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REDUCTION OF *DIPLYCOSIA INDICA* (2009) TO *GAULTHERIA AKAENSIS* (2006) (ERICACEAE)

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ABSTRACT

Diplycosia indica M.R. Debta & H.J. Chowdhery is reduced to synonymy under *Gaultheria akaensis* Panda & Sanjappa due to a misinterpretation of immature floral features of the type material used by Debta and Chowdhery to establish their new species.

KEY WORDS: nomenclature, synonymy, India, Singalelah National Park

Diplycosia indica was described by Debta and Chowdhery (2009) based on two specimens collected by M.R. Debta in the Singalelah National Park area of the Darjeeling Himalaya. During the course of recent field studies (mid-December 2011) at different locations in Singalelah National Park as part of post-revisionary work in Indian Ericaceae, specimens of a species of *Gaultheria* L. were collected near Megma, Megma-Tonglu road and in the Kainyakata-Kalapokhri area on rocky slopes near adjacent road sides. The *Gaultheria* was identified as *G. akaensis* Panda & Sanjappa (2006), a critically endangered species then known only from Aka Hill in the Arunachal Himalaya. This expression of *G. akaensis* from the Singalelah National Park then proved to be identical to the type of *D. indica*, which also was collected on hilly slopes in the Kainyakata-Kalapokhri area.

Surprisingly, during the consultation of the type specimens of *Diplycosia indica* at CAL and BSD, it was noted that the validating description and associated line drawing published by Debta and Chowdhery did not match features of the type specimens. Observations were made on different populations of *Diplycosia indica/Gaulthera akaensis* flowering in discontinuous patches from Megma to Tonglu and from Kainyakata to Kalapokhri, although Debta and Chowdhery (p. 149) stated that "the new species could not be traced from anywhere inside the Singalila [=Singalelah] National Park except for a small population." Here we provide a comparison of *G. akaensis* from two locations with the two specimens cited when *D. indica* was established to demonstrate that only a single species is involved (Table 1).

Taxonomic treatment

Gaultheria akaensis Panda & Sanjappa, Edinburgh J. Bot. 63: 15-20. 2006. **TYPE**: **INDIA**. Arunachal Pradesh, Aka Hills, West Kameng district, 3 km from Nechephu, 27 km towards Tenga, left bank of the bridge, 1800 m, 25 Dec 2002, *S. Panda 30824* (holotype: CAL!; isotype: CAL!). Fig. 1.

Diplycosia indica M. R. Debta & H. J. Chowdhery, J. Bot. Res. Inst. Texas 3: 147. 2009. **TYPE**: **INDIA**. West Bengal, Darjeeling, Singalila [=Singalelah] National Park, Kainyakata to Kalapokhri, ca. 2950 m, 2 Jun 2006, *M.R.Debta 40813* (holotype: CAL!; isotype: BSD!). Fig. 2.

Distribution. Endemic to the eastern Himalaya of India (Darjeeling in West Bengal and Arunachal Pradesh).

Habitat. This species is extremely rare and threatened in subtropical-temperate forests at an altitude of about 2250–3000 m associated with *Gaultheria stapfiana* Airy Shaw, various species of *Rhododendron*, and *Quercus leucotrichophora* A. Camus ex Bahadur. Fig. 3.

Flowering. June; December. **Fruiting**. July–August; January.

Specimens examined. **INDIA**. Eastern Himalaya-**Arunachal Pradesh**: Aka Hills, West Kameng district, 3 km from Nechephu, 27 km towards Tenga, left bank of the bridge, 1800 m, 25 Dec 2002, *S. Panda 30824* (CAL; type of *Gaultheria akaensis*). **West Bengal**: Darjeeling district, Singalelah National Park, 3 km from Chitray toward Megma, 2300 m, 11 Dec 2011, *S. Panda 78* (CAL); 7 km from Chitray toward Megma, 2400 m, 11 Dec 2011, *S. Panda 79* (CAL); Kainyakata-Kalapokhri road, 2900 m, 12 Dec 2011, *S. Panda 80* (CAL); Kainyakata to Kalapokhri, 2950 m, 2 Jun 2006, *M. R. Debta 40813* (BSD, CAL; type material of *Diplycosia indica*).

