

# FLORA OF SOUTHERN AFRICA

VOLUME 9

Editor G. Germishuizen



Part: Urticaceae

by I. Friis and K.L. Immelman





Digitized by the Internet Archive  
in 2016

# FLORA OF SOUTHERN AFRICA

which deals with the territories of

SOUTH AFRICA, LESOTHO, SWAZILAND, NAMIBIA AND BOTSWANA

VOLUME 9

PART: URTICACEAE

by

I. Friis and K.L. Immelman

Scientific editor: G. Germishuizen

Technical editor: E. du Plessis



NATIONAL  
*B*OTANICAL  
INSTITUTE

Pretoria  
2001

## **Editorial Board**

<b>B.J. Huntley</b>	National Botanical Institute, Cape Town, RSA
<b>R.B. Nordenstam</b>	Swedish Museum of Natural History, Stockholm, Sweden
<b>W. Greuter</b>	Botanischer Garten und Botanisches Museum Berlin-Dahlem, Berlin, Germany

Typesetting and page layout by S.S. Brink, NBI, Pretoria

Reproduction by 4 Images, P.O. Box 34059, Glenstantia, 0010 Pretoria  
Printed by United Litho, P.O. Box 40900, 0007 Arcadia

© published by and obtainable from the  
National Botanical Institute, Private Bag X101, Pretoria, 0001 South Africa  
Tel. (012) 804-3200 Fax (012) 804-3211

ISBN 1-919795-55-3

## CONTENTS

New taxa, new combinations and new statuses published in Volume 9, Part: Urticaceae . . . .	iv
Introduction . . . . .	v
Urticaceae . . . . .	1
Urtica . . . . .	2
Urera . . . . .	7
Obetia . . . . .	8
Laportea . . . . .	10
Girardinia . . . . .	14
Pilea . . . . .	15
Pouzolzia . . . . .	17
Parietaria . . . . .	21
Forsskaolea . . . . .	23
Droguetia . . . . .	26
Didymodoxa . . . . .	29
References . . . . .	32
Index . . . . .	35
Appendix:	
Plan of <i>Flora of southern Africa</i> . . . . .	A-1
FSA contributions in <i>Bothalia</i> . . . . .	A-3
<i>Flora of southern Africa</i> : alphabetical list of published taxa . . . . .	A-4

**NEW TAXA, NEW COMBINATIONS AND NEW STATUSES  
PUBLISHED IN VOLUME 9, PART: URTICACEAE**

None.

## INTRODUCTION

This part was compiled in accordance with the Guide for contributors to the *Flora of southern Africa* (compiled by Leistner, Ross & De Winter and available from the Editor, National Botanical Institute, Private Bag X101, Pretoria, 0001 South Africa).

The maps show the distribution of the various taxa in the *FSA* region only. In the text, exotic taxa are marked with an asterisk.

The numbering of the genus is according to De Dalla Torre & Harms in their *Genera siphonogamarum* (1900–1907), as adapted by Arnold & De Wet (1993, *Plants of southern Africa: names and distribution*).





## URTICACEAE

by I. FRIIS\* and K.L. IMMELMAN\*\*

Herbs, shrubs, lianas or small trees, monoecious, dioecious or rarely polygamous, sometimes anisophyllous, some genera with stinging hairs, sometimes with stiff non-stinging hairs which may be curled or sharply hooked; epidermal cells usually with cystoliths, these punctiform, elongated or linear. *Leaves* alternate or opposite, petiolate or sessile, simple or 3–5(–7)-lobed, usually triplinerved from base, sometimes penninerved, margin entire or variously dentate; stipules usually present, lateral or often intrapetiolar, often fused; cystoliths usually present. *Inflorescences* very varied, mostly lax or condensed racemes, often with flowers in small cymose glomerules, or condensed cymes in leaf axils, sometimes subtended by involucre bracts; inflorescence axis sometimes flattened into a disc-shaped, fleshy receptacle. *Flowers* minute, unisexual or rarely bisexual, actinomorphic or (especially female flowers) zygomorphic, with single whorl of tepals or rarely female flowers naked; pedicel often articulated below perianth. *Female flowers*: tepals 3–5, free or united, often very unequal, often accrescent after pollination, rarely absent; staminodes, if present, rudimentary and scale-like; ovary superior, usually somewhat laterally compressed, sometimes asymmetrical, unilocular, unicarpellate, placentation basal; stigma capitate, brush-like or linear. *Male flowers*: tepals (1)2–5; stamens equalling tepals or solitary, inflexed in bud; rudimentary ovary often present. *Fruit* an achene, sometimes enclosed by persisting, accrescent perianth which sometimes becomes fleshy.

About 50 genera and 1 000 species; almost cosmopolitan but most numerous in the tropics. Most occur in humid habitats, for example on forest floors or at forest margins, often along streams, but some genera are adapted to arid areas (*Obetia* and *Forsskaolea*).

There are 11 genera and 21 species represented in the FSA area. *Boehmeria nivea* (L.) Gaudich. has been collected twice in KwaZulu-Natal (both specimens in NU) but, although not stated on the specimens, the plants are almost certainly cultivated. This species is widely cultivated for fibre. It has large (up to 140 × 80 mm) leaves with dense white felt beneath, similar to but usually not as dense as in *Pouzolzia mixta*, the apical tooth is long and the leaf base decurrent, and the young stems and leaves are covered with dense golden hairs.

A few species have been documented only by old collections, the southern African origin of which is not beyond doubt. Such cases are discussed under the generic description of *Laportea* (no. 4) and the excluded names under *Parietaria* (no. 8).

- 1a Plants with stinging hairs, at least on inflorescences and petioles; inflorescence a panicle with flowers in minute cymose clusters along inflorescence axes:  
 2a Stipules free, lateral:  
 3a Trees; leaves alternate . . . . . 3. *Obetia* (p. 8)  
 3b Herbs; leaves opposite . . . . . 1. *Urtica* (p. 2)  
 2b Stipules fused, intrapetiolar or lacking:

\* Botanical Museum and Library, University of Copenhagen, Gothersgade 130, DK-1123 Copenhagen K, Denmark.

\*\* Formerly of the National Botanical Institute, Pretoria. Present address: Range and Forage Institute, Agricultural Research Council, Private Bag X05, East Lynne, 0039 South Africa.

- 4a Climbers; stems woody throughout; fruit surrounded by persisting fleshy perianth . . . . . 2. **Urera** (p. 7)
- 4b Herbs; stems lignified at base only; fruit dry:
- 5a Female flowers with 3 almost completely united tepals; stinging hairs mostly longer than 5 mm and very dense . . . . . 5. **Girardinia** (p. 14)
- 5b Female flowers with 4 free, unequal tepals—2 larger lateral ones and 2 smaller dorsal and ventral ones; stinging hairs mostly shorter than 5 mm, moderately dense to sparse . . . . . 4. **Laportea** (p. 10)
- 1b Plants completely without stinging hairs; inflorescence a  $\pm$  sessile axillary cluster:
- 6a Leaves opposite, slightly to definitely anisophyllous; stipules completely fused, intrapetiolar; female and male flowers with 3 tepals . . . . . 6. **Pilea** (p. 15)
- 6b Leaves alternate or rarely a few on each plant opposite or leaves opposite throughout, but then male flowers with 1 tepal and 1 stamen only, and female flowers naked; stipules free, lateral or lacking (in *Parietaria*):
- 7a Bracts below inflorescence prominent, covering at least three quarters of inflorescence and forming a  $\pm$  fused, campanulate involucre:
- 8a Involucral bracts free for most of their length; leaves alternate, usually with numerous hooked hairs above; shrubs or herbs of arid areas of Namibia and the Northern Cape, Western Cape and western part of the Eastern Cape . . . . . 9. **Forsskaolea** (p. 23)
- 8b Involucral bracts almost completely fused; leaves opposite or alternate, without or with very few hooked hairs; herbs of forest margins and clearings in KwaZulu-Natal and the Western and Eastern Cape . . . . . 10. **Droguetia** (p. 26)
- 7b Bracts below inflorescence small and insignificant:
- 9a Shrubs; flowers unisexual; male flowers globular, 4(5)-merous; female flowers with tubular perianth constricted below stigma . . . . . 7. **Pouzolzia** (p. 17)
- 9b Annual or short-lived perennial herbs; flowers polygamous or unisexual; male flowers tubular and with 4 stamens, or club-shaped and with 1 stamen; female flowers with tubular perianth or naked:
- 10a Flowers polygamous, male and bisexual flowers tubular or campanulate, with 4 stamens; leaves entire; in summer-rainfall areas . . . . . 8. **Parietaria** (p. 21)
- 10b Flowers unisexual; male flowers club-shaped, with 1 stamen only; female flowers naked; leaves crenate or dentate or, if entire, then in winter-rainfall area . . . . . 11. **Didymodoxa** (p. 29)

## 1973000

## 1. URTICA

*Urtica* L., Species plantarum 2: 983 (1753); Benth.: 381 (1880); Engl.: 104 (1888); Hutch.: 181 (1967); Friis: 5 (1989a); Friis: 302 (1990); Friis: 620 (1993). Type species: *U. dioica* L.

Annual or perennial herbs, monoecious or dioecious. *Stems* with stinging and sometimes stiff hairs, with punctiform cystoliths. *Leaves* opposite, petiolate, simple; stipules lateral, free, or (in Africa outside FSA region) interpetiolar, fused. *Inflorescences* axillary, often paired in each leaf axil, bisexual or unisexual, lax cymose panicles, flowers usually clustered in small cymose glomerules. *Flowers* unisexual, 4-merous; tepals free. *Female flowers* in 2 slightly unequal pairs; staminodes absent; ovary ovoid, laterally compressed, symmetrical; stigma sessile, penicillate. *Male flowers* in 2 subequal to unequal pairs; rudimentary ovary present. *Achenes* enclosed in or released from persisting perianth, lenticular, with a raised central area on each face.

About 80 species, mostly in the northern temperate regions, with a few in the tropics and southern temperate regions; three species are found in southern Africa, of which one is indigenous and the other two are introduced weeds.

- 1a Leaves usually as broad as or broader than long, slightly to deeply cordate; petiole (20–)35–112 mm long; achenes 1.5–2.0 mm long . . . . . 3. *U. lobulata*
- 1b Leaves usually longer than broad, cuneate, truncate or rarely cordate at base; petiole up to 30(–50) mm long; achenes 1–2 mm long:
  - 2a Achenes 1.0–1.5 mm long; tepals of female flowers pubescent over whole exterior surface; leaves (20–)50–150 mm long, base truncate to subcordate, rarely cordate, teeth never lobed; dioecious perennial . . . . . 1. *U. dioica*\*
  - 2b Achenes 1.5–2.0 mm long; tepals of female flowers glabrous except for marginal fringe and single central stinging hair; leaves 22–45 mm long, base cuneate or rarely truncate, teeth often lobed; monoecious annual . . . . . 2. *U. urens*\*

1. \**Urtica dioica* L., Species plantarum 2: 984 (1753); N.E.Br.: 543 (1925). Type: from Sweden, collector unknown (LINN; microfiche in PRE, Nos. 1111.6!, 7!, 8!). Several possible lectotypes exist, none of which have been so designated.

*U. dioica* var. *capensis* Wedd.: 78 (1856). Syntypes: Eastern Cape, Queenstown Div., Swart Kei River, *Drège 2844* (K!, P!), both as *8244*, there seems to be misprint in Wedd. l.c.); South Africa, further locality unknown, *Zeyher 1547* (BM!, P!); Somerset Div., *Bowker s.n.* (K!).

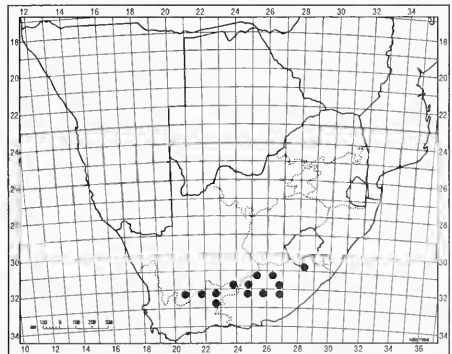
*U. eckloniana* Blume: 142 (1856). *U. dioica* var. *eckloniana* (Blume) Wedd.: 51 (1869). Type: Cap bon. sp., further locality unknown, *Ecklon 12.116.12* (L!, P!).

*U. eckloniana* var. *flavovirens* Blume: 143 (1856). Type: South Africa, not further indicated; no type material traced.

Erect perennial herb up to 1 m high, growing from horizontal, ± woody rhizome, dioecious. *Stems* almost always with dense stinging hairs; stiff hairs present or absent. *Leaves* lanceolate, (20–)50–150 × (12–)25–90 mm, apical tooth shorter to longer than broad, margin with 11–25 pairs of teeth, with stinging hairs scattered on upper surface or absent, and on veins below, with stiff hairs densely scattered below; petiole (5–)10–40 mm long, with dense stinging hairs, with or without stiff hairs; stipules oblong to broadly lanceolate, 2–6 × 1–3 mm, acute to nearly obtuse, membranous, with up to 5 parallel veins. *Inflorescence* lax, drooping, with cymose clusters of subsessile flowers, up to 90 mm long; peduncle up to 15 mm long. *Female flowers* with hairs as in key, 1.0–1.5 mm long;

pedicel with stinging and stiff hairs. *Male flowers* with stiff hairs, 1.25–1.5 mm in diameter. *Achenes* ovoid, laterally compressed to lenticular, with a raised central area on each face, smooth or minutely punctate, pale ochre.

An introduced weed in southern Africa, recorded mainly from the Great Karoo of the Western and Eastern Cape, with a single record from the Northern Cape; originally from Europe, where the species is much more variable in general morphology and indumentum. Southern African specimens almost uniformly have a dense indumentum of stinging and stiff hairs. Grows near rivers and along paths in forest, and on rocky mountain slopes, presumably with some shade. Map 1.



MAP 1.—*Urtica dioica*

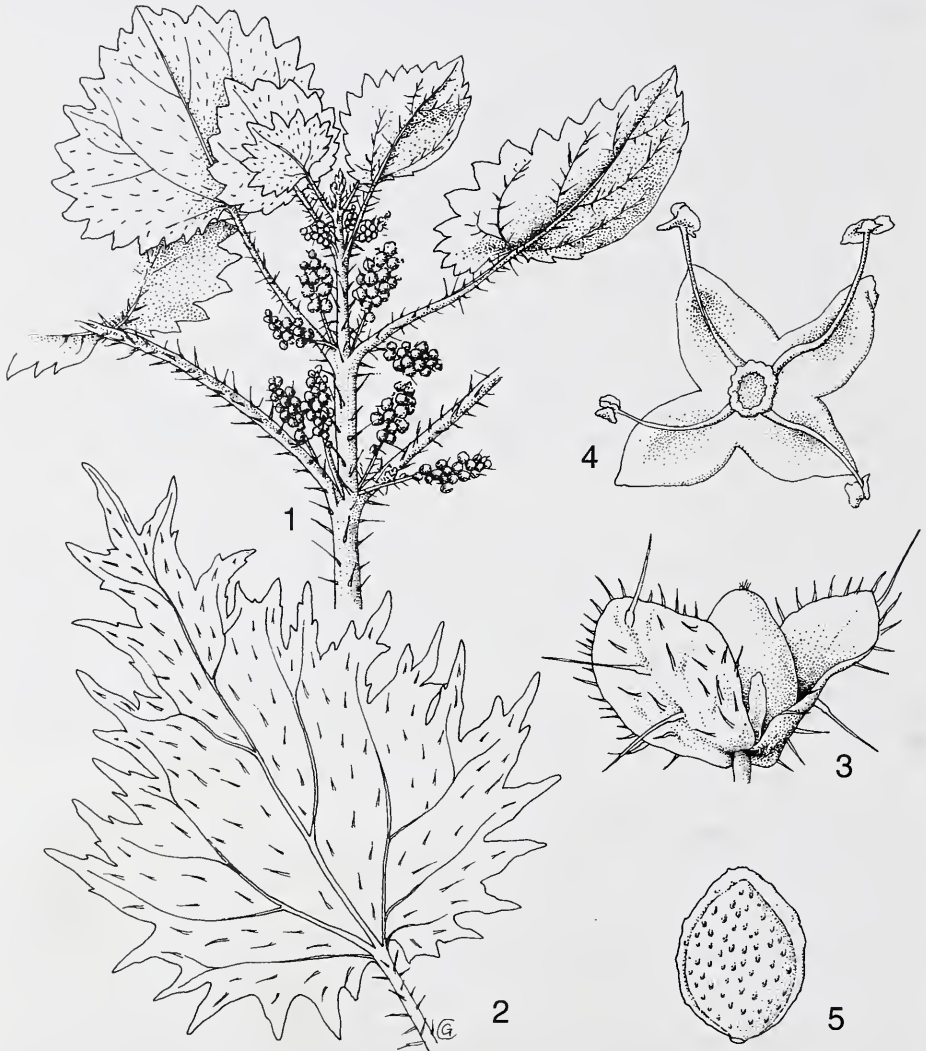


FIGURE 1.—*Urtica lobulata*: 1, branch with pairs of inflorescences at each node, leaves with teeth unlobed,  $\times 1$  (Hoener 1715, Archibald 4484); 2, leaf with lobed teeth,  $\times 1$  (Dieterlen 59a); 3, female flower,  $\times 10$ ; 4, male flower,  $\times 15$ ; 5, fruit with dark speckling,  $\times 10$  (Archibald 4484). Artist: Gillian Condy.

Vouchers: *Acocks 14129* (PRE); *Dieterlen 59b* (PRE); *Pappe PRE52599* (PRE); *Theron 54* (PRE).

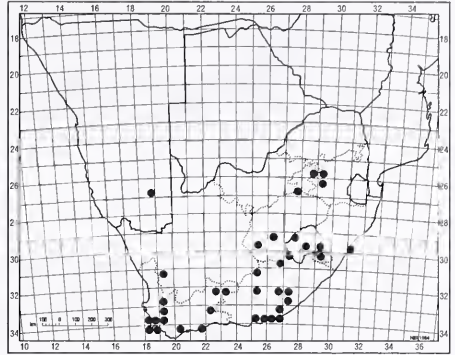
2. \**Urtica urens* L., Species plantarum 2: 984 (1753); Rendle: 242 (1917a); N.E.Br.: 543 (1925); Roessler: 6 (1967); Friis: 5 (1989a). Type: from Sweden, collector unknown (LINN; microfiche in PRE, No. 1111.5!).

Erect, ascending or procumbent annual herb up to 0.5 m high, sometimes profusely branched from base, monoecious. *Stems* with stiff hairs when young, later glabrescent; stinging hairs dense to sparse. *Leaves* elliptic, 22–45 × 18–28 mm, apical tooth as long as or longer than broad, margin with 9–13 pairs of long narrow teeth which are often trilobed, with stinging hairs scattered on upper surface and on veins of lower surface, with stiff hairs absent or sometimes a few present on young leaves; petiole (7–)30–50 mm long, with stinging and usually with stiff hairs; stipules narrowly lanceolate, ± 1.5 × 0.5 mm, acute, pubescent. *Inflorescence* at first dense, later becoming lax, cylindrical, 5–20 × 3–5 mm, bisexual, with male and female flowers mixed, frequently with stinging and stiff hairs; peduncle short. *Female flowers* with hairs as in key, 1.75–2.0 mm long; pedicel with stinging and stiff hairs. *Male flowers* 0.8–1.0 mm in diameter; pedicel ± 0.5 mm long. *Achenes* smooth or minutely punctate, pale ochre.

An introduced weed in southern Africa, with scattered records from Gauteng, Mpumalanga, the Free State, Lesotho, KwaZulu-Natal, Eastern, Western and Northern Cape and southern Namibia; originally from Europe. A weed of open disturbed places, in shade or sun. Map 2.

Vouchers: *Acocks 3571* (PRE); *Flora 1862* (PRE); *Pegler 18* (PRE); *Pole Evans & Smith s.n.* (PRE); *Potts 3571* (PRE).

