110987, HBG-505180!, NY-00232710!, P-027281!, P-027282!, P-027283, P-027284!, PRE, W-Rchb-1889-0278258!, W-0008809!). — see Notes.

Shrub, to 100 cm high. *Stems* slightly puberulous, pale grey. *Leaves* alternate, clustered on stem tips, succulent, glabrous, linear, grooved above, keeled below, to 10 × 1 – 1.5 mm; apex obtuse, base cuneate; pleasant aroma. *Capitula* solitary, terminal, ovoid-cylindrical, to 15 – 20 × 5 – 7 mm; apex contracted. *Receptacle* concave, fimbriate-honeycombed. *Phyllaries* 7 – 10-seriate, gradate, ovate to linear, to 12 mm long, straw-coloured; midrib faint; apex obtuse; margins distinctly ciliate. *Florets* to 15; *corollas* to 10 mm long, glabrous, greenish-yellow; lobes linear-lanceolate, acute. *Achenes* obconic, long sericeous, to 3 mm long. *Pappus* multiseriate, to 5 mm long, brownish-yellow.

DISTRIBUTION. Africa: Namibia, South Africa. Map 4.

SPECIMENS EXAMINED. NAMIBIA. Karas Region, Lüderitz Distr.: Diamond Area 1, Klinghardts Mts, 2 Jan. 1996, *Burke* 96134 (WIND!); Sperrgebiet. N Klinghardts Mts, 5 Aug. 2001, *Klaassen & Bartsch* EK484 (WIND!); First level section above the E foot of Rooiberg (Sperrgebiet), 4 Sept. 1992, *Kubirske, Strohbach & Swart* 42 (WIND!); Sperrgebiet. Klinghardts Mts, 11 Sept.



Map 4. Known distribution of *Pteronia ciliata* in Namibia.

2005, *Kwembeya* EKw64 (WIND!); Granite outcrops on road to Obib, SW of Farm Spitzkop, 1 Sept. 1963, *Merxmüller & Giess* 3424 (M, WIND!); W edge of Obib Mts Hill 3 km N of Obibwasser, 2 Sept. 1977, *Merxmüller & Giess* 32382 (M, WIND!); Gabusib, Feb. 1992, *Strohbach* 73 (WIND!). **SOUTH AFRICA.** Northern Cape Prov.: Klein Namaqualand, between Kaus, Natvoet and Doornpoort [III B 6], 17 Oct. 1830, *Drège* s.n.; Namaqualand, *Drège* s.n. [5665] (*P. turbinata* holotype G-DC; isotypes HAL-0110987, HBG-505180!, NY-00232710!, P-027281!, P-027282!, P-027283, P-027284!, PRE, W-Rchb-1889-0278258!, W-0008809!); Namaqualand, Nov. 1837, *Ecklon & Zeyher* 238 (*P. ciliata* var. *ecklonis* holotype PRE, possible isotype HBG-505133!); Western Cape Prov.: Ebenezar, on rocky, dry karoo hills [III E a 4], Nov. 1833, *Drège* s.n. (K-000273499!); Olifantrivier, W. F., *Drège* s.n. [5664] (*P. ciliata* var. *subtrigona* holotype G-DC; isotypes HBG-505132!, P-027011!); Cape of Good Hope, *Thunberg* s.n. (*P. ciliata* holotype UPS-THUNB; isotype S-07-7225!).

HABITAT. Rocky slopes in steppe dominated by succulent species; 700 – 800 m.

CONSERVATION STATUS. The estimated EOO and AOO of this species falls below the threshold value for the VU category, but two of the additional criteria of population fragmentation, decline or fluctuation could not be satisfied. Also under criterion D2, although the number of localities is ≤5, qualifying for VU, a plausible future threat could not be established. The Namibian threat status thus is LC (IUCN 2001, 2013). Present data, however, suggest that the species is rare in Namibia. The South African threat status is LC (SANBI 2011).

PHENOLOGY. Flowering: February to September. Fruiting: August.

VERNACULAR NAME. Biltongbos (Afrikaans, South Africa).

NOTES. Only a few collections have been made in Namibia (and all of these since 1963) but *Pteronia ciliata* is more widespread in South Africa.

The locality cited with the holotype (as well as in de Candolle's *Prodromus*) of *Pteronia ciliata* var. *subtrigona* is only "Olifantrivier", a river that runs through the Western Cape Province in South Africa. Similar to *P. latisquama* (a synonym of the accepted *P. glauca*, see below) it is problematic to ascertain which collections are possibly isotypes of the varietal name. Critical evaluation includes P-027011, as it carries not only "5664" on the label, but has another small label attached, which we believe may well present locality details, date, and coding in Drège's handwriting. It reads (in our annotated version): "/11 33 [as in: November 1833] [unreadable location name] bei Ebenezar [which is on the Olifant River], — 300 [as in: meters altitude] (III, E, a)". (The coding system of III, E, a, etc. is explained below in the notes at *P. glauca*.). More locality details are provided by, for example HBG-505132 (annotated with "*Pteronia ciliata β. DC.*" and considered an isotype): "Ebenezar, auf steinigen, trockenen (karrooartigen) Hügeln" with the locality code "III E a 4" added. Other specimens marked similarly "5664" but in clearly different handwriting are P-027010 and P-027013. A similar problem is a possible isotype (HBG-505133) of *P. ciliata* var. *ecklonis*: this is reportedly an Ecklon & Zeyher collection, but does not show no. 238 and while considered an (iso-) type this is with a question mark.

The locality cited for the type of *Pteronia turbinata* is the one recorded on the holotype, but more precise locations are found on some of the isotypes, such as "zwischen Kaus, Natvoet und Doornpoort [III B 6]", *Drège* s.n. (HAL-0110987, HBG-505180, W-0008809); but "17 / 10 30 (= 17 Oct. 1830), Kaus" (in what looks like Drège's handwriting) and the number 5665 are on isotype P-027281. The date mentioned on K-00273497 is 1837, which could refer to a collection or herbarium dispatch or receipt date. This specimen, as well as K-00273498 does not refer to the number "5665" and both are not considered to be isotypes.

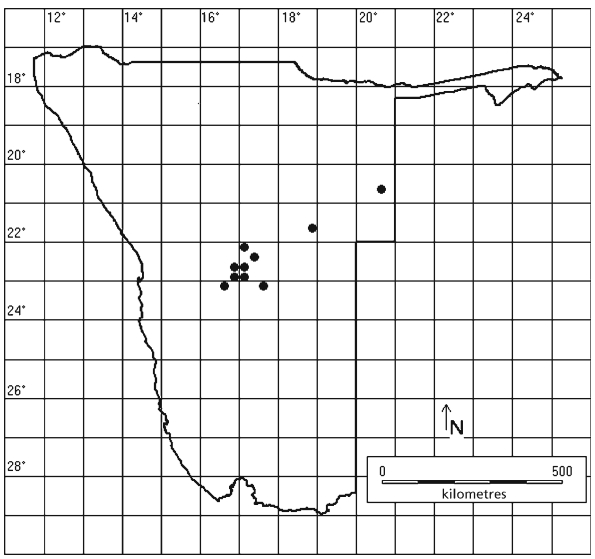
It should be noted that here and elsewhere for taxa described in the *Prodromus* by Auguste Pyramus de Candolle, we follow the information provided to us by Dr Fernand Jacquemoud in Geneva who kindly inspected the type material.

5. Pteronia cylindracea *DC.* (de Candolle 1836: 363); Harvey in Harvey & Sonder (1865: 106); Hutchinson & Phillips (1917: 313); Dinter (1926: 132); Range (1935: 275); Merxmüller (1967: 155); Merxmüller & Roessler (1984: 89); Herman (2003: 277). Type: South Africa, Northern Cape Prov., at Buffels Bout, Carnarvon Div., 12 Sept. 1811, *Burchell* 1603 (holotype G-DC; isotypes K-00273480!, P-027025!, PRE).

Shrub to 40 cm high. *Stems* glabrous, older branches very woody, bark grey. *Leaves* opposite, mostly clustered along stems, glabrous, linear, flat or grooved above, to 10 × 1 mm; apex hooked; base sometimes eared and clasping stem but not connate. *Capitula* solitary, terminal, cylindrical, 20 – 25 × 6 mm; apex acute. *Phyllaries* multiseriate, gradate, obovate to linear-oblong, 5 – 15 × 4 mm; pale, matte yellow, chaffy-membranous; apex obtuse, mucronulate; margins lacerate. *Florets* c. 5; *corollas* to 15 mm long, exserted up to 8 mm from phyllaries, yellow; lobes linear lanceolate, subacute; tube widening in upper half. *Achenes* narrowly obconic, long sericeous and densely sessile glandular, c. 5 mm long. *Pappus* multiseriate, to 10 mm long, straw-coloured.

DISTRIBUTION. Africa: Botswana, Namibia, South Africa. Map 5.

SPECIMENS EXAMINED. NAMIBIA. Khomas Region, Windhoek Distr.: Khomas Hochland, 14 May 2000, *Burke* 00090 (WIND!); Farm Harris (22), 32 km (20 miles) SW of Windhoek, 2 March 1955, *De Winter* 2546 (WIND!); Farm Mahonda WIN 39, 12 July 1963, *Giess* 7628 (WIND!); Farm Bergland, 12 Aug. 1963, *Merxmüller & Giess* 3593 (M, PRE, WIND!); Verdwaal (REH 41), 29 Aug. 1972, *Merxmüller & Giess* 28087 (M, PRE, WIND!); Farm Naos, 1 Jan. 1953, *Schwerdtfeger* 4227 (WIND!); Avis, Windhoek, 6 May 1964, *Seydel* 4016 (WIND!); Avis, the mountain parallel with the Avis R., at power lines, 26 July 1966, *Seydel* 4432 (WIND!); Farm Haris, on S part of pan, 18 April 2000, *Strohbach* BS5102 (WIND!); Farm Lichtenstein Süd, dissected plain towards SW corner, 29 April 2002, *Strohbach* BS5586 (WIND!); Grazing plots. Neudam Experimental Farm, 23 June 1959, *Van Vuuren* 595 (PRE, WIND!); Omaheke Region, Gobabis Distr.: Farm Sturmfeld, Steinhausen, 19 June 1958, *Schwerdtfeger* 4081 (WIND!); Farm Sturmfeld GO 252, Steinhausen, 14 July 1962, *Toelken* 156 (WIND!); Otjinene Distr.: among rocks and stones on banks of Eiseb omuramba, 54 miles from Gam, on way to Windhoek, 31 Aug. 1955, *Story* 5340 (PRE, WIND!); Otjozondjupa Region, Okahandja Distr.: Farm Osema OK 63, 25 June 1965, *Giess* 9006 (WIND!). **SOUTH AFRICA.** Northern Cape Prov.: at Buffels Bout, Carnarvon Div., 12 Sept. 1811, *Burchell* 1603 (holotype G-DC; isotypes K-00273480!, P-027025!, PRE).



Map 5. Known distribution of *Pteronia cylindracea* in Namibia.

HABITAT. Plains, slopes, dry river banks in high altitude shrubland and woodland on Kalahari sands; 1800 – 2100 m.

CONSERVATION STATUS. This relatively widespread species has an estimated EOO and AOO well above the thresholds for the threatened categories. No small or restricted populations or decline in population size could be identified to satisfy any of the five criteria according to IUCN (2013). The Namibian conservation status is therefore LC (IUCN 2001). SANBI (2011) lists the South African threat status as LC.

PHENOLOGY. Flowering: January to August. Fruiting: July to December.

NOTES. It is very difficult to separate this species from the closely related *Pteronia unguiculata*, and Merxmüller (1967) remarked that there is an overlap in the phyllary characters whereas it is these same characters that are used to separate these species. The specimens at WIND could mainly be separated on a phytogeographical basis: *P. cylindracea* occurs in Kalahari sand in the north and east of the country while *P. unguiculata* is found on rocky, mountainous terrain at higher altitudes in the south-west and west of Namibia. In general, capitula of *P. unguiculata* are smaller and obtuse in bud, while those of *P. cylindracea* are acute; the phyllaries of *P. unguiculata* are shiny, bright yellow while those of *P. cylindracea* are a matte, pale yellow. More material is needed from the north-east of Namibia and neighbouring areas in Botswana and South Africa to arrive at a more definite conclusion on the relationship between these two species, taking it outside the scope of this study.

6. Pteronia divaricata *Less.* (Lessing 1832: 196); de Candolle (1836: 357); Harvey in Harvey & Sonder (1865: 99); Hutchinson & Phillips (1917: 296); Merxmüller (1967: 155); Merxmüller & Roessler (1984: 89); Herman (2003: 277). Type: South Africa, Western Cape Prov., Cape of Good Hope, *s.coll.* s.n. (lectotype LINN 982.1!, selected by Lowrey in Jarvis & Turland (1998: 358) for *Chrysocoma oppositifolia*).

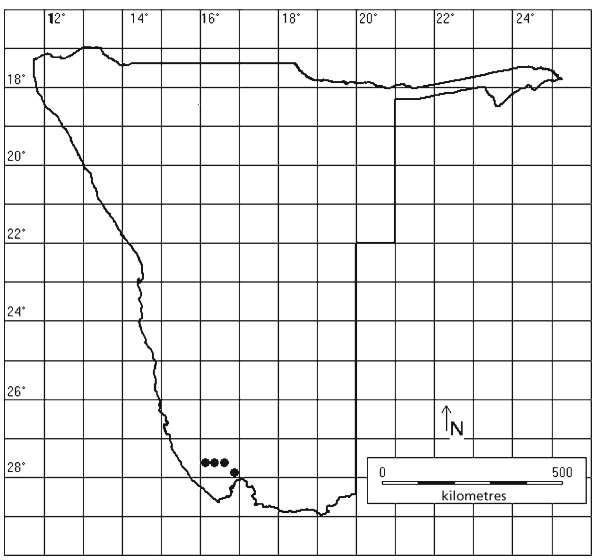
Eupatorium divaricatum P. J. Bergius (1767: 229); Thunberg (1800: 142), **nom. illegit.** — see Notes.

Chrysocoma oppositifolia L. (Linnaeus 1760: 18, 1763a: 97, 1763b: 1177), non *P. oppositifolia* L. Type: as for *P. divaricata* — see Notes.

Shrub to 150 cm high. *Stems* puberulous, tan to grey. *Leaves* opposite, grey-green, surface puberulous-papillate and glandular, flat, obovate to orbicular, 25 × 15 mm; apex subacute to obtuse; base narrowed into a short petiole; aromatic. *Capitula* in terminal corymbs, turbinate, 15 × 3 – 4 mm; apex acute in bud. *Phyllaries* multiseriate, outer broadly ovate, 2.5 mm long, inner linear-oblong, 8 mm long, green to yellow, glabrous; apex obtuse or subacute; margins membranous. *Florets* c. 5, sweetish smell; *corollas* 10 – 12 mm long, white to cream; lobes linear-lanceolate, acute; tube gradually widening, ribbed and pubescent below middle. *Achenes* obovoid, compressed, sparingly pubescent, densely glandular, c. 5 mm long. *Pappus* multiseriate, setae connate at base, barbellate, 8 – 10 mm long, whitish or with reddish tint.

DISTRIBUTION. Africa: Namibia, South Africa. Map 6.

SPECIMENS EXAMINED. NAMIBIA. Karas Region, Lüderitz Distr.: S of Lüderitz. Diamond Area No. 1. Mountain slopes E of Aurus Peak in Aurus Mts, 11 Aug. 2001, *Burgoyne* 8431b (PRE, WIND!); Rooiberg, Sperrgebiet, 28 Sept. 1996, *Burke* 96231 (WIND!); About 34 km (21 miles) N of Lorelei Copper Mine on the road to Witputz, 15 Sept. 1958, *De Winter & Giess* 6408 (PRE, WIND!); Farm Namuskluft LU 88, 8 km E of Rosh Pinah, 13 Aug. 1976, *Giess* 14614 (PRE, WIND!); Ai-Ais conservation area, McMillan's Pass, 2 km SE of summit of pass along track, 12 Oct. 2005, *Kolberg & Tholkes* HK1697 (K!, WIND!); Namuskluft LU 88, 13 Sept. 1963, *Kräusel & Wiss* 2071 (WIND!); 35 km N of Rosh Pinah (road to Aus), 2 – 4 km W of road, 29 Oct. 1983, *Leuenberger, Raus & Schiers* 3248 (WIND!); Base of Rooiberg, 29 Sept. 1996, *Mannheimer & Mannheimer* 420 (WIND!); Aurus basin, 10 Aug. 2001, *Mannheimer* CM1558 (WIND!); Namuskluft, hill behind hall, 11 Sept. 2002, *Mannheimer* CM2256 (WIND!); Farm Witputz, 26 Aug. 1963, *Merxmüller & Giess* 3196 (M, PRE, WIND); Namuskluft LUS 88, 9.5 km E of Rosh Pinah, 18 Sept. 1972, *Merxmüller & Giess* 28533 (M, PRE, WIND!); Farm Zebrafontein LUS 87, 2 April 1972, *Merxmüller & Giess* 28783 (M, WIND!); Aurus Mts, quartz koppie 7 km N of the mountains, 20 Sept. 1977, *Merxmüller & Giess* 32189 (M, PRE, WIND!); Farm Zebrafontein, 22 Sept. 1981, *Müller & Horn* 1564 (WIND!); Sperrgebiet, Aurus Mts, main complex around the beacon, 6 Sept. 1992, *Oliver* 10148 (WIND!); Numaeis, S of Witputz, Sept. 1957, *Rusch* 4678 (WIND!); Sperrgebiet, N end of Aurus Mts on W side, 8 Aug. 2001, *Smook* 11255 (PRE, WIND!); Sperrgebiet, N end of Aurus Mts on W side, 8 Aug. 2001, *Smook* 11263 (PRE, WIND!); Sperrgebiet, SE side of Aurus Mts just below the highest peak, 11 Aug. 2001, *Smook* 11341 (PRE, WIND!); Rooiberg, 30 Sept. 1992, *Strohbach* 299 (WIND!); Rosh Pinah, Namuskluft 88, 31 Aug. 1989, *Van Wyk* 8827 (PRE, WIND!); Rosh Pinah. Namuskluft 88, 31 Aug. 1989, *Van Wyk* 8828 (PRE, WIND!). **SOUTH AFRICA.** Western Cape Prov.: Groenkloof, *Drège* s.n. (P-027029!, PRE); Cape of Good Hope, *s.coll.*, s.n. (lectotype LINN 982.1!).



Map 6. Known distribution of *Pteronia divaricata* in Namibia.

HABITAT. Rocky slopes and sandy plains in steppe dominated by succulent species; 600 – 1000 m.

CONSERVATION STATUS. The Namibian distribution of this species is restricted with an estimated EOO below the threshold for the VU category under criterion B1 but two of the additional criteria of population fragmentation, decline or fluctuation could not be identified (IUCN 2013). The Namibian threat status therefore is LC (IUCN 2001). The South African threat status is also recorded as LC (SANBI 2011).

PHENOLOGY. Flowering: April to November. Fruiting: August to December.

VERNACULAR NAMES. Geelknopbos, spalkpenbos (Afrikaans, South Africa).

NOTES. This species is restricted to the extreme southwest of Namibia (Map 6), which receives winter rainfall. It is more common in the Northern and Western Cape Provinces of South Africa. According to Merxmüller (1967) *Pteronia divaricata* is reported to have yellow florets in South Africa whereas in Namibia only white to cream florets have been seen.

The type of *Pteronia divaricata* is the same as that of the Linnaean *Chrysocoma oppositifolia*. The latter name was first mentioned in the thesis of Jacob Printz, *Plantae rariores Africanæ*, which appeared in 1760 and where the *Chrysocoma* is cited under no. 49 on p. 18. The thesis is also part of Linnaeus's *Amoenitates academicæ*, vol. 6 (1763a: 97), and this version is cited as "*Amæn. acad.* 6. *afr.* 49" in the second edition of *Species plantarum*, vol. 2 (1763b: 1177). Both works by Linnaeus are cited by Bergius when he renamed the

species *Eupatorium divaricatum* (1767: 229), but such a complete renaming is superfluous and illegitimate. Lessing's recombination into *Pteronia* using the epithet *divaricata* created, however, a legitimate replacement name (as *P. oppositifolia* would be blocked by the earlier Linnaean name); its author citation should ascribe to Lessing only.

7. Pteronia eenii *S. Moore* (1902: 325); Hutchinson & Phillips (1917: 287); Merxmüller (1952: 124; 1967: 155); Merxmüller & Roessler (1984: 89); Herman (2003: 277). Type: Namibia, Damaraland, 1879, *Een* s.n. (holotype BM-000903813!).

Dicoma seitziana Dinter (1921: 186, "*Seitziana*"). Type: Namibia, Otjozondjupa Region, Grootfontein Distr., Gemsbocklaagte, Aug. 1911, *Dinter* 3007 (lectotype P-00138958!, selected here; isolectotypes four sheets in SAM: SAM-0071799-1to -4, all "!") — see Notes.

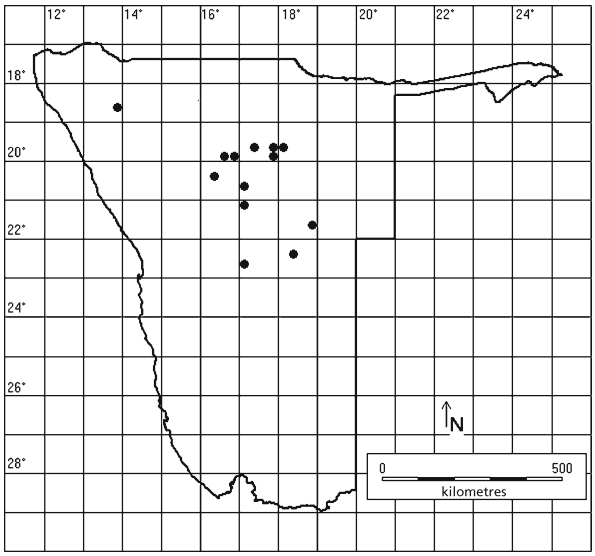
Pteronia feldtmanniana Dinter ex Merxm. (Merxmüller 1955: 79), **nom. nud.** — see Notes.

Shrub to 50 cm high and in diam. *Stems* white to grey woolly. *Leaves* opposite, densely grey, woolly-felty, linear, 8 – 15 × 1 – 1.5 mm; apex obtuse; base slightly eared and clasping stem. *Capitula* solitary, terminal, about half its length enclosed by leaves, obconic, 13 – 15 × 8 mm; apex acute in bud. *Receptacle* flat. *Phyllaries* multiseriate, gradate, lanceolate to linear-lanceolate, 4 – 11 mm long, red-brown, maroon to purple, woolly outside; apex acute, sharply mucronate; margins narrowly transparent-maroon membranous. *Florets* c. 15; *corollas* 7 mm long, glabrous, yellow; lobes linear-lanceolate, subacute, tubes constricted and ribbed at base. *Achenes* turbinate, 3.5 mm long, densely appressed white villous. *Pappus* multiseriate, to 11 mm long, purple to maroon. Fig. 2.

DISTRIBUTION. Africa: endemic to Namibia. Map 7.

SPECIMENS EXAMINED. NAMIBIA. Unknown Region and Distr.: Damaraland, 1879, *Een* s.n. (*P. eenii* holotype BM-000903813!); Khomas Region, Windhoek Distr.: Windhoek and surroundings, 9 March 1988, *Bohlmann* 88/ 83 (WIND!); Kunene Region, Opuwo Distr.: 9.5 km NW of Ombombo (former road D3708?), 13 June 2007, *Kolberg & Tholkes* HK2327 (K!, WIND!); Outjo Distr.: Farm Westland, cattle post to Elf, 21 Oct. 1998, *Hobohm* HOB1 28 (WIND!); Omaheke Region,

Fig. 2. Capitulum of *Pteronia eenii* near Grootfontein. PHOTO: H. KOLBERG.



