

Flora of Dakshin Gangotri in Antarctica

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ABSTRACT

The occurrence of a moss — *Bryum* sp. and a petrophilous lichen — *Acarospora* sp. has been reported from *Dakshin Gangotri*, an unmanned station set up by the first Indian Expedition in January, 1982 at Antarctica.

INTRODUCTION

The land flora of Antarctic region has been described by several scientists like Hooker (1839-43), Siple (1938) Holdgate (1963), Skottsberg (1960), Cardot (1908), Savich-Lyubitskaya and Smirnova (1962)

The first Indian Expedition (Dec. 1981 to Feb. 1982) visited Antarctica and set up an unmanned station named *Dakshin Gangotri* (lat. 70°45'12''S and Long. 11°38'13''E). This station is situated near Dronning Maud Land and at the foot of the hill 'Oasis'. The flora of *Dakshin Gangotri* consisted of lichens and mosses only, which were found to be growing on rocky substratum and in crevices. No other floral elements belonging to any group of plants were observed in this region. The period of visit was beginning of the Antarctic summer with temperature fluctuating from 1° to 3°C.

Mosses and lichens are predominant and abundant in the 'Maritime Antarctic Region' which is under oceanic influence, whereas fewer species of mosses and lichens are found in the 'Continental Antarctic Region', which has a colder and drier climate (Rastoveer, 1972). Lichens and mosses have been reported from almost all ice-free land accessible from the sea. Lichens comprise the bulk of terrestrial vegetation and are considered most widely distributed elements in Antarctica (Llano, 1965; Steere, 1961). According to Lange and Kappen (1972) lichens are dominant in the Antarctica. So far about 400 taxa of lichens, have been reported (Llano, 1956). Ahmadjian (1970) has recorded 350 sp. of lichens, 75 spp. of mosses, 75 spp. of fungi, 2 spp. of liverworts and 2 higher plants. In spite of the vast information available on the flora of this far off polar region, knowledge of taxonomy and distribution of the bryophytes of Antarctica is still incomplete (Greene, 1964).

The description of a moss and a lichen species collected during this expedition is given below:

Order : Bryales

Genus : *Bryum*

Pascher (1931) has described the genus *Bryum* under *Musci acrocarp.* of the Bryales. Robinson (1972) has also given a useful key for the taxonomy of mosses from Antarctica. The identification of this moss-*Bryum* could not be done upto species level, because of the absence of capsules. Llano (1965) has opined that fruiting of mosses is a rare phenomenon in Antarctic region. Genus *Bryum* has also been reported from Antarctica. The species of *Bryum* forms a dense mat on the rocky surfaces and also in the crevices near a fresh water lake.

The entire moss is 1.5 cm in length and the rachis is covered by delicate leaves which are 1.3 mm in length and 0.27 mm in width (Fig. 1A, Plate 1, C & D). The lowermost leaves are bent towards the base, however, the upper leaves cling to the main shoot and remain in upward position (Fig. 1B). The apex of the leaf is short and acute (Fig. 1C). Leaves are with thick midrib with 6 to 8 elongated cells, dark green in colour and narrows towards the apex of the leaf. Cells of the basal part of the leaf are elongated and bigger in comparison to cells of the apical part of the leaf (Fig. 1E, D). The margin of the leaf is entire without any denticulate projections (Fig. 1C). Rhizoids are about 1 to 1.5 cm long and are hairy in nature.

