

**Uncommon flowering in *Rhododendron cinnabarinum* Hook.
f. subsp. *cinnabarinum* (Ericaceae: Ericoideae) observed in
Darjeeling Himalaya, India**

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Abstract

During field studies at different places of Singalila National Park in Darjeeling Himalaya from September 2013 to November 2019, uncommon flowering of *Rhododendron cinnabarinum* Hook. f. subsp. *cinnabarinum* was observed at three different populations viz., Tonglu, Tumling-Gairibas and Kaiakata-Kalipokhri. *Rhododendron cinnabarinum* Hook. f. subsp. *cinnabarinum* flowers once in a year throughout its natural habitat from April to early June. Flowering populations of this subspecies were not observed in other natural habitats in Darjeeling during September to November since the period from 2013 to 2019 as a result of regular monitoring, also not reported from other phytogeographical regions viz., Sikkim, Nepal, Bhutan and China so far literature and herbarium specimens consulted. Therefore, this phenomenon of uncommon flowering of this subspecies is a significant scientific novelty reported for the first time from Darjeeling Himalaya.

Rhododendron cinnabarinum Hook. f. was first described by Sir J. D. Hooker¹⁰ based on his collections from Sikkim Himalaya. Populations of this species are variable in respect to shape of lamina and corolla, colour of corolla and presence or absence of lepidotes on corolla lobes. Therefore, Cullen & Chamberlain⁵ recognized three distinct subspecies under *R. cinnabarinum* Hook. f.,

viz., subsp. *cinnabarinum*, subsp. *xanthocodon* (Hutch.) Cullen and subsp. *tamaense* (Davidian) Cullen mainly based on presence or absence of lamina lepidotes on upper half, corolla lepidotes outside and corolla shape. Hanbi & Chamberlain⁸ treated subsp. *xanthocodon* (Hutch.) Cullen as a distinct species, *R. xanthocodon* Hutch., while treating *R. tamaense* Davidian as subsp.

tamaense (Davidian) Cullen under *R. cinnabarinum* Hook. f. based on corolla colour and characteristic scales of abaxial corolla lobes. However, Bhattacharyya & Sanjappa¹ reported two subspecies, viz., subsp. *cinnabarinum* and subsp. *xanthocodon* (Hutch.) Cullen from India, as subsp. *tamaense* (Davidian) Cullen is restricted only to South-western China and Northern Myanmar.

Key to the Subspecies

(for easy identification in the field)

1a. Corolla lobes lepidote outside; most leaves deciduous; corolla purple

subsp. *tamaense*

1b. Corolla lobes elepidote outside; most leaves evergreen; corolla variable in colour to rarely purple 2

2a. Length/breadth ratio of lamina 2.2 or more; lamina elepidote above; corolla always tubulocampanulate

subsp. *cinnabarinum*

2b. Length/breadth ratio of lamina always less than 2.2; lamina always lepidote above; corolla usually campanulate to rarely broad tubulocampanulate

subsp. *xanthocodon*

Generally *R. cinnabarinum* Hook. f. subsp. *cinnabarinum* flowers once in a year throughout its natural habitat. Peak flowering occurs from late April to late May, but sometimes also occurs in early April and lasts up to early June^{1-4,6,8,12-14}. Subsp. *cinnabarinum*, an ericoid plant of temperate and subalpine climate, is found naturally in India (Arunachal Pradesh, Darjeeling in West Bengal and Sikkim Himalaya), Eastern Nepal, Bhutan and South-western China. Local Nepalese of Darjeeling call it as '*Sano Chimal*'.

During field studies at different places of Singalila National Park in Darjeeling Himalaya in September 2013, author noticed uncommon flowering at two different populations of *R. cinnabarinum* Hook. f. subsp. *cinnabarinum* at an interval of 1 km area, one at proper Tonglu at an altitude of about 3050 m. (total 7 plants in flowering among 14 plants) and another at Tumling-Gairibas trek route at an altitude of about 2936 m. (total 9 plants in flowering among 17 plants). Flowering populations of this subspecies were not observed in other natural habitats in Darjeeling during September since the period from 2013 to 2019 as a result of regular monitoring, also not reported from other phytogeographical regions viz., Sikkim, Nepal, Bhutan and China so far literature (already mentioned) and herbarium specimens consulted (CAL, BSHC, ASSAM, DD, BSD, ARUN, APFH, Lloyd Botanical Garden Herbarium, Darjeeling).

As a result of regular monitoring since September 2013, author also observed its uncommon flowering at Tonglu and Tumling-Gairibas populations in September 2014 to September 2019 (except 2016, when no flowering seen). Meanwhile author also noticed uncommon flowering at Kaiankata-Kalapokri population consisting of about 21 plants at an altitude of about 2907 m (about 13 km from Tumling-Gairibas population toward Sandakphu trek route) in late October 2017 (4 plants in flowering), November 2018 (9 plants in flowering) and November 2019 (7 plants in flowering).

Taxonomy :

Rhododendron cinnabarinum Hook. f., subsp. *cinnabarinum* in Rhododendr. Sikkim-

Himal.: t. 8. 1849; C. B. Clarke³ in Hook. f., Fl. Brit. India 3: 474. 1882; Cullen, Notes Roy. Bot. Gard. Edinburgh 39: 123. 1980; H. Hara in H. Hara *et al.*, Enum. Fl. Pl. Nepal 3: 57. 1982; Pradhan & Lachungpa¹³, Sikkim-Himalayan Rhodod.: 56. 1990; Long¹¹ in Grierson & D. G. Long, Fl. Bhutan 2: 382. 1991; Y. Hanbi & D. C. Chamb. in Wu *et al.*, Fl. China 14: 300. 2005; Bhattacharyya¹ & Sanjappa in Sanjappa & Sastry, Fasc. Fl. India 25: 23. 2014; Mao *et al.*¹², Rhododendron NE India: 44. 2017. *Rhododendron roylei* Hook. f. in Rhododendr. Sikkim-Himal.: t. 7. 1849. *R. blandfordiiflorum* Hook. f. in Bot. Mag. 82: t. 4930. 1856. (Figs. 1–9).