3. *Urtica lobulata* Blume in Museum botanicum Lugduno-Batavum 2,10 & 11: 143 (1856); Wedd.: 84 (1856); N.E.Br.: 544 (1925). Type: 'Liliefontijn', 'Camisberge', *Drège 2987*



MAP 2.—*Urtica urens*

(L. holo!). Blume stated that his type material came from 'Leliefontein', which would indicate that specimens marked '*Urtica lobulata* E.M.a.' (BM!, K!, P!), also stated to come from that locality, would represent *Drège* collections which are isotypes. It is uncertain where the '2987' cited in the protologue and on the specimen comes from.

*U. lobata* Blume: 144 (1856). Type: Cap. bon. sp., further locality unknown, *Ecklon 11.10.9* (L).

*U. meyeri* Wedd.: 64 (1856); Wedd.: 44 (1869). Type: locality unknown, *Drège s.n.* (Herb. Delessert, as stated by Weddell).

*U. burchellii* N.E.Br.: 544 (1925). Syntypes: Cape, Uitenhage, *Zeyher s.n.* (K!); Cape, Bathurst Div., near Barville Park, *Burchell 4092* (K!).

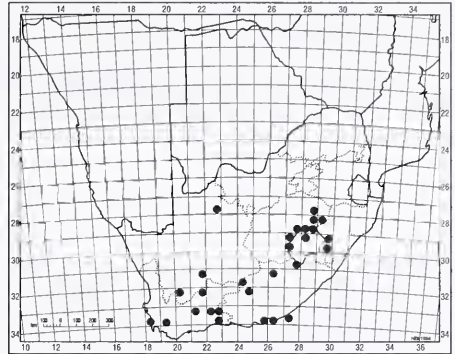
Erect, probably annual herb up to 0.8 m high. *Stems* unbranched or branched from base only, with dense stinging hairs; stiff hairs sometimes present. *Leaves* broadly ovate to broader than long, (10–)20–170 × (10–)20–180 mm, apical tooth usually longer than broad, margin with 11–18 pairs of teeth which may be trilobed, or with irregular lobes, upper surface with scattered stinging hairs only, lower surface with scattered stiff hairs, with dense stinging hairs along veins; petiole (20–)35–112 mm long, with stinging hairs, with or without stiff hairs; stipules pubescent, narrowly lanceolate, ± 3 × 1 mm, acute. *Inflorescence* cylindrical, dense, later becoming lax, erect to drooping, 20–100



FIGURE 2.—*Uretra trinervis*: 1, branch with inflorescences and branching aerial roots,  $\times 1$  (composite of *Staner 1568*, *Pegler 1533* and *Wells & Edwards 41*); 2, female inflorescence,  $\times 2$  (*Leeuwenburg 7187*); 3, female flower,  $\times 10$  (*Leeuwenburg 7187*); 4, male flower,  $\times 10$  (*Breteleur 1491*); 5, fruit,  $\times 10$  (*Leeuwenburg 7187*). Artist: Gillian Condy.

mm long, apparently unisexual, with cymose clusters of sessile or shortly pedicellate flowers; peduncle 4–15 mm long, with stinging hairs. *Female flowers* with scattered bristly hairs which are denser along margin, with single dorsal stinging hair,  $\pm 2$  mm long; pedicel with stinging hairs. *Male flowers* with or without bristly hairs, up to 2 mm in diameter; pedicels up to 1 mm long. *Achenes* smooth to rugose, pale ochre to brownish, may have pale to dark brown speckling. Figure 1.

Indigenous species occurring in the eastern Free State, KwaZulu-Natal Drakensberg and Lesotho and the Eastern, Western and Northern Cape. Very variable; probably most closely related to *U. urens* (no. 2), with which it is sometimes confused. Found among rocks, probably in seepage areas or along streams, and occasionally on the floor and margins of forests. Map 3.



MAP 3.—*Urtica lobulata*

Vouchers: *Galpin 2496* (PRE); *Henderson 617* (PRE); *Hilliard & Burt 8998* (PRE); *Hoener 1715* (PRE); *Shearing 367* (PRE).

## 1978000

## 2. URERA

*Urera Gaudich.* in Freycinet, Voyage autour du monde ... exécuté sur les corvettes de S.M. l'Uranie et la Physicienne Pillet-ainé: 496 (1830); Benth.: 383 (1880); Engl.: 105 (1888); Hutch.: 181 (1967); Friis: 6 (1989a); Friis: 304 (1990); Friis: 80 (1991); Friis: 621 (1993). Type species: *U. baccifera* (L.) Gaudich.

Woody climbers, often fixed to substratum by adventitious, axillary roots from stems, dioecious, with stinging hairs on petioles and inflorescences, stiff hairs absent, with punctiform cystoliths. *Leaves* alternate, petiolate, simple; stipules intrapetiolar, fused but with tips free. *Inflorescence* a lax axillary raceme with flowers in small cymose glomerules. *Female flowers* with 4 somewhat unequal tepals fused for three quarters of their length or more; ovary ovoid; stigma almost sessile, penicillate. *Male flowers* 4- or 5-merous; rudimentary ovary present. *Fruit* an achene enclosed by persisting 4-lobed to 4-lobulate perianth which enlarges and becomes fleshy and red in fruit.

Some 35 species, widespread in tropical Africa, on Madagascar, in tropical America and on the Pacific Islands. One species occurs in southern Africa.

*Urera trinervis* (Hochst.) Friis & Immelman in Friis, Immelman & Wilmot-Deary in Nordic Journal of Botany 7,2: 126 (1987); Friis: 6 (1989a); Friis: 81 (1991). Type: KwaZulu-Natal, Umlaas River, July 1839, *Krauss 1267* (TUB, holo!; C, K, PRE, photo!).

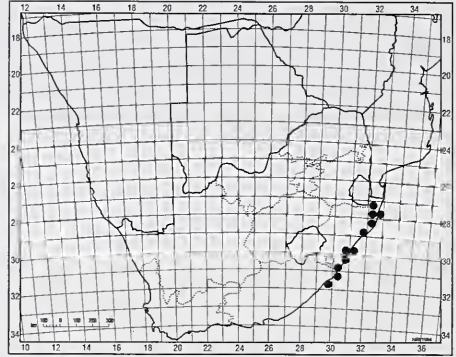
*Elatostemma trinerve* Hochst.: 88 (1845).

*U. cameroonensis* Wedd.: 97 (1869); Rendle: 261 (1917a); Hauman: 185 (1948); Keay: 618 (1958); Letouzey: 76 (1968); Agnew: 321 (1974); Friis: 549 (1985a). *U. acuminata* var. *cameroonensis* (Wedd.) Leandri: 24 (1965) excl. spec. cit. Type: Cameroun, Mt Cameroon, 1 500 m, *Mann 2173* (K!).

*U. woodii* N.E.Br.: 96 (1911); N.E.Br.: 549 (1925). Syntypes: Eastern Cape, in a cutting to the lighthouse near Port St Johns, *Pegler 1533* (BM!, BOL!, K!); KwaZulu-

Natal, near Umzinyati Falls, *Wood 1803* (K!); without precise locality, *Sanderson 594* (K!).

Robust climber, sometimes creeping among rocks. *Stems* softly woody, with wide spongy pith or hollow in centre, with large leaf scars on young branches, up to 100 mm in diameter at base. *Bark* longitudinally striate, brown to purplish. *Leaves* elliptic to very broadly elliptic, 63–120 × 40–65 mm, apex acute to long- or short-attenuate, base cuneate, truncate or slightly cordate, margin entire, main veins prominent, side veins scalariform, glabrous, often discoloured; petiole 20–50 mm long, glabrous or with a few large stinging hairs, often mounted on protuberances; stipules early caducous, ± 7 mm long. *Female inflorescence* lax, paniculate, ± 20 mm long, with small cymose clusters of flowers; peduncle with a few stinging hairs. *Male inflorescence* lax, paniculate, ± 65 mm long, with flowers densely clustered at intervals along axes and branches of inflorescence; peduncle mostly with a few stinging hairs. *Female flowers* sessile; perianth cylindrical, with constriction at apex, with 4 blunt but clearly marked teeth, glabrous, ± 1 mm long. *Male flowers* on pedicels up to 1 mm long, glabrous, ± 1.75 mm in diameter. *Achenes* glabrous, 1.5–2.0 mm long, without markings, enclosed in persisting, accrescent, fleshy, orange perianth. Figure 2.



MAP 4.—*Uretra trinervis*

In South Africa it occurs in KwaZulu-Natal and as far south as Port St Johns in the Eastern Cape, restricted to areas near the coast; also from Ghana through central Africa to Ethiopia, through East Africa to South Africa. A climber in coastal or riverine forest, especially near margins and in clearings, or sprawling in forest margins and among boulders. Map 4.

Vouchers: *Ross 1872* (PRE); *Vahrmeijer 497* (PRE); *Vahrmeijer & Tölken 312* (PRE); *Wells & Edwards 41* (PRE); *Wood 1872* (PRE).

## 1979000

## 3. OBETIA

*Obetia Gaudich.*, Voyage autour du monde exécuté pendant les années 1836 & 1837 sur la corvette La Bonite – Botanique, Atlas: t. 82 (1844); Benth.: 382 (1880); Engl.: 106 (1888); Hutch.: 182 (1967); Friis: 221 (1983); Friis: 10 (1989a); Friis: 306 (1990); Friis: 85 (1991); Friis: 620 (1993). Type species: *O. ficifolia* (Savigny) Gaudich.

Small to medium-sized shrubs or small trees, completely deciduous in dry season, dioecious. *Stems* herbaceous when young, wood soft and juicy, pith often wide; cystoliths dot-like or slightly elongated. *Leaves* alternate, petiolate, simple or lobed; stipules free, lateral. *Inflorescence* a bracteate panicle, in axils of fallen leaves or sometimes of young leaves, developing before leaves appear; male inflorescence much smaller than female. *Female flowers* 4-merous, outer pair of tepals smaller than inner pair, enlarging and becoming thinly membranous in fruit; ovary ovoid, with sessile penicillate stigma. *Male flowers* 5-merous, regular; rudimentary ovary present. *Achenes* compressed, enclosed in persisting membranous perianth.

Eight species in eastern and southern Africa, Madagascar, the Mascarenes and Aldabra. In southern Africa there are two species, which are closely related.



- Stipules 2.5–4.0 mm broad, with scattered stiff hairs and often with stinging hairs along midrib; lamina often bullate; Namibia . . . . . 1. *O. carruthersiana*
- Stipules 1.0–2.5 mm broad, entirely glabrous; lamina not bullate; North-West, Gauteng, Northern Province, Mpumalanga, Swaziland, KwaZulu-Natal and the Eastern Cape . . . . . 2. *O. tenax*

### 1. *Obetia carruthersiana* (Hiern) Rendle,

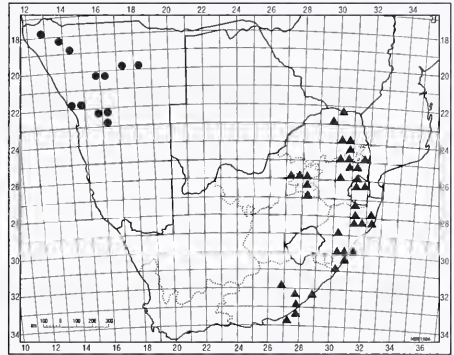
Flora of tropical Africa 6,2: 245 (1917a); Roessler: 5 (1967); Coates Palgrave: 121 (1977). Type: Angola, Golungo Alto, Delamboia, *Welwitsch 6267* (BM!, K!, P!, SAM!).

*Urticastrum carruthersianum* Hiern: 987 (1900). *Laportea carruthersiana* (Hiern) K.Schum.: 463 (1902).

*Ureia engleriana* Dinter: 54 (1909), name invalidly published. Based on the following original material: Namibia, Waterberg, near the spring; Teufelsbacher Schlucht, Farm Dobra; Spitskoppies; Otavi; etc., no collector given. ? *Dinter*. No original material has been traced, but from circumstantial evidence, this is certainly *O. carruthersiana*.

*O. australis* Engl.: 424, t. 2 (1914); Engl.: 54, t. 35 (1915). Syntypes: Angola, Huila, *Antunes 241* (B!, COI!); Namibia, Hereroland, Gaub, *Dinter & Engler 1913*; Namibia, Otavi, Kalkbergen, *Dinter 629*; Namibia, Waterberg Distr., Okosongo-Muingo, flat-topped sandstone mountain, no collector given (possibly also *Dinter* ?); Namibia, Otjimbingue, *Ilse Fischer s.n.*; Namibia, near Okahandja, micaceous schist, *Dinter s.n.* (Friis has verified that only the Antunes collection survives).

Shrub or small tree up to 3 m high. *Branches* densely covered with long stinging hairs, longitudinally striate, brown, with large leaf scars, wood soft, fibrous, with wide, spongy pith or hollow centre. *Leaves* with lamina broadly ovate in outline, up to 140 × 190 mm, sometimes shallowly lobed, base cordate, margin with 16–29 pairs of broad irregular teeth, usually bullate, upper surface with scattered stinging and stiff hairs, the latter sometimes very dense, lower surface with scattered bristly hairs, stinging hairs concentrated along veins; petiole up to 100 mm long, with short stiff hairs and stinging hairs; stipules ovate, 6–11(–18) × 2.5–4.0 mm, apex acuminate, with scattered stiff hairs and stinging hairs along midrib. *Inflorescence* a laxly and profusely branching panicle, forming a tangled mass ± 150 mm long, on short peduncle. *Female flowers* single or in small clusters, shortly pedicellate, glabrous, ± 1 mm long.



MAP 5.—● *Obetia carruthersiana*  
▲ *O. tenax*

*Male flowers* not seen. *Achenes* laterally compressed, rugose over whole surface, 1.0–1.5 mm long, brown, papery perianth persisting and enlarging to length of ± 2 mm.

In southern Africa it is restricted to a few localities in northern and central Namibia; also in southwestern Angola. Occurs on rocky slopes, probably on calcrete. Map 5.

*Vouchers*: *Esterhuysen 436* (PRE); *Gibson 30* (PRE, WIND); *Strey 2681* (PRE); *Viljoen WIND4361* (PRE, WIND).

2. *Obetia tenax* (N.E.Br.) Friis in Kew Bulletin 38,2: 226 (1983); Friis: 85 (1991). Type: KwaZulu-Natal, Inanda, *Wood 3837* (K!, holo., vide Friis 1983: 226; BOL!, without no.).

*Ureia tenax* N.E.Br.: t. 1748 (1888); N.E.Br.: 548 (1925); Coates Palgrave: 121 (1977).

Shrub or small tree up to 5 m high. *Branches* densely covered with long stinging hairs or

glabrous, purplish brown to grey, often longitudinally striate, gnarled with large leaf scars, wood soft and fibrous, with wide spongy pith or hollow in centre. *Leaves* with lamina broadly ovate in outline, 35–130(–170) × 35–115(–190) mm, sometimes shallowly lobed, base usually truncate, rarely deeply cordate, margin with 12–22 pairs of broad irregular teeth, upper surface with scattered stinging and stiff hairs, lower surface with scattered stiff hairs and stinging hairs along veins; petiole up to 120 mm long; stipules lanceolate, 4–8 × 1–2.5 mm, with long-acuminate apex, glabrous. *Inflorescence* of profusely branched panicles, up to 100 mm long; peduncle with stinging hairs. *Female flowers* single or in small clusters along axes and branches of inflorescence, shortly pedicel-

late, glabrous, ± 1.25 mm long. *Male flowers* in denser inflorescences, ± 2 mm in diameter, usually with stinging hairs on tepals. *Achenes* laterally compressed, rugose over whole surface, ± 1.5 mm long, ochre to brown, papery perianth persisting and enlarging to length of ± 2 mm.

In southern Africa it is found in the Northern Province, Mpumalanga, North-West, Gauteng, Swaziland, KwaZulu-Natal and the Eastern Cape; also in Zimbabwe and Mozambique. Grows on rocky hillsides and in forest margins. Map 5.

Vouchers: *Coetsee 238* (PRE); *Leistner, Thom & Gillham 3312* (PRE); *Mogg 12380* (PRE); *Van der Schijff 4985* (PRE); *Ward 5830* (PRE).

## 1980000

## 4. LAPORTEA

*Laportea* Gaudich. in Freycinet, Voyage autour du monde ... exécuté sur les corvettes de S.M. l'Uranie et la Physicienne Pillet-aime: 496 (1830), nom. cons.; Benth.: 383 (1880); Engl.: 106 (1888); Chew: 200 (1965); Hutch.: 183 (1967); Chew: 111 (1969); Friis: 156 (1981); Friis: 203 (1985b); Friis: 15 (1989a); Friis: 308 (1990); Friis: 88 (1991); Friis: 620 (1993). Type species: *L. canadensis* (L.) Wedd. (lecto., vide Chew 1969: 115).

*Fleurya* Gaudich.: 496 (1830); Benth.: 382 (1880); Engl.: 106 (1888); Hutch.: 183 (1967). Type species: *F. spicata* Gaudich. (lecto. of sect. *Fleurya*, vide Chew 1969: 115).

Annual or perennial herbs or shrubs, monoecious or dioecious. *Stems* with numerous stinging hairs. *Leaves* alternate, petiolate, simple, serrate; cystoliths linear or punctiform; stipules intrapetiole, fused almost to apex. *Inflorescence* unisexual, paniculate or appearing spike-like because of very reduced branches, may have interrupted 'spikes'. *Female flowers* pedicellate; pedicel sometimes winged, either laterally or on dorsal and ventral side (as defined by symmetry of flower); tepals 4, unequal, lateral pair usually much larger than median pair, median pair of unequal size; staminodes absent; ovary asymmetrical, ovoid, laterally compressed; stigma sessile, filiform or deeply trifid with filiform branches. *Male flowers* usually pedicellate, 4- or 5-merous; rudimentary ovary present. *Achenes* compressed, often with characteristic sculpturing on sides, consisting of a ring-like ridge enclosing a rugose surface, stipitate and shed without the persisting perianth (previously placed in sect. *Laportea*) or sessile and shed with the persisting perianth (previously placed in sect. *Fleurya* (Gand.) Chew).

About 22 species, pantropical, extending into the temperate regions of North America and East Asia; three species with two subspecies in southern Africa. *L. interrupta* (L.) Chew has not been found in the FSA region for more than 150 years, and has therefore been excluded from this treatment. Chew (1969: 148) records one specimen from southern Africa but this is based on a misidentification of the specimen cited [*Schlechter 2791*, collected at Durban, June 1893 (BM!)], which is *L. peduncularis* subsp. *latidens*, as verified by us. However, at Kew there is another specimen of this species from the FSA region, marked: 'Cap. bon. spei, Roxburgh', collected about 1794. *L. interrupta* is authentically recorded from Mozambique, and could occur in southern Africa, but no

other specimen was seen by either author. The distinguishing characters are the trifid stigma (one branch longer than the other two) and the inflorescence which resembles an interrupted spike owing to reduction of the lateral branches.

- 1a Leaf margins each with 4–7(–9) equal-sided triangular teeth; lamina usually with white blotches with a stinging hair in the centre of each blotch; stinging hairs mounted on long, slender protuberances with long-decurrent bases . . . . . 3. *L. grossa*
- 1b Leaf margins each with (5–)15–40 unequal-sided teeth; lamina without white blotches; petiole and young stems with stinging hairs hardly ever mounted on protuberances and (if so) these never with decurrent bases:
- 2a Leaf margins with 25–40 pairs of teeth; plant erect, up to 2 m high; male flowers with 4 tepals; female flowers in fruit with pedicels greatly expanded at right angles to plane of flattened achene (laterally winged) . . . . . 1. *L. alatis*
- 2b Leaf margins with 5–25 pairs of teeth; plant ascending or scrambling or sometimes erect when young; male flowers with 5 tepals; female flowers in fruit with pedicels slightly expanded parallel to the plane of the flattened achene (dorsiventrally winged) . . . . . 2. *L. peduncularis*

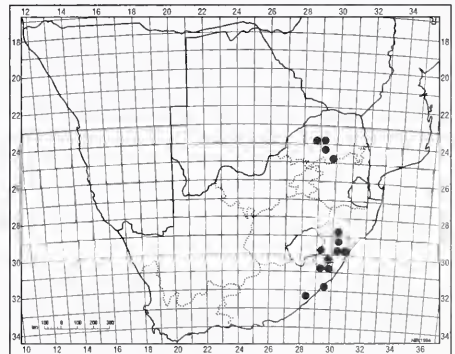
1. *Laportea alatis* Hook.f. in Journal of the Linnean Society, Botany 7: 215 (1864); Wedd.: 79 (1869); Rendle: 252 (1917a); Hauman: 194 (1948); Robyns: 71, t. 6 (1948); Keay: 620 (1958); Letouzey: 117, t. 18 (1968); Chew: 124 (1969); Agnew: 321 (1974); Friis: 16 (1989a); Friis: 93 (1991). Type: Cameroun, Cameroon Mountain, 7 000 ft, Mann 1973 (K!, holo.).

