

CHANGE of *Marchantia* sp SIZE AND COLOUR RELATED TO DISTANCE FROM WATER RESOURCE IN CUGHUP EMBUN, SOUTH SUMATERA

¹Hanifa Marisa

¹Biology Department, Faculty of Mathematic and Natural Science
The University of Sriwijaya, km 32 Indralaya, South Sumatera, Indonesia 30662
Email address: gmdighan2002@yahoo.com

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ABSTRACT

An investigation about size and colour of *Marchantia* sp moss, had been done in Cughup Embun water fall, Pagar Alam, South Sumatera, Indonesia at November 9th, 2014(end of drough season). The aim was to know wether the distance from water fall (air and soil moisture) should effect the size and colour of those moss. Twenty meters sistematically distance in 4 points location from above slope to water fall pond; 5, 25, 45, 65 and 85 m were considered for *Marchantia* sp sampling. Body size, colour and existing of Sporangium were noted. It is found that the size of moss body gradually bigger from 0.8, 1.0, 1.2, 1.3 and 1.3 cm. Colour of moss change from pale brown, pale green, green and deep green. Amount of archegoniopore seems exist in many number at 45 m distance from above ground.

Keywords: *Marchantia* sp, kelembaban, archegoniopore, antheridiopore.

ABSTRAK

Penelitian berkenaan dengan ukuran dan warna lumut *Marchantia* sp dilakukan di Air Terjun Cughup Embun, Pagar Alam, Sumatra Selatan, Indonesia pada 9 Nopember 2014 (ujung musim kemarau). Tujuannya untuk mengetahui apakah jarak dari titik air terjun (kelebabab udara dan tanah) berpengaruh pada ukuran dan warna lumut hati. Titik pengamatan dibuat 5 buah yang secara sistematis berjarak 20 m, pada 5, 25, 45, 65 dan 85 m dari gerbang turun ke telaga air terjun. Pengamatan dilakukan pada ukuran tubuh tumbuhan, warna serta sporangium dan ditemukan bahwa ukuran secara gradual meningkat dari 0,8., 1,0., 1,2., 1,3 dan 1,3 cm disertai perubahan warna coklat pucat, hijau pucat, hijau dan menjadi hijau pekat. Jumlah arkegeniopor terlihat banyak pada jarak 45 m dari gerbang atas menuju ke telaga air terjun.

Kata Kunci: *Marchantia* sp, moisture, archegoniopore, antheridiopore.

INTRODUCTION

Some researcher, like Dilks and Proctor (1979) cit. Proctor et al.,(1998) considered the water content of a bryophyte as divisible into three parts –external capillary water, symplast water within the cells and apoplast water in the cell walls- and emphasized that the external capillary water is an essential functional component in the physiology of many bryophyte. The external water is held at relatively high water potential related to the sized of the capillary spaces provided by the morphology of the plant. *Marchantia* distributed widely on over the world wick moist habitat. *Marchantia* sp live at Alpine Pond, EH Lohbrunner Alpine Garden. It is considered a weed by gardeners and horticulturist, but in the early spring it is at its most interesting, in reproductive mode. Male plants have erect stalks and female liverwort show similar stalks but instead of plate there is an umbrella like disc with many downward pointing lobes (Anonymous, 2002). In Singapore, *Marchantia acaulis* decided as endangered species, and just could find at MacRitchie Reservoir and Bukit Gombak, growing on wet and shaded boulders or concrete walls of artificial ditches and canals (Anonymous, 2008). *Marchantia polymorpha*, growth at river bank where wet soil condition exist in Jobolarangan forest, Mount Lawu, Java Island, Indonesia. Those microhabitat is good for *Riccia* sp too (Setyawan and Sugiyarto, 2001). Liverworts were used as agen for decrease of oxygen demand of Jumputan liquid waste (Yuliasari et al., 2011).

Cughup Embun mean dew cloud water fall. It is located in Pagar Alam town, South Sumatera province, Indonesia. Topography contour and the height of water fall made the continuous wet wind move from waterfall to downward of small river outlet. Wet wind is called by local peoples as Embun or dew-cloud. Effect of those wet wind is the moisture of air and soil water content always high, and decrease as long of distance from waterfall. As could be seen at figure 1, it is interested to know wether the distance from waterfall pond shoul be effect the morphological performance of liverwort.

MATERIAL AND METHODS

Twenty meters sistematically distance in 4 points location from above slope ground to water fall pond; 5, 25, 45, and 65 m were considered for *Marchantia* sp sampling. Body size, colour and existing of Sporangium were noted.