Map 7. Known distribution of *Pteronia eenii* in Namibia.

VERNACULAR NAME. |haurus (Khoekhoegowab, Namibia).
USES. Forage.
NOTES. Until recently this Namibian endemic has been recorded only in the central and north-eastern parts of the country (Map 7). In 2007 the first author found a small population of *Pteronia eenii* in north-western Namibia on calcareous soil typical for the species (Fig. 2). This disjunct distribution could be explained by either under-collection in the north-central areas of Namibia or by the species' preference of calcrete substrates, which are not prevalent in the far central north, or over-utilisation of the species as a forage (reported on several herbarium specimens), thus reducing population sizes.

The holotype of *Pteronia seitziana* was destroyed in Berlin, and we designate the P collection, indicated as "isotype" (unlike the collections in SAM) as the lectotype. The name *P. feldtmanniana* used by Dinter on his collections was listed by Merxmüller (1955: 79) as synonymous with *P. eenii*, but was never validly published.

Gobabis Distr.: On S banks of Epukiro, Sturmfeld, 20 June 1953, *Schwerdtfeger* 4115 (WIND!); Otjozondjupa Region, Grootfontein Distr.: Gemsbocklaagte, Aug. 1911, *Dinter* 3007 (*Dicoma seitziana* lectotype P-00138958!, isolectotypes SAM-0071799-1 to -4!); Grootfontein, 11 July 1934, *Dinter* 7691 (HBG!, WIND!); Farm Rietfontein GR 344, 26 April 1963, *Giess, Volk & Bleissner* 6523 (PRE, WIND!); Farm Achlam GR 583, on Elefantenberg, 12 Nov. 1976, *Giess* 14790 (PRE, WIND!); Rietfontein GR 344, 3 km (2 miles) towards Waterberg, 27 April 1963, *Kers* 356 (WIND!); 6.5 km N of Grootfontein on road to Rundu, 23 June 2008, *Kolberg & Tholkes* HK2633 (K!, WIND!); Near Meteor, Grootfontein, 19 July 1965, *Leach & Bayliss* 13013 (PRE, WIND!); Farm Nassau, 11 Jan. 1953, *Walter & Walter* 963 (WIND!); Otjiwarongo Distr.: Omatjenne Experimental Farm, 1940, *Pfeiffer* s.n. (WIND-34113!); Okosongomingo, June 1940, *Volk* 3062 (WIND!).
HABITAT. Rocky calcrete areas in shrubland or woodland; 1400 – 1700 m.
CONSERVATION STATUS. Evaluated by the 1994 IUCN criteria as Lower Risk — Least Concern (LRlc) by Craven & Loots (2002). Using more recent criteria (IUCN 2001) the evaluation is found here to be Least Concern (LC) since the estimated EOO and AOO are well above the maxima for the threatened categories and none of the other criteria A to E are met (IUCN 2013). The possible reduction in population size (see Notes) would also be below the thresholds for the threatened categories (at least 30% for VU) resulting in an evaluation of LC. Since this is a Namibian endemic species, this is a global conservation status (IUCN 2001).
PHENOLOGY. Flowering: January to July. Fruiting: June to November.

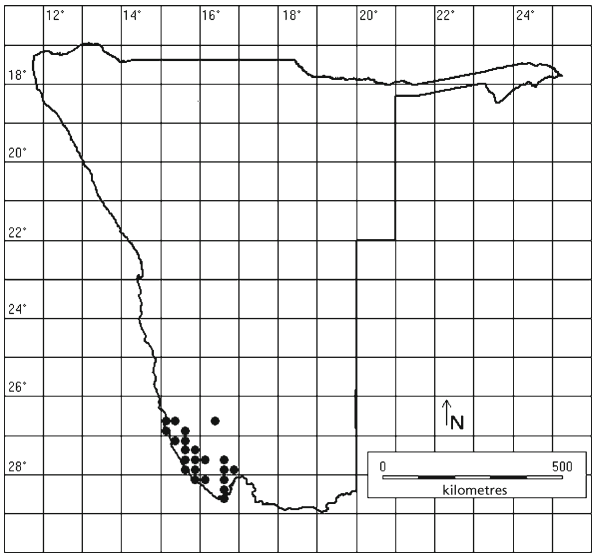
8. Pteronia glabrata *L. f.* (Linnaeus filius 1782: 356); Thunberg (1800: 143); de Candolle (1836: 362); Harvey in Harvey & Sonder (1865: 102); Hutchinson & Phillips (1917: 321); Dinter (1926: 132, 1931: 167); Range (1935: 275); Merxmüller (1952: 125; 1967: 155); Merxmüller & Roessler (1984: 89); Herman (2003: 277). Type: South Africa, Western Cape Prov., Cape of Good Hope, *Thunberg* s.n. (holotype UPS-THUNB; isotype S-G-5142!).
Pteronia sesuviifolia DC. (de Candolle 1836: 360). Type: South Africa, Western Cape Prov., Kaus, R III, 1835, *Drège* s.n. [2778] (G-DC no. G-00322348! lectotype, selected here). — see Notes.
Pteronia carnosa Muschl. (Muschler 1911a: 95). Type: Namibia, Lüderitzbucht, 4 Jan. 1910, *Dinter* 1026 (holotype B†; isotype SAM-71804-0!).
Pteronia succulenta auct. non Thunb.: Dinter (1926: 132); Range (1935: 276).
Pteronia anisata Dinter ex Merxm. (Merxmüller 1952: 124 – 125), **nom. nud.**
Pteronia glabrata L. f. var. *succulenta* (Thunb.) Merxm. (Merxmüller 1952: 125), quoad specim. cit., non quoad basionym.

Shrub, to 60 cm tall. *Stems* glabrous, brittle, initially with pale grey bark, brown when older. *Leaves* opposite, fleshy to succulent, glabrous, flattish, oblong to linear, boat-shaped, adaxially grooved, to 10 – 25 × 3 – 5 mm, apex rounded, base clasping stem but not connate with opposite leaf. *Capitula* solitary, terminal, ovoid, to 20 × 15 mm, apex rounded in bud. *Receptacle* honeycombed and slightly fimbriate. *Phyllaries* multiseriate, gradate, broadly ovate to orbiculate, 3 – 15 mm long, glabrous, papery and brown at maturity, opaque central part green with red margin; apex rounded; margins narrow, membranous all round.

Florets 7 – 12; *corollas* c. 10 mm long, glabrous, bright yellow; lobes linear-lanceolate, subacute; tube gradually widening. *Achenes* turbinate, densely appressed villous, to 3.5 mm long. *Pappus* multiseriate, setae connate at base, to 10 mm long, brown to golden. Fig. 3.

DISTRIBUTION. Africa: Namibia, South Africa. Map 8.

SPECIMENS EXAMINED. NAMIBIA. Karas Region, Lüderitz Distr.: Diamond Area No 1, Chamnaub Inselberg, NE of Boegoeberg, 28 Aug. 2002, *Bartsch, Loots & Mannheimer* SB930 (WIND!); Diamond Area 1, Namitsis Inselberg, about 30 km S of Klinghardts, 1 Sept. 2002, *Bartsch, Loots & Mannheimer* SB956 (WIND!); Diamond Area 1, at foot of Tsabiams Mtn, 4 Sept. 2002, *Bartsch, Loots & Mannheimer* SB1021 (WIND!); Diamond Area 1, en route from Tsabiams to Grillental, 5 Sept. 2002, *Bartsch, Loots & Mannheimer* SB1031 (WIND!); Diamond Area 1, Rote Kuppe – Chamais road, 6 Sept. 2002, *Bartsch, Loots & Mannheimer* SB1036 (WIND!); Diamond Area No 1, S of Lüderitz, about 48 km from Pomona on road to Klinghardts Mts, 4 Aug. 2001, *Burgoyne* 8286 (PRE, WIND!); Diamond Area 1, Klinghardts Mts, 21 Sept. 1996, *Burke* 96115 (WIND!); Oranjemund. Gais area, E of Hohenfels on the road to Jakkalsberge, 5 Sept. 1958, *De Winter & Giess* 6201 (PRE, WIND!); Mile 50



Map 8. Known distribution of *Pteronia glabrata* in Namibia.

Fig. 3. Flowering *Pteronia glabrata*. PHOTO: H. KOLBERG.

on road Lüderitz to Oranjemund, 6 Sept. 1958, *De Winter & Giess* 6224 (PRE, WIND!); Farm Spitskop LU 111, 35 km (22 miles) N of Lorelei Copper mine on road to Witputs, 15 Sept. 1958, *De Winter & Giess* 6411 (PRE, WIND!); Lüderitzbucht, 4 Jan. 1910, *Dinter* 1026 (*P. carnosa* isotype SAM-71804-0!); Alicetal bei Pomona, 13 Aug. 1929, *Dinter* 6591 (NBG-202184-0, PRE-160652-0); E of Oranjemund, 34 km from the check point on the road to Sendelingsdrif, 25 Sept. 1997, *Gess & Gess* 97/98/64 (WIND!); 3 km (2 miles) SE of Lüderitz, 9 Aug. 1959, *Giess & Van Vuuren* 731 (PRE, WIND!); S of Lüderitzbucht, on the way to the lighthouse, 12 Sept. 1967, *Giess* 10196 (WIND!); About 40 km N of Rosh Pinah, Farm Witpütz Süd, 29 Sept. 1983, *Goldblatt* 7019 (PRE, WIND!); Namuskluft, 28 Oct. 1970, *Jankowitz* 12/190 (WIND!); Ai-Ais conservation area, McMillan's Pass, 2 km SE of summit of pass along track, 12 Oct. 2005, *Kolberg & Tholkes* HK1698 (K!, WIND!); Sperrgebiet. Lüderitz – Oranjemund road at N turn-off to Bogenfels, 14 Oct. 2006, *Kolberg & Tholkes* HK2103 (K!, WIND!); Tafelberg, SE of Klinghardts, Sperrgebiet, Aug. 1971, *Logan & Jensen* 899 (WIND!); Tafelberg, N of Affenrücken (coast), Sperrgebiet 1, Aug. 1971, *Logan & Jensen* 959 (WIND!); Just outside Lüderitz on road to Aus, 15 Aug. 2001, *Loots* SL114 (WIND!); Lüderitz – Oranjemund road, 27 Aug. 2002, *Mannheimer* CM2021 (WIND!); Namitsas, S of Klinghardt Basin, 1 Sept. 2002, *Mannheimer* 2110 (WIND!); Namitsas, S of Klinghardt Basin, 1 Sept. 2002, *Mannheimer* CM2122 (WIND!); Limestone-dolomite ridge, NE Klinghardts, 3 Sept. 2002, *Mannheimer* CM2175 (WIND!); Road to Grillental from Kaukausib, 5 Sept. 2002, *Mannheimer* CM2201 (WIND!); Blue ridges at Pomona pumphouse, 27 Sept. 2004, *Mannheimer, Maggs-Kölling & Loots* CM2646 (WIND!); Road between Grillental and Drachenberg, 9 Sept. 2005, *Mannheimer* CM2737 (WIND!); Nautilus, N of Lüderitz, 23 Aug. 1963, *Merxmüller & Giess* 3074 (M, WIND!); Farm Spitzkop, plain before Numais-bank, 1 Sept. 1963, *Merxmüller & Giess* 3412 (M, PRE, WIND!); Lüderitzbucht, 8 Sept. 1972, *Merxmüller & Giess* 28277 (M, PRE, WIND!); Buchuberge, 10 Sept. 1972, *Merxmüller & Giess* 28302 (M, PRE, WIND!); 23 km S of Grillental, 12 Sept. 1972, *Merxmüller & Giess* 28380 (M, PRE, WIND!); Klinghardt Mts, S part, in the region of Sargdeckel, 17 Sept. 1977, *Merxmüller & Giess* 32109 (M, PRE, WIND!); Klinghardt Mts, near foot of the mountain, 27 July 1977, *Müller* 699 (WIND!); Schakals Mts, 31 July 1977, *Müller* 756 (PRE, WIND!); Sperrgebiet, on main road between Lüderitz and Oranjemund, 14 Aug. 2001, *Smook* 11383 (PRE, WIND!); (Buchuberg) Found on NW slope, 28 Sept. 1992, *Strohbach* 218 (WIND!); Namuskluft, 22 Aug. 1989, *Strohbach* 458 (WIND!); McMillians Pass, 23 Aug. 1989, *Strohbach* 486 (WIND!); Rosh Pinah, Namuskluft 88, 31 Aug. 1989, *Van Wyk* 8822 (PRE, WIND!); Farm Zebrafontein 87, Mountains near farmhouse on Spitskop 111, Feb. 1989, *Van Wyk* 8986 (PRE, WIND!); Diamond area no. 1, Obib Springs, where the stream exits from the mountain, 3 Sept. 1989, *Van Wyk* 9041 (PRE, WIND!); 30 km S of Auffenrücken, June 1993, *Williamson* 4617 (WIND!); 30 km S of Affenrücken, June 1993, *Williamson* 4618 (WIND!); Daberas gorge, 55 km NE of Oranjemund, 16 July 1993, *Williamson* 5035 (WIND!); 10 km S of Chameis gate, 110 km N of Oranjemund, 21 July 1993, *Williamson* 5075 (WIND!). **SOUTH AFRICA.** Western Cape Prov.: Cape of Good Hope, *Thunberg* s.n. (*P. glabrata* holotype UPS-THUNB; isotype S-G-5142)!); Kaus, R III, 1835, *Drège* s.n. [2778] (*P. sesuviifolia* lectotype G-DC no. G-00322348!); Olifant R. W (of "West"?), R I, 1835, *Drège* s.n. [?778 or 2778] (*P. sesuviifolia* syntypes G-DC no G-00322349!, P-027091!, P-27092!, P-027093 (ex hb. Hennecart)!); possible syntypes HAL-0110985!, HBG-505117!, HBG-503991!, NY-00232709!).

HABITAT. In gravel or sand of plains and hill slopes in steppe dominated by succulents; mostly near the coast; 50 – 800 m.

CONSERVATION STATUS. The Namibian distribution of this species falls almost entirely into the protected diamond mining area, which has now been declared a national park, limiting human access and activity. The effect of mining on *Pteronia glabrata* is minimal since mining is restricted to small areas and governed by a sound environmental management policy. The species is widely distributed (large estimated EOO and AOO) and no threats could be identified, thus resulting in a Namibian evaluation of LC (IUCN 2001, 2013). The South African threat status is listed as LC (SANBI 2011).

PHENOLOGY. Flowering: February to October. Fruiting: June to November.

NOTES. Among earlier collectors in Namibia there has been some confusion around this species and its difference (or not) to *Pteronia succulenta*. Material of *P. succulenta*, which occurs only in South Africa, must be inspected to verify if these are two separate species or not, but this falls outside the scope of this study.

The syntypes of *Pteronia sesuviifolia* in G-DC are on one sheet: "Kaus, *Drège*, and Olifantrivier, *Drège*", with both showing the number 2778. (On the Olifantrivier collection the label number is unclear and appears to have the 2 and the first of the two number 7s superimposed, raising the impression of "778" only.) We have selected the Kaus material as lectotype because, though lacking (parts of) flowers, the overall quality of the material is better. It should be noted that, here and elsewhere, after designating a lectotype the remainder of all original material (if any) is *not* to be named "paralectotype" or "lectoparatype" (whatever one prefers), but remain "syntype(s)" in accordance with Turland's (2013: 62) interpretation — an opinion we have followed in all cases where we have chosen a lectotype among syntypes.

There are syntypes of the Olifantrivier collection in P (P-027091!, P-27092!, P-027093 (ex hb. Hennecart)!)) and G-DC (G-00322349!). Potential syntypes have annotations, sometimes indicating effectively the same location but lack the number 2778 (unlike the P specimens) or lack the precise locality. We identified HAL-0110985, HBG-505117, HBG-503991 and NY-00232709 in this respect.

A Drège specimen at Vienna, W-0008793, has a locality "*near* Kaus" and what we assumed to be a collecting date, "1837-12" (Dec. 1837), but which is probably a herbarium dispatch or a receipt date. Similarly, W-0008794 shows "1837-12" and is from *near* the Ebenezar, Olifantrivier locality. We therefore exclude these specimens as syntypes. Also W-Rchb. 1889-0292322 is not exactly from any of the two locations in the protologue and should also, we believe, be excluded as original material — contrary to the annotations in W.

9. Pteronia glauca *Thunb.* (Thunberg 1800: 144); de Candolle (1836: 365); Harvey in Harvey & Sonder (1865: 107); Hutchinson & Phillips (1917: 289); Range (1935: 275); Merxmüller (1955: 79; 1967: 156); Merxmüller & Roessler (1984: 90); Herman (2003: 277). Type: South Africa, Western Cape Prov., Cape of Good Hope, *Thunberg* s.n. (holotype UPS-THUNB; isotype LD-1254625!).

Pteronia latisquama DC. (de Candolle 1836: 363). Type: South Africa, Northern Cape Prov., Zwischen (noted on label as "Zw:") Camisberge und Onder-Bokkeveld, R V, 1835, *Drège* s.n. [607] (holotype G-DC no. G-00322350!). — see Notes.

Pteronia glabrata auct. non L. f.: de Candolle (1836: 362); Hutchinson & Phillips (1917: 289, noting "DC, not of L. f.").

Pteronia candollei Harv. (Harvey in Harvey & Sonder 1865: 105, "*Candollei*"). Type: South Africa, Northern Cape Prov., Fraserburg Div., between Karree R. and Quaggas Fontein, *Burchell* 1410 (holotype K-00273422!).

Pteronia thymifolia Muschl. & Dinter (Muschler 1911a: 100). Type: Namibia, Bezirk des Damaralandes, Farm Hoffnung, 1900 m, 20 Aug. 1909, *Dinter* 967 (holotype B†; isotypes K-00273419!, K-000273424!, SAM-71826-0).

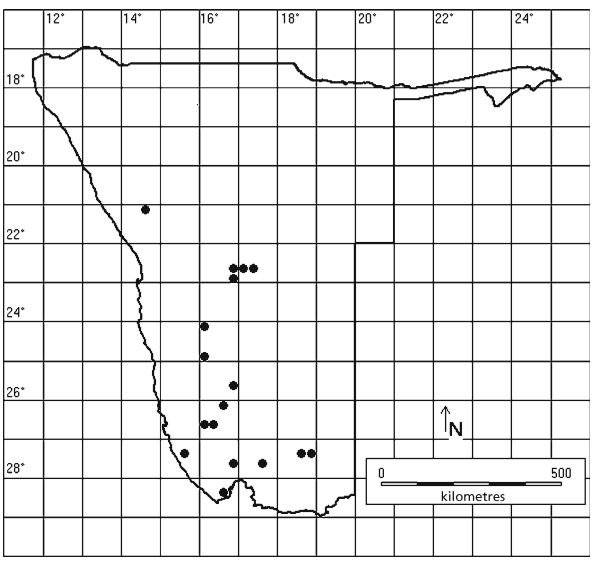
Pteronia arcuata Dinter (1932: 182). Type: Namibia, Aus, in der Mesembr.-Steppe am Wege nach Gubub [Kubub], 26 Oct. 1922, *Dinter* 4152 (holotype B†; isotypes HBG-505144!, PRE-156640-0, SAM-71805-0, Z-000052352!, Z-0000523531, Z-000003814!), **synon. nov.**

Pteronia glauca Thunb. subsp. *arcuata* (Dinter) Merxm. (Merxmüller 1955: 79; 1967: 156).

Shrub, to 80 cm tall and 120 cm in diam. *Stems* sometimes arching to ground, grey pubescent, bark splitting on older stems. *Leaves* opposite, clustered along stems, densely silver-grey felty, linear to linear-lanceolate, 4 – 10 × 2 – 2.5 mm, apex obtuse or subacute, base sessile; aromatic. *Capitula* numerous, densely covering plant, all along branches, narrow-elongate ellipsoid to turbinate, 12 – 15 × 8 mm; apex acute in bud. *Receptacle* fimbriate. *Phyllaries* multiseriate, outer broadly lanceolate, inner oblong-lanceolate, yellow to straw-coloured; grey felty on outside; midrib pubescent, thickened towards apex but never tapering into a mucro; apex acute; margins narrow glabrescent, indistinctly ciliate. *Florets* c. 4; *corollas* to 10 mm long, yellow; lobes triangular, obtuse; tube widening upwards, ribbed at base. *Achenes* obovate, contracted into a distinct neck, villous in lower half, to 3 mm long. *Pappus* multiseriate, c. 10 mm long, straw-coloured.

DISTRIBUTION. Africa: Botswana, Namibia, South Africa. Map 9.

SPECIMENS EXAMINED. NAMIBIA. Erongo Region, Omaruru Distr.: Brandberg, upper reaches of Königstein, 5 May 1993, *Craven* 4010 (WIND!); Valleys of upper Brandberg Mt, June 1955, *Wiss* 1427 (PRE, WIND!); Hardap Region, Maltahöhe Distr.: (Naukluft Park) 17 May 1979, *Cronje* 2 (WIND!); No 9. Naukluft-Plateau, 9 April 1971, *Meyer* 491 966 (WIND!); Karas Region, Bethanie Distr.: Farm Gamochas BET 31, 6 Sept. 1972, *Merxmüller & Giess* 28257 (M, PRE, WIND!); Keetmanshoop Distr.: Farm Witmond, on rim of W plateau, 31 March 1998, *Strohbach & Dauth* 3826 (WIND!); Farm Rishon, on top of Graberberg at Telecom tower, 1 April 1998, *Strohbach & Dauth* 3835 (WIND!); Lüderitz Distr.: Aus, Mesembr.-Steppe along road to Gubub [Kubub], 26 Oct. 1922, *Dinter* 4152 (*P.*



Map 9. Known distribution of *Pteronia glauca* in Namibia.

arcuata isotypes HBG-505144!, PRE-156640-0, SAM-71805-0, Z-000052352!, Z-000052353!, Z-000003814!); Farm Klein Aus, W of Aus, 11 Aug. 1959, *Giess & Van Vuuren* 768 (PRE, WIND!); Aus, Kubub, 4 Oct. 1959, *Giess* 2387 (PRE, WIND!); Farm Zebrafontein, track from road D463; at locked gate just before homestead, 20 Oct. 2007, *Kolberg & Tholkes* HK2410 (K!, WIND!); Sperrgebiet, 19 km S of Obib Fountain, track turns E and leads over hill, 24 Oct. 2008, *Kolberg & Tholkes* HK2694 (K!, WIND!); Farm Plateau LU 38, 8 Sept. 1963, *Kräusel & Wiss* 2015 (WIND!); (Aus) quartz foothills, 17 Sept. 2005, *Mannheimer* CM2822 (WIND!); Aus, in the river on the way to Helmeringhausen, 7 Aug. 1963, *Merxmüller & Giess* 2918 (M, PRE, WIND!); Klinghardt Mts, near top of the mountain, 28 July 1977, *Müller* 703 (PRE, WIND!); Farm Plateau, Aus, 13 April 1953, *Walter & Walter* 2555 (WIND!); Maltahöhe Distr.: Farm Chamchawib, Helmeringhausen, 15 Aug. 1963, *Merxmüller & Giess* 2812 (M, PRE, WIND!); Khomas Region, Windhoek Distr.: Windhoek, 1955, *Basson* 137 (WIND!); Khomas Hochland, 14 May 2000, *Burke* 00089 (WIND!); Farm Hoffnung, 20 Aug. 1909, *Dinter* 967 (*P. thymifolia* isotypes K-00273419!, K-000273424!, SAM-71826-0); Lichtenstein, 15 Oct. 1934, *Dinter* 7892 (Z!); Windhoek, Augeigas, Daan Viljoen road, turn-off to Matchless Mine, ± 500 m from turn-off, 6 Aug. 2000, *Friedrich* FRI2 43 (WIND!); Farm Keres WIN 39, on the Kereshöhe, 6 Nov. 1965, *Giess* 9038 (PRE, WIND!); Moltkeblick, Auasberge, 29 Aug. 1971, *Giess & Von Alvensleben* 11493 (PRE, WIND!); Farm Hohenau, Aug. 1963, *Kräusel & Wiss* 1994 (WIND!); Farm Harris, 19 July 1965, *Leach, Bayliss & Giess* 12938 (PRE, WIND!); Farm Regenstein, below SW mountain foot towards plain, 22 Aug. 1972, *Merxmüller & Giess* 28008 (M, PRE, WIND!); Farm Regenstein, near Windhoek, 12 April 1953, *Schwerdtfeger* 2/294 (WIND!); Farm Bellerode, 13 km (8 miles) from Windhoek, 17 March 1965, *Toelken & Hardy* 712 (PRE, WIND!); Farm Immental, *Von Koenen* s.n. (WIND-34158!); Farm Voigtland, Okamatuja, 17 Nov. 1952, *Walter & Walter* 118 (WIND!). **SOUTH AFRICA.** Western Cape Prov.: Boschjemanskarroo [III A b 1], *Drège* s.n. (HAL-0111565!, HBG-505116!, HBG-503989!, P-027102!, P-027103!, P-00179775!, PRE, W-0008795); Aasvogelberg [II e 11], *Drège* s.n. (HAL-0111564!, K-000273420!, P-00179776!, P-027104!, P-027101!, P-027100!, W-0008796!); Fraserburg Div., between Karree R. and Quaggas Fontein, *Burchell* 1410 (*P. candollei* holotype K-00273422!); Cape of Good Hope, *Thunberg* s.n. (*P. glauca* holotype UPS-THUNB; isotype LD-1254625!); Northern Cape Prov.: between Camisberge and Onder-Bokkeveld, R V, 1835, *Drège* s.n. [607] (*P. latisquama* holotype G-DC no. G-00322350!).

