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Journal of Threatened Taxa

Building evidence for conservation globally

www.threatenedtaxa.org

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

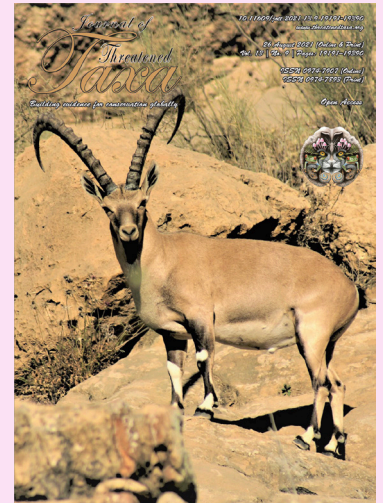
NOTE

REDISCOVERY OF THE BHUTAN PRIMROSE *PRIMULA JIGMEDIANA* W.W. SMITH (ANGIOSPERMS: PRIMULACEAE) AFTER 87 YEARS IN BUMDELING WILDLIFE SANCTUARY, BHUTAN

Tez B. Ghalley, Tshering Dendup, Karma Sangay & Namgay Shacha

26 August 2021 | Vol. 13 | No. 9 | Pages: 19386–19388

DOI: [10.11609/jott.7289.13.9.19386-19388](https://doi.org/10.11609/jott.7289.13.9.19386-19388)



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Rediscovery of the Bhutan Primrose *Primula jigmediana* W.W. Smith (Angiosperms: Primulaceae) after 87 years in Bumdeling Wildlife Sanctuary, Bhutan

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The genus *Primula* L. of the family Primulaceae is one of the largest and widely spread of all genera with approximately 430 species distributed mainly in temperate and alpine regions of the northern hemisphere (Richards 2003). In Bhutan, there are about 71 species of *Primula* L. recorded in the country (Grierson & Long 1999). The first expedition of Ludlow & Sherriff to explore eastern Himalaya, particularly Bhutan and southeastern Tibet, was in 1933. During their expedition they discovered no less than 26 species of *Primula* new to science (Richards 2003). It was during that time the species *Primula jigmediana* was discovered for the first time and was named in honour of His Majesty the 2nd King of Bhutan for his kindness and courtesy during their visit to the country (Smith 1936).

Primula jigmediana is atypical compared to other *Primula* species and its distribution is still poorly studied (Smith & Fletcher 1942). Bawri et al. (2018) during botanical expedition in Arunachal Pradesh, India discovered *Primula jigmediana* for the first time. The species is found to be rare with few individuals (Bawri et al. 2018). The same species found in Arunachal Pradesh has narrower leaves as compared to species recorded in

Bhutan (Bahrli et al. 2018). The present observation of the species from Bumdeling Wildlife Sanctuary, Bhutan records the rediscovery of this species after a lapse of 87 years, and presents additional morphological description along with conservation threat and distribution of the species.

Primula jigmediana was sighted in northeastern part of Bumdeling Wildlife Sanctuary, Bhutan (91.541°E, 27.906°N) on 18 July 2020 at an elevation of 4,490 m. The manual Flora of Bhutan (Grierson & Long 1999) was used for identification and morphological description of *Primula jigmediana*. The herbarium was prepared following Smith (1971). The specimen is deposited in the herbarium section of the Bumdeling Wildlife Sanctuary.

Taxonomy

Primula jigmediana W.W. Smith (1936); Smith & Fletcher (1942); Grierson & Long (1999); Richard (2003); Bawri et al. (2018).

Type: Bhutan, Me La, 3.viii.1933, Ludlow & Sherriff 397 (Holotype- BM!). Seen as a photo.

Description: *Primula jigmediana* W.W. Smith is a perennial herb in the family Primulaceae. It has calyx

Editor: K. Haridasan, Palakkad District, Kerala, India.

Date of publication: 26 August 2021 (online & print)

Citation: Ghalley, T.B., T. Dendup, K. Sangay & N. Shacha (2021). Rediscovery of the Bhutan Primrose *Primula jigmediana* W.W. Smith (Angiosperms: Primulaceae) after 87 years in Bumdeling Wildlife Sanctuary, Bhutan. *Journal of Threatened Taxa* 13(9): 19386–19388. <https://doi.org/10.11609/jott.7289.13.9.19386-19388>

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Funding: None.

