

The genus *Lessertia* DC. (Fabaceae—Galegeae) in KwaZulu-Natal (South Africa)

M.-J. Balkwill* and K. Balkwill¹

*Department of Botany, University of Natal, Private Bag X01, Scottsville, 3209 Republic of South Africa

¹C.E. Moss Herbarium, Department of Animal, Plant and Environmental Sciences, University of the Witwatersrand, Private Bag 3, Wits, 2050 Republic of South Africa

Received 12 February 1999; revised 10 August 1999

An account of 10 taxa of *Lessertia* DC. that occur in KwaZulu-Natal, is presented. Three of the taxa, *L. ingeliensis* M. Balkwill, *L. contracta* M. Balkwill and *L. macroflora* M. Balkwill are described here for the first time. *L. brachystachya* DC. *sens. str.*, which occurs only in the Eastern Cape but has previously been reported to occur in KwaZulu-Natal, is also included. The most useful taxonomic characters include growth form (prostrate or erect and shrubby), the form of the inflorescence (capitate or elongate) and the length of the peduncle, the shape and dimensions of the petals, the shape of the mature pods and the shape and dimensions of the calyx lobes.

Keywords: Conservation, Fabaceae, KwaZulu-Natal, *Lessertia*, taxonomy.

*To whom correspondence should be addressed, (E-mail: Mandy@gecko.biol.wits.ac.za). Current address: C.E. Moss Herbarium, Department of Animal, Plant and Environmental Sciences, University of the Witwatersrand, Private Bag 3, Wits, 2050 Republic of South Africa.

Introduction

Lessertia DC. (Fabaceae—Galegeae, *sensu* Polhill, 1981) comprises approximately 50 species, about 35 of which are restricted to southern Africa (concentrated in the Western and Eastern Cape) with the remainder extending into Tropical East Africa. This genus is superficially similar to *Sutherlandia* R. Br., but is easily distinguished from it on the basis of differences in the corollas, the presence or absence of a long stipe and the form of the pod. In *Sutherlandia*, the standard (vexillum) is shorter than the keel (carina), the ovary is borne on a stipe up to 10 mm long and the pod is extremely inflated, bladder-like, papery and indehiscent. In *Lessertia*, the standard is as long as or longer than the keel; the ovary is shortly stipitate (stipe 1–2 mm long) and the pod is only slightly inflated, laterally compressed or sub-compressed, dehiscent and scarious. The most recent comprehensive revision of the genus in South Africa was that of Harvey (1862). Since that time, L. Bolus (1915) has worked on a number of Cape species and Ross (1972) listed eight species (of which three were unnamed) from KwaZulu-Natal. We undertook a revision of the species occurring in KwaZulu-Natal. *L. brachystachya* DC. is included, even though this species does not occur in KwaZulu-Natal, because this name has often been misapplied to material from this region. *Lessertia* is to be revised in full by workers at the Rand Afrikaans University, but in the meanwhile, publication of this partial revision should contribute to the knowledge of the taxonomy of the genus and will facilitate the conservation of the new species: *L. ingeliensis* M. Balkwill, *L. contracta* M. Balkwill and *L. macroflora* M. Balkwill.

Methods

Observations of morphology were made with a Wild-Heerbrugg stereo dissecting microscope (magnifications from 6× to 50×) and an Olympus BII-2 compound microscope (magnifications from 100× to 400×, with phase contrast). The method of O'Brien and Von Teichman (1974) was used to clear material for the study of epidermal features. Pollen, seeds and small squares of pericarp were removed from herbarium specimens, sputter-coated with gold-palladium and viewed with an Hitachi S570 scanning electron microscope.

Morphometry

For each species, a number of specimens from each quarter degree square were selected and for each sheet, five measurements were

made for each character. The mean and variance for each character were calculated for each specimen. These data were then used to calculate the mean and variance for each character for each taxon. All measurements were made in millimetres and are summarised in bar graphs (Figures 1–5).

Taxonomy

Lessertia DC., *Astragalogia* 37: 47 (1802); DC.: 271 (1825); Harv.: 216 (1862); Thistleton-Dyer: t. 6 106 (1874); L. Bolus: 90 (1915); Polhill (1981). Type species: *Lessertia perennans* (Jacq.) DC. (= *Colutea perennans* Jacq. type cons.).

Prostrate to decumbent herbs or erect suffrutices up to 1.5 m tall; stems perennial or annual from a perennial woody rootstock. *Leaves* alternate, imparipinnately compound, stipulate, shortly petiolate; leaflets mostly elliptic or oblong-elliptic to obovate, often with rounded or retuse and minutely apiculate apices, variously hairy on one or both surfaces, rarely glabrous, with sessile to sub-sessile glands in axils, margins entire; stipules small (2–7 mm long), narrowly ovate to triangular, usually green, sometimes membranous, variously hairy. *Inflorescence* an axillary raceme, either sub-capitate or elongate and laxly racemose. *Bracts* small (1–4 × 1–2 mm), lanceolate-acuminate, narrowly elliptic, ovate or triangular, variously hairy or glabrous. *Calyx* campanulate, shortly and sub-equally 5-lobed, the upper two lobes shorter than the lower three. *Corolla* papilionate, pink, cerise, mauve, magenta or purple, often darkest at the tip of the keel and with prominent dark venation on the standard; standard longer than or sometimes as long as the wings and keel, recurved; wings and keel clawed. *Stamens* diadelphous, 9 fused, vexillary filament free; anthers uniformly bithecous, parallel oblong-elliptic. *Gynoeceium*: ovary laterally flattened, hairy or glabrous, multi-ovulate, ovules biseriate, attached to marginal placenta; style laterally flattened, usually gently curving upwards, sometimes angled upwards at base or occasionally straight, pubescent around stigma and sometimes adaxially. *Pod* opening along the sutures, inflated or laterally compressed, dry, membranous or scarious, variously hairy. *Seeds* reniform, 2–3 mm in diameter, black or dark brown; funicles filiform.

Harvey (1862) commented that the species of *Lessertia* are difficult to define and that probably too many have been described. In KwaZulu-Natal, some of the species are highly distinctive and can be easily distinguished on the basis of diagnostic characters.

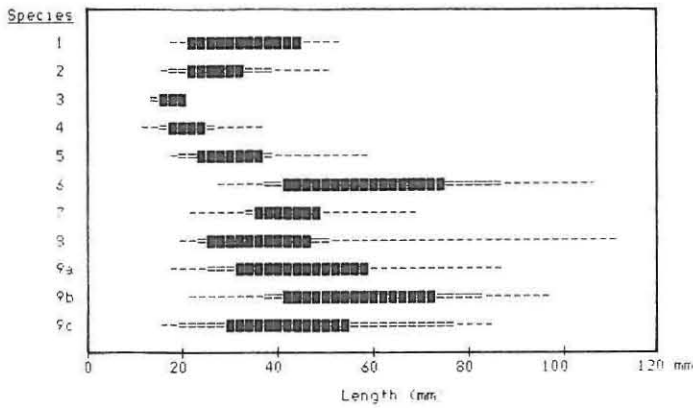


Figure 1 Graphic presentation of variation in leaf length. 1. *L. dykei*; 2. *L. thodei*; 3. *L. ingeliensis*; 4. *L. harveyana*; 5. *L. stricta*; 6. *L. brachystachya*; 7. *L. contracta*; 8. *L. macroflora*; 9a. *L. perennans* var. *perennans*; 9b. *L. perennans* var. *sericea* and 9c. *L. perennans* var. *polystachya* Key: --- range of measurements, === range of means for specimens and ■■■■ 95 % confidence interval for species.

In other cases, although species may appear quite distinctive, it is difficult to tie the apparent differences to discontinuous variation in specific characters. In almost every case, a suite of characters is used to distinguish between the species and usually the same characters cannot be used successfully in all species. For example, differences in the calyx lobes are extremely useful for distinguishing between *L. harveyana* L. Bolus and *L. stricta* Bolus, but they are of little significance in *L. thodei* L. Bolus and *L. dykei* L. Bolus. Differences in single characters can sometimes be used to distinguish between very closely related species pairs such as *L. stricta* and *L. harveyana*, and *L. thodei* and *L. ingeliensis*.

Taxonomically useful characters

We have found the most useful characters to be growth form (prostrate herbs or erect shrublets), the form of the inflorescence (capitate or elongate), shape and pubescence of the mature pods, dimensions of the calyx lobes and shape and dimensions of the petals. The length of the peduncles and characters of the leaves (especially overall leaf length and number of leaflets) are also

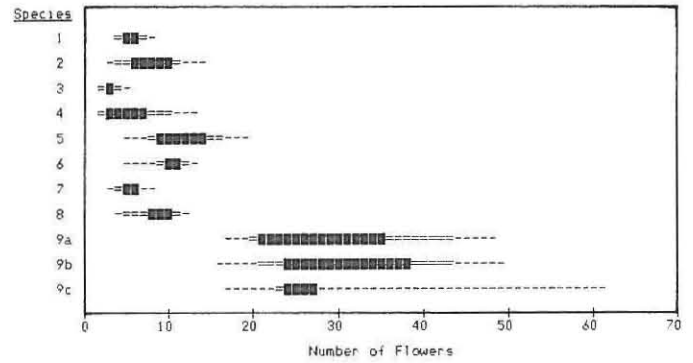


Figure 3 Graphic presentation of variation in number of flowers per inflorescence. 1. *L. dykei*; 2. *L. thodei*; 3. *L. ingeliensis*; 4. *L. harveyana*; 5. *L. stricta*; 6. *L. brachystachya*; 7. *L. contracta*; 8. *L. macroflora*; 9a. *L. perennans* var. *perennans*; 9b. *L. perennans* var. *sericea* and 9c. *L. perennans* var. *polystachya* Key: --- range of measurements, === range of means for specimens and ■■■■ 95 % confidence interval for species.

useful, although in his account of a larger number of species, Harvey (1862) found these characters to be rather variable.

Growth form

The KwaZulu-Natal species can be conveniently divided into two groups on the basis of growth form. One group, including *L. dykei*, *L. thodei* and *L. ingeliensis* comprises prostrate or decumbent herbs (seldom taller than 0.1 m), which are much-branched from a perennial woody rootstock. These species tend to be restricted to altitudes above 1 500 m, where they are often found growing singly rather than in large populations. The other group comprises perennial, erect, sometimes diffuse suffrutices with ligneous stems.

Indumentum

Hairs may be found on almost all parts of the plants except the petals and stamens. Plants range from being almost entirely glabrous (e.g. *L. ingeliensis*) to very densely sericeous and silvery in appearance (e.g. *L. perennans* var. *polystachya*). Most trichomes in *Lessertia* are eglandular and there are no hair types that are species-specific. Figure 6 shows some of the common

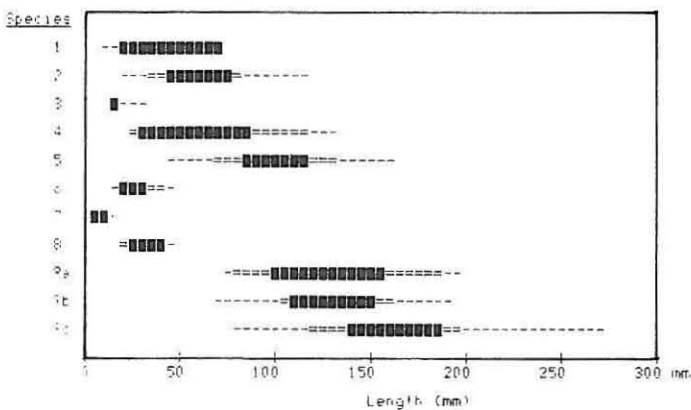


Figure 2 Graphic presentation of variation in peduncle length. 1. *L. dykei*; 2. *L. thodei*; 3. *L. ingeliensis*; 4. *L. harveyana*; 5. *L. stricta*; 6. *L. brachystachya*; 7. *L. contracta*; 8. *L. macroflora*; 9a. *L. perennans* var. *perennans*; 9b. *L. perennans* var. *sericea* and 9c. *L. perennans* var. *polystachya* Key: --- range of measurements, === range of means for specimens and ■■■■ 95 % confidence interval for species.

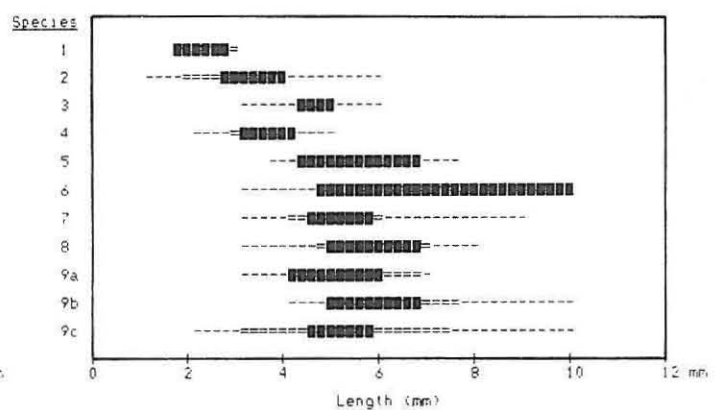


Figure 4 Graphic presentation of variation in pedicel length. 1. *L. dykei*; 2. *L. thodei*; 3. *L. ingeliensis*; 4. *L. harveyana*; 5. *L. stricta*; 6. *L. brachystachya*; 7. *L. contracta*; 8. *L. macroflora*; 9a. *L. perennans* var. *perennans*; 9b. *L. perennans* var. *sericea* and 9c. *L. perennans* var. *polystachya* Key: --- range of measurements, === range of means for specimens and ■■■■ 95 % confidence interval for species.

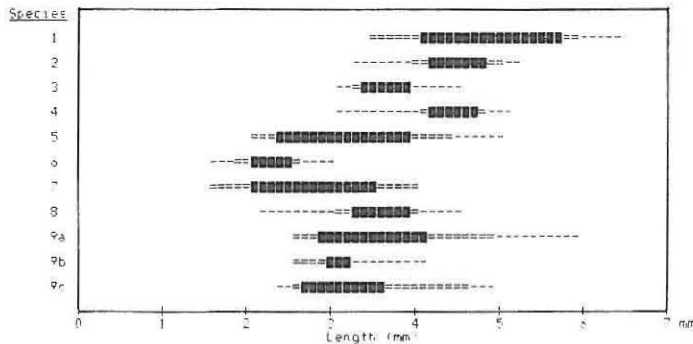


Figure 5 Graphic presentation of variation in calyx length. 1. *L. dykei*; 2. *L. thodei*; 3. *L. ingeliensis*; 4. *L. harveyana*; 5. *L. stricta*; 6. *L. brachystachya*; 7. *L. contracta*; 8. *L. macroflora*; 9a. *L. perennans* var. *perennans*; 9b. *L. perennans* var. *sericea* and 9c. *L. perennans* var. *polystachya*. Key: --- range of measurements, — range of means for specimens and ■■■ 95 % confidence interval for species.

types of hairs found in the KwaZulu-Natal species. Small, sessile or sub-sessile glands occur in the axils of the leaflets; they are not equally developed in all species and are most pronounced in *L. brachystachya* and *L. contracta*.

Attempts have been made by previous authors (Harvey 1862; Bolus 1915; Burt Davy 1932) to use the nature of the overall pubescence (e.g. strigose or silky) to distinguish between species and particularly within the *L. perennans* complex, but in general, this character is too variable to be of diagnostic value.

Leaves and leaflets

The petiole may be very much shorter than the leaflets in some species (*L. ingeliensis*) and as long as or longer than the leaflets in others (e.g. *L. perennans* and *L. brachystachya*). Characters of the leaf are diagnostic in most species, but not in *L. perennans*, in which there is much variation. The length of the mature leaves is a useful character for distinguishing between pairs of closely related species (Figure 1), especially when combined with the number of leaflets. The shape of the leaflets, and particularly the apices, is variable within individual plants, but like leaf length, can be reliable if the shape of the leaflets on mature leaves is used.

