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Re-examination of *Vaccinium dialypetalum* (Ericaceae)

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Abstract

Morphological re-examination of *Vaccinium dialypetalum sensu lato* supports the view that it includes three distinct taxa: *V. dialypetalum* J.J.Sm., *V. micranthum* (Ridl.) Vander Kloet and *V. perakensis* (Ridl.) Vander Kloet, all first described by Ridley under *Agapetes* but transferred by Sleumer to *Vaccinium.* Keys and descriptions are provided to distinguish the three taxa and new combinations are made for two taxa.

Introduction

Ridley (1923) recognized three species of *Agapetes* (Ericaceae) based on their distinct floral development patterns. In all three species, floral axis development is sequential. First, the rachis emerges from the perennating bud, followed by the development of the pedicel and calyx tube at the first node (indicated by a tiny bract on the rachis) and finally the corolla, style and stamens are initiated. Thus in *A. perakensis* Ridl., the rachis and pedicels continue to lengthen and thicken in tandem until anthesis when rachis growth stops but the pedicel continues to elongate until the fruit ripens, producing a rachis 3-5 cm long with many pedicels 1-2 cm long. In *A. micrantha* Ridl., the development of the rachis is arrested but the pedicels continue to lengthen and thicken until the berry is ripe, resulting in a slender, 3-flowered rachis but *A. wrayii* Ridl., has a short stout rachis bearing many flowers on long pedicels that continue to elongate as the fruit matures.

Sleumer (1967) did not recognize these differences as significant and united them into a single species, *Vaccinium dialypetalyum* J.J. Sm. While Sleumer's transfer of Ridley's three *Agapetes* species to *Vaccinium* § *Galeopetalum* (J.J.Sm.) Sleumer is widely accepted, his broad species concept of *V. dialypetalum* was called into question when Ng (1976) separated specimens with shorter calyx lobes and stamens with glabrous filaments and short dorsal spurs as a new species, *V. pseudodialypetalum.* This latter species is, however, identical with Ridley's *Agapetes micrantha.*

Indeed, to place all three taxa in *V. dialypetalum* is quite untenable since at least two qualitative features separate each taxon, viz., corolla shape and stamen architecture separate *V. micrantha* from *V. dialypetalum*

and *V. perakensis,* whilst anther fusion and the shape of the staminal awns separate *V. perakensis* from *V. dialypetalum.* This morphological gap is sufficient to recognize each of Ridley's taxa at the specific level.

Taxonomic Treatment

Vacciniuin § Galeopetalum (J.J.Sm.) Sleumer, Notizbl. Berlin-Dahl. 13 (1936) 115. Subgenus *Galeopetalum,* J.J.Sm. Icones Bogoriensis 4 (1912) 101. **Type:** *Vaccinium dialypetalum* J.J.Sm.

In Malesia, according to Sleumer, this section is restricted to northern Sumatra and adjacent Peninsular Malaysia. Species, such as *V. petelotii* Merr., *V. lanigerum* Sleumer, and *V. dunalianum* Wight from northern Vietnam, adjacent Yunnan and the Tibet-Burma border, have also been referred to this section by Stevens (1969). However, Vander Kloet and Paterson (2000) found that *V. petelottii* is genetically quite similar to *V. tonkinense* Dop of sect. *Conchophyllum* Sleumer, hence Stevens' extension of sect. *Galeopetalum* into SE Asia needs to be reassessed.

Keys to Identify Malesian Taxa of *Vaccinium* § *Galeopetalum*

Key for flowering material

Corollas globose; calyx lobes shorter than the tube; stamens c. 1 mm long ..... 2. *V. micrantha*
Corollas campanulate; calyx lobes much longer than the tube; stamens 3-4 mm long
- Anthers fused ..... 1. *V. dialypetalum*
- Anthers free ..... 3. *V. perakensis*

Key for fruiting material

Rachis much shorter than the pedicels ..... 1. V. *dialypetalum*
Rachis as long as or much longer than the pedicels
- Rachis 1—2 cm long, fruits per raceme 3 or fewer ... 2. *V. micrantha*
- Rachis 3—10 cm long, fruits per raceme 4 or more . 3. *V. perakensis*

1. **Vaccinium dialypetalum** J.J.Sm. Icones Bogoriensis 4 (1912) 99, t. 331. **Type:** Indonesia, Java (cult.) *Rant & Smith 513 in* 1911. (holo, BO).
Synonyms: Agapetes pubescens Ridl., J. Bot. 62 (1924) 298. **Type:** *Burkill 6 Holttum 7828* (SING); *A. wrayii* Ridl, Fl. Malay Pen. 2 (1923) 205. **Type:** *Wray 8054* (SING);
Vaccinium longipes Sleumer, Bot. Jahrb. 71 (1941) 424. **Type:** not seen.