Competing interests: The authors declare no competing interests.

Acknowledgements: The authors would like to thank the management of Bumdeling Wildlife Sanctuary, Trashiyangtse for their full support and guidance.

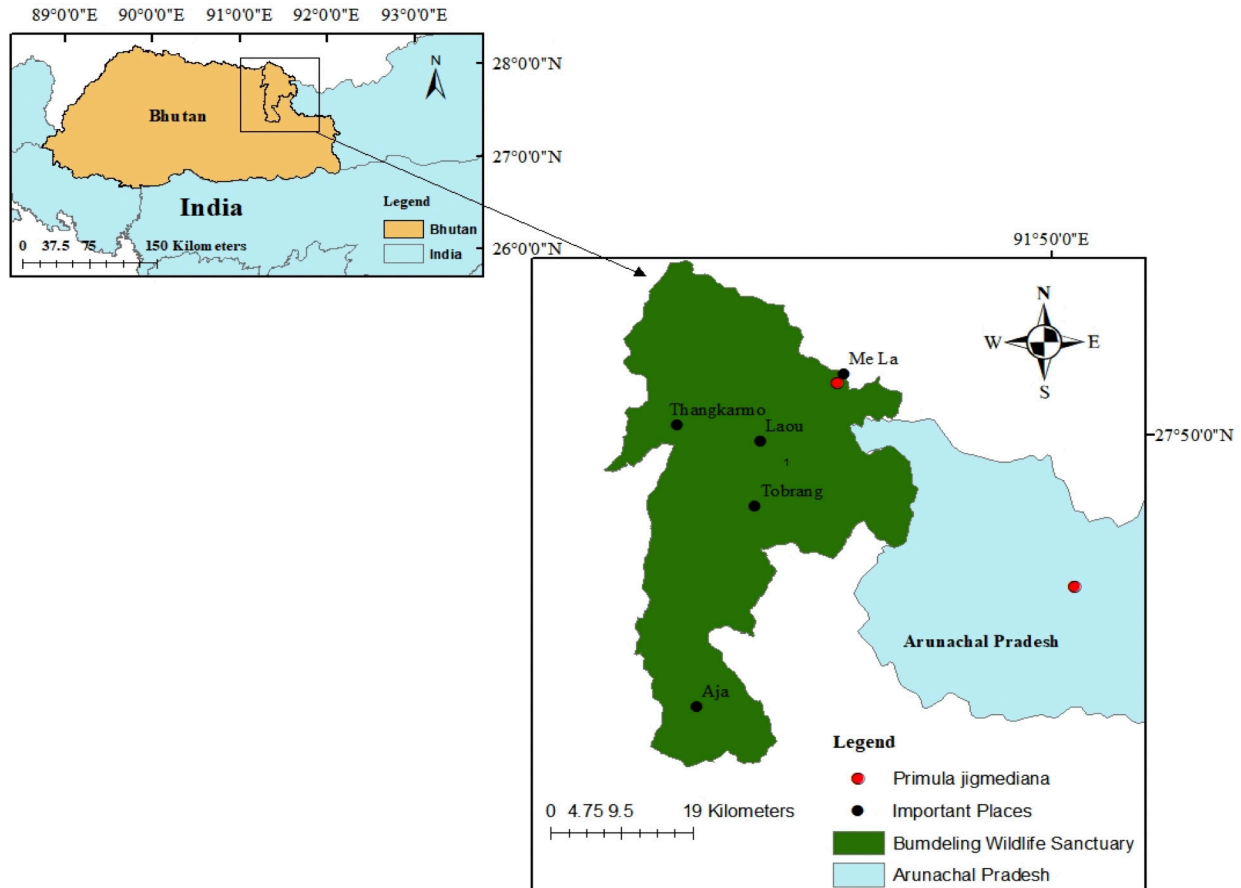


Figure 1. Distribution record of *Primula jigmediana* in Bumdeling Wildlife Sanctuary, Bhutan.