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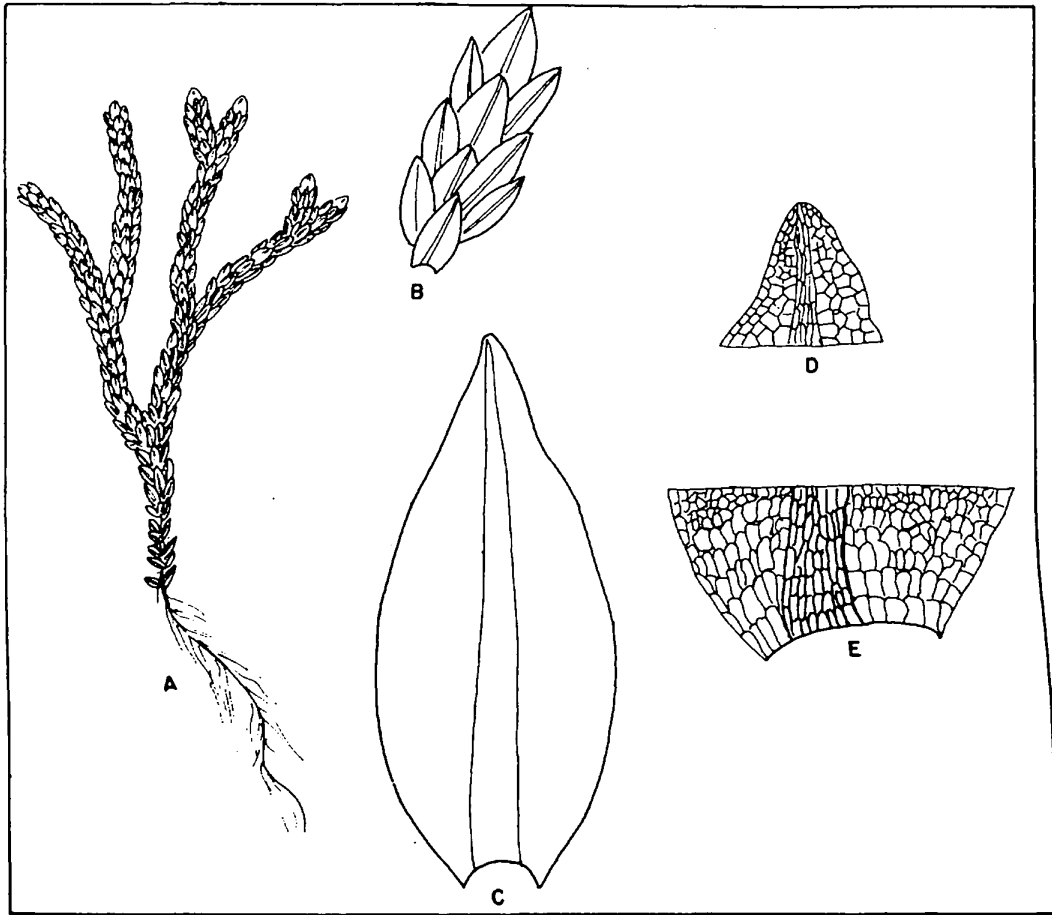


Figure 1 : *Bryum* sp.

A. Entire *Bryum* plant B. Arrangement of leaves in *Bryum* sp. C. Entire leaf with midrib
D. Apex of the leaf E. Base of the leaf

LICHEN

Family — Acarosporaceae

Genus — *Acarospora*

A petrophilous lichen, *Acarospora* sp. was also collected from the same site. This lichen was found in thick dense patches on the rocks. (Plate 1 A). The surface view of these lichen patches appears to be honeycomb-like structure of different sizes (Plate 1 B). The colour of the lichen was light green. The mature lichens develop blackish coloured spots on the upper surface as a result of fungal spore formation (Plate 1.B). The thickness of the thallus varies from 2 to 5 mm.

The species of this genus could not be identified. However, Skotsberg (1912) has reported *Acarospora* from South Shetland Islands. Zahlbruckner (1928) has not indicated distribution of any *Acarospora* spp. in Antarctica region.

