Agapetes smithiana Sleumer var. *smithiana* -- a threatened plant on the verge of extinction

Populations of *Agapetes smithiana* Sleumer var. *smithiana* (Ericaceae: Vaccinioideae) are decreasing day by day in their natural habitats since its discovery by Gammie (1892) from Lachung Valley in Sikkim. The taxon is endemic to the eastern Himalaya of India (Sikkim & Darjeeling of West Bengal), Nepal, and Bhutan (Ghosh & Mallick 2014). Currently, the taxon is survived by a single to six individual plants in their natural habitats in Sikkim (Versay WS: Singh 2002–based on herbarium specimen by P. Singh 24981 at BSHC; Damthang: Sahu 2004 - based on herbarium specimen by A.K. Sahu 26669 at BSHC); West Bengal (Lower Tonglu in Darjeeling: Chamberlain 1975– based on herbarium specimen by D. Chamberlain 49 at DD and one reference (Panda & Reveal 2012); Nepal (an unknown locality under Eastern Nepal: H. Hara in (Hara et al. 1982) and Bhutan (Chhukha District: D.G. Long & S.J. Rae in A.J.C. Grierson & D.G. Long, 1991 and Trongsa District (Hara 1971). Based on herbarium consultations and field visits, present work provides its field description, distribution, current status and conservation aspects along with live images.

Agapetes smithiana Sleumer was first described by William Wright Smith (1911) based on specimens collected by George Alexander Gammie in 1892 as *Pentapterygium sikkimense* W.W.Sm. from Lachung Valley in the state of Sikkim. After Gammie, this species was collected by Charles Gilbert Rogers in 1899 from the lower Tonglu region of Darjeeling Himalaya in the state of West Bengal, India. Since Rogers collection (1899), no further collections were made for long time until Chamberlain (1975) who collected from Dilpa of lower Tonglu Valley. Following Chamberlain, Singh (2002: herbarium data), Sahu (2004: herbarium data), and Panda (2011: herbarium data) collected and reported this species from different localities of Sikkim and Darjeeling Himalaya, respectively. Hara (1982) reported from a locality under eastern Nepal based on his collection of two fruiting materials deposited at Tokyo University Herbarium (TI 6300562 & 6300563, fr). Hara (1971) also reported from Chendebi-Tashiling area in Trongsa district of Bhutan based on his collection in 1967 at an altitude of about 2300m. D.G. Long & S.J. Rae (1991) in A.J.C. Grierson & D.G. Long reported from Chukka District (north of Jumudag) of Bhutan based on their collections.

Agapetes smithiana Sleumer var. ***smithiana*** in *Bot. Jahrb. Syst*. 70: 106. 1939; Panda & Reveal, *Phytoneuron* 2012–8: 2. 2012. *Pentapterygium sikkimense* W.W.Sm. in *Rec. Bot. Surv. India* 4: 268. 1911. Type:

