Systematic Botany

Section Pelargonium
Paul Rees Course 47
11 June 2011
Table of Contents

Systematic Botany ............................................................................................................................... 1
   Introduction......................................................................................................................................... 5
   Classification................................................................................................................................... 5
   Section Pelargonium.......................................................................................................................... 9
   Verification....................................................................................................................................... 33
   Representative Living Collections.................................................................................................... 33
   Glossary............................................................................................................................................ 39
   References........................................................................................................................................ 40

Illustration Index

Illustration 1: Distribution of Geraniaceae .......................................................................................... 5
Illustration 2: APG iii Family tree-
http://www.mobot.org/mobot/research/apweb/treeapwebstudent.gif .................................................. 6
Illustration 3: Phylogeny of the family Geraniaceae from:
http://www.mobot.org/mobot/research/apweb/trees/geranialesnotl.gif..................................................... 7
Illustration 4: Pelargonium fruit from: Diana Millar Pelargoniums pg 21........................................... 7
Illustration 5: Cross-section through Pelargonium flower from:Diana Millar Pelargoniums pg 25...... 7
Illustration 6: Comparison between Pelargonium and Geranium flowers from:Diana Millar
Pelargoniums pg 22................................................................................................................................ 8
Illustration 7: Parts of a Pelargonium from: Diana Millar Pelargoniums pg 24..................................... 8
Illustration 8: Characteristics of the sections from: Diana Millar Pelargoniums pg 21...................... 9
Illustration 9: P. tomentosum - J.J.A Van der Walt, P.J.Vorster Pelargoniums of Southern Africa Vol
2 pg 147.................................................................................................................................................. 12
Illustration 10: P. betulinum - J.J.A Van der Walt Pelargoniums of Southern Africa pg 23............. 13
Illustration 11: P. cucullatum - J.J.A Van der Walt, P.J.Vorster Pelargoniums of Southern Africa Vol
2 pg 50................................................................................................................................................... 14
Illustration 12: P. scabrum - J.J.A Van der Walt, Pelargoniums of Southern Africa pg 8................... 15
Illustration 13: P. graveolens - J.J.A Van der Walt, P.J.Vorster Pelargoniums of Southern Africa Vol
3 pg 85.................................................................................................................................................. 16
Illustration 14: P. quercifolium - J.J.A Van der Walt, P.J.Vorster Pelargoniums of Southern Africa Vol
3 pg 123................................................................................................................................................ 17
Illustration 15: P. denticulatum - J.J.A Van der Walt, P.J.Vorster Pelargoniums of Southern Africa
Vol 2 pg 62............................................................................................................................................. 18
Illustration 16: P. englerianum - J.J.A Van der Walt, P.J.Vorster Pelargoniums of Southern Africa Vol
3 pg 72.................................................................................................................................................... 19
Illustration 17: P. radens - J.J.A Van der Walt, Pelargoniums of Southern Africa pg 96...................... 20
Illustration 18: P. citronellum - J.J.A Van der Walt, P.J.Vorster Pelargoniums of Southern Africa Vol
3 pg 46.................................................................................................................................................... 21
Illustration 19: P. cordifolium - J.J.A Van der Walt, Pelargoniums of Southern Africa pg 31............. 22
Illustration 20: P. greytonese - J.J.A Van der Walt, P.J.Vorster Pelargoniums of Southern Africa Vol
3 pg 86.................................................................................................................................................... 23
Illustration 21: P pseudoglutinosum - J.J.A Van der Walt, P.J.Vorster Pelargoniums of Southern
Africa Vol 3 pg 116............................................................................................................................ 24
Illustration 22: P. glutinosum - J.J.A Van der Walt, P.J.Vorster Pelargoniums of Southern Africa Vol
3 pg 79.................................................................................................................................................... 25
Illustration 23: P. panduriforme - J.J.A Van der Walt, P.J.Vorster Pelargoniums of Southern Africa Vol
3 pg 111.................................................................................................................................................. 26
Illustration 24: P. hispidum - J.J.A Van der Walt, P.J.Vorster Pelargoniums of Southern Africa Vol 2
pg 95......................................................................................................................................................... 27
Section Pelargonium

Introduction

*Pelargonium* belongs to the family Geraniaceae – The Cranebill family, which derives its name from Greek word *Geranos* meaning crane which is in reference to the seeds of the family which have a long pointed beak like structure, and the genus name Pelargonium is derived from the Greek word *Pelargos* meaning stork.

The genre within the family include: *Geranium*, *Erodium*, *Monsonia*, *Sarcocalon*, *Pelargonium*, *Hypseocharis*, *California*,

Geraniaceae consists of approximately 800 species of which 280 species belong to the genus *Pelargonium*.

The family is distributed widely across the world, with *Pelargonium* concentrated in the Cape Flora Region of Southern Africa, with some species represented in Australia, eastern Africa, the Middle East, St. Helena and Madagascar.

![Illustration 1: Distribution of Geraniaceae](map: from van Steenis & van Balgooy 1966; Hultén 1971; Meusel et al. 1978; Aedo et al. 2005)

*Pelargonium* is easily distinguished from near relatives due to the flower structure, where *Pelargonium* has two distinct upper petals and three lower petals with the upper petals larger than the lower ones making the flowers zygomorphic, where the other members of the family have actinomorphic flower structure. *Pelargonium* also has a hypanthium where the other members do not. *Pelargonium* always has less than 10 stamens where the other genre have more than 10.

*Pelargonium* are divided into 16 sections according to their habit and form.

Classification

The large number of species are conveniently divided into sections, which appear quite natural, since certain groups of species have evolved in a similar manner and possess similar characteristics. Recognising the section is often also useful in choosing the optimal horticultural conditions. Some of the associations are quite obvious and have not changed ever since the sections were united in a single genus by de Candolle in 1824. The genus was revised by Knuth (1912) and is the most compressive taxonomic study however it has it short comings. The debate among taxonomists continues and is mirrored by constant changes at the subgeneric level. Recently, the use of karyological, palynological and chemotaxonomic data has resulted in redefinitions of some sections, while macromorphologic characters were given less significance.
Illustration 2: APG iii Family tree-
http://www.mobot.org/mobot/research/apweb/treemapwebstudent.gif
Section Pelargonium

Illustration 3: Phylogeny of the family Geraniaceae from:
http://www.mobot.org/mobot/research/apweb/trees/geraniaceasnotl.gif

Illustration 4: Pelargonium fruit from:
Diana Millar Pelargoniums pg 21

Illustration 5: Cross-section through Pelargonium flower from:
Diana Millar Pelargoniums pg 25
Illustration 6: Comparison between Pelargonium and Geranium flowers from: Diana Millar Pelargoniums pg 22

Illustration 7: Parts of a Pelargonium from: Diana Millar Pelargoniums pg 24
### Key to the Genre