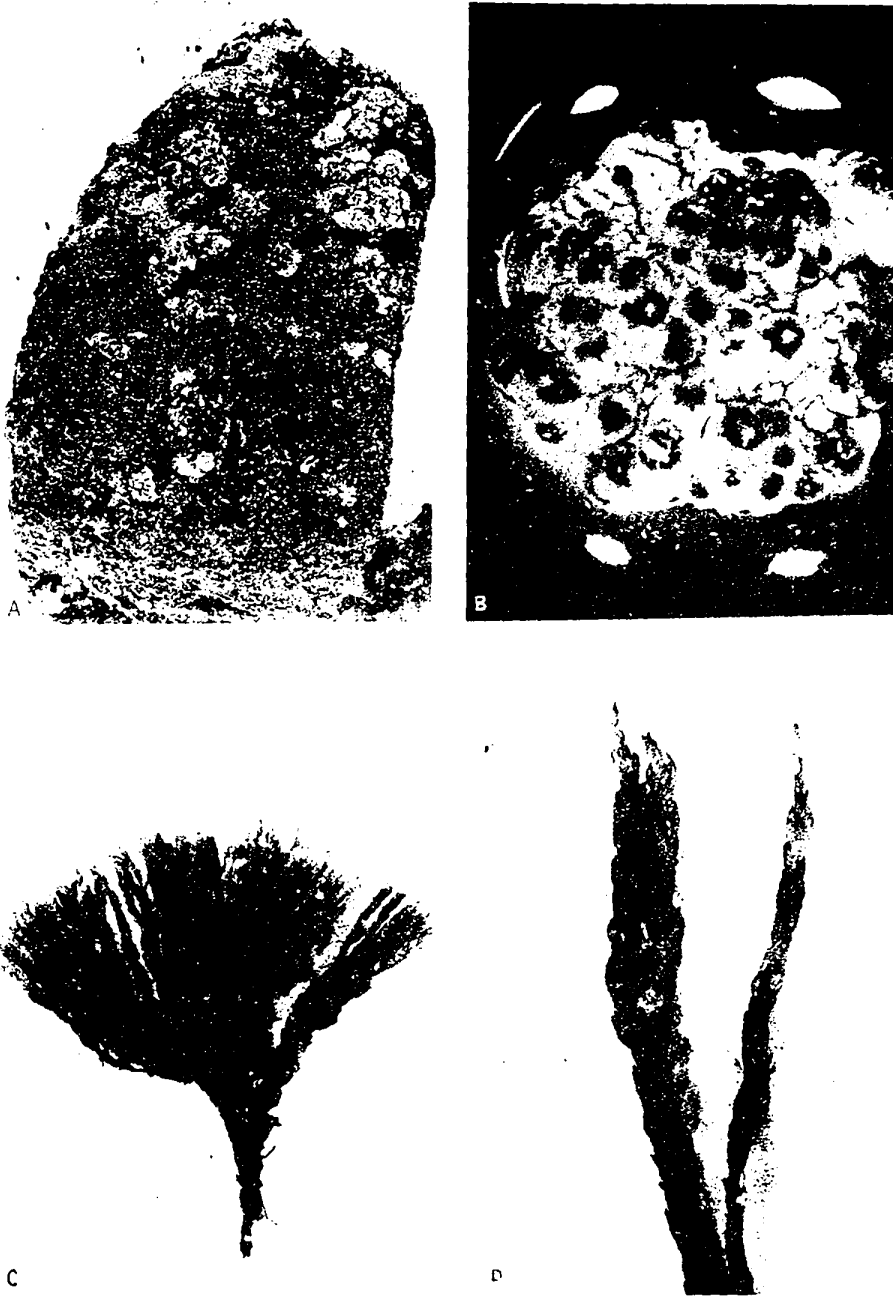


Plate 1 : *Acarospora* sp.
A. *Acarospora* lichen patches on stones B. Magnified surface view of *Acarospora* sp.
C. Habit of *Bryum* moss D. Magnified view of *Bryum* sp.

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REFERENCES

- Ahmadjian, V. (1970)
Adaptation of Antarctic terrestrial plants. In '*Antarctic Ecology*' (Ed. M. W. Holdgate), Academic Press, New York. II : 801-811
- Cardot, J. (1908)
La flore bryologique de Terres Magnéliques de Georgie du sud et de L'Antarctique. Wissenschaftliche Ergebnisse der Schwedischen Sudpolar-expedition 1901-1903. Bd. 4, Lief. 8:298 pp.
- Greene S. W. (1964)
Plants of the land. In '*Antarctic Research*' (Ed.R. Pfistley, J. R. Adie and G. de Q. Robin), 240-253 Butterworths, London.
- Holdgate, M. W. (1963)
Observations on the South Sandwich Islands 1962. *The Polar Record* II (73) pp. 394-405
- Hooker, J. D. (1844-1847)
The botany of the Antarctic voyage, pt. I — *Flora Antarctica* 2 vols. Reeve Bros., London
- Llano, G. A. (1956)
Biological work during 1957-58 USNC/IGY Programme Annual meeting of the American Association for the Advancement of Science, Dec. 29, Washington D. C. 2 pp.
- Llano, G. A. (1965)
The flora of Antarctica. In the *Antarctica* (Ed-T. Hatherton) published by the New Zealand Antarctic Society, London
- Lange, O. L. and L. Kappen (1972)
Photosynthesis of Lichens from Antarctica. In *Antarctic Terrestrial Biology* (Ed.G.A. : Llano) 20 : 83-95. Published by American Geophysical Union).
- Pascher, A. (1931)
Die Süßwasser-Flora Mitteleuropas, Heft 14 : Bryophyta, JENA-Verlag Von Gustav Fischer
- Rastoveer, J.R. (1972)
Comparative Physiology of four West Antarctic mosses. In *Antarctic Terrestrial Biology* 20 : 143-161 (Ed. G.A. Llano) published by American Geophysical Union.
- Savich Lyubitskaya L. I. and Smirnova, Z. N. (1962)
The endemic moss of the Antarctic *Sarconeurum glaciale* (Hook Fil. et wits) card Bryhn., In *Biological Reports of the Soviet Antarctic Expedition (1955-58)* (Ed. E. P. Povlovskii) II pp. 301-316. Published by Izdatelstvo Akademii Nauk SSSR, Moskva, Leningard.
- Skottsberg C. (1960)
Remarks on the plant geography of the southern cold temperate zone. *Proceedings of the Royal Society Ser. B. 152 (949) : pp 447-457*
- Steere W. C. (1961)
A preliminary review of the Bryophytes of Antarctica. In *Science in Antarctica*. I : pp. 20-23 U. S. Nat. Acad. Sc. Publi. 839
- Zahlbruckner A. (1928)
Calogus Lichenum Universalis 5 : 50. Published by Johnson Reprint Corporation, New York