HABITAT. Rocky hills and mountains in high-altitude shrubland, dwarf shrub savanna, desert-dwarf shrub transition and steppe dominated by succulent species; 450 – 1900 m.

CONSERVATION STATUS. This species is evaluated LC in Namibia with a very large estimated EOO and AOO that puts it outside the thresholds for threatened species (IUCN 2013). In addition, no threats causing population decline could be identified. The threat status for South Africa is also listed as Least Concern (LC) (SANBI 2011).

PHENOLOGY. Flowering: May to November. Fruiting: September to December.

VERNACULAR NAMES. Boegoekaroo, geelboegoekaroo, perdekaroo (Afrikaans, South Africa).

NOTES. This species is restricted to higher altitudes or mountains in Namibia. Plants with arching branches found near Aus were described as *Pteronia arcuata* Dinter, later considered a subspecies of *P. glauca* (Merxmüller 1955: 79). The arching branches, however, are not consistently displayed. Plants with arching and non-arching branches have been found by the first author in the same population. The stem habit seems to be determined by the plant's environment and arching branches occur mostly on plants in hard, rocky soil, such as the specimens near Aus. For this reason subsp. *arcuata* is not upheld here.

An enumeration of localities and species collected by J. F. Drège in southern Africa (mainly in present-day South Africa) was published in 1843 (Drège 1843) with an introduction (on pp. 3 – 43) by E. Meyer. It is structured along an elaborate site coding system, using numerals and letters such as I, II, III, A, B, a, b, 1, 2, etc., a combination of which is often found on what have been or are being designated (iso) types of, in our case, *Pteronia* species. For example "III.E.a" in association with *P. sesuviifolia* (q.v.) is listed by Drège in 1843 on p. 108. Although this works well with most species as a precise source of additional locality data it fails with *P. latisquama* where none of the potential isotypes is directly linked to (part of) the "Camisberge, Onder-Bokkeveld" of the holotype. One also needs to keep in mind that this enumeration was published six years *after* de Candolle's 1836 treatment of the genus in the fifth volume of his *Prodromus* — and thus that Candolle's locality names could easily have been included in the Drège listing. That localities in the protologue by de Candolle do not match any in Drège/Meyer was already annotated in association with specimens in W (0008795 and -8796; see below) by L. Pignotti. We found two sets of specimens with the name *P. latisquama*, but have been unable to link any of them to the holotype locality. One set of specimens carries: (1) *Boschjemanskarroo* (the locality "III A b 1" in Drège 1843: 69), found in HAL-0111565!, HBG-505116!, HBG-503989!, P-027102!, P-027103!, P-00179775!, PRE, and W-0008795!, sometimes with the (presumed) de Candolle number [607] added. The name is also on K-000273421!, but we exclude this as "1837" is cited, which is possibly a herbarium despatch or receipt date. Of all these specimens P-027103 seems

the most authentic as we think it shows an original Drege label with his handwriting and with "III A b 1" cited. The other carries: (2) *Aasvogelberg* (the locality II.e.11 in Drège 1843: 65), and is present in HAL-0111564!, K-000273420!, P-00179776!, P-027104!, P-027101!, P-027100!, W-0008796!.

10. Pteronia inflexa *L. f.* (Linnaeus filius 1782: 356); Thunberg (1800: 144); de Candolle (1836: 365); Harvey in Harvey & Sonder (1865: 99); Hutchinson & Phillips (1917: 300); Merxmüller (1967: 156); Merxmüller & Roessler (1984: 90); Herman (2003: 278). Type: South Africa, Western Cape Prov., Cape of Good Hope, *Thunberg* s.n. (holotype UPS-THUNB; isotype LD-1254505!).

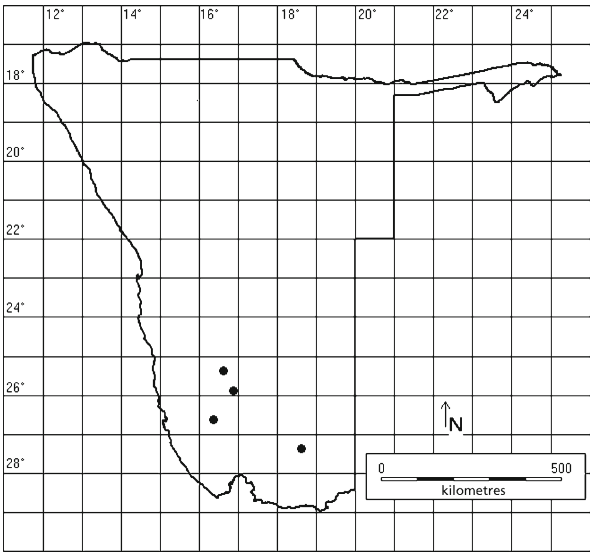
Pteronia lupulina DC. (de Candolle 1836: 357). Type: South Africa, Northern Cape Prov., Fraserburg, between Zack R. and Kopjes Fontein, 4 Sept. 1811, *Burchell* 1495 (holotype G-DC; isotypes K-00273447!, P-027188!, PRE-157943-0, W-0008801!).

Pteronia lupulina DC. var. *rotundifolia* DC. (de Candolle 1836: 358). Type: South Africa, Western Cape Prov., Nieuweveld, R IV, 1835, *Drège* s.n. [767] (holotype G-DC no. G-00322347!; isotypes may exist — see Notes).

Shrub, to 30 cm tall. *Stems* sparingly pubescent, bark pale grey to grey, splitting on old growth. *Leaves* opposite, coriaceous, surface densely short bristly and sessile glandular, flat, elliptic to narrowly ovate, 5 – 15 × 4 mm; apex rounded; base sessile; margins pectinate. *Capitula* solitary on short branchlets, ovoid-campanulate, 15 – 20 × 6 – 10 mm; apex rounded to truncate in bud. *Receptacle* honeycombed. *Phyllaries* multiseriate, ovate to orbicular, to 5 × 3 mm, green to brown, glabrous except for a few glands on outside; apex rounded; margins distinct, translucent, membranous. *Florets* c. 10; *corollas* to 10 mm long, glabrous, yellow; lobes lanceolate, subacute; tube gradually widening. *Achenes* obconical, sparsely villous, to 4 mm long. *Pappus* c. 10 mm long, straw-coloured.

DISTRIBUTION. Africa: Namibia, South Africa. Map 10.

SPECIMENS EXAMINED. NAMIBIA. Hardap Region, Maltahöhe Distr.: Farm Naudaus/Duwisib MAL 76/84, 10 May 1956, *Volk* 12771 (WIND!); Farm Naudaus/Duwisib 76/84, 3 May 1956, *Volk* 12772 (WIND!); Karas Region, Bethanie Distr.: Farm Goais BET 13, 23 June 1974, *Giess* 13353 (PRE, WIND!); Keetmanshoop Distr.: Farm Witmond 162A, NW of farmhouse on sloping plain, 14 Feb. 1997, *Strohbach, Kubirske & Sheuyange* 2872 (WIND!); Lüderitz Distr.: Farm Plateau, 20 Aug. 1963, *Merxmüller & Giess* 3012 (M, PRE, WIND!). **SOUTH AFRICA.** Western Cape Prov.: Cape of Good Hope, *Thunberg* s.n. (*P. inflexa* holotype UPS-THUNB; isotype LD-1254505!); Fraserburg, between Zack R. and Kopjes Fontein, 4 Sept. 1811, *Burchell* 1495 (*P. lupulina* holotype G-DC; isotypes K-00273447!, P-027188!, PRE-157943-0, W-0008801!); Nieuweveld, R IV, 1835, *Drège* s.n. [767] (*P. lupulina* var. *rotundifolia* holotype G-DC no. G-00322347!); between Waschbank and Rietpoort, Nieuweveld, 3500 (ft.), (loc.) I d, 26 Nov. 1826, *Drège* s.n. (P-027186!).



Map 10. Known distribution of *Pteronia inflexa* in Namibia.

HABITAT. Gravelly plains and slopes of dwarf shrub savanna and desert. None of the Namibian specimens examined present any altitudinal data.

CONSERVATION STATUS. The uncertain identity of Namibian specimens (see Notes) together with insufficient information on these led us to conclude that the status Data Deficient (DD) must be assigned for Namibia (IUCN 2001, 2013). Least Concern (LC) is recorded as the South African threat status (SANBI 2011).

PHENOLOGY. Flowering: February to August.

NOTES. According to Hutchinson & Phillips (1917) this species belongs to what they called sect. *Ciliatae* with ciliate leaf margins. The leaves of Namibian collections are, however, papillate-glandular and do not have ciliate margins, which would put the species into their sect. *Papillatae*. In Hutchinson & Phillips' (1917) description of *Pteronia inflexa* there is also no mention of ciliate or pectinate leaf margins. *P. inflexa* has rarely been recorded in Namibia and the distribution in south-western and south-eastern Namibia is disjunct from its distribution in the Karoo of South Africa. More Namibian material must be collected and compared with South African specimens to verify if *P. inflexa* does indeed occur in Namibia or if these specimens belong to another species.

Possible isotypes of *Pteronia lupulina* var. *rotundifolia* may exist: relevant specimens in P (e.g. P-027186! and

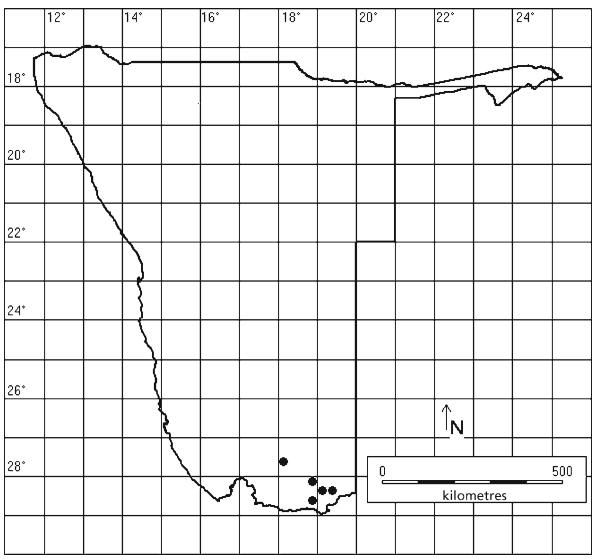
027187!) and W (e.g. W-Rchb.-1889-0292329! and W-0020460) all show the handwritten annotation of the full name, but do not show the year or associated number 767.

11. Pteronia leucoclada *Turcz.* (Turczaninow 1851: 65); Harvey in Harvey & Sonder (1865: 105); Hutchinson & Phillips (1917: 314); Merxmüller (1967: 156); Merxmüller & Roessler (1984: 90); Herman (2003: 278). Type: South Africa, Western Cape Prov., Cape of Good Hope, *Zeyher* 811 (holotype KW-001000912!; isotypes K-000273482!, K-000273483!, K-000273484!, P-027205!, P-027206!, PRE-0159187-0!, PRE-0587284-0!, SAM-0037738-0!, W-Rchb.-1889-0278261!, Z-000052407!).

Shrub, to 50 cm tall. *Stems* smooth, glabrous, white when young. *Leaves* alternate, clustered along stem, fleshy, glabrous, oblong to narrowly obovate-clavate, to 7 × 1.5 mm; apex rounded; narrowed into base. *Capitula* solitary, terminal, obconic to almost spherical, to 15 × 10 mm, apex rounded in bud. *Receptacle* honeycombed, fimbriate. *Phyllaries* multiseriate, lanceolate to linear, keeled, 2 – 3 mm long, inner phyllaries to 2.5 mm broad, glabrous; apex acuminate; margins membranous. *Florets* c. 20; *corollas* to 5.5 mm long, yellow; lobes unequal, triangular-lanceolate, subacute. *Achenes* compressed turbinate, densely villous, to 2 mm long. *Pappus* multiseriate, sparsely barbellate, to 6 mm long, golden.

DISTRIBUTION. Africa: Namibia, South Africa. Map 11.

SPECIMENS EXAMINED. NAMIBIA. Karas Region, Karasburg Distr.: Farm Vrede, 19 July 2005, *Bruyns* 10107 (BOL, WIND!); Klein Karas, 6 Aug. 1923, *Dinter* 4849 (Z!); Farm Klein-Aub WAR 52, 17 May 1963, *Giess, Volk & Bleissner* 7022 (PRE, WIND!); Farm Udabis WAR 77, 19 May 1963, *Giess, Volk & Bleissner* 7108 (WIND!); Near border between Huniam Ost and Uheib 84, 19 April 1997, *Strohbach* 3429 (WIND!); Keetmanshoop Distr.: Klein Karas Mts, 6 March 1999, *Burke* 99149 (WIND!). **SOUTH AFRICA.** Western Cape Prov.: Cape of Good Hope, *Zeyher* 811 (holotype KW-001000912!; isotypes K-000273482!, K-000273483!, K-000273484!, P-027205!, P-027206!, PRE-0159187-0!, PRE-0587284-0!, SAM-0037738-0!, W-Rchb.-1889-0278261!, Z-000052407!)



Map 11. Known distribution of *Pteronia leucoclada* in Namibia.

HABITAT. Dwarf shrubland; c. 950 m.

CONSERVATION STATUS. This species has a relatively restricted range in SE Namibia and present information suggests that it is rare here. The estimated EOO would qualify it for VU status but no two of the additional three criteria under criterion B can be satisfied (IUCN 2013). For criterion D2 the number of localities is restricted but no additionally required plausible future threat could be identified to qualify *Pteronia leucoclada* as VU. The Namibian conservation status is thus assessed here as LC (IUCN 2001). The South African threat status is also LC (SANBI 2011).

PHENOLOGY. Flowering: March to July. Fruiting: April.

VERNACULAR NAMES. Bleekbossie, witbossie, witbasbossie (Afrikaans, South Africa).

NOTES. Thus far only a few collections have been made from the extreme south-east of Namibia. The greater part of the species' range falls into adjacent areas in South Africa.

Although Turczaninow cites "*Zeyher coll. n. 811.*" it is often impossible to separate Zeyher from "Ecklon & Zeyher" collections — indeed the isotype in Z carries a label to that extent and does not indicate who of the two actually collected no. 811. (In contrast, K, KW, SAM, P-027206, PRE and W-Rchb. all have "*Zeyher* 811" as the sole collector.) Ecklon & Zeyher's collections from "S. Africa" (Lanjouw & Stafleu 1957: 176) are in many herbaria. They are not, however, reported from KW where Turczaninow's types are, and thus the type of *leucoclada* from KW presents a rare exception. We follow Stafleu & Cowan (1986: 538) on the location of the type, which in this case also carries "verified by Turczaninow".

As with other *Pteronia* species (see above), the various isotypes provide more locality details than the holotype: the SAM and W-Rchb. collections have "Bitterfontein, Bosmansland" on the label. Isotype P-027205 has the *Zeyher* 811 "communicated" by Drège, and with the locality described as: "Clanwilliam. A Tulbaghskloof ad Pikenierskloof. 500′ – 1000′. Martii.". However, this annotation is certainly *not* in Zeyher's handwriting. Furthermore, P-027206 is the only isotype with a year of collecting: 1847. Though the total of these isotypes provides much more detail, they are not necessarily Zeyher's notes.

12. Pteronia lucilioides *DC.* (de Candolle 1836: 358); Harvey in Harvey & Sonder (1865: 100); Hutchinson & Phillips (1917: 293); Dinter (1926: 132); Range (1935: 275); Merxmüller (1952: 126; 1967: 156); Merxmüller & Roessler (1984: 90); Herman (2003: 278). Type: South Africa, Northern Cape Prov., Klein Namaqualand, R. II, *Drège* s.n. [2779] (holotype G-DC; isotype P-027210!).

Pteronia lucilioides DC. var. β *sparsifolia* Harv. (Harvey in Harvey & Sonder 1865: 100). Type: South Africa, Namaqualand, *Wyley* s.n. (not traced).

Pteronia gymnocline auct. non DC.: (Meyer in) Drège (1843: 94, 214); Range (1935: 275); Hutchinson & Phillips (1917: 294). — see Notes.

Pteronia bromoides S. Moore (1904: 1011). Type: Namibia, Gross Namaland, Jakalskopje, *Dinter* 1197 (holotype BM-000903815!).

Pteronia beckeoides auct. non DC.: Dinter (1926: 132); Range (1935: 275, "*beckioides*"); Merxmüller (1955: 80).

Pteronia roesemanniana Dinter ex Merxm. (Merxmüller 1952: 128; 1955: 80), **nom. nud.** — see Notes.

Shrub to 2.5 m tall, virgate, sparsely branched; near coast only to 30 cm high and much-branched. *Stems* scabrid-puberulous, glabrescent, grey. *Leaves* opposite, clustered on stems, matte grey-green, surface with acute conical, multicellular papillae interspersed with sessile, spherical glands, linear to obovate or oblong-spathulate, boat-shaped, 5 – 8 × 1.5 mm; apex obtuse; base sessile, not connate with opposite leaf. *Capitula* solitary, terminal, cylindrical, 15 – 20 × 5 – 10 mm; apex sharply acute in bud. *Receptacle* deeply honeycombed. *Phyllaries* multiseriate, oblong-oblanceolate to linear-oblong, 6 –18 × 3 – 5 mm, pale yellow, glabrous except for finely puberulous outer midrib; apex rounded to subacute to cuspidate; margins not distinctly membranous. *Florets* c. 12; *corollas* to 10 mm long, yellow; lobes lanceolate, subacute; tube gradually widening. *Achenes* obovoid-turbinate, densely glandular and sparsely setose, to 6 mm long. *Pappus* multiseriate, barbellate, to 10 mm long, straw-coloured. Figs 4 – 5.

DISTRIBUTION. Africa: Namibia, South Africa. Map 12.