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Flowers irregular (the upper two petals different in shape and/or size from the lower three); hypanthium present, (fertile stamens fewer than 10)</td>
<td>Pelargonium</td>
</tr>
<tr>
<td>1</td>
<td>Flowers regular (all petals more or less the same in shape and size); no hypanthium</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Stamens 10 or fewer</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Stamens more than 10</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Fertile stamens 5</td>
<td>Erodium</td>
</tr>
<tr>
<td>3</td>
<td>Fertile stamens 10</td>
<td>Geranium</td>
</tr>
<tr>
<td>4</td>
<td>Stamens 15: plant herbaceous; stems not spiny</td>
<td>Monsonia</td>
</tr>
<tr>
<td>4</td>
<td>Stamens 15: plant succulent; stems spiny,</td>
<td>Sarcocaulon</td>
</tr>
</tbody>
</table>

**Illustration 8**: Characteristics of the sections from: Diana Millar Pelargoniums pg 21
**Section Pelargonium**

Key to the Section *Pelargonium*- Diana Millar *Pelargoniums* pg 96

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Leaves viscid</td>
</tr>
<tr>
<td></td>
<td>Leaves not viscid</td>
</tr>
<tr>
<td>2</td>
<td>Leaves not aromatic</td>
</tr>
<tr>
<td></td>
<td>Leaves aromatic</td>
</tr>
<tr>
<td>3</td>
<td>Leaves rough</td>
</tr>
<tr>
<td></td>
<td>Leaves not rough</td>
</tr>
<tr>
<td>4</td>
<td>Leaf segments under 3mm wide, grooved along the mid rib.</td>
</tr>
<tr>
<td></td>
<td>Leaf segments over 3mm wide, grooved along the mid rib.</td>
</tr>
<tr>
<td>5</td>
<td>Leaves pinnatisect, pinnae also deeply divided</td>
</tr>
<tr>
<td></td>
<td>Leaves not so deeply or repeatedly divided</td>
</tr>
<tr>
<td>6</td>
<td>Inflorescence lax; leaf segments about 3mm wide</td>
</tr>
<tr>
<td></td>
<td>Inflorescence compact; leaf segments over 4mm wide</td>
</tr>
<tr>
<td>7</td>
<td>Pedicel under 3mm long</td>
</tr>
<tr>
<td></td>
<td>Pedicel over 3mm long</td>
</tr>
<tr>
<td>8</td>
<td>Upper petals over 2cm long</td>
</tr>
<tr>
<td></td>
<td>Upper petals under 2cm long</td>
</tr>
<tr>
<td>9</td>
<td>Leaves soft, rose scented</td>
</tr>
<tr>
<td></td>
<td>Leaves rough; somewhat lemon scented</td>
</tr>
<tr>
<td>10</td>
<td>Leaves peppermint scented</td>
</tr>
<tr>
<td></td>
<td>Leaves not peppermint scented</td>
</tr>
<tr>
<td>11</td>
<td>Leaves lemon scented</td>
</tr>
<tr>
<td></td>
<td>Leaves not lemon scented</td>
</tr>
<tr>
<td>12</td>
<td>Leaves under 2cm across</td>
</tr>
<tr>
<td></td>
<td>Leaves over 2cm across</td>
</tr>
<tr>
<td>13</td>
<td>Inflorescence frequently branched</td>
</tr>
<tr>
<td></td>
<td>Inflorescence rarely branched</td>
</tr>
<tr>
<td>14</td>
<td>Lobes of leaves acute</td>
</tr>
<tr>
<td></td>
<td>Lobes of leaves obtuse or leaves unlobed</td>
</tr>
<tr>
<td>15</td>
<td>Pedicel longer than the hypanthium; young stems green</td>
</tr>
<tr>
<td></td>
<td>Hypanthium longer than than pedicel; young stems red</td>
</tr>
<tr>
<td>16</td>
<td>Upper petals over 2cm long</td>
</tr>
<tr>
<td></td>
<td>Upper petals not exceeding 2cm, usually less</td>
</tr>
<tr>
<td>17</td>
<td>All petals more or less similar in shape and size.</td>
</tr>
<tr>
<td></td>
<td>Upper and lower petals very dissimilar in shape and size</td>
</tr>
<tr>
<td>18</td>
<td>Leaves usually over 4cm across, often cupped and softly hairy</td>
</tr>
<tr>
<td></td>
<td>Leaves under 3cm across, never cupped not soft and hairy</td>
</tr>
<tr>
<td>19</td>
<td>Flowers white</td>
</tr>
<tr>
<td></td>
<td>Flowers pink</td>
</tr>
<tr>
<td>20</td>
<td>Leaves arranged in two opposite rows</td>
</tr>
<tr>
<td></td>
<td>Leaves not arranged in two opposite rows</td>
</tr>
<tr>
<td>21</td>
<td>Plant robust over 1m tall with unpleasant scent</td>
</tr>
<tr>
<td></td>
<td>Plant not exceeding 70cm without an unpleasant scent</td>
</tr>
<tr>
<td>22</td>
<td>Leaves crisped with rose-like scent</td>
</tr>
<tr>
<td></td>
<td>Leaves not crisped and not rose scented</td>
</tr>
<tr>
<td>23</td>
<td>Young stems green</td>
</tr>
<tr>
<td></td>
<td>Young stems brown to reddish</td>
</tr>
</tbody>
</table>
Pelargonium (DC.) Harv.

Erect to decumbent, non-aromatic to aromatic, non-viscid or viscid sub-shrubs or shrubs with rather woody stems. Leaves simple, laminae entire to variously palmately or pinnately incised. Inflorescences: flowering branches with smaller and normal foliar leaves or smaller foliar leaves only, pseudo-umbels with 1-20 flowers each. Flowers white, pink, pinkish-purple or purple, posterior petals with dark purple, wine-red or dark red feather-like markings, fertile stamens 7 (4 long, 1 medium, 2 short).

http://www2.arnes.si/~mstrli/pp.html
**Pelargonium tomentosum** Jacq., Icon. Pl. Rar, 3:10, t. 537 (1794)

**Common Names**: Pennyroyal *Pelargonium*; Peppermint-scented *Pelargonium*

Meaning of name: Latin meaning thickly and evenly covered in short hairs which is in reference to the leaves.

**Synonyms**: *Pelargonium micranthum* Eckl. & Zeyh. Enum. 1:79 (1835)

**Description**: *Pelargonium tomentosum* is a low growing, evergreen, scrambling, branching subshrub, which has a strong peppermint scent, reaching 50cm in height and up to 1,5m across. The stems are herbaceous, somewhat hairy with glandular hairs and green in colour. The leaves are light green, simple, cordate, hairy with glandular hairs giving them their peppermint scent. Have 3 - (5) rounded lobes (palmatilobate to palmatipartite). With crenate to serrate leaf margins. 4-6 x 5-7cm in size. The petiole often twice as long as the lamina and is soft and hairy with 6-20 x 4-12mm triangular stipules which tend to be deciduous. The white flowers have faint purple markings and are arranged in loosely grouped branched inflorescences with 4 -15 flowered pseudo-umbels. Pedicel 18-20mm long and hairy. Hypanthium 2mm long. Sepals elliptic to lanceolate 6 x 2-3.5mm. With 5 white purple marked petals with 2 upper petals elliptic – obovate 9mm long and three lower linear - spathulate petals 11 x 1.5mm. There are 7 fertile stamens which are in three lengths with orange pollen.