Discussion

It is concluded that the description of *Diplycosia indica*, as given by Debta and Chowdhery (2009), does not conform to their type materials due to their misinterpretation of the floral features associated with immature flower buds. They presented and described a mature flower which is not associated with their type material, although vegetatively their description conforms with collections made by the senior author (*S. Panda 78, 79, 80*; CAL) from Singalelah National Park, including the type location cited by Debta and Chowdhery.

Diplycosia indica does not possess any generic characters of *Diplycosia* Blume, namely a fasciculate inflorescence, awnless anther lobes, and anthers with tubules. Rather the type specimens of Debta and Chowdhery possess the generic characters of *Gaultheria*. Without doubt, their assumption that the anther lobes were awnless was due to the immature nature of the flowers, as an awnless condition is not unusual in immature flowers of some species of *Gaultheria*. From Table 1, it is also concluded that while geographically isolated from *G. akaensis*, the Darjeeling populations of *D. indica* are nearly identical with the Arunachal population of *G. akaensis* except for leaf shape. The Arunachal population of *G. akaensis* has slightly larger ovate to ovate-elliptic lamina and a reduced number of stamens (5–7) while the Darjeeling populations have a slightly shorter elliptic to ovate-elliptic lamina and more stamens (10). As variation in leaf shape is to be expected, and differences in anther numbers are not uncommon in *Gaultheria*, we conclude that *D. indica* is a heterotypic synonym *G. akaensis*.

Figure 1. Holotype of *Gaultheria akaensis* Panda & Sanjappa (CAL). Arunachal population