SPECIMENS EXAMINED. NAMIBIA. Erongo Region, Karibib Distr.: Okongava, Kalkberge, 2 Feb. 1934, *Dinter* 6933 (K-000273436!, PRE, WIND!); Farm Okongawa, Marmorberg, 9 May 1958, *Seydel* 1553 (WIND!); Hardap Region, Maltahöhe Distr.: Losberg, path to the repeater, very close to the top and on highest plateau, 1 July 2004, *Clapham & Drayer* 145 (WIND!); Mountain Zebra Park, Naukluft MAL 9, 2 June 1968, *Giess* 10445 (PRE, WIND!); Found above the Hudup R., some 1.6 km N of Maltahöhe, 5 Sept. 1972, *Merxmüller & Giess* 28222 (M, PRE, WIND!); Farm Naudaus/Duwisib, Helmeringhausen, 20 May 1956, *Volk* 12496 (WIND!); Near Farm Maguams, slopes of Schwarzrand, 22 March 1953, *Walter & Walter* 2115 (WIND!); Karas Region, Bethanie Distr.: 38 km (23.5 miles) N of Helmeringhausen, 19 Oct. 1949, *Acocks* 15631 (PRE, WIND!); Farm Mara, kloof on E side of Konkiep near house, 11 July 1988, *Craven* 3310 (WIND!); Farm Mara, O'Connell's prospecting kloof, in Hunsberg Mts, above middle windpump, 24 Sept. 1989, *Craven* 3521 (WIND!); Farm Mara E of Hunsberg Mts, In kloof of mountain, W of farm house, 23 June 1991, *Craven* 3862 (WIND!); Farm Mooifontein BET 50, 19 May 1965, *Giess* 8817 (PRE, WIND!); Farm Heigums BET 105, 16 June 1976, *Giess & Müller* 14433 (WIND!); Farm Chamchawib, Helmeringhausen, 15 Aug. 1963, *Merxmüller & Giess* 2813 (M, PRE, WIND!); Farm Kosos, 15 Aug. 1963, *Merxmüller & Giess* 2819 (M, PRE, WIND!); Farm Saraus BET 16, 5 Sept. 1972, *Merxmüller & Giess* 28226 (M, PRE, WIND!); Farm Aruab 23, near Aris Post, 5 April 1998, *Miller* MIL1/ 55 (WIND!); Karasburg Distr.: Farm Kromrivier WAR 359, May 1963, *Giess, Volk & Bleissner* 6997 (WIND!); Farm Sperlingspüts WAR 259, 6 Aug. 1976, *Giess* 14516 (WIND!); Spes Bona, 31 Aug. 1970, *Jankowitz* 81/1493 (WIND!); Karas Mt on route to the Telecom tower on farm Rishon, 14 Feb. 1997, *Strohbach* 2854 (WIND!); Goodhouse Poort, 29 Aug. 1989, *Van Wyk* 8711 (PRE, WIND!); Keetmanshoop Distr.: 56 km (35 miles) SW of Narubis, 30 April 1955, *Acocks* 18045 (PRE, WIND!); Farm Kochena KEE 74, in the mts N of the farmhouse, 12 May 1972, *Giess & Müller* 11895 (PRE, WIND!); Farm Pieterskloof (Kraaikluft) KEE 370, Mt. N of Schroffenstein, 14 May 1972, *Giess & Müller* 11926 (PRE, WIND!); Lüderitz Distr.: Diamond Area 1, Drachenberg, 9 Sept. 2005, *Bartsch, Mannheimer & Kwembeya* SB2048 (WIND!); Rosh Pinah. Nooitgedacht, 10 Aug. 2000, *Bruyns* 8330 (BOL, WIND!); Dik Willem, 29 April 2000, *Burke* 00076 (WIND!); SE of Aurus Mts, Sperrgebiet, 24 Sept. 1999, *Burke* 99212 (WIND!); SE of Aurus Mts, Sperrgebiet, 24 Sept. 1999, *Burke* 99215 (WIND!); Skorpion turn-off D716 c. 5 km N of Rosh Pinah, *Bührmann* BUH1 76 (WIND!); Diamond area no. 1, Grillental, marble hills, 6 Sept. 1958, *De Winter & Giess* 6228 (PRE, WIND!); Farm Namuskluft LU 88, c. 29 km (18 miles) S on road to Lorelei, 13 Sept. 1958, *De Winter & Giess* 6337 (NBG, PRE, SAM, WIND!); Great Namaland, Jakalskopje, *Dinter* 1197 (*P. bromoides* holotype BM-000903815!); Kahanstal, 9 Dec. 1934, *Dinter* 8192 (K!); Hunsberge; in the Nuob R., 26 Sept. 1976, *Giess & Wendt* 14714 (WIND!); Farm Witputz Nord LUS 22, June 1976, *Giess & Wendt* 14783 (WIND!); About 40 km N of Rosh Pinah, Farm Sud Witputs. Granitic outcroppings NE of farm houses, 29 Sept. 1983, *Goldblatt* 7015 (PRE, WIND!); N of Witputz, 2 Oct. 1978, *Hardy & Venter* 4863 (PRE, WIND!); Sperrgebiet, N Klinghardt Mts, 6 Aug. 2001, *Klaassen & Bartsch* EK507 (WIND!); C13 on way to Rosh Pinah

Fig. 4. The typically acute budding capitula of *Pteronia lucilioides*. PHOTO: H. KOLBERG.

from Aus, 8 Aug. 2001, *Klaassen & Bartsch* EK535 (WIND!); Sperrgebiet, 50 km from Rotkop Station, powerline track, 23 Oct. 1987, *Kolberg & Maggs* HK210 (WIND!); Farm Klein Aus Vista, Geister Trail from cabin in Geisterschlucht, rocky hill slopes to SW, 4 Oct. 2006, *Kolberg & Tholkes* HK2049 (K!, WIND!); Namuskluft LU 88. Witputz, 13 Sept. 1963, *Kräusel & Wiss* 2074 (WIND!); White quartz outcrop, Sperrgebiet, 3 Sept. 1992, *Kubirske, Strohbach & Swart* 18 (WIND!); NW corner of the farm Namuskluft, 3 Feb. 1981, *Lavranos, Barad & Pehlemann* 19226 (WIND!); Namuskluft, July 1971, *Logan* 414/1493 (WIND!); Namuskluft, July 1971, *Logan* 414 (WIND!); Between Klinghardts and Aurus towards Heioab, 12 Aug. 2001, *Loots* SL108 (WIND!); S of Tsaus (Sperrgebiet), 26 Sept. 1996, *Mannheimer & Mannheimer* 324 (WIND!); S of Tsaus (Sperrgebiet), 26 Sept. 1996, *Mannheimer & Mannheimer* 325 (WIND!); Rocky area next to borehole, near Aurus Mts, 26 Sept. 1996, *Mannheimer & Mannheimer* 329 (WIND!); On kopje near access to Aurus basin, 28 Sept. 1996, *Mannheimer & Mannheimer* 383 (WIND!); Aurus fountain on W-face, 9 Aug. 2001, *Mannheimer* CM1545 (WIND!); N of Dik Willem, 31 July 2002, *Mannheimer* 1933 (WIND!); Boegoeberg, N end of ridge, 29 Aug. 2002, *Mannheimer* 2061 (WIND!); Namitsas, S of Klinghardt Basin, 1 Sept. 2002, *Mannheimer* CM2123 (WIND!); (Sperrgebiet), 3 Sept. 2002, *Mannheimer* CM2173 (WIND!); Road from Grillental to Kaukausib, 5 Sept. 2002, *Mannheimer* CM2206 (WIND!); Namuskluft farm, just SW of MacMillans pass, 9 Sept. 2002, *Mannheimer* CM2221 (WIND!); Valley adjacent to Kahanstal, 12 km SE of Rosh Pinah on road to Loreley, 21 Sept. 1972, *Merxmüller & Giess* 28643 (M, PRE, WIND!); 9.5 km S of Grillental, 15 Sept. 1977, *Merxmüller & Giess* 32021 (M, PRE, WIND!); Farm Spitzkop LUS 111, 25 Sept. 1977, *Merxmüller & Giess* 32310 (M, WIND!); Numaeis South, Witputz, 1957, *Rusch* 4720 (WIND!); Sperrgebiet, between Aurus and Klinghardt Mts, 12 Aug. 2001, *Smook* 11347 (PRE, WIND!); Diamond area no. 1, Obib Mt. peak, 3 Sept. 1989, *Van Wyk* 9014 (PRE, WIND); Huns Mts, 24 km up Letterklip R., 26 Sept. 1983, *Walter* 159 (WIND); Aus, Farm Plateau, on the slopes of plateau, N of the farmhouse, 13 April 1953, *Walter & Walter* 2575 (WIND!); Diamond Area 1, Tsaus Mt. Oct. 1977, *Wendt* B/1 (WIND!); Diamond area 1, Tsaus Spinnenberg, Oct. 1977, *Wendt* 8/2 (WIND!);

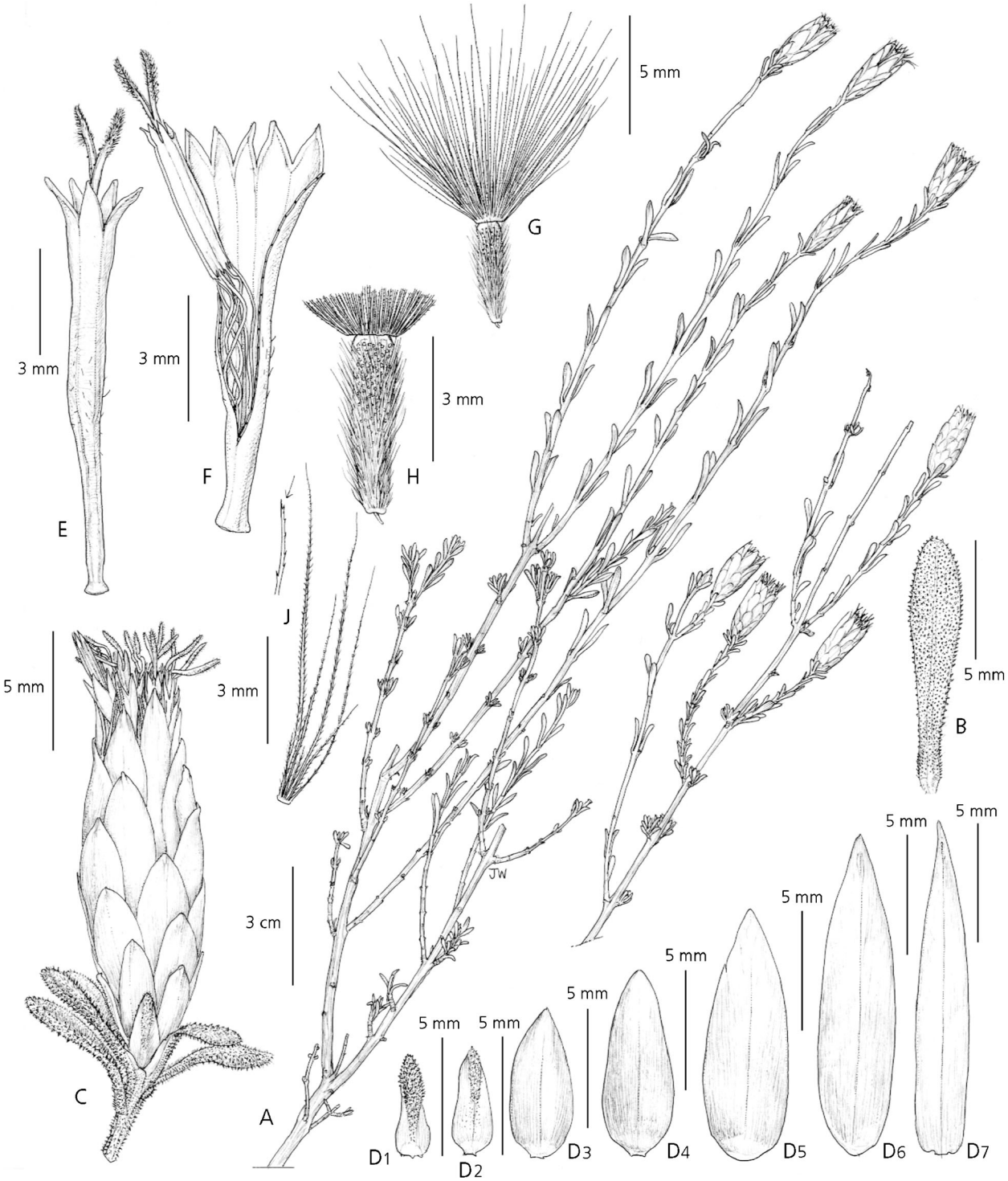
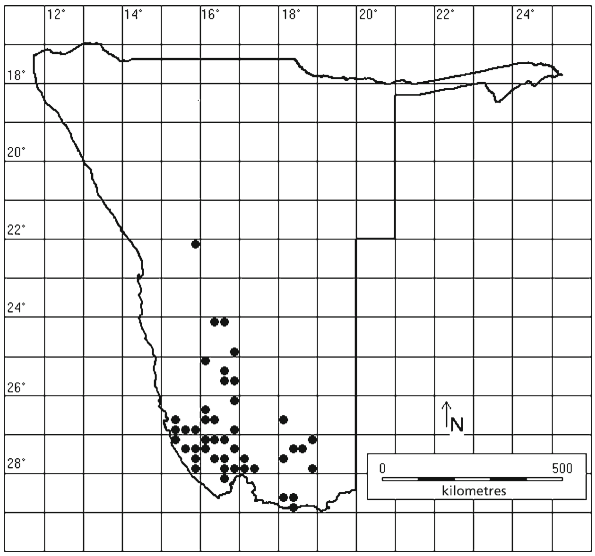


Fig. 5. *Pteronia lucilioides*. **A** habit; **B** leaf, abaxial; **C** capitulum; **D** phyllaries; **E** floret, side view; **F** floret, opened; **G** achene and pappus; **H** achene; **J** pappus setae of mixed length. **A – B, E** *Kolberg & Tholkes* HK2049; **C – D, F – J** *Dinter* 8192. DRAWN BY JULIET BEENTJE.

Narudous Poort (Anusi 73), between Aus and Rosh Pinah, 30 Aug. 1989, *Wittneben* 8771 (PRE, WIND!); Uitsig, 40 km from Witputz, 1 Sept. 1989, *Zietsman* 1892 (WIND!). **SOUTH AFRICA.** Northern Cape Prov: Klein Namaqualand, R. II, *Drège* s.n. [2779] (*P. lucilioides* holotype G-DC, isotype P-027210!).

HABITAT. Slopes, gorges, dry rivers and washes in dwarf shrub savanna, dwarf shrubland, desert-dwarf shrub



Map 12. Known distribution of *Pteronia lucilioides* in Namibia.

transition and steppe dominated by succulent species; 300 – 2000 m.

CONSERVATION STATUS. This common and very widespread species has an estimated EOO and AOO well above the threshold for any of the threatened categories and no threats causing decline, fragmentation or fluctuation of populations could be identified (IUCN 2013). The Namibian status thus is LC (IUCN 2001). The South African threat status is listed as LC too (SANBI 2011).

PHENOLOGY. Flowering: February to October. Fruiting: June to December.

NOTES. The species is near-endemic to Namibia with the greater part of its distribution extending from the Karibib area southwards to the Orange river with a few localities south of this river in South Africa. The specimens from the Karibib district (*Dinter* 6933 and *Seydel* 1553) to the best of current knowledge must be placed with *Pteronia lucilioides*, although this locality is disjunct from the rest of the species' range.

The collection *Dinter* 6933 in K carries the original (Dinter) identification of *Pteronia roesemanniana*, a Dinter manuscript name, which was re-determined by Merxmüller as *P. lucilioides*.

The leaves of *Pteronia lucilioides* are densely papillose and the capitula typically sharply acute in bud. In its range in southern Namibia *P. lucilioides* exhibits considerable variability in growth form: nearer the coast plants are low, much-branched shrublets, while further inland they are mostly virgate, sparsely branched shrubs which may be over 2 m tall. The density of leaf indumentum also varies but leaves of Namibian material were never completely glabrous. Glabrous leaves are the main character that distinguishes this species from *P. gymnocline* DC. (de Candolle 1836: 359). The latter is reported to occur in the Northern and Western Cape Provinces of South Africa. Images of South African material were seen and it seems highly likely that *P. lucilioides* and *P. gymnocline* are conspecific, but this cannot be confirmed without seeing more material. The variability of leaf indumentum density in Namibia also points towards this assumption. The sharply acute immature capitula are a constant character in all Namibian and South African material seen of *P. lucilioides* (Figs 4 & 5). Hutchinson & Phillips (1917: 294) retained *P. gymnocline* DC. while they listed *P. gymnocline* E. Mey. in Drege ("not of DC.") as synonym of *P. lucilioides* together with *P. bromoides* S. Moore and *P. lucilioides* var. *sparsifolia* Harv.

13. Pteronia mucronata *DC.* (de Candolle 1836: 362); Harvey in Harvey & Sonder (1865: 106); Hutchinson & Phillips (1917: 308); Merxmüller (1955: 80; 1967: 157); Merxmüller & Roessler (1984: 90); Herman (2003: 278). Type: South Africa, Eastern Cape Prov., Zwart-Ruggens, *Drège* s.n. [2158] (holotype G-DC; isotype P-027224!; other isotypes may exist — see Notes).

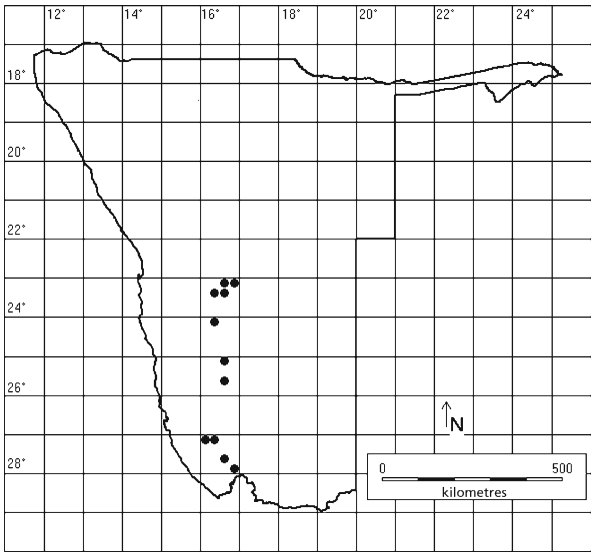
Pteronia dinteri S. Moore (1904: 1012); Dinter (1926: 132, "*Dinteri*"); Range (1935: 275, "*Dinteri*"). Type: Namibia, Hereroland, Südrand der Etosapfanne [Etoschapfanne], 23 July 1899, *Dinter* 739 (holotype BM-001114680!; isotype Z-000052414!).

Pteronia mucronata DC. subsp. *dinteri* (S. Moore) Merxm. (Merxmüller 1955: 80).

Shrub to 70 cm tall. *Stems* much-branched, short, glabrous, grey to black, striate. *Leaves* opposite, clustered along stems, dark green, surface glabrous or scattered white bristly, linear, boat-shaped or somewhat keeled, to 8 × 1 mm; apex obtuse; base connate; margins white ciliate; aromatic. *Capitula* solitary, terminal, narrowly cylindrical, 12 – 20 × 5 – 7 mm; apex rounded in bud; base acute. *Receptacle* honeycombed. *Phyllaries* multiseriate, ovate to oblong-linear, 3 – 10 mm long, bright yellow, shiny, glabrous; midrib thickened towards apex and forming a small, recurved mucro; apex truncate, slightly emarginate; margins jagged, ciliate. *Florets* c. 12 – 15; *corollas* to 10 mm long, sparsely glandular, yellow; lobes lanceolate, subobtuse. *Achenes* obconical, densely villous, to 4 mm long. *Pappus* c. 10 mm long, yellow.

DISTRIBUTION. Africa: Namibia, South Africa. Map 13.

SPECIMENS EXAMINED. NAMIBIA. Hardap Region, Maltahöhe Distr.: Naukluft. Kapokvlakte on plateau, 1 Oct. 1995, *Bridgeford* 95359 (WIND!); Bergzebrapark Naukluft MAL 9, 2 June 1968, *Giess* 10441 (WIND!); Bergzebrapark Naukluft MAL 9, NW gorge, 3 Sept. 1972, *Merxmüller & Giess* 28191 (M, WIND!); Farm Rooiberg-Süd, 1935, *Steyn* 9960 (WIND!); Rehoboth Distr.: 23 km W along road D1261 from junction on road C24 (NE of Nauchas), 28 Aug. 2009, *Kolberg & Tholkes* HK2823 (K!, WIND!); Farm Narais North 245,



Map 13. Known distribution of *Pteronia mucronata* in Namibia.

14 June 2004, *Wittneben* W04 248 (WIND!); Karas Region, Bethanie Distr.: Farm Soutkuil, stock camp before turning off to road to Bobbejaankranz, 22 Sept. 1989, *Craven* 3472 (WIND!); Fish R. Canyon, 10 Aug. 1976, *Giess* 14581 (PRE, WIND!); Fish R. Canyon, 10 Aug. 1976, *Giess* 14583 (WIND!); Farm Aruab 23, area around Aris Post, 5 April 1998, *Miller* MIL1/ 49 (WIND!); Farm Aruab 23, S part of farm, April 1998, *Miller* MIL1/ 088 (WIND!); Karasburg Distr.: Farm Mooirivier, 1 Sept. 1997, *Strohbach, Kubirske & Sheuyange* 2972 (WIND!); Keetmanshoop Distr.: Farm Dassiefontein 87, E camp, 29 March 1998, *Strohbach & Dauth* 3780 (WIND!); Lüderitz Distr.: Namuskluft, Rosh Pinah, Aug. 2003, *Bruyns* 9847 (BOL, WIND!); Farm Kolke LU 84, 4 Oct. 1975, *Giess* 13831 (PRE, WIND!); Farm Piet-se-Puts LUS 77. Black limestone gorge at the gate of farm Kanies LUS 71, Sept. 1976, *Giess & Wendt* 14748 (WIND!); Farm Namuskluft 88, 20 Sept. 2003, *Klaassen, Bartsch & Loots* EK1204 (WIND!); Pockenbank, 15 – 20 km E of main road against N boundary to Kokerboomkloof, 30 Oct. 2000, *Loots* SL20 (WIND!); Farm Witpütz South, Aug. 1963, *Merxmüller & Giess* 3213 (M, PRE, WIND!); Diamond Area 1, centre of Tsausberg, Oct. 1977, *Wendt* 3/4 (WIND!); Diamond Area 1, Tsaus Spinnenberg, Oct. 1977, *Wendt* 15/2 (WIND!); Khomas Region, Windhoek Distr.: Weener farm, Gamsberg, on E side, *Craven* 5111 (WIND!); Gurumanas REH 241, 29 Aug. 1972, *Merxmüller & Giess* 28073 (M, WIND!); Weissenfels, 30 Aug. 1972, *Merxmüller & Giess* 28110 (M, PRE, WIND!); Farm Naos, 15 July 1953, *Schwerdtfeger* 4350 (WIND!); Kunene Region, Outjo Distr.: S edge of Etosha Pan, 23 July 1899, *Dinter* 739 (*P. dinteri* holotype BM-001114680!; isotype Z-000052414!). **SOUTH AFRICA.** Eastern Cape Prov.: Jansenville Div., Zwart-Ruggens, Aug. 1827, *Drège* s.n. [2158] (*P. mucronata* holotype G-DC; isotype P-027224!; potential isotypes HAL-0110982!, HBG-505099!, HBG-503990!, K-000273457!, P-027225!, P-027226!, P-027227!, PRE, SAM-0016168-0!, TUB-005029!, W-0020461!, W-0008803!, W-Rchb.-1899-0219753!).

HABITAT. Mountains, hills and rocky outcrops of dolomite or calcrete in dwarf shrub savanna, desert-dwarf shrub transition, desert and steppe dominated by succulent species; 1200 – 1800 m.

CONSERVATION STATUS. Estimated EOO and AOO for *Pteronia mucronata* in Namibia are above the maxima that would qualify it for a threatened category (IUCN 2013). In addition, no threats that would cause qualification under any of the five IUCN criteria were established (IUCN 2013). The conservation status in Namibia is therefore LC (IUCN 2001). The South African threat status is recorded as LC (SANBI 2011).

PHENOLOGY. Flowering: June to October. Fruiting: October to March.

VERNACULAR NAMES. Kersbossie (Afrikaans, South Africa).

NOTES. The consistently ciliate leaf margins or keels best distinguish *Pteronia mucronata* from *P. unguiculata*, in addition to the fewer and smaller florets, achenes and shorter pappus in the latter. Specimens with sparsely ciliate margins can be mis-identified as *P. unguiculata* also because the distribution areas overlap. In Namibia *P. mucronata* is confined to higher altitudes of the south-west and the central highlands. However, the type specimen of *P. dinteri*, *Dinter* 739, even though its locality on the "southern edge of the Etosha pan" covers a large area (and was therefore not indicated on Map 13), does not conform to this. This area in the central north of Namibia is only around 1100 m above sea level without any high mountains (1200 – 1800 m high mountains is more typical of the *mucronata* distribution) although it has calcareous and/or saline soils. The vegetation on the fringes of the Etosha pan consists of dwarf shrubs, which is, together with the soils, comparable to the habitat of *P. mucronata*. The closest records of *P. mucronata* (Map 13) are in the central highlands, approximately 500 km due south of the Etosha pan; on the other hand a disjunct locality of *P. unguiculata* (see distribution on Map 23) at the Brandberg is only about 250 km SW thereof. *Dinter* 739 has clearly pectinate leaves though, which place it into *P. mucronata* even though *P. unguiculata* would make more sense from a phytogeographical perspective. Because of differences in number of florets (12 – 15 in *P. mucronata*; c. 5 in *P. dinteri*), capitula length (*P. mucronata*: 15 – 20 mm; *P. dinteri*: 10 – 14 mm) and pappus length (*P. mucronata*: 10 mm; *P. dinteri*: 7 mm), Merxmüller (1955) did not agree with the sinking of *P. dinteri* into *P. mucronata* by Hutchinson & Phillips (1917: 308) and kept it as a subspecies, which would support the odd distribution of this specimen. He later

(Merxmüller 1967), however, included both *P. dinteri* and *P. mucronata* subsp. *dinteri* under *P. mucronata*. No other species of *Pteronia* besides the clearly different *P. eenii* has been found in the area directly south of the Etosha pan. A thorough investigation of this extensive area would be needed to confirm the presence of any other species of *Pteronia*, especially of *P. mucronata*, to better assess the anomaly of the *Dinter* 739 location.