**Flowers**: October - January

**Geographic location**: Hottentots Holland Mountains near Sommerset West, Riviersonderend Mountains near Greyton, Langeberg range from Swellendam to Riversdale and possibly once occurred in Wynberg in the Cape Peninsula.

**Habitat**: *Pelargonium tomentosum* occurs in mountainous areas in the Cape where it grows in semi shaded and moist environments usually at riverine forest margins. Soil is sandy derived from weathered sand stone rock.
Section Pelargonium


**Common Names:** Camphor-scented *Pelargonium*, Birch-leaved *Pelargonium*

**Meaning of name:** *betulinum* comes from the fact that the leaves look similar to that of the genus *Betula*.

**Synonyms:** *Pelargonium georgense* Knuth

**Description:** *Pelargonium betulinum* is a small herbaceous growing to 1m high with an upright or decumbent habit, developing woody stems with age at the base of the plant. The birch-like leaves are simple, dentate, ovate and tough leathery with often a reddish tip to the teeth. Leaves are asymmetrical hairless to glabrous with short hairs. (2 x 1.5cm.) Scented with a camphor like smell when crushed. Petioles 1cm. Stipules triangular and deciduous. Flowers are pink/purple occasionally white and borne on an umbel inflorescence with 3-4 flowers. (3cm). The two upper petals are purple/red with dark veins, obovate (25 x 15mm) the three lower petals are faintly marked or unmarked, lighter and narrower than the upper ones. Peduncle 2-8cm. Hypanthium 5mm, pedicel up to 15mm. There are seven fertile stamens with orange pollen.

**Flowers:** August – October in its habitat.

**Geographic location:** *Pelargonium betulinum* can be found growing in the Western Cape South Africa along the coast from Yzerfontein (west coast) to Knysna (east coast).

**Habitat:** It grows in sand dunes and flats, receiving winter rainfall.
Section Pelargonium

*Pelargonium cucullatum* (L) L'hér. In Ait., Hort Kew. ed. 1,2: 426 (1789)

Common Names: Wilde malva, Hooded-leaf Pelargonium, Tree Pelargonium

Meaning of name: *cucullatum* is derived from latin meaning hooded which is in reference to the shape of the leaves.


Description: *Pelargonium cucullatum* is a tall growing upright to somewhat decumbent shrub reaching 2m in height, branched, becoming woody at the base. The leaves are hooded or cup shaped as the name suggests but depending on the locality maybe to a lesser degree than others. (4.5 x 6 cm) kidney shaped, villous, sometimes aromatic. Crowded towards the end of the stems. Margins dentate sometimes with a red tinge. Petiole 2cm. Ovate stipules up to 1cm. The flowers are borne on large branched umbel-like inflorescence with 4 -10 flowers. Flowers purple/pink but can be white (4cm). The two upper petals are slightly bigger than the lower three and have purple markings, obovate (25 x 15mm) the lowers petals have no markings and narrower. Hypanthium 5 -12mm, pedicel up to 1cm, has seven fertile stamens with 4 of them long, 1 shorter and 2 short, orange pollen. Peduncle 2- 7cm pilose with glandular hairs.

Flowers: September to February.

Geographic location: South Western Cape between Saldanha and Elim.

Habitat: Coastal dunes and flats

**Common Names:** Rough-leaved Pelargonium; Three-pointed Pelargonium

**Meaning of name:** Derived from the Latin word *scaber* (scabrous) due to the rough leaves and stems.

**Synonyms:** Pelargonium scabrum var. balsameum Harv.; Geranium scabrum Burman.

**Description:** Pelargonium scabrum is an erect, branching shrub becoming woody at the base, hairy stems, reaching 1.2m tall. The leaves are lemon scented when crushed, rough due to the glandular hairs. They have three lobes often deeply cut, rhomboid in shape, palmately veined. Margins are finely to coarsely toothed, with acute apices and cuneate base. (4.3 x 4 cm) Leaves can be variable depending on where it is growing. Petioles 2cm. Stipules are deltoid in shape often with reddish tinge. Flowers are born on a loose umbel-like inflorescence with 2 - 6 flowers. The individual flowers are dark small purple/pink to almost white. Upper two petals are twice the size of the lower ones, narrow and spathulate with purple stripes (15 x 5 mm), lower three petals(10 x 3 mm). Hypanthium 5mm, pedicel up 10mm, seven fertile stamens. Peduncles can be branched.

**Flowers:** May – January

**Geographic location:** Springbok (Namaqualand) to the Western Cape to Grahamstown (Eastern Cape).

**Habitat:** Occurs on rocky, sandstone slopes in dry areas.
Section Pelargonium


**Common Names:** Rose-scented *Pelargonium*

**Meaning of name:** strongly scented in Latin.

**Synonyms:** *Pelargonium terebinthinaceum* (Cav.) Desf.; *Pelargonium asperum*; *Geranium radula* Roth.; *Pelargonium intermedium* Knuth.

**Description:** *Pelargonium graveolens* is a branched herbaceous shrub with an erect habit growing to 1.5 m with a spread of 1m. The stems are hairy and semi-succulent which become woody at the base, villous with glandular hairs. The leaves are rose scented, velvety, some what rough, with segmented margins, palmatipartite to pinnatisect, cordiform in shape, cordate base, apices obtuse to acute, margins irregularly serrate and revolute. The Abaxial surface more villous than the adaxial surface. (4 x 6 cm) Petiole 3cm. Stipules cuspidate (6mm x 4mm). Flowers borne on a pseudo-umbel of 3-5 pink-pale purple flowers (15mm). Peduncle 15-40mm, villous, with glandular hairs. Pedicel 1-7mm. Hypanthium 4 -15mm. Sepals are lanceolate, green to reddish-brown with white margin (8 x 3 mm). The upper two petals are spatulate, obovate, notched or rounded apex, red vein markings (10 x 5mm). Lower three unmarked, smaller than upper ones, spatulate with narrow claws, reflexed (22 x 5mm). Hypanthium 5mm. Pedicel 3mm. Seven fertile stamens 4 long, 1 medium and two short. Pollen orange. Mericarps 3-4mm.

**Flowers:** August – January

**Geographic location:** Occurs in Limpopo, south Eastern Cape, Zimbabwe, Mozambique.

Habitat: Mountain areas and kloofs in moist semi-shaded habitats.
Section Pelargonium

*Pelargonium quercifolium* (L.f.) L 'Herit. In Ait., Hort. Kew. ed. 1,2: 422 (1789)

**Common Names:** Oak leafed *Pelargonium*

**Meaning of name:** Leaves look like that of the genus *Quercus.*

**Synonyms:** *Pelargonium karrooense* Knuth, *Geranium quercifolium* L.

**Description:** *Pelargonium quercifolium* grows to 1.75m high and 0.75m wide, it is branched, viscid, herbaceous becoming woody with age. Balm scented. Stems have long glandular hairs and villous. Leaves oak shaped, palmately – pinnately incised, acute to obtuse apices, viscous or sticky, leathery or hard. Strigose with soft hairs in amongst the glandular hairs. Dentate to serrate leave margins. Leaves are variable e.g. 'fillicifolium' which is a natural variety with finer leaves. Petiole 4-5cm, hairy, indumentum. Stipules cordate (4 x 5mm). Pale pink to darker pink/purple flowers (5cm) are borne on an pseudo-umbel inflorescence with 2-6 flowers. Peduncle 20-80mm, villous, hairy. Pedicel 1-2cm long. Hypanthium with glandular hairs and villous. The two upper petals are spathulate with a notched tip with darker veins and markings (25 x 7mm). The lower three are slightly smaller and narrower, clawed, without markings, slightly reflexed and spathulate. Seven fertile stamens 4 long, 1 medium, 2 short with orange pollen. Mericarps 14mm.