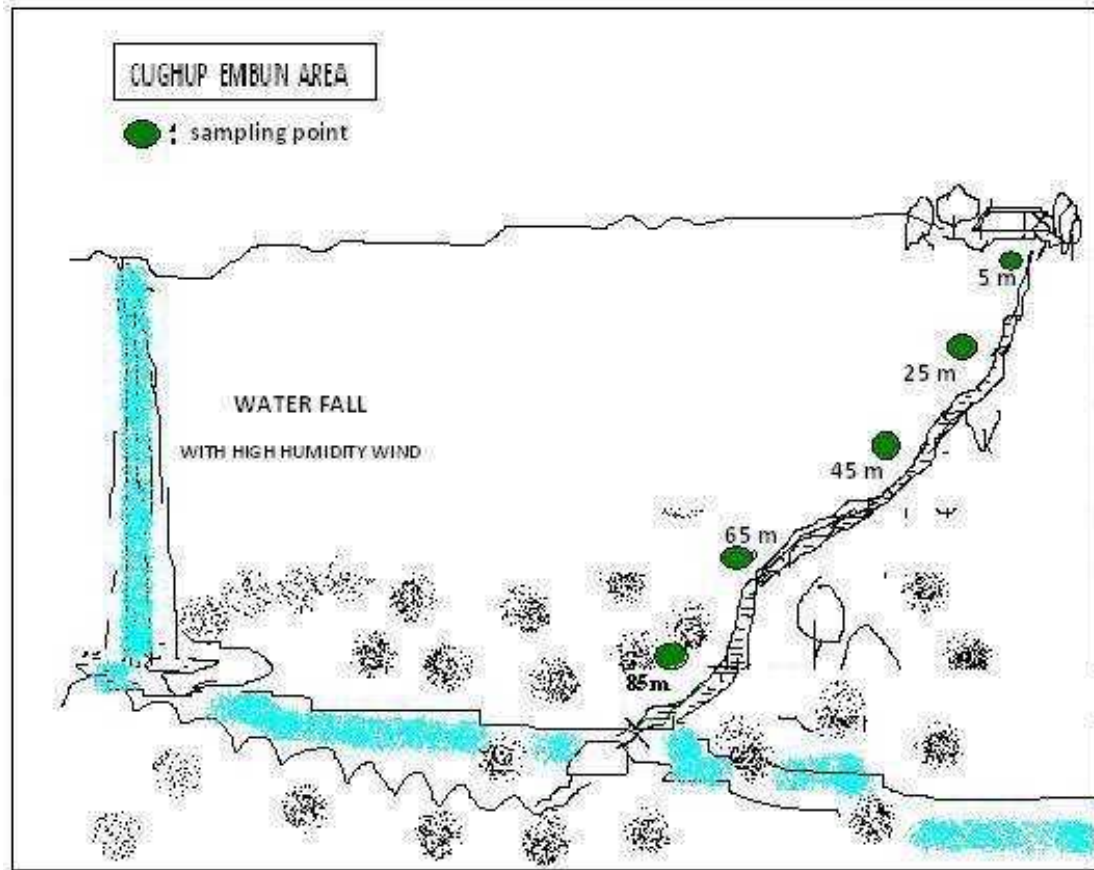


Figure 1. Cughup Embun waterfall area and sampling location. Upper sampling point (eg. 5 m) is the closed microhabitat that affected by human daily activity.

It is found that the size of moss body gradually bigger from 0.8, 1.0, 1.2, 1.3 and 1.3 cm. It is seems that thallus and reproductive organs (antheridiopore and archegeniopore) both morphological performance and amount were impacted by moisture of soil and air condition represented by distance from water dew resource and distace from ground to downward position of sampling point. Figure 2 is *Marchantia* sp performance; from left to right; 5, 25, 45 and 65 m from ground level to below toward waterfall pond, where the moisture increase because of

80 m ater fall. The very depth green colour exist on the liverwort live at the very close sampling point to water dew resource, and gradually change to pale green and brown as addition of distance from water dew resource.

According to Nelson and Halpern (2005), examined short-term responses of ground-layer bryophytes to logging disturbance and creation of edges in mature

Pseudotsuga forests of western Washington (USA). The abundance and richness of species were measured in four 1-ha forest aggregates (patches of intact forest) and in surrounding logged areas before and after structural retention harvests. One year after treatment, species richness, total cover, and frequency of most moss and liverwort taxa declined within harvest areas.



Fig 2. *Marchantia* sp performance; from left to right; 5, 25, 45 and 65 m from ground level to downstairs toward waterfall pond, where the moisture increase because of 80 m ater fall. Note the width of liverwort body increase from left to right and amount of archegoniopore and antheridiopore on middle liverwort (45 m from upward ground).

At the end of drought season, it is shown that the colour of liverwort thallus become brown and small thallus (about 8 mm). South Sumatera overcome by many smoke and forest fire, and affect the live of plants, especially mosses.

Eventhough spore production may be prolific in suitable habitats, it require adequate moisture which may be limited in the warmer and drier habitat (Miles and Longton, 1992). According to Une (1984), there is a negative correlation between the production of gemma cups and the formation of sexual branches in a colony of *Marchantia polymorpha* L. These negative correlatioan is associated with difference in age of thalli and the change of nutrient condition of soil. Furthermore, Vujicic et al. (2010) reported for the same species, the factor of light and temperature are important for culturing.

CONCLUSION

It is found that the size of moss body gradually bigger from 0.8, 1.0, 1.2, 1.3 and 1.3 cm. Colour of moss change An from pale brown, pale green, green, deep green and very deep green. Amount of archegonipore and antheridiopore seems exist in many number at 45 m distance from above ground. It means the condition for reproductivity is better at rare wet.

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