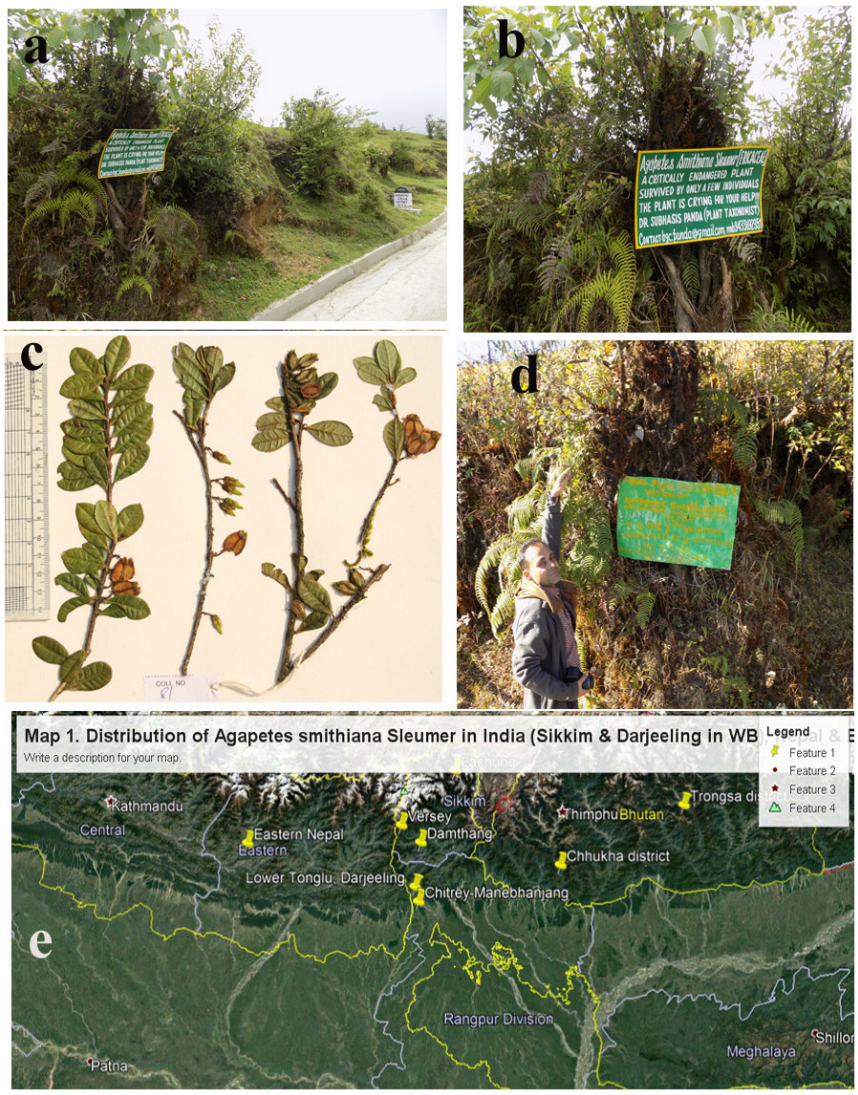

Image 1. *Agapetes smithiana* Sleumer var. *smithiana*: a–d—Chitrey-Manebhanjang-lower Tonglu population, Darjeeling | a—epiphytic Habit on *Quercus* tree trunk | b—twigs and branches | c—close-up of twigs showing flowers and fruits | d—putting awareness board in front of habit | e—distribution map.

India, Sikkim Himalaya, Lachung Valley, 7500 ft, 14.09.1892, *G.A. Gammie 1216* (lectotype: K!barcode no. K000729429).

Usually epiphytic dwarf shrub on tree trunks, 0.1–1m long. Stems rigid, terete, lenticellate, sparsely strigose-hispid; branches. Leaves compactly 2–3-stichous, 2–10 mm apart, coriaceous, subsessile; petioles 1–3 mm long, puberulous. Inflorescence cauline, 1–4-fascicled in a corymb. Flowers 12–16 mm long including pedicels with bract and bracteoles; pedicels greenish-pink, sparsely hirtellous, 4–5 mm long. Calyx campanulate, winged, light green with pinkish wings, persistent in fruits. Corolla greenish-yellow, tubular, 10–13 × 4 mm, 3.5–4.5 mm diam., glabrous. Stamens 10, encircling the pistil, distinct, 8–8.5 mm long; filaments slightly adnate to ovary disc. Pistil ca. 12 mm long. Fruit a berry, ovoid, 12–16 × 10–12 mm, light green (immature) to white (mature), glabrous, with an accrescent, winged calyx.

Distribution*:* Endemic to eastern Himalaya of India (Sikkim and Darjeeling), eastern Nepal, and Bhutan.

Flowering: April–early September; December.

Fruiting: July–August; December–January.

Habit: Epiphytic on tree trunks or rarely in rock crevices.

Habitat: Subtropical-temperate forests at altitudes ranging from 2,300–2,650 m.

Specimens examined: 24981 (BSHC), 18.v.2002, India, Sikkim Himalaya, Chitrey to Uttarey, coll. P. Singh; Damthang, 2,133–2,438m, ii.2004, coll. A.K. Sahu; 26669 (BSHC: fl.). West Bengal, Darjeeling, 3km

NW of Chitrey, along Sandakphu Trek route, 2,650m, 27.135 N & 88.167 E, 11.xii.2011, S. Panda 81 (CAL!); below Tonglu at Dilpa, 2,530m, 02.iv.1975, D. Chamberlain 49 (DD).
Local name: *Chara-ko-khorsanejato-pahelo* (Nepalese of Manebhanjang, Chitrey & Lamedura).
Notes: Author assumes Lower Tonglu population near Dilpa collected by Chamberlain (1975) may be similar to Chitrey population collected by Panda (2011) as both possessing nearly same altitude and 'Dilpa' basti is located about 1 km down of Chitrey toward Nepal side (Dilpa is located under Elam district in Nepal).

Conservation status: As a result of detailed herbarium consultations in different Indian herbaria as well as extensive field visits in Darjeeling (2011–2018) and Sikkim (2000–2004; 2007) Himalaya, currently four smaller populations were traced in Indian eastern Himalaya, viz., Versey (Chitrey-Uttarey route) in West Sikkim, Damthang in South Sikkim, Dilpa-Lower Tonglu and Chitrey in Darjeeling. Unfortunately, no further collections were made from the Lachung valley (type locality) in Sikkim after Gammie (1892). Populations of Chhukha and Trongsa districts in Bhutan showed a few individual plants epiphytic on tree trunks (D.G. Long & S.J. Rae 1991). Nepal populations collected by Hara (deposited in TI-Tokyo University Herbarium) also showed the smaller populations survived by only two individual plants epiphytic on tree trunks. The author put up a board in front of Chitrey population of Darjeeling in 2014 and 2019 to create awareness among the local Nepalese for conservation. The taxon is not assessed yet as per the IUCN Red List of Threatened Species (2019), but the taxon will qualify as Critically Endangered based on Criteria A [A4c], B [B2,b,c] and D [<50 in each population based on field visit and herbarium consultation].

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Acknowledgements: Author is grateful to the herbarium-in-charges of Indian herbaria (CAL, DD, BSHC) for their permission to consult herbarium specimens, to Dr. P. Lama, officer-in-charge of Darjeeling Government College and to Dr. Subhasis Dutta, principal of Maulana Azad College for their kind permission to conduct this work.

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Citation: Panda, S. (2020). *Agapetes smithiana* Sleumer var. *smithiana* -- a threatened plant on the verge of extinction. Plantasia #21, In: *Zoo's Print* 35(10): 09–11.