Argentina recognita (Rosaceae, Potentilleae), a new species from New Guinea, with a key to the species known from the island

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Abstract

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A new species of Argentina from Mt Jaya in the Indonesian part of New Guinea is described, illustrated and compared with related species occurring on the island. It is characterised by having patent hairs on the rachides, almost rounded leaflets that are silvery or greyish green beneath, all stems terminated by flowers, and five stamens. An up-to-date identification key to all currently known Argentina species of New Guinea is provided.

Additional key words: Potentilla, taxonomy, Indonesia, Irian Jaya, Mt Jaya

The tribe Potentilleae of Rosaceae is represented in New Guinea by a single group of species, which is usually classified in Potentilla L., either as a section [P. sect. Pentaphylloides Tausch, P. sect. Anserina (Gaudin) Pfeiffer, P. sect. Leptostylae (Th. Wolf) Raja] or a subgenus [P. subg. Chenopotentilla (Focke) Juz.]. Rarely it is treated as member of a separate genus. The author of the present paper is convinced that it is appropriate to treat this group in a distinct genus under the name Argentina Hill, based on morphological differences corroborated by results of molecular phylogenetic analyses (Eriksson & al. 2003; Dobeš & Paule 2010, Piletophyllum (Soják) Soják and Tylosperma Botsch. are members of the genus Argentina, see Töpel & al. 2011). Argentina and Potentilla s.str. are morphologically clearly separated and not a single transitional species exists.

Argentina is characterised by ventral stipular auricles and lateral styles, whereas Potentilla s.str. has lateral stipular auricles and subterminal styles (Soják 2010).

So far, 23 species of Argentina have been found in New Guinea. Of these, 20 are endemic, i.e. 87 %, while the distribution of three species extends to Borneo, Sulawesi and the Philippines, respectively. Further 45 species of Argentina (as treated by the present author) are distributed in continental Asia from Pakistan to SE China and Vietnam, and southwards to Sri Lanka, Sumatra and Java. In other parts of the Old World and in America, only species of the Argentina anserina (L.) Rydb. complex can be found.

Argentina in New Guinea is very polymorphic, much more so than in any other part of the world, including the main evolutionary centre of the genus, which lies in the Sino-Himalayan region. The polymorphism manifests itself, for example, in the number, shape and indumentum of leaflets, stem length and the number of stamens. Some species have leaflets that are silvery beneath (the surface is not visible even under a magnifier); leaflets of other species are green or grey, glabrous or slightly hairy beneath (the surface is well visible under a magnifier). Some species have leaflets shaped as usual; in other species, however, the shape of leaflets is striking and unparallelled in continental species of Argentina (e.g. leaflets entire, 2–3-fid, bisect, palmatisect, etc.). Stems of some species are of usual size; in other species they are 1–2 cm or even only a few millimetres tall. The number of stamens varies, too. Nine New Guinean spe-

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cies have 5 stamens; three species have between 5 and 13 stamens. In eleven species, the number ranges from 1 to 20 (–30).

Among herbarium material from New Guinea recently studied, plants were noticed by the author that are characterised by a patent indumentum of the rachides, abaxially silvery or greyish green leaflets combined with the absence of runners terminated by leaves and five stamens. No other Argentina from New Guinea possesses such a combination of characters, which justifies its recognition of a separate species.

**Argentina recognita** Soják, sp. nov.

Holotypus: Indonesia, Irian Jaya: Mount Jaya. Head of Carstensz Meadow, 4.05°S, 137.1°E, 22.8.1992, H. A. Miller 23725 (MU; isotypus: K) – Fig. 1A–D.