Inflorescence

The inflorescence is either a sub-capitate raceme (as in the prostrate herbaceous species *L. thodei*, *L. dykei* and *L. ingeliensis*) or an elongate, lax raceme (all other taxa, except *L. contracta* and *L. macroflora*). Although the length of the peduncle is slightly variable within each species, a clear subdivision of the species into two groups can be made on the basis of this character (Figure 2).

Bracts

In most of the species, the bracts are of similar shape and size, and cannot be used to distinguish between the taxa.

Pedicels

The pedicels range in length from 2 mm (*L. dykei*) to 9 mm (*L. brachystachya* and *L. perennans*) (Figure 4). In all the species, the pedicels elongate considerably as the flowers mature, so all measurements that appear in the text are for pedicels that support mature flowers. Variation in the length of the pedicels does have some taxonomic significance, but the length of the pedicels relative to the calyx is more useful.

Calyx

The length and shape of the calyx lobes and the length of the lobes relative to the tube are diagnostic. All comparisons of length are based on the longer lower lobes. In most KwaZulu-Natal species, the calyx lobes are shorter than or as long as the calyx tube. The lobes of the calyx may be deltoid, broadly triangular and acute, lanceolate-acuminate or narrowly triangular (Figure 7).

The calyx is always pubescent on the inner surfaces of the lobes, but often on the outer surfaces too. The hairs on the calyx are usually very wiry and darkly pigmented and this feature is most pronounced in *L. dykei* and *L. harveyana*. Differences in the degree of hairiness (Figure 7) are often variable, but can still be taxonomically helpful, especially when used in conjunction with differences in other features.

Corolla

The shape and size of the petals (standards, Figure 8; wings, Figure 9; keels, Figure 10) are species-specific. Differences in the absolute length of the petals are not important, but rather the length of the petals relative to each other. For example, the wings in *L. stricta* are conspicuously shorter than the keel and in *L. thodei* and *L. ingeliensis*, the standard is much longer and broader than all the other petals (Figure 8).

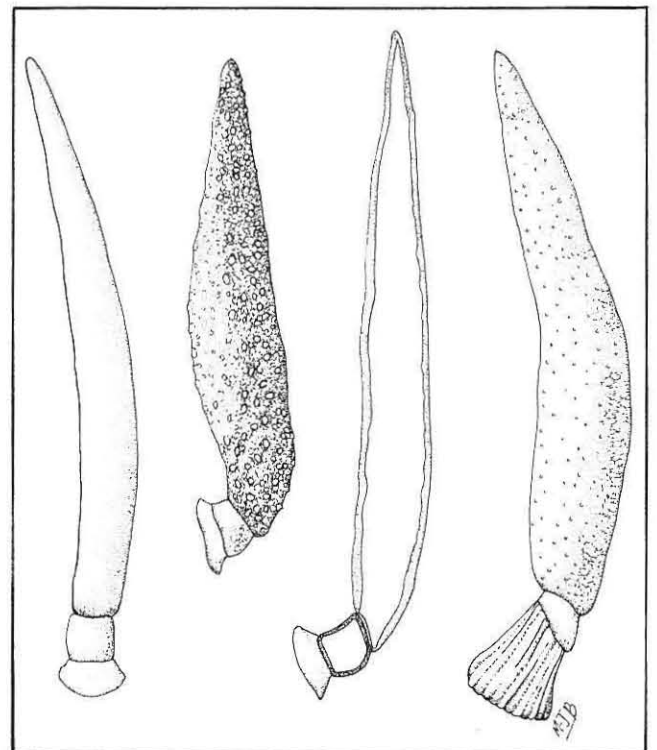


Figure 6 Hairs commonly found in the KwaZulu-Natal species of *Lessertia*: a. non-ornamented, eglandular trichome, often found on the outer surface of the pod in species with hairy pods (*Flanagan* 1 939); b. ornamented trichome found on leaflets and stems in *L. brachystachya*, *L. contracta*, *L. macroflora*, *L. stricta* and *L. harveyana* (*Bowland sub Balkwill & Cadman* 3 025); c. non-ornamented trichome with thickened terminal cell and heavily thickened basal cell, found on vegetative parts and pods of all KwaZulu-Natal species except *L. ingeliensis* (*Stirton* 6 189); d. eglandular trichome with ornamented terminal cell and heavily thickened basal cell, found on pods of *L. brachystachya*, *L. contracta* and *L. macroflora* (*Bowland sub Balkwill & Cadman* 3025).

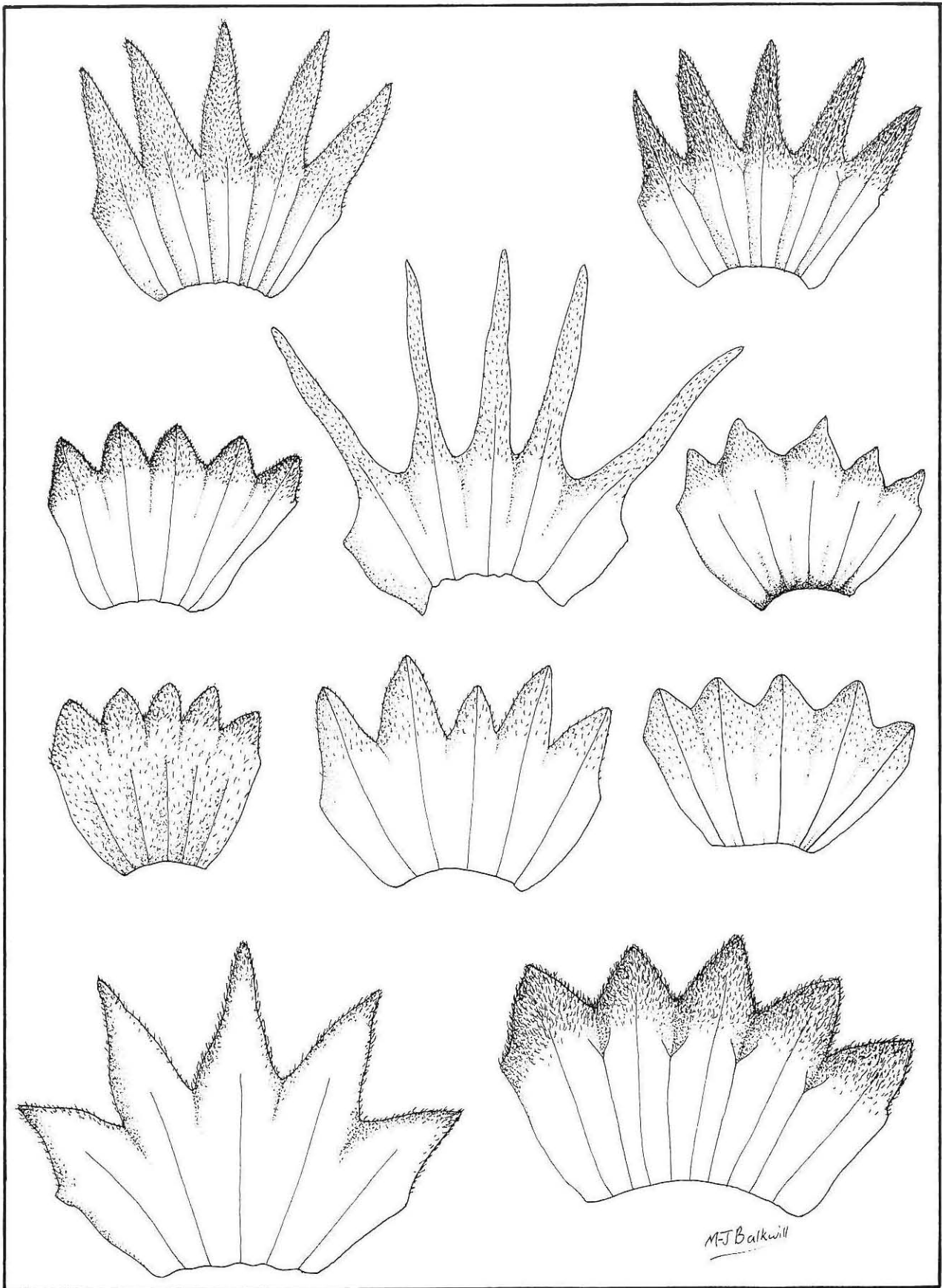


Figure 7 Variation in calyx morphology of the KwaZulu-Natal species of *Lessertia*: a. *L. dykei*, Bayer & McClean 275; b. *L. thodei*, Thode 12; c. *L. ingeliensis*, Hilliard & Burt 5 812; d. *L. harveyana*, Pegler 1 281; e. *L. stricta*, Jacobsz 32; f. *L. brachystachya*, Stirton 6 189A; g. *L. contracta*, Strey 11 346; h. *L. macroflora*, Nel 225; i. *L. perennans* var. *perennans*, Hilliard & Burt 7 820; j. *L. perennans* var. *polystachya* and *L. perennans* var. *sericea*, Hilliard 2 408. The inner surface of the opened calyx is illustrated, at 20× magnification.

Pollen

The pollen in the KwaZulu-Natal species of *Lessertia* is uniformly ellipsoid and tricolpate with fine, reticulate sculpturing on the exine (Figures 11 and 12). The only differences appear to be minor variations in the size and shape of the grains, but these do not appear to be constant. The only consistently different pollen is that of the *L. brachystachya* complex, in which the grains are prolate and slightly larger than in the other species (Figure 12).

Gynoecium

The shape of the ovary undergoes distortion soon after fertilisation of the ovules and it is important that comparisons of the shape of the ovary are made in flowers of similar age. The gynoecium of each species is illustrated in Figure 13.

Pod morphology

Harvey (1862) divided the species of *Lessertia* into two groups on the basis of the morphology of the pod: *Platylobae* (legume inflated or sub-compressed, obliquely obovate, roundish or broadly oblong), in which all species except the *L. brachystachya* complex fall, and *Stenolobae* (legume laterally compressed, linear, straight or falcate), accommodating *L. brachystachya*. The shape of the mature pod is diagnostic for each species (Figure 14).

Seeds

The seeds of the KwaZulu-Natal species of *Lessertia* are fairly uniform, being small (2–3 mm in diameter), reniform and black or very dark brown with smooth surfaces. Under the SEM, the seed surface is tessellate with thin wax strips running across the cell surfaces (Figure 15). Although the ovules are biseriate, it is usually only those in the row on the longer funicles that develop into mature seeds. In *L. harveyana* and *L. stricta*, however, both rows may develop and the largest number of seeds (4–11) is always found in these species.

Status of the genus

In KwaZulu-Natal, *Lessertia* is represented by ten taxa, three of which are described for the first time in this paper. *L. brachystachya*, which is essentially restricted to the Eastern Cape, has been included in the account because two of the newly described taxa from KwaZulu-Natal are clearly closely allied to it and have previously been misidentified as *L. brachystachya*. *L. perennans* is a complex species in which three varieties are recognised. *L. perennans* var. *sericea* L. Bolus is quite distinct and has a fairly restricted distribution, but the distinctions between *L. perennans* var. *polystachya* (Harv.) L. Bolus and *L. perennans* var. *perennans* become blurred in the regions where their wide distributional ranges overlap, suggesting that some hybridisation has recently taken place or is taking place.

Key to the KwaZulu-Natal species

- 1a Inflorescences very much shorter than, as long as or very slightly longer than the leaves 2
- 1b Inflorescences very much longer (two times or more) than the leaves 5
- 2a Prostrate herbs, almost entirely glabrous; stems up to 0.2 m long; leaves 20–30 mm long; leaflets 4–5-jugate, broadly elliptic to obovate, entirely glabrous and thickly-textured 3. *L. ingeliensis*
- 2b Erect, or sometimes decumbent suffrutices, variously hairy but never entirely glabrous; stems 0.2–1 m long; mature leaves up to 60 mm long, never less than 30 mm long, leaflets 3–11-jugate, very narrowly elliptic to oblanceolate or elliptic, strigose on one or both surfaces but not entirely glabrous, thinly-textured 3

- 3a Inflorescences 2.5–11.5 mm long (\bar{x} = 6.7 mm), contracted into the axils of the leaves; plants from the coast in southern Zululand and from southern KwaZulu-Natal. 7. *L. contracta*
- 3b Inflorescences 14–60 mm long, not contracted into the axils; plants from the Eastern Cape or northern Zululand and Swaziland 4
- 4a Leaflets 6.5–13.7 × 1–2.8 mm, 7–11-jugate, very narrowly elliptic to oblanceolate; erect, few-stemmed suffrutices mainly from the Eastern Cape 6. *L. brachystachya*
- 4b Leaflets 12.4–20.4 × 3–7.4 mm, 3–6-jugate, elliptic or oblong-elliptic; bushy suffrutices, much branched near the base; plants from northern KwaZulu-Natal and Swaziland. 8. *L. macroflora*
- 5a Mature pods (or ovaries) always totally glabrous 6
- 5b Mature pods (or ovaries) strigose, strigoso-tomentose to densely sericeous OR with glabrous valves and hairs along the sutures. 8
- 6a Pods obliquely ovate or obliquely elliptic, 19–33 × 7–11 mm, 4–11-seeded 7
- 6b Pods elliptic (oblique at the apex), oblong-elliptic to roundish, 12–19 × 6–9 mm, 2–3-seeded 11
- 7a Calyx 4–5 mm long; lobes lanceolate-acuminate, 3–4 mm long, always conspicuously longer than the tube; wings 6 × 1.5–2 mm, obliquely oblong-elliptic with rounded apex; leaflets 7–11 × 3–7 mm, 4–5-jugate, elliptic to obovate 4. *L. harveyana*
- 7b Calyx 3–4 mm long; lobes shallowly triangular, 2–3 mm long, always shorter than the tube; wings 7 × 2 mm, hastate with sharply angled apex; leaflets 11–17 × 3–5 mm, 4–7-jugate, narrowly elliptic to elliptic 5. *L. stricta*
- 8a Procumbent herbs, much branched from base; stems up to 0.5 m long; inflorescences sub-capitate, 30–80 mm long, 3–11-flowered 9
- 8b Erect or diffuse suffrutices; stems up to 1.5 m long; inflorescences elongate, laxly racemose, 90–270 mm long, 25–50-flowered 10
- 9a Plants conspicuously strigoso-tomentose; pods obliquely ovate, densely pubescent; style bearded around stigma and adaxially down style; standard broadly ovate, apex rounded or retuse 1. *L. dykei*
- 9b Plants glabrescent or very thinly strigose; pods broadly oblong-ovate, strigose; style bearded around stigma only; standard broadly obovate, apex emarginate 2. *L. thodei*
- 10a Pods densely strigose, strigoso-tomentose or sericeous over valves and sutures. 9b. *L. perennans* var. *sericea*
- 10b Pods with hairs along sutures but glabrous (or very thinly strigose) on valves 11
- 11a Calyx lobes narrowly triangular, long-acuminate; plants variously hairy, but not silvery. 9a. *L. perennans* var. *perennans*
- 11b Calyx lobes deltoid, acute; plants very densely tomentose or sericeous and silvery 9c. *L. perennans* var. *polystachya*

1. *Lessertia dykei* L. Bolus, Annals of the Bolus Herbarium 1: 91 (1915). Type: KwaZulu-Natal, slopes of Mont-aux-Sources, Dyke sub Marloth 5 445 (SAM!, lecto., here designated; BOL!).