**Flowers:** August – January

**Geographic location:** Oudtshoorn and Willowmore South Africa.

**Habitat:** Grows on rocky hills and sloped in Fynbos or Renosterveld vegetation. Likes disturbed areas.

*Illustration 14: P. quercifolium - J.J.A Van der Walt, P.J.Vorster Pelargoniums of Southern Africa Vol 3 pg 123*
**Section Pelargonium**

*Pelargonium denticulatum* Jacq. Horst. Schoenbr. 2: 5, t. 135 (1797)

**Common Names:** toothed-leaved *Pelargonium*, pine-scented *Geranium*, fern leaf *Geranium*.

**Meaning of name:** derived from Latin meaning very finely toothed referring to the leaves.

**Synonyms:** *Geranium denticulatum* (Jacq.) Poir.; *Geranium reticulatum* Nocca; *Geraniospermum denticulatum* (Jacq.) Kuntze.

**Description:** *Pelargonium denticulatum* is a branching herbaceous shrub, erect, evergreen becoming woody at the base. Growing to 1-2m high with a 1m spread. Stems green sometime with a purple tinge, hirsute with glandular hairs in amongst other hairs. Leaves are strongly scented, sticky and tough to the touch, bipinnatisect with pinnatisect segments, green with darker marking along veins.. Cordate base, triangular shape. Margins finely irregularly toothed (6-8 x 7-9cm). Petiole 5cm, stipules asymmetrical, triangular (6 x 5mm). Abaxial surface hirsute, glandular hairs. 3-7 purple/pink flowers (2cm) are borne on a pseudo-umbel inflorescence with an unbranched peduncle (2-6cm). Pedicel (1-2cm) hirsute with glandular hairs. Hypanthium 9mm. Upper two petals narrow, spatulate, reflexed, notched apex, with dark red markings, 18 x 6 mm. The lower three slightly smaller unmarked, with claws, 14 x 4mm. Seven fertile stamens, 4 long, 1 medium, 2 short, orange pollen. Mericarp 15-25mm. Sepals lanceolate, hairy with glandular hairs 10mm with reddish tinge.

**Flowers:** April – November

**Geographic location:** Cloete's Pass in the southern Cape South Africa.

**Habitat:** Mountains near streams in moist er conditions.
**Section Pelargonium**

*Pelargonium englerianum* Knuth in Pflanzenr. 4, 129, 53: 470 (1912)

**Common Names:** Engler's *Pelargonium*

**Meaning of name:** named in honour of Adolf Engler a German taxonomist.

**Synonyms:** None recorded

**Description:** *Pelargonium englerianum* is a branched sub-shrub grows to 1m spreading 0.75m, with a erect to decumbent habit. Has a rose-camphor scent. The herbaceous stems become woody towards the base and have long glandular hairs turning purple, villous. Leaves (2x 3cm) are reniform with a wavy margin, hispid with glandular hairs, base truncate to cordate. Dentate margin. Petiole hairy 1.5cm. Stipules are cordiform 4x 4mm. The pink/purple flowers are borne on a pseudo-umbel of 2-5 flowers. Peduncle 10-40mm hispid with glandular hairs. Pedicel sparsely hispid with glandular hairs 6- 20mm. Hypanthium 1-10mm. Upper two petals spatulate with red markings, reflexed (15 x 7 mm). Lower three are clawed and narrow, slight reflexed, oblanceolate, 7-12mm x 2-4mm. Sepals 6- 10mm x 2-4mm lanceolate with white margins. Seven fertile stamens 4 long, 1 medium 2 short. Pollen orange.

**Flowers:** August – April

**Geographic location:** Cedarberg mountain range.

**Habitat:** Grows in amongst sandstone boulder in course sandy soils in semi shade.
**Pelargonium radens** (Cav.) L'Herit. In Ait. Hort. Kew. ed. 1,2: 423 (1789)

**Common Names:** Rasp-leaved *Pelargonium*; multifid-leaved *Pelargonium*.

**Meaning of name:** Derived from Latin meaning rasp or file (harsh) in reference to the leaves.

**Synonyms:** *Pelargonium radula* (Cav,) L'Herit.; *Geranium radula* Cav.; *Anisopetala radula* (Cav.) Walp.

**Description:** *Pelargonium radens* is an erect growing shrub with branched her stems which become woody at the base, reaching 1m with a rose - lemon scent. Stems are hairy/bristly giving them a rough touch. The triangular leaves have a greyish green colour and are deeply dissected, palmately. They are tough and rough to the touch, aromatic. Margins rolled under, apices rounded.(3-5 x 3-6cm). Stipules ovate and pointed. Petioles 5cm. Flowers occur 2 - 6 in loosely arranged umbel-like inflorescences and are pale purple/pink. Peduncle 3cm. The upper two petals have deep red markings, obovate with a slightly notched tip (17 x 6 mm). The lower three are unmarked and slightly narrower. Hypanthium 6mm. Pedicil up to 1cm. Seven stamen.

**Flowers:** August – December.

**Geographic location:** Southern and Eastern Cape (South Africa)

**Habitat:** Grows in ravines or on the sides of mountains

Illustration 18: P. citronellum - J.J.A Van der Walt, P.J.Vorster Pelargoniums of Southern Africa Vol 3 pg 46

Common Names: Lemon-scented Pelargonium
Meaning of name: derived from the presence of citronella in the leaves.
Synonyms: none
Description: Tall bushy, branching, evergreen shrub growing to 2m with a spread of 1m. Herbaceous hairy (glandular) stems becoming woody at the base. Strongly lemon scented. The leaves with glandular hairs, simple, alternately arranged with conspicuous veins on the abaxial surface, palmate, pointed lobes. Toothed or serrate, cordate base, (5 x 5-6cm). Petiole 3-4cm. Stipules with glandular hairs, triangular (6-10 x 3-6mm). Flowers pink/purple arranged in groups of up to 5 flowers in open branched inflorescences. Upper two petals spathulate – obovate with rounded tips, reflexed with deep purple markings (2 x 8 cm). The lower three are oblong, unmarked smaller than upper ones with claws, reflexed. Pedicel 1cm. Hypanthium 5mm. Sepals lanceolate with reddish tinge. Seven pink/purple stamens 4 long, 1 medium, 2 short.
Flowers: August – January
Geographic location: South-eastern Western Cape on the northern foothill of the Langeberg Mountain range.
Habitat: Occurs near streams in well drained soils.
Section Pelargonium

*Pelargonium cordifolium* (Cav.) Curt. in Bot. Mag. 5: t, 165 (1791)

**Common Names:** Heart leaved Pelargonium.

**Meaning of name:** Derived from the Latin word *cordatus* meaning cordate or heart shaped, referring to the shape of the leaves

**Synonyms:** *Pelargonium cordatum* L'Herit; *Geranium cordifolium* Cav. Diss.

**Description:** Spreading branching shrub over 1.5m, aromatic with pubescent herbaceous stems becoming woody towards the base. Leaves cordate abaxial surface pubescent, shallowly lobed, toothed, grey green colour, could be flat or curly, (6 x 5 cm). Petiole 2-3cm, stipules triangular. Flowers occur on a branched inflorescence of terminal umbels of 4-8 flowers, papilionaceous, purple/pink. Upper two petals ovate, purple markings, reflexed, 2.5 x 1 cm. Lower three petals paler in colour, unmarked, linear. Hypanthium 5-6mm. Seven stamens.