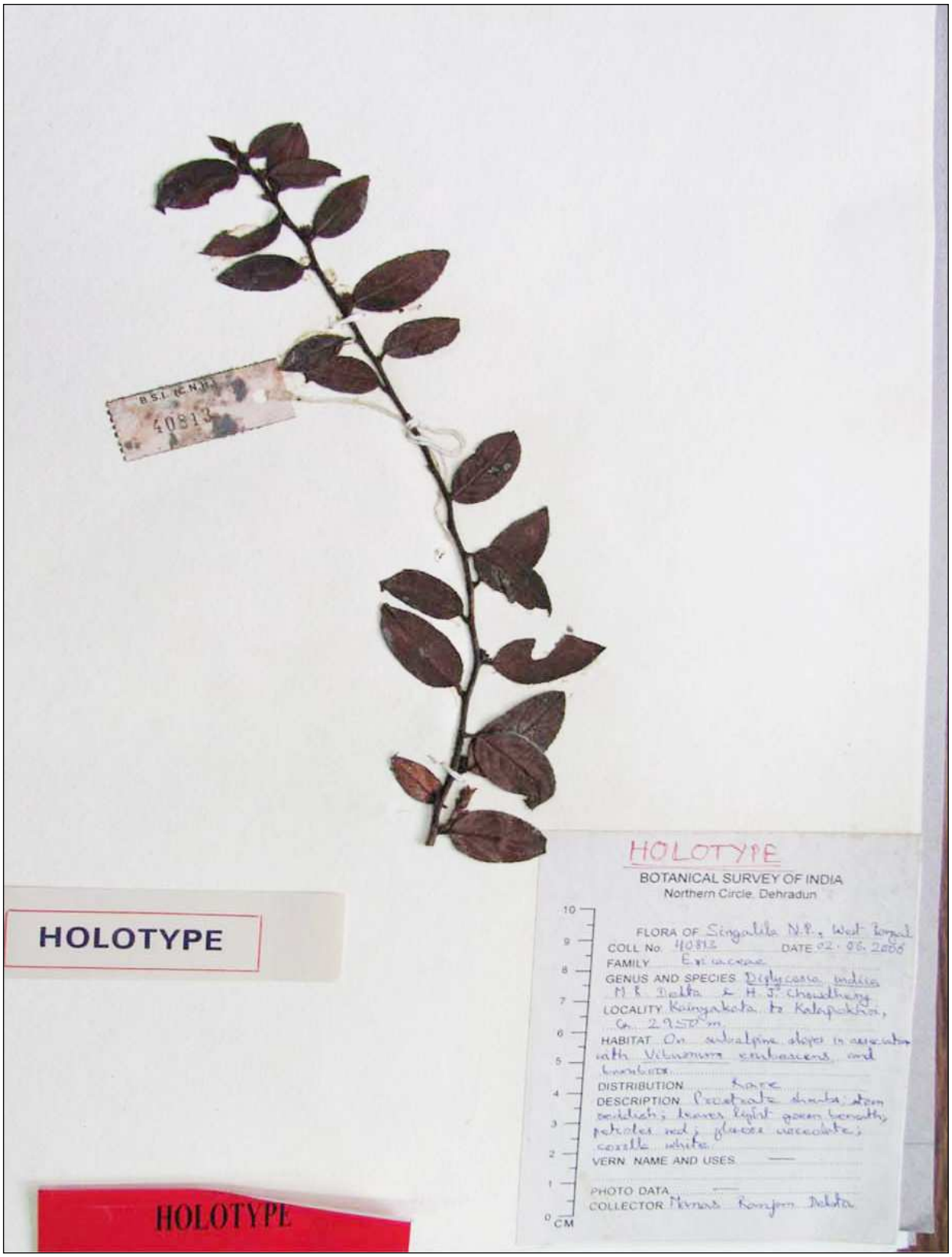

Figure 2. Holotype of *Diplycosia indica* M.R. Debta & H.J. Chowdhery (CAL). Darjeeling population.