Diffuse, procumbent to semi-prostrate herbs; stems up to 0.2 m long, branching mostly from the slightly woody bases; stems, branches (especially younger ones), petioles and rachae sericeo-tomentose; hairs stiff, pointed, markedly curved at bases. Leaves 19–48 mm long, 10–15 mm apart; leaflets 4–6 × 2–4 mm, 7–8-jugate, oblong-elliptic to obovate, apex emarginate or obtuse to obovate, base cuneate, upper surface glabrous, lower surface strigose, margins sometimes very slightly involute; petiole 10 mm long; stipules 2.4 × 1.4 mm, ovate-acuminate, pubescent (as stem). Inflorescence 13–57 mm long (\bar{x} = 43 mm), with 5–9 flowers crowded near the

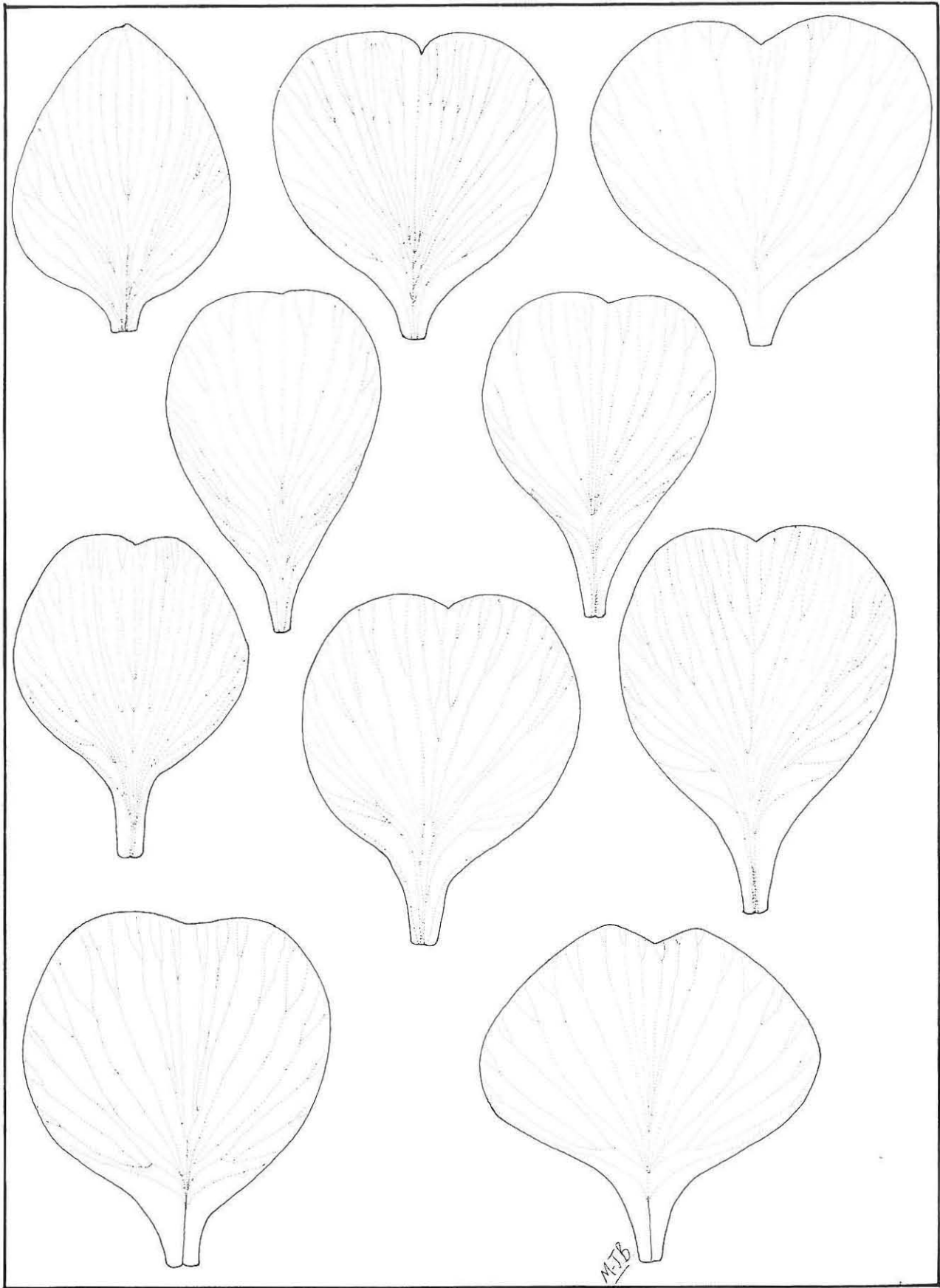


Figure 8 Variation in the shape of the standard of the KwaZulu-Natal species of *Lessertia*: a. *L. dykei*, Flanagan s.n. sub BOL 8 152 ($\times 11$); b. *L. thodei*, Flanagan 1 939 ($\times 10$); c. *L. ingeliensis*, Hilliard & Burt 5 812 ($\times 11$); d. *L. harveyana*, Pegler 1 281 ($\times 11$); e. *L. stricta*, Jacobsz 32 ($\times 11$); f. *L. brachystachya*, Stirton 6 189A ($\times 10$); g. *L. contracta*, Strey 11 346 ($\times 10$); h. *L. macroflora*, Edwards 435 ($\times 10$); i. *L. perennans* var. *perennans*, Hilliard & Burt 7 820 ($\times 12$); j. *L. perennans* var. *polystachya* and *L. perennans* var. *sericea*, Hilliard 2 408 ($\times 12$).

apex of the peduncle; peduncle strigoso-tomentose. *Bracts* 2–3 mm long (\bar{x} = 2.4 mm), narrowly elliptic, acute, fringed with hairs. *Pedicel* 2–3 mm long, much shorter than the calyx, strigose. *Calyx* 4–6 mm long, unequally 5-lobed; tube 2–3 mm long; lobes 2–3 mm long, narrowly triangular, acuminate, strigose to tomentose without, sericeous within. *Corolla* pink; standard 5.5–8.5 × 7 mm, broadly ovate, apex retuse to rounded; wings 6–7.5 × 2 mm, oblong, obtuse; keel 8 × 6 mm, obliquely oblong, obtuse. *Gynoecium*: ovary 5 mm long, stipitate, narrowly elliptic, sericeous (particularly along sutures); ovules many; style 2 mm long, bearded dorsally for one third of its length and around stigmatic surface; stigma asymmetric, semi-clavate. *Pods* 19–21 × 10–11 mm, obliquely ovate, laterally compressed, slightly inflated, pubescent, apiculate. *Seeds* 4–6.

Discussion

Lessertia dykei was named in honour of Daniel John Dyke, a cashier in the Cape Government Railways and an avid mountaineer, photographer and plant collector (Gunn & Codd 1981). Two specimens were cited by L. Bolus in her original description of this species: *Dyke sub Marloth 5 445* and *Flanagan s.n. sub BOL 8 152*. Only the Dyke specimen in SAM includes mature pods and it must have been the basis for the illustration (Plate XI, B) that accompanied the original description (Bolus 1915); it has therefore been chosen as the lectotype.

Lessertia dykei and its allies *L. thodei* and *L. ingeliensis* (described below) differ from the other KwaZulu-Natal species of the genus in a number of features, the most obvious being their herbaceous, prostrate habit. These three species stand apart by virtue of their shorter, less floriferous inflorescences and by their smaller leaflets. *L. dykei* and *L. thodei* have similarly shaped, hairy pods and the shape of the calyx is almost identical. In addition, both grow in rocky grasslands at high altitudes in the KwaZulu-Natal Drakensberg. A number of reliable characters easily distinguish them, however. *L. dykei* is conspicuously strigoso-tomentose particularly on the stems and lower surfaces of the leaflets (not glabrescent or glabrous); the pods are densely pubescent (not strigose); the peduncle, pedicels and calyces are strigoso-tomentose (not glabrescent); the style is bearded adaxially for about one third of its length (as well as being bearded around the stigmatic surface) and the standard is broadly ovate (not broadly obovate) with a retuse to rounded (not cleft) apex. Other differences that are sometimes useful, in combination with those already listed, are that in *L. dykei*, the leaves are generally longer (\bar{x} = 32 mm, not \bar{x} = 26 mm) and the peduncles, shorter (\bar{x} = 44 mm, not \bar{x} = 56 mm); the leaflets are oblong-elliptic to obovate with retuse to obcordate apices (not elliptic with rounded, mucronulate apices). *L. dykei* is known only from the type locality, Mont-aux-Sources, in the KwaZulu-Natal Drakensberg (Figure 16). It grows in rocky grassland at altitudes between 2 460 and 3 230 m and has only been collected in flower twice (December and February) and in pod once (April). This species is both rare and severely under-collected.

Specimens examined

—2828 (Bethlehem): Mont-aux-Sources (–DD), Bayer & McClean 275 (NU); *ibidem*, 2 460 m (–DD), Flanagan s.n. sub BOL 8 152 (BOL).

2. *Lessertia thodei* L. Bolus, *Annals of the Bolus Herbarium* 1: 92 (1915). Type: KwaZulu-Natal, Mont-aux-Sources, rocky grassland near summit, Flanagan 1 939 (BOL!, lecto., here designated; NU!, PRE!).

Perennial, procumbent herb; stems glabrescent, up to 0.2 m long and mainly branching from the slightly woody bases. *Leaves* 16–37 mm long (\bar{x} = 27 mm), 10–20 mm apart; leaflets 5–9 × 2–4 mm, 5–

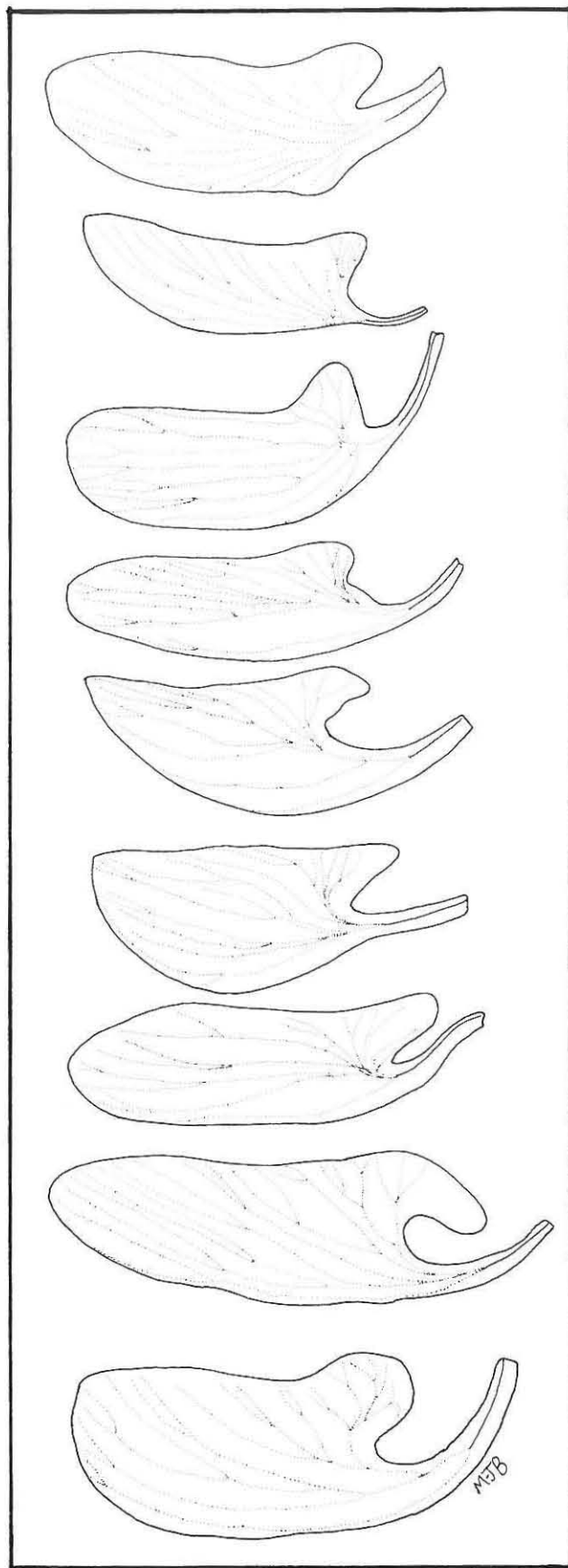


Figure 9 Variation in the shape of the wings of the KwaZulu-Natal species of *Lessertia*: a. *L. dykei*, Flanagan s.n. sub BOL 8 152; b. *L. thodei*, Thode 12; c. *L. ingeliensis*, Hilliard & Burt 5 812; d. *L. harveyana*, Pegler 1 281; e. *L. stricta*, Jacobsz 32; f. *L. brachystachya*, Stirton 6 189A; g. *L. contracta*, Strey 11 346; h. *L. macroflora*, Edwards 435; i. *L. perennans* var. *sericea*, Hilliard 2 408; all ×10.

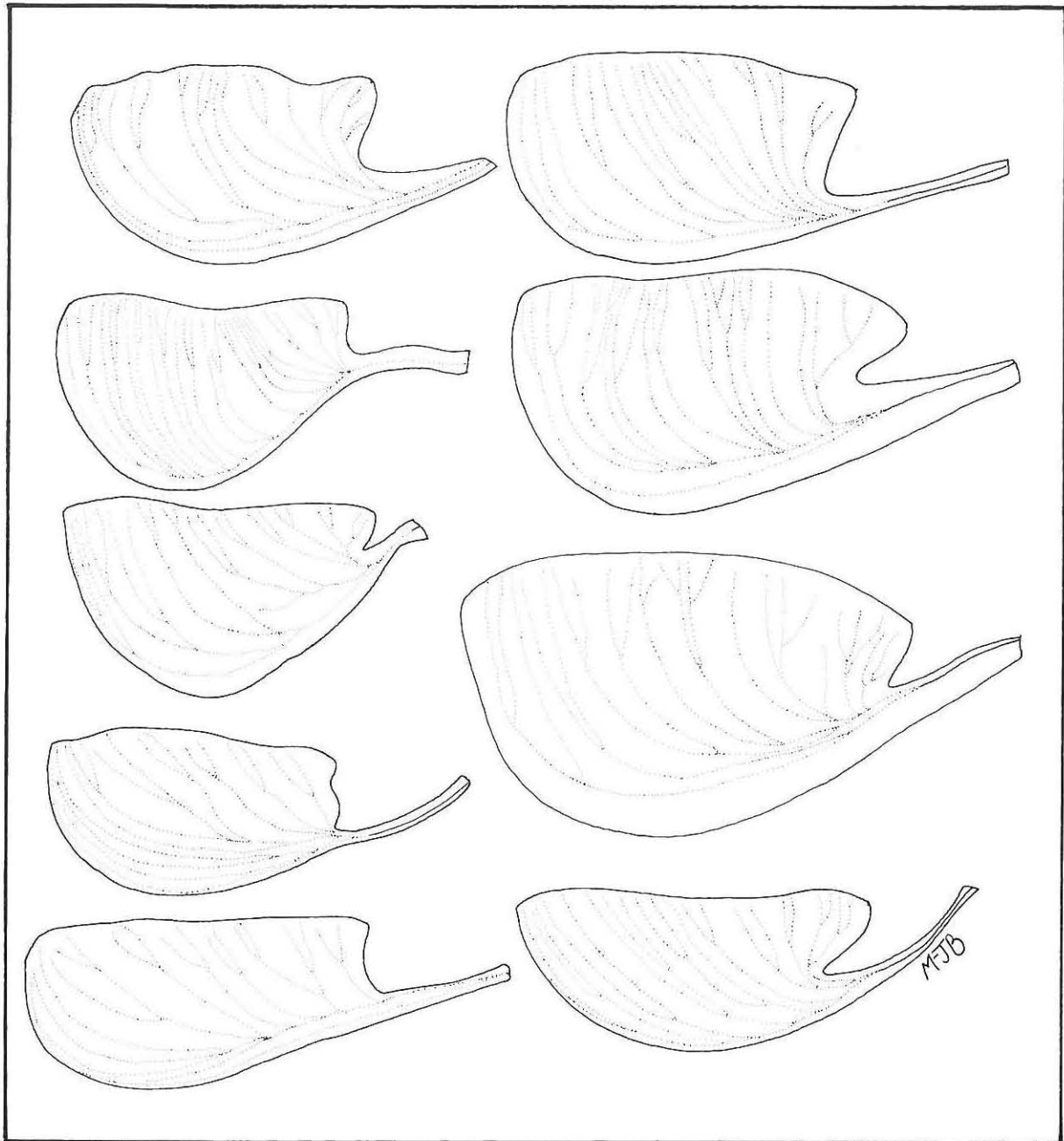


Figure 10 Variation in the shape of the keel of the KwaZulu-Natal species of *Lessertia*: **a.** *L. dykei*, Flanagan s.n. sub BOL 8 152; **b.** *L. thodei*, Thode 12; **c.** *L. ingeliensis*, Hilliard & Burt 5 812; **d.** *L. harveyana*, Pegler 1 281; **e.** *L. stricta*, Jacobsz 32; **f.** *L. brachystachya*, Sturton 6 189A; **g.** *L. contracta*, Strey 11 346 ($\times 11$); **h.** *L. macroflora*, Edwards 435 ($\times 11$); **i.** *L. perennans* var. *sericea*, Hilliard 2 408; all $\times 10$ unless otherwise specified.