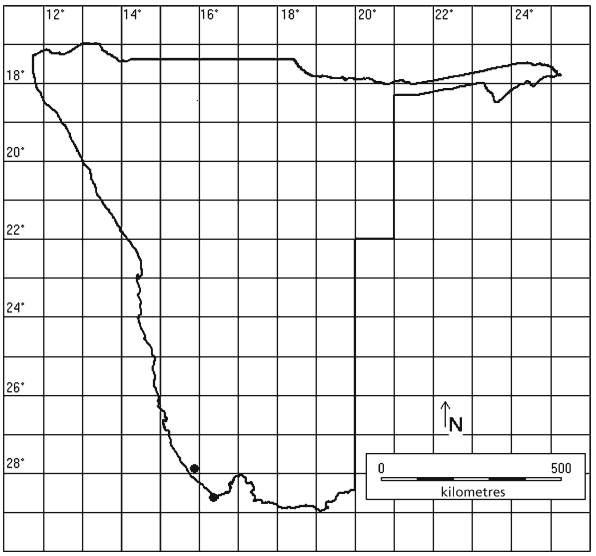
At his locality II c 4 "Zwart-Ruggens, Karrooflâche, 2000 – 3000 Fuss, August" Drège (1843: 61) lists *Pteronia mucronata*. Parts, or all, of this locality data is found in association with many potential isotypes that all lack a reference to the de Candolle number "[2158]" — for example HAL-0110982, HBG-503990, HBG-505099, K-000273457, P-027225, P-027226, P-027227, PRE, SAM-0016168-0, TUB-005029, W-0020461, W-Rchb.-1899-0219753. Similar to other cases, those presented with the year "1837" are also excluded (for example K-000273458 and W-0008803, the latter actually indicated as an isotype by W) as it is uncertain if this is a collection date or a herbarium dispatch or receipt date.

14. Pteronia onobromoides *DC.* (de Candolle 1836: 364); Harvey in Harvey & Sonder (1865: 109); Hutchinson & Phillips (1917: 299); Dinter (1931: 167); Range (1935: 276); Merxmüller (1967: 157); Merxmüller & Roessler (1984: 90); Herman (2003: 278). Type: South Africa, Western Cape Prov., Olifantrivier W (of "West"?), *Drège* s.n. [5660] (lectotype G-DC, no. G-00322353!, selected here; isolectotype P-027233! (sub nom. *P. mucronata* but with "Ebenezar" and [5660] added); other isolectotypes may exist — see Notes).

Shrub, to 50 cm tall. *Stems* glabrous, smooth, pale grey-white. *Leaves* alternate, glabrous, flat, linear-oblong, distinctly 1-veined beneath, to 20 – 40 × 3 – 5 mm; apex obtuse or subacute; base truncate; margins stiffly white ciliate. *Capitula* solitary, terminal, obconical, 35 × 15 – 25 mm. *Receptacle* honeycombed and fimbriate. *Phyllaries* multiseriate, gradate, orbicular to ovate to linear-oblong (inner), to 8 mm long, greenish, glabrous, coriaceous; without midrib; apex truncate or obtuse; margins coriaceous. *Florets* c. 15; *corollas* to 20 mm long, glabrous, yellow; lobes linear-lanceolate, acute; tube slender, ribbed. *Achenes* compressed oblanceolate, densely golden sessile glandular, not hairy, to 7 mm long. *Pappus* multiseriate, barbellate, to 15 mm long, golden-brown.

DISTRIBUTION. Africa: Namibia, South Africa. Map 14.

SPECIMENS EXAMINED. NAMIBIA. Karas Region, Lüderitz Distr.: Oranjemund, slopes towards diamond mine, 24 March 1958, *Merxmüller & Giess* 2326 (M, PRE, WIND!). **SOUTH AFRICA.** Western Cape Prov.: Olifantrivier W (of "West"?), *Drège* s.n. [5660] (*P. onobromoides* lectotype G-DC, no. G-00322353!; isolectotype P-027233!; possible isolectotypes: HAL-0110983!, HBG-505195!, K000273445!, TUB-005030!, W-Rchb.-1889-0219717!, W-Rchb.-1889-0278273!). Northern Cape Prov.: Namaqualand, *Ecklon* 31 (*P. onobromoides* syntype G-DC no. G-00322351!); *Ecklon* 73 (*P. onobromoides* syntype G-DC no. G-00322352!).



Map 14. Known distribution of *Pteronia onobromoides* in Namibia.

HABITAT. Sandy slopes, coastal steppe dominated by succulent species; no altitudinal data are present on the examined collections.

CONSERVATION STATUS. The South African threat status is Least Concern (LC) (SANBI 2011). There are very few collections from Namibia, suggesting that it is rare but the limited information available does not allow an evaluation at this stage, and it must be assigned Data Deficient (DD) status in Namibia (IUCN 2001).

PHENOLOGY. Fruiting: March.

NOTES. This coastal species has been collected only twice in Namibia (only one of which was seen by us), likely caused by being in the access-restricted diamond mining area in the south-west of the country. Elsewhere it is common along the coast of the Northern and Western Cape Provinces of South Africa.

De Candolle (1836: 364) lists two locations with collectors: "in Africa Capensi ad Olifant-rivier (Dreg.!) et in Namaqualand (Eckl.!).". Inspection in G-DC revealed that there are three collections involved (mounted together on a single sheet), one by Drège with the associated number [5660], and two by Ecklon, nos 31 and 73. These are all of comparable quality, but our research showed that only of the Drège one there is the (distinct) possibility that it has been distributed to other herbaria. Only for this reason we have selected the Drège collection as the lectotype. The enumeration of 1843 shows that Drège collected *Pteronia onobromoides* at locality III E a 4, which is Ebenezar and located on the Olifant River,

and it seems reasonable to assume a copy of this gathering was seen by de Candolle. Some possible isolectotypes are the Drège specimens in HAL, HBG, K, TUB and W-Rchb., which are annotated with the locality "Ebenezar" and the code III E a 4, though none carries [5660], which would have demonstrated a more direct link with the G-DC lectotype. *Ecklon* 31 and 73 in G-DC are now the remaining syntypes.

15. Pteronia paniculata *Thunb.* (Thunberg 1800: 143); de Candolle (1836: 365); Harvey in Harvey & Sonder (1865: 102); Hutchinson & Phillips (1917: 312); Dinter (1931: 168); Merxmüller (1967: 157); Merxmüller & Roessler (1984: 90); Herman (2003: 278). Type: South Africa, Western Cape Prov., Cape of Good Hope, *Thunberg* s.n. (holotype UPS-THUNB).

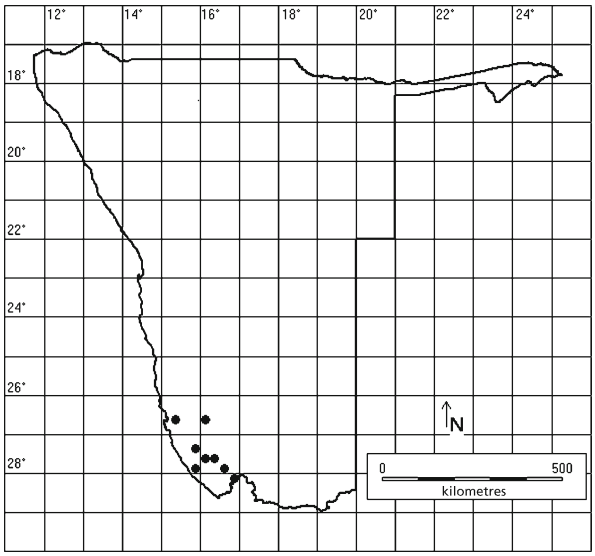
Pteronia flexicaulis auct. non L. f.: de Candolle (1836: 360).

Shrub, to 50 cm tall. *Stems* glabrous, grey. *Leaves* opposite, clustered along stems, fleshy, lacquered, viscid, bright green, glabrous, linear, terete to boat-shaped, to 15 – 25 × 1 – 2 mm; apex recurved, subobtuse; base connate, forming a c. 5 mm long sheath. *Capitula* in dense terminal cymes, cylindrical to narrowly turbinate, 10 × 3 – 4 mm; apex obtuse in bud. *Receptacle* honeycombed, remains long after seed is shed, conspicuous. *Phyllaries* multiseriate, ovate-oblong to oblanceolate, 3 – 8 × 1 – 2 mm, lime-yellow, glabrous, lacquered; apex obtuse; without conspicuous membranous margins. *Florets* to 4; *corollas* to 5 mm long, glabrous, yellow; lobes lanceolate, subacute; tube ribbed. *Achenes* compressed obovoid, contracted terminally, long villous, to 2.5 mm long. *Pappus* bi-seriate, bristles broadened at base, scale-like, c. 4 mm long, white to golden. Fig. 6.

DISTRIBUTION. Africa: Namibia, South Africa. Map 15.

SPECIMENS EXAMINED. NAMIBIA. Karas Region, Lüderitz Distr.: Diamond Area 1, Skorpion, 27 Aug. 1997, *Burke* 97208 (WIND!); Kovis Mts, 32 km (20 miles) E of Lüderitz, on the Lüderitz – Aus road, 6 March 1963, *De Winter & Hardy* 7912 (PRE, WIND!); Aus, 21 Oct. 1922, *Dinter* 4147 (Z!); Farm Klein Aus, W of Aus, 9 Aug. 1959, *Giess & Van Vuuren* 932 (PRE, WIND!); Rocky gorge just as you exit Klinghardt Mts, travelling

Fig. 6. Fruiting *Pteronia paniculata*. PHOTO: H. KOLBERG.



Map 15. Known distribution of *Pteronia paniculata* in Namibia.

E, 11 Sept. 2005, *Mannheimer* CM2759 (WIND!); (Aus) quartz foothills, 17 Sept. 2005, *Mannheimer* CM2821 (WIND!); Kovis Mts, E side, mostly at foot of mountain, 13 Sept. 1972, *Merxmüller & Giess* 28433 (M, PRE, WIND!); Klinghardt Mts, S part near the Sargdeckel, 19 Sept. 1977, *Merxmüller & Giess* 32120 (M, WIND!); Gabusib R., 18 Feb. 1992, *Strohbach* 72 (WIND!); Boegoeberg, 28 Sept. 1992, *Strohbach* 219 (WIND!); S Namib, Diamond Area no. 1, Aurus Mts (N), 21 April 1988, *Ward & Seely* 10238 (WIND!); Diamond Area no. 1, Rooiberg, Oct. 1977, *Wendt* 23/1 (WIND!).

HABITAT. In windblown sand on slopes, steppe dominated by succulents; 700 – 1400 m.

CONSERVATION STATUS. Although this species' distribution in Namibia is fairly restricted, the estimated EOO and AOO still exceed the threshold for threatened categories (IUCN 2013). In addition no threats are known that would cause population fragmentation, decline or fluctuation to the extent that the species would fall into any threatened category according to criteria A to E of the IUCN system (IUCN 2001). The Namibian conservation status is thus evaluated as LC. The South African threat status is also listed as LC (SANBI 2011).

PHENOLOGY. Flowering: August to October. Fruiting: February to April (the exceptional four – six-month period rather than the two – three months as would normally be expected could be ascribed to the limited Namibian data on which this assessment is based).

VERNACULAR NAMES. Gombossie (Afrikaans, South Africa).

NOTES. In Namibia this species is restricted to the extreme south-west, which receives winter rainfall.

16. Pteronia polygalifolia *O. Hoffm.* (Hoffmann 1893: 73); Dinter (1926: 132); Range (1935: 276); Merxmüller (1955: 80, 1967: 157); Merxmüller & Roessler (1984: 90); Herman (2003: 278). Type: Namibia, Gross Namaland, Gubub [Kubub], südöstlich von Aus, *Schenck* 147 (holotype Z-000003817!).

Pteronia quinquecostata Dinter (1932: 183). Type: Namibia, Jakkalskuppe, 1 Nov. 1922, *Dinter* 4184 (holotype B†; isotype SAM-0071810-0!).

Pteronia kingesii Merxm. (Merxmüller 1952: 125). Type: Namibia, Klein Aus, 27 June 1949, *Kinges* 2280 (holotype M-0104532!; isotype PRE).

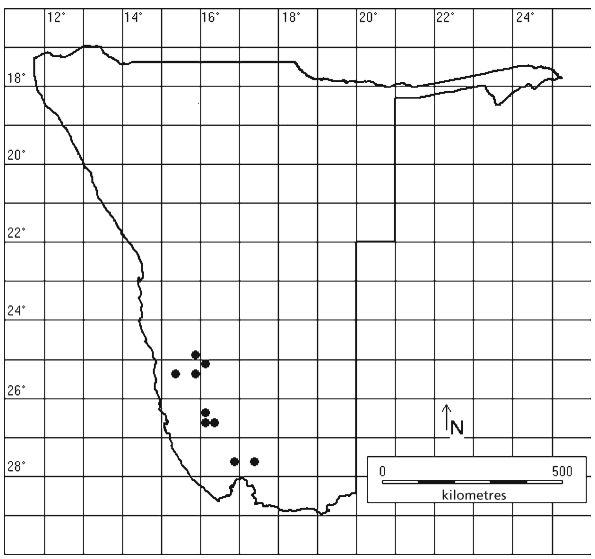
Shrub, much branched, 80 cm tall. *Stems* scabrid, brittle, pale grey, striate. *Leaves* opposite, soft, surface rough papillate, glandular, flat, obovate, spathulate to orbicular, to 10 × 8 mm; apex rounded to subacute; base narrowed into a short petiole. *Capitula* solitary, terminal, cylindrical, 15 × 3 – 9 mm; apex acute in bud. *Receptacle* slightly concave. *Phyllaries* multiseriate, gradate, lanceolate to oblong, to 5 × 2 mm, pale yellow, glabrous; apex subacute; margins membranous. *Florets* 10 – 12; *corollas* c. 7 mm long, well exserted above phyllaries, pale yellow; lobes linear-lanceolate, acute. *Achenes* compressed obovoid, glandular, long white villous, to 3 mm long. *Pappus* setae basally connate, at most 8 mm long, white to pale golden. Fig. 7.

DISTRIBUTION. Africa: endemic to Namibia. Map 16.

SPECIMENS EXAMINED. NAMIBIA. Hardap Region, Maltahöhe Distr.: Satanskop off farm Springbokvlakte 166, 23 July 1983, *Craven* 4218 (WIND!); Namibrand Nature Reserve, 19 Sept. 1997, *De Winter* 10227 (WIND!); Farm Vreemdelingspoort 141, July 1971, *Logan* 311 (WIND!); Karas Region, precise district unknown: Gross Namaland, Oranje, 1880, *Steingröver* 1 (Z!); Bethanie Distr.: Mara farm 114, 11 July 1986, *Craven* 2666 (WIND!); Lüderitz Distr.: Aus. Dikwillem, 31 July 2002, *Bartsch* SB873 (WIND!); Granite hills 3 km (1 mile) W of Aus, 11 Sept. 1958, *De Winter & Giess* 6261 (WIND!, PRE); Jakkalskuppe, 1 Nov. 1922, *Dinter* 4184 (*P. quinquecostata* isotype SAM-0071810-0!); Huns Mts, S of farm Uitsig LU 82, state land, 9 June 1976, *Giess & Müller* 14287 (WIND!, PRE); Aus (?), May 2005, *Greyling & Wolf* CW 05-08 (WIND!); Klein Aus farm; on slope of Zipfel hill, 27 June 1949, *Kinges* 2280 (*P. kingesii* holotype M-0104532!; isotype PRE); Aus Municipal campsite, 7 Aug. 2001, *Klaassen & Bartsch* EK523 (WIND!); Farm Klein Aus Vista, Geister Trail from cabin in Geisterschlucht, rocky hill slopes to SW, 4 Oct. 2006, *Kolberg & Tholkes* HK2051 (K!, WIND!); Farm Klein Aus Vista, Geisterschlucht. Rocky gorge E of cabin, 20 Sept. 2007, *Kolberg, Van Slageren, Tholkes & Whaley* HK2347 (K!, WIND!); Municipal campsite at Aus, 22 Sept. 2003, *Mannheimer* CM2455 (WIND!); Koppie W of Aus, Sept. 2005, *Mannheimer* CM2832 (WIND!); Heinrichsfelde, near koppie W of chalets, 29 July 2006, *Mannheimer* CM3030 (WIND!); Aus, mts on Farm Klein Aus, 18 Aug. 1963, *Merxmüller & Giess* 2961 (M, WIND!); Kubub Mts S

Fig. 7. Fruiting *Pteronia polygalifolia*. PHOTO: A. MCROBB, RBG KEW.

of Aus, 21 Aug. 1963, *Merxmüller & Giess* 3028 (M, WIND!); Farm Eureka 49, 14 Sept. 1972, *Merxmüller & Giess* 28449 (M, WIND!); Aus townlands, 10 Oct. 1979, *Owen Smith* 1274 (WIND!); Great Namaland, Gubub [Kubub], SE of Aus, 14 July 1885, *Schenck* 147 (*P. polygalifolia* holotype Z-000003817!); Kubub, March 1885, *Schinz* 697 (Z!); Namib Desert Park. SW side of Hauchab Mts, approx. 100 m above base of outcrop, 19 Aug. 1980, *Seely & Ward* 26 (WIND!); Farm Neisip 34. Aus, 10 June 1972, *Wiss* 2554 (WIND!).



Map 16. Known distribution of *Pteronia polygalifolia* in Namibia.

HABITAT. Rocky slopes (mostly granite) in desert and desert-dwarf shrub transition zone; 750 – 1650 m.

CONSERVATION STATUS. Using the 1994 IUCN criteria, Craven & Loots (2002) evaluated this species as Lower Risk – Least Concern (LRlc). Using more recent criteria (IUCN 2001) *Pteronia polygalifolia* is re-evaluated as LC here because its estimated EOO and AOO are larger than the maxima qualifying it for a threatened category. No threats to the species are known that would cause qualification under any of the other criteria in the IUCN system (IUCN 2013). Since this is a Namibian endemic, this is a global conservation status.

PHENOLOGY. Flowering: May to October. Fruiting: September to December.

NOTES. This species has been recorded only in south-western Namibia (Map 16).

17. Pteronia pomonae *Merxm.* (Merxmüller 1952: 127; 1967: 157); Merxmüller & Roessler (1984: 90); Herman (2003: 278). Type: Namibia, Alicetal bei Pomona, 6 June 1929, *Dinter* 6412 (holotype M-0104533!; isotypes B-10-0097214!, B-10-0097215!, HBG-505135!, HBG-505187!, HBG-505188!, HBG-

505189!, HBG-505191!, K-000273528!, PRE-0161631-0!, S-07-7260!, Z-000052428!).

Pteronia cancellata Dinter (1932: 184), **nom. nud.** — see Notes.

Pteronia villosa auct. non L. f.: Dinter (1931: 169, author as "L.";1932: 184); Range (1935: 276, author as "L.").

Shrub, much-branched, to 50 cm tall. *Stems* glabrous, pale grey when young, dark grey and fissured when older. *Leaves* alternate to almost opposite, clustered on dwarf shoots, terminally with long, white marginal bristles forming cage around capitula, lower leaves without bristles, glabrous, linear, terete, 10 × 1 mm; apex obtuse; base slightly eared, sessile, not connate. *Capitula* solitary, terminal, cylindrical to ovoid, 8 – 10 × 4 – 5 mm; apex rounded in bud. *Receptacle* fimbriate. *Phyllaries* multiseriate, narrowly oblong to elliptic, 2 – 3 × 5 – 10 mm, green to yellow, glabrous; apex rounded; margins dark brown or red on outer and narrow hyaline on inner phyllaries. *Florets* 9 – 12; *corollas* to 6 mm long, pilose, bright yellow; lobes linear-lanceolate, acute; tube gradually widening. *Achenes* turbinate compressed, densely sericeous, glandular, to 2 mm long. *Pappus* setae connate at base, c. 4 mm long, golden. Fig. 8.

DISTRIBUTION. Africa: endemic to Namibia. Map 17.

SPECIMENS EXAMINED. NAMIBIA. Karas Region, Lüderitz Distr.: Diamond Area No. 1, Chamnaub Inselberg, NE of Boegoeberg, 28 Aug. 2002, *Bartsch* SB929 (WIND!); Diamond Area 1, Namitsis Inselberg, about 30 km S of Klinghardts, 1 Sept. 2002, *Bartsch, Loots & Mannheimer* SB947 (WIND!); Rote Kuppe – Chamais road, 6 Sept. 2002, *Bartsch, Loots & Mannheimer* SB1035 (WIND!); Diamond Area 1, Klinghardt's Mts, 21 Sept. 1996, *Burke* 96156 (WIND!); W side of Münzen Mts, 30 Aug. 1958, *De Winter & Giess* 6120 (PRE, WIND!); Gais area, E of Hohenfels, on the road to Jakkalsberge, Oranjemund, 4 Sept. 1958, *De Winter & Giess* 6199 (PRE, WIND!); Diamond area no 1, Oranjemund, Gais area, E of Hohenfels, on the road to Jakkalsberge, 5 Sept. 1958, *De Winter & Giess* 6202 (WIND!); Coastal desert on gneiss hills at Halenberg, 15 Oct. 1922, *Dinter* 4086 (K!, PRE); Alicetal near Pomona, 6 June 1929, *Dinter* 6412 (*P. pomonae* holotype M-0104533!; isotypes B-10-0097214!, B-10-0097215!, HBG-505135!, HBG-505187!, HBG-505188!, HBG-505189!, HBG-505191!, K-000273528!, PRE-0161631-0!, S-07-7260!, Z-000052428!; *P. cancellata* vouchers B-10-0097214!, B-10-0097215!, E-00413376!, HBG-505135!, HBG-505187!, HBG-505188!, K-000273528!, S-07-7260!, SAM-0071825-0!, Z-000052428!); Klinghardt Mts, 31 Aug. 2002, *Gess & Gess* 02/03/28 (WIND!); Farm Witputz Nord LU 22. 20.5 km SW of the police station, 30 Sept. 1975, *Giess* 13766 (PRE, WIND!); Farm Spitzkop LU 111, 14 Aug. 1976, *Giess* 14630 (PRE, WIND!); Sperrgebiet, turn-off at N entrance to Klinghardt Mts, 4 Aug. 2001, *Klaassen & Bartsch* EK466 (WIND!); 39 km from Rotkop on powerline track, low koppie, 22 Oct. 1987, *Kolberg & Maggs* HK194 (PRE, WIND!); Kovis Mts, campsite, at base of mountain, SW of radio mast, 8 Oct. 2006, *Kolberg & Tholkes* HK2079 (K!, WIND!); Sperrgebiet, Lüderitz – Oranjemund road at N turn-off to Bogenfels, 14 Oct. 2006, *Kolberg & Tholkes* HK2098 (K!, WIND!); Close to the mainroad, 9 Sept. 2005, *Kwembeya* EKw57 (WIND!); Tafelberg, SE of Klinghardt Mts, Sperrgebiet 1, Aug. 1971, *Logan & Jensen* 902 (WIND!); Schwarzkop, NE of Bogenfels, Sperrgebiet 1, Aug. 1971, *Logan & Jensen* 1093 (WIND!); Pietab 1, Klinghardt Mts, Sperrgebiet, Aug. 1971, *Logan & Jensen* 1137 (WIND!); Between Chamnaib and Bogenfels, 29 Aug. 2002, *Mannheimer* CM2046 (WIND!); Namitsas, S of Klinghardt Basin, Sept. 2002, *Mannheimer* CM2095 (WIND!); E Sperrgebiet, 2 Sept. 2002, *Mannheimer* CM2148 (WIND!); Road to Grillental from Kaukausib, 5 Sept. 2002, *Mannheimer* CM2202 (WIND!); 23 km S of Grillental, 12 Sept. 1972, *Merxmüller & Giess* 28381 (M, PRE, WIND!); 9.5 km S of Grillental, 15 Sept. 1977, *Merxmüller & Giess* 32019 (M, PRE, WIND!); Klinghardt Mts, in the S part, in the region of Sargdeckel, 17 Sept. 1977, *Merxmüller & Giess* 32110 (M, WIND!); Klinghardt Mts, near the foot of the mountain, 28 July 1977, *Müller* 696 (WIND!); Sperrgebiet, hills on N side of Klinghardt Mts, 13 Aug. 2001, *Smook* 11374 (PRE, WIND!); Diamond area no. 1, c. 18 km W of Rosh Pinah, towards Obib Mt, 1 Sept. 1989, *Van Wyk* 8890 (PRE, WIND!); S Namib, Diamond area no. 1, S of Klinghardt Mt, 21 April 1988, *Ward & Seely* 10233 (WIND!); Diamond Area 1, Tsaus Spinnenberg, Oct. 1977, *Wendt* 8/1 (WIND!).

