



**Research Article**

**DISTRIBUTION, DENSITY AND ECONOMIC IMPORTANCE OF BRYOPHYTES OF  
G.MADUGULA FOREST DIVISION, EASTERN GHATS OF INDIA**

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**Abstract:** Bryophytes are primitive group without much differentiation of the plant parts and vascular tissues. This group is received little attention from the researchers and scientists of Eastern Ghats of India. Present communication deals with the species composition, density and economic importance of Bryophytes in G.Madugula forest division of Eastern Ghats of India. Studies were made for a period of one year from January 2012 to December 2012. Quadrata method was used for collection of numerical data and a total of 60 quadrata samples were collected in different seasons of the year. In the present study a total of 10 species belonging to six families have been reported. Maximum abundance was reported for the species *Polytrichum densiflorum*. Medicinal and economic importance of these species was also discussed.

**Keywords:** Density, medicinal importance, Bryophytes, G.Madugula.

**INTRODUCTION**

Bryophytes are amphibians of the plant kingdom and distributed in tropical, subtropical temperate regions of the globe. Bryophytes are occurring in Himalayas, Eastern Ghats and Western Ghats of India. Bryophytes play vital role in carbon fixing and nitrogen cycling.<sup>1</sup> Some species of Bryophytes are economically and medicinally important for antimicrobial activities.<sup>2-4</sup> Several authors studied the distribution and density of the bryophytes in the Visakhapatnam district of the Eastern Ghats of India.<sup>5-6</sup> Present communication deals with the distribution, density and economic importance of the Bryophytes in the G.Madugula region (Visakhapatnam district, Andhra Pradesh) of the Eastern Ghats of India.

**STUDYSITES AND METHODS**

G.Madugula region of eastern Ghats of India located latitudes 18° 10' and longitudes 18° 79' above the ground level. Thick forest cover and low temperature and abundant humidity in these forest areas favor the growth of bryophytes and other important plants of the plant kingdom. Perennial streams in the forest promote the growth of the bryophytes and lower and higher groups of the plant kingdom. Data on distribution and density of Bryophytes was collected in three seasons during January 2012 to December 2012. Environmental features such as temperature and humidity measured by the thermometer and hygrometer respectively and rain fall data was collected from the cyclone warning centre, Visakhapatnam. 0.5X 0.5 M quadrata was used for collection of data. Quadrates were randomly placed and count the number of individual species present in each quadrata. A total of 60 quadrata samples were collected in three different seasons. The values of frequency, density and abundance were calculated by the following formulas.<sup>7,8</sup> Information on ethno medicinal practices by the tribes was collected through the

interviewing the herbal practitioners, elderly people and vaidyas of this region.

**RESULTS AND DISCUSSION**

Table-1 shows the environmental parameters of the G.Madugula forest region in the Eastern Ghats of India. Highest record in the humidity was reported in the month of May and minimum in January and temperature varied from 21.7 to 31.2°C with maximum temperature was recorded in May. Highest rainfall was recorded in the month of September and minimum in the month of January and December, no rain fall was recorded in the months of February, March and April months.

**Table.1: environmental parameters in the G.Madugula during January 2012 to December 2013**

S.No	Month	Humidity (%)	Rainfall (mm)	Temperature (°C)
1	January	57	32	22.8
2	February	78	00	23.6
3	March	82	00	27.5
4	April	72	00	30.2
5	May	92	110	31.2
6	June	84	128	26.7
7	July	79	184	26.8
8	August	74	172	24.6
9	September	68	286	22.8
10	October	62	132	22.4
11	November	64	86	22.6
12	December	61	32	21.7

Bryophytes present in G.Madugula region was presented in Table-2, a total of 10 species was recorded in the quadrat samples and these species are belonging to six genera and six families. Frequency, density and abundance of these Bryoflora was presented in the Table-3. Maximum frequency was reported for the species *Polytrichum densiflorum* and minimum frequency was reported for *Plagiochasma rupestre*. Information was gathered on the medicinal and economical uses of bryophytes of this region. Among the bryophytes Sphagnum is commonly known as peat moss and widely used as storage material as it has special cells to store water. So *Sphagnum cymbifolium* play vital role in transport of the plants from nurseries and other places. Peat moss also used in treating the toxic wastes materials. Peat mosses are best suited for the production of methane and also important source for the production of fuel. People from Himalayan region used mosses as insect repellents. Mosses and liverworts are dried made into a coarse powder that is sprinkled over grains and others to be stored in containers. Native Americans have used various moss species like *Philonotis*, *Bryum*, *Mnium* crushed into a kind of paste and applied as a poultice. *Marchantia polycarpa* is used as a medicine for boils and abscesses. The burned ash of mosses mixed with fat and honey is used as an ointment for cuts, burns and wounds in the Himalayan region. *Riccia discolor* used as to cure ring worm. According to the Chinese traditional medicine nearly 40 kinds of bryophytes used to treat cardiovascular system, bronchitis, as well as skin diseases and burns. peat water possesses astringent and antiseptic properties. 'Sphagnol', a distillate of Peat Tar, is useful in eczema, psoriasis.

**Table .2: Flora of Bryophytes in G.Madugula forest region of Eastern Ghats of India**

S.No	Name of the plant species	Family
1	<i>Funaria hygrometrica</i>	Funariaceae
2	<i>Marchantia polymorpha</i>	Marchantiaceae
3	<i>Plagiochasma rupestre</i>	Aytoniaceae
4	<i>Plagiochasma wrightii</i>	Aytoniaceae
5	<i>Polytrichum alpinum</i>	Polytrichaceae
6	<i>Polytrichum densiflorum</i>	Polytrichaceae
7	<i>Riccia discolor</i>	Ricciaceae
8	<i>Riccia fluitans</i>	Ricciaceae
9	<i>Spagnum cymbifolium</i>	Spagnaceae
10	<i>Spagnum squarrosum</i>	Spagnaceae

**Table 3: Numerical data on Bryophytes present in G.Madugula**

S.No	Name of the species	Frequency	Density	Abundance
1	<i>Funaria hygrometrica</i>	76	5.6	6.7
2	<i>Marchantia polymorpha</i>	72	5.2	5.9
3	<i>Plagiochasma rupestre</i>	38	2.5	2.8
4	<i>Plagiochasma wrightii</i>	41	2.7	2.9
5	<i>Polytrichum alpinum</i>	79	5.8	6.9
6	<i>Polytrichum densiflorum</i>	82	6.1	7.0
7	<i>Riccia discolor</i>	75	5.5	6.6
8	<i>Riccia fluitans</i>	78	5.7	6.7
9	<i>Spagnum cymbifolium</i>	69	5.1	5.8
10	<i>Spagnum squarrosum</i>	62	4.8	3.2

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