**Flowers:** June – January

**Geographic location:** Coastal areas of southern and Eastern Cape South Africa.

**Habitat:** Moist Fynbos and forest margins.

**Common Names:** none found.

**Meaning of name:** Named after Greyton the name of the area where it occurs.

**Synonyms:** none found.

**Description:** *Pelargonium greytonense* is upright, branching, aromatic reaching 1 m x 0.75m stems are herbaceous becoming woody at the base hairy with glandular hairs. Leaves have three shallow lobes with rounded apices, toothed margins and cordate leave base, with glandular hairs. Petiole 5cm, broad triangular stipules (4-8 x 4-6mm). White/pale pink flowers are borne on a branches inflorescences of 9 flowers, leafy. Peduncles 1-7cm hirsute with glandular hairs. Pedicel 8 -20mm, hypanthium 3-8mm, sepals lanceolate 12 x 4 mm . The upper two petals are spathulate with dark red markings, reflexed 20 x 8mm, the lower three petals are narrowly spathulate with short claws, 18 x 3mm. Seven stamens 4 long, 1 medium and 2 short. Orange pollen.

**Flowers:** September – January

**Geographic location:** South-western Cape, Greyton South Africa.

**Habitat:** Ravine forests on south slope of Riviersonderend Mountain.
Section Pelargonium

*Pelargonium pseudoglauclus*um Knuth in Reprium nov. Spec. Regni veg. 45: 64 (1938)

**Illustration 21: P pseudoglauclus*um - J.J.A Van der Walt, P.J.Vorster
Pelargoniums of Southern Africa Vol 3 pg 116

**Meaning of name:** The epithet is derived because it looks similar to *P. glutinosum*, and puedo meaning false.

**Synonyms:** *Pelargonium uniondalense* Knuth.

**Description:** *P. pseudoglauclus*um is a branching shrub over 1m with an erect to decumbent habit, non aromatic. Stems herbaceous becoming woody at the base, with glandulars hairs brownish/red, interspersed with longer soft hairs becoming red with age. Leaves are variable in shape, glabrescent, with glandular hairs, green often with dark purple margin. Pinnatisect – palmate with caurusly tooth margin, apices acute, cordate leaf base (5 x 5 cm). Petiole 1-2cm, stipules triangular with glandular hairs 6x 4mm. The flowers are pale to dark pink (1.5cm), borne on a pseudo-umbel inflorescence or 1-8 flowers. Peduncle 5-25mm with glandular hairs, pedicil 1-2mm, hypanthium 6-10mm with glandular hairs, sepals lanceolate with glandular hairs, green to red (10 x 5mm). The upper two petals are spathulate with darker markings 13 x 6 mm while the lower three are unmarked, slightly reflexed. (12-20 x 4-6mm) Seven stamen

**Flowers:** September – January.

**Geographic location:** Southern Cape from Mannetjiesberg, Keurboomsriver, Uniondale and Prince Alberts Pass. (South Africa)

**Habitat:** Ravines, near rivers in well drained soil.
Section Pelargonium


**Meaning of name:** the epithet is Latin meaning sticky.

**Synonyms:** *Pelargonium erectum* Knuth; *Geranium viscosum* Scrop.; *Geranium crataegifolium* Roth.

**Description:** *Pelargonium glutinosum* is an aromatic shrub with a balsam scent, viscid, up to 1,8 x1 m with an erect, branching habit. Stems are herbaceous becoming woody towards the base, with glabrous to villous glandular hairs turning brown. The leaves are green to dark green glabrescent with glandular hairs, cordiform, pinnatisect – 3 palmatiobate, cordate leaf base, apices acute, toothed margins serrate – dentate with hairs (5 x 5,5 cm), petiole 3cm. Pale to dark pink flowers (1,5cm) are borne on 1-8 flower pseudo-umbel inflorescences. Peduncles 1,5 – 8cm, glabrous with glandular hairs. Pedicel 1mm. Hypanthium 3- 10mm, villous. Lanceolate sepals green – redish brown with white margins 12 x 3-6mm. The upper two petals are spathulate with obtuse tips, dark purple markings, reflexed, (12-25 x 5-8mm) the three lower petals spathulate, slightly reflexed with narrow claws, (12-25 x 4-8mm). Seven fertile stamens 4 long, 1 medium 2 short.

**Flowers:** All year

**Geographic location:** Piguetherb in south-western Cape to the Kei River in the eastern Cape and the Soutpansberg in Limpopo South Africa.

**Habitat:** Moist habitats and mountainous areas.
Section Pelargonium

*Pelargonium panduriforme* Ecki. & Zeyh., Enum, 1:82 (1835)

**Common Names:** balsam-scented geranium, fiddle leaf geranium.

**Meaning of name:** in reference to the fiddle-shaped leaf blades.

**Synonyms:** none recorded

**Description:** *Pelargonium panduriforme* is a shrub up to 1.75m tall with a spread of 0.5m. It has an erect branching habit with soft, villous herbaceous stems becoming woody at the base. The balsam scented leaves with glandular hairs, soft, cordiform lobed (pinnatifid) with a cordate leaf base. Adaxial surface green, glabrate. Abaxial greyish green, sparsely villous. Wavy margins, crenate viscid, (3.5 x 2.5cm). Petiole 2cm. Stipules triangular (6 x 5mm). The flowers are pink, large occurring in pseudo-umbels of 2 -20 flowers. Peduncle 2-8cm, villous with glandular hairs. Pedicel 1-3mm. Hypanthium 6 -13mm villous with glandular hairs. Lanceolate sepals reddish brown with white margins 8-14 x 3-5mm. The upper two petals narrow, spatulate, reflexed with darker pink markings 35 x 13 mm. The lower three petals are smaller and faintly marked, slightly reflexed with narrow claws 15- 28 x 5-10 mm. Seven fertile stamens 4 long, 1 medium and 2 short.