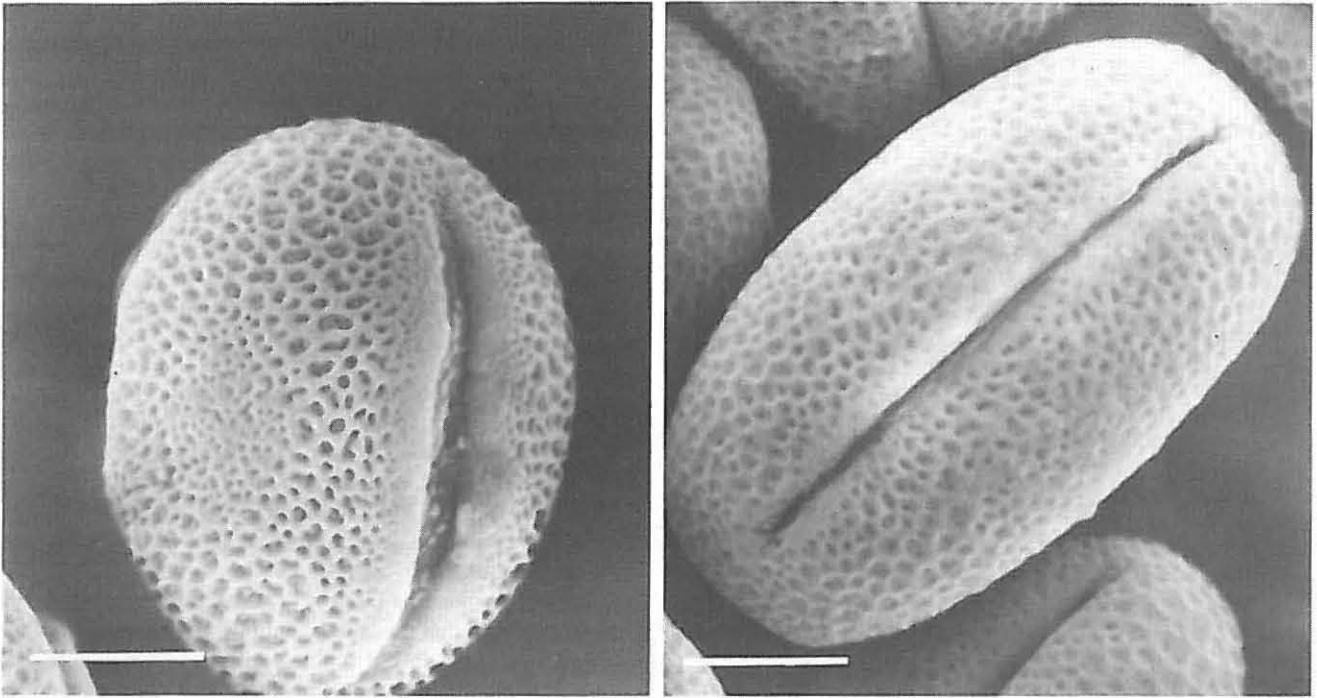
9-jugate ($\bar{x} = 7$), elliptic to very slightly obovate, apex rounded and apiculate, base broadly cuneate, both surfaces glabrescent; petiole 4–7 mm long, upper surface very slightly grooved; stipules 2–3 \times 1–2 mm, ovate, apex acute, glabrescent. *Inflorescence* 31–78 mm long ($\bar{x} = 56$ mm); peduncle very sparsely strigose, with 3–11 flowers ($\bar{x} = 7$) crowded near the apex. *Bracts* 2–4 mm long, usually shorter than the calyx, sparsely strigose. *Calyx* 4–5 mm long, 5-lobed; tube 2–3 mm long; lobes 2–3 mm long, as long as or longer than the tube, triangular, apex acute, strigose without, strigosotomentose within. *Corolla* magenta, paler at base; standard 9–11 \times 8–10 mm, widely to very widely obovate, apex obcordate, base attenuate; wings 7.5 \times 2 mm, narrowly depressed-obovate, apex rounded. *Gynoecium*: ovary 5 mm long, stipitate, narrowly elliptic, flattened along lower suture, sericeous; ovules many; style 3 mm long, bearded only immediately below the stigmatic surface (Figure 13b); stigma asymmetric,

semi-clavate. *Pods* 16–20 \times 8–12 mm, broadly oblong-ovate, semi-membranous, apex apiculate, strigose. *Seeds* 4–5.

Discussion

Lessertia thodei commemorates H.J. Thode (1859–1932) who was the first person to collect plants in the KwaZulu-Natal Drakensberg (Gunn & Codd 1981). In her original description of the species, L. Bolus (1915) cited two specimens, Thode 12 and Flanagan 1 939; the latter is chosen as the lectotype because there are duplicates (housed at BOL, NU and PRE), while the Thode specimen appears to be a unicate.

Lessertia thodei is closely allied to both *L. dykei* (see above) and *L. ingeliensis*. The most reliable features for distinguishing between *L. thodei* and *L. ingeliensis* are: the vestiture on the pod (strigose, never glabrous), the shape of the calyx lobes



Figures 11 and 12 11. Tricolpate, reticulate pollen found in all KwaZulu-Natal species except *L. brachystachya*, *L. contracta* and *L. macroflora*, from Jacobsz 32. Scale bar: 5 μ m. 12. Prolate, tricolpate pollen found in *L. brachystachya*, *L. contracta* and *L. macroflora*, from Bowland sub Balkwill & Cadman 3 024. Scale bar: 5 μ m.

(triangular and fine-pointed, not deltoid and acute), the length of the calyx lobes (2–3 mm and longer than the tube, not 1–2 mm and shorter than the tube), the length of the peduncle (almost always longer than 30 mm in *L. thodei* and shorter than 30 mm in *L. ingeliensis*), the number of flowers (3–11, not 2–4) and the overall vestiture of the plant (very sparsely strigose or glabrescent, not glabrous). They also differ in a number of vegetative characters, but these tend to be somewhat variable and, therefore, less reliable to use on their own; when used in combination with other characters, however, they can be extremely useful for distinguishing between the two species. In *L. thodei*, the leaves are 16–37 mm long (\bar{x} = 27 mm) and the petioles are 4–7 mm long. The leaflets are 5–9-jugate, elliptic to obovate with a few scattered hairs on both surfaces, but particularly the lower. In contrast, *L. ingeliensis* has leaves 15–20 mm long and petioles that are seldom longer than 2.5 mm. The leaflets are 4–5-jugate, broadly elliptic to obovate and always entirely glabrous. Furthermore, the leaflets tend to be further apart and more thickly textured than they are in *L. thodei*.

Lessertia thodei was originally described from Mont-aux-Sources and is endemic to the Drakensberg in KwaZulu-Natal, Lesotho and the north-eastern Free State. It has been collected at altitudes between 2 250 and 2 900 m, where it is found growing in moist, rocky grasslands or on open, stony ridges. In the former situation, the plants are most commonly found at the bases of rocks or rocky outcrops. This species flowers in summer; whilst some fruiting does occur simultaneously with flowering during December and January, most pods are borne between mid-February and March.

Specimens examined

—2828 (Bethlehem): Witzieshoek. Sentinel footpath, 2 520 m and upward (–DB), Hilliard & Burt 8 626 (E, K, MO, NU); Royal Natal National Park (–DB), Oliver 327 (NH); Mont-aux-Sources, grassland near summit (–DD), Thode 12 (BOL); *ibidem* (–DD), Schelpe 1 335 (NU).

—2829 (Harrismith): Platberg, summit grassland above One Man Pass (–AC), Hilliard & Burt 9 497 (E, NU); Cathedral Peak (–CC), Buthelesi 380 (NH).

—2929 (Underberg): Cathedral Peak area, Organ Pipes Pass, 2 770 m (–AA), Edwards 1 183 (NU); Drakensberg, Giant's Castle Game Reserve, Bannerman Pass (–AB), Abbott 3 421 (NH); Estcourt district, Giant's Castle Game Reserve (–AD), Trauseld 366 (NU); Estcourt district, Highmoor Forest Reserve, spur running south-east from Giant's Castle (–BB), Hilliard & Burt 5 674 (NH, NU); *ibidem* (–BB), Hilliard 4 804 (NU); Mpendhle district, Kamberg area, Storm Heights, 2 150 m (–BC), Hilliard & Burt 11 730 (NU); upper tributaries, south of Mkomazi River, 2 610 m (–CB), Hilliard & Burt 15 698 (E, K, NU, PRE); *ibidem*, upper reaches of Ntshishini River (–CB), Hilliard & Burt 15 779 (E, NU); 8–11 km north-west of 'Castle View' farm, Headwaters of Mhlahlangubo River, 2 400 m (–CB), Hilliard & Burt 15 207 (E, K, NU, PRE); Sani Pass, 2 460 m (–CB), Hilliard & Burt s.n. (E, K, MO, NU, PRE); Bergville district, Cathedral Peak (–CC), Granger 324 (NU); Cathedral Peak area, Cleft Path, 2 430 m (–CC), Schelpe 501 (NU); *ibidem*, Umlambonjwa Buttress, 2 800 m (–CC), Schelpe 947 (NU); Bushman's Pass, summit grassland, 2 769 m (–CC), West 1 726 (NH); above Bushman's Neck, Tarn Cave vicinity, 2 520 m (–CC), Hilliard & Burt 17 394 (E, K, NU, PRE).

3. *Lessertia ingeliensis* M. Balkwill sp. nov. arcte affinis *L. thodei*, sed distinguibili ovario glabro (nec strigoso neque sericeo), pedunculo brevioris quam 30 mm (nec 31–78 mm longo), racemo cum 2 (nec 3–11) floribus et partibus vegetativis fere omnino glabris (nec maxime sparsim strigosis neque glabratibus).

TYPUS. —KwaZulu-Natal: Alfred district, Ngeli Mountain, Weza Forest Reserve, moist rocky grassland above waterfall alongside path to Ngeli Peak, 2 000 m, Feb. 1985, Balkwill & Cadman 2 670 (NU, holotypus; E, J, isotypi).

Herb with annual stems from woody perennial rootstock; stems prostrate, up to 0.17 m long, glabrous, branching mostly at base.

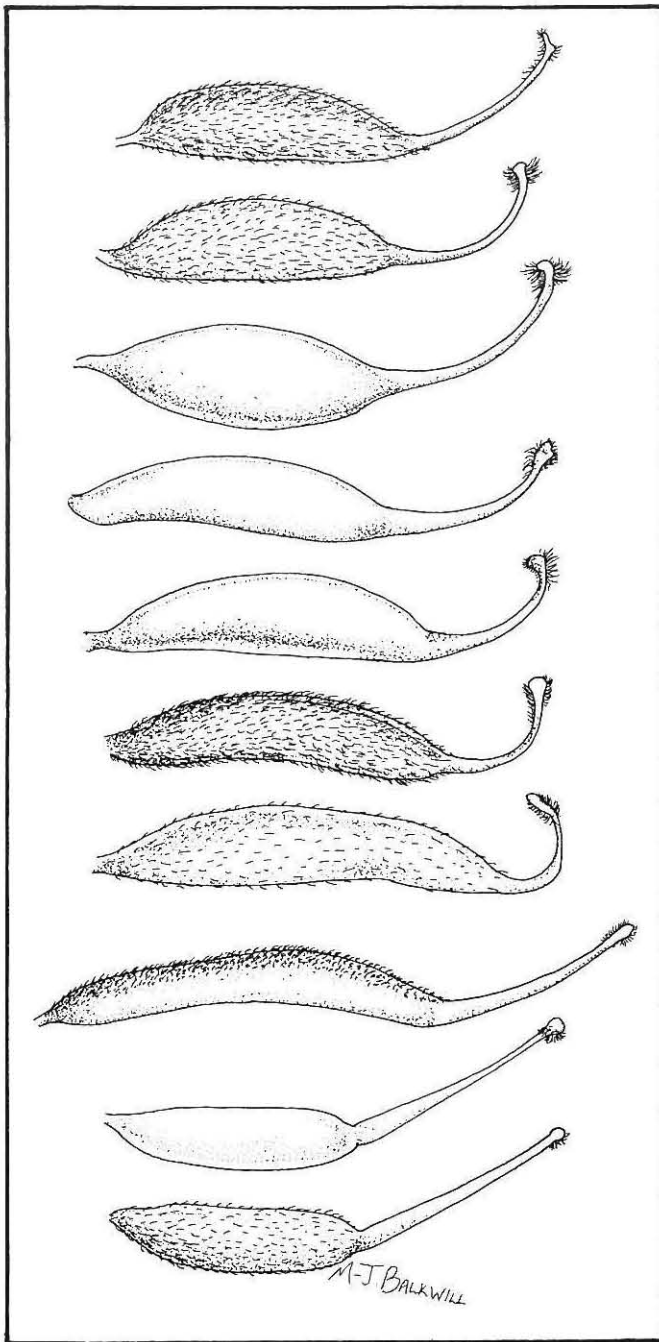


Figure 13 Variation in the gynoecium of KwaZulu-Natal species of *Lessertia*: a. *L. dykei*, Flanagan s.n. sub BOL 8 152; b. *L. thodei*, Thode 12; c. *L. ingeliensis*, Hilliard & Burt 5 812; d. *L. harveyana*, Pegler 1 281; e. *L. stricta*, Jacobsz 32; f. *L. brachystachya*, Stirton 6 189A; g. *L. contracta*, Strey 11 346; h. *L. macroflora*, Edwards 435; i. *L. perennans* var. *perennans*, Hilliard & Burt 7 820; *L. perennans* var. *sericea*, Hilliard 2 408; all $\times 20$.