*Urticastrum alatis* (Hook.f.) Kuntze: 635 (1891).  
*Fleurya alatis* (Hook.f.) N.E.Br.: 547 (1925).

Robust annual or short-lived perennial herb, monoecious. *Stems* soft, erect or decumbent, up to 2 m long, with sparse to dense stinging hairs when young, glabrescent, stiff hairs sometimes present. *Leaves* broadly lanceolate to ovate, 100–160 × 58–104 mm, apical tooth longer than broad, base cordate, margin with 25–40 pairs of small close-set teeth, surface often bullate, with dense or sparse stinging hairs scattered on upper surface and concentrated along veins on lower surface, stiff hairs sparse, usually on lower surface; petiole 40–125 mm long, with both stinging and stiff hairs; stipules deciduous, linear-lanceolate to lanceolate, 3–8 × ± 2.5 mm, with long-acuminate apex, with bristly hairs. *Inflorescences* loosely branching panicles, with clusters of flowers; female in upper axils, up to 180 mm long; male in axils below female ones, up to 100 mm long. *Female flowers* with pedicels broadly, laterally winged, stinging hairs dense to sparse,

bristly hairs usually in two lines along peduncle or sometimes over whole peduncle. *Male flowers* 4-merous, usually with stinging hairs, stiff hairs present, ± 0.5–1.0 mm in diameter. *Achenes* shortly stipitate, laterally compressed, ± 2 mm in diameter, centre of flattened sides irregularly rugose and pale brown, margin smooth and black-brown, dispersed without perianth.

In southern Africa it is found in two discrete areas: from the Northern Province, and from southwestern KwaZulu-Natal and the Eastern Cape; also widespread in East and West tropical Africa. Found in undergrowth of forest, usually near water. Map 6.



MAP 6.—*Laportea alatis*

Vouchers: *Codd* 7859 (PRE); *Kerfoot* 8375 (PRE); *Moll* 3002 (PRE); *Van Warmelo* 223 (PRE); *Vorster* 279 (PRE).

2. *Laportea peduncularis* (Wedd.) Chew in *Gardens' Bulletin*, Singapore 21: 201 (1965); Chew: 152 (1969); Friis: 205 (1985b); Friis: 19 (1989a); Friis: 93 (1991). Type: KwaZulu-Natal, Port Natal (Durban), at Yellowwood River, Kachu, *Drège s.n.*, marked '*Urtica peduncularis* E.M.' (G!), lecto., vide Chew 1965: 201, K!).

Annual herb, monoecious, or dioecious by abortion. *Stems* soft, decumbent or scrambling, sometimes rooting at lower nodes, up to 1.5 m long, with few to fairly many  $\pm$  1 mm long stinging hairs, stiff hairs sometimes present when young. *Leaves* lanceolate to ovate, 17–125  $\times$  11–77 mm, apical tooth longer than broad, base rounded, truncate or rarely cordate, with long stinging hairs scattered above and on veins of lower surface, with stiff hairs; petiole 6–115 mm long, with stiff hairs and sometimes with stinging hairs, these occasionally mounted on short, slender protuberances without decurrent base; stipules as in *L. alatipes* but 4–10  $\times$  1–2 mm. *Inflorescence* paniculate, mostly with flowers in small cymose clusters; female in upper axils, usually repeatedly dichotomously branched, or with one branch taking the lead over the other, up to 110 mm long; peduncles glabrous or with stinging hairs; male in lower axils, up to 35 mm long, often with two or more glomerules of equal size terminating the branches; peduncles as in female. *Female flowers* pedicellate, 1–2 mm long. *Male flowers* 5-merous, shortly pedicellate; pedicel with a narrow dorsiventral wing, 1.75–3.0 mm in diameter. *Achenes* almost sessile, laterally compressed, centre of flattened sides warty, with smooth circular marginal ridge,  $\pm$  1.5 mm long, dispersed with perianth attached.

Occurs in the Northern Province, Mpumalanga, Swaziland, KwaZulu-Natal and the Eastern and Western Cape; also in Mozambique to tropical East Africa. Grows in forest, often in clearings or along the margins.

Two subspecies are recognised:

Leaf margin with (5–)12–25 pairs of small teeth; lamina ovate, base rounded, truncate or rarely cordate, never cuneate, indumentum usually of stiff hairs and stinging hairs mounted on small protuberances . . . . .

. . . . . 2a. subsp. *peduncularis*

Leaf margin with 5–8(–12) pairs of broad triangular teeth; lamina ovate to rhomboid, base cuneate or sometimes truncate, usually glabrous and without mounted stinging hairs . . .

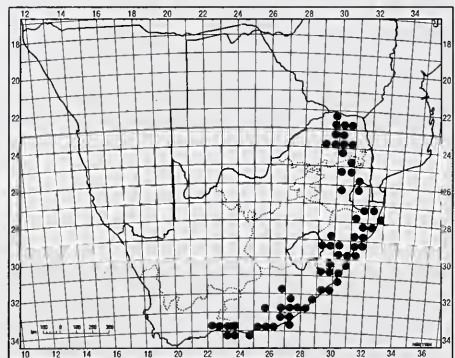
. . . . . 2b. subsp. *latidens*

### 2a. subsp. *peduncularis*.

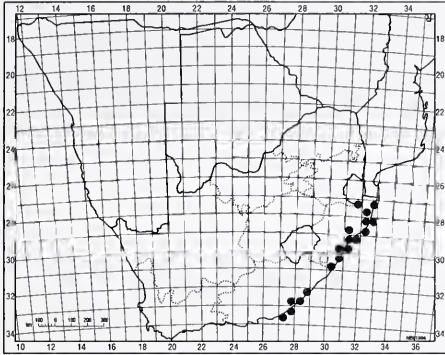
*Fleurya peduncularis* Wedd.: 75 (1869).

*Urtica mitis* Hochst.: 88 (1845), nom. nud. *F. mitis* Wedd.: 183 (1854), nom. nud. *F. capensis* var. *mitis* Wedd.: 118 (1856). *F. peduncularis* var. *mitis* (Wedd.) Wedd.: 76 (1869). *F. mitis* (Wedd.) N.E.Br.: 546 (1925). Syntypes: Cape Province, Galgebosch, forest, *Drège s.n.*, marked '*Urtica mitis* E.M.a.' (BM!, K!, P!); Strandfontein & Matjiesfontein, *Drège s.n.*, marked '*Urtica mitis* variet. E.M.b.' (K!, P!); Doukamma, forest, *Drège s.n.*, marked '*Urtica mitis* variet. E.M.a.' (SAM!); Natal, Yellowwood River, Rachu, *Drège s.n.*, marked '*Urtica mitis* E.M.b.' (not the same as the type of *L. peduncularis*) (K!, P!); Van Staadens Rivier, *Drège s.n.*, marked '*Urtica mitis* variet. E.M.c.' (not traced).

*F. capensis* auct.: Wedd.: 117, t. la, figs 7, 8 (1856); Rendle: 249 (1917a); excl. spec. typ., not of Wedd. (1854).



MAP 7.—*Laportea peduncularis* subsp. *peduncularis*

MAP 8.—*Laportea peduncularis* subsp. *latidens*

*L. caffra* Chew: 155 (1969). Type: Western Cape, Outeniquaberg Distr., near George, forest margin, *Schlechter* 2331 (A, BOL!, BM!, BR!, GRA!, K!, P!, PRC, PRE!, S!, SAM!, STE!, UPS!, Z!).

*Leaves* ovate, indumentum usually of stiff hairs and stinging hairs mounted on small protuberances, base rounded, truncate or rarely cordate, never cuneate, margin with (5–)12–25 pairs of small teeth.

Occurs in southern Africa in the Northern Province, Mpumalanga, Swaziland, KwaZulu-Natal and the Eastern and Western Cape; also in tropical East Africa as far north as northern Tanzania. In forest from the Drakensberg down to sea level. Map 7.

Vouchers: *Meeuse* 9765 (PRE); *Rogers* 1966 (PRE); *Scheepers* 588 (PRE); *Strey* 8531 (PRE); *Theron* 1145 (PRE); *Van Warmelo* 5159/7 (PRE).

2b. subsp. *latidens* *Friis*: 206 (1985b); *Friis*: 94 (1991). Type: Mozambique, Inhaca Island, near sea level, *Mogg* 30920 (K, holo!; LMU!).

*L. interrupta* sensu Chew (1969), p.p. quoad spec. *Schlechter* 2791 (BM!), non *Urtica interrupta* L.

*Leaves* ovate to rhomboid, usually glabrous and without mounted stinging hairs, base cuneate or sometimes truncate, margin with 5–8(–12) pairs of broad triangular teeth.

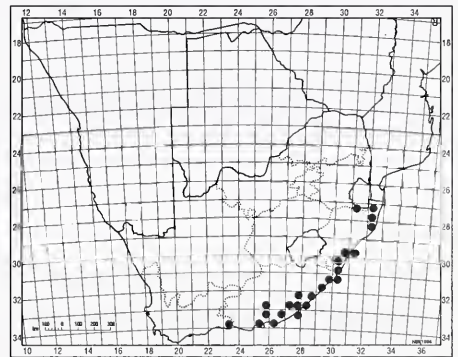
In South Africa it is found from KwaZulu-Natal to the Eastern Cape, more or less in coastal areas; also in Mozambique. Found in dune forest or coastal scrub. Map 8.

Vouchers: *Flanagan* 1225 (PRE); *Lambinon* 82/213 (PRE); *McClellan* 122 (PRE); *Strey* 5108 (PRE); *Watmough* 410 (PRE).

3. *Laportea grossa* (*Wedd.*) *Chew* in *Gardens' Bulletin*, Singapore 21: 200 (1965). Type: Eastern Cape, Uitenhage Div., *Zeyher* 3865 (P!, lecto., vide Chew 1965: 200; FI, SAM!).

*Fleurya grossa* *Wedd.*: 119, t. 1A, figs 1–3 (1856); N.E.Br.: 545 (1925).

Annual herb, monoecious. *Stems* soft, juicy, sometimes decumbent and rooting at nodes, up to 1 m high, glabrous or young parts with few stinging hairs mounted on long protuberances and with decurrent bases, deeply striate. *Leaves* broadly ovate, sometimes broader than long, (35–)65–130 × (35–)45–120 mm, each side with 4–7(–9) large, equal-sided, triangular teeth, apical tooth longer than broad, base cuneate to truncate, with whitish blotches, upper surface glabrous except for a single stinging hair in centre of each white blotch, lower surface with a few stinging hairs along 3 main veins especially near petiole; petiole 30–125 mm long, sometimes pink, with stinging hairs up to 1.5 mm

MAP 9.—*Laportea grossa*

long, on protuberances up to 2.5 mm long with long, usually decurrent bases on petiole, stiff hairs absent; stipules minute, early caducous. *Female inflorescence* paniculate, regularly branching, up to 80 × 30 mm; peduncle and axes with sparse long, stinging hairs. *Male inflorescence* paniculate, branching less, up to 50 mm long; peduncle glabrous or with a few stinging hairs. *Female flowers* 1.5 mm long. *Male flowers* 4- or 5-merous, 2 mm in diameter. *Achenes* with circular ridge near edge, smooth, ± 1.75 mm long, dispersed with perianth.

Occurs in Mpumalanga, KwaZulu-Natal and the Eastern Cape, with one record from the Western Cape. Erroneously indicated for Mozambique by Chew (1969: 159), the specimens cited being *L. mooreana* (Hiern) Chew. Found in undergrowth of forest and near streams, also in waste places where it is moist and shady. Map 9.

Vouchers: *Acocks* 13572 (PRE); *Galpin* 5681 (PRE); *Heineken* K92 (PRE); *Marais* 783 (PRE); *Nicholson* 1513 (PRE).

## 1983000

## 5. GIRARDINIA

*Girardinia Gaudich.* in Freycinet, Voyage autour du monde ... exécuté sur les corvettes de S.M. l'Uranie et la Physicienne ... Pillet-ainé: 498 (1830); Endl.: 283 (1837); Benth.: 384 (1880); Engl.: 107 (1888); Hutch.: 183 (1967); Friis: 143 (1981); Friis: 12 (1989a); Friis: 306 (1990); Friis: 85 (1991); Friis: 621 (1993). Type species: *G. leschenaultiana* Decne. (= *G. diversifolia*).

Erect annual (or very short-lived perennial) herbs, monoecious, or dioecious by abortion, with long stinging hairs on all aerial parts; cystoliths punctiform. *Leaves* alternate, petiolate, simple or mostly variously divided, margin coarsely serrate; stipules intrapetiolar, fused almost to apex. *Inflorescence* unisexual, of dense, elongated cymes in axils of upper leaves. *Female flowers* sessile, with 3 almost completely fused tepals ± enclosing ovary, sometimes with 1 minute membranaceous free tepal, without staminodes; ovary ± asymmetrical, reflexed, laterally compressed, with sessile, filiform stigma. *Male flowers* pedicellate, 4- or 5-merous; rudimentary ovary present. *Achenes* laterally compressed, rugose.

Two species distributed in the mountains of the Old World tropics from West Africa to South China and Taiwan; one species found in the Northern Province, Mpumalanga and Swaziland. This genus has the longest stinging hairs in the family, but apparently the effect is less severe than that of some other genera, for example *Laportea*.

*Girardinia diversifolia* (Link) Friis in Kew Bulletin 36,1: 145 (1981); Friis: 13 (1989a); Friis: 86 (1991). Type: plant from India, cultivated in Berlin Botanical Garden, not preserved. Neotype (see Friis, *ibid.*): India, Sikkim, 5–7 000 ft, *Hooker s.n.* (K!, neo., vide Friis 1981: 145; isoneo. B!, C!, CAL!, L!).

*Urtica diversifolia* Link: 385 (1822) non Blume (1825).

*U. heterophylla* D. Don: 59 (1825), nom. illegit. non Vahl (1790). Type: Nepal, *Wallich* 4603 (K!).

*G. heterophylla* Decne.: 151, t. 153 (1844); Letouzey: 110, t. 17 (1968). Based on *U. heterophylla* Vahl: 76 (1790),

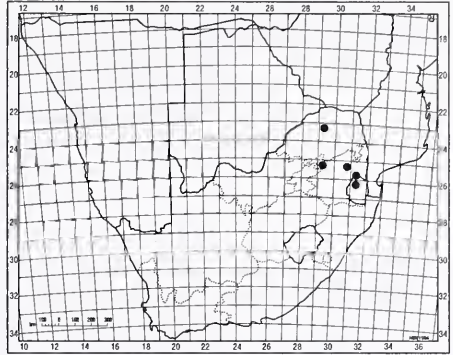
nom. illegit. superfl., including the type of *U. palmata* Forssk. (1775). Syntypes: Yemen, *Forsskål s.n.* (C!); Rheede-tot-Drakenstein, Hort. Ind. Malab. 2: t. 41 (1679).

*G. condensata* (Steud.) Wedd.: 181 (1854); Agnew: 323 (1974). *U. condensata* Steud.: 260 (1850). Type: Ethiopia, Mt Sellueda near Adua, *Schimper Series III, 1888* (BM!, BR!, FI!, G!, K!, L!, LE!, P [in Herb. Steudel], P!, S!).

*G. palmata* Blume: 158 (1856), nom. illegit. non *U. palmata* Forssk. (1775). Type: India, Nilgiri Hills, *Leschenault* 54 (P!, also holotype of *G. leschenaultiana* Decne. 1844).

*G. vahlii* Blume: 158 (1856), nom. illegit. superfl. Based on *U. palmata* Forssk. (1775).

Erect, probably annual herb up to 1 m high. *Stems* with stinging and stiff hairs. *Leaves* broadly ovate in outline, deeply 3–5-lobed, or unlobed near base of plant or on side shoots, 111–170 × 90–170 mm, apical tooth longer than broad, base cuneate to truncate, margin with 19–24 pairs of broad teeth, each tooth sometimes with a single adaxial lobe, densely covered with long stinging hairs 3–7(–9) mm long, these scattered on upper surface, concentrated along veins on lower surface, stiff hairs also present; petiole 55–90 mm long, with stinging and adpressed stiff hairs; stipules lanceolate,  $\pm 8 \times 3$  mm, fused, except for the free, attenuate apices. *Female inflorescence* densely cylindrical, 1 or 2 per node, 35–75 mm long; peduncles densely covered with long, hard, pungent stinging hairs up to 4 mm long. *Male inflorescence* not seen in material from FSA region, thin and spike-like, 1 or 2 per node, 50–80 mm long; peduncle covered with stiff hairs. *Female flowers* sessile, without free fourth tepal,  $\pm 2$  mm long, with thick unilateral dorsal ridge. *Male flowers* on pedicels  $\pm 1$  mm long; tepals without subapical horn-like appendage. *Achenes* ovoid, laterally compressed, strongly rugose over whole surface, 3–4 mm in diameter, dark brown when mature.



MAP 10.—*Girardinia diversifolia*

From a few scattered localities in the Northern Province, Mpumalanga and Swaziland; widespread from East and West tropical Africa, Madagascar, Yemen, India to East China, Taiwan and Indonesia. Grows in shady places, often in disturbed habitats. Map 10.

Vouchers: *Strey & Schlieben 8612* (PRE); *Theron 2105* (PRE); *Thorncroft 2050* (PRE).

## 1984000

## 6. PILEA

*Pilea* Lindl., *Collectanea botanica*: t. 4 (1821), nom. cons.; Benth.: 384 (1880); Engl.: 108 (1888); Hutch.: 185 (1967); Friis: 648 (1988); Friis: 25 (1989a); Friis: 557 (1989b); Friis: 310 (1990); Friis: 96 (1991); Friis: 622 (1993). Type species: *P. muscosa* Lindl., nom. illegit. (= *P. microphylla* (L.) Liebm.).

Annual or perennial herbs, monoecious. *Stems*  $\pm$  juicy, without stinging hairs. *Leaves* opposite, petiolate or subsessile, the two of a pair often unequal, margin usually serrate; cystoliths linear; stipules intrapetiolar, completely fused thus appearing as one. *Inflorescences* unisexual or bisexual, dense cymes or  $\pm$  lax panicles. *Female flowers* with 3 free tepals, one usually considerably larger, usually cucullate or with dorsal horn-like appendage, the 2 lateral ones usually much smaller, flat, rarely cucullate or with horn-like appendage; staminodes 3, scale-like, inflexed, later reflexing to eject the achene; ovary symmetrical, erect, with sessile penicillate stigma. *Male flowers* 3–5-merous; tepals with a dorsal horn-like appendage; rudimentary ovary present. *Achene* ovate,  $\pm$  smooth.