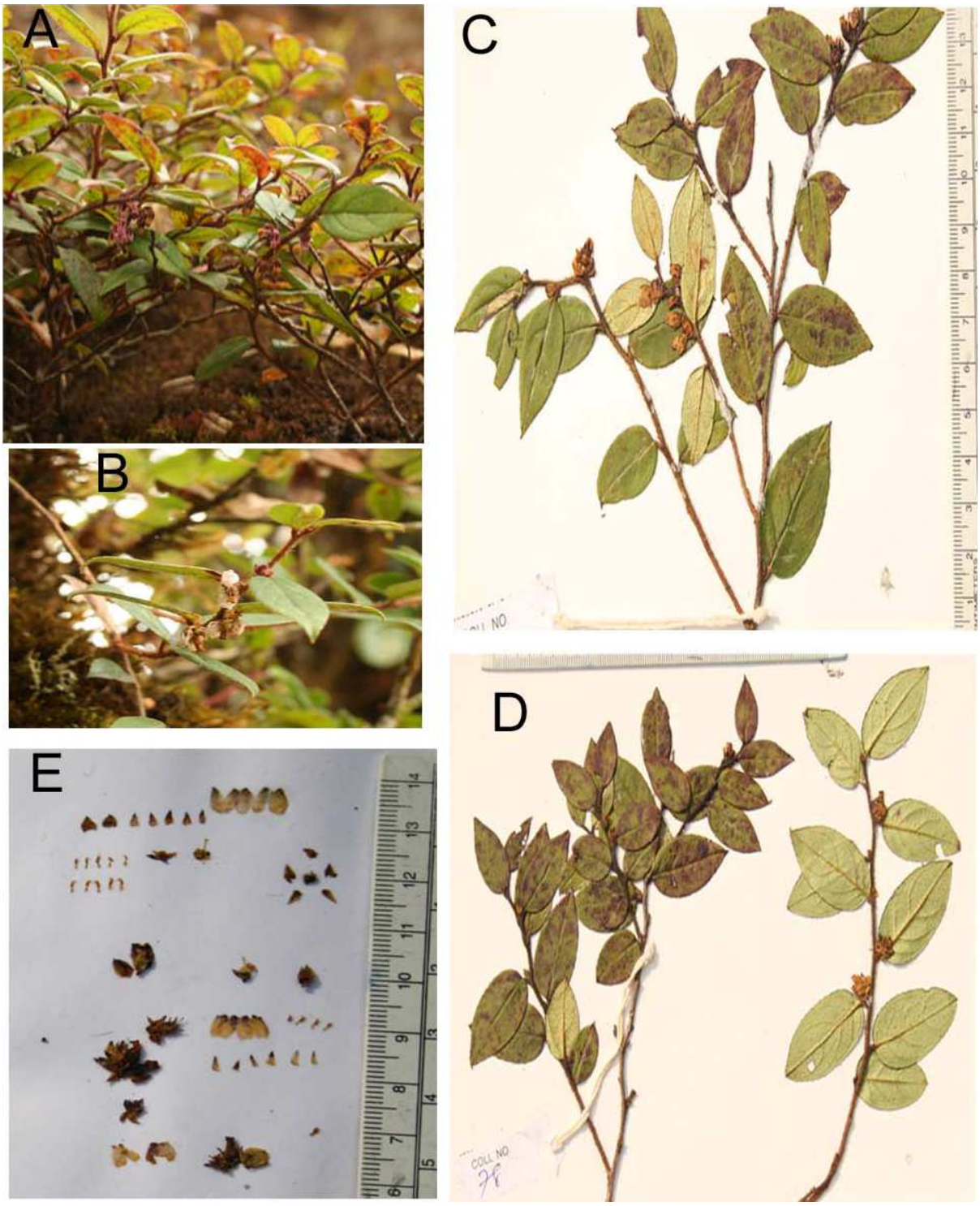

Figure 3. Live plants of *Gaultheria akaensis*. Darjeeling populations. A–B. Habit (part). C–D. Flowering twigs (close up). E. Dissected floral parts.

Table 1. Comparison among *Diplycosia indica*, *Gaultheria akaensis* (Arunachal population) and *G. akaensis* (Darjeeling population) – see also Fig. 3.

Unique characters	***Diplycosia indica*** (*M.R.Debta* 40813: CAL & BSD) ***Darjeeling population***	***Gaultheria akaensis*** (*S. Panda* 30824: CAL) ***Arunachal Population***	***G. akaensis*** (*S. Panda* 78, 79, 80: CAL) ***Darjeeling populations***
Habit	Prostrate shrub up to 1.5 m high.	Prostrate-decumbent mat-forming stout shrub up to 1 m high.	Prostrate-decumbent mat-forming stout shrub up to 1 m high.
Stem	Terete, laxly to densely brown hirsute or setose, reddish.	Terete, densely brown hispid-setose, branchlets blood-red to dark pink.	Terete, densely brown hispid-setose, branchlets blood-red to dark pink.
Lamina	Subcoriaceous; elliptic to ovate-elliptic; 13–36×7–18 mm; mucronate at apex; serrulate margin with short cilia up to 1 mm long;	Papery to subcoriaceous; ovate to ovate-elliptic; (15) 25–42×16–28 mm; mucronate at apex; serrulate margin with long cilia up to 5 mm long;	Subcoriaceous; elliptic, ovate-elliptic to oblong-elliptic; 12–46×10–22 mm; mucronate at apex; serrulate margin with short cilia up to 1 mm long;
petioles	1.5–3 mm long, densely hispid-setulose, reddish.	2–3 mm long, setulose, reddish.	2–3 mm long, densely hispid-setulose, pink.
Inflorescence	Congested and short racemes with fascicle of 3–6-flowered.	Congested and short racemes with fascicle of 4–5-flowered.	Congested and short racemes with fascicle of 4–5-flowered.
Flower	Not on type material but 6–8 mm long, urceolate with 1 basal bract and 2 opposite and apical bracteoles as per description.	8 mm long, urceolate with 1 basal bract and 2 opposite and median bracteoles.	6–8 mm long, urceolate with 1 basal bract and 2 opposite and apical bracteoles.
Calyx lobes	5-lobed; each lobe ovate-triangular, 3×1.5 mm, puberulous.	5-lobed; each lobe ovate-triangular, 2×1 mm, glabrous.	5-lobed; each lobe ovate-triangular, 3×1.5 mm, puberulous.
Corolla	Not seen but as per description: 4 mm long (due to mature flower bud); urceolate; white; glabrous.	5 mm long; urceolate; light pink to white; glabrous.	5 mm long; urceolate; light pink to white with purple stripes at apex; glabrous.
Stamens	Not seen but as per description: 10; encircling round the pistil, loosely epipetalous, 1.5 mm long (due to immaturity); each lobe of anthers without awns (due to immature flower buds); no apical tubule seen.	5 (7); encircling round the pistil, loosely epipetalous, 2 mm long; each lobe of anthers with 2 minute apical awns; no apical tubule seen.	10; encircling round the pistil, free (not epipetalous), 2.5 mm long; each lobe of anthers with 2 minute apical awns; no apical tubule seen.
Pistil	2.5–3.5 mm long; ovary 1×1.5 mm, scarcely puberulous.	3.5 mm long; ovary 1×1 mm, densely puberulous.	3.5 mm long; ovary 1×1.5 mm, densely puberulous.
Fruit	Not seen.	Immature fruits: loculicidally 5-valved capsule, 3×3 mm.	Immature fruits: loculicidally 5-valved capsule, 3×2 mm.

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