Leaves 15–20 mm long (\bar{x} = 17 mm), very shortly petiolate, 5–15 mm apart; leaflets 6–7 \times 3–4 mm, 4–5-jugate, broadly elliptic to broadly obovate, apex rounded and shortly apiculate, base broadly cuneate, sometimes asymmetric, both surfaces glabrous, thickly-textured, veins slightly prominent on lower surface; petiole 2.5 mm long; stipules 2 \times 1 mm, triangular to narrowly ovate, acute, glabrous, recurved. Inflorescence 13–25 mm long (\bar{x} = 20 mm), peduncle glabrous, with 2–4 flowers near apex. Bracts 1.5 mm long, ovate, acute, glabrescent, semi-membranous. Pedicel 4–5 mm long, usually longer than the calyx, very sparsely strigose or glabrescent. Calyx 3.5–4.5 mm long; tube 2–3 mm long, usually longer than the calyx, very sparsely strigose or glabrescent; lobes 1–2 mm long, always

shorter than tube, deltoid, acute, very sparsely strigose or glabrescent without, strigoso-tomentose within. Corolla cerise to magenta-pink; standard 8 \times 8 mm, very widely obovate to widely depressed-obovate, apex obcordate, base attenuate, cerise with a white patch at the base; wings 6–7 \times 2 mm, oblong with a posticous lobe, apex rounded, dark cerise pink; keel 7 \times 6 mm, obliquely depressed-obovate, apex blunt, base very shortly clawed, very deep pink, particularly at apex, fading to almost white at base. Gynoecium: ovary 5 mm long, stipitate, elliptic, glabrous; ovules up to 5; style 3 mm long, with a tuft of hairs on each side of the stigma, abaxial hairs longest; stigma asymmetric, rounded. Pods 18 \times 9 mm, oblong-ovate, tapering to a point, glabrous. Seeds 3–5.

Discussion

Lessertia ingeliensis has been collected only from Ngeli Mountain, near Harding, in southern KwaZulu-Natal. It occurs in moist, rocky grasslands at altitudes above 1 800 m and flowers in summer. This species is known only from three collections. Balkwill & Cadman 2 670 bears pods (unlike the other two collections), as well as a few flowers, and has, therefore, been selected as the type.

Lessertia ingeliensis (Figure 17) differs markedly from all the other species in that it is almost entirely glabrous. The only hairs present are those on the style, the inner surfaces of the calyx lobes and occasionally on the pedicels. The shape of the leaflets of *L. ingeliensis* (very broadly elliptic to obovate) is distinctive. There are seldom sharp contrasts in colour on single petals in the genus, but in *L. ingeliensis* there is a white patch at the base of the cerise standard. The glabrous ovaries further distinguish *L. ingeliensis* from *L. dykei* and *L. thodei*.

The close relationship between *L. ingeliensis* and *L. thodei* has already been discussed in some detail. The flowers of these two species are rather different from those of all the others in that the standard is much broader and longer than the wings and keel.

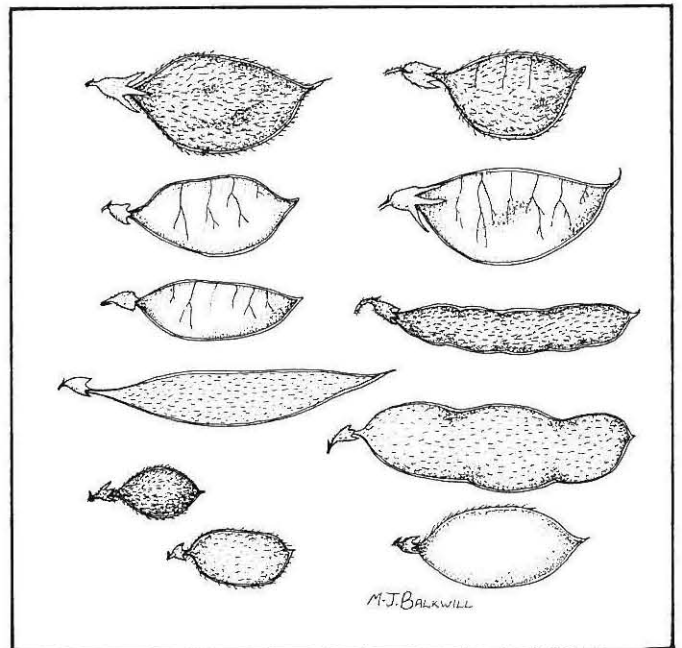


Figure 14 Variation in the morphology and pubescence of the pods of KwaZulu-Natal species of *Lessertia*: a. *L. dykei*, Bayer & McClean 275; b. *L. thodei*, Flanagan 1 939; c. *L. ingeliensis*, Balkwill & Cadman 2 670; d. *L. harveyana*, Pegler 1 281; e. *L. stricta*, Jacobsz 32; f. *L. brachystachya*, Stirton 6 189A; g. *L. macroflora*, Lawn 1 385; *L. macroflora*, Nel 225; i & j. *L. perennans* var. *sericea*, Galpin 1 912; k. *L. perennans* var. *perennans*, Hilliard & Burt 7 820; all $\times 4$.



Figure 15 Tessellated seed surface of *Lessertia perennans* var. *perennans*, as in all taxa investigated, from Balkwill & Cadman 2 894. Scale bar: 50 μ m.

The reason for *L. ingeliensis* being found on Ngeli Mountain (Figure 16) but not in the grasslands of the Drakensberg, where the very closely related *L. thodei* is endemic, might lie in the geological differences between these two areas. The rocks of the Drakensberg belong to the Stormberg series, but Ngeli Mountain (situated approximately 90 km south-south-east of Bushman's Nek in the southern Drakensberg) is an immense intrusion of gabbro. It carries along its crest small, disjunct remnants of sandstone and highly metamorphosed mudstone from the Ecca and Lower Beaufort series (Maske 1966).

Lessertia ingeliensis should be sought further south in the Transkei (northern part of the Eastern Cape) on mountains such as Thabankulu, Insizwe and Mtonte, which are geologically similar to Ngeli Mountain. At present, this species should be regarded as extremely rare.

Specimens examined

—3029 (Kokstad): Alfred district, Ngeli Mountain, moist rocky grassland, 1 800–2 000 m (–DB), Hilliard & Burt 3 470 (E, K, NU), 5 812 (NU), *ibidem* (–DB), Balkwill & Cadman 2 670 (E, J, NU).

4. *Lessertia harveyana* L. Bolus, *Annals of the Bolus Herbarium* 1: 89–90 (1915). Type: Eastern Cape, Kentani district, in valley, Pegler 1 281 (BOL!, lecto., here designated; PRE!).

Perennial, much branched, herb, sometimes erect or decumbent to prostrate; stems up to 0.7 m long. *Leaves* 15–25 mm long (\bar{x} = 20 mm), shortly petiolate, 20–70 mm apart; leaflets 7–11 \times 3–7 mm, 4–5-jugate, elliptic to obovate, apex rounded and mucronulate, base cuneate, upper surface glabrous, lower surface strigose; petiole 2–6 mm long, glabrescent or glabrous; stipules 3–4 \times 1–2 mm, narrowly triangular, acuminate, glabrescent. *Inflorescence* 22–117 mm long (\bar{x} = 57 mm); peduncle glabrous, with 2–10 flowers (\bar{x} = 4) above the middle; flowers 2–5 mm apart. *Bracts* 2–3 mm long, triangular to narrowly ovate, acuminate, glabrous. *Pedicel* 3–4 mm long, usually shorter than the calyx, glabrescent or very sparsely strigose. *Calyx* 4–5 mm long, unequally 5-lobed; tube 2 mm long; lobes 3–4 mm long, always conspicuously longer than the tube, lanceolate, acute, glabrescent without, strigose to strigosotomentose within, hairs brown. *Corolla* pink; standard 7 \times 6 mm, obovate to broadly obovate, apex rounded to retuse, base broadly attenuate; wings 6 \times 1.5–2 mm, obliquely oblong-elliptic, apex rounded, claw long; keel 7 \times 6 mm, obliquely oblong, apex rounded to oblique. *Gynoecium*: ovary 5

mm long, narrowly elliptic, oblique basally, sub-stipitate, glabrous; style 2 mm long, sparingly bearded around the stigma; stigma asymmetric, clavate. *Pods* 20–23 \times 8–10 mm, obliquely depressed-ovate or ovate, scarious, glabrous. *Seeds* 5–11.

Discussion

Lessertia harveyana was named by L. Bolus in honour of William Henry Harvey (1811–1866), who, together with O.W. Sonder, wrote the first three volumes of *Flora Capensis*. Harvey had recognised the species as distinct and had written the name *L. biflora* on several sheets, but did not publish this name. Of the seven specimens cited by L. Bolus in her original description, Pegler 1 281 has been chosen as the lectotype because this collection provides the best material and sheets are housed in both BOL and PRE.

Lessertia harveyana bears a superficial resemblance to some specimens of *L. perennans* but is most closely allied to *L. stricta*. In *L. harveyana*, the calyx lobes are twice as long as the tube (never shorter than the tube) and lanceolate-acuminate (not shallowly triangular and acute); the pedicels are 3–4 mm long (not 5–10 mm long), always shorter (not much longer) than the calyx; the pods are shorter and narrower (30 \times 8 mm, not more than 30 \times 10 mm) and depressed-ovate or obovate (not obliquely elliptic); leaflets are 4–5-jugate (not 7-jugate), elliptic or obovate with rounded, mucronulate apices and cuneate bases (not narrowly elliptic with apiculate apices). There are also very distinct differences in the shapes and sizes of the standard and wings. In *L. harveyana*, the wing is longer (never shorter) than the keel, obliquely oblong-elliptic with a rounded apex (not hastate with a broad claw) and the standard is 7 \times 6 mm (not 9 \times 6 mm), obovate, sometimes widely so, with a rounded apex (not widely obovate with a distinctly cleft apex). The growth form of *L. harveyana* is variable, ranging from erect to decumbent or even prostrate. This differs markedly from *L. stricta* which is usually stiffly erect. Plants of *L. harveyana* are generally much less robust than those of *L. stricta*. The pod in *L. harveyana* is obliquely depressed-ovate or ovate, whereas that of *L. stricta* is obliquely elliptic and taper-pointed.

Lessertia harveyana occurs mainly in the Eastern Cape. In KwaZulu-Natal, it has been collected only in the districts of

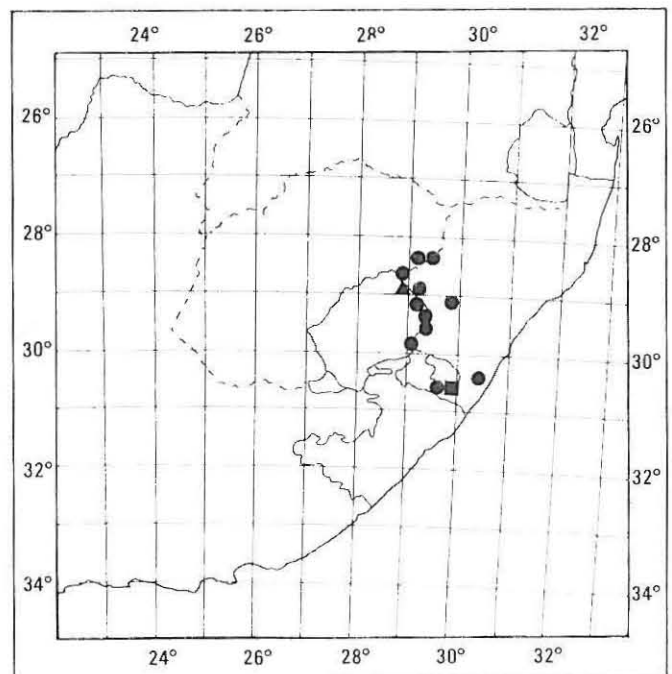


Figure 16 Known distributions of *L. dykei* (\blacktriangle), *L. thodei* (\bullet) and *L. ingeliensis* (\blacksquare)

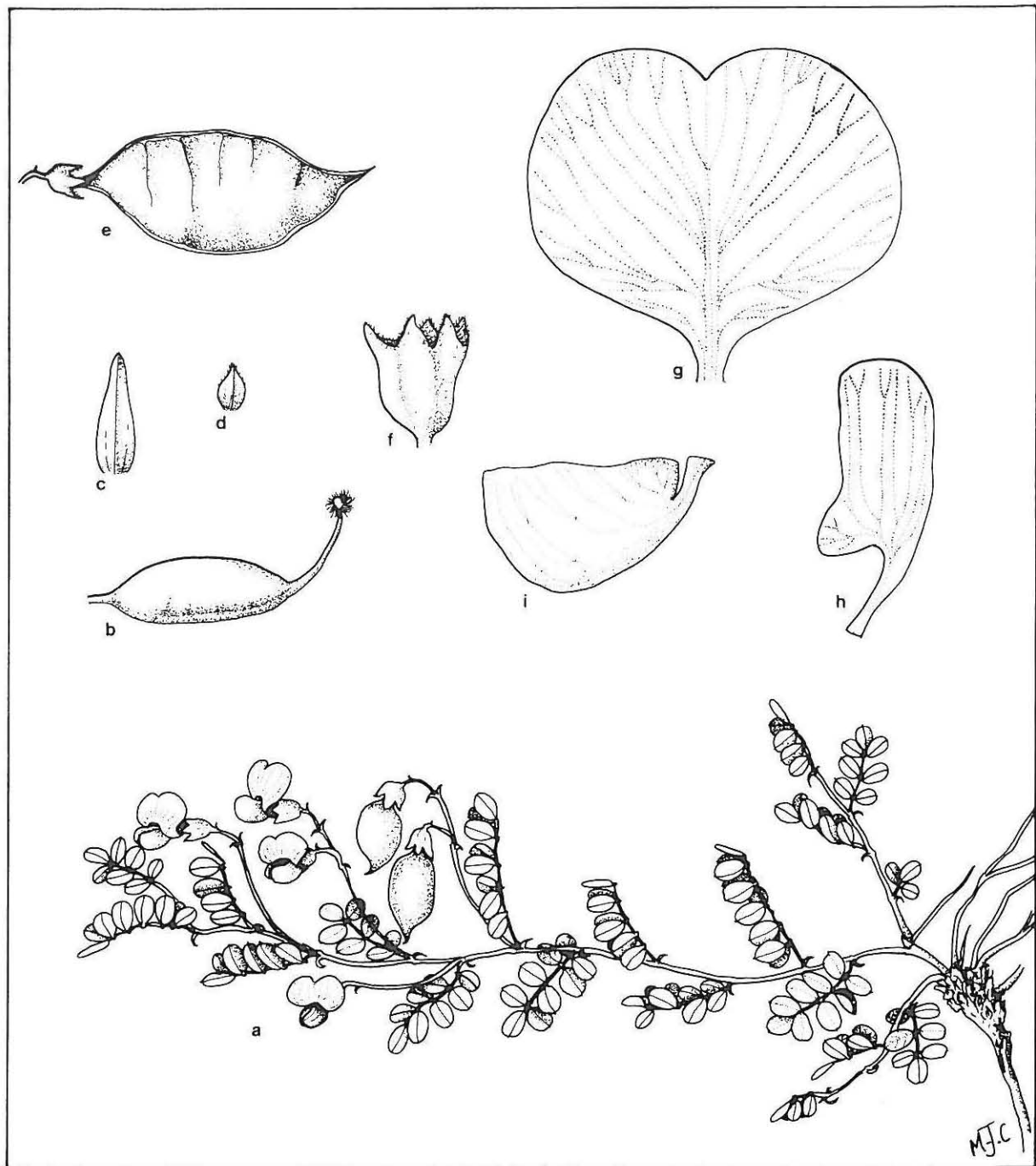


Figure 17 *Lessertia ingeliensis*: a. habit ($\times 1$); b. gynoeceium ($\times 6$); c. stipule ($\times 7$); d. bract ($\times 5$); e. pod ($\times 2.5$); f. calyx ($\times 9$); g. standard ($\times 4$); h. wing ($\times 4$); i. keel ($\times 4$) (Balkwill & Cadman 2 670).

Kokstad and Durban (Figure 18). In contrast, *L. stricta* occurs mainly in the inland areas of central and northern Kwa-Zulu-Natal, the Free State, Gauteng and Mpumalanga (Figure 18). It grows in a wide range of habitats including grassland (often rocky), valley bushveld and forest margins, and at altitudes between 500 and 900 m.