About 250 species, almost pantropical in distribution. One species is found in southern Africa. There is also a single specimen in PRE of *P. microphylla* (L.) Liebm. (= *P. muscosa* Lindl.) from Durban, growing between bricks in a garden. This species is widely distributed in tropical Africa (Friis 1989b: 596) and is probably an adventive there, but there is no evidence that the species has

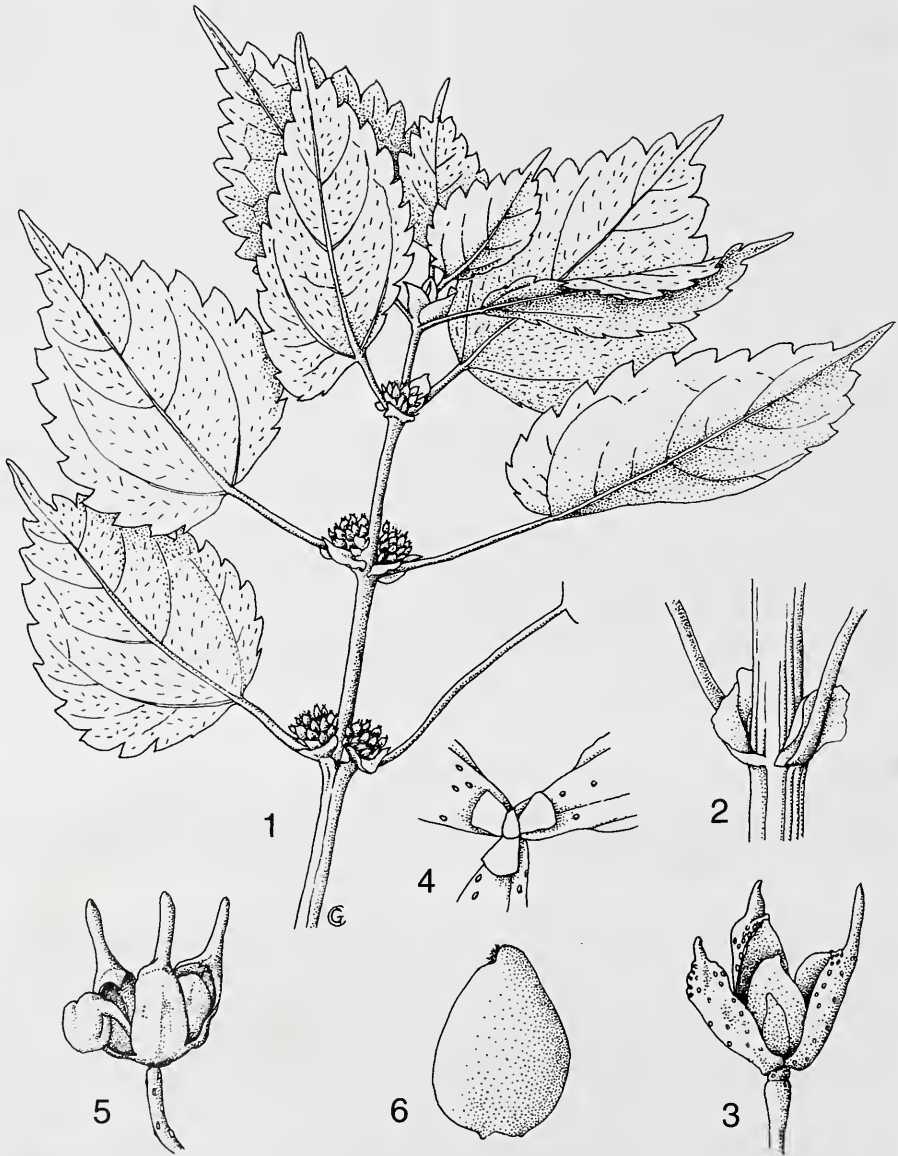


FIGURE 3.—*Pilea rivularis*: 1, branch with sessile inflorescences and unequal leaves,  $\times 1$ ; 2, two pairs of fused intrapetalous stipules,  $\times 2$ ; 3, female flower,  $\times 18$ ; 4, 6 scale-like staminodes in female flower,  $\times 18$ ; 5, male flower,  $\times 18$ ; 6, fruit,  $\times 18$  (Scheepers 590). Artist: Gillian Condy.



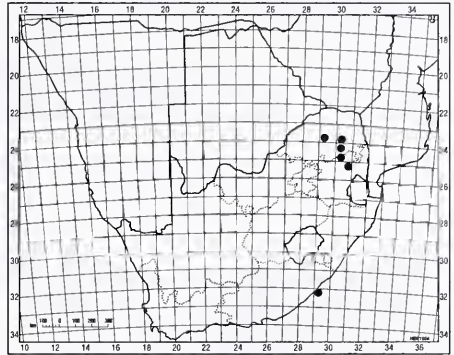
become naturalised in the *FSA* area. It is a small, prostrate or creeping, mat-forming, anisophyllous plant with leaves  $\pm 3 \times 2$  and  $1.75 \times 1.25$  mm respectively. It is originally from North and Central America, but possibly came to South Africa via East Africa.

***Pilea rivularis* Wedd.** in Archives du Muséum National d'Histoire Naturelle, Paris 9,1: 266 (1856); Letouzey: 163, t. 27 (1968); Friis: 29 (1989a); Friis: 565 (1989b); Friis: 98 (1991). Type: Comoro IIs, *Boivin s.n.* (P, holo.!).

*P. ceratomera* Wedd.: 132 (1869); Rendle: 269 (1917a); Hauman: 203 (1948); Agnew: 323 (1974). Type: Fernando Po, Clarence Peak, *Mann 626* (K!).

*P. worsdellii* N.E.Br.: 550 (1925). Syntypes: Northern Province, Houtbosch, *Schlechter 4740* (K!); Northern Province, Soutpansberg, *Worsdell s.n.* (K!).

Perennial herb, up to 0.6 m high. *Stems* erect, usually unbranched, slightly anisophyllous, arising from creeping stolons which may root at nodes, glabrous, fleshy. *Leaves* broadly ovate, 55–75  $\times$  40–60 mm, terminal tooth longer than broad, base truncate to slightly cordate, margin with 10 or 11 pairs of teeth, lower surface glabrous, upper surface glabrous or with scattered broad translucent hairs; petioles distinctly unequal, 22–38 (short) or 35–55 mm (long), glabrous; stipules broadly ovate to broader than long, 4–6  $\times$  4–7 mm, apex obtuse, base cordate, membranous. *Inflorescence* a dense, sessile, cymose cluster of flowers in each axil, 7–10 mm long. *Female flowers* pedicellate, with 3 somewhat unequal boat-shaped tepals each with a prominent dorsal horn; horn on largest tepal  $\pm$  as long as tepal, glabrous except for sessile glands,  $\pm 1.5$  mm long; staminodes present. *Male flowers* pedicellate, 3-merous; tepals equal, glabrous except for sessile glands,  $\pm 2$



MAP 11.—*Pilea rivularis*

mm long; rudimentary ovary absent. *Achenes* shortly stipitate,  $\pm 2$  mm long, smooth, pale ochre to brown with pale narrow rim round apex and both margins. Figure 3.

Occurs in the Northern Province and Mpumalanga, with one record from the Eastern Cape; widespread in West and East tropical Africa, the Comoro Islands and Madagascar. Found in forests and in forest margins, in damp places and on streambanks. Map 11.

Vouchers: *Kluge 1604* (PRE); *Kluge 2501* (PRE); *Mohle 266* (PRE); *Scheepers 590* (PRE); *Schlechter s.n.* (PRE, 21063 in Tv1 Mus. Herb.).

## 1992000

## 7. POUZOLZIA

***Pouzolzia* Gaudich.** in Freycinet, Voyage autour du monde ... exécuté sur les corvettes de S.M. l'Uranie et la Physicienne Pillet-ainé: 503 (1830); Benth.: 387 (1880); Engl.: 112 (1888); Hutch.: 188 (1967); Friis & Jellis: 587 (1984); Friis: 46 (1989a); Friis: 317 (1990); Friis: 108 (1991); Friis: 623 (1993). Type species: *P. laevigata* (Poir.) Decne. (= *Parietaria laevigata* Poir., as '*P. levigata*').

Erect perennial herbs or shrubs, sometimes annual, monoecious. *Leaves* alternate, petiolate, entire or dentate; cystoliths punctate; stipules free, lateral. *Inflorescence* of compact axillary bisex-



FIGURE 4.—*Pouzolzia mixta*: 1, branch apex showing sessile inflorescences,  $\times 1$ ; 2, female inflorescence, with pair of free stipules,  $\times 10$ ; 3, male flower,  $\times 10$  (Immelman 635). Artist: Gillian Condy.

ual glomerules. *Female flowers* sessile, with an indefinite number of completely fused tepals enclosing the ovary; staminodes absent; stigma filiform with lateral papillae, deciduous. *Male flowers* pedicellate, 4- or 5-merous; ovary rudimentary or absent. *Achenes* ovoid, erect, completely enclosed in persistent membranous perianth.

About 70 species, mainly in the tropics of the Old World; in southern Africa there are two widespread species.

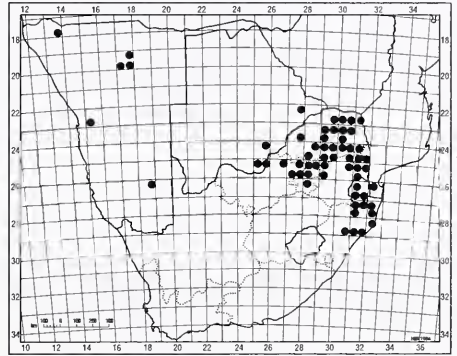
Leaves entire, usually densely grey-white-felted below; shrub or tree up to 5 m high . . . . . 1. *P. mixta*  
Leaves with dentate margins, not felted below; herb up to 1 m high or scrambling . . . 2. *P. parasitica*

1. ***Pouzolzia mixta* Solms** in Sitzungs-Bericht der Gesellschaft Naturforschender Freunde zu Berlin 1864: 21 (1864); Solms: 188 (1867); Friis & Jellis: 590 (1984); Friis: 48 (1989a); Friis: 109 (1991). Type: border between Sudan and Ethiopia, Fazugly, *Cienkowski s.n.* (B, holo., destroyed; LE!, lecto., vide Friis & Jellis 1984: 590).

*P. hypoleuca* Wedd.: 227 (1869); Rendle: 291 (1917a); N.E.Br.: 551 (1925); Roessler: 6 (1967). Type: Mozambique, Miramballa, *Kirk s.n.* (K!).

Shrub or small tree up to 3(–5) m high. *Stems* longitudinally striate, greyish or reddish brown, with wide spongy pith or hollow centre, wood soft, inflorescence and leaf scars prominent especially on young stems, with dense curved or arachnoid hairs when young, glabrescent. *Leaves* deciduous, ovate to lanceolate, 48–115 × 25–75 mm, apex attenuate-acute, base cuneate to truncate, upper surface roughly velvety or scabrid, with dense hairs, lower surface densely to slightly white-felted, felt sparse on veins; petiole 15–22 mm long, pubescent to white-felted; stipules ovate to lanceolate, membranous, red-brown, apex acute to acuminate, midrib pronounced, hairs scattered or restricted to midrib and margin. *Inflorescence* appearing with young leaves, sessile in leaf axils or scattered along twigs. *Female flowers* sessile, pubescent, 2–3 mm long. *Male flowers* pedicellate, pubescent, 1.5–2.5 mm long. *Achenes* ± compressed fusiform, smooth, shiny, dark brown, ± 2.5 mm long, sometimes dispersed with persisting membranaceous perianth. Figure 4.

Occurs in Namibia, Botswana, North-West, the Northern Province, Gauteng, Mpumalanga,



MAP 12.—*Pouzolzia mixta*

Swaziland and KwaZulu-Natal; also in the southern Arabian Peninsula, Ethiopia, East tropical Africa and Angola. Found on rocky hillsides in open bushveld, often in sandy soil. Map 12.

Vouchers: *Fourie M010* (PRE); *Oliver, Schweickerdt & Verdoorn 337* (PRE); *Rogers 30020* (PRE); *Van der Schijff 3605* (PRE); *Verdoorn 2258* (PRE).

2. ***Pouzolzia parasitica* (Forssk.) Schweinf.** in Bulletin de l'Herbier Boissier 4, App. 2: 145 (1896); Rendle: 293 (1917a); Hauman: 215 (1948); Robyns: 84 (1948); Keay: 763 (1958); Letouzey: 194 (1968); Agnew: 325 (1974); Friis & Jellis: 593 (1984); Friis: 51 (1989a); Friis: 111 (1991). Type: Yemen, Hadie, on walls of coffee plantations, *Forsskål s.n.* (C, holo.!).

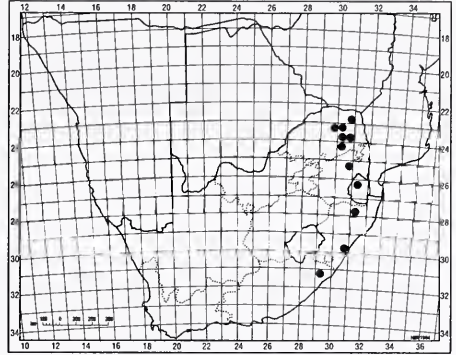
*Urtica parasitica* Forssk.: 160 (1775).



FIGURE 5.—*Parietaria debilis*: 1, branch,  $\times 1$ ; 2, male flower,  $\times 20$ ; 3, female flower with developing fruit,  $\times 20$ ; 4, bisexual flower,  $\times 20$  (Merxmüller & Giess 28148). Artist: Gillian Condy.

*Margarocarpus procridioides* Wedd.: 204 (1854).  
*Boehmeria procridioides* (Wedd.) Blume: 204 (1856).  
*P. procridioides* (Wedd.) Wedd.: 412 (1857); N.E.Br.: 551 (1925). Syntypes: Eastern Cape, Pondoland, between Mtata (Umtata) and Umsimubu (Port St John's) Rivers, 1 000–2 000 ft, Drège s.n., marked '*Urtica ?procridioides* E.M.' (BM!, K!, P!); Umsimubu (Port St John's) River, Drège s.n., marked '*Urtica ?procridioides* E.M.b.' (P!).

Erect or ascending perennial herb up to 1 m high, sometimes scrambling, often with slender shoots from a woody base, up to 50 mm in diameter. *Stems* often rooting at lower nodes, with long, dense, patent, often pale golden yellow hairs, glabrescent. *Leaves* lanceolate to ovate, 60–125 × 40–70 mm, apical tooth longer than broad, base broadly cuneate, margin with 10–23 pairs of teeth, both surfaces with fairly dense scattered hairs, these denser on veins of lower surface; petiole slender, (20–)40–80 mm long, densely patent-hairy; stipules prominent, lanceolate, 5–10 × 1.5–3.0 mm, membranous, persistent, apex attenuate and recurved, base sessile and cordate, with long hairs on margin and midrib. *Female flowers* hairy, ± 2 mm long. *Male flowers* with perianth deeply 4-lobed, acuminate, hairy, ± 2.5 mm long. *Achenes* fusiform, 1.5–2.5 mm long, enclosed in hairy accrescent perianth; seed pale cream, smooth, glistening.



MAP 13.—*Pouzolzia parasitica*

Occurs in the Northern Province, Mpumalanga and Swaziland, with scattered records from KwaZulu-Natal and the Eastern Cape; widespread in mountains of tropical Africa and Yemen. Found in undergrowth of forests, usually near water, recorded once as a garden weed (Mbabane). Map 13.

Vouchers: *Acocks 13949* (PRE); *Gerstner 5719* (PRE); *Kluge 812* (PRE); *Pegler 733* (PRE); *Pole Evans 3942* (PRE).

## 2007000

## 8. PARIETARIA

*Parietaria* L., Species plantarum 2: 1052 (1753); Benth.: 392 (1880); Engl.: 115 (1888); Hutch.: 193 (1967); Friis: 52 (1989a); Friis: 320 (1990); Friis: 627 (1993). Type species: *P. officinalis* L.

Annual or perennial herbs, polygamous. *Leaves* alternate, petiolate, entire; cystoliths punctate; stipules absent. *Inflorescences* of paired sessile or shortly pedunculate clusters in leaf axils; bracts sometimes very prominent; flowers bisexual or unisexual. *Female flowers* with ± tubular, 3- or 4-lobed perianth; ovary symmetrical; stigma sessile, penicillate, deciduous. *Male and hermaphrodite flowers* 3- or 4-merous; tepals almost free; rudimentary ovary present. *Achenes* enclosed in persistent perianth.

Some 10 species widely distributed in the tropics, subtropics and warm temperate regions; one polymorphic species occurs in mountains of tropical and southern Africa.

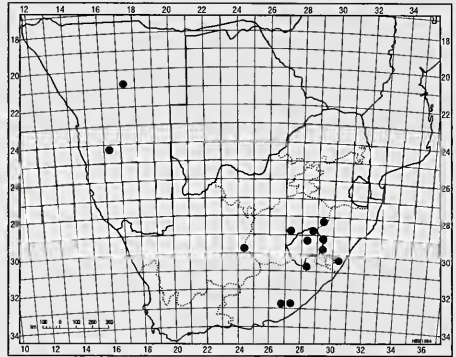
*Parietaria debilis* G.Forst., Florulae insularum praustraliu prodromus: 73 (1786); Rendle: 298 (1917a); Roessler: 5 (1967);

Letouzey: 208 (1968); Agnew: 325 (1974); Friis: 52 (1989a). Type: from islands in South Pacific, not yet designated.

Annual herb. *Stems* prostrate, delicate, sometimes rooting at nodes, glabrous or with short stiff hairs, sometimes with stalked glands when young, stinging hairs absent. *Leaves* broadly ovate to broader than long, 5–30 × 3–23 mm, apex obtuse or slightly obtuse-acuminate, base truncate to slightly cordate, margin entire, glabrous or with short stiff hairs, hairs denser along veins and margin, sometimes with long curved hairs intermixed; petiole glabrous or with curved stiff hairs. *Inflorescence* of 1–few sessile or shortly pedicellate flowers in leaf axils, with male, female and bisexual intermixed. *Flowers* with bracts having glandular hairs and long curved hairs. *Female flowers* 4-merous, shortly pedicellate; perianth ± 0.5 × 1.5 mm long, with minute hairs on outer surface. *Bisexual flowers* with perianth with short hairs on outer surface, ± 1 mm long. *Male flowers* subsessile, 4-merous, up to 1.5 mm in diameter. *Achenes* ± 1.5 mm long, smooth, shiny, dark brown. Figure 5.

Occurs in the Free State, Lesotho, KwaZulu-Natal and the Eastern Cape, with two records from Namibia; widespread in warm temperate regions and mountains of tropical regions. Found in wet shady areas such as caves and dense forest, also on edges of vleis. Map 14.

It has been suggested (B.L. Burt pers. comm.) that the specimens of *Parietaria* from the mountains of tropical and South Africa are conspecific with those from the Himalayas, and that all this material should be determined as *P. micrantha* Ledeb., as Hara (1975: 23) has done



MAP 14.—*Parietaria debilis*

for the eastern Himalayan specimens. We quite agree with the view that the South African specimens belong to the same species as the western Himalayan material, but they are also very similar to at least part of the material from New Zealand and Polynesia, the region from which the type of *P. debilis* originated. In absence of a more complete study of the tropical and southern hemisphere species of the genus, we are very reluctant to change the name of the African species, and have therefore retained the epithet *debilis*.

Vouchers: *Hilliard & Burt* 6730 (PRE); *Hilliard & Burt* 14998 (PRE); *Hilliard & Burt* 15072 (PRE); *Merxmüller & Giess* 28148 (PRE); *Schlechter* 4889 (PRE).

#### Names excluded

*Parietaria capensis* Thunb., *Prodromus plantarum capensium*: 31 (1794); Thunb.: 155 (1823). *Boehmeria capensis* (Thunb.) Spreng.: 844 (1826). *Droguetia thunbergii* N.E.Br.: 80 (1913); N.E.Br.: 558 (1925), nom. illegit. superfl. Type: Cape Province, Grootvadersbosch, specimen marked 'Urtica caffra alpha', *Thunberg s.n.* (UPS-THUNB No. 22129!), lecto., vide Friis 1986: 703. This is *Droguetia iners* (Forssk.) Schweinf.

*Parietaria lanceolata* Thunb., *Prodromus plantarum capensium*: 31 (1794); Thunb.: 155 (1823). *Didymodoxa debilis* var. *lanceolata* (Thunb.) Wedd.: 235.61 (1869). *Australina lanceolata* (Thunb.) N.E.Br.: 555 (1925). Type: specimen in UPS-THUNB (No. 24019!) marked '*Parietaria lanceolata*', and marked 'Cap. bon. spei' on reverse.

This is *Pouzolzia zeylanica* (L.) Benn., which does not occur in the FSA region. The species is widespread in tropical and warm temperate Asia, and may have been collected by Thunberg on his travels in Indonesia and Japan. See Friis: 703 (1986).

*Parietaria pilosa* Willd., *Species plantarum* 4: 954 (1806). Type: 'Caput b. spei', stated to have been collected by Thunberg (B-WILLD No. 18900!, holo.). See Friis: 704 (1986). This is *Parietaria judaica* L., which at present does not seem to occur in the FSA region. Another specimen that appears to be the same species (or *P. officinalis* L.), *Oldenburg* 1405 at BM!, is also stated to have been collected in South Africa (dated 1772).

