

Taxonomical study of *Dicranum scoparium* Hedw. from Kumaon Hills, India

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The present paper describes the taxonomical account of an acrocarpous moss genus *Dicranum scoparium* Hedw. of Dicranaceae family, collected from Artola, Dandeswar and Jageswar, of Kumaon region of India, from an altitude of 5070-6000 feet during the year 2001-2003. The species is being described in detail from this region for the first time.

Key-words - Bryophyte, *Dicranum scoparium* Hedw., Kumaon hills, Artola, Almora.

INTRODUCTION

DICRANUM Hedwig, Spec. Muc. 126.1801(Dicranaceae) is one of the largest genus of Musci (Worley Iwatsuki 1970, Weber 1973, Snider *et al.* 1988), distributed world wide, with a representation of up to 150 species and is the most easily recognized genus (Takaki 1964; Allen 1998; Otnyukova 2001). In India about 10 species of *Dicranum* Hedw. have been reported so far (Chopra 1961). On this genus, only fragmentary information is available and no report is available on its distribution in Kumaon hills.

The present study is therefore an attempt to focus on the distribution of *Dicranum* Hedw. The study area, i.e. Almora, is located at 29.37N : 79.40E (I.G. 1931) in Uttaranchal (Kumaon hills), at the height of 6000 feet. Jageswar is about 33kms from Almora proper, having luxuriant bryoflora along a dense pine-deodar forest (Singh & Singh 1992). Average temperature during the summers (March to June) is around 25°C; in rainy season (July to Sept.) 10° to 20°C and in winters (Nov. to Feb.), the temperature is in low range, i.e. up to 5°C. Climate of larger part is tropical; of rainfall is about 1500 mm, which offers favourable climatic conditions for luxuriant growth of bryophytes.

The moss *Dicranum scoparium* Hedw. was found growing luxuriantly along both sides of road as

well as rural and urban sites of Nainital, Ranikhet, Majkhali, Almora, Musteswar and on the way to Jageswar. Thick and rich population was observed in dry habitat or on exposed rock. The observations were based on the specimens collected from Nainital, Almora, Ranikhet and Mukteswar (Kumaon hills), India.

DESCRIPTION

Dicranum scoparium Hedw.

Plate 1, Figs. 1-8

Plants dioecious, in loose to dense tufts, green to light green; stem measured up to 9 cm long, erect (when moist) to sub-secund (when dry) (Fig. 1); leaves crowded, glossy to sometime dull, stem tomentose, white to brown rhizoid (Ireland 2002); leaves lanceolate, subulate, inflexed (Figs. 3, 4); leaf margin entire to denticulate (Fig. 2), while leaf apex is highly denticulate (Fig. 5), leaf measured to be 5-6 mm long and 2-3 mm wide at base; basal cells rectangular to hexagonal (Fig. 6), length and width 35-52 µm and 15-25 µm respectively; mid-leaf cells were rhomboidal (Fig. 7), length and width measured 30-45µm and 10-15 µm respectively; basal as well as mid-leaf cells non-porous; brownish coloured, angular cells hexagonal, inflated, incrassate (Fig.8); nerve strong having sterid cells; 2.5-4 mm, accurate, inclined to horizontal, smooth, striate (when dry), yellow or reddish brown, seta 2-4 cm long.

Gametophyte appearance - Leaves yellowish green to dark green or yellow-brown in tufts. Leaves spreading, strongly contorted when dry. Leaf margins entire to denticulate. Lower leaf cells elongate, rectangular to hexagonal, mid-leaf cells rhomboidal to quadrate, slightly prostrate or non, while upper leaf cells or apex highly denticulate; alar cells yellow-brown, not extending to the costa, angular cells brownish 2-stratose, well differentiated to costa, inflated, incrassate; prominent nerve with sterid cells. Male plants comparatively dwarf.

Sporophyte appearance - Capsule 2.5 to 4 cm solitary inclined to horizontal, smooth to straight, mature in summer, yellowish brown to reddish brown (when dry), operculum 2 to 3.5 mm, capsules 2 to 2.5 cm long, horizontal, strongly curved and asymmetric, furrowed, not stromose. Annulus of two rows of cells, fragmenting; 2 to 3 cm long.

Interesting facts: The different common names come from the different structures and growth habits of the plant. The name "forked moss" is from the fact that peristome teeth are forked. It is also called as "broom moss" because the leaves look like they are brushed in one direction.

ECOLOGY

Dicranum scoparium Hedw. appears to be tolerant of a wide range of conditions. It has been found to grow on acidic to around neutral soil of Artola. It was growing on acid raw humus in woods, roadsides, in an area covered by pine needles as well as on stones surface lying along the bank of river, on the bases of trees; grows in dense to loose tufts.

Dicranum scoparium Hedw. is one of the commonest mosses of the Kumaon region, suitably adapted for wide variety of substrate, especially to xeric conditions. However, their presence is also not ruled out in moist places.

Specimens loaned and examined

The following specimens were borrowed on loan and consulted from different herbaria for comparison and study:

Dicranum scoparium Hedw., Missouri Botanical Garden Herbarium, Missouri, U.S.A., collected from NEPA: central region, Tiri, 2000 m altitude, on moist humus on Oct. 4, 1988. Herbarium no. 5215743. Collected by M. Higuchi.