Epiphytic shrub with a well-developed tuber; stems 2 or 3, sinuous, 1-3 m long; innovations initially reddish and pubescent; leaves ovate-lanceolate, narrowly acuminate, 6-12 x 1.5-4.5 cm, margin entire, petioles 1-2 mm long; racemes axillary, 6-10-flowered; rachis much shorter than the pedicels; pedicels 2-4 cm long articulated with the calyx tube; calyx lobes longer than the tube at anthesis; corolla campanulate, whitish-green, 6 mm long, 7 mm in diameter, 5-lobed, lobes 4-5 mm long; stamens 7 mm long, anthers fused into ring, awns and tubules well developed; style glabrous, slender 6-7 mm long; berry black, 7-9 mm diam., seeds many and small.

Distribution and ecology: Northern Sumatra and Peninsular Malaysia (Main Range), in montane forests 900-1300 m altitude.

2. **Vaccinium micranthum** (Ridl.) Vander Kloet, **comb. nov.**
Type: Malaysia, Selangor, Sempang Mines, *Ridley 15768* (1911). (holo SING!).

Basionym: Agapetes micrantha Ridl., Fl. Malay Pen. 2 (1923) 205.
Synonyms: A. parviflora sensu Ridl., J. Roy. As. Soc. S. Br. 61 (1912) 26 *non A. parviflora* Dunn; *Vaccinium ridleyii* Sleumer, Bot. Jahr. 71 (1941) 424. **Type:** *Ridley 15768* (SING); *V. pseudodialypetalum* Ng, Gard. Bull. Sing. 28 (1976) 233. **Type:** *KEP 56673.*
non Vaccinium parviflorum Andrews, Bot Rep. (1800) 1.125 = *Gaylussacia resinosa* (Aiton) T & G.

Epiphytic shrub with a well-developed tuber; stems 2 or 3, slender, sinuous 1-2 m long; innovations initially reddish and softly pubescent; leaves deltoid-ovate, long caudate, 6-8 x 3-4.2 cm, margin entire, petioles 1-2 mm long; racemes slender, 3-flowered, often obscured by the leaves; rachis 1-2 cm long; pedicels 1-2 cm long, calyx lobes shorter than the tube; corolla globose, greenish-white, 3 mm long, 3-4 mm diam., 5-lobed; stamens 1 mm long, anther tubules and awns vestigial; style stout, glabrous, cylindrical, 3 mm long;berry black, 8-9 mm diam.; seeds small, 25-40; testa pale brown.

Distribution and ecology: Known only from Peninsular Malaysia (Pahang and Selangor), in montane forests between 1000-1600 m altitude.

3. **Vaccinium perakensis** (Ridl.) Vander Kloet, **comb. nov.**
Type: Malaysia, Perak, Thaiping, Maxwell's Hill, 750-1200 m altitude. *Ridley 5532* (holo SING!).
Basionym: Agapetes perakensis Ridl., Fl. Malay Pen. 2 (1923) 205.
Synonyms: A. griffithii sensu K&G, J. As. Soc. Beng. 74 (1905) 59 *non* C.B. Clarke in Hook.f. **Type:** *King 6363* (SING); *Vaccinium longilingue* Sleumer, Bot. Jahr. 71 (1941) 424. **Type:** *Ridley 5532* (SING); *V. urophyllum* Merr., Pap. Mich Ac. Sc. 19 (1934) 184. **Type:** *King 6363* (iso SING).

Epiphytic shrub with a well-developed tuber; stems few, slender and sinuous, up to 5 m long; innovations reddish and pubescent, rarely glandular; leaves ovate-lanceolate and often caudate, 8-14 x 2.2-5.5 cm wide, margin entire, petioles 2-3 mm long; racemes axillary, well-developed, glabrous, pubescent or glandular, 5-15 flowered; rachis invariably longer than the pedicels; pedicels 1-3 cm long, calyx lobes as long as or longer than the tube at anthesis; corolla campanulate, slightly 5-angled, creamy white often pink inside, 5-6 mm long, obtusely 4 or 5 lobed; stamens c. 6 mm long, anthers free, with 2 dorsal spreading and ultimately upwardly curved echinate arms, tubules slender and erect; style slender and glabrous, 6-7 mm long; berry reddish-black, often pubescent, 7-9 mm diam., seeds small, testa blackish.

Distribution and ecology: Northern Sumatra and Peninsular Malaysia, where it is uncommon, in montane forest, or riverine at lower elevations, 600-1200 m altitude.

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