



***Exacum paucisquamum* (Gentianaceae): A New Record for Odisha State from Bonai Forest Division, Odisha, India**

Sanath Kumar N. ^{a*}, Sweta Mishra ^b and Sanjeet Kumar ^c

^a Office of the Divisional Forest Officer, Bonai Forest Division, Bonaigarh, Odisha, India.

^b Department of Life Sciences, Rama Devi Women's University, Bhubaneswar, India.

^c Ambika Prasad Research Foundation, Odisha, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/APRJ/2022/v10i2188

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/93612>

Short Communication

Received: 15/09/2022

Accepted: 28/11/2022

Published: 01/12/2022

ABSTRACT

Exacum paucisquamum (C. B. Clarke) Klack., so far known only from Western & Eastern Himalayas in India, is reported for the first time from Odisha state. A detailed description of the species, including its phenology, distribution and photographs along with documented associated plants are provided for easy identification in the field. The authors observed it under the leaf litter in moist deciduous forest of Bonai Forest Division, Odisha, India. Therefore, the prevention of forest fire is important to conserve the plants growing associated with leaf litter. The occurrence of *E. paucisquamum* also indicates the healthy forest of the study areas and further need more exploration works on floral diversity.

*Corresponding author: E-mail: sanathkumarifs1980@gmail.com;

Keywords: Bonai; leaf litter; moist deciduous forest; mycoheterotrophic.

1. INTRODUCTION

Exacum paucisquamum (C. B. Clarke) Klack. was known to occur in India in the state of Sikkim (Singalila range), West Bengal (Darjeeling), in the moist Eastern Himalayas and Uttarakhand (Chamoli) in the Western Himalayas [1,2,3], but the species is not reported from the Odisha state, India. During recent exploration on biodiversity assessment and restoration of threatened plants, on 3 September 2022 in Sole range of Bonai

Forest Division (Fig. 1), Odisha, the authors collected an interesting species under the leaf litter. After critical morphological observation and literature review [4,5,6,3,7], it was found that the collected species on decomposed leaf litter was *Exacum paucisquamum* (C. B. Clarke) Klack. This paper is the first report of the species from Odisha state, India. A detailed description, phenology, distribution and photographs along with its associated plants are provided for easy identification.

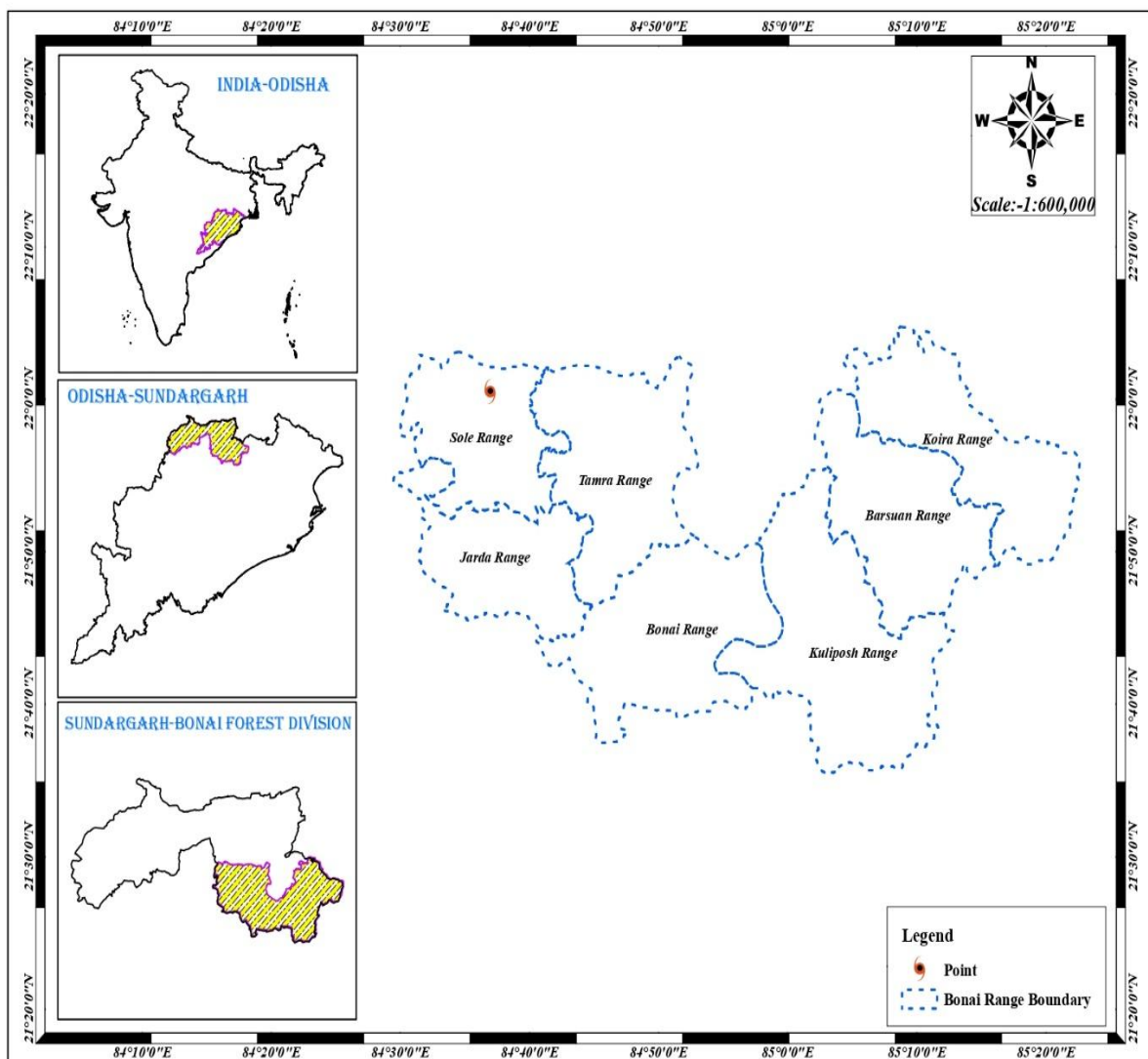


Fig. 1. Location map of collected specimen in study area (Point = location of collected species)