**Flowers:** August – January

**Geographic location:** Antoniesberg to Riebeeck and the Transkei in Southern Africa.

**Habitat:** lower foothills and ravines close to streams.

*Illustration 23: P. panduriforme - J.J.A Van der Walt, P.J.Vorster Pelargoniums of Southern Africa Vol 3 pg 111*
**Section Pelargonium**

*Pelargonium hispidum* (L.f.) Willd., Sp. Pl. 3: 677 (1800)

**Common Names:** hispid *Pelargonium*; Grofharige *Pelargonium*

**Meaning of name:** Latin meaning covered in bristle hairs.

**Synonyms:** *Geranium hispidum* L.f; *Geraniospermum hispidum* (L.f.) Kuntze

**Description:** *Pelargonium hispidum* is an evergreen, branching shrub with an erect habit, 2.5m tall with a 1m spread. The herbaceous stems become woody at the base with age and are covered with thick bristly, pubescent, with glandular hairs. The leaves are aromatic and a dull green, simple, with glandular hairs. Palmatisect, lobed (5-7), irregularly incised, dentate leave margin. Cordate leave base. Acute leaf apices. (10 x 15 cm). Petiole 12 -20cm. Stipules – lanceolate, membranous (7-10mm). The pink/purple flowers are borne on a branched inflorescence with pseudo-umbels of 6 - 12 flowers. Peduncle to 4cm. Two upper petals have a darker purple marking, reflexed, obovate, (12 x 7mm, while the lower three are spathulate, much smaller than upper, with narrow claws, pink with darker colour to the base, (8 x 2 mm). Pedicel 5-7mm, hirsute with glandular hairs. Hypanthium 3-4mm, sepals lanceolate with white margins and a reddish base (8 x 3 mm). Seven fertile stamens, 4 long, 1 medium, 2 short with orange pollen.

**Flowers:** September – April

**Geographic location:** Western Cape mountains, Swartberg Range Piketberg – Outshoorn – South Africa.

**Habitat:** Occurs in mountainous areas on the lower slopes in shaded areas of ravines often near streams, between boulders and scree. Sandy humus rich soils. 300 – 1000m

![Illustration 24: P. hispidum - J.J.A Van der Walt, P.J.Vorster Pelargoniums of Southern Africa Vol 2 pg 95](image-url)
Illustration 25: Herbarium specimen P. greytonense - RBG Kew
Illustration 26: Illustration 25: Herbarium specimen P. citronellum-RBG Kew
Illustration 27: Illustration 25: Herbarium specimen P. graveolens - RBG Kew
Illustration 28: Herbarium specimen P. glutinosum - RBG Kew
Section Pelargonium

Illustration 29: Herbarium specimen P. betulinum - RBG Kew
Section Pelargonium

Verification

Taken from www.theplantlist.com

P. greytonense – unresolved name, could be a natural hybrid between *P. papilionaceum* and *P. hermanniifolium*.
P. glutinosum - accepted name
P. panduriforme – accepted name
P. hispidum – unresolved name
P. cordifolium – accepted name
P. pseudoglutinosum – accepted name
P. betulinum – accepted name
P. cucullatum – synonym of *Pelargonium cucullatum* subsp. *tabulare* Volschenk.
P. denticulatum – unresolved name
P. quercifolium – unresolved name
P. radens – accepted name
P. graveolens – accepted name
P. capitatum – unresolved name
P. vitifolium – accepted name
P. tomentosum – unresolved name
P. crispum – unresolved name
P. citronellum – unresolved name
P. scabrum – accepted name
P. scabroide - unresolved name
P. ribifolium – accepted name
P. hermanniifolium – unresolved name
P. papilionaceum – synonym of *Geraniospermum papilionaceum* (L.) Kuntze
P. englerianum – unresolved name
P. sublignosum – unresolved name

Representative Living Collections

Criteria for collection:
Of concentration concern: Endangered species or species which occur in small areas need to be with in a collection as so they are conserved ex-situ should they be lost from their habit so they can be reintroduced if needed.
Of scientific importance/research: species which have potential for research such as essential oils, medicines ext. should be in the collection so they are available for research projects.
Ornamental value: species with good ornamental and horticultural value should be in the collection to show their value to the public.
Educational value: species which hold educational value are important to include in the collection so they can play a role though interpretation boards in public engagement education.

Species should be of natural source where possible and should be representative of the population variability and genetic variability.
Section Pelargonium

Kews collection of section Pelargonium species excluding cultivars:
LivColl DATABASE - - - - - - - - - - 04/07/2011 16:25:38

2005-1108  GGT  GERANIACEAE Pelargonium betulinum
Location(s): Temperate House 21 (1 plants) Temperate House 23 (1 plants) Tropical Nursery 7 (2 plants) Temperate House 20 (1 plants) Tropical Conservatory 3 09 (1 plants)
ARP Rating(s): . B(Amenity/education/heritage)
Curation notes: (A/R11134) Condition good.

2003-1756  GGT  GERANIACEAE Pelargonium capitatum (L.) L’Her.
Location(s): Tropical Nursery 7 (2 plants)
Donated by: Jard.Bot.de Nancy (NANC) on 01/04/2003

2003-779  GGT  GERANIACEAE Pelargonium capitatum (L.) L’Her.
Location(s): Tropical Nursery 7 (2 plants)
Donated by: Bot.Gtn Johann Wolfgang Goethe Univ. (FRNK) on 28/02/2003
Material received: Seeds

2007-1156  GGT  GERANIACEAE Pelargonium citronellum
Location(s): Tropical Nursery 7 (2 plants)
ARP Rating(s): . B(Amenity/education/heritage)
Donated by: Ashley Hughes (HUGH) on 01/09/2006
Material received: Plant
Curation notes: (A/R 14248) Condition good.

2004-2854  GGT  GERANIACEAE Pelargonium cordifolium
Location(s): Tropical Nursery 7 (2 plants) Tropical Conservatory 3 11 (1 plants)
Material received: Rooted cutting

2007-1158  GGT  GERANIACEAE Pelargonium cucullatum subsp. tabulare
Location(s): Tropical Nursery 7 (2 plants)
ARP Rating(s): . B(Amenity/education/heritage)
Donated by: Ashley Hughes (HUGH) on 01/09/2006
Material received: Plant
Curation notes: (A/R 14250) Condition good.

2007-1157  GGT  GERANIACEAE Pelargonium cucullatum (L.) L’Her.
Location(s): Tropical Nursery 7 (2 plants)
ARP Rating(s): . B(Amenity/education/heritage).
Donated by: Ashley Hughes (HUGH) on 01/09/2006
Material received: Plant
Curation notes: (A/R 14249) Condition good.

2009-1270  GGT  GERANIACEAE Pelargonium cucullatum subsp. strigifolium
Location(s): Tropical Nursery 7 (2 plants)
Material received: Plant

2004-2564  GGT  GERANIACEAE Pelargonium denticulatum Jacq.
Location(s): Tropical Conservatory 3 09 (1 plants) Tropical Nursery 7 (1 plants)
Fully Verified by Sven Landrein (LADN) on 06/12/2005
Material received: Rooted cutting

2005-74  GGT  GERANIACEAE Pelargonium denticulatum Jacq.
Location(s): Tropical Nursery 7 (2 plants)
Section Pelargonium

Donated by: Fibrex Nurseries Ltd. (FIBE) on 01/12/2004
Material received: Plant

2004-2169 GGT GERANIACEAE Pelargonium englerianum
Location(s): Tropical Nursery 7 (2 plants)
Donated by: Fibrex Nurseries Ltd. (FIBE) on 02/05/2004
Material received: Rooted cutting
Curation notes: Condition good.