HABITAT. Plains and slopes in steppe characterised by succulents; 200 – 700 m.

CONSERVATION STATUS. Present information leads to an evaluation of LC (IUCN 2001) for this relatively abundant species. Both estimated EOO and AOO are well above the thresholds for threatened categories and no population decline, fragmentation or fluctuation could be identified that would qualify this species as threatened (IUCN 2013). *Pteronia pomonae* is endemic to Namibia and is LC thus the global status.

PHENOLOGY. Flowering: July to October. Fruiting: October to January.

NOTES. The characteristic long ciliate leaves at the base of capitula make this Namibian endemic species easily recognisable amongst *Pteronia* species in the country (Fig. 8).

Pteronia cancellata is a manuscript name (Dinter 1932: 184) associated with *Dinter* 6412, now the type of *P. pomonae*, and found on vouchers in (at least) B, E, HBG, K, S, SAM, and Z, as follows: B-10-0097214!, B-10-0097215!, E-00413376!, HBG-505135!, HBG-505187!, HBG-505188!, K-000273528!, S-07-7260!, SAM-0071825-0!, and Z-000052428!. Of these vouchers E and SAM do not present a reference to *P. pomonae* on the sheet,

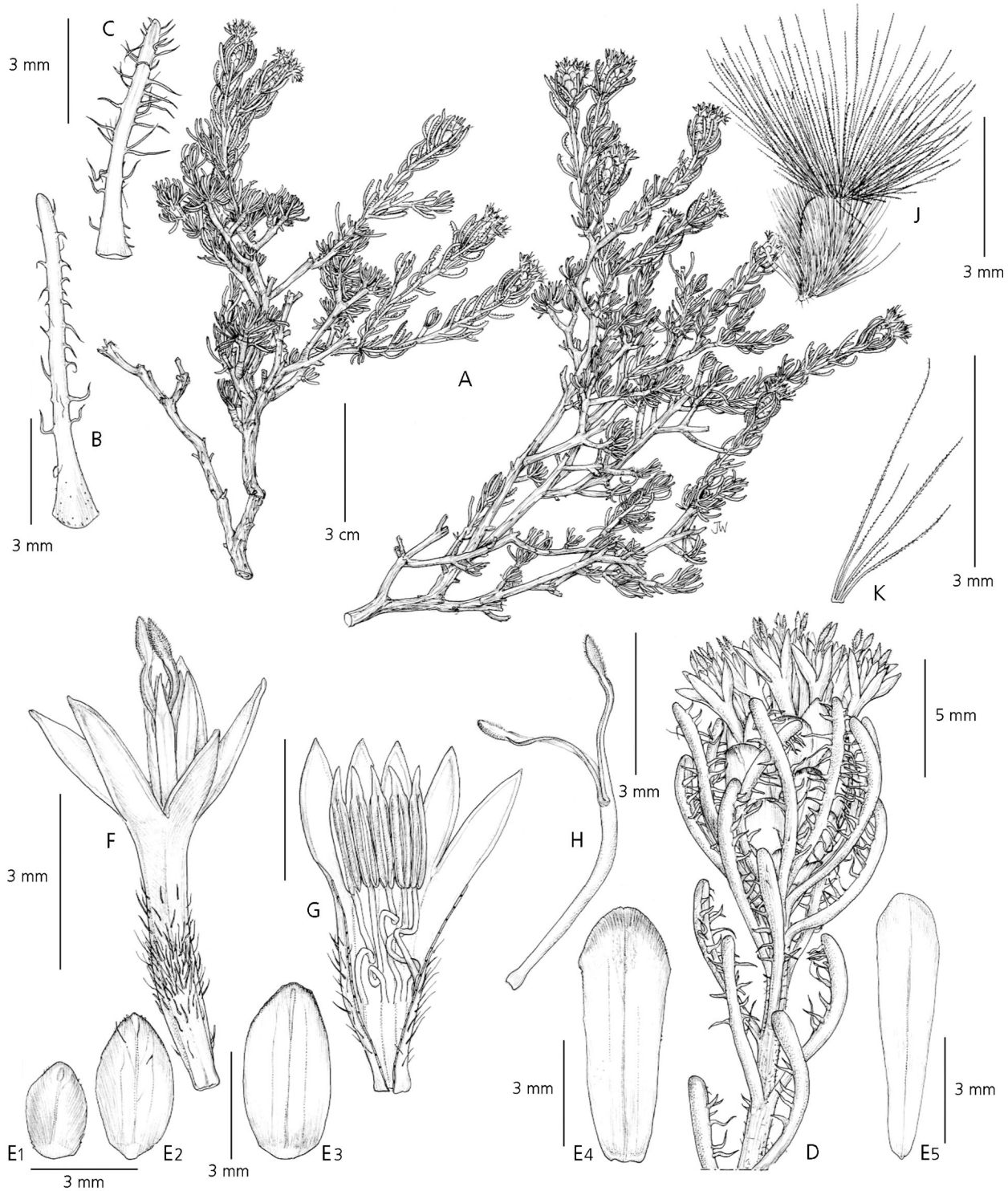
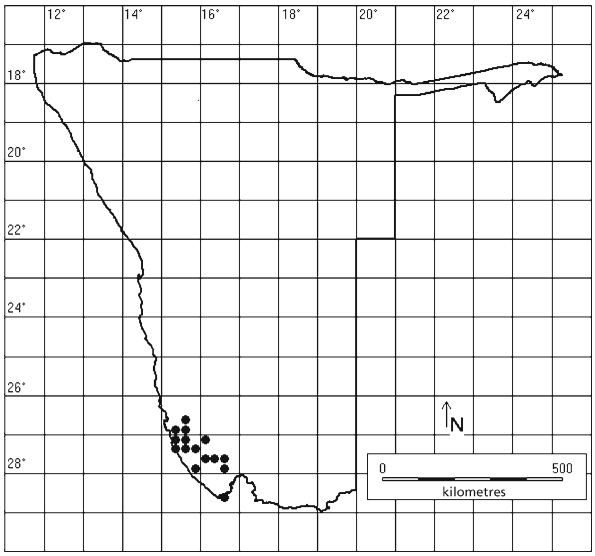


Fig. 8. *Pteronia pomonae*. **A** habit; **B** (upper) leaf, abaxial; **C** (upper) leaf, adaxial; **D** capitulum, side view; **E (1 – 5)** phyllaries, left to right: outer to inner; **F** floret, side view; **G** corolla, opened and stamens; **H** style; **J** (young) achene with pappus; **K** pappus setae detail. **A – K** *Kolberg & Tholkes* HK2098. DRAWN BY JULIET BEENTJE.

while all others do. Rather than describing and adopting the name *cancellata*, Merxmüller (1952) chose to ignore the epithet and replace it with *pomonae*.



Map 17. Known distribution of *Pteronia pomonae* in Namibia.

18. Pteronia quadrifaria *Dinter* (1932: 182). Type: Namibia, Gross Namaland, Zwartaus, 17 March 1929, *Dinter* 6190 (holotype B†; lectotype HBG-505185!, selected here; isolectotype HBG-505186!).

Erect, intricately branched *shrub*, to 25 cm tall. *Stems* pale tan or pale grey, lower layers white, farinose, bark on older stems dark grey, longitudinally fissured, leaf scars conspicuous, spiny remains of parts connecting opposite leaves most conspicuous near branch tips. *Leaves* decussate-imbricate, densely arranged at branch tips, less imbricate on flowering branches, dehiscent at base of branches, somewhat fleshy, surface minutely papillose, margins ciliate-pectinate, more so towards leaf apex, sometimes abaxial keel pectinate at apex, narrowly oblong to linear-lanceolate, apex obtuse, boat-shaped, convex beneath, midrib indented on slightly concave adaxial surface, 4 – 5 × 1 – 1.5 mm; apex obtuse; base sessile, somewhat connate, with spinules between bases of opposite leaves. *Capitula* solitary, terminal, obconical to ovoid, 10 – 12 × 4 – 6 mm; apex constricted, truncate in bud. *Receptacle* epaleate. *Phyllaries* multiseriate, gradate, spirally arranged, c. 20 per capitulum, oblong, 3 × 1.5 mm to 10 × 1 mm, pale yellow-green, shiny, papillose towards apex on abaxial surface; apex of outer acute, of inner truncate; margins undulate, membranous and reflexed at right angles. *Florets* 5 – 6; *corollas* 6.5 – 7 × 1 mm, short papillate at area where translucent part meets opaque part, pale yellow; lobes narrowly acute, short bristly on outer surface; tube gradually widening towards apex, basal third translucent, rest opaque. *Stamens* 5, filaments fused to base of corolla. *Anthers* fused into a tube, about half as long as stamens, bases shortly sagittate, tips acute. *Style* bifid, branches acute, half the length of style; stigmatic papillae short. *Ovary* obconical to obtrigonous, densely cov-

Fig. 9. *Pteronia quadrifaria* showing the reflexed, undulate phyllaries, maroon pappus and densely imbricate, decussate leaves. PHOTO: H. KOLBERG.

ered with pale yellow, spherical, sessile glands, densely hirsute. *Achenes* compressed obconical, densely long, white hirsute and densely covered with golden, spherical, sessile glands, 4.5 – 5 × 2 – 2.5 mm.

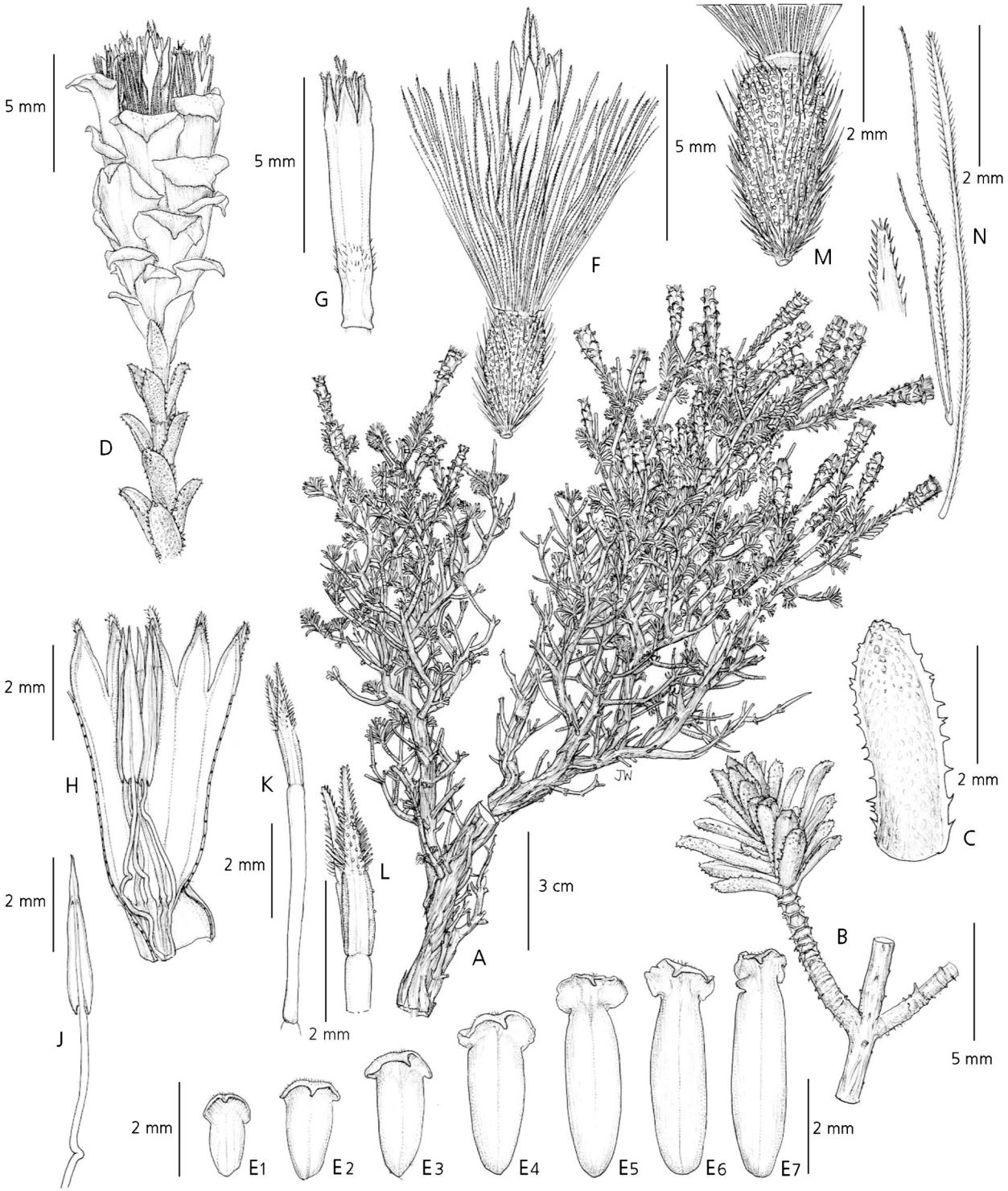
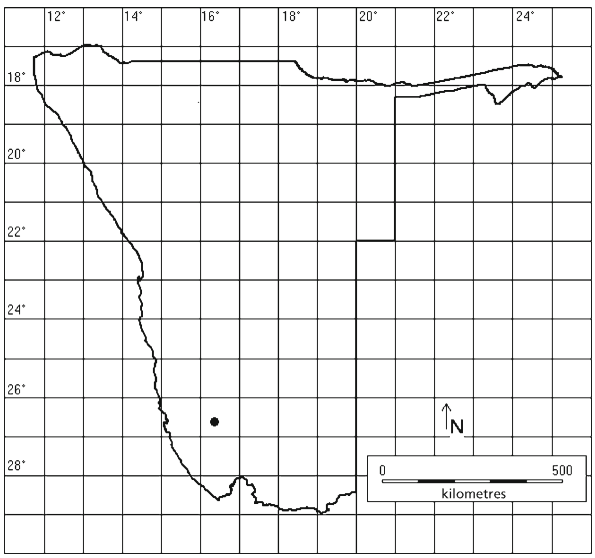


Fig. 10. *Pteronia quadrifaria*. **A** habit; **B** detailed positions of leaves; **C** leaf; **D** capitulum; **E (1 – 7)** sample of phyllaries; **F** side view of floret and (young) achene; **G** floret, side view; **H** corolla tube, opened; **J** stamen; **K** style; **L** style branches; **M** young achene; **N** pappus setae (three lengths). **A – N** *Kolberg & Tholkes* HK2893. DRAWN BY JULIET BEENTJE.

Pappus setae fused at base into a ring, 4 – 8 mm long, bristles barbellate, of different lengths, from half the length of floret to longer than floret, maroon-purple. Figs 9 – 10.

DISTRIBUTION. Africa: endemic to Namibia. Map 18.
SPECIMENS EXAMINED. NAMIBIA. Karas Region, Lüderitz Distr.: Zwartaus, 17 March 1929, *Dinter* 6190 (*P. quadrifaria* lectotype HBG-505185!, isolectotype HBG-505186!); Aus, hill N of Aus with NBC mast, below quartz ridge, 12 Oct. 2009, *Kolberg & Tholkes* HK2893 (K!, WIND!); Aus townlands, white quartz hill with NBC mast, N of town, 13 Oct. 2010, *Kolberg & Tholkes* HK2994 (K!, WIND!).
HABITAT. Quartz or granite hills in steppe characterised by a diversity of succulent species; c. 1600 m.
CONSERVATION STATUS. A preliminary global conservation status of EN D1 can be assigned to this Namibian endemic species because of the small number of individuals found at the only site known (IUCN 2013). The population found recently was the first one in Namibia since Dinter's 1929 collection, and consists of about 50 – 70 old plants on white quartz with an estimated EOO well below 100 km^2 and an AOO smaller than 10 km^2. No young plants were seen. The species was not found on other hills with similar substrate in the Aus vicinity. At the same time no visible or increasing threat to the population could be observed. Dinter (1932), however, reported having found this species on granite of which there are many hills in the Aus area that still need to be investigated. Until the possible distribution area is searched more closely for further populations of this species, no final assessment of the conservation status can be made.



Map 18. Known distribution of *Pteronia quadrifaria* in Namibia.

PHENOLOGY. Flowering: October. Fruiting: December.
NOTES. Dinter (1932: 182) described *Pteronia quadrifaria* from granite hills near Aus. The collected material at the time was, by Dinter's account, sterile (*Dinter* 3580) or "with sterile heads" (*Dinter* 6190). Indeed, both specimens at HBG have no intact flowering parts. Dinter's original collections were at Berlin (Lanjouw & Stafleu 1954: 163) and are now considered lost. Of the two syntypes *Dinter* 3580 was not found anywhere else, but two specimens of 6190 were located at HBG, each with annotations in Dinter's handwriting; the collection HBG-505185, being a bit more copious, is selected as the lectotype.

Pteronia quadrifaria was treated by Merxmüller (1955) as a synonym of *Pteronia lucilioides* DC., based mainly on the papillate leaves of the *Dinter* 6190 specimen. He argued that the growth form of *P. lucilioides* is very variable in Namibia and that *Dinter* 6190 represents a densely branched, small, shrubby form. Around Aus, however, *P. lucilioides* is a tall, virgate shrub and the stunted dwarf shrub forms are found mostly nearer to the coast. Based on recent flowering and fruiting collections the differences between the two species were confirmed, such as the apex of the budding capitula that is constricted to truncate in *P. quadrifaria* and sharply acute in *P. lucilioides* (compare Figs 4 and 9). Furthermore the densely imbricate, decussate leaf arrangement of *P. quadrifaria* clearly differs from the opposite leaves of *P. lucilioides*, and the undulate, reflexed phyllaries of the former differ from the smooth, straight phyllaries of the latter. *P. quadrifaria* can also be clearly distinguished from *P. lucilioides* by the maroon-purple pappus (straw-coloured in the latter). Reviewing all presented evidence we conclude that this merits the resurrection of *P. quadrifaria* as a distinct entity. *Pteronia quadrifaria* is similar to *P. mucronata* in its leaves with ciliate margins and truncate phyllaries, but differs in its decussate-imbricate leaf arrangement, its phyllary apex not being mucronate but undulate-reflexed, and the conspicuous maroon-purple pappus (Fig. 9).

19. Pteronia rangei *Muschl.* (Muschler 1911a: 96); Hutchinson & Phillips (1917: 319); Dinter (1926: 132); Range (1935: 276); Merxmüller (1952: 128; 1967: 158); Merxmüller & Roessler (1984: 90); Herman (2003: 278). Type: Namibia, Bezirk von Gross Namaqualand, Aus, Tafelberg, 1600 m, Oct. 1906, *Range* A 26 (holotype B†; lectotype BOL-138777!, selected here; isolectotype K-000273503!).

Shrub, to 60 cm tall. *Stems* glabrous, cream to pale grey, leaf scars distinct. *Leaves* alternate, clustered along stems, somewhat succulent, greyish-green, aromatic, surface glabrous and tuberculate, linear, subterete, curved towards stem, to 25 × 1 mm; apex obtuse; base sessile, with tuft of hairs in axil. *Capitula* solitary,

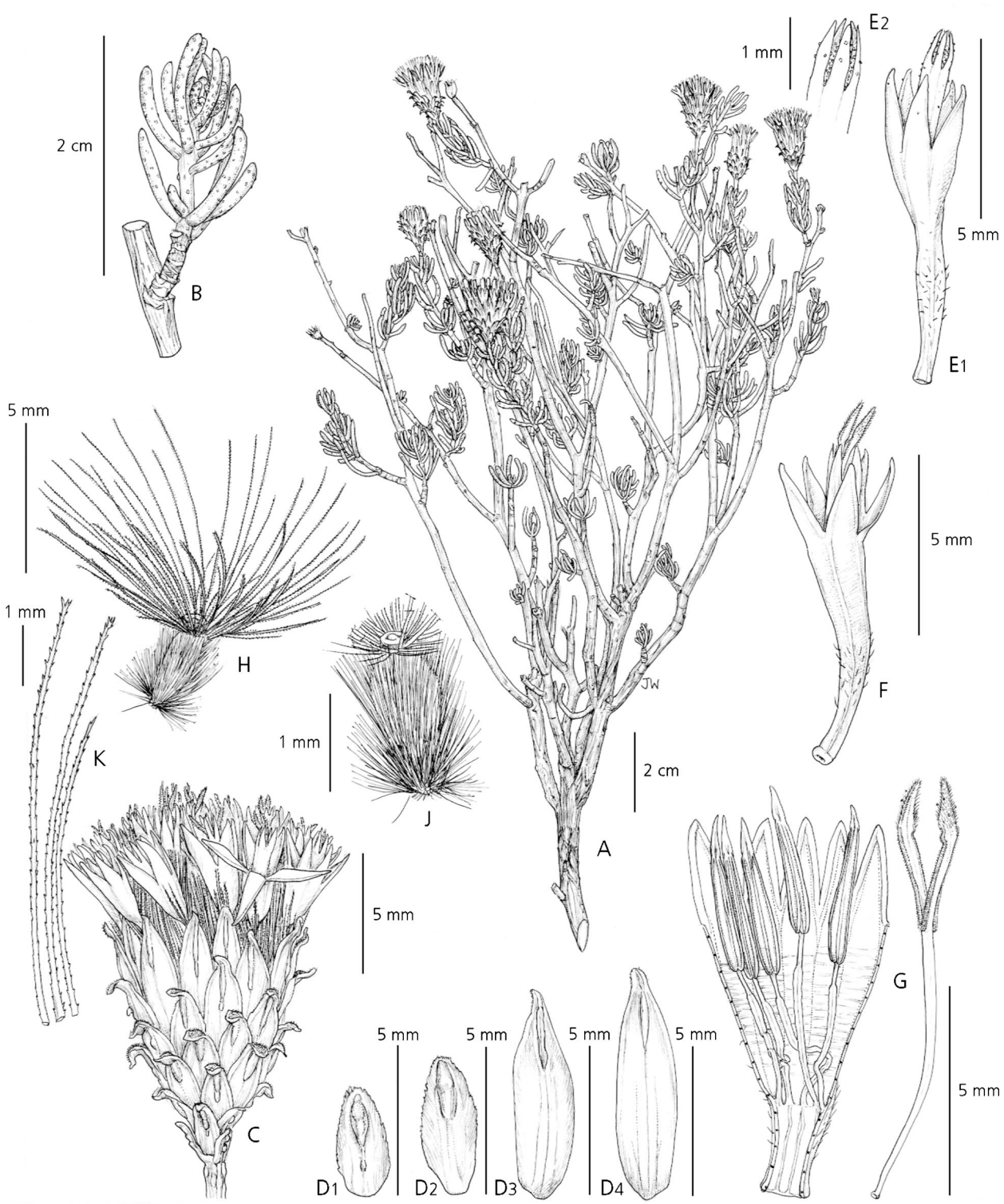


Fig. 11. *Pteronia rangei*. **A** habit of branches; **B** branchlet with leaves; **C** capitulum, side view; **D** (left to right) phyllaries in outer, mid, and inner position in capitulum, and an inner one viewed abaxially; **E** (left and right) floret side view with stamens (detail, left), and overview from the side with stamens protruding (right); **F** floret side view with style branches; **G** corolla opened with stamens and style (separate); **H** young achene with pappus; **J** achene detail; **K** pappus setae detail. **A** – **K** *Kolberg & Tholkes* HK2892. DRAWN BY JULIET BEENTJE.

terminal, cylindrical to campanulate, elongate, to 15 × 10 mm; apex truncate in bud. *Phyllaries* multiseriate, gradate, oblong-lanceolate to linear-lanceolate, to 10 × 2 mm, green to yellow, glabrous;

midribs thickened, glandular, forming a recurved, small mucro; apex subacute; margins membranous. *Florets* c. 12; *corollas* to 8 mm long, yellow; lobes linear lanceolate, subacute; tube contracted at apex, strongly ribbed in lower half. *Achenes* oblong-cylindrical, appressed villous, to 3 mm long. *Pappus* multiseriate, barbellate, c. 12 mm long, pale yellow to golden brown. Fig. 11.