Lessertia harveyana flowers in late spring or early summer, with a peak in December.

Specimens examined

—2930 (Pietermaritzburg): Near Howick (–AC), *Medley-Wood* 8 433 (NH).

—3029 (Kokstad): East Griqualand, Mount Currie (–AD), *Tyson* (BOL, PRE); Harding, Rooival Farm, drainage line near boundary with Bedford Farm (–DB), *Balkwill & Cadman* 2 330 (NU); Harding (–DB), *Oliver* 60 (NH).

—3030 (Port Shepstone): Isipingo North, near water hole (–BB), *Ward* 837 (NU, PRE); 25 km from Highflats on the road to St Faiths (–CA), *Schrire* 2 277 (NH); 23 km from Port Edward to Izingolweni (–CC), *Schrire* 749 (NH).

—3127 (Lady Frere): Engcobo (–DB), *Bolus* 8 880 (BOL).

—3227 (Stutterheim): Fort Cunyngame (–AD), *Sim* 2764 (PRE); King William's Town, foot of Pirie Bush (–CC), *Flanagan* 2 143 (PRE); near King William's Town (–CD), *Flanagan* 2 143 (NH).

—3228 (Butterworth): Kentani district, in valley (–AC), *Pegler* 1 281 (BOL, PRE).

—3326 (Grahamstown): Northern face of Howeson's Kloof (–AD), *Grobbelaar* 657 (PRE).

5. *Lessertia stricta* *Bolus*, Transactions of the Royal Society of South Africa 1: 149 (1909). Type: Eastern Cape, Griqualand East, Clydesdale, *Tyson* 2 527 (PRE!), lecto., here designated;

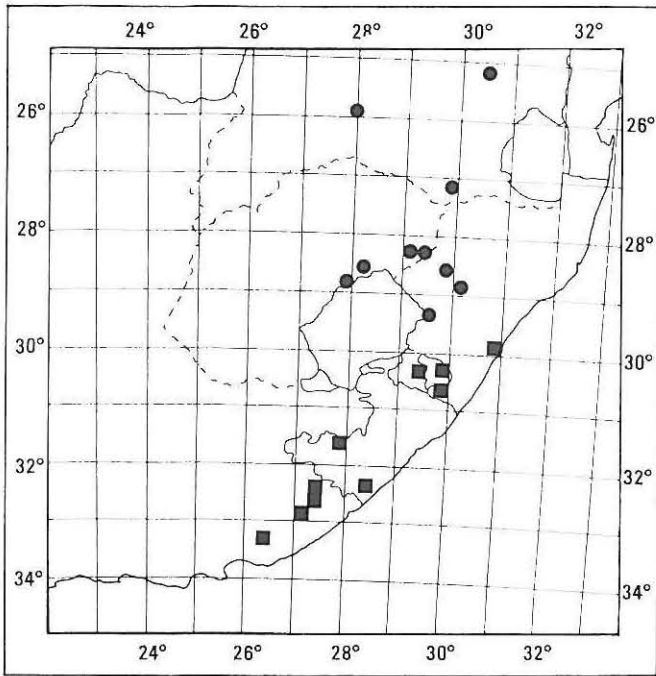


Figure 18 Known distributions of *L. harveyana* (■) and *L. stricta* (●).

BOL!).

Perennial, erect or occasionally sprawling suffrutex, branching mostly at the base; stems up to 1 m long (usually 0.4–0.8 m), ribbed-striate. Leaves 20–50 mm long (\bar{x} = 30), 20–45 mm apart; leaflets 11–17 × 3–5 mm, 4–7-jugate (\bar{x} = 6), narrowly elliptic to elliptic or slightly obovate, apex apiculate, base very slightly attenuate to cuneate, sometimes asymmetric, upper surface glabrous, lower surface strigose; petiole 3–5 mm long, sparsely strigose; stipules 3–5 × 1–2 mm, triangular, apex sharply acuminate, margins with sparse hairs. Inflorescence 66–100 mm long (\bar{x} = 97), with 7–16 flowers (\bar{x} = 10) above the middle, peduncle glabrescent. Bracts 2–3 mm long, ovate-acuminate, sparsely strigose, slightly conduplicate. Pedicel 5–10 mm long, much longer than the calyx, strigose. Calyx 3–4 mm long, unequally 5-lobed; tube 2–3 mm long, strigose in coastal regions; lobes 1–2 mm long, very much shorter than the tube, shallowly triangular, acute to acuminate, strigose on both surfaces. Corolla dark pink; standard 9 × 6 mm, obovate, apex cleft, base attenuate; wings 7 × 2 mm, hastate with a short claw, apex broadly acute; keel 8.5 × 5 mm, oblong, apex markedly obtuse. Gynoecium: ovary 5.5 mm long, stipitate, narrowly depressed-ovate, glabrous; style 2 mm long, bearded mostly on abaxial side of stigma, beard very sparse on adaxial side. Pods 30 × 9 mm, obliquely elliptic, taper-pointed, glabrous, scarious, semi-opaque. Seeds 10.

Discussion

The habit of *L. stricta* is stiffly erect and the stems are markedly ribbed-striate. The shape of the wings and keel is very unusual in this species. The wing is always shorter than the keel and is hastate with a broad, curved claw. The keel is more elongate than in any of the other species and it is widest at the apex, which is another unusual feature. The long pedicels, which are always longer than the calyx, are another striking feature of this species.

Lessertia stricta is closely allied to *L. harveyana* (see above) and is sometimes confused with *L. perennans* var. *perennans*. A number of features distinguish *L. stricta* from the latter: dimensions of the pod (30 × 9 mm, not 14 × 7 mm), number of seeds (8–10, not 2–3), number of flowers (7–17, not 25–50), shape of leaflets (narrowly elliptic and apiculate, not ovate, obovate or

broadly elliptic and rounded), width of leaflets (2–4 mm, not 4–8 mm), number of leaflets (9–13, not 11–19), length of stipules (2–4 mm, not 3–10 mm), general pubescence (strigose, not villous or tomentose), pubescence of leaflets (glabrous above and strigose below, not strigose, villous or tomentose on either surface) and the flowers tend to be more laxly racemose.

Lessertia stricta has been collected in KwaZulu-Natal, the Free State, Gauteng and Mpumalanga (Figure 18). It grows in rocky grasslands or along streambanks at altitudes between 800 and 1 900 m and flowers are produced between December and March (with a peak in January).

Specimens examined

- 2527 (Rustenburg): Scheerpoort (–DD), *Leendertz 757* (PRE).
- 2530 (Lydenburg): Crocodile River, 1 470 m (–AB), *Schlechter 3 898* (BOL).
- 2629 (Wakkerstroom): Vlakfontein, near Amersfoort (–DC), *Burt Davy 4 035* (BOL).
- 2729 (Volksrust): Botha's Pass, 18 km from Memel on road to Newcastle (–DA), *Germishuizen 4 367* (NH).
- 2827 (Senekal): Ficksburg district, 4 miles from Ficksburg on Clocolan road, bushy slope below krantz (–DD), *Acocks 11 095* (PRE).
- 2828 (Bethlehem): Lesotho, Leribe (–CC), *Dieterlen 95* (NH); Golden Gate (–DA), *Ueckermann 7 039* (PRE).
- 2829 (Harrismith): Ladysmith, Biggarsberg, Boschoek Military Area (–AA), *Manning 629* (NH); Harrismith, edge of wood (–AC), *Medley-Wood 4 785* (NH); Swinburne district, rocky grassland on farm 'Grootvlei' (–AC), *Jacobsz 32* (PRE); 7 km from Swinburne, Rensburg Kop Farm, on Manyenyeza (–AC), *Jacobsz 704* (PRE); Van Reenen, 1 700 m (–AD), *Medley-Wood 8 846* (BOL, NH); *ibidem*, farm 'Nolens Volens' (–AD), *Jacobsz 1 630* (PRE); *ibidem*, 1 700 m (–AD), *Medley-Wood 10 727* (NH, PRE); Ladysmith district, 25 minutes north-east of Ladysmith, thornveld (–DB), *Godfrey s.n.* (NU); near Ladysmith (–AD), *Medley-Wood 5 622* (NH).
- 2830 (Dundee): Weenen County (–CC), *Medley-Wood 3 545* (BOL, NH); Lambonjwa River (–CD), *Medley-Wood 3 546* (NH).
- 2929 (Underberg): Estcourt (–BB), *Medley-Wood 10 266* (NH); Mooi River district, Warley Common, 1 500 m (–BC), *Mogg 7 225*

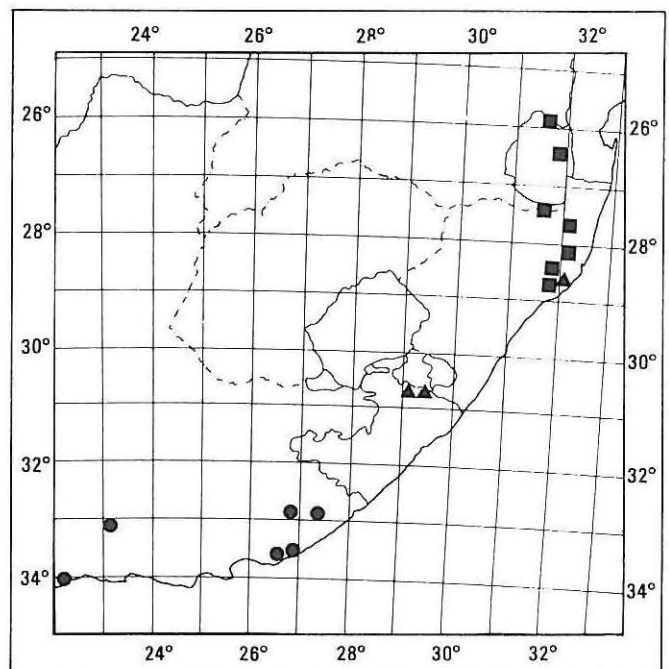


Figure 19 Known distributions of *L. brachystachya* (●), *L. contracta* (▲) and *L. macroflora* (■).

(PRE); Giant's Castle Game Reserve (–BC), *Reid 986* (NH); Ixopo district, near Comrie Halt, open rocky streamside (–CD), *Shirley s.n.* (NU).

—**3128** (Umtata): Fort Gale (–DB), *Schrire 940* (NH).

6. *Lessertia brachystachya* DC., *Prodromus* 2: 272 (1825); Harvey: 222 (1862). Type: Eastern Cape, Albany district, 1813, *Burchell 3 353* (K; J!, photo.).

Erect or sometimes diffuse suffrutex; stems up to 0.4 m long, strigose, branching near base. *Leaves* 36–87 mm long (\bar{x} = 57), 15–55 mm apart (\bar{x} = 45 mm); leaflets 6.5–13.7 × 1–2.8 mm, 7–11-jugate, narrowly elliptic to lanceolate or oblanceolate, apex emarginate to retuse or obovate, base cuneate, upper surface glabrous or strigose, lower surface strigose, sericeo-tomentose or glabrescent (if so, hairs restricted to midrib and base); petiole 7–11 mm long, strigose; stipules 2–4 × 1–2 mm, triangular (sometimes broadly so), markedly acute, with scattered hairs. *Inflorescence* 14–38 mm long (\bar{x} = 24); peduncle strigose, always much shorter than the leaves. *Flowers* 8–12 (\bar{x} = 10), borne on upper two-thirds of axis. *Bracts* 1–3 mm long, ovate, sharply acuminate, pubescent along margins and at base. *Pedicels* 5–8 mm long (\bar{x} = 7), always much longer than the calyx, densely strigose to strigosotomentose. *Calyx* 2–3 mm long, tube 1.6–2 mm long, unequally 5-lobed; lobes 0.5–1 mm long, shallowly triangular, acute, strigose or strigosotomentose. *Corolla* purple, lilac or pale pink; standard 7–8 × 4–6 mm, broadly elliptic, apex obovate, base attenuate; wings 5–6 × 1.5–2 mm, always shorter than the keel, obliquely oblong-obovate, apex truncate, claw long, slender; keel 5.5–7.5 × 4–5.5 mm, machete-shaped, darkest at apex. *Gynoeceum*: ovary 5 mm long, sub-stipitate, narrowly elliptic, flattened abaxially, sericeo-tomentose along sutures, strigose to strigosotomentose on valves; ovules many; style 2–2.5 mm long, bearded dorsally with short hairs for one quarter of length and on abaxial side of stigmatic surface; stigma rounded. *Pods* 33–44 × 6–8 mm, laterally compressed, narrowly elliptic, apex acute, base cuneate, strigose, scarious. *Seeds* 6–9 (\bar{x} = 7).

Discussion

This species is characterised by its short inflorescences (for which it is named) and unusually narrow leaflets (1–2 mm wide). It also differs from the other species in the form of the pod which is always much longer than it is broad, laterally compressed and very narrowly elliptic. The flowering time is variable, with flowering occurring sporadically in response to rain.

Within the *L. brachystachya* complex, there is considerable variation in the shape and size of the calyx lobes but the constancy of these differences has not been established. Within the complex, the style of *L. brachystachya* is curved through an angle of about 90 degrees, whilst that of *L. contracta* is very strongly curved and that of *L. macroflora* is not curved, but angled slightly upwards at the base.

Lessertia brachystachya sens. str. is confined to the Eastern Cape (Figure 19). Material from Oribi Gorge (southern KwaZulu-Natal), northern KwaZulu-Natal and nearby parts of Swaziland and Mpumalanga, that has previously been referred to as both *L. brachystachya* and *L. stricta*, comprises two clearly distinguishable entities whose affinities lie with *L. brachystachya* (not *L. stricta*, which has very different pods and overall morphology). These entities may be distinguished from *L. brachystachya* as discussed under *L. contracta* and *L. macroflora*.

Specimens examined

—**3226** (Fort Beaufort): Victoria East (–DD), *Acocks 15 976* (PRE).

—**3227** (Stutterheim): King William's Town district, 700 m (–CD), *Tyson 2 893* (NH, PRE).

—**3326** (Grahamstown): Port Alfred, on East River bank (–DB), *Barker 10 899* (PRE); *ibidem* (–DB), *Tyson s.n. sub PRE 55 347*

(PRE); Port Elizabeth, Grahamstown road, 15 km from Port Elizabeth, waste area near roadside (–DC), *Stirton 6 189A* (PRE).

—**3422** (Mossel Bay): Boundary of George and Mossel Bay districts, near Great Brak River (–AA), *Barclay & Acocks 934* (PRE).

—**3423** (Knysna): 9 miles west of Knysna (–AA), *Godfrey s.n. sub PRE 55 366* (PRE).

7. *Lessertia contracta* M. Balkwill sp. nov. affinis *L. brachystachya*, sed longitudine pedunculorum (2.5–11.5 mm, non 14–38 mm), bractearum (0.5–1 mm, non 1–3 mm), pedicellorum (plerumque 5 mm, non 7 mm), vexilli (8–10 × 6–6.5 mm, non 7–8 × 4–6 mm), alarum (9.5 mm, non 5–6 mm) cum apice rotundato (non acutangulari), carinae (9.5 mm, non 5.5–7.5 mm) et foliorum (plerumque 43 mm, non 57 mm) et numero floribus (7–10, non 8–12) et folioliorum (4–7, non 7–11 jugato) differt.

TYPUS. —KwaZulu-Natal: Port Shepstone district, Horseshoe Farm (–CA), *Strey 11 346* (NH, holotypus; PRE, isotypus).