up to 2.5–3 cm tall. Leaves in compact rosettes, 6–11 mm. Petiole and leaf blade almost equal in length, 2–5 mm. Lamina oblanceolate, bluntly dentate at the margin, glabrous, efarinose, leaf apex obtuse, 5–6 pairs, alternate, yellowish-green. Scapes 2.5–3 cm tall with single heterostylous flower. Pedicel 1–3 mm and is curved and farinose. Single curved bract, 1–2 mm long. Calyx greenish or blackish-purple, 2–3 mm, cup shape with faintly farinose, parted to middle, lobes ovate, acute to obtuse. Corolla funnel shaped, 4–8 mm long, bluish-purple with dark wine purple annulus, lobes obovate (Image 1). Long style makes the stigma above the anther (pin flower), some flowers have short style making the anther above the stigma (Thrum flower). Capsule subglobose (Smith 1936; Grierson & Long 1999; Richard 2003; Bawri et al. 2018).

Distribution: Bhutan, Bumdeling Wildlife Sanctuary (Figure 1) and India (Arunachal Pradesh).

Specimens examined: Bhutan, Bumdeling Wildlife Sanctuary, Rigsumlhatsho, (91.541°E, 27.906°N; 4,490 m), 18 July 2020, W.W. Smith, Me La, 1936 (Holotype BM, Photo!).

Habitat: *Primula jigmediana* in Bumdeling Wildlife Sanctuary was found growing in marshy and humid areas along the sides of streams and lakes. It was also found growing on wet stony slopes along with the mosses (Image 1). Associate species like *Potentilla penduncularis* D. Don, *Rumex nepalensis* Sprengel and the high value insect-pathogenic fungus *Ophiocordyceps sinensis* (Berk.) G.H. Sung, J.M. Sung, Hywel-Jones, & Spatafora were found growing in the area. *Primula jigmediana* was found growing in Rigsum Gonpa, Ngangpatsho, Padmaling, and Goneyla area in Bumdeling Wildlife Sanctuary in between elevation of 4,300–4,600 m. Bawri et al. (2018) described the ecology of this species in humid and marshy areas along the sides of streams and wet stony slopes of meadows. In Arunachal Pradesh the species was recorded at the altitude of 3,500–4,500 m (Bawri et al. 2015) and later in between the elevation of 3,900–4,000 m (Bawri et al. 2018). This indicates narrow growth territory of *Primula jigmediana* as it is restricted to specific locality.

Flowering: *Primula jigmediana* flowers in June–July. Similar flowering time was recorded in Arunachal



Image 1 . *Primula jigmediana*. left—entire plant; right—habitat of a plant. © B.T. Ghalley.

Pradesh, India (Bawri et al. 2015, 2018).

Conservation status: A few individuals of *Primula jigmediana* were found growing at critical stage in a narrow habitat in northeastern part of Bumdeling Wildlife Sanctuary. Despite of being rare, *Primula jigmediana* is still not listed in the IUCN Red list category. It is palatable and a fodder species for yaks in Himalaya. Nomadic inhabitants rear a large number of yaks and other breeds of cattle. These animals destroy the population by browsing and trampling impeding natural regenerations. Similar threats from grazing, developmental activities, and landslides were recorded from Arunachal Pradesh, India (Bawri et al. 2015, 2018). Every year these areas receive hundreds of *Ophiocordyceps sinensis* collectors, which is also one of the threats to its habitat. Hence, larger damage to the population of *Primula jigmediana* by trampling can be foreseen from *Ophiocordyceps sinensis* collectors. Since, prime habitat of the Bhutan Primrose is along the sides of streams and lakes, the landslides and runoff were observed affecting the habitat of the species. Therefore, it is very important that concerned authorities and agencies initiate appropriate strategies to conserve this species from anthropogenic and natural threats.

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ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

August 2021 | Vol. 13 | No. 9 | Pages: 19191–19390

Date of Publication: 26 August 2021 (Online & Print)

DOI: 10.11609/jott.2021.13.9.19191-19390

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