_Caudex_ eramosus, 0.5–18 cm longus, crassus (saepe ± 1 cm in diam.), residus stipularum cano-albidus appresse pilosis dense obtectus. _Caules_ decumbentes vel e basi arcuatae ascendentes, (5–)8–17 (–25) cm alti, foliis basalisibus aquiliongi, interdum pauro breviore vel longiores, ±1–2-phylli (folia ea pinnata), 2–3(–6)-flori, pilis plerumque horizontaliter patentibus, flexuosis, longis et saepe item brevibus vestiti. _Rhaches_ pilis rectis (1–)1.5–2 (–2.5) mm longis, horizontaliter patentibus induatae. _Auriculae stipularum_ omnino connatae. _Folia_ matura (4–)8–15 (–23) cm longa, 14–18-jugopinnata (in parte superiore interdum nonnulla foliolis interpositis parvis, 2–4 mm longis praedita). _Foliola foliorum maturorum in medio lateris_ (5.5–)7–9 (–15) × (5–)6–9 (–13) mm magna, fere rotundata, marginibus non vel moderate tegentia, dentibus utrinque 4–6 (–8), brevibus, saepe obtusius, supra pilis oblique patentibus mediocrier diversissulis tecta, subitus argentea vel cana (usque cano-viridula), pilis appressis (vel subappressis) dense vel densissime induta (superficies folioli infra indumentum sub lente non visibilis vel visibilis), nervis lateralisibus plerumque insigniter prominentibus. _Foliola jugi summi_ e basi truncata brevir [0.3–2 (–3) mm], late decrementia. _Episepala_ lata, (2–)2.5 mm longa, interdum trifida. _Sepala_ (2–)2.5 mm longa. _Petala_ ± 3 mm longa. _Stamina_ 5; filamenta (saltem inferne) dilatata, plana; antheraeae 0.4–0.5 mm longae. _Syzygium_ lateralis, 0.5–0.8 mm longus, basi attenuatus, deinde saepe aequiquassus, stigmate dilatato. _Nuculae_ maturitate nigrae, glabrae, laeves, (0.9–)1–1.1 (1–1.4) mm longae; carpohorum crassum, patenter pilosum; receptaculum insigniter latum; calyx ad basin interdum cum bracteolis episperala immittavitis.

**Stock** unbranched. _Stems_ (5–)8–17 (–25) cm high, as long as or a little shorter or longer than basal leaves, with 1–2 leaves, 2–3(–6)-flowered. _Rachides_ with horizontally patent hairs. _Stipular auricles_ fused. _Adult leaves_ (4–)8–15 (–23) cm long, with 14–18 pairs of leaflets. _Leaflets in middle of leaf_ 5.5–15 × 5–13 mm, almost rounded, with 4–6 (–8) pairs of obtuse teeth, beneath silvery or greenish grey, with ± appressed, usually dense hairs. _Uppermost leaflet pair_ 0.3–2 (–3) mm decreent. _Episepals_ and _sepal_ (2–)2.5 mm long. _Stamens_ 5; filaments flat, dilated below. _Matres achenes_ black, smooth.

**Distribution.** — _Indonesia, Irian Jaya:_ Mount Jaya, Mimika Regency, PT-Freeport Indonesian Concession Area, W of Carstensz Meadow, 4°2’S, 137°6’E, 7.8.1998, R. J. Johns 9527 (K); Mount Jaya, E of Carstensz Meadow, 4°3’S, 137°6’E, 4.8.1998, M. J. S. Sand 7089 (K); Mount Jaya, 4.8.1998, R. J. Johns 9462 (K); Mount Jaya, DOM, 19.3.1999, P. Paradyamitika 10471A (K).

**Delimitation and affinities.** — In 2003, Johns marked three herbarium sheets of _Argentina recognita_ with revision labels with the name _P. hooglandii_ Kalkm. and published them correspondingly (Johns & al. 2006). This is understandable, since according to the identification keys in Royen (1983) as well as in Flora Malesiana (Kalkman 1993) the material cannot otherwise be identified. _A. recognita_ and _A. hooglandii_ (Kalkm.) Soják share two taxonomically important features, the indumentum of the rachides and the indumentum of the leaflet underside. This combination of characters is not present in any other species from New Guinea. The differences between the two species are, however, significant: _A. recognita_ has 5 stamens and stems terminated by a flower (‘axis determinata’), while _A. hooglandii_ has 10–12 (–20) stamens, crawling stems (runners) that are usually terminated by a bud and a leaf (‘axis indeterminata’), and its flowers tend to grow on lateral branches of the creeping main stem.

_Argentina recognita_ is also somewhat similar to _A. yonoweana_ (Danet) Soják. Both species share the same shape of the base of the uppermost pair of leaflets (shortly and broadly decreant) and a somewhat similar shape of leaflets. They are separated by a different number of stamens, a different number of leaflet pairs and their teeth, and a different indumentum of the rachides and stems. A similar habit is also found in some forms of _A. papuana_ (Focke) Soják, but their rachides are covered with appressed hairs and their flowers have 15–20 stamens.

Table 1 summarises the differential characters of species of _Argentina_ in New Guinea with a very dense indumentum of the leaflet underside, except those with an unusual leaflet shapes, which preclude any confusion.
with *A. recognita*. An up-to-date identification key to the currently known species of *Argentina* on New Guinea, also including all novelties published since Soják (1994), is given in the following.