## 2012000

## 9. FORSSKAOLEA

**Forsskaolea** *L.*, *Opobalsamum declaratum*: 17 (1764); Benth.: 393 (1880); Engl.: 117 (1888); Hutch.: 194 (1967); N.E.Br.: 556 (1925); Roessler: 17 (1967); Merxm. & Roessler: 263 (1980); Lobin & Roessler: 373 (1985); Friis & Wilmot-Dea: 25 (1988); Friis: 54 (1989a); Friis: 321 (1990); Friis: 628 (1993). Type species: *F. tenacissima* L.

Annual or perennial herbs or shrublets, monoecious, often covered with hispid hairs. *Leaves* alternate, petiolate, variously serrate; cystoliths punctate, prominent; stipules lateral, free. *Inflorescence* bisexual, rarely unisexual (female), sessile in leaf axils, enclosed in a campanulate involucre of bracts; bracts lanceolate, ovate or obovate, free or fused at base, almost covered by long dense woolly indumentum, but hairs at base long and stiff. *Female flowers* few at centre of inflorescence, without perianth; ovary erect; stigma sessile and filiform. *Male flowers* pedicellate, mostly near edge of inflorescence; perianth irregularly 3-lobed; stamen 1, inflexed, later reflexing; rudimentary ovary absent. *Achenes* ovate, covered by woolly indumentum.

Three species are found in southern Africa, two of them endemic to the *FSA* region; there are five or six species from the drier parts of Africa, the Macaronesian Islands, Spain and extending to Pakistan and northwestern India. All occur in dry areas and are taxonomically difficult. Merxmüller & Roessler (1980) have shown that, in the *FSA* region, there are frequently intermediate specimens between the three taxa, but that these intermediates are localised to comparatively restricted transition zones, a phenomenon which they explain by assuming introgressive hybridisation. We have consequently chosen to maintain the three taxa at specific rank.

- 1a Involucre of inflorescence usually 8–13 mm long; lobes 3.3–10 times as long as broad; leaf margin broadly and shallowly dentate with up to 4 pairs of teeth; mostly restricted to the Namib Desert of southern Namibia and the Northern Cape . . . . 1. *F. hereroensis*
- 1b Involucre of inflorescence usually 4–9 mm long; lobes 1.3–3.3 times as long as broad; leaf margin either broadly and shallowly dentate or crenate, with 3–8 pairs of teeth; from northern Namibia to the Northern, Western and Eastern Cape:
  - 2a Leaf margins crenate; plant usually herbaceous; Namibia north of Windhoek . . . . 2. *F. viridis*
  - 2b Leaf margins with broad shallow irregular teeth; plant usually woody at base; Namibia mainly south of Windhoek, the Northern Cape, Western Cape and western part of the Eastern Cape . . . . . 3. *F. candida*

1. **Forsskaolea hereroensis** *Schinz* in Bulletin de l'Herbier Boissier 4, App. 3: 51 (1896); Rendle: 300 (1917a); N.E.Br.: 557 (1925); Roessler: 4 (1967); Friis & Wilmot-Dea: 35 (1988). Type: Damaraland, *Lindner s.n.* (BR, holo.!; K!).

Woody annual herb up to 1 m high, much branched. *Stems* with curved broad-based, stiff hairs interspersed with shorter puberulous hairs. *Leaves* lanceolate to ovate, 17–40 × 10–26 mm, apex broadly acute, base decurrent, margin with teeth obsolete or in up to 4 pairs, with broad-based curved hairs, upper surface with scattered

slender hooked hairs, lower surface usually with dense white wool, wool thinner on veins which often have curved broad-based, stiff hairs; petiole ± 10–30 mm long; stipules broadly ovate, apex abruptly acuminate, base cordate, membranous with thicker midrib, fringed with long stiff hairs. *Inflorescence* with (6–)8–12-lobed involucre, dimensions of lobes as in key, otherwise as for genus. *Flowers* as for genus. *Achenes* shortly stipitate, ovoid, 2.5–3.0 × 1.50–2.25 mm, dark brown. Figure 6: 7, 8.

Endemic to Namibia and the Northern Cape. On rocky hillsides and in riverbeds, usually in

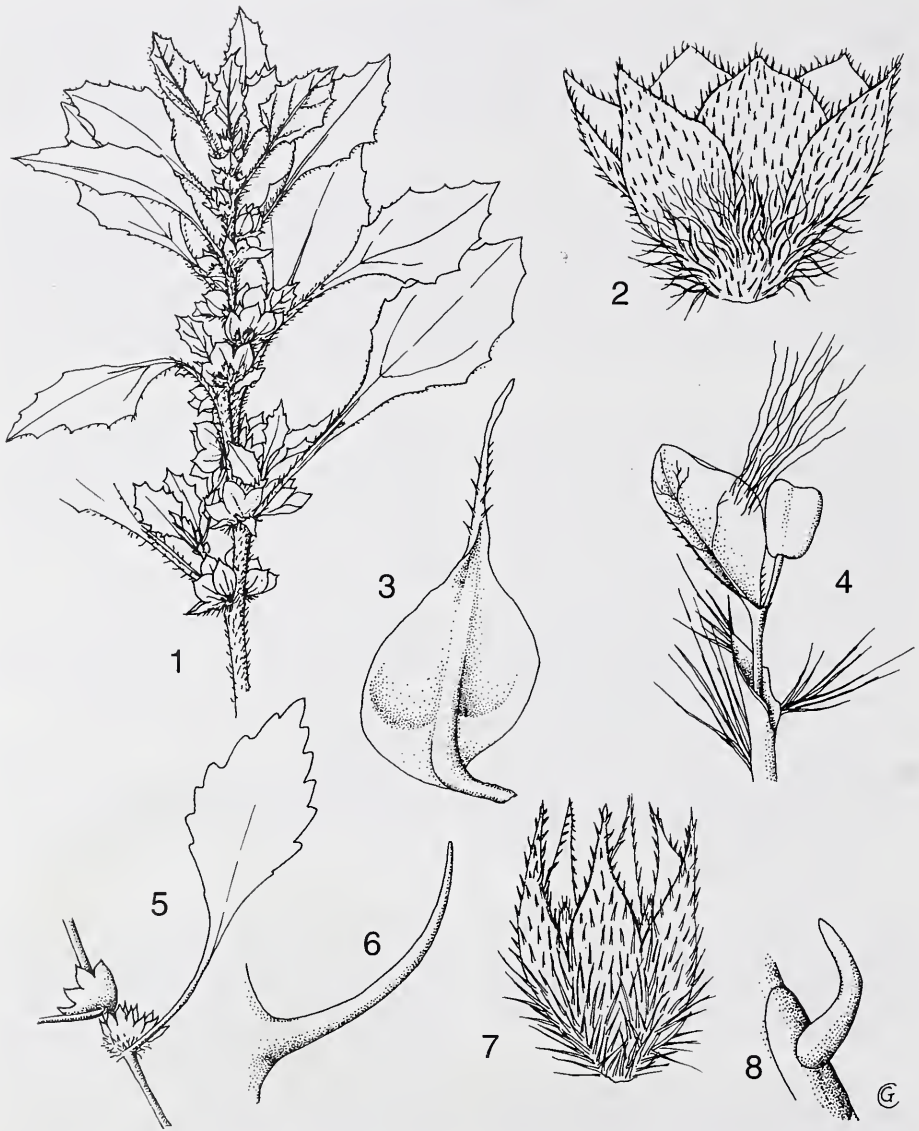
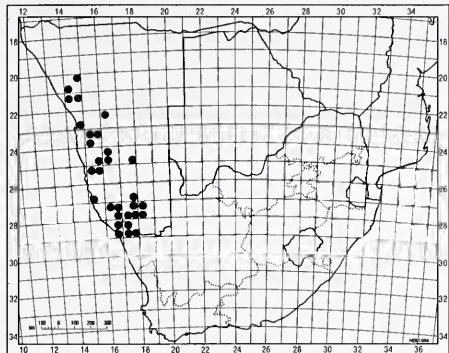


FIGURE 6.—*Forsskaolea candida*: 1, branch apex showing sessile inflorescences,  $\times 1$ ; 2, inflorescence  $\times 4$ ; 3, female flower,  $\times 15$ ; 4, male flower,  $\times 15$  (Oliver, Muller & Schweickerdt 6328). *F. viridis*: 5, leaf with inflorescence,  $\times 1$ ; 6, slender curved hair on leaf margin,  $\times 40$  (Giess 13510). *F. hereroensis*: 7, inflorescence,  $\times 4$ ; 8, broad-based sharply curved hair on upper surface of leaf,  $\times 40$  (Jensen 341). Artist: Gillian Condy.



MAP 15.—*Forsskaolea hereroensis*

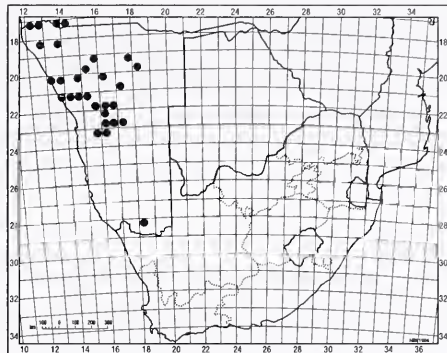
shade. Transitional forms between *F. hereroensis* and *F. viridis* (no. 2) are known from northern Namibia, and between *F. hereroensis* and *F. candida* (no. 3) from central and southern Namibia (see Merxmüller & Roessler 1980). Map 15.

Vouchers: *Giess & Muller 14440* (PRE); *Hardy 672* (PRE); *Jensen 341* (PRE); *Strey 2291* (PRE); *Visser 00230* (PRE).

2. *Forsskaolea viridis* Webb in Hook., *Niger Flora*: 179 (1849); Wedd.: 235.56 (1869); Rendle: 302 (1917a); Roessler: 4 (1967); Friis: 727 (1982); Friis & Wilmot-Dea: 35 (1988). Type: plant grown at the Paris Botanical Garden from seed collected at the Red Sea coast of Ethiopia by *Ehrenberg s.n.* (FI-WEBB!), lecto., vide Friis 1982: 727).

*F. eenii* Rendle: 203 (1917b); Rendle: 301 (1917a). Type: Damaraland, *Een s.n.* (BM!).

Annual herb up to 1.2 m high, base usually herbaceous. *Stems* with sparse broad-based curved hairs and denser shorter often hooked stiff hairs. *Leaves* lanceolate to ovate, 18–40 (–95) × 12–20 (–55) mm, apex broadly acute, base decurrent, margin crenate with 4–8 pairs of teeth, with curved hairs, upper surface with scattered curved hairs, lower surface usually with dense white wool, wool thinner on veins

MAP 16.—*Forsskaolea viridis*

which often have curved hairs; petiole 13–30 (–45) mm long; stipules broadly ovate, margin ciliate. *Inflorescence* with (3–)4–7 (–8)-lobed involucre, dimensions of lobes as in key, otherwise as for genus. *Flowers* as for genus. *Achenes* shortly stipitate, ovoid, 2–3 × 1.25–2.00 mm, dark brown. Figure 6: 5, 6.

Occurs mainly in Namibia in the area north of Windhoek; also widely distributed in southern Angola, tropical East Africa, Yemen, Saudi Arabia, southern Egypt and the Cape Verde Islands. Occurs on rocky slopes and in dry watercourses in shade. Transitional forms to *F. hereroensis* (no. 1) exist (see under that species). Map 16.

The involucral bracts of the type of *F. eenii* approach those of *F. hereroensis*, as the length/width ratio is  $\pm 3.5$  and the length of the involucre 8–9 mm, but the general morphology is most similar to that of *F. viridis*. For this reason we have placed it under *F. viridis*, while Roessler (1967: 3) has placed it under *F. candida* (no. 3). As the type belongs to the group of intermediate specimens, the choice of position will remain somewhat arbitrary.

Vouchers: *De Winter & Leistner 5222* (PRE); *Dinter 492* (PRE); *Giess 13308* (PRE); *Goyns 64* (PRE); *Schoenfelder S623* (PRE); *Volk 2331* (PRE).

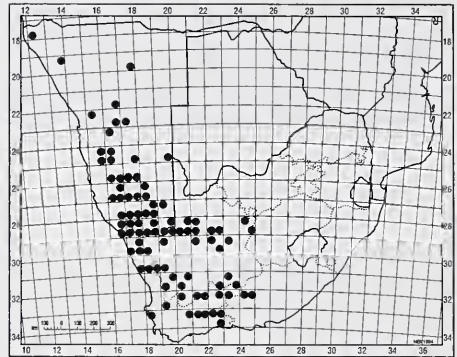
3. *Forsskaolea candida* L.f., *Supplementum plantarum*: 245 (1782); Rendle: 301 (1917a); N.E.Br.: 556 (1925); Roessler: 3 (1967); Friis & Wilmot-Dea: 35 (1988). Type: Cap. bon. spei, *Thunberg s.n.* A specimen in LINN (No. 605.3) might be a suitable lectotype; there is also a specimen, perhaps a duplicate, at S-LINN (No. 195.13).

*F. candida* var. *virescens* Wedd.: 235.56 (1869); N.E.Br.: 557 (1925). Type: South Africa, *Drège s.n.*, marked '*Forsskaolea viridis* Ehrenb.?' (P, ex Herb. Lenormand!).

*F. scabra* Retz.: 31 (1783). Type: Cape, *Thunberg s.n.* (A specimen at LD, in the Herb. Retzius, would be a suitable lectotype.)

Description as for *F. viridis* except the following: Base of plant often woody. *Leaves* 10–75 × 6–40 mm, margin with 3–7 pairs of broad irregular teeth; petiole 6–30 mm long. *Inflorescence* with (4–)5–9(–11)-lobed involucre, dimensions of lobes as in key, otherwise as for genus. Figure 6: 1–4.

Confined mainly to south-central Namibia and the dry areas of the Northern and Western Cape, with a few records from northern Namibia



MAP 17.—*Forsskaolea candida*

and the Eastern Cape. On rocky hillsides and in riverbeds, usually in shade. Transitional specimens between this species and *F. hereroensis* exist (see under that species). Map 17.

Vouchers: *Giess 14591* (PRE); *Giess & Muller 12297* (PRE); *Oliver, Muller & Steenkamp 6328* (PRE); *Oliver & Steenkamp 6237* (PRE); *Van der Westhuizen 226* (PRE).

## 2013000

## 10. DROGUETIA

*Droguetia* *Gaudich.* in Freycinet, *Voyage autour du monde ... exécuté sur les corvettes de S.M. l'Uranie et la Physicienne Pillet-ainé* – Botanique: 505 (1830); Benth.: 394 (1880); Engl.: 117 (1888); Hutch.: 195 (1967); Friis, Immelman & Wilmot-Dea: 125 (1987); Friis & Wilmot-Dea: 36 (1988); Friis: 56 (1989a); Friis: 322 (1990); Friis: 112 (1991); Friis: 628 (1993). Type species: *D. leptostachys* (Pers.) Wedd. (lecto., vide Friis & Wilmot-Dea 1988: 36).

Slender annual or perennial herbs, monoecious, or apparently dioecious by abortion. *Leaves* alternate or opposite, petiolate, serrate; cystoliths dot-like; stipules lateral, free. *Inflorescences* sessile axillary clusters, either bisexual and surrounded by a common campanulate involucre of fused bracts, or a cluster of very small involucre each with 1(2) female flowers (involucre then appearing like perianths); bisexual involucre usually with many male and 1–few female flowers (rarely all male); female involucre much smaller than bisexual ones; bracts and flowers with long woolly hairs. *Female flowers* pedicellate, naked; ovary covered with a woolly tomentum; stigma sessile, filiform; staminodes absent. *Male flowers* pedicellate, clavate; perianth 3-lobed, 1 lobe apiculate and with prominent setae; stamen single, inflexed in bud. *Achenes* enclosed in involucre, brown, shiny, often crowned by persistent stigma.

Seven species in tropical and southern Africa, Yemen, South India and on Java; in southern Africa the two species and two subspecies are found in KwaZulu-Natal and the Eastern and Western Cape.

Leaves always opposite . . . . . 1. *D. iners*  
 At least uppermost leaves on stem or some of the leaves on side branches alternate . . . 2. *D. ambigua*

1. ***Droguetia iners*** (Forssk.) Schweinf. in Bulletin de l'Herbier Boissier 4, App. 2: 146 (1896); Rendle: 303 (1917a); Letouzey: 213 (1968); Agnew: 325 (1974); Friis, Immelman & Wilmot-Deaer: 126 (1987); Friis & Wilmot-Deaer: 38 (1988); Friis: 57 (1989a); Friis: 112 (1991). Type: Yemen, *Forsskål s.n.* (C, holo!; microfiche in PRE, No. 774!).

Perennial herb or subshrub. *Stems* prostrate and erect, up to ± 1 m high, indumentum very varied (see key to subspecies). *Leaves* ovate, up to 45(–80) × 25(–45) mm, apex acute or acuminate, base cuneate, margin serrate with 3–12 pairs of teeth, upper surface with scattered stiff hairs above, lower surface with stiff hairs on veins or sometimes also scattered; petiole up to 20(–45) mm long, with indumentum as in branches; stipules lanceolate, apex acuminate, up to 3 mm long, midrib brown and prominent, membranous. *Inflorescences* in upper axils consisting of clusters of bisexual, female or mixed inflorescences, in lower axils often only female inflorescences, bisexual inflorescences up to 4 mm in diameter. *Flowers* as for genus. *Achenes* enclosed in persistent, glabrous or lanate involucre.

Found in KwaZulu-Natal and the Eastern and Western Cape; also through East tropical Africa to the Sudan, northern Ethiopia, Macías Nguema (Fernando Po), Cameroon, and in Angola; also in the Yemen and in the mountains of southern India and Indonesia. Occurs in montane forests and evergreen scrub.

There are two subspecies in the *FSA* area:

Young stems and petioles subglabrous or with an indumentum of stiff sparse hairs or stiff appressed hairs; terminal tooth usually more than twice as long as broad; stipules lanceolate, not prominent . . . . . 1a. subsp. *iners*

Young stems and petioles with a dense indumentum of erect or slightly curly fine hairs; terminal tooth rarely more than 1.5 times as long as broad; stipules prominent and broad . . . . . 1b. subsp. *burchellii*

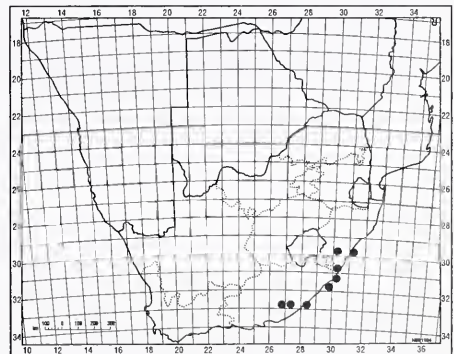
1a. subsp. ***iners***.

*Urtica iners* Forssk.: 160 (1775). *U. urens* var. *iners* (Forssk.) Wedd.: 40 (1869).

*D. thunbergii* N.E.Br.: 80 (1913); N.E.Br.: 558 (1925). Type: Cape Province, probably Grootvadersbosch, *Thunberg* specimen marked '*Urtica capensis* alpha' (UPS-THUNB No. 22129!, lecto., vide Friis 1986: 703).

*D. woodii* N.E.Br.: 561 (1925). Type: KwaZulu-Natal, Inanda, *Wood 1243* (K!).

Slender or robust herb or subshrub 0.1–1 m high. *Stems* with hairs as in key. *Leaves* 18–45(–80) × 10–25(–45) mm, margin with 4–8(–12) pairs of teeth, upper surface glabrous to sparsely hairy, lower with a few stiff hairs on veins, sometimes also with scattered stiff hairs; petiole 5–20(–40) mm long; stipules lanceolate, 1–2 × up to 2 mm. *Inflorescence* with involucre always lanate on the inside, otherwise as for species. *Flowers* and fruit as for species.



