



Distribution of *Balanophora involucrata* Hook.f in the Forest fringes of Khanchenzonga National Park, Sikkim

Durga K. Pradhan

High Altitude Research-Quality Control Laboratory/ Sikkim State Forest Herbarium
Forest and Environment Department Forest Secretariat, Block C, Deorali, Gangtok, Sikkim

Corresponding author: pradhansikkim@gmail.com

[Received 23 June, 2022; Revised 1 November, 2022; Accepted 31 December, 2022; Published 31 December, 2022]

Abstract

Balanophora involucrata Hook.f., is the rarely found root parasite growing in the forest areas of Sikkim. During the study, it was found that the species was available at ca. 4500 ft in and around the forest fringed village of Khanchenzonga National Park.

As the species is rare in occurrence, so the study of the distribution of *Balanophora involucrata* Hook.f. in the Sikkim Himalaya is paramount. *Balanophora involucrata* Hook.f. forma *rubra* is documented by depositing its representative specimen in Sikkim State Forest Herbarium (SSFH). This is a new record of distribution of *Balanophora involucrata* Hook.f. forma *rubra* at the forest fringed of Khanchenzonga National Park of Sikkim at elevation of 4500 ft.

Keywords: *Balanophora involucrata* Hook. f., root parasite, Sikkim Himalaya

Introduction

The achlorophyllous plant, *Balanophora involucrata* Hook.f., is a root parasite. *Balanophora involucrata* Hook.f. was reported in Sikkim Himlaya by J. D. Hooker having four forms namely *rubra*, *flava*, *gracilis* and *cathcartii*. He reported at the elevation 7000-10000 ft in the temperate forest of Sikkim.

During the study, the forest areas of the forest fringes of Khanchenzonga National Park, Sikkim was explored by transect work and found *Balanophora involucrata* Hook. f. at the elevation of 4500 ft.

Besides these, *Balanophora dioica*, *Balanophora indica* Wall and *Balanophora polyandra* Griff were also reported from Sikkim.

This paper deals with the documentiaton of *Balanophora involucrata* Hook.f. existence at the elevation of 4500 ft in the forest fringed of Khanchenzonga National Park, North Sikkim.

Materials and Methods

The field survey was conducted across the forest fringed of Khanchenzonga Naitonal Park towards the North of Dzongu, during 2021-2022. The achlorophyllous specimen collected from Kachi Forest, North Sikkim and was identified referring the literatures (Hooker, 1872-1897; Hara, 1966).

The representative specimen deposited in the Sikkim State Forest Herbarium, SSFH SK005155.

Taxonomy

Balanophora involucrata Hook.f., Trans. Linn. Soc. London, Bot. 22: 30. 1859.

DISTRIBUTION: INDIA: Sikkim: Khanchenzonga Natonal Park; CHINA
BHUTAN; NEPAL.

Elevation: 4500 ft-10000 ft

Specimen examined: SSFH SK00 5155, Altitude 4500 ft., Coll.: Norden Lepcha, Locality: Kachi Forest, Dzongu, Sikkim.

Achlorophyllous plant, root parasite, rhizome yellowish brown like wart growth. Scapes yellow ca. 3 cm long. Leaves like sheath in whorls covering the scape. Peduncle yellowish. Inflorescence ellipsoid. Flowering period July-August.

Results and Discussion

The different species of *Balanophora* were reported from the different parts of India (Bora et al., 2010; Kipgen and Singh, 2010) and were reported as rare in occurrence (Jain and Sastry, 1980; Bora et al., 2010; Bora and Raj, 2017). Several parts of the world, the report of distribution of *Balanophora* was recorded (Tao et al., 2009; Su et al., 2012; Wang et al., 2013; Thriveni et al., 2016) and in India, Hooker reported *Balanophora involucrata* Hook.f, one of *Balanophora* species. from Sikkim and Himachal Pradesh (Hooker, 1885). But this species is not common across the forest fringes, thus, the information of its distribution is presented.