**Key to the species of *Argentina* in New Guinea**

1. All or most lateral leaflets divided as far as the base into two separate, entire, unequal segments
   - Lateral leaflets not divided to the base into two segments

2. Leaflet segments linear or linear-elliptic, acute, to 0.6 mm wide, all lateral leaflets divided, leaves with 1–8 pairs of leaflets
   - *A. brassii* (Merr. & L. M. Perry) Soják
   - Leaflet segments broadly elliptic or ovate-elliptic, rounded at the tip, usually 0.7–0.9(–1.5) mm wide, some leaflets sometimes undivided, leaves sometimes with 8 or more pairs of leaflets
   - *A. simulans* (Merr. & L. M. Perry) Soják

3. Lateral leaflets palmatisect, divided up to their base
   - *A. habbemana* (Merr. & L. M. Perry) Soják

4. Terminal leaflet 2–3-fid
   - Terminal leaflet with 5 or more incisions

5. Lateral leaflets all entire or some entire and some with a small lateral tooth
   - Lateral leaflets all toothed

6. Leaves to 1 cm long, with 2–3 pairs of leaflets; stems 0.5–1.3 cm tall, cushion-like plant
   - *A. archboldiana* (Merr. & L. M. Perry) Soják
   - Leaves 9–10 cm long, with 10–12 pairs of leaflets; stems up to 16 cm tall, rosette plant
   - *A. indivisa* (Kalkman) Soják

7. Leaflet underside green, surface visible through the indumentum
   - *A. irianensis* (Kalkman) Soják

8. Leaves 0.5–1.5(–2) cm long, with 3–6 pairs of leaflets; stems 0.5–1(–1.5) cm tall; petals 2 mm long
   - *A. hooglandii* (Merr. & L. M. Perry) Soják
   - Leaves 2–10(–25) cm long, with 6–21 pairs of leaflets; stems 2–20(–38) cm tall; petals 5–11 mm long

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Fig. 1 A–D: *Argentina recognita* – habit (A); stipular auricle (B); indumentum of pedicel (C) and rachis (D); all after Miller 23725. – E–F: distal leaf portion of similar species – *A. papuana* (E), after Hoogland & Pullen 5680; *A. hooglandii* (F), after Barker 66984. – Scale bars: A = 5 cm, B = 5 mm, C = 2 mm, D = 4 mm, E–F = 1 cm.
Table 1. Differential characters of *Argentina* species in New Guinea with usual leaf shape and a very dense indument of the leaflet underside.

<table>
<thead>
<tr>
<th>Character</th>
<th><em>A. recognita</em></th>
<th><em>A. yonoweana</em></th>
<th><em>A. papuana</em></th>
<th><em>A. pycnophylla</em></th>
<th><em>A. adinophylla</em></th>
<th><em>A. gorokana</em></th>
<th><em>A. wilhelminensis</em></th>
<th><em>A. mangenii</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of stem [cm]</td>
<td>(5–)8–17–25</td>
<td>(15–)20–30–40</td>
<td>3–20–45?</td>
<td>(4–)15–30–50</td>
<td>4–12</td>
<td>0.8–1.5–3</td>
<td>1–3</td>
<td>1–2</td>
</tr>
<tr>
<td></td>
<td>as long as basal leaves</td>
<td>longer than basal leaves</td>
<td>longer than or as long as basal leaves</td>
<td>longer than basal leaves</td>
<td>longer than basal leaves</td>
<td>much shorter than basal leaves</td>
<td>shorter than basal leaves</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(plus 4–10 small, interposed pairs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of leaflet pairs</td>
<td>14–18</td>
<td>(7–)9–13</td>
<td>(5–)7–9–10</td>
<td>6–8–11</td>
<td>12–18</td>
<td>14–18</td>
<td>12–18</td>
<td>4–5</td>
</tr>
<tr>
<td>Length of upper leaflets in adult leaves [cm]</td>
<td>(0.5–)0.7–0.9–1.5</td>
<td>0.5–1.3</td>
<td>0.7–1–2</td>
<td>1.3–2.6</td>
<td>0.3–0.4–0.5–0.8</td>
<td>0.5–1</td>
<td>0.4–0.6</td>
<td>0.4–0.7</td>
</tr>
<tr>
<td></td>
<td>(leaflets of first order)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of tooth pairs (of leaflets in the middle of leaf)</td>
<td>4–6–8</td>
<td>1–4–5</td>
<td>5–8–9</td>
<td>8–16</td>
<td>3–8</td>
<td>(2–)3–4</td>
<td>(2–)3–4–5</td>
<td>1–3–5</td>
</tr>
<tr>
<td>Uppermost pair of leaflets</td>
<td>with truncate base shortly decurrent</td>
<td>sessile or shortly widely decurrent</td>
<td>not decurrent or very shortly decurrent</td>
<td>decurrent, rarely ± sessile</td>
<td>gradually long-decurrent</td>
<td>gradually long-decurrent</td>
<td>gradually long-decurrent</td>
<td>not decurrent or shortly widely decurrent</td>
</tr>
<tr>
<td>Number of flowers</td>
<td>2–3–6</td>
<td>4–15–18</td>
<td>2–3</td>
<td>1–10–20</td>
<td>1–2</td>
<td>1–4</td>
<td>1–4</td>
<td>1</td>
</tr>
<tr>
<td>Length of petals [mm]</td>
<td>unknown (3?)</td>
<td>3–5</td>
<td>5–8</td>
<td>5–7</td>
<td>unknown</td>
<td>5–7–18–8</td>
<td>3–3.5</td>
<td>3.5</td>
</tr>
</tbody>
</table>
9. Lateral leaflets 2-fid or mixed 2-fid and 3-fid. 