DISTRIBUTION. Africa: endemic to Namibia. Map 19.

SPECIMENS EXAMINED. NAMIBIA. Karas Region, Bethanie Distr.: Farm Kosos 11, 15 Aug. 1963, *Merxmüller & Giess* 2817 (M, WIND!); Farm Saraus BET 16, 5 Sept. 1972, *Merxmüller & Giess* 28227 (M, WIND!); Keetmanshoop Distr.: Farm Lourensia, N of homestead, 28 March 1998, *Strohbach & Dauth* 3764 (WIND!); Lüderitz Distr.: Kuibis, 2 Nov. 1922, *Dinter* 4181 (Z!); Farm Kolke LU 84, not far from the farmhouse, 11 June 1976, *Giess & Müller* 14332 (WIND!); 70 km from Rotkop Station on power-line track, W slope of mountains, 23 Oct. 1987, *Kolberg & Maggs* HK208 (WIND!); Farm Zebrafontein, track from road D463; at locked gate just before homestead, 20 Oct. 2007, *Kolberg & Tholkes* HK2411 (K!, WIND!); 21 km E along road D463 from Witpütz junction on Aus – Rosh Pinah tar road, 12 Oct. 2009, *Kolberg & Tholkes* HK2892 (K!, WIND!); Aus, Tafelberg, 1600 m, Oct. 1906, *Range* A 26 (*P. rangei* lectotype BOL-138777!, isolectotype K-000273503!); Farm Plateau 38, on the slope of the ridges N of the farmhouse, 13 April 1953, *Walter & Walter* 2577 (WIND!).

HABITAT. Rocky slopes and plains of dwarf shrub savanna, desert-dwarf shrub transition and steppe dominated by succulent species; 1300 – 1400 m.

CONSERVATION STATUS. Data Deficient (DD) according to Craven & Loots (2002) and Loots (2005). During recent fieldwork the first author could not identify any threats to populations and the species is more abundant and widespread than the small number of herbarium specimens would suggest. Re-evaluation using IUCN (2001) criteria resulted in a global LC status (*Pteronia rangei* is endemic to Namibia) also because estimated EOO and AOO are well above the thresholds for threatened status (IUCN 2013).

PHENOLOGY. Flowering: June to October. Fruiting: October to December.

NOTES. The tuberculate leaf surface is unique among the Namibian species of *Pteronia* (Fig. 11). This Namibian endemic has been recorded only in the central south and south-west of the country (Map 19).

We have chosen a lectotype since the original holotype in B is assumed lost. Isotypes were found only in BOL and K. As the BOL isotype is of altogether better quality, it is selected here as the lectotype. The isolectotype in K (fragments only) notes (strung together here): "flowers yellow, shrub, ½ m, Tafelberg 1600 m, Oct. 06, Deutsch – Südwest Afrika, Dr. Range", while BOL has the altitude in feet (4800'). It should be noted that none of the lectotype collections actually carries "Aus" as the locality, only "Tafelberg" — of which there is one near Aus where the type was collected at a place called Kubub. This is in accordance with Paul Range's handwritten list of localities, seen by the first author.

20. Pteronia scariosa *L. f.* (Linnaeus filius 1782: 356); Thunberg (1800: 144); de Candolle (1836: 361); Harvey in Harvey & Sonder (1865: 104); Hutchinson & Phillips (1917: 315); Dinter (1926: 132); Range (1935: 276); Merxmüller (1952: 128; 1967: 158); Merxmüller & Roessler (1984: 90); Herman (2003: 278). Type: South Africa, Western Cape Prov., Cape of Good Hope, *Thunberg* s.n. (holotype UPS-THUNB; isotype LD-1254325!).

Pteronia lycioides Muschl. ex Dinter (Dinter 1926: 132); Range (1935: 275). Type: Namibia, Büllsporter Fläche, *Dinter* 2146 (not traced, likely B†).

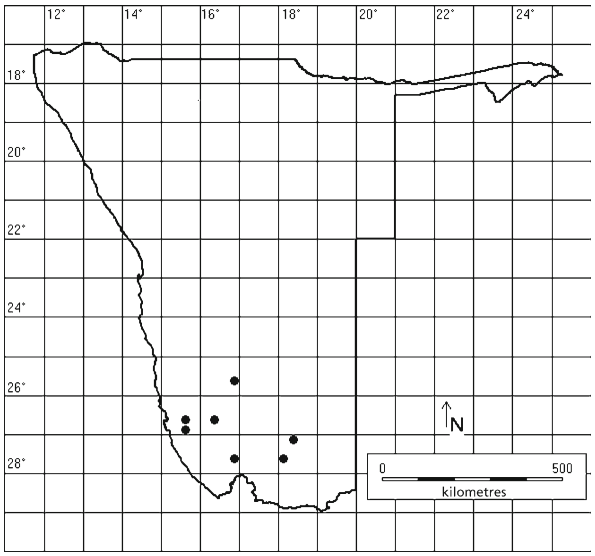
Shrub, to 50 cm tall. *Stems* glabrous, tan to greyish-brown, tips somewhat spinescent. *Leaves* alternate, thickish, coriaceous, glabrous, obovate to oblong-lanceolate, to 10 × 3 mm; apex rounded to subacute; base cuneate. *Capitula* solitary, terminal, subcampanulate, to 20 × 18 mm; apex acute in bud. *Receptacle* flat, surface slightly jagged. *Phyllaries* multiseriate, gradate, outer much smaller than inner, broadly lanceolate, keeled, 3.5 × 2 mm to 15 × 4 mm, pale reddish-brown, membranous, translucent, glabrous; midrib narrow, brown, extending into a sharp point; apex mucronate, acute; margins finely lacerate. *Florets* c. 14; *corollas* to 2.5 mm long, yellow; lobes linear-lanceolate, subacute, margins reddish-brown when dry; tube cylindric, 5-ribbed near base. *Achenes* obovoid, contracted into a short, glabrous neck, long villous, to 4 mm long. *Pappus* setae fused into a basal ring, to 13 mm long, brown to reddish-brown.

DISTRIBUTION. Africa: Namibia, South Africa. Map 20.

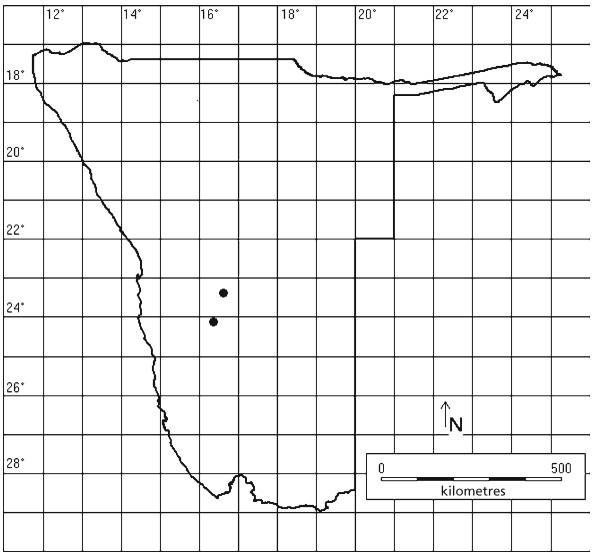
SPECIMENS EXAMINED. NAMIBIA. Hardap Region, Maltahöhe Distr.: Büllsporter Fläche, 20 Sept. 1947, *Strey* 2130 (NBG!, PRE); Khomas Region, Windhoek Distr.: Farm Göllschau, 19 Nov. 1934, *Dinter* 7980 (P!, WIND!). **SOUTH AFRICA.** Western Cape Prov.: Zilverfontein, 25 Oct. 1830, *Drège* s.n. (HBG-505184!, K-000273490!, P-027261!); Cape of Good Hope, *Thunberg* s.n. (*P. scariosa* holotype UPS-THUNB, isotype LD-1254325!).

HABITAT. Seasonally flooded plain in dwarf shrub savanna.

CONSERVATION STATUS. This species has restricted distribution (small estimated EOO and AOO) and small number of populations in Namibia but no



Map 19. Known distribution of *Pteronia rangei* in Namibia.



Map 20. Known distribution of *Pteronia scariosa* in Namibia.

specific threats are known from the area of distribution. However, *Pteronia scariosa* has not been collected in Namibia in the past 65 years and no specific efforts were made to find it. Because of the lack of sufficient recent data, the Namibian status is DD (IUCN 2001, 2013). Existing herbarium collections suggest that it is rare in Namibia. The South African threat status has been recorded as LC (SANBI 2011).

PHENOLOGY. Flowering: September to November.

NOTES. Only three specimens are known from Namibia, of which *Dinter* 2146 could not be traced (it was undoubtedly in B and is now considered lost), and the species has not been collected since 1947. The Namibian population is disjunct from the distribution of the species in South Africa's Northern and Western Cape Provinces. More material needs to be collected in Namibia. The chances of plants still being at the recorded localities are good, since these are in relatively protected commercial farmland that has been utilised sustainably.

21. Pteronia sordida *N. E. Br.* (Brown 1906: 108); Hutchinson & Phillips (1917: 325); Merxmüller (1955: 80, 1967: 158); Merxmüller & Roessler (1984: 90); Herman (2003: 278). Type: South Africa, Eastern Cape Prov., Conway Farm, Middelburg Div., 1100 m, Aug. 1899, *Gilfillan* in herb. *Galpin* 5527 (holotype K-000273517!; isotype PRE-161726-0).

Pteronia chlorolepis Dinter (1932: 181). Type: Namibia, Gross Namaland, Aus, 26 Oct. 1922, *Dinter* 4153 (lectotype HBG-505115!, selected here; isolectotypes SAM-0071816-0!, Z-000003813!). — see Notes.

Pteronia glomerata auct. non L. f.: Range (1935: 275).

Shrub to 35 cm tall. *Stems* mostly glabrous, sometimes whitish pubescent, older bark grey, fissured. *Leaves* opposite, glabrous or minutely puberulous, linear to linear-lanceolate, boat-shaped, to 6 × 2 mm; apex obtuse; bases somewhat fused. *Capitula* solitary, terminal, obconical, base narrow, 15 × 10 – 12 mm; apex subacute to truncate in bud. *Receptacle* fimbriate. *Phyllaries* multiseriate, oblong-oblanceolate, closely imbricate, to 10 × 3 mm, greenish-yellow, glabrous; midrib dark greyish-green; apex acute to obtuse; lateral margins membranous. *Florets* 5 – 9; *corollas* to 12 mm long, yellow; lobes lanceolate, subacute; tube contracted near base. *Achenes* oblong, densely villous, to 3.5 mm long. *Pappus* multiseriate, 8 – 9 mm long, golden to straw-coloured.

DISTRIBUTION. Africa: Namibia, South Africa. Map 21.

SPECIMENS EXAMINED. NAMIBIA. Hardap Region, Rehoboth Distr.: 23 km W along road D1261 from junction with road C24 (NE of Nauchas), 28 Aug. 2009, *Kolberg & Tholkes* HK2824 (K!, WIND!); Karas Region, Bethanie Distr.: 28 km S of Helmeringhausen on road to Aus, 3 Oct. 2006, *Kolberg & Tholkes* HK2042 (K!, WIND!); Tirasberge, 16 Aug. 1963, *Merxmüller & Giess* 2866 (M, WIND!); Lüderitz Distr.: Aus, 26 Oct. 1922, *Dinter* 4153 (*P. chlorolepis* lectotype HBG-505115!; isolectotypes SAM-0071816-0!, Z-000003813!); Aus townlands, S of town, 3 Oct. 2006, *Kolberg & Tholkes* HK2045 (K!, WIND!); Farm Witpütz Süd, about 5 km NE of house, calcrete ridges E of track to road D463, 25 Oct. 2007, *Kolberg & Tholkes* HK2443 (K!, WIND!); Aus, at river on road to Helmeringhausen, 7 Aug. 1963, *Merxmüller & Giess* 2917 (M, PRE, WIND!); Farm Plateau, 20 Aug. 1963, *Merxmüller & Giess* 3014 (M, WIND!); Gross Namaland, Farm Plateau at Schakalskuppe station, 13 April 1953, *Walter & Walter* 2558 (WIND!); Farm Plateau near Aus, 9 Sept. 1963, *Wiss* 2021 (WIND!). **SOUTH AFRICA.** Eastern Cape Prov.: Conway Farm, Middelburg Div., Aug. 1899, *Gilfillan* in

herb. *Galpin* 5527 (*P. sordida* holotype K-000273517!; isotype PRE-161726-0).

HABITAT. Gravelly and rocky hills and plains in desert, desert-dwarf shrub transition and dwarf shrub savanna; 1200 – 1650 m.

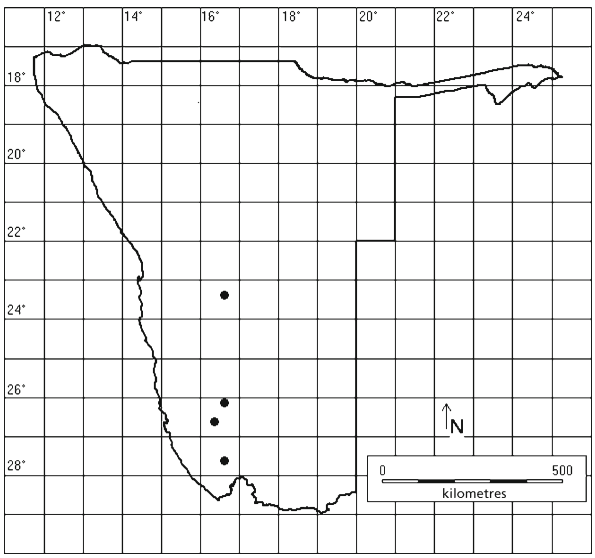
CONSERVATION STATUS. In Namibia the estimated EOO and AOO (22,500 km^2 and 2,500 km^2 respectively) just exceed the maximum for the VU category under criterion B (IUCN 2013). *Pteronia sordida* is known from only four localities in Namibia, which would qualify it for a VU status under criterion D2, but the necessary additional criteria for threatened status (plausible threat, population decline, fragmentation or fluctuation) are not established (IUCN 2001, 2013). This results in a status of LC in Namibia, the same as in South Africa (SANBI 2011).

PHENOLOGY. Flowering: April to September. Fruiting: August to November.

NOTES. The distribution is disjunct in Namibia with populations along the south-western escarpment and one record from central Namibia. The Namibian populations are in turn disjunct from the South African ones in the Northern, Western and Eastern Cape Provinces. The Namibian distribution can be explained by the species' preference for higher altitudes but more material is needed to confirm this.

The HBG sheet of *Dinter* 4153 is chosen as the lectotype of *Pteronia chlorolepis* since it is marginally more informative than the other two extant duplicates seen. The other syntype associated with the name (Gross Namaland, Aus, 7 April 1929, *Dinter* 6259), was probably only present in B and is now considered lost.

22. Pteronia spinulosa *E. Phillips* in Hutchinson & Phillips (1917: 320); Merxmüller (1967: 158); Merxmüller & Roessler (1984: 90); Herman (2003: 279). Type: Namibia, Angra Pequena [Lüderitzbucht], 18 January 1907, *Galpin & Pearson* 7645 (lectotype SAM-0001648-0!, selected here; isolectotypes BOL-138778!, K-000273506!, PRE-0160582-0!).



Map 21. Known distribution of *Pteronia sordida* in Namibia.

Shrub, to 40 cm tall. *Stems* with rows of spinules where leaf connections remain, glabrous, glaucous-grey. *Leaves* opposite, clustered along stems, slightly succulent, glabrous but densely warty when dry, linear, boat-shaped to trigonous, keeled, to 12 × 4 mm; apex obtuse; base connate. *Capitula* solitary, terminal, oblong-ovoid, 12 – 15 × 6 – 7 mm; apex subacute in bud. *Receptacle* deeply honeycombed, fimbriate. *Phyllaries* multiseriate, oblong, closely imbricate, 2 – 10 mm long, bright yellow, glabrous; midrib with oblong thickening; apex rounded; margins not obviously membranous. *Florets* to 10; *corollas* to 6.5 mm long, glabrous, bright yellow; lobes narrowly triangular, subobtuse. *Achenes* obovoid, long appressed villous, 3 – 4 mm long. *Pappus* c. 5 mm long, straw-coloured. Figs 12 – 13.

DISTRIBUTION. Africa: endemic to Namibia. Map 22.

SPECIMENS EXAMINED. NAMIBIA. Karas Region, Lüderitz Distr.: Diamond Area 1, Chameis, 22 Aug. 1997, *Burke* 97169 (WIND!); Bogenfels, 5 Sept. 1958, *De Winter & Giess* 6216 (NBG, PRE, WIND!); Lüderitzbucht, Jan. 1929, *Dinter* 5994 (Z!); Lüderitzbucht, 18 Jan. 1907, *Galpin & Pearson* 7645 (*P. spinulosa* lectotype SAM-0001648-0!; isolectotypes BOL-138778!, K-000273506!, PRE-0160582-0!); Spencer Bay – Nordhuk, 12 Jan. 1974, *Giess & Robinson* 13192 (PRE, WIND!); Sperrgebiet, Pomona, road to house, 3 Aug. 2001, *Klaassen & Bartsch* EK460 (WIND!); Lüderitz peninsula, Mesemb Bay, 10 Oct. 2006, *Kolberg & Tholkes* HK2091 (K!, WIND!); Sperrgebiet, Granitberg Station, N of Bogenfels, N of old mine dumps, 17 Feb. 2007, *Kolberg & Tholkes* HK2199 (K!, WIND!); Lüderitzbucht, Nov. 1908, *Marloth* 4621 (GRA-0002940-0!, PRE-0160583-0!); Lüderitzbucht, on rocky terrain towards Sturmvogelbucht, 21 March 1958, *Merxmüller & Giess* 2246 (M, PRE, WIND!); Nautilus, N Lüderitz, 23 Aug. 1963, *Merxmüller & Giess* 3075 (M, WIND!); Bogenfels, 9 Sept. 1972, *Merxmüller & Giess* 28327 (M, PRE, WIND!); Valley W of Elizabeth Bay, June 1993, *Williamson* 4543 (WIND!).

HABITAT. Gravelly or rocky plains and hill slopes with windblown sand in desert and coastal steppe characterised by a diversity of succulent species; 50 – 950 m.

CONSERVATION STATUS. This species is restricted almost entirely to the protected diamond mining area, now a national park. Although *Pteronia spinulosa* is found mostly close to the coast where mining activities are also concentrated, a significant threat that would cause population reduction has not been identified. Mining here also underlies a sound environmental management policy that would control future threats. The estimated EOO and AOO and population sizes and number of locations are well above

the threshold for the threatened categories (IUCN 2001, 2013). The conservation status was assessed by Loots (2005) as LC using IUCN (2001) criteria. This is a Namibian endemic and the status thus global.

PHENOLOGY. Flowering: August to October. Fruiting: December to March.

NOTES. Edwin Phillips (in Hutchinson & Phillips 1917) listed *Galpin & Pearson* 7645 and *Marloth* 4621, these together being the syntypes of *Pteronia spinulosa*. The collections are equal in terms of quality and documentation, preventing an obvious choice between them for a lectotype. It appears, however, that the *Galpin & Pearson* specimen is more widely distributed than the *Marloth* one, and is therefore chosen as the lectotype. Since Phillips worked at the South African Museum at the time of publishing this species, the *Galpin & Pearson* specimen at SAM is selected as lectotype among the four existing specimens. *Marloth* 4621 from Angra Pequena [Lüderitzbucht] remains the other syntype.

This coastal species is endemic to Namibia (Map 22). The spinules that remain after leaf dehiscence can best be seen on younger twigs because they wear off on older branches (Figs 12 & 13).

23. Pteronia unguiculata *S. Moore* (1904: 1012); Hutchinson & Phillips (1917: 326); Dinter (1926: 133); Range (1935: 276); Merxmüller (1967: 158); Merxmüller & Roessler (1984: 90); Herman (2003: 279). Type: Namibia, Gross Namaland, Gubub [Kubub], July 1897, *Dinter* 1233 (holotype BM-001114681!, isotype Z-000003820!).

Shrub, to 100 cm tall, much-branched. *Stems* glabrous, pale grey to grey-brown. *Leaves* opposite, clustered along stems, glabrous, linear to clavate, terete, to 10 × 1 mm; apex obtuse; base slightly eared, sessile. *Capitula* solitary, terminal, elongate-cylindrical, 15 × 8 mm; apex obtuse in bud. *Phyllaries* multiseriate, broadly obovate to elliptic, broadest at apex, slightly contracted below apex, 7 – 9 × 5 mm, bright yellow, glabrous; apex truncate, mucronulate, often emarginate; margins entire, at most indistinctly lacerate-ciliate. *Florets* c. 10; *corollas* to 5 mm long, glabrous, bright yellow; lobes narrlowly lanceolate. *Achenes* turbinate, long sericeous, with few sessile glands, to 3 mm long. *Pappus* c. 5 mm long, pale yellow. Fig. 14.

DISTRIBUTION. Africa: Namibia, South Africa. Map 23.

SPECIMENS EXAMINED. NAMIBIA. Erongo Region, Omaruru Distr.: Brandberg, Amis Kloof, Sept. 1979, *Craven* 1097 (WIND!); Brandberg, near Horn on the higher plains on NW Brandberg, 19 July 1984, *Craven* 1883 (WIND!); Brandberg, upper reaches of Königstein, 6 May 1993, *Craven* 4009 (WIND!); Hardap Region, Maltahöhe Distr.: Namib Naukluft Park, Naukluft Plateau, 6 July 1993, *Bridgeford* 141 (WIND!); E facing path up Losberg to "repeater" (a telecoms mast) in the Namibrand Nature Reserve, 1 July 2004, *Clapham & Drayer* 149 (WIND!); Farm Mooirivier 169, 2 Sept. 1978, *Horn* 31 (WIND!); (Naukluft park)

Fig. 12. Horizontal-spreading branches of *Pteronia spinulosa* with fruiting capitula just prior to releasing achenes. PHOTO: H. KOLBERG.