MAP 18.—*Droguetia iners* subsp. *iners*

Distribution and ecology as for the species, with exception of the Western Cape and the Indian and Indonesian part of the range, where it is replaced by subsp. *burchellii* and subsp. *urticoides* (Wight) Friis & Wilmot-Dear respectively. Map 18.

Vouchers: *Duthie s.n.* (13059 in STE, PRE); *Rattray 334* (PRE).

1b. subsp. ***burchellii*** (N.E.Br.) Friis & Wilmot-Dear in Friis, Immelman & Wilmot-Dear in *Nordic Journal of Botany* 7,2: 126 (1987); Friis & Wilmot-Dear: 41 (1988). Type: Eastern Cape, Bathurst Division, Barville Park, *Burchell 4084* (K, holo.!).

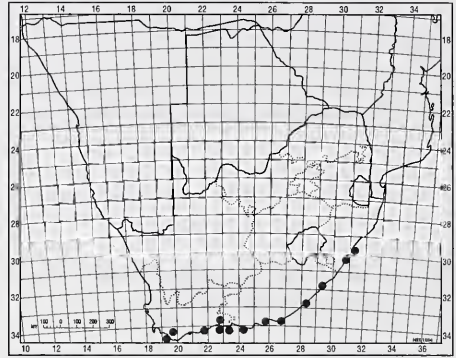
*D. burchellii* N.E.Br.: 561 (1925).

Differs from subsp. *iners* as follows: Plants up to 0.5 m high; pubescence differing as given in key. *Leaves* 15–60 × 6–25 mm, margin with 3–10 pairs of teeth, apex and pubescence differing as given in key; petiole 5–25 mm long; stipules broadly lanceolate to ovate, especially in upper part of stems, sometimes broader than long, up to 3 × 4 mm.

Endemic to South Africa, from southern KwaZulu-Natal and the Eastern and Western Cape. Found in coastal forest and scrub, sometimes in dune forest or evergreen scrub. Map 19.

Vouchers: *Flanagan 1224* (PRE); *Rousseau 67* (PRE); *Taylor 10401* (PRE); *Tyson PRE12643* (PRE); *Wager s.n.* (PRE, 24109 in Tvl Mus.).

Note on variation in *D. iners*: There is a degree of overlap in all characters used to distinguish taxa in this widespread species. Friis & Wilmot-Dear have therefore recognised only three taxa (subspecies *iners*, *burchellii* and *urticoides*), and only at the subspecific level. Subsp. *burchellii* was recognised on its different indumentum and larger stipules; it also occupies a limited distribution along the southern coast of South Africa. The type of *D. thunbergii* is interpreted as a small-leaved form of *D. iners*.



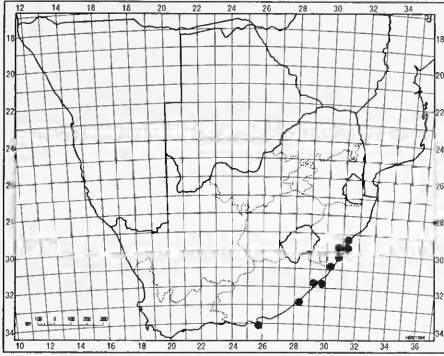
MAP 19.—*Droguetia iners* subsp. *burchellii*

The placement of the type of *D. woodii* has proved somewhat difficult, as it has exceptionally large leaves and does not fit well into any of the subspecies, but it was decided that it was closest to subsp. *iners*.

2. *Droguetia ambigua* Wedd. in *Annales des Sciences Naturelles, Paris. Botanique, Ser. 4*, 1: 211 (1854); N.E.Br.: 560 (1925) excl. specimen. cit.; Friis & Wilmot-Dear: 41 (1988). Type: South Africa, without further locality, *Drège s.n.*, specimen marked '*Parietaria urticaefolia* L. a' (P!, lecto., vide Friis & Wilmot Dear 1988: 42; BM!, E!, G!, K!).

*D. urticaefolia* Wedd.: 235.58 (1869); N.E.Br.: 559 (1925), nom. illegit. superfl. based on *D. ambigua*.

Herb, apparently annual but possibly sometimes perennial. *Stems* prostrate and ascending, up to 0.4 m high; young branches with sparse to dense erect stiff or sometimes curly hairs. *Leaves* broadly ovate to rhomboid, up to 40 × 22 mm but usually much smaller, almost glabrous above, with a few stiff hairs along veins below, apex bluntly acute, terminal tooth ± as long as broad, base broadly cuneate, margin crenate to bluntly serrate with 2–7 pairs of teeth; petiole up to 14 mm long but usually shorter; stipules broadly lanceolate, up to 2 × 1.5 mm, green, ciliate. *Inflorescences* bisexual and almost globular in upper

MAP 20.—*Droguetia ambigua*

axils, unisexual (female) only in lower axils; bisexual inflorescences pubescent or lanate on

outside, densely lanate on inside, up to 2.5 mm in diameter. *Achenes* enclosed in markedly lanate involucre.

Endemic to South Africa (KwaZulu-Natal and Eastern Cape). Found in coastal bush, often on dunes, or in forest. Map 20.

Often confused in the literature with *D. iners* (no. 1), but can easily be distinguished by the deep green leaves, the characteristic leaf shape, the crenate leaf margin and the usually almost globular bisexual involucre, which have a characteristic pale pubescent or lanate indumentum on the outer surface.

Vouchers: *Ross & Moll 2197* (PRE); *Ross & Moll 2315* (PRE); *Ward 4901* (PRE); *Watmough 414* (PRE).

## 2014010

## 11. DIDYMODOXA

***Didymodoxa*** Wedd. in Archives du Muséum National d'Histoire Naturelle, Paris 9: 547 (1857); Wedd.: 235.61.8 (1869); Friis: 209 (1985b); Friis, Immelman & Wilmot-Dea: 126 (1987); Friis & Wilmot-Dea: 45 (1988); Friis: 60 (1989a); Friis: 114 (1991); Friis: 628 (1993). Type species: *D. integrifolia* Wedd. (lecto., vide Friis & Wilmot-Dea 1988: 45).

*Australina* auct., non Gaudich.; Benth.: 394 (1880), p.p.; Engl.: 117 (1888), p.p.; Rendle: 305 (1917a) quoad *A. acuminata*; N.E. Br.: 552 (1925); Hutch.: 194 (1967), p.p. and other authors on the flora of southern and East Africa.

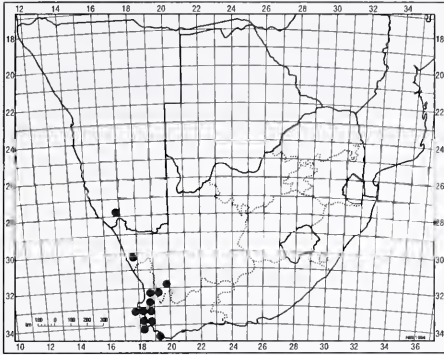
The name *Didymotoca* E.Mey. is recorded in the *Index kewensis* and elsewhere, but has not been validly published.

Annual herbs, monoecious, or dioecious by abortion. *Leaves* alternate, petiolate, serrate, crenate or entire; cystoliths punctiform; stipules free, lateral. *Inflorescence* usually bisexual, axillary, sessile, bracteate; bracts free, not prominent, usually shorter than flowers. *Female flowers* without perianth; ovary erect, with a subcapitate or shortly linear style. *Male flowers* with a boat-shaped, sometimes almost bract-like perianth with erect tip and slightly fused cylindrical base; stamen 1, inflexed (later reflexed); rudimentary ovary absent. *Achenes* slightly winged along one side, other side rounded, 2 ovaries or achenes frequently joining along rounded side thus forming a double fruit much larger than 2 single fruits, both seeds developing in this case.

Two species in southern Africa and East tropical Africa, as far north as northern Ethiopia. Widespread in southern Africa but not often collected, from northern and southern Namibia, the Northern Province, Gauteng, Mpumalanga, the Free State, KwaZulu-Natal, Lesotho and the Eastern, Western and Northern Cape.

What was formerly known as the genus *Australina*, distributed in Australia and Africa, has been divided into two genera by Friis & Wilmot-Dea (1988: 30), who resuscitated Weddell's genus *Didymodoxa*, applying the name to two of the African species, while restricting *Australina sensu*



MAP 21.—*Didymodoxa capensis* var. *capensis*

Both this and the following variety are distributed in the winter-rainfall area of the Cape, from the Cape Peninsula in the Western Cape to Namaqualand in the Northern Cape; also found in southern Namibia. Growing among rocks and on sandy flats. Map 21.

Vouchers: *Acocks* 14922 (PRE); *Acocks* 23318 (PRE); *Bolus* 9455 (PRE); *Bolus* 12827 (PRE); *Mittendorf* 104 (PRE).

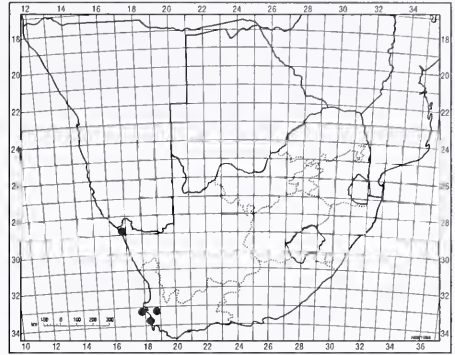
**1b. var. *integrifolia* Friis & Wilmot-Dear** in Friis, Immelman & Wilmot-Dear in *Nordic Journal of Botany* 7,2: 126 (1987); Friis & Wilmot-Dear: 49 (1988). Type: South Africa, without further indication; Cape Province, *Drège s.n.*, marked '*Parietaria lanceolata* Thunb. ?c' (P!, lecto., vide Friis & Wilmot-Dear 1987; P!, K!).

*Australina integrifolia* Wedd.: 212 (1854). *D. integrifolia* (Wedd.) Wedd.: 549 (1857).

*A. capensis* Wedd.: 212 (1854); N.E.Br.: 554 (1925). *D. debilis* Wedd.: 548, t. 20B (1857); Wedd.: 235 (1869), nom. illegit. superfl. Type: Cape Province, *Drège s.n.*, specimen marked '*Didymodoxa debilis* E.M. a' (BM!, E!, G!, K!, MEL!, P!, S!).

*A. paarlensis* N.E.Br.: 553 (1925). Type: Western Cape, Paarl Div., Paarl Mountain, *Drège s.n.*, marked '*Didymodoxa debilis* E.M.c.' (BM!, E!, G!, K!, SAM!).

Erect or procumbent herb, often delicate. Leaves ovate to broadly ovate, usually less than 20

MAP 22.—*Didymodoxa capensis* var. *integrifolia*

× 15 mm, margin entire to slightly crenate, rather membranous; stipules lanceolate, up to 1.25 mm wide. Inflorescences comparatively few-flowered, often situated on part of plant with longer internodes and shorter leaves than the infertile part.

Distribution (except for southern Namibia) and habitat as for typical variety. Map 22.

Vouchers: *Galpin* 11506 (PRE); *Hafstrom & Acocks* 379 (PRE); *Marloth* 146 (PRE); *Oliver, Tölken & Venter* 512 (PRE); *Taylor* 7126 (PRE).

**2. *Didymodoxa caffra* (Thunb.) Friis & Wilmot-Dear** in Friis in *Boletim Sociedade Broteriana* 58: 210 (1985b); Friis & Wilmot-Dear: 49 (1988); Friis: 60 (1989a); Friis: 114 (1991). Type: South Africa, without further locality, *Thunberg s.n.*, specimen marked '*Urtica caffra* beta' (UPS-THUNB!, lecto., vide N.E.Br. 1913: 80).

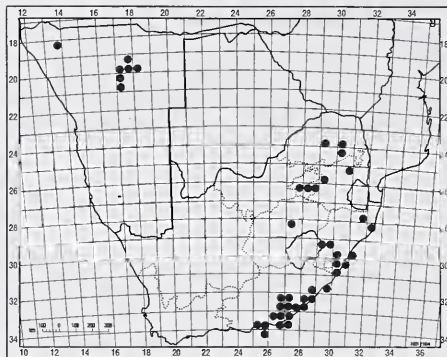
*Urtica caffra* Thunb.: 31 (1794); Thunb.: 155 (1823). *Australina caffra* (Thunb.) Prain: 388 (1913); Fourc.: 80 (1941).

*A. acuminata* Wedd.: 212 (1854); Rendle: 306 (1917a); N.E.Br.: 555 (1925); Roessler: 2 (1967); Agnew: 325 (1974). *D. acuminata* (Wedd.) Wedd.: 549 (1857). *D. cuneata* Wedd.: 235.62.8 (1869), nom. illegit. superfl., based on *A. acuminata*. Type: KwaZulu-Natal, Yellowwood River, *Drège s.n.*, specimen marked '*Parietaria cuneata* E.M. a' (G!, K!, P!).

Slender annual herb. Stems up to 0.5 m high, much branched, sometimes rooting at nodes,

moderately to sparsely pubescent with patent stiff or slender curly hairs, sometimes also with a few hooked hairs. *Leaves* lanceolate, 23–75 × 14–40 mm, base cuneate, margin clearly crenate with 5–11 pairs of teeth, upper surface with sparse appressed stiff hairs, lower with numerous hairs on veins, few scattered hairs between veins; petiole 25–47 mm long; stipules lanceolate, 2–5 × 0.3–0.6 mm, attenuate, glabrous or ciliate. *Inflorescence* up to 5 mm in diameter; bracts linear to narrowly lanceolate, ciliate. *Achenes* covered with broad hooked hairs and glands, ± 1.75 × 1 mm, double fruits up to ± 3 × 2.5 mm present in Namibian material.

In northern Namibia, the Northern Province, Gauteng, Mpumalanga, the Free State, Kwa-Zulu-Natal, Lesotho and the Eastern Cape; tropical East Africa as far north as Ethiopia. Among rocks or in forest in moist places. Map 23.



MAP 23.—*Didymodoxa caffra*

Vouchers: *Dinter 5638* (PRE); *Giffen 868* (PRE); *Kluge 1747* (PRE); *Repton 252* (PRE); *Repton 703* (PRE).

#### REFERENCES

- AGNEW, A.D.Q. 1974. Urticaceae. *Upland Kenya wild flowers*: 320–325. Oxford University Press, London.
- BENTHAM, G. 1880. Urticaceae. In G. Bentham & J.D. Hooker, *Genera plantarum* 3,1: 341–395. Reeve, London.
- BLUME, C.L. 1825. *Bijdragen tot de flora van Nederlandsch Indië*, parts 1–9. Batavia.
- BLUME, C.L. 1856. Urticaceae. *Museum botanicum Lugduno-Batavum* 2,10 & 11: 145–170. Brill, Leiden.
- BROWN, N.E. 1888. *Ureria tenax*. *Hooker's Icones plantarum* 18: t. 1748.
- BROWN, N.E. 1911. Diagnoses Africanæ XXXIX. *Bulletin of Miscellaneous Information, Royal Botanic Gardens, Kew* 1911: 82–97.
- BROWN, N.E. 1913. Diagnoses Africanæ: LII. *Bulletin of Miscellaneous Information, Royal Botanic Gardens, Kew* 1913: 79, 80.
- BROWN, N.E. 1925. Urticaceae. In W.T. Thistleton-Dyer, *Flora capensis* 5,2: 541–561. Reeve, London.
- CHEW, W.-L. 1965. *Laportea* and allied genera. *The Gardens' Bulletin, Singapore* 21: 195–208.
- CHEW, W.-L. 1969. A monograph of *Laportea* (Urticaceae). *The Gardens' Bulletin, Singapore* 25: 111–177.
- COATES PALGRAVE, K. 1977. Urticaceae. *Trees of South Africa*: 120–122. Struik, Cape Town.
- DECAISNE, J. 1844. In V. Jacquemont, *Voyage dans l'Inde* 4, Bot.: 151, t. 153. Didot frères, Paris.
- DINTER, K. 1909. *Deutsch-Südwest Afrika*: 54. Wiegell, Leipzig.
- DON, D. 1825. *Prodromus florae nepalensis*: 59. Gale, London.
- ENDLICHER, S.L. 1837. *Genera plantarum secundum ordines naturales disposita*: 283. Beck, Vienna.
- ENGLER, H.G.A. 1888. Urticaceae. *Die natürlichen Pflanzenfamilien* 3,1. Engelmann, Leipzig.
- ENGLER, H.G.A. 1914. Urticaceae africanæ II. *Botanische Jahrbücher* 51: 423–425, t. 2.
- ENGLER, H.G.A. 1915. In H.G.A. Engler & C.G.O. Drude. Urticaceae. *Die Vegetation der Erde* 9,III,1: 51–64. Engelmann, Leipzig.
- FORSSKÅL, P. 1775. *Flora aegyptiaco-arabica*: 160. Möller, Copenhagen.
- FORSTER, J.G.A. 1786. *Florulae insularum praeaustralium prodromus*. J.C. Dietrich, Göttingen.
- FOURCADE, H.G. 1941. Checklist of the flowering plants of the divisions of George, Knysna, Humansdorp and Uniondale: Urticaceae. *Botanical Survey of South Africa Memoir* No. 20: 80.
- FRIIS, I. 1981. A synopsis of *Girardinia* (Urticaceae). *Kew Bulletin* 36,1: 143–157.
- FRIIS, I. 1982. The typification of *Forsskaolea viridis* Ehrenberg ex Webb (Urticaceae). *Taxon* 31,4: 727–729.
- FRIIS, I. 1983. A synopsis of *Obetia* (Urticaceae). *Kew Bulletin* 38,2: 221–228.
- FRIIS, I. 1985a. The genus *Ureria* Gaudich. (Urticaceae) in East tropical Africa. *Nordic Journal of Botany* 5,6: 547–553.