Type: India, Sikkim Himalaya, *J. D. Hooker s.n.* (K, cibachrome image!).

Erect or straggling shrub to treelet, up to 4 m tall (usually 2–3 m). Stem profusely branched with purple and glaucous young shoots beset with lepidote scales. Lamina broadly to narrowly elliptic to rarely lanceolate, 5–7.5 × 2–3.5 cm, greyish-green above, lepidote and glaucous beneath. Inflorescences 3–7-flowered during April–May (2–4-flowered seen in September–October–November flowering), drooping. Calyx 5-lobed, dark pink, disc-like or undulate, lepidote dorsally, 1.5–2.5 mm long. Corolla 5-lobed, tubulo-campanulate, size variable, 27–51 mm long (highest length seen in Tonglu population *c.* 51 mm long in May flowering, not reported yet), orange red, purple-red, yellowish-red, coppery-red, salmon to cinnabar-red, waxy, light saffron inside, glabrous; tube 15–31 mm long; lobes 12–20 mm long. Stamens 10, heteromorphic, 18–36 mm long; filaments pilose basally, reddish-pink to light pink toward apex; anther lobes *c.* 1

mm long, smooth, brown. Ovary densely beset with lepidote scales, 4–5 mm long, oblong-ovoid. Style basally pilose or rarely lepidote at the base, variable, 27–39 mm long, pinkish-purple. Capsule 8–12 mm long, beset with lepidote scales, cylindrical.

Habitat: This species grows gregariously in temperate and subalpine forest along rocky slopes, cliffs and ridges along with *Rhododendron barbatum*, *R. fulgens*, *R. falconeri* and *Lyonia villosa* at altitudes ranging from 2900–3400 m.

Flowering phenology: Common Occurrence—early April to early June (up to early July reported by D. G. Long¹¹ in Flora of Bhutan: 1991), peaking during late April to Late May. Uncommon occurrence reported in this work—late September to mid-November (late September to early October in Tonglu and Tumling-Gairibas populations while late October to mid-November in Kaiankata-Kalapokri population). **Fruiting:** November to early December.

Specimens examined: India, Eastern Himalaya, Darjeeling district, **Tonglu:** 3050 m, 27° 02.152¹ N & 88°04.614¹ E, 26.09.2013, S. Panda 88 (Darjeeling Govt College Herbarium, DGC); 16.09.2014, S. Panda & SS Nepal 322 (DGC); 27.09.2015, S. Panda & A. Mukherjee 09 (DGC); 18.09.2017, S. Panda 99 (Maulana Azad College Herbarium, Kolkata, MAC); 23.09.2018, S. Panda & P. Roy 177 (MAC); 19.09.2019, S. Panda & R. Thakuri 74 (MAC). **Tumling-Gairibas** Trek route: 2936 m, 27° 01.053¹ N & 88°03.057¹ E, 26.09.2013, S. Panda 92 (Darjeeling Govt College Herbarium, DGC); 16.09.2014, S.



Fig. 1 (September 2013)



Fig. 2 (Sept. 2014)



Fig. 3 (Sept. 2015)

Figs. 1–3: subsp. *cinnabarinum* flowering populations in September at Tonglu



Fig. 4 (Sept. 2017: Tumling-Gairibas);
Fig. 6 (November 2019: Kaiakata-Kalapokri).



Fig. 5 (October 2018: Kaiakata-Kalapokri);
Figs. 4–6: subsp. *cinnabarinum* flowering population.

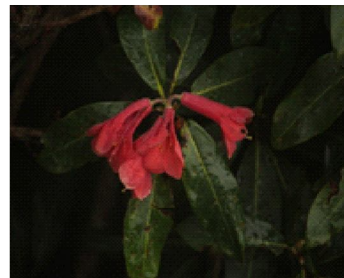


Fig. 7. Tumling-Gairibas population (MAC-77: Sept. 2019); Fig. 8–9: Kaiakata-Gairibas population (MAC-97 & MAC-99: October & November 2019 respectively). Figs. 7–9: dissected floral parts of subsp. *cinnabarinum*

Ethnic use: Corollas are used to prepare indigenous good quality wine by the Nepalese of Tumling.
IUCN Status: Evaluated as LC (Least Concern) by Gibbs *et al.*⁷ 2011.

Panda & SS Nepal 326 (DGC); 27.09.2015, S. Panda & A. Mukherjee 13 (DGC); 18.09.2017, S. Panda 112 (Maulana Azad College Herbarium, Kolkata, MAC); 23.09.2018, S. Panda & P. Roy 182 (MAC); 19.09.2019, S. Panda & R. Thakuri 77 (MAC). **Between Kaiankata and Kalapokri** trek route, 2907 m, 27°04.327¹ N & 88°00.277¹ E, 29.10.2017, S. Panda & J.K. Thami 271 (MAC); 13.11.2018, S. Panda & R. Thakuri 97 (MAC); 14.11.2019, S. Panda & R. Thakuri 199 (MAC).

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