The habitat of *Balanophora involucrata* Hook.f. comprises with *Bambusa* [Poaceae], *Arundanaria* [Poaceae], *Quercus lamellosa* Sm. [Fagaceae], *Arisaema* [Araceae] *Engelhardtia spicata* Blume [Juglandaceae], *Castanopsis indica* A.DC, *Castanopsis tribuloides* A.DC [Fagaceae], *Berchemia floribunda* Wall. [Rhamnaceae], *Maesa chisia* Don [Myrsinaceae], *Quercus lamellosa* Smith. [Fagaceae] *Digitaria filiformis* (L.) Koeler [Poaceae], *Betula alnoides* Ham [Betulaceae], *Selaginella selaginoides* (L.) Schrank & C.F.P.Mart. etc. There might be more than these enumerated species but here in this case, the object of this enumeration is to depict the representative species which are mostly found in association with this plant.

Eventually, the recording of *Balanophora involucrata* Hook.f at the elevation 4500 ft at Kachi Forest of Khanchenzonga National Park, North Sikkim is the new record of its existence in Sikkim.

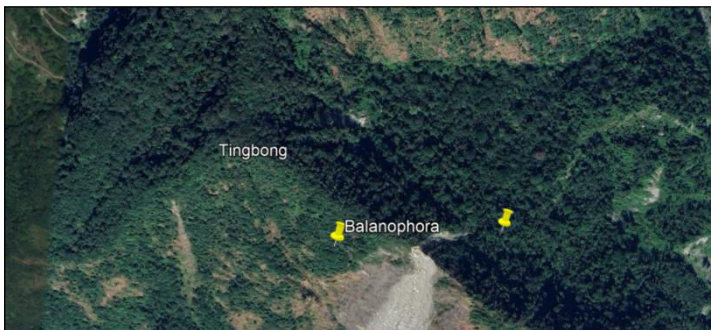


Fig 1: Spot showing the habitat of *Balanophora involucrata* Hook.f



Fig 2: *Balanophora involucreta* Hook.f

Acknowledgements

Authors are thankful to the Department of Forest and Environment, Government of Sikkim for the kind support and also to the staffs of the QCL-HARC, F&ED and FAPM, South Sikkim.

References

- Bora, H.R., Yadav, A., Das, K. and Kumar, R.K. 2010. *Balanophora dioica* R. Br. ex Royle (Balanophoraceae): a rare total root parasite reported from Karbi-Anglong District, Assam, India. *Journal of Economic and Taxonomic Botany* 34(2): 298-299.
- Bora, H.R. and Raj, H. 2017. A new distribution of *Balanophora dioica* R.Br. ex Royle- A Total root parasite from Zongaw Reserve Forest, Mirzoram, India. *Indian Journal of Plant Science* 6(1): 48-50.
- Hara, H. 1966. *The Flora of Eastern Himalaya*. First Report, University of Tokyo, Japan.
- Hooker, J. D. 1872-1897. *The Flora of British India*. Vol. 1-7. L. Reeve & Co., Kent, London.
- Rai, I.D., Adhikari, B.S. and Rawat, G.S. 2014. A rare and endangered root parasite *Balanophora involucreta* Hook.f. & Thompson. *Indian Forester* 140(4): 435-436.
- Su, H.J., Murata, J., and Hu, J.M. 2012. Morphology and phylogenetics of two holoparasitic plants, *Balanophora japonica* and *B. yakushimensis* (Balanophoraceae), and their hosts in Taiwan and Japan. *Journal of Plant Research* 125: 317-236.

- Tao, R., Ye, F., He, Y., Tian, Y., Liu, G., Ji, T. & Su, Y. 2009. Improvement of high-fat-diet-induced metabolic syndrome by a compound from *Balanophora polyandra* Griff. in mice. *European Journal of Pharmacology* 616: 328-333.
- Thriveni, M.C., Shivamurthy, G. R. and Amruthesh, K.N. 2016. *Balanophora dioica* (Balanophoraceae): a new record for South India from Western Ghats. *The Bulletin of the Botanical Survey of India* 58: 1017-110.
- Wang, Y., J. Yang, A. Wang, J. Ma, J. Tian, T. Ji and Y. Su 2013. Hydrolyzable tannins from *Balanophora polyandra* Griff. *Acta Pharmaceutica Sinica B* 3(1): 46-50.