2. TAXONOMIC TREATMENT

Exacum paucisquamum (C. B. Clarke) Klack., Bot. Jahrb. Syst. 126:478. 2006. *Cotylanthera paucisquama* C.B. Clarke in Hook. f., Fl. Brit. India 4: 94. 1883; H. Hara, J. Jap. Bot. 50:327. 1975; Ho & Pringle, Fl. China 16:3. 1995. *Cotylanthera yunnanensis* W.W. Smith, Notes Roy. Bot. Gard. Edinburgh 13: 158. 1921.

3. DESCRIPTION

Mycoheterotrophic herb, reached about 3.5-6.5 cm in height. Stem is white, erect, simple and fleshy. Leaves 3-6 pairs, scale-like, opposite, sessile; blade 1.5-3.0 mm long, margin entire, apex acute. Indumentum slightly pubescent. Flowers are solitary, terminal. Calyx 4-lobed, dull white, 3-5 mm long, triangular, apex obtuse; mid-vein distinct. Corolla 4-lobed, dark blue-whitish, 1 cm long, narrowly oblong, entire at margin, obtuse at apex. Stamens 4, anther yellow, 2.5-4.2 mm long, sagittate, slightly curved; filament white, up to 3.1 mm long, linear. Style is linear, 5.8-8.5 mm long. Ovary ovoid-ellipsoid, 2-celled. Capsules are subglobose. Seeds are numerous (Plate 1).

Flowering & fruiting: August – September.

Habitat: The species was collected in moist area with rich decomposed leaf litter in evergreen and moist deciduous forest at elevation of 680 msl.

Distribution: China, Hong Kong, NW. Vietnam, India (Sikkim, Uttarakhand, West Bengal, Odisha).

Associate plant species: *Combretum roxburghii* Spreng. (Combretaceae), *Aeginetia indica* L. (Orobanchaceae), *Epipogium roseum* (D. Don) Lidl. (Orchidaceae), *Goodyera hispida* Lind. (Orchidaceae), *Shorea robusta* Roth. (Dipterocarpaceae) and *Nervilia concolor* (Blume) Schltr. (Orchidaceae) (Plate 2).

Notes: The collected plant is growing under leaf litter only. Therefore, the conservation and protection of forest floor from forest fire is important for the conservation of the species. The population was also associated with ground orchids and other terrestrial parasitic plants.

Specimen examined: India, Odisha, Sundargarh, Bonai Forest Division, Sole, 22° 0' 30" N, 84° 36' 57" E, 680.17 m elevation, 3rd September 2022, Sweta Mishra & Sanjeet Kumar, 0073 (APRFH 073).



Plate 1. *Exacum paucisquamum* (C. B. Clarke) Klack. A) Habit, B) Flower, C) Roots, D) Whole plant and E) Lateral view of the flowers



Plate 2. Some documented associated plants species, A) *Aeginetia indica* L., B) *Epipogium roseum* (D. Don) Lidnl., C) *Nervilia concolor* (Blume) Schltr.

4. CONCLUSION

The species is described for the first time in this study from the Indian state of Odisha. The presence of *E. paucisquamum* also suggests that the study areas' forests are in good shape and that additional research is needed to understand the richness of their floral species.

ACKNOWLEDGEMENT

The authors are thankful to the PCCF & HOPE (WL); Dr. Rajeev Kumar Singh, BSI, Gol and field staffs of Bonai Forest Division, Odisha.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Clarke CB. *Cotylanthera* Blume. In: JD Hooker (Ed.), Flora of British India. Reeve & Co., London. 1883;4:94-95.
2. Hara H. A new species of *Cotylanthera* (Gentianaceae) from Philippines with a conspectus of the genus. The Journal of Japanese Botany. 1975;50:321-328.
3. Tiwari JK, Rawat DS, Tiwari P. *Exacum paucisquamum* (Gentianaceae): A new record for Western Himalaya, India. Rheedia. 2015;25(1):57-58.
4. Yuan YM, Wohlhauser S, Moller M, Chassot P, Mansion G, Grant J, Kupfer P, Klackenberg J. Monophyly and relationships of the tribe Exaceae (Gentianaceae) inferred from nuclear ribosomal and chloroplast DNA sequences. Molecular Phylogenetics and Evolution. 2003;28:500-517.
5. Yuan YM, Wohlhauser S, Moller M, Klackenberg J, Callmander M, Kupfer P. Phylogeny and biogeography of *Exacum* (Gentianaceae): A disjunctive distribution in the Indian Ocean Basin resulted from long distance dispersal and extensive radiation. Systematic Biology. 2005;54: 21-34.
6. Klackenberg J. *Cotylanthera* transferred to *Exacum* (Gentianaceae). Botanische Jahrbücher für Systematik. 2006;126:477-481.

7. Gomes SI, Kikuchi IA, Lachenaud O, phylogeny and biogeography of
Perdomo J, Léotard G, Maas PJ, the mycoheterotrophic Voyriaceae
Maas-van de Kamer H, Merckx VS. (Gentianaceae) and the description of a
Unravelling the species diversity, new species. TAXON. 2022;71(5):1013-24.

© 2022 Sanath et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:

<https://www.sdiarticle5.com/review-history/93612>