Perennial, erect suffrutex. *Leaves* 34–48 mm long (\bar{x} = 43 mm); leaflets 10–14 × 2–3 mm, 4–7-jugate, narrowly elliptic to elliptic or obovate-oblong, apex oblique or emarginate, upper surface usually glabrous, lower surface sparsely strigose. *Inflorescence* 2.5–11.5 mm long (\bar{x} = 6.7 mm); peduncle sparsely strigose, extremely short, with 7–10 flowers borne near the base of the peduncle and contracted into axils of leaves. *Bracts* 0.5–1 mm long. *Pedicels* 4–6 mm long (\bar{x} = 5 mm), longer than the calyx, very sparsely strigose. *Corolla* orange-pink or cream with pink lines, standard 8–10 × 6–6.5 mm, broadly oblong-elliptic, base broadly attenuate, apex retuse to emarginate; wings 9.5 × 2 mm, oblong elliptic with adaxial lobe well-developed, as long as the keel, apex rounded, claw curved; keel 9.5 × 8.5 mm, broadly machete-shaped. *Gynoeceum*: ovary broadly oblong-elliptic, strigose or strigosotomentose, style very strongly curved, bearded just below the stigmatic surface.

Discussion

The most striking and consistent difference between *L. contracta* and *L. brachystachya* is that the peduncles of the former are extremely contracted, and in some plants, the flowers emerge directly from the axil of the leaf. The leaflets of *L. contracta* are very narrowly elliptic or oblanceolate, which is distinctive. *L. contracta* occurs in southern KwaZulu-Natal, extending as far north as Kwambonambi (Figure 19).

Specimens examined

—**2831** (Nkandla): Empangeni, Nyala Game Reserve (–DD), *Edwards 967* (NH).

—**2832** (Mtubatuba): Kwambonambi, roadside (–CA), *Hilliard & Burt 3 210* (E, NU).

—**3030** (Port Shepstone): Horseshoe Farm, ruderal place, roadside (–CA), *Strey 11 346* (NH, PRE); Umzimkulu River Valley, Gibraltar Rock (–CB), *Nicholson 2 071* (PRE).

8. *Lessertia macroflora* M. Balkwill sp. nov. affinis *L. brachystachya*, sed foliis brevibus (34 mm, non 57 mm), foliolis paucis (3–5, non 7–11 jugatis), foliolis longioribus et latioribus (12.4–20.4 × 3–7 mm, non 6.5–13.7 × 1–3 mm), stipulis longioribus (3.6–6.4 mm, non 2–4 mm), ovario dense pubescente suturam superam versus (non sericeo-tomentoso secus suturas et strigoso in valvis), stylo recto (non valde curvato) et petalis multum grandioribus: vexillo (9–11 × 6–10 mm, non 7–8 × 4–6 mm); alo (8–10 × 2–3 mm, non 5–6 × 1.2–2 mm) et carina (9–10 × 7–9 mm, non 5.5–7.5 × 4–5.5 mm) differt.

TYPUS. —KwaZulu-Natal: Piet Retief district, Pongola Bosveld Plaas (–BC), *Nel 225* (NH, holotypus; PRE, isotypus).

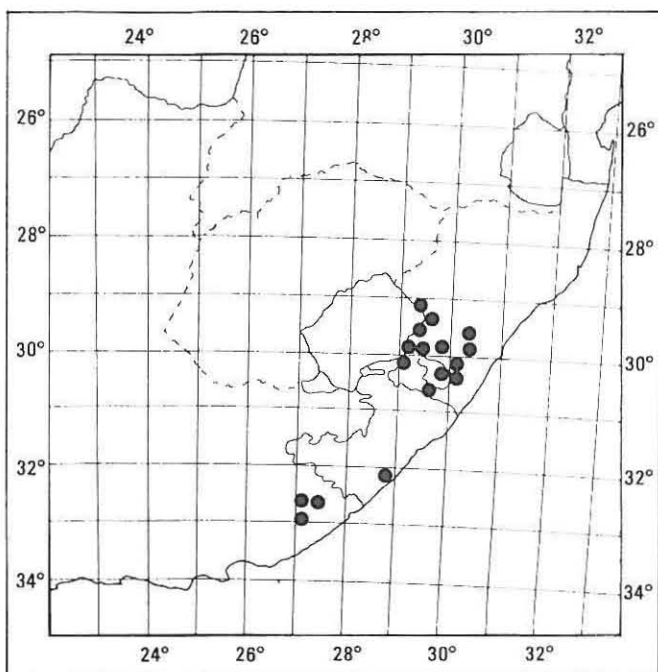


Figure 20 Known distributions of *L. perennans* var. *perennans* in KwaZulu-Natal and the Eastern Cape.

Perennial, bushy suffrutex, much-branched from the base; stems up to 0.35 m long, slightly ribbed-striate, ligneous. *Leaves* 24–50 mm long (\bar{x} = 34 mm), 15–25 mm apart; leaflets 12.4–20.4 × 3–7.4 mm, 3–11-jugate, elliptic to oblong-elliptic, apex rounded to retuse, base usually cuncate, sometimes very broadly attenuate, upper surface glabrous, lower surface strigose or occasionally strigoso-tomentose; stipules 3.6–6.4 × 1–2 mm, narrowly oblong elliptic, acute, glabrescent or glabrous. *Inflorescence* 15–40 mm long (\bar{x} = 29 mm); peduncles strigose or softly and finely hairy, usually shorter than the leaves, with 3–11 flowers (\bar{x} = 9) often crowded together near apex of peduncle. *Pedicel* 4.6–7 mm long (\bar{x} = 5.9 mm). *Calyx* 3–4 mm long; tube about 2–3 mm long; lobes shallowly triangular, apices blunt, densely strigose. *Corolla*: standard 9–11 × 6–10 mm, broadly oblong-elliptic, base attenuate, apex emarginate; wings 8–10 × 2–3 mm, oblong-elliptic, apex rounded, adaxial lobe well-developed and curved towards claw, claw robust and strongly curved; keel 9–10.5 × 7–9 mm, markedly obtuse. *Gynoecium*: ovary stipitate, narrowly oblong-elliptic, oblique on abaxial surface, densely pubescent towards upper suture; style curving gently upward, bearded dorsally for about $\frac{1}{8}$ of its length and just below the stigma abaxially. *Pods* and seeds unknown.

Discussion

Lessertia macroflora is clearly separable from *L. brachystachya*. The distributions of *L. macroflora* and *L. brachystachya* are disjunct, with the former occurring in the Tongaland-Pondoland Region, following the Lebombo Mountains (Figure 19), and the latter occurring in the southernmost part of this phytogeographic region where it adjoins the Karroo-Namib and Cape Regions (Figure 19). At this stage, the morphology of the pod is unknown; of all the specimens seen only one bears mature pods and these are malformed. *L. macroflora* is not a homogeneous group. It includes several specimens (Aitken & Gale 1 and Lawn 1 287 & 1 385) that do not match most of the other plants in the taxon very well. Further field work and comparison of material from outside of KwaZulu-Natal is indicated.

Specimens examined

- 2531 (Komatipoort): Mananga Mountain, halfway up near Mhlume (–DC), *Edwards 435* (PRE).
 - 2631 (Mbabane): Foothills of Lebombo, 3 miles from Manzini (–BD), *Clarke 280* (PRE).
 - 2731 (Louwsburg): Pongola Bosveld Plaas (–BC), *Nel 225* (NH, PRE).
 - 2732 (Ubombo): North of Munywane River (–CA), *Aitken & Gale 1* (NU, PRE).
 - 2831 (Nkandla): Umfolozi Game Reserve (–BD), *Bowland sub Balkwill & Cadman 3 025* (E, NU); Empangeni Road (–DD), *Lawn 1 287, 1 385* (NH).
 - 2832 (Mtubatuba): Hlabisa district, Hluhluwe Game Reserve (–AA), *Ward 1 438* (NH, NU, PRE); St Lucia Lake (–AD), *Gerstner 3 164* (NH).
- Without precise locality: Swaziland, *Stewart 9 545* (PRE).

9. *Lessertia perennans* (Jacq) DC., *Prodromus* 2: 271 (1825); Harv.: 216 (1862); Thistleton-Dyer: t. 6 106 (1874); Burt Davy: 380 (1932). *Colutea perennans* Jacq.: 311 (1762). Iconotype: Jacq.: 5, t. 3 (1770), from Africa.

Erect, perennial suffrutex; stems up to 1.5 m long, markedly ribbed-striate. *Leaves*: petiole 3–10 mm long, pubescent; stipules narrowly triangular-acuminate or lanceolate-acuminate, softly pubescent or villous over entire abaxial surface. *Inflorescence*: peduncle villous, villosa-tomentose to sericeous, with flowers borne from below the middle. *Bracts* narrowly ovate, apex acuminate, margins and midrib villous. *Pedicel* longer than the calyx, variously hairy but mostly villosa-tomentose. *Calyx* villous to densely tomentose; lobes shorter than or sometimes as long as the tube. *Corolla*: standard broadly elliptic to rounded, apex retuse to emarginate; wings oblong-elliptic, apex rounded, claw strongly curved; keel broadly scimitar-shaped. *Gynoecium*: ovary 3 mm long, narrowly elliptic to oblong-elliptic, sub-stipitate; ovules 2–5; style straight or very slightly curved at base, with a dense ring of hairs around stigmatic surface, sometimes restricted to abaxial side of stigma. *Pods* obliquely elliptic, sharply cuneate at base, obliquely acute at apex, scarious, slightly inflated.

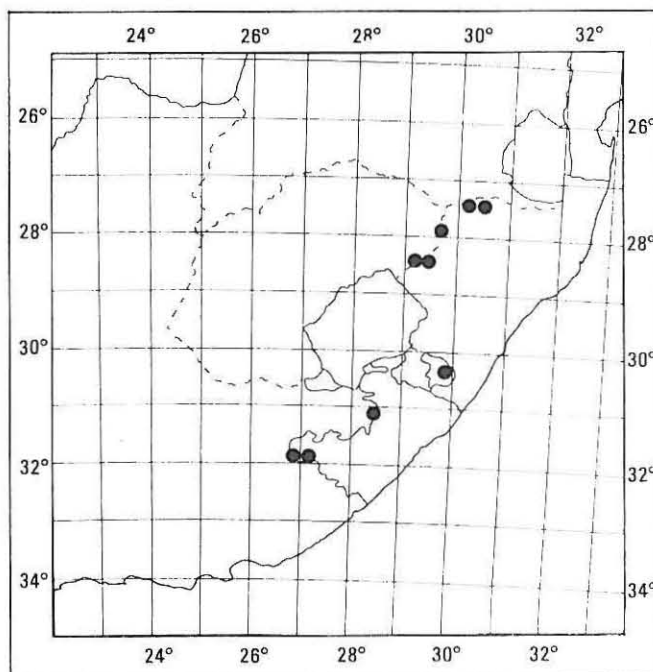


Figure 21 Known distributions of *L. perennans* var. *sericea* in KwaZulu-Natal and the Eastern Cape.

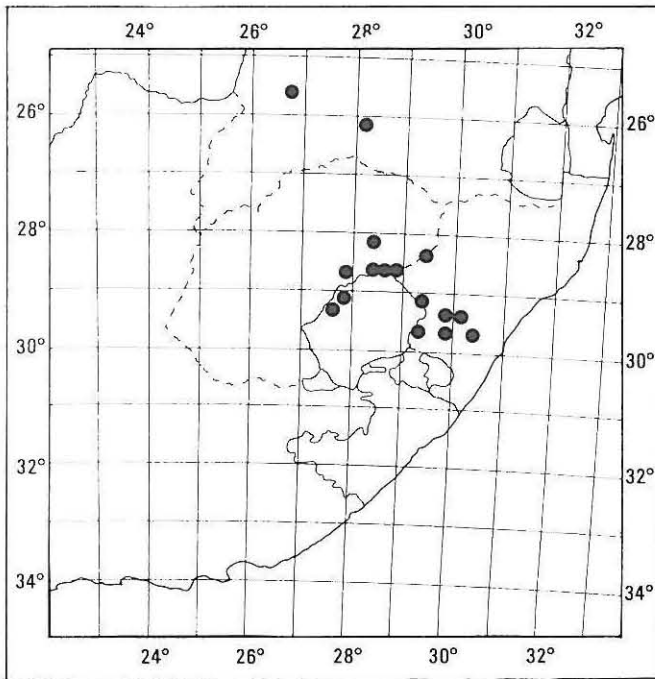


Figure 22 Known distributions of *L. perennans* var. *polystachya* in KwaZulu-Natal and the Eastern Cape.

Discussion

In his comprehensive original description of *Colutea perennans*, Jacquin (1762) noted that the calyx teeth were acuminate, and in his description and plate that followed some years later, he further noted that the pod was glabrous (Jacquin 1770). Jacquin gave the place of origin of his plant simply as Africa, but his accurate illustration leaves no doubt that the name is being correctly used for a southern African species. The illustration was probably made from a plant in cultivation, but for historical reasons, Jacquin's original material must have been collected in the Eastern Cape and indeed it is plants from this area that precisely fit his description and plate.

L. Bolus (1915) segregated those specimens of *L. perennans* that have a persistently hairy legume as *L. perennans* var. *sericea*. These plants are partially sympatric with var. *perennans*, but also extend the range of the species north and east (Figures 20 and 21). She also reduced *L. polystachya* Harv. to a variety of *L. perennans*. This was possibly not justified as these taxa differ in shape of the calyx lobes and they are also mostly allopatric. Clarification of this problem requires further fieldwork and the varietal status is therefore upheld at this stage.

Key to the varieties

- 1a Pods densely strigose, strigoso-tomentose or sericeous over valves and sutures 9b. var. *sericea*
- 1b Pods with hairs along sutures but glabrous (or very thinly strigose) on valves 2
- 2a Calyx lobes narrowly triangular, long-acuminate; plants variously hairy, but not silvery 9a. var. *perennans*
- 2b Calyx lobes deltoid, acute; plants very densely tomentose or sericeous and silvery 9c. var. *polystachya*

9a. var. *perennans*

Plants variously pubescent. *Leaves* 15–86 mm long (\bar{x} = 44 mm); leaflets 11–23 (\bar{x} = 19), 7–21 × 1–11 mm, ovate to slightly obovate or elliptic, apex rounded or occasionally emarginate, base cuneate, either both surfaces villous to tomentose or hairy on one surface;

stipules 3.5–12 × 0.5–2 mm. *Inflorescence*: peduncle 72–195 mm (\bar{x} = 126 mm) long, with 15–36 flowers (\bar{x} = 27). *Bracts* 1.5–6 mm long (\bar{x} = 3.4 mm). *Pedice*l 4–7 mm long (\bar{x} = 4.9). *Calyx* 2.5–6 mm long (\bar{x} = 3.5 mm); lobes 0.8–3 mm long (\bar{x} = 1.4 mm). *Corolla* vivid to pale pink, standard with conspicuous dark veins; standard 4–8.5 × 4–9.5 mm; wings 3–8 × 1.5–3.5 mm; keel 2–7.5 × 4–6 mm. *Gynoe*cium: ovary slightly hairy along adaxial suture; style 1.5–3.3 mm (\bar{x} = 2.5 mm) long. *Pods* 12–22 × 5–8.5 mm, obliquely elliptic, sharply cuneate at base, glabrous, but sometimes with scattered hairs along suture (Figure 13), occasionally with hairs on valves, but glabrous when mature. *Seeds* 1–4 (\bar{x} = 3).

Discussion

Lessertia perennans proves to be a highly complex species and the circumscription of var. *perennans* has been widened to include specimens that may have some hairs on the ovary, but these hairs disappear as the pod matures. Such plants occur from the Eastern Cape to southern KwaZulu-Natal, particularly in the southern Drakensberg (Figure 20).