A. biloba (Danet) Sojak

Leaflets never 2-fid. 

A. parvula (Stapf) Sojak

10(7). Stems 4–18-flowered, 15–30(–40) cm tall; leaflets with 1–4(–5) pairs of teeth. 

A. yonoweana (Danet) Sojak

Stems 1–2-flowered, 4–9 cm tall; leaflets 2–3-fid. 

11. Stolons present; all or at least lower lateral leaflets 2-fid. 

A. bidentula (Sojak) Sojak

Stolons absent; all lateral leaflets 3-fid. 

12(4). Leaflets divided up to the midrib (i.e. their middle undivided part along the midrib only 0.2–0.4 mm wide) 

A. filiacincta (P. Royen) Sojak

Leaflets not divided to the midrib. 

13. Leaflet underside green, surface visible through the indumentum. 

14. Carpels apically hairy; petals 8–10 mm long. 

15. Surface of leaflet underside glabrous or only on veins hairy. 

A. balimiensis (Danet) Sojak

Leaflets with shallow incisions. 

16. Petals 2 mm long; leaves 0.5–1.5 cm long; stems to 1.5 cm tall. 

A. irianensis (Kalkman) Sojak

Petals more than 3 mm long; leaves 2–10(–25) cm long; stems 2.5–20(–38) cm tall. 

A. parvula (Stapf) Sojak

17(13). Petoioles and rachides with patent hairs. 

18. Plant with prostrate stems (runners, terminating usually by leaf instead flower) bearing erect leaves and lateral flowering branches; stamens 10 or more. 

A. hooglandii (Kalkman) Sojak

Stems distinct, ± as long as the basal leaves; stamens 5. 

A. recognita Sojak

19. Stems distinctly longer than basal leaves. 

A. adinophylla (Merr. & L. M. Perry) Sojak

20. Leaflets deeply (to 2/3–3/4 towards the midrib) divided, middle undivided part along midrib only 1–2 mm wide. 

A. victoriaidis (Sojak) Sojak

Leaflets with shallow incisions. 

21. Leaves in upper part of blade doubly interruptedly pinnate, leaflets with 8–16 pairs of incisions. 

A. pycnophylla (Sojak) Sojak

Leaves not or simply interrupted, leaflets with 1–3–9 pairs of incisions. 

22. Stems 4–15(–18)-flowered; leaflets with 1–4(–5) pairs of teeth (in the same individual). 

A. yonoweana (Danet) Sojak

Stems 1–3-flowered; leaflets with 3–9 pairs of incisions.

23. Leaves with (5–)7–9(–10) pairs of leaflets, leaflets (0.7–1)–2 cm long, not or slightly crowded; epispals 3–6 mm long. 

A. papuana (Focke) Sojak

Leaves with 12–18 pairs of leaflets, leaflets (0.3–) 0.4–0.5(–0.8) cm long, strongly crowded, often folded; epispals 2–3.5 mm long. 

A. adinophylla (Merr. & L. M. Perry) Sojak

24(19). Leaves with 4–5 pairs of leaflets. 

A. mangenii (Kalkman) Sojak

Leaves with 12–23 pairs of leaflets. 

25. Carpels apically hairy; petals 8–10 mm long. 

A. balimiensis (Danet) Sojak

Carpels glabrous; petals 3–7 mm long. 

26. Stamens 10–15; petals 5–7 mm long; leaves not densely hairy above. 

A. gorokana (Kalkman) Sojak

Stamens 5; petals 3–3.5 mm long; leaflets very densely hairy above. 

A. wilhelminensis (P. Royen) Sojak

References