- FRIIS, I. 1985b. Two new taxa and a new combination in the Urticaceae for the *Flora zambesiaca*. *Boletim Sociedade Broteriana* 58: 201–211.
- FRIIS, I. 1986. The typification and identity of three species of *Parietaria* L. (Urticaceae), ostensibly described from South Africa. *Taxon* 35,4: 701–705.
- FRIIS, I. 1988. New taxa and combinations in tropical African *Pilea* (Urticaceae). *Kew Bulletin* 43: 648.
- FRIIS, I. 1989a. Urticaceae. In R.M. Polhill, *Flora of tropical East Africa*. Balkema, Rotterdam.
- FRIIS, I. 1989b. A revision of *Pilea* (Urticaceae) in Africa. *Kew Bulletin* 44,4: 557–600.
- FRIIS, I. 1990. Urticaceae. In I. Hedberg & S. Edwards, *Flora of Ethiopia* 3: 302–325. EMPDA, Addis Ababa.
- FRIIS, I. 1991. Urticaceae. In E. Launert & G.V. Pope, *Flora zambesiaca* 9,6: 79–116.
- FRIIS, I. 1993. In K. Kubitzki, J.G. Rohwer & V. Bittrich (eds), *The families and genera of vascular plants II, flowering plants—dicotyledons*. Magnoliid, hamamelid and caryophyllid families: 612–630. Springer-Verlag, Berlin.
- FRIIS, I. & JELLIS, S. 1984. A synopsis of *Pouzolzia* Gaud. (Urticaceae) in tropical Africa, with an identification of *P. erythraea* and *P. piscicelliana*. *Kew Bulletin* 39,3: 587–601.
- FRIIS, I., IMMELMAN, K. & WILMOT-DEAR, C.M. 1987. New taxa and combinations in African and Australian Urticaceae. *Nordic Journal of Botany* 7,2: 125–126.
- FRIIS, I. & WILMOT-DEAR, C.M. 1988. A revision of the tribe Forsskaoleae (Urticaceae). *Nordic Journal of Botany* 8,1: 25–59.
- GAUDICHAUD-BEAUPRÉ, C. 1830. Botanique, part 12. In M.L. Freycinet, *Voyage autour du monde ... exécuté sur les corvettes de S.M. l'Uranie et la Physicienne ...* Pillet-aine. Paris.
- GAUDICHAUD-BEAUPRÉ, C. 1844. *Voyage autour du monde exécuté pendant les années 1836 & 1837 sur la corvette La Bonite—Botanique, Atlas*: tab. 82. Bertrand, Paris.
- HARA, H. 1975. Urticaceae. In H. Oghshi, *Flora of eastern Himalaya*, third report: 17–29. University Museum of Tokyo.
- HAUMAN, L. 1948. Urticaceae. In W. Robyns, *Flora du Congo-Belge et du Ruanda-Burundi* 1: 177–212. I.N.E.A.C., Bruxelles.
- HIERN, W.P. 1900. Urticaceae. *Catalogue of the African plants collected by Dr Friedrich Welwitsch in 1853–1861*. 1,4: 986–994, Trustees of the British Museum, London.
- HOCHSTETTER, C.F. 1845. Urticaceae. Pflanzen des Cap- und Natallandes, gesammelt und zusammengestellt von Dr Ferdinand Krauss. *Flora* 28,5: 88.
- HOOKE, J.D. 1864. On the plants of the temperate regions of the Cameroons Mountains and the islands in the Bight of Benin; collected by Mr Gustav Mann, Government Botanist: Urticaceae. *Journal of the Linnean Society. Botany* 7: 215–217.
- HUTCHINSON, J. 1967. Urticaceae. *The genera of flowering plants* 2: 178–196. Oxford University Press, Oxford.
- KEAY, R.W.J. 1958. Urticaceae. In J. Hutchinson & J.M. Dalziel, *Flora of West tropical Africa* (edn 2) 2,1: 439–444. Crown Agent, Millbank, London.
- KUNTZE, O. 1891. *Revisio generum plantarum ...*, pars 2: 375–1011. Felix, Leipzig.
- LEANDRI, J. 1965. Urticaceae. In H. Humbert, *Flora du Madagascar* 56: 1–107. Muséum National d'Histoire Naturelle, Paris.
- LETOUZEY, R. 1968. Urticacées. In A. Aubreville, *Flora du Cameroun* 8: 67–216. Muséum National d'Histoire Naturelle, Paris.
- LINDLEY, J. 1821. *Collectanea botanica*: t. 4. R & A Taylor, London.
- LINK, J.H.F. 1822. *Enumeratio plantarum horti regii Berolinensis altera* 2: 385. Reimer, Berlin.
- LINNAEUS, C. 1753. *Species plantarum* 2: 983, 984, 1052. Salvii, Stockholm.
- LINNAEUS, C. 1764. *Opobalsamum declaratum*: 17. H.A.M.S., Uppsala.
- LINNAEUS, C. (filius) 1782 ('1781'). *Supplementum plantarum systematis vegetabilium*. Orphanotrophei, Brunsvigae.
- LOBIN, W. & ROESSLER, H. 1985. Die Gattung *Forsskaolea* Linnæus 1764 auf den Kanarischen und Kapverdischen Inseln. *Senckenbergiana Biologica* 65: 373–390.
- MERXMÜLLER, H. & ROESSLER, H. 1980. Merkmals-Introggressionen bei *Forsskaolea* (Urticaceae). *Landbouwhogeschool Wageningen, Miscellaneous Papers* 19: 263–280.
- MÜLLER ARGOVIIENSIS, J. 1866. Euphorbiaceae. In A. de Candolle, *Prodromus systematis naturalis regni vegetabilis* 15,2: 189–1273. Masson & fils, Paris; Wagner, Leipzig.
- PRAIN, D. & HUTCHINSON, J. 1913. Notes on some species of *Acalypha*. *Bulletin of Miscellaneous Information, Royal Botanic Gardens, Kew* 1913: 15, 16.
- PRAIN, D. 1913. The Mercurialineae and Adenoclineae of South Africa. *Annals of Botany* 27: 371–410.
- RENDLE, A.D. 1917a. Urticaceae. In D. Prain, *Flora of tropical Africa* 6,2: 240–306. Reeve, London.
- RENDLE, A.D. 1917b. Tropical African Urticaceae. *Journal of Botany* 55: 201–203.
- RETZIUS, A.J. 1783. *Observationes botanicae, sex fascicularis comprehensae* 3: 31. S.L. Crusium, Leipzig.
- ROBYNS, W. 1948. *Flore des spermatophytes du Parc National Albert*: Urticaceae 1: 68–89. Institut des Parcs Nationaux du Congo Belge, Brussels.
- ROESSLER, H. 1967. Urticaceae. In H. Merxmüller, *Prodromus einer Flora von Südwestafrika* 17. Cramer, Lehre.
- SCHINZ, H. 1896. Die Pflanzenwelt Deutsch-Südwestafrikas: Urticaceae. *Bulletin de l'Herbier Boissier* 4, App. 3: 51, 52.
- SCHUMANN, K. 1902. *Just's Botanische Jahresberichte* 28,1: 463.
- SCHWEINFURTH, G.A. 1896. Sammlung arabisch-aethiopischer Pflanzen: Urticaceae. *Bulletin de l'Herbier Boissier* 4, App. 2: 145–148.

- SOLMS-LAUBACH, H.M.C.L.F. 1864. *Sitzungs-Bericht der Gesellschaft Naturforschender Freunde zu Berlin* 1864: 21.
- SOLMS-LAUBACH, H.M.C.L.F. 1867. Urticaceae. In G.A. Schweinfurth, *Beitrag zur Flora Aethiopiens*: 187, 188. Reimer, Berlin.
- SONDER, O.W. 1850. Beiträge zur Flora von Südafrika. *Linnaea* 23: 112.
- SPRENGEL, K.P.J. 1826. *Caroli Linnaei ... Systema vegetabilium* 3: 844. Librariae Dieterichianae, Göttingen.
- STEUDEL, E.G. VON. 1850. Urticae nondum descriptae. *Flora* 33: 257–261.
- THUNBERG, C.P. 1794. *Prodrromus plantarum capensium* 1: 31. Edman, Uppsala.
- THUNBERG, C.P. 1823. *Flora capensis* 1,3: 155. Cotta, Stuttgart.
- VAHL, M. 1790. *Symbolae botanicae* 1: 76. Möller, Copenhagen.
- WEBB, P.B. 1849. *Spicilegia gorgonea*, or a catalogue of all the plants as yet discovered in the Cape de Verd Islands: Urticaceae. In W.J. Hooker, *Niger Flora*: 179, 180. Baillièrre, London, Paris, Madrid.
- WEDDELL, H.A. 1854. Revue de la Famille des Urticacées. *Annales des Sciences Naturelles, Paris. Botanique*, Sér. 4,1: 173–212.
- WEDDELL, H.A. 1856. Monographie de la Famille des Urticacées. *Nouvelles Archives du Muséum National d'Histoire Naturelle, Paris* 9: 1–400.
- WEDDELL, H.A. 1857. Monographie de la Famille des Urticacees. *Nouvelles Archives du Muséum National d'Histoire Naturelle, Paris* 9: 401–591.
- WEDDELL, H.A. 1869. Urticaceae. In A. de Candolle, *Prodrromus systematis naturalis regni vegetabilis* 16,1: 32–235,64. V. Masson & fils, Paris; F. Wagner, Leipzig.
- WILLDENOW, C.L. 1806. *Caroli a Linné species plantarum* 4: 954. Nauk, Berlin.

## INDEX\*

- Acalypha capensis* (L.f.) Prain, 30  
*decumbens* Thunb., 30
- Australina auct., 29
- Australina acuminata* Wedd., 31  
*caffra* (Thunb.) Prain, 31  
*capensis* Wedd., 31  
*integrifolia* Wedd., 31  
*lanceolata* (Thunb.) N.E.Br., 22  
*paarlensis* N.E.Br., 31  
*procumbens* N.E.Br., 30  
*thunbergii* N.E.Br., 30
- Boehmeria capensis* (Thunb.) Spreng., 22  
*nivea* (L.) Gaudich., 1  
*procridioides* (Wedd.) Blume, 21
- DIDYMODOXA Wedd., 29  
*acuminata* (Wedd.) Wedd., 31  
*caffra* (Thunb.) Friis & Wilmot-Deaer, 31  
*capensis* (L.f.) Friis & Wilmot-Deaer, 30  
 var. *capensis*, 30  
 var. *integrifolia* Friis & Wilmot-Deaer, 31  
*cuneata* Wedd., 31  
*debilis* Wedd., 31  
 var. *lanceolata* (Thunb.) Wedd., 22  
*integrifolia* Wedd., 29  
*integrifolia* (Wedd.) Wedd., 31
- Didymotoca E.Mey., 29
- DROGUETIA Gaudich., 26  
*ambigua* Wedd., 28  
*burchellii* N.E.Br., 28  
*iners* (Forssk.) Schweinf., 22, 27  
 subsp. *burchellii* (N.E.Br.) Friis & Wilmot-Deaer, 28  
 subsp. *iners*, 27  
*leptostachys* (Pers.) Wedd., 26  
*thunbergii* N.E.Br., 22, 27  
*urticaefolia* Wedd., 28  
*woodii* N.E.Br., 27
- Elatostemma trinerve* Hochst., 7
- Fleurya* Gaudich., 10  
*alatipes* (Hook.f.) N.E.Br., 11  
*capensis* auct., 12  
*capensis* (L.f.) Wedd., 30  
 var. *mitis* Wedd., 12  
*grossa* Wedd., 13  
*mitis* Wedd., 12  
*mitis* (Wedd.) N.E.Br., 12  
*peduncularis* Wedd., 12  
 var. *mitis* (Wedd.) Wedd., 12  
*spicata* Gaudich., 10
- FORSSKAOLEA L., 23  
*candida* L.f., 26  
 var. *virescens* Wedd., 26  
*eenii* Rendle, 25  
*heroensis* Schinz, 23  
*scabra* Retz., 26
- tenacissima* L., 23  
*viridis* Webb, 25
- GIRARDINIA Gaudich., 14  
*condensata* (Steud.) Wedd., 14  
*diversifolia* (Link) Friis, 14  
*heterophylla* Decne., 14  
*leschenaultiana* Decne., 14  
*palmata* Blume, 14  
*vahlil* Blume, 14
- LAPORTEA Gaudich., 10  
*alatipes* Hook.f., 11  
*caffra* Chew, 13  
*canadensis* (L.) Wedd., 10  
*carruthersiana* (Hiern) K.Schum., 9  
*grossa* (Wedd.) Chew, 13  
*interrupta* (L.) Chew, 10, 13  
*mooreana* (Hiern) Chew, 14  
*peduncularis* (Wedd.) Chew, 12  
 subsp. *latidens* Friis, 10, 13  
 subsp. *peduncularis*, 12
- Leidesia capensis* (L.f.) Müll.Arg., 30  
*Margarocarpus procridioides* Wedd., 21  
*Mercurialis capensis* (L.f.) Sond., 30
- OBETIA Gaudich., 8  
*australis* Engl., 9  
*carruthersiana* (Hiern) Rendle, 9  
*ficifolia* (Savigny) Gaudich., 8  
*tenax* (N.E.Br.) Friis, 9
- PARIETARIA L., 21  
*capensis* Thunb., 22  
*debilis* G.Forst., 21  
*judaica* L., 22  
*laevigata* Poir., 17  
*lanceolata* Thunb., 22  
*micrantha* Ledeb., 22  
*officinalis* L., 21, 22  
*pilosa* Willd., 22
- PILEA Lindl., 15  
*ceratomera* Wedd., 17  
*microphylla* (L.) Liebm., 15  
*muscosa* Lindl., 15  
*rivularis* Wedd., 17  
*worsdellii* N.E.Br., 17
- POUZOLZIA Gaudich., 17  
*hypoleuca* Wedd., 19  
*laevigata* (Poir.) Decne., 17  
*mixta* Solms, 1, 19  
*parasitica* (Forssk.) Schweinf., 19  
*procridioides* (Wedd.) Wedd., 21  
*zeylanica* (L.) Benn., 22
- URERA Gaudich., 7  
*acuminata* var. *cameroonensis* (Wedd.) Leandri, 7  
*baccifera* (L.) Gaudich., 7  
*cameroonensis* Wedd., 7  
*engleriana* Dinter, 9  
*tenax* N.E.Br., 9  
*trinervis* (Hochst.) Friis & Immelman, 7  
*woodii* N.E.Br., 7

\* Synonyms are in italics; naturalised taxa are marked with an asterisk.

## URTICA L., 2

- burchellii* N.E.Br., 5
- caffra* Thunb., 31
- capensis* L.f., 30
- condensata* Steud., 14
- dioica* L.\*, 2, 3
  - var. *capensis* Wedd., 3
  - var. *eckloniana* (Blume) Wedd., 3
- diversifolia* Link., 14
- eckloniana* Blume, 3
  - var. *flavovirens* Blume, 3
- heterophylla* D.Don., 14
- heterophylla* Vahl, 14

- iners* Forssk., 27
- interrupta* L., 13
- lobata* Blume, 5
- lobulata* Blume, 5
- meyeri* Wedd., 5
- mitis* Hochst., 12
- palmata* Forssk. 14
- parasitica* Forssk., 19
- urens* L.\*, 5
  - var. *iners* (Forssk.) Wedd., 27

## URTICACEAE, 1

- Urticastrum alatipes* (Hook.f.) Kuntze, 11
- carruthersianum* Hiern, 9

## APPENDIX

### PLAN OF *FLORA OF SOUTHERN AFRICA*

Cryptogam volumes will in future not be numbered, but will be known by the name of the group they cover. The number assigned to the volume on Charophyta therefore becomes redundant. Occasional contributions to the *Flora* are published in *Bothalia* under the title *FSA contributions*.

Exotic families are marked with an asterisk.

Published volumes and parts are shown in bold.

#### INTRODUCTORY VOLUMES

**The genera of southern African flowering plants, Vols 1 (1975) and 2 (1976). Replaced by Seed plants of southern Africa: families and genera, published as *Strelitzia* 10 (2000).**

**Botanical exploration of southern Africa (1981)**

#### CRYPTOGAM VOLUMES

**Charophyta (as Vol. 9 in 1978)**

Bryophyta: Part 1: Musci: **Fascicle 1: Sphagnaceae, Andreaeaceae, Fissidentaceae, Nanobryaceae, Archidiaceae, Ditrichaceae, Seligeriaceae, Dicranaceae, Calymperaceae, Encalyptaceae, Pottiaceae, Bryobartramiaceae, Grimmiaceae (1981)**

**Fascicle 2: Gigaspermaceae, Ephemeraceae, Funariaceae, Splachnaceae, Bryaceae, Mniaceae, Eustichiaceae, Rhizogoniaceae, Aulacomniaceae, Bartramiaceae (1987)**

**Fascicle 3: Erpodiaceae, Rhachitheciaceae, Ptychomitriaceae, Orthotrichaceae, Rhabdowiaceae, Racopilaceae, Fontinalaceae, Wardiaceae, Hedwigiaceae, Cryphaeaceae, Leucodontaceae, Prionodontaceae, Trachypodaceae, Pterobryaceae, Meteoriaceae, Leptodontaceae, Neckeraceae, Thamnobryaceae, Hookeriaceae (1998)**

**Fascicle 4: Fabroniaceae, Leskeaceae, Thuidiaceae, Rigodiaceae, Amblystegiaceae, Brachytheciaceae, Entodontaceae, Plagiotheciaceae, Catagoniaceae, Sematophyllaceae, Hypnaceae, Hylacomiaceae, Polytrichaceae**

Hepatophyta: Part 1: Marchantiopsida: **Fascicle 1: Targioniaceae, Lunulariaceae, Aytoniaceae, Cleveaceae, Exormothecaceae, Marchantiaceae, Oxymitracae, Ricciaceae (1999)**

Anthocerotophyta

**Pteridophyta (1986)**

#### FLOWERING PLANTS VOLUMES

**Vol. 1: Stangeriaceae, Zamiaceae, Podocarpaceae, Pinaceae\*, Cupressaceae, Welwitschiaceae, Typhaceae, Zosteraceae, Potamogetonaceae, Ruppiaceae, Zannichelliaceae, Najadaceae, Aponogetonaceae, Juncaginaceae, Alismataceae, Hydrocharitaceae (1966)**

Vol. 2: Poaceae

Vol. 3: Cyperaceae, Areaceae, Araceae, Lemnaceae, Flagellariaceae

Vol. 4: Part 1: Restionaceae

**Part 2: Xyridaceae, Eriocaulaceae, Commelinaceae, Pontederiaceae, Juncaceae (1985)**

Vol. 5: Part 1: Fascicle 1: **Aloaceae (First part): *Aloe* (2000)**

Colchicaceae, Eriospermaceae, Asphodelaceae (*Chortolirion*, 1995 in *Bothalia* 25: 31–33; *Poellnitzia*, 1995 in *Bothalia* 25: 35, 36)

Part 2: **Alliaceae, Liliaceae\*, Hyacinthaceae, Agavaceae (1996 in *Bothalia* 26: 31–35)**

**Part 3: Dracaenaceae, Asparagaceae, Luzuriagaceae, Smilacaceae (1992)**

- Vol. 6: Haemodoraceae, Amaryllidaceae, Hypoxidaceae, Tecophilaeaceae, Velloziaceae, Dioscoreaceae
- Vol. 7: Iridaceae: Part 1: Nivenioideae, Iridoideae  
Part 2: Ixioidae: Fascicle 1: **Ixiaceae (First part): Ixiinae, Tritoniinae (1999)**  
Fascicle 2: **Syringodea, Romulea (1983)**
- Vol. 8: Musaceae, Strelitziaceae, **Zingiberaceae (1998 in *Bothalia* 28: 35–39)**, Cannaceae\*, Burmanniaceae, Orchidaceae (*Holothrix*, 1996 in *Bothalia* 26: 125–140)
- Vol. 9: Part: **Urticaceae (2001)**  
**Casuarinaceae\* (2000 in *Bothalia* 30: 143–146)**, **Piperaceae (2000 in *Bothalia* 30: 25–30)**, Salicaceae, Myricaceae, Fagaceae\*, **Ulmaceae (1999 in *Bothalia* 29: 239–247)**, Moraceae, **Cannabaceae\* (1999 in *Bothalia* 29: 249–252)**, Proteaceae
- Vol. 10: Part 1: **Loranthaceae, Visceae (1979)**,  
Santalaceae, Grubbiaceae, Opiliaceae, Olacaceae, Balanophoraceae, Aristolochiaceae, Rafflesiaceae, Hydro-  
raceae, Polygonaceae, Chenopodiaceae, Amaranthaceae, Nyctaginaceae
- Vol. 11: Phytolaccaceae, Aizoaceae, Mesembryanthemaceae
- Vol. 12: Portulacaceae, Basellaceae, Caryophyllaceae, Illecebraceae, Cabombaceae, Nymphaeaceae, **Ceratophyllaceae (1997 in *Bothalia* 27: 125–128)**, Ranunculaceae, Menispermaceae, Annonaceae, Trimeniaceae, Lauraceae, Hernandiaceae, Papaveraceae, Fumariaceae
- Vol. 13: **Brassicaceae, Capparaceae, Resedaceae, Moringaceae, Droseraceae, Roridulaceae, Podostemaceae, Hydrostachyaceae (1970)**
- Vol. 14: **Crassulaceae (1985)**
- Vol. 15: Vahliaceae, Montiniaceae, Escalloniaceae, Pittosporaceae, Cunoniaceae, Myrothamnaceae, Bruniaceae, Hamamelidaceae, Rosaceae, Connaraceae
- Vol. 16: Fabaceae: **Part 1: Mimosoideae (1975)**  
**Part 2: Caesalpinioideae (1977)**  
Part 3: Papilionoideae: Fascicle 1: Swartzieae–Robinieae  
Fascicle 2: Indigofereae  
Fascicle 3: Desmodieae, Phaseoleae  
Fascicle 4: Psoraleae–Galegae  
Fascicle 5: Loteae–Lipariaceae  
**Fascicle 6: Crotalarieae (*Aspalathus*) (1988)**  
Fascicle 7: Crotalarieae (*Bolusia–Lebeckia*)  
Fascicle 8: Crotalarieae (*Lotononis–Wiborgia*)  
Fascicle 9: Crotalarieae (*Pearsonia–Argyrolobium*), Genisteae (*Cytisus–Ulex*)
- Vol. 17: Geraniaceae, Oxalidaceae
- Vol. 18: Part 1: Linaceae, Erythroxylaceae, Zygophyllaceae, Balanitaceae  
Part 2: Rutaceae  
**Part 3: Simaroubaceae, Burseraceae, Ptaeroxylaceae, Meliaceae (Aitoniaceae), Malpighiaceae (1986)**
- Vol. 19: Part 1: Polygalaceae, Dichapetalaceae  
Part 2: Euphorbiaceae, Callitrichaceae, **Buxaceae (1996 in *Bothalia* 26: 37–40)**  
Part 3: Anacardiaceae: **Fascicle 1: *Rhus* (1993)**  
Fascicle 2: remaining genera  
**Aquifoliaceae (1994 in *Bothalia* 24: 163–166)**
- Vol. 20: Celastraceae, Icacinaceae, Sapindaceae, Melianthaceae, Greyiaceae, Balsaminaceae, Rhamnaceae, Vitaceae
- Vol. 21: **Part 1: Tiliaceae (1984)**  
Malvaceae, Bombacaceae, Sterculiaceae
- Vol. 22: **Ochnaceae, Clusiaceae, Elatinaceae, Frankeniaceae, Tamaricaceae, Canellaceae, Violaceae, Flacourtiaceae, Turneraceae, Passifloraceae, Achariaceae, Loasaceae, Begoniaceae, Cactaceae (1976)**
- Vol. 23: Geissolomataceae, Penaeaceae, Oliaceae, Thymelaeaceae, Lythraceae, Lecythidaceae
- Vol. 24: Rhizophoraceae, Combretaceae, Myrtaceae, Melastomataceae, **Onagraceae (1997 in *Bothalia* 27: 149–165)**, **Trapaceae (1998 in *Bothalia* 28: 11–14)**, Haloragaceae, Gunneraceae, Araliaceae, Apiaceae, Cornaceae