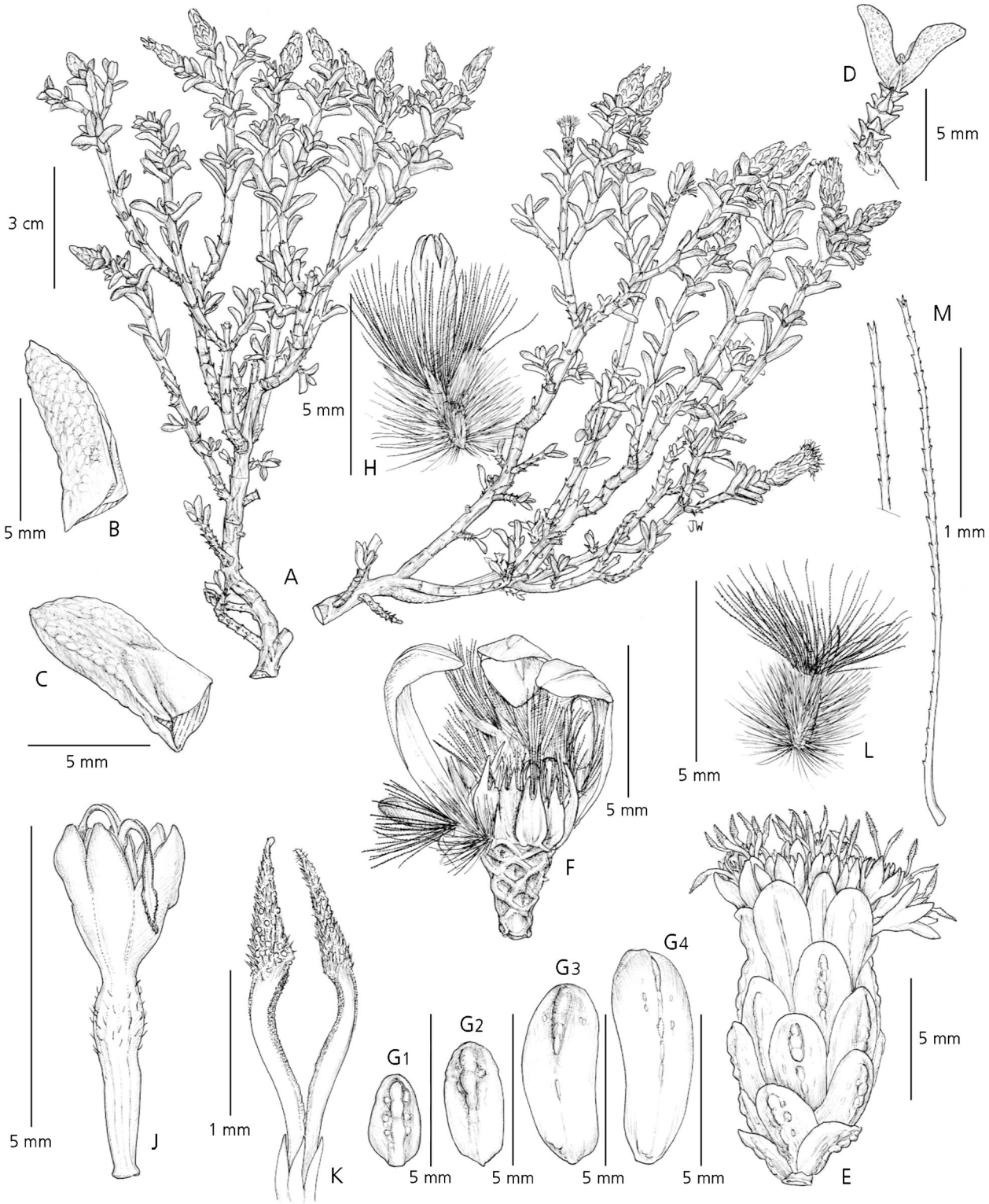
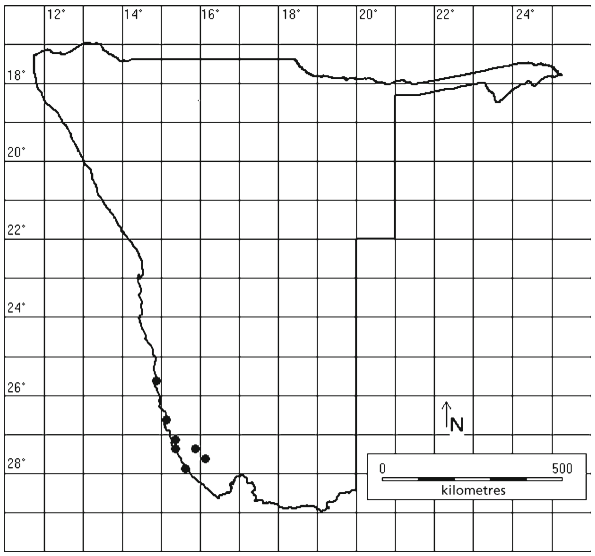
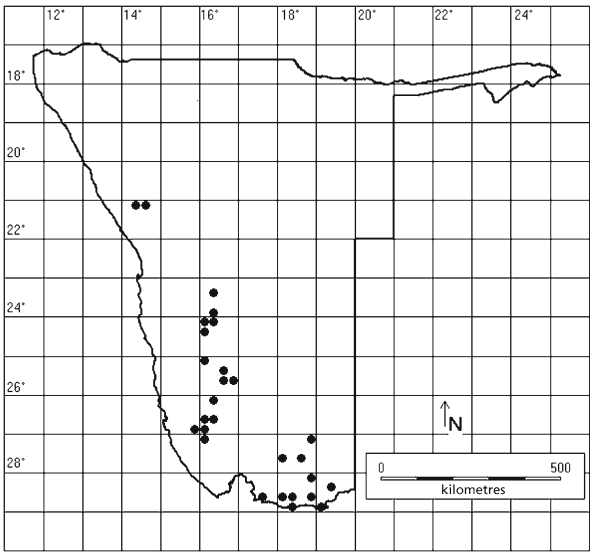


Fig. 13. *Pteronia spinulosa*. **A** habit; **B** leaf, side view; **C** leaf showing fleshy adaxial surface; **D** detail of "spinules" (remnants after pair of leaves drop off); **E** capitulum; **F** capitulum with most phyllaries removed; **G** range of phyllaries; **H** budding floret, side view; **J** floret, side view; **K** style branches, detail; **L** young achene with pappus; **M** pappus setae, detail. **A** – **M** *Kolberg & Tholkes* HK2199. DRAWN BY JULIET BEENTJE.



Map 22. Known distribution of *Pteronia spinulosa* in Namibia.



Map 23. Known distribution of *Pteronia unguiculata* in Namibia.

Tweelingpan No. 9, 9 April 1971, *Meyer* 500 987 (WIND!); Losberg on the NRNR. (Namibrand Nature Reserve), 6 Oct. 2001, *Rahn* 36 (WIND!); Bergzebrapark-Naukluft, 20 June 1968, *Van der Westhuizen* 3 (WIND!); Farm Naudaus/Duwisib MAL 76/84, 20 May 1956, *Volk* 12756 (WIND!); Farm Maguams-Krähwinkel, Helmeringhausen, 23 March

Fig. 14. Flowering *Pteronia unguiculata* branches. PHOTO: I. DINTER.

1953, *Walter & Walter* 2141 (WIND!); Rehoboth Distr.: Springbokvlakte (Farm Nauzerus), 1 Nov. 1997, *Bührmann & Bührmann* BUH1/13 (WIND!); Quartz dyke, Bastardland, Nov. 1934, *Dinter* 8045 (Z!); Karas Region, Bethanie Distr.: 38 km (23.5 miles) N of Helmeringhausen, 19 Oct. 1949, *Acocks* 15634 (PRE, WIND!); Farm Kosos, Helmeringhausen, Aug. 1963, *Merxmüller & Giess* 2818 (M, WIND!); Farm Saraus (BET 16), 5 Sept. 1972, *Merxmüller & Giess* 28228 (M, PRE, WIND!); Rolling hills on Farm Aruab 23, July 1998, *Miller* MIL1/097 (WIND!); Karasburg Distr.: 20 km (12.25 miles) NNE of Grünau, 13 Oct. 1949, *Acocks* 15562 (PRE, WIND!); Farm Vrede, 19 July 2005, *Bruyns* 10106 (BOL, WIND!); Farm Witpütz WAR 258, 15 May 1963, *Giess, Volk & Bleissner* 6951 (WIND!); Farm Genadendal, WAR 264, 20 May 1972, *Giess & Müller* 12087 (PRE, WIND!); Farm Sandfontein, WAR 148, 5 Aug. 1976, *Giess* 14505 (PRE, WIND!); 16 km SE of gate to Farm Pioneer homestead along Warmbad-Onseepkans road, 8 Sept. 2005, *Kolberg & Tholkes* HK1663 (K!, WIND!); Farm Aussenkehr, 13 km along German Outpost Trail (NE) from Noordoewer road, 18 Oct. 2005, *Kolberg & Tholkes* HK1728 (K!, WIND!); Farm Udabis, 15 Oct. 1979, *Lind* 482 (WIND!); Farm Sperlingspütz. No. 259, 21 Sept. 1979, *Owen Smith* 1209 (WIND!); Lüderitz Distr.: Aus – Rosh Pinah Road, ± 7 km from Aus, on road verge, 2 Aug. 2002, *Bartsch* SB890a (WIND!); Rosh Pinah. Nooitgedacht, 10 Aug. 2000, *Bruyns* 8332 (BOL, WIND!); Sperrgebiet, SW corner of Letterkuppe Mts, 9 Sept. 2003, *Burke* 03182 (WIND!); Gubub [Kubub], July 1897, *Dinter* 1233 (*P. unguiculata* holotype BM-001114681!, isotype Z-000003820!); Kubub, Aus, 4 Oct. 1959, *Giess* 2388 (PRE, WIND!); N of Aus, quartz ridge, 28 Sept. 1975, *Giess* 13738 (PRE, WIND!); Farm Weissenborn LU 45, slopes of Rietrivier, 10 July 1940, *Kinges* 2468 (PRE, WIND!); Farm Plateau, found in the saddle in front of the farmhouse. Aus, Sept. 1963, *Kräusel & Wiss* 2012 (WIND!); Klein Aus Vista campsite koppies, Oct. 2002, *Mannheimer* CM2285 (WIND!); Paddaput, E of house, 21 Sept. 2004, *Mannheimer, Maggs-Kölling & Loots* CM2616 (WIND!); (Aus) Quartz foothills, 17 Sept. 2005, *Mannheimer* CM2820 (WIND!); Aus, found on the mountains on farm Klein-Aus, 18 Aug. 1963, *Merxmüller & Giess* 2968 (M, PRE, WIND!); Gross Namaland, Aus, 17 Nov. 1884, *Schenck* 203 (Z!); Khomas Region, Windhoek Distr.: Farm Areb-Nord REH 202, Nauchas, 30 Aug. 1972, *Merxmüller & Giess* 28113 (M, PRE, WIND!).

HABITAT. Rocky mountains in desert, desert-dwarf shrub transition, dwarf shrub savanna, dwarf shrubland, escarpment and steppe characterised by succulent species; 500 – 1700 m.

CONSERVATION STATUS. This is the most widespread species of *Pteronia* in Namibia with an estimated EOO at least 40-fold the maximum for a status of VU under criterion B1 (IUCN 2013). Populations are fairly large and the estimated AOO also much larger than required for classification in a threatened category. No threats are identified that negatively affect population size, further disqualifying *P. unguiculata* as a threatened species under the IUCN (2001) system. The Namibian conservation status therefore is LC (IUCN 2001, 2013). The South African threat status is also LC (SANBI 2011).

PHENOLOGY. Flowering: March to November. Fruiting: July to January.

USES. Browsed by animals.

NOTES. The species seems to be closely related to *Pteronia mucronata* (Merxmüller 1952) but the absence of bristles on the leaves in *P. unguiculata* distinguishes the two species (Fig. 14); see also the discussion under *P. mucronata*. Specimens from the Brandberg show most similarities with *P. mucronata* but the leaves are not at all ciliate or pectinate. From a phytogeographical point of view these specimens would also better fit into *P. mucronata*, another high altitude species found to the south of the Brandberg (see Map 13). In his description of the species Moore (1904) discussed the similarity of *P. unguiculata* and *P. cylindracea* (q.v.), claiming there is a clear distinction in the shape of the capitula (short, narrowly ovoid in *P. unguiculata* (Fig. 14), long, strictly cylindrical in *P. cylindracea*) and apices of phyllaries (entire or very nearly so in *P. unguiculata*, ciliate-lacerate in *P. cylindracea*). This distinction is, unfortunately, not always that clear in Namibian material.

24. Pteronia viscosa *Thunb.* (Thunberg 1800: 144); de Candolle (1836: 364); Harvey in Harvey & Sonder (1865: 108); Hutchinson & Phillips (1917: 306); Merxmüller (1967: 159); Merxmüller & Roessler (1984: 90); Herman (2003: 279). Type: South Africa, Western Cape Prov., Cape of Good Hope, *Thunberg* s.n. (holotype UPS-THUNB).

Shrub, to 60 cm tall. *Stems* glabrous, greyish-white. *Leaves* opposite, thick, fleshy, glabrous except for keel and sometimes lower surface that may be setulose-ciliate, lanceolate to oblong-lanceolate, keeled, 8 – 10 × 4 mm; apex slightly mucronate, base slightly connate; margins and keel bristly-ciliate. *Capitula* solitary, terminal, obconic, 20 – 25 × 15 mm. *Receptacle* honeycombed. *Phyllaries* multiseriate, outer broadly ovate, scaly, apex subacute, inner linear-lanceolate, membranous, apex acute; 8 – 15 mm long, rugulose distally on outside. *Florets* c. 15; *corollas* to 12 mm long, glabrous, yellow; lobes ovate-lanceolate, subacute; tube slender, slightly angular at base. *Achenes* compressed, obovoid, ribbed, glabrous or with a few hairs on ribs, to 7 × 4 mm. *Pappus* c. 12 mm long, straw-coloured.

DISTRIBUTION. Africa: Namibia (uncertain — see Notes), South Africa. Map 24.

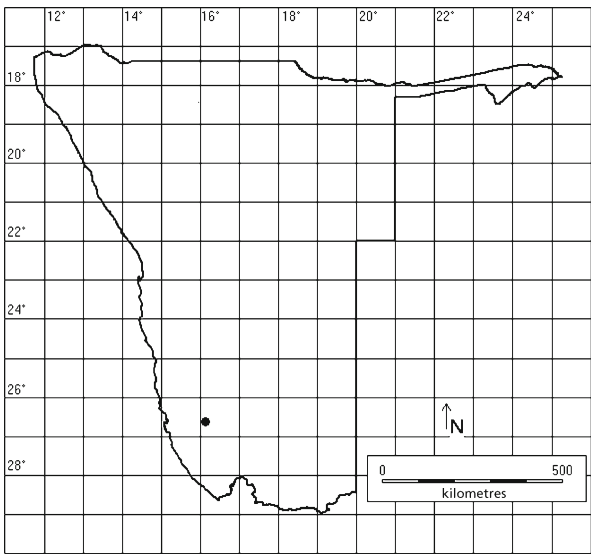
SPECIMENS EXAMINED. SOUTH AFRICA. Eastern Cape Prov.: Uitenhage, *Zeyher* 98 (P!); Western Cape Prov.: Matjiesvalei, *Drège* s.n. (P-027299!); Zwart Ruggens, *Drège* s.n.[5661] (P-027299! to -301!); Cap de Bonne Espérance, *Ecklon* s.n. (P-027302!).

HABITAT. Steppe dominated by a diversity of succulent species.

CONSERVATION STATUS. There is only one specimen reported to be from Namibia (*Pearson* 3677); however, as this could not be found and occurrence in Namibia is not entirely certain, no assessment can be made of the species' status in Namibia, which therefore has to be Not Evaluated (NE) (IUCN 2001). The South African threat status is recorded as LC (SANBI 2011).

VERNACULAR NAMES. Gombossie (Afrikaans, South Africa).

NOTES. According to the specimens cited by Hutchinson & Phillips (1917: 307), this species occurs in Namibia. Their cited specimen (*Pearson* 3677, Karas Region, Lüderitz District: Great Namaqualand, 18 km W of Aus) could, however, not be traced in NBG, K, PRE, SAM or WIND, and its occurrence in Namibia could therefore not be verified. In South Africa the species occurs in the Western and Eastern Cape Provinces, disjunct from the Namibian locality of *Pearson* 3677. According to Pearson (1911) he spent time at this locality on 20 February 1909. Other Pearson specimens from that time have collector's numbers far removed from 3677 (in the 4- or 5-thousands). Specimens with numbers close to 3677 were collected far from the Aus locality or during different years. It is therefore possible that there is some error and that this species does not occur in Namibia. The Pearson locality (18 km W of Aus) needs to be searched to clarify this issue.



Map 24. Reported but unconfirmed distribution of *Pteronia viscosa* in Namibia.

***Pteronia* species reported from Namibia but no longer belonging to the genus**

Pteronia aizoides Muschl. (Muschler 1911a: 102). Type: Bezirk [Distr.] of Great Namaqualand, *Dinter* 1388 (holotype B†; isotype K!, located in unsorted *Pteronia* collections and rather poor material, consisting of loose leaves and seeds with pappus only). Currently a synonym of **Eremothamnus marlothianus** *O. Hoffm.*

Pteronia engleriana Muschl. (Muschler 1911a: 98, "*Engleriana*"); Dinter (1926: 132, "*Engleriana*"); Range (1935: 275, "*Engleri*"). Type: Bezirk [Distr.] of Great Namaqualand, Aus, in 1400 m Meereshöhe, *Dinte* (the *-r* is missing) 1107 (holotype B†; isotypes SAM-071501, K-000415078!). Currently a synonym of **Amphiglossa tomentosa** (*Thunb.*) *Harv.*

Pteronia geigerioides Muschl. ex Dinter (1926: 132); Range (1935: 275), **nom. nud.** Bremer (1983: 195) considered it a synonym of *Asaemia minuta* (L. f.) K. Bremer, while Källersjö (1991: 39) placed it under the now accepted **Athanasia minuta** (*L. f.*) *Källersjö* subsp. **minuta**.

Pteronia marlothiana (O. Hoffm.) Dinter (1926: 132); Range (1935: 275). Type: [Namibia] Namaland, Angra Pequena [Lüderitz and environs], in saxosis desertis, alt. 10 m, florif. m. Aprili 1886, *Marloth* 1154 (lectotype (chosen for *Eremothamnus marlothianus*) PRE-0206236-0!, selected here; isolectotypes NBG-0200255-0!, SAM-0039695-0!, PRE-0594888-0!). Marloth collections from SW Africa are reported from L, M, OXF, and PRE (Vegter 1976: 504). In this particular case they were not found in (K or) L, M, or OXF, but NBG, PRE and SAM did have what are effectively isotypes. The PRE collections are considered the original set of Marloth's material (Glen & Germishuizen 2009: 286) and hence the PRE copy of 1154 is chosen as lectotype. Currently its accepted identity is that of the basionym **Eremothamnus marlothianus** *O. Hoffm.*

Pteronia minuta L. f. (Linnaeus filius 1782: 357). Type: (South Africa) Cap. bonæ spei" [Cape of Good Hope], *Thunberg* 18977 (holotype UPS-THUNB, selected by Bremer 1983: 195). Distribution maps presented by Bremer (1983) and Källersjö (1991) show presence in Namibia. Currently the basionym of **Athanasia minuta** (*L. f.*) *Källersjö* subsp. **minuta**.

Conclusions

Some uncertainties still exist on the status of some of the Namibian species of *Pteronia* and more specimens from outside Namibia need to be studied to clarify these issues. A revision of this largely African genus over its entire range is needed. For this synopsis many specimens were seen only as high-resolution photographs and

although these are a tremendous help, they cannot completely replace looking at the real thing.

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Index of plant names

Accepted names in **bold**; synonyms in *italics*.

Pteronia ciliata Thunb. var. *ecklonis* Harv. = **Pteronia ciliata** *Thunb.*
Pteronia ciliata Thunb. var. *subtrigona* DC. = **Pteronia ciliata** *Thunb.*
Pteronia ciliata Thunb. var. *thunbergii* Harv. = **Pteronia ciliata** *Thunb.*
Pteronia cylindracea *DC.*
Pteronia dinteri S. Moore = **Pteronia mucronata** *DC.*
Pteronia divaricata *Less.*
Pteronia eenii *S. Moore*
Pteronia engleriana Muschl. = **Amphiglossa tomentosa** *(Thunb.) Harv.*
Pteronia feddeana Muschl. = **Pteronia acuminata** *DC.*
Pteronia feldtmanniana Dinter ex Merxm., **nom. nud.** = **Pteronia eenii** *S. Moore*
Pteronia flexicaulis auct. non L. f. = **Pteronia paniculata** *Thunb.*
Pteronia geigerioides Muschl. ex Dinter, **nom. nud.** = **Athanasia minuta** *(L. f.) Källersjö*
Pteronia glabrata *L. f.*
Pteronia glabrata auct. non L. f. = **Pteronia glauca** *Thunb.*
Pteronia glabrata L. f. var. *succulenta* (Thunb.) Merxm. = **Pteronia glabrata** *L. f.*
Pteronia glauca *Thunb.*
Pteronia glauca Thunb. subsp. *arcuata* (Dinter) Merxm. = **Pteronia glauca** *Thunb.*
Pteronia glomerata, auct. non L. f. = **Pteronia sordida** *N. E. Br.*
Pteronia gymnocline auct. non DC. = **Pteronia lucilioides** *DC.*
Pteronia inflexa *L. f.*
Pteronia kingesii Merxm. = **Pteronia polygalifolia** *O. Hoffm.*
Pteronia latisquama DC. = **Pteronia glauca** *Thunb.*
Pteronia leucoclada *Turcz.*
Pteronia lucilioides *DC.*
Pteronia lucilioides DC. var. *sparsifolia* Harv. = **Pteronia lucilioides** *DC.*
Pteronia lupulina DC. = **Pteronia inflexa** *L. f.*
Pteronia lupulina DC. var. *rotundifolia* DC. = **Pteronia inflexa** *L. f.*
Pteronia lycioides Muschl. ex Dinter = **Pteronia scariosa** *L. f.*
Pteronia marlothiana (O. Hoffm.) Dinter = **Eremothamnus marlothianus** *O. Hoffm.*
Pteronia minuta L. f. = **Athanasia minuta** *(L. f.) Källersjö* subsp. **minuta**
Pteronia mucronata *DC.*
Pteronia mucronata DC. subsp. *dinteri* (S. Moore) Merxm. = **Pteronia mucronata** *DC.*
Pteronia onobromoides *DC.*
Pteronia paniculata *Thunb.*
Pteronia polygalifolia *O. Hoffm.*
Pteronia pomonae *Merxm.*
Pteronia quadrifaria *Dinter*
Pteronia quinquecostata Dinter = **Pteronia polygalifolia** *O. Hoffm.*
Pteronia rangei *Muschl.*
Pteronia roesemanniana Dinter ex Merxm., **nom. nud.** = **Pteronia lucilioides** *DC.*
Pteronia scariosa *L. f.*
Pteronia sesuviifolia DC. = **Pteronia glabrata** *L. f.*
Pteronia sordida *N. E. Br.*
Pteronia spinulosa *E. Phillips*
Pteronia succulenta auct. non Thunb. = **Pteronia glabrata** *L. f.*
Pteronia thymifolia Muschl. & Dinter = **Pteronia glauca** *Thunb.*
Pteronia turbinata DC. = **Pteronia ciliata** *Thunb.*
Pteronia unguiculata *S. Moore*
Pteronia villosa auct. non L. f. = **Pteronia pomonae** *Merxm.*
Pteronia viscosa *Thunb.*