Specimens examined

- 2929 (Underberg): Estcourt district, Giant's Castle Game Reserve, moist stream bank, 1 600 m (–AB), *Paterson* 18 (NU); Mphendle district, Mulangane ridge, above Carter's Neck, steep grassy slope, 2 100–2 300 m (–BC), *Hilliard & Burt* 18 404 (NU); Sani Pass, 2 150 m (–CB), *Hilliard* 961 (NU); Gxalingenwa valley, between Sani Pass and Polela valley, damp grassy slope amongst sandstone rocks, 2 050 m (–CB), *Hilliard & Burt* 17 063 (E, NU); upper tributaries of Mkomazi River, boulder bed, 2 000 m (–CB), *Hilliard & Burt* 15 814 (E, NU); 5–7 miles north-north-west of Castle View Farm, headwaters of Mhlahlangubo River, streambank, 2 400 m (–CB), *Hilliard & Burt* 15 204 (E, NU); Garden Castle Nature Reserve, valley of Umzimkulu River, scattered in grassland in old boulder beds, 1 800 m (–CD), *Hilliard & Burt* 7 820 (NU); Bulwer district, Sunset, 1 700 m (–DD), *Rennie* 419 (NU).
- 2930 (Pietermaritzburg): Lion's River, Midlands (–AC), *Green* 654 (NH); Mowbray, Ahrens (–BB), *Fisher* 928 (NH); Merrivale, Wahroongo Farm (–CA), *Nichols* 1 012 (NH); Thorneville (–CB), *Shirley s.n. sub NU* 30 723 (NU); Zwaartkop (–CB), *Medley-Wood* 10 449 (NH); Richmond district, Byrne, in valley, 1 200 m (–CD), *Galpin* 11 932 (PRE).
- 3029 (Kokstad): Mt Currie (–AA), *Goossens s.n. sub PRE* 55 325 (PRE); Umzimkulu district, Umzimkulu village (–BD), *Shirley s.n. sub NU* 32 907 (NU); Alfred district, Ngeli Mountain, grassy slopes, 2 000 m (–DA), *Hilliard & Burt* 5 774 (E, K, NH, NU).
- 3030 (Port Shepstone): Ixopo district, Comrie/Eastwolds Road (–AA), *Shirley s.n.* (NU); *ibidem*, farm Lynn Avis, 17.5 km from Ixopo on Donnybrook Rd, 1 400 m (–AA), *Crewe* 26 (NH, NU); 3 km from Ixopo to Highflats (–AA), *Stirton* 10 478 (NH); Highflats (–AC), *Warren* 132 (NU).
- 3227 (Stutterheim): Hogsback, grassy slopes, 1 200 m (–CA), *Rattray* 47 (PRE); 10 km from Stutterheim on Stutterheim-King William's Town road (–CB), *Van Wyk* 5 278 (PRE); Pirie, 1 200 m (–CC), *Sim* 19 442 (NU).
- 3228 (Butterworth): Willowvale district, Msendo Halt, between Mpozolo school and Mendu, grassland with loamy soil, 550 m (–BB), *Wood* 160 (NU).

9b. var. *sericea* L. Bolus, *Annals of the Bolus Herbarium* 1(2): 89 (1915). Type: Eastern Cape, Glen Grey, N'Zebanya Mountain, 1 600 m, ??/8/1894, *Galpin* 1 912 (BOL!, lecto.; PRE!).

Plants variously pubescent, but never glabrous. *Leaves* 20–95 mm long (\bar{x} = 56 mm); leaflets: 9–27 (\bar{x} = 19), 10–25 × 3–8 mm, elliptic to narrowly elliptic or occasionally ovate, apex rounded to acute.

base cuneate, either both surfaces villous to tomentose or only the lower surface strigose; stipules 4–15 × 1–2 mm. *Inflorescence*: peduncle 65–190 mm long (\bar{x} = 128 mm), with 15–49 flowers (\bar{x} = 31). *Bracts* 1.5–4 mm long (\bar{x} = 3 mm). *Pedicel* 4–10 mm long (\bar{x} = 6 mm). *Calyx* 2.5–4 mm long (\bar{x} = 3 mm); lobes 0.5–1.5 mm long (\bar{x} = 1.1 mm). *Corolla* pink or scarlet, ageing to mauve or white; standard c. 7 × c. 8 mm; wings c. 6.5 × c. 3 mm; keel c. 6 × c. 5 mm. *Gynoecium*: ovary hairy; style 3–4 mm long (\bar{x} = 3.5 mm). *Pods* 10–20 × 5–8 mm, always hairy. *Seeds* 1–4 (\bar{x} = 2.6).

Discussion

A few herbarium sheets are worthy of special mention: *Talukdar 7 433* has hairs only along the sutures of the ovary but it comes from almost the same locality and is rather similar to *Boardman 183* and *Hoener 1 680 & 1 710*. The latter three specimens have pods with 7–10 ovules, many more than is usual in var. *perennans*. It is possible that these specimens may bridge the gap between var. *perennans* and var. *sericea*.

It is also interesting to note that in the northern part of the distributional range, where the areas of var. *sericea* (Figure 21) and var. *perennans* (Figure 20) overlap, the calyx lobes of var. *sericea* tend to be deltoid rather than acuminate. This suggests that some degree of hybridisation may be taking place where these varieties become sympatric.

Specimens examined

- 2729 (Volksrust): Newcastle district, below summit of Normandien Pass, 2 100 m (–DC), *Hilliard 2 408* (NU).
- 2730 (Vryheid): Utrecht district, 1 850 m (–AC), *Codd & Dyer 6 275* (PRE); Tweekloof, Altemooi (–AD), *Thode A1 155* (NH, PRE); Wakkerstroom district, 1 900 m (–AD), *Devenish 359* (PRE).
- 2829 (Harrismith): Platberg, 1 800 m (–AC), *Jacobsz 3 012* (PRE); Van Reenen, 1 600 m (–AD), *Medley-Wood 12 091* (PRE).
- 2830 (Dundee): Weenen, Culvers (–CC), *Rogers 20141* (NH).
- 2929 (Underberg): Lesotho, near the confluence of the Sinqebetu and Mokhotlong Rivers (–AC/AD), *Liebenberg 5 644* (NH); Weenen County, South Downs (–BB), *Evans 471, 509* (NH); Kamberg, Game Pass Farm (–BC), *Williams 733* (NH); Drakensberg Gardens Forest Station (–CD), *Schrire 804* (NH); Bulwer Mountain Plateau, Sunset (–DA), *Rennie 1 200d* (NH).
- 2930 (Pietermaritzburg): Near Boston, 1 km along sand road to Sevenfontein off Edendale-Pietermaritzburg road (–CA), *Schrire 2 262* (NH).
- 3027 (Lady Grey): Ekowe, Gathberg, 1 200 m (–AD), *Baur 1 163* (BOL).
- 3029 (Kokstad): Nsikeni Nature Reserve (–AB), *Ngwenya & Singh 1 229* (NH); Nsikeni vlei (–AB), *Arnell 290* (NH); Clydesdale, 800 m (–BD), *Tyson 1 436* (PRE); Thornham Farm (–BD), *Coleman 777* (NH); Weza State Forest (–DA), *Taylor 5 250* (NH).
- 3128 (Umtata): Maclear district, 1 600 m (–AB), *Acocks 21 917* (PRE).
- 3226 (Fort Beaufort): Katberg (–DA), *MacOwan 1 184* (NH). Without precise locality: Free State, *Cooper 1 862* (BOL).

9c. var. *polystachya* (Harv.) L. Bolus, *Annals of the Bolus Herbarium* 1(2): 89 (1915). *Lessertia polystachya* Harv. 2: 216 (1862). Type: Gauteng, Magaliesberg, *Zeyher 460* (PRE!, iso.).

Plants densely sericeous and silvery. *Leaves* 13–80 mm long (\bar{x} = 41 mm); leaflets: 5–25 (\bar{x} = 14), 6–21 × 1.5–10 mm, elliptic or narrowly elliptic, occasionally obovate or ovate, apex rounded, base cuneate, very densely tomentose or sericeous and silvery; stipules 3–13 × 0.5–2 mm. *Inflorescence*: peduncle 75–270 mm long (\bar{x} = 150 mm), with 16–61 flowers (\bar{x} = 24). *Bracts* 2–5 mm long (\bar{x} = 2.5

mm). *Pedicel* 2–10 mm long (\bar{x} = 5.1 mm). *Calyx* 2.5–4 mm long (\bar{x} = 3.1 mm); lobes 0.5–2.5 mm long (\bar{x} = 1.1 mm). *Corolla* pale mauve to red or magenta, with conspicuous dark veins; standard 5–9 × 4.5–9 mm; wings 5–8 × 1.5–3 mm; keel 5.5–8 × 4–5.5 mm. *Gynoecium*: ovary glabrous; style 2–3.3 mm long (\bar{x} = 2.4 mm). *Pods* 11–19 × 5–9.5 mm, glabrous on valves, hairy on sutures. *Seeds* 1–3 (\bar{x} = 2.3).

Discussion

Lessertia perennans var. *polystachya* differs from var. *perennans* by its deltoid (not long-acuminate) calyx lobes, longer peduncles (130–270 mm, not 90–170 mm), fewer (\bar{x} = 13, not \bar{x} = 15), narrower leaflets (\bar{x} = 4 mm, not \bar{x} = 6 mm) that are narrowly elliptic, not broadly elliptic, ovate or obovate and densely sericeous and silvery, not villous or villosotomentose.

When Harvey (1862) described *L. polystachya*, he stressed the difference in indumentum between his new species and that of *L. perennans*. Bolus (1915) and Burt Davy (1932) also attempted to separate the two entities on the basis of differences in the indumentum. Now that more material is available for study, it is clear that there is great variation in both the degree of hairiness and silkiness or woolliness and that this character does not provide a clear distinction between the two taxa. Although neither Harvey (1862) nor L. Bolus (1915) referred to it, the shape of the calyx lobes (deltoid and acute in *L. polystachya*, narrowly triangular and acuminate in *L. perennans*) can be used to separate the taxa reliably.

Lessertia perennans var. *polystachya* occurs on the Highveld of the Northwest Province and the Free State and in the mountainous areas of Lesotho and KwaZulu-Natal (Figure 22).

Specimens examined

- 2628 (Johannesburg): Germiston, 1 800 m (–AA), *Rogers 12 199* (BOL).
- 2827 (Senekal): Farm Franshoek, 27.2 km north-east of Ficksburg, among hillside bush and donga verges, 700 m (–DB), *Boddam-Wetham 91* (PRE).
- 2828 (Bethlehem): Bethlehem, higher slopes of sandstone koppie, 1 700 m (–AB), *Phillips s.n. sub PRE 1 107* (PRE); 24 km east of Clarens, moist grassland (–CB), *Marais 1 282* (PRE); Golden Gate Highlands National Park, near cliffs north-west of Glen Reenen House, 2 000 m (–DA), *Liebenberg 7 277a* (PRE); Golden Gate (–DA), *Van der Berg GG15* (PRE); Witzieshoek (–DB), *Junod 17 376* (PRE).
- 2829 (Harrismith): Swinburne, Rensburg Kop Farm (–AD), *Jacobsz s.n. sub PRE 55 332* (PRE).
- 2830 (Dundee): Lambonje River (–CD), *Thode 8 319* (NH).
- 2927 (Maseru): Mahlatsas, 2 100 m (–BB), *Guillarmod 442* (PRE).
- 2929 (Underberg): Champagne Castle, 1 600 m (–AB), *Bayer 1261* (NU); Estcourt district, Giant's Castle Game Reserve, stream bank, 2 200 m (–AB), *Trauseld 311* (NU); Giant's Castle, 1 900 m (–AD), *Bruyns-Haylett 75* (NU); Lion's River district, Kamberg, grassland at foot of south-facing slope, 1 800 m (–BD), *Wright 2 052* (NU); Bergville district, Pholela, 'The Cavern', 1 800 m (–CB), *L'Ange 31* (NU); Estcourt district, Giant's Castle (–DB), *Legge s.n. sub NU 47 488* (NU).
- 2930 (Pietermaritzburg): Lidgetton (–AC), *Mogg 6 886* (PRE); Balgowan (–AC), *Mogg 3 536* (PRE); Zwaartkop, 1 000–1 200 m (–CB), *Medley-Wood 10 449* (NU, PRE); Mid-Illovo (–DC), *Thode A 3 127* (NH).
- 3029 (Kokstad): Ngeli Mountain, north-west of Kwa-Shili (–DA), *Abbott 4 797* (NH). Precise locality unknown: Krokodil River, *Nelson 11 154* (PRE).

Insufficiently known species

After the completion of the research on which this paper is based, A. Ngwenya collected two specimens of *Lessertia* in the Dannhauser district. They show some affinities to *L. falciformis* DC., which has longer pods and appears to grow in rather drier habitats, but are probably not members of that species. In this account, the specimens will key out to *L. thodei*, but quite clearly are not that species either. Thus they probably represent an as yet undescribed species, but unfortunately the material is insufficient to describe it here.

Specimens examined

—2730 (Vryheid): Dannhauser district, Fairbreeze Farm (–CC). Ngwenya 459 (NH); *ibidem*, Mbabane River (–CC). Ngwenya 548 (NH).

Acknowledgements

We thank Dr O.M. Hilliard and Mr B.L. Burt of the Royal Botanic Gardens, Edinburgh, for their interest in and very valuable assistance with many aspects of this study and anonymous referees for their constructive comments. The curators of cited herbaria are thanked for the loan of material and the Herbarium, Royal Botanic Gardens, Kew, is thanked for the Cibachrome copy of the type of *Lessertia*. The Electron Microscope Unit, University of Natal, is thanked for use of its facilities. M.-J. B. gratefully acknowledges financial assistance from the Foundation for Research Development, the University of Natal and Hoechst South Africa (Pty) Ltd.

References

- BOLUS, H. 1909. Contributions to the African Flora. *Trans. Roy. Soc. S. Afr.* 1: 149.
- BOLUS, L. 1915. Notes on *Lessertia* with descriptions of six new species and a key. *Ann. Bot. Herb.* 1: 90.
- BURTT DAVY, J. 1932. A manual of the flowering plants and ferns of the Transvaal and Swaziland, South Africa. Longmans, Green and Co., London.
- DE CANDOLLE, A.P. 1802. *Astragalologia*. J.B. Garnery, Paris.
- DE CANDOLLE, A.P. 1825. *Prodromus systematis naturalis regni vegetabilis*, Vol. 2, pp. 93–524. Treuttel & Würtz, Paris.
- GUNN, M. & CODD, L.E. 1981. *Botanical Exploration of Southern Africa*. Balkema, Cape Town.
- HARVEY, W.H. 1862. Leguminosae. In: *Flora Capensis*, eds W.H. Harvey & O.W. Sonder. Vol. 2, pp. 1–285. Hodges, Smith and Co., Dublin.
- JACQUIN, N.J. 1762. *Enumeratio stirpium plerarumque, quae sponte crescunt in agro vindobonensi*. Joannis Pauli Kraus, Wien (Vindobonae).
- JACQUIN, N.J. 1770. *Hortus botanicus vindobonensis*, Vol. 1. Wien (Vindobonae).
- MASKE, S. 1966. The petrography of the Ingeli Mountain Range. *Annals of University of Stellenbosch* 41: 1–111.
- O'BRIEN, T.P. & VON TEICHMAN, I. 1974. Autoclaving as an aid in the clearing of plant specimens. *Stain Technol.* 49: 175–176.
- POLHILL, R.M. 1981. Galegeae (Bronn) Torrey & Gray (1838). In: *Advances in Legume Systematics 1*, eds R.M. Polhill & P.H. Raven, pp. 357–363. Royal Botanic Gardens, Kew.
- ROSS, J.H. 1972. *The Flora of Natal*. Department of Agricultural Technical Services, Pretoria.
- THISELTON-DYER, W.T. 1874. *Lessertia perennans*. *Bot. Mag. series* 3, 30: t. 1 606.