- Vol. 25: Ericaceae
- Vol. 26: **Myrsinaceae, Primulaceae, Plumbaginaceae, Sapotaceae, Ebenaceae, Oleaceae, Salvadoraceae, Loganiaceae, Gentianaceae, Apocynaceae (1963)**
- Vol. 27: Part 1: Periplocaceae, Asclepiadaceae (*Microloma–Xysmalobium*)  
 Part 2: Asclepiadaceae (*Schizoglossum–Woodia*)  
 Part 3: Asclepiadaceae (*Asclepias–Anisotoma*)  
**Part 4: Asclepiadaceae (*Brachystelma, Ceropegia, Riocreuxia*) (1980)**  
 Asclepiadaceae (remaining genera)
- Vol. 28: Part 1: **Convolvulaceae (2000)**  
 Part 2: Hydrophyllaceae, Boraginaceae  
 Part 3: Stilbaceae, Verbenaceae (*Vitex*, 1996 in *Bothalia* 26: 141–151)  
**Part 4: Lamiaceae (1985)**  
 Part 5: Solanaceae, Retziaceae
- Vol. 29: Scrophulariaceae
- Vol. 30: Part 1: Bignoniaceae, Pedaliaceae, Martyniaceae, Orobanchaceae  
 Part 2: Gesneriaceae, Lentibulariaceae  
**Part 3: Acanthaceae: Fascicle 1: Justiciinae (1995)**  
 Acanthaceae (remaining genera), Myoporaceae
- Vol. 31: Part 1: Fascicle 1: **Plantaginaceae (1998 in *Bothalia* 28: 151–157)**, Rubiaceae (Rubioidae—First part)  
**Fascicle 2: Rubiaceae (Rubioidae—Second part): Paederieae, Anthospermeae, Rubieae (1986)**  
 Fascicle 3: Ixoroideae, Chinchoideae  
 Part 2: Valerianaceae, Dipsacaceae, Cucurbitaceae
- Vol. 32: Campanulaceae, **Sphenocleaceae (2000 in *Bothalia* 30: 31–33)**, Lobeliaceae, Goodeniaceae
- Vol. 33: Asteraceae: Part 1: Lactuceae, Mutisiceae, ‘Tarchonanthae’  
 Part 2: Vernonieae, Cardueae  
 Part 3: Arctotideae  
 Part 4: Anthemideae  
 Part 5: Astereae  
 Part 6: Calenduleae  
 Part 7: Inuleae: Fascicle 1: Inulinae  
 Fascicle 2: **Gnaphaliinae (First part) (1983)**  
 Part 8: Heliantheae, Eupatorieae  
 Part 9: Senecioneae

## FSA CONTRIBUTIONS IN *BOTHALIA*

- FSA contributions 1: Aquifoliaceae. S. ANDREWS. 1994. *Bothalia* 24: 163–166.
- FSA contributions 2: Asphodelaceae/Aloaceae, 1029010 *Chortolirion*. G.F. SMITH. 1995. *Bothalia* 25: 31–33.
- FSA contributions 3: Asphodelaceae/Aloaceae, 1028010 *Poellnitzia*. G.F. SMITH. 1995. *Bothalia* 25: 35, 36.
- FSA contributions 4: Agavaceae. G.F. SMITH & M. MÖSSMER. 1996. *Bothalia* 26: 31–35.
- FSA contributions 5: Buxaceae. H.F. GLEN. 1996. *Bothalia* 26: 37–40.
- FSA contributions 6: Orchidaceae: *Holothrix*. K.L. IMMELMAN. 1996. *Bothalia* 26: 125–140.
- FSA contributions 7: Verbenaceae: *Vitex*. C.L. BREDENKAMP & D.J. BOTH. 1996. *Bothalia* 26: 141–151.
- FSA contributions 8: Ceratophyllaceae. C.M. WILMOT-DEAR. 1997. *Bothalia* 27: 125–128.
- FSA contributions 9: Onagraceae. P. GOLDBLATT & P.H. RAVEN. 1997. *Bothalia* 27: 149–165.
- FSA contributions 10: Trapaceae. B. VERDCOURT. 1998. *Bothalia* 28: 11–14.
- FSA contributions 11: Zingiberaceae. R.M. SMITH. 1998. *Bothalia* 28: 35–39.
- FSA contributions 12: Plantaginaceae. H.F. GLEN. 1998. *Bothalia* 28: 151–157.
- FSA contributions 13: Ulmaceae. C.M. WILMOT-DEAR. 1999. *Bothalia* 29: 239–247.
- FSA contributions 14: Cannabaceae. C.M. WILMOT-DEAR. 1999. *Bothalia* 29: 249–252.
- FSA contributions 15: Piperaceae. K.L. IMMELMAN. 2000. *Bothalia* 30: 25–30.
- FSA contributions 16: Sphenocleaceae. W.G. WELMAN. 2000. *Bothalia* 30: 31–33.
- FSA contributions 17: Casuarinaceae. C.M. WILMOT-DEAR. 2000. *Bothalia* 30: 143–146.

**FLORA OF SOUTHERN AFRICA**  
**ALPHABETICAL LIST OF PUBLISHED TAXA**

\* exotic families

- Acanthaceae: Justiciinae, Vol. 30, Part 3, Fasc.1 (1995)  
 Achariaceae, Vol. 22 (1976)  
 Agavaceae (*Bothalia* 26, 1996)  
 Alismataceae, Vol. 1 (1966)  
 Aloaceae (first part): *Aloe*, Vol. 5, Part 1, Fasc. 1 (2000)  
*Aloe*, Aloaceae (first part), Vol. 5, Part 1, Fasc. 1 (2000)  
 Anacardiaceae: *Rhus*, Vol. 19, Part 3, Fasc. 1 (1993)  
 Andreaeaceae, Bryophyta, Part 1, Fasc. 1 (1981)  
 Anthospermeae, Rubiaceae: Rubioideae (second part), Vol. 31, Part 1, Fasc. 2 (1986)  
 Apocynaceae, Vol. 26 (1963)  
 Aponogetonaceae, Vol. 1 (1966)  
 Aquifoliaceae (*Bothalia* 24, 1994)  
 Archidiaceae, Bryophyta, Part 1, Fasc. 1 (1981)  
 Asclepiadaceae: *Brachystelma-Riocrexia*, Vol. 27, Part 4 (1980)  
*Aspalathus*, Fabaceae: Papilionoideae, Vol. 16, Part 3, Fasc. 6 (1988)  
 Asparagaceae, Vol. 5 (1992)  
 Asphodelaceae: *Chortolirion, Poellnitzia* (*Bothalia* 25, 1995)  
 Asteraceae: Inuleae: Gnaphaliinae (first part), Vol. 33, Part 7, Fasc. 2 (1983)  
 Aulacomniaceae, Bryophyta, Part 1, Fasc. 2 (1987)  
 Aytoniaceae, Hepatophyta, Part 1, Fasc. 1 (1999)  
 Bartramiaceae, Bryophyta, Part 1, Fasc. 2 (1987)  
 Begoniaceae, Vol. 22 (1976)  
*Brachystelma*, Asclepiadaceae, Vol. 27, Part 4 (1980)  
 Brassicaceae, Vol. 13 (1970)  
 Bryaceae, Bryophyta, Part 1, Fasc. 2 (1987)  
 Bryobartramiaceae, Bryophyta, Part 1, Fasc. 1 (1981)  
 Bryophyta (three fascicles published 1981, 1987, 1998: see plan of *FS4*)  
 Burseraceae, Vol. 18 (1986)  
 Buxaceae (*Bothalia* 26, 1996)  
 Cactaceae, Vol. 22 (1976)  
 Caesalpinioideae, Fabaceae, Vol. 16, Part 2 (1977)  
 Calymperaceae, Bryophyta, Part 1, Fasc. 1 (1981)  
 Canellaceae, Vol. 22 (1976)  
 Cannabaceae (*Bothalia* 29, 1999)  
 Capparaceae, Vol. 13 (1970)  
 Casuarinaceae (*Bothalia* 30, 2000)  
 Ceratophyllaceae (*Bothalia* 27, 1997)  
*Ceropegia*, Asclepiadaceae, Vol. 27, Part 4 (1980)  
 Charophyta, Cryptogams 'Vol. 9' (1978)  
*Chortolirion*, Asphodelaceae (*Bothalia* 25, 1995)  
 Cleveaceae, Hepatophyta, Part 1, Fasc. 1 (1999)  
 Clusiaceae, Vol. 22 (1976)  
 Commelinaceae, Vol. 4 (1985)  
 Convolvulaceae, Vol. 28, Part 1 (2000)  
 Crassulaceae, Vol. 14 (1985)  
 Crotalariaeae, *Aspalathus*, Fabaceae: Papilionoideae, Vol. 16, Part 3, Fasc.6 (1988)  
 Cryphaeaceae, Bryophyta, Part 1, Fasc. 3 (1998)  
 Cupressaceae, Vol. 1 (1966)  
 Dicranaceae, Bryophyta, Part 1, Fasc. 1 (1981)  
 Ditrichaceae, Bryophyta, Part 1, Fasc. 1 (1981)  
 Dracaenaceae, Vol. 5 (1992)  
 Droseraceae, Vol. 13 (1970)  
 Ebenaceae, Vol. 26 (1963)  
 Elatinaceae, Vol. 22 (1976)  
 Encalyptaceae, Bryophyta, Part 1, Fasc. 1 (1981)  
 Ephemeraceae, Bryophyta, Part 1, Fasc. 2 (1987)  
 Eriocaulaceae, Vol. 4 (1985)  
 Erpodiaceae, Bryophyta, Part 1, Fasc. 3 (1998)  
 Eustichiaceae, Bryophyta, Part 1, Fasc. 2 (1987)  
 Exormothecaceae, Hepatophyta, Part 1, Fasc. 1 (1999)  
 Fabaceae: Caesalpinioideae, Vol. 16, Part 2 (1977)  
 Fabaceae: Mimosoideae, Vol. 16, Part 1 (1975)  
 Fabaceae: Papilionoideae, Crotalariaeae, *Aspalathus*, Vol. 16, Part 3, Fasc. 6 (1988)  
 Fissidentaceae, Bryophyta, Part 1, Fasc. 1 (1981)  
 Flacourtiaceae, Vol. 22 (1976)  
 Fontinalaceae, Bryophyta, Part 1, Fasc. 3 (1998)  
 Frankeniaceae, Vol. 22 (1976)  
 Funariaceae, Bryophyta, Part 1, Fasc. 2 (1987)  
 Gentianaceae, Vol. 26 (1963)  
 Gigaspermaceae, Bryophyta, Part 1, Fasc. 2 (1987)  
 Gnaphaliinae (first part), Asteraceae: Inuleae, Vol. 33, Part 7, Fasc. 2 (1983)  
 Grimmiaceae, Bryophyta, Part 1, Fasc. 1 (1981)  
 Hedwigiaceae, Bryophyta, Part 1, Fasc. 3 (1998)  
 Hepatophyta, Part 1, Fasc. 1 (1999)  
*Holothrix*, Orchidaceae (*Bothalia* 26, 1996)  
 Hookeriaceae, Bryophyta, Part 1, Fasc. 3 (1998)  
 Hydrocharitaceae, Vol. 1 (1966)  
 Hydrostachyaceae, Vol. 13 (1970)  
 Inuleae, Asteraceae: Gnaphaliinae (first part), Vol. 33, Part 7, Fasc. 2 (1983)  
 Iridaceae: Ixieae (first part): Ixiinae, Tritoniinae, Vol. 7, Part 2, Fasc. 1 (1999)  
 Iridaceae: *Syringodea, Romulea*, Vol. 7, Part 2, Fasc. 2 (1983)  
 Ixieae (first part), Iridaceae: Ixiinae, Trinoniinae, Vol. 7, Part 2, Fasc. 1 (1999)  
 Ixiinae, Iridaceae: Ixieae (first part), Vol. 7, Part 2, Fasc. 1 (1999)



- Juncaceae, Vol. 4 (1985)  
 Juncaginaceae, Vol. 1 (1966)  
 Justiciinae, Acanthaceae, Vol. 30, Part 3, Fasc. 1 (1995)  
 Lamiaceae, Vol. 28 (1985)  
 Leptodontaceae, Bryophyta, Part 1, Fasc. 3 (1998)  
 Leucodontaceae, Bryophyta, Part 1, Fasc. 3 (1998)  
 Loasaceae, Vol. 22 (1976)  
 Loganiaceae, Vol. 26 (1963)  
 Loranthaceae, Vol. 10 (1979)  
 Lunulariaceae, Hepatophyta, Part 1, Fasc. 1 (1999)  
 Luzuriagaceae, Vol. 5 (1992)  
 Malpighiaceae, Vol. 18 (1986)  
 Marchantiaceae, Hepatophyta, Part 1, Fasc. 1 (1999)  
 Marchantiales, Hepatophyta, Part 1, Fasc. 1 (1999)  
 Marchantiidae, Hepatophyta, Part 1, Fasc. 1 (1999)  
 Marchantiopsida, Hepatophyta, Part 1 (1999)  
 Meliaceae, Vol. 18 (1986)  
 Meteoraceae, Bryophyta, Part 1, Fasc. 3 (1998)  
 Mimosoideae, Fabaceae, Vol. 16, Part 1 (1975)  
 Mniaceae, Bryophyta, Part 1, Fasc. 2 (1987)  
 Moringaceae, Vol. 13 (1970)  
 Myrsinaceae, Vol. 26 (1963)  
 Nanobryaceae, Bryophyta, Part 1, Fasc. 1 (1981)  
 Najadaceae, Vol. 1 (1966)  
 Neckeraceae, Bryophyta, Part 1, Fasc. 3 (1998)  
 Ochnaceae, Vol. 22 (1976)  
 Oleaceae, Vol. 26 (1963)  
 Onagraceae (*Bothalia* 27, 1997)  
 Orchidaceae: *Holothrix* (*Bothalia* 26, 1996)  
 Orthotrichaceae, Bryophyta, Part 1, Fasc. 3 (1998)  
 Oxymitraceae, Hepatophyta, Part 1, Fasc. 1 (1999)  
 Paederieae, Rubiaceae: Rubioideae (second part), Vol. 31, Part 1, Fasc. 2 (1986)  
 Passifloraceae, Vol. 22 (1976)  
 Pinaceae\*, Vol. 1 (1966)  
 Piperaceae (*Bothalia* 30, 2000)  
 Plantaginaceae (*Bothalia* 28, 1998)  
 Plumbaginaceae, Vol. 26 (1963)  
 Podocarpaceae, Vol. 1 (1966)  
 Podostemaceae, Vol. 13 (1970)  
*Poellnitzia*, Asphodelaceae (*Bothalia* 25, 1995)  
 Pontederiaceae, Vol. 4 (1985)  
 Potamogetonaceae, Vol. 1 (1966)  
 Pottiaceae, Bryophyta, Part 1, Fasc. 1 (1981)  
 Primulaceae, Vol. 26 (1963)  
 Prionodontaceae, Bryophyta, Part 1, Fasc. 3 (1998)  
 Pteroxylaceae, Vol. 18 (1986)  
 Pteridophyta (1986) (for list of families, see p. v of Pteridophyta volume)  
 Pterobryaceae, Bryophyta, Part 1, Fasc. 3 (1998)  
 Ptychomitriaceae, Bryophyta, Part 1, Fasc. 3 (1998)  
 Racopilaceae, Bryophyta, Part 1, Fasc. 3 (1998)  
 Resedaceae, Vol. 13 (1970)  
 Rhabdoweisiaceae, Bryophyta, Part 1, Fasc. 3 (1998)  
 Rhachitheciaceae, Bryophyta, Part 1, Fasc. 3 (1998)  
 Rhizogoniaceae, Bryophyta, Part 1, Fasc. 2 (1987)  
*Rhus*, Anacardiaceae, Vol. 19, Part 3, Fasc. 1 (1993)  
 Ricciaceae, Hepatophyta, Part 1, Fasc. 1 (1999)  
*Riocrexia*, Asclepiadaceae, Vol. 27, Part 4 (1980)  
*Romulea*, Iridaceae, Vol. 7, Part 2, Fasc. 2 (1983)  
 Roridulaceae, Vol. 13 (1970)  
 Rubiaceae: Rubioideae (second part): Paederieae, Anthonospermeae, Rubieae, Vol. 31, Part 1, Fasc. 2 (1986)  
 Rubieae, Rubiaceae: Rubioideae (second part), Vol. 31, Part 1, Fasc. 2 (1986)  
 Rubioideae (second part), Rubiaceae, Vol. 31, Part 1, Fasc. 2 (1986)  
 Ruppiaceae, Vol. 1 (1966)  
 Salvadoraceae, Vol. 26 (1963)  
 Sapotaceae, Vol. 26 (1963)  
 Seligeriaceae, Bryophyta, Part 1, Fasc. 1 (1981)  
 Simaroubaceae, Vol. 18 (1986)  
 Smilacaceae, Vol. 5 (1992)  
 Sphagnaceae, Bryophyta, Part 1, Fasc. 1 (1981)  
 Sphenocleaceae (*Bothalia* 30, 2000)  
 Splachnaceae, Bryophyta, Part 1, Fasc. 2 (1987)  
 Stangeriaceae, Vol. 1 (1966)  
*Syringodea*, Iridaceae, Vol. 7, Part 2, Fasc. 2 (1983)  
 Tamaricaceae, Vol. 22 (1976)  
 Targioniaceae, Hepatophyta, Part 1, Fasc. 1 (1999)  
 Thamnobryaceae, Bryophyta, Part 1, Fasc. 3 (1998)  
 Tiliaceae, Vol. 21 (1984)  
 Trachypodaceae, Bryophyta, Part 1, Fasc. 3 (1998)  
 Trapaceae (*Bothalia* 28, 1998)  
 Tritoniinae, Iridaceae: Ixieae (first part), Vol. 7, Part 2, Fasc. 1 (1999)  
 Turneraceae, Vol. 22 (1976)  
 Typhaceae, Vol. 1 (1966)  
 Ulmaceae (*Bothalia* 29, 1999)  
 Urticaceae, Vol. 9, Part: Urticaceae (2001)  
 Verbenaceae: *Vitex* (*Bothalia* 26, 1996)  
 Violaceae, Vol. 22 (1976)  
 Viscaceae, Vol. 10 (1979)  
*Vitex*, Verbenaceae (*Bothalia* 26, 1996)  
 Wardiaceae, Bryophyta, Part 1, Fasc. 3 (1998)  
 Welwitschiaceae, Vol. 1 (1966)  
 Xyridaceae, Vol. 4 (1985)  
 Zamiaceae, Vol. 1 (1966)  
 Zannichelliaceae, Vol. 1 (1966)  
 Zosteraceae, Vol. 1 (1966)





