



**STUDY OF LIFE CYCLE EVENTS OF *FUNARIA HYGROMETRICA* HEDW.
UNDER THE INFLUENCE OF DIFFERENT CULTURE MEDIA**

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ABSTRACT

Life cycle events of *Funaria hygrometrica* hedw. were studied under the influence of four culture media (Knop, Hogland, MS and Basile). It is found that Knop and Hogland media are more suitable than remaining two. *F. hygrometrica* requires 100 to 105 days to complete life cycle under culture conditions.

Keywords: *Funaria hygrometrica* hedw., Life Cycle, Culture

INTRODUCTION

Funaria hygrometrica Hedw. is type member of moss family funariaceae. The species is common at some places in western ghat of Maharashtra, India. It is ephemeral species with life cycle shorter than one year. Reproductive events are not restricted to a particular season and mortality is mostly determined by abiotic factors [1]. Being a moss all the cells of *Funaria hygrometrica* are totipotent. They are able to give rise to new plants in the form of protonema [2]. Gametophytic cells,

spores and even the calyptra can give rise to protonema in culture conditions [3]. Bryophytes have been cultured on defined nutrient media. Since the early 1900's [4]. But contamination by algae, fungi and bacteria is one of the well known problems in bryophyte culture. The morphology of bryophytes grown in a sterile culture is often abnormal [5]. Shaw [6] devised a new approach to the experimental propagation of bryophyte by drying and crushing entire plant body.

Therefore, during present piece of work, different culture media are used to study life cycle events of *Funaria hygrometrica* using experimental propagation technique [6].

MATERIAL AND METHODS

Funarica hygrometrica clumps were collected, washed and processed according to experimental propagation technique [6] 0.5 g material was sprinkled on a pot (5" x 4" x 3") filled with 750 g mixture of soil, sand and cocopit (1 : 1 : 1). Knop [7], Hogland [8], MS basal [9] and Basile [10] media were prepared separately and used to irrigate the soil by keeping the pots in a tray filled with the respective medium. The pots were kept in light conditions in triplicate, monitored for developmental stages of *F. hygrometrica*.

RESULTS AND DISCUSSION

During present piece of work effect of four different media was studied on life cycle events of *F. hygrometrica*. Time required to produce different stages of life cycle i.e. protonema, first visible gametophyte and first visible sporophyte was recorded. Quantitative assessment of sporophyte, biomass and spore number per capsule was also carried out. Among all the media, Knop's medium is found to be best as gametophyte and sporophyte development starts earlier than remaining three. Results of Knop's and Hogland medium are comparable. The biomass produced in MS

and Basile media is considerably less than remaining two. Number of spores produced per sporophyte is also variable. Knop's medium is found to be best for invitro culture of bryophyte [3]. According to Southorn [11] ammonia nitrogen is harmful for spore germination in *Funaria hygrometrica*. Knop's and Hogland media contain nitrate nitrogen while MS and Basile media contain ammonium nitrogen. It may be the reason behind low biomass production in later two media. Spore size is somewhat stable among all the media. According to Nakosteen and Hughes [12], life cycle of *F. hygrometrica* may be completed in 4 months on *In-vitro* culture on Knop's inorganic medium. As compared to this report experimental propagation technique using Knop's medium is found to be more suitable.

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Table 1: Effect of Different Nutrient Media on Life Cycle Events in *F. hygrometrica*

S. No.	Medium	Protonema development	Days required to produce 1st visible gametophore	Days required to produce 1st visible sporophyte	No. of sporophytes produced per pot after 60 days	Biomass* produced (g) after maturation of all sporophytes	No. of spores produced per single sporophyte	Spore size (μm)
1.	Knop's	Visible after 2 weeks as green mat	24 \pm 1	35 \pm 1	108 +	7.928 (103 \pm 2)	12.3 x 10 ³ (\pm 1.97 x 10 ³)	22.2 \pm 1.9
2.	Hogland	Visible after 2 weeks as green mat	26 \pm 1	38 \pm 1	103 +	7.201 (103 \pm 3)	11.8 x 10 ³ (\pm 1.3 x 10 ³)	23 \pm 1.8
3.	MS	Visible after 2 weeks as green mat	26 \pm 1	41 \pm 2	90 +	5.159 (105 \pm 2)	9.6 x 10 ³ (\pm 2.98 x 10 ³)	22.4 \pm 2.4
4.	Basile	Visible after about 3 weeks as green mat.	32 \pm 1	41 \pm 2	85 +	4.578 (100 \pm 3)	7.8 x 10 ³ (\pm 2.11 x 10 ³)	22.2 \pm 2.7

NOTE: Average of Three Replicates; *Values in Parenthesis Indicate Days Required to Mature all the Sporophytes in Pot