1998-3492 GGT GERANIACEAE Pelargonium glutinosum L’Her.
Location(s): Jodrell Glass T3 BENCH1 (2 plants) Tropical Conservatory 3 09 (1 plants) Tropical Nursery 7 (2 plants)
Partially Verified by R.Clifton (CLIR) on 02/08/1999
Donated by: J.P.Lartigau (LARJ)
Material received: Plant
Scientific interest: Possible
References: Herbarium Voucher - Dry

1957-13201 GGT GERANIACEAE Pelargonium aff. graveolens
Location(s): Jodrell Glass T3 BENCH1 (2 plants) Tropical Conservatory 3 06 (1 plants) Tropical Nursery 7 (2 plants)
Donated by: Hort.Bot.Univ.Amsterdam (AMST) on 01/06/2004
Material received: Seeds

2004-2953 GGT GERANIACEAE Pelargonium graveolens
Location(s): Tropical Nursery 7 (2 plants)
Natural Source
Donated by: Hort.Bot.Univ.Amsterdam (AMST) on 01/06/2004
Material received: Plant
Curation notes: (A/R11002) Condition good.

2004-2173 GGT GERANIACEAE Pelargonium hispidum
Location(s): Tropical Nursery 7 (1 plants) Tropical Conservatory 3 09 (1 plants)
Donated by: Fibrex Nurseries Ltd. (FIBE) on 02/05/2004
Material received: Rooted cutting

2007-1161 GGT GERANIACEAE Pelargonium panduraeforme
Location(s): Tropical Nursery 7 (3 plants)
Donated by: Ashley Hughes (HUGH) on 01/09/2006
Material received: Plant
Curation notes: (A/R 14257) Condition good.

1986-636 GGT GERANIACEAE Pelargonium papillonaceum (L.) L’Her.
Location(s): Tropical Conservatory 3 09 (1 plants)
Donated by: J.P.Lartigau (LARJ)
Material received: Plant
Identification notes: Ver. by S.Andrews 22.7.88. Dry
Horticultural merit: High

Identification notes: Ver. by S.Andrews 22.7.88. Dry
Horticultural merit: High
Section Pelargonium

2004-2573  GGT  GERANIACEAE Pelargonium pseudoglutinosum
Location(s): Tropical Nursery 7  (2 plants) Tropical Conservatory 3 11  (1 plants)
Donated by: Ashley Hughes (HUGH) on 21/07/2004
Material received: Plant

1998-3489  GGT GERANIACEAE Pelargonium quercifolium (L.f.) L’Her.
Location(s): Jodrell Glass T3 BENCH1 (2 plants) Tropical Nursery 7  (2 plants) Tropical Conservatory 3 09  (3 plants)
Fully Verified by Sven Landrein (LADN) on 16/11/2005
Material received: Plant
Horticultural merit: High
References: Herbarium Voucher - Dry Illustrated - Photo: 0149-0153

2007-1196  GGT GERANIACEAE Pelargonium radens H.E.Moore
Location(s): Tropical Nursery 7  (2 plants)
Donated by: Ashley Hughes (HUGH) on 01/09/2006
Material received: Plant
Curation notes: (A/R 14258) Condition good.

1986-640   GGT GERANIACEAE Pelargonium radens H.E.Moore
Location(s): Jodrell Glass T3 BENCH1 (2 plants) Tropical Nursery 7  (2 plants) Tropical Conservatory 3 09  (1 plants)
Fully Verified by R.Clifton (CLIR) on 15/02/2000
Donated by: J.P.Lartigau (LARJ)
Material received: Plant
Scientific interest: Possible
References: Herbarium Voucher - Dry

2004-2565  GGT GERANIACEAE Pelargonium ribifolium
Location(s): Tropical Nursery 7  (3 plants) Tropical Conservatory 3 11  (1 plants)
Material received: Root cutting

2004-1630  GGT GERANIACEAE Pelargonium scabrum
Location(s): Tropical Nursery 7  (2 plants)
Donated by: Bot.Gtn.Munchen (MNCH) on 01/03/2004
Material received: Seeds

1968-35401 GGT GERANIACEAE Pelargonium tomentosum Jacq.
Location(s): Tropical Nursery 7/2 plants) Tropical Conservatory 3 09  (1 plant) area 148  (5 plants)
Donated by: Lady Hanbury (HANB)
Material received: Seeds
References: Herbarium Voucher - Dry

2003-782  GGT GERANIACEAE Pelargonium vitifolium
Location(s): Tropical Nursery 7  (1 plants)
Donated by: Bot.Gtn Johann Wolfgang Goethe Univ. (FRNK) on 28/02/2003
Material received: Seeds

5 out of the 27 accessions in the group represented at Kew have been verified and 1 partially.
1 accession is natural source. There are very few accessions of a given species mostly one which
does not represent the genetic diversity of that species. A large amount of the collection has been
donated by a private collector meaning that the original source of the material is unknown and the
accuracy of the naming if not verified maybe inaccurate.
The section *Pelargonium* has 24 species in the group of which Kew has all but *P. crispum*, *P. scabroide*, *P. hermannifolium* and *P. sublignosum*. Therefore Kew has a relatively good representation of the species within the group however many species in the group are variable in the wild with distinct populations, this variability is not represented at Kew. The group has good horticultural value and is widely cultivated across the world with many hybrids and cultivars. Species however are poorly represented outside of botanic gardens. The national *Pelargonium*, is held at Fibrex Nursery LTD, Honeybourne Road, Pebworth, Stratford-upon-Avon, Warwickshire CV37 8XP | 01789 720788, who have 29 species in the collection across all sections and only 5 from the section *Pelargonium*. Kirstenbosch Botanical Gardens in the Cape has and extensive collection and the group is well represented.

Interpretation within the Glasshouses at Kew are relatively poor with many of the plant labels unclear as to which plant it is referring to due plants grown close to one another. There is no interpretation boards for the group. The collection in the collection in the Princes of Wales Conservatory has very few of the species represented from the collection held in the Tropical Nursery. More of these species should be incorporates and clear interpretation boards set up to show the conservation threats, value of these plants to man, their uses and a clear correlation between the species and the cultivars grown in the house.

The collection in the Temperate House has a few species or cultivars and no interpretation with many of the species in the house poorly labelled and has more potential to represent the group than the Princess of Wales Conservatory does.

The group has not been revised, and is therefore not up to date. There needs to be a full revision and monograph drawn up as to know whether the species are in fact species and whether the variability in some of the species are subspecies or not. There is also no definite Kew for the genus rather as above a table of characteristic for the groups, which is not always useful and then relatively good keys to the sections, although with the naming a classification of the genus still confused the key is not going to be as accurate as it should be.

This posses problems for horticulture in terms of the large amount of cultivars, because if the classification of the species are incorrect it becomes impossible to trace the roots of a cultivar/hybrid back to the original species. In terms of conservation it is important that the species and subspecies of the group are known and the variability between populations are documented. In order to know which species are under threat and which populations are distinct from others, to know where conservation efforts should be focused.

Should collecting trips be arranged to the Cape and focus collection areas for rare, variable and species which occur in a relatively small area. Although many species are common and not threatened they often have a limited distribution meaning they could become endangered quickly should lad use change.