Dicranum scoparium Hedw., Cryptogamic Herbarium, Department of Biology, Duke University, Durham, North Carolina, U.S.A; collected from China: Sichuan prov., Nanchuan Co., Mt. Jinfu, on ground, altitude 1650m, Oct. 8, 1986. Herbarium no. 860876. Collected by M. Zh. Wang.

Dicranum scoparium Hedw., Herbarium Komi Science Center (Syktyvkr), Russia; collected from Syktyvkar region, vicinities of the c. Syktyvkar, settlement Nizhnii Cohov, 2 km to the other west, the right bank of the Chov-u-river, a bilberry pine forest green moss type, on sandy soil, 61°44'; 50°45'E. Collected by Michail V. Dulin.

Dicranum scoparium Hedw., collected from Kumaon hills, India: deposited at Bryological collection, Botany Department, Bareilly College, Bareilly; Eger University Herbaria, Eger University (EGR) Hungary and New York Herbarium, U.S.A.; collected from Jageswar, districts Almora Nainital, Mukteswar (western Himalayas), altitude 5600-7500 feet in April and December, 2002. Herbarium no. 200212099 to 200312140 collected by D.K. Saxena and Ruchika Gangwar.

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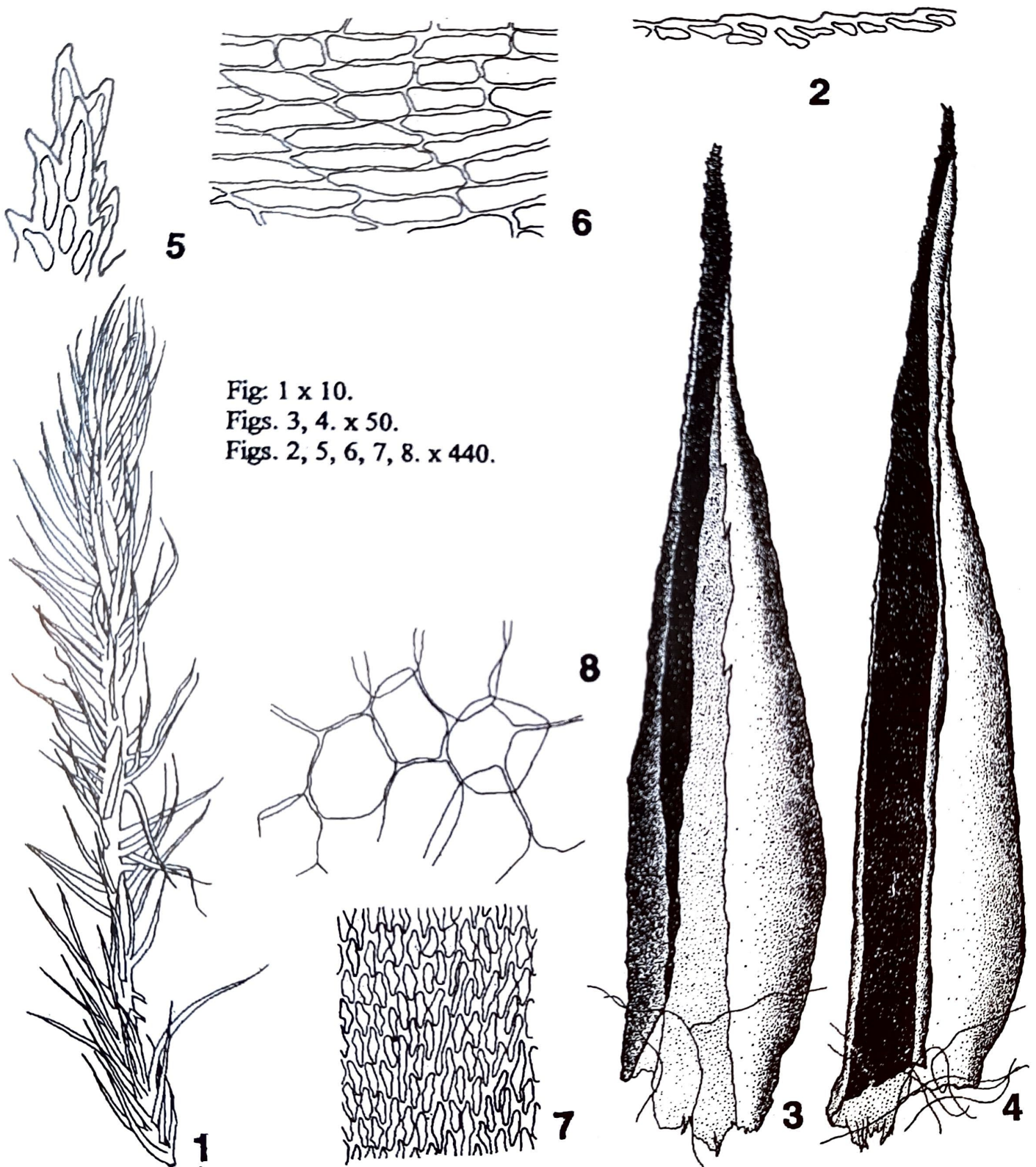


Fig. 1 x 10.

Figs. 3, 4. x 50.

Figs. 2, 5, 6, 7, 8. x 440.

PLATE-1

Figures: 1-8. *Dicranum scoparium* Hedw., 1. A single plant x 10., 2. Laf margin x 440x., 3 & 4. leaves x 50x., 5. Leaf apex x 440x., 6. Basal cells of a leaf x 440x., 7. Mid-leaf cells x 440x., 8. Angular cells of a leaf x 440 x.

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