*P. denticulatum* – Red list rare species – Langeberg and Kammanassie Mountains in the southern Cape
*P. vitifolium* – Red list least concern south western and southern areas of the Western Cape
*P. greytonense* – small distribution area -Riviersonderend Mountains
*P. glutinosum* – not listed common
*P. panduriforme* – common not listed.
*P. hispidum* – Listed as least concern  common - Swartberg Range, Piketberg eastwards for about 450 km to Meiringspoort
Section Pelargonium

*P. cordifolium* – common
*P. pseudoglutinosum* – restricted distribution in the southern Cape
*P. betulinum* – Not listed but has scientific interest
*P. cucullatum* – common - Two distinct populations, Table Mountain different form the other populations in the Cape.
*P. quercifolium* – Listed as least concern
*P. radens* – Common not listed
*P. graveolens* – common- has two distinct populations – Limpopo Province (Pilgrims rest area. and Cape (George )
*P. capitatum* – common
*P. tomentosum* – common – scientific interest
*P. crispum* – Not listed but not represented in the collection as a straight species- Worcester to Bredasdorp
*P. citronellum* – not listed
*P. scabrum* – Common not listed.
*P. scabroide* – not in the collection – Poterville to Touws river.
*P. ribifolium* – not listed
*P. hermannifolium* – not in the collection – Worcester to Caledon and to Swellendam
*P. papilionaceum* –Common listed as least concern - Stellenbosch District to the Klein River mountains and on to Grahamstown.
*P. englerianum* – not listed
*P. sublignosum* – not in the collection Piquetberg and between Porterville and Ceres
Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abaxial</td>
<td>Bottom surface of the leaf</td>
</tr>
<tr>
<td>Actinomorphic</td>
<td>Having more than one line of symmetry</td>
</tr>
<tr>
<td>Acute</td>
<td>With a sharply tapering tip.</td>
</tr>
<tr>
<td>Adaxial</td>
<td>Top surface of a leaf</td>
</tr>
<tr>
<td>Alternate</td>
<td>Leaves alternating up the stem not opposite.</td>
</tr>
<tr>
<td>Apices</td>
<td>More than one apex or leaf tip.</td>
</tr>
<tr>
<td>Cordate</td>
<td>Heart shaped</td>
</tr>
<tr>
<td>Cordiform</td>
<td>Heart shaped</td>
</tr>
<tr>
<td>Cuneate</td>
<td>Wedge shaped</td>
</tr>
<tr>
<td>Cuspidate</td>
<td>Terminating in or ending in a sharp firm point</td>
</tr>
<tr>
<td>Deciduous</td>
<td>Loosing its leaves during the dormant period</td>
</tr>
<tr>
<td>Decumbent</td>
<td>Laying or growing near the ground</td>
</tr>
<tr>
<td>Deltoid</td>
<td>Delta shaped</td>
</tr>
<tr>
<td>Dentate</td>
<td>Edged with tooth like margin</td>
</tr>
<tr>
<td>Elliptic</td>
<td>Oval shaped</td>
</tr>
<tr>
<td>Glabrate</td>
<td>Without hair</td>
</tr>
<tr>
<td>Glabrescent</td>
<td>Becoming hairless with age</td>
</tr>
<tr>
<td>Glabrous</td>
<td>Without hair</td>
</tr>
<tr>
<td>Glandular hairs</td>
<td>Hairs producing oils</td>
</tr>
<tr>
<td>Hirsute</td>
<td>Covered in stiff course hairs</td>
</tr>
<tr>
<td>Hispid</td>
<td>With stiff or rough hairs bristly</td>
</tr>
<tr>
<td>Hypanthium</td>
<td>Floral structure to which the bases of the sepals, petals and stamens are fused, cup shaped</td>
</tr>
<tr>
<td>Indumentum</td>
<td>A covering of fine hairs or bristles</td>
</tr>
<tr>
<td>Inflorescences</td>
<td>More than one flower in a floral structure.</td>
</tr>
<tr>
<td>Lamina</td>
<td>Leaf blade</td>
</tr>
<tr>
<td>Lanceolate</td>
<td>Shaped like a lance</td>
</tr>
<tr>
<td>Linear</td>
<td>Narrow with almost parallel margins.</td>
</tr>
<tr>
<td>Mericarps</td>
<td>Structure containing the seed derived from the carple.</td>
</tr>
<tr>
<td>Oblanceolate</td>
<td>Lance shaped with the widest part at the leaf apex.</td>
</tr>
<tr>
<td>Obovate</td>
<td>Egg shaped with the widest part at the apex.</td>
</tr>
<tr>
<td>Ovate</td>
<td>Egg shaped</td>
</tr>
<tr>
<td>Palmate</td>
<td>With several lobes hand shaped</td>
</tr>
<tr>
<td>Palmatilobate</td>
<td>Palmately lobed</td>
</tr>
<tr>
<td>Papilionaceous</td>
<td>Flowers resembling a butterfly</td>
</tr>
<tr>
<td>Pedicel</td>
<td>Stalk of a single flower</td>
</tr>
<tr>
<td>Peduncle</td>
<td>Stalk of an inflorescence</td>
</tr>
<tr>
<td>Petiole</td>
<td>Leaf stalk</td>
</tr>
<tr>
<td>Piliolate</td>
<td>Hairy with long hairs</td>
</tr>
<tr>
<td>Pinnatisect</td>
<td>Pinnately divided almost to the mid rib</td>
</tr>
<tr>
<td>Pseudo-umbels.</td>
<td>Umbel like inflorescence</td>
</tr>
<tr>
<td>Reflexed</td>
<td>Bent or curved backwards</td>
</tr>
<tr>
<td>Reniform</td>
<td>Kidney shaped</td>
</tr>
<tr>
<td>Revolute</td>
<td>Rolled backwards</td>
</tr>
<tr>
<td>Scabrous</td>
<td>Rough, scab like</td>
</tr>
<tr>
<td>Sepals</td>
<td>Leaf like structures below the petals.</td>
</tr>
<tr>
<td>Serrate</td>
<td>Serrated leaf margin</td>
</tr>
<tr>
<td>Simple</td>
<td>Whole not divided</td>
</tr>
<tr>
<td>Spathulate</td>
<td>Shaped like a spatula</td>
</tr>
<tr>
<td>Stamens</td>
<td>Male parts of a flower containing the pollen.</td>
</tr>
<tr>
<td>Stipules</td>
<td>Leaf like structure at the base of the petiole or peduncle</td>
</tr>
<tr>
<td>Strigose</td>
<td>Covered with short appressed hairs</td>
</tr>
<tr>
<td>Sub-shrub</td>
<td>Dwarf shrub or woody perennial</td>
</tr>
<tr>
<td>Truncate</td>
<td>Squared off tip</td>
</tr>
<tr>
<td>Umbel</td>
<td>Inflorescence with a number of stalks the same length joined at a common point</td>
</tr>
<tr>
<td>Villous</td>
<td>Covered with soft un-matted hairs</td>
</tr>
<tr>
<td>Viscid</td>
<td>Sticky</td>
</tr>
<tr>
<td>Viscous</td>
<td>Having a thick sticky consistency</td>
</tr>
<tr>
<td>Zygomorphic</td>
<td>With one line of symmetry</td>
</tr>
</tbody>
</table>
References


