



## Biophysical basis of productivity in little millet (*Panicum miliare* L)

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**Abstract :** Plant regulation of water utilization and loss is important in determining the drought tolerance in crop plants. It was observed that high yielding genotypes had higher stomatal conductance at 60 days after sowing which could be because of higher stomatal frequency on abaxial surface which intern would have enhanced the canopy photosynthesis. The transpiration rate was higher in low yielding genotypes and low in high yielding genotypes. There was a minimum interveinal distance and high vein load frequency in high yielding genotypes.

**Key Words :** Biophysical parameters, Little millet genotypes, Yield

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### INTRODUCTION

Little millet (*Panicum miliare* L.), commonly known as “Same” is an important minor millet belonging to the family Poaceae. It is rich in nutrients. It is suited to conditions of low and moderate rainfall areas ranging from 500 to 700 mm. It is widely cultivated as a cereal across India, Nepal and Western Burma. It is particularly important in the Eastern Ghats of India, where it forms important part of tribal agriculture (de Wet *et al.*, 1984). In India, the cultivation of little millet is mainly confined to Tamil Nadu, Karnataka, Andhra Pradesh, Maharashtra, Orissa, Bihar, Madhya Pradesh and Uttar Pradesh. It is known that biophysical parameters may affect yield in many ways. It is better to identify those which have close positive relation with grain yield. With this background, the present study was taken up.

### MATERIALS AND METHODS

A field experiment on little millet was conducted with 13 genotypes at university of Agricultural Sciences, Dharwad. The genotypes were classified in to high yielding (TNAU-63,

OLM -20, TNAU-89, CO-2), medium yielding (OLM-203, TNAU-98, DLM-423, OLM -23) and low yielding (DLM -322, Varisukhdar, OLM-37PRC-3). Along with local check above little millet genotypes were sown in Randomized Block Design with three replications.

Measurement of photosynthetic rate (p), stomatal conductance and transpiration rate was made on third fully expanded leaf from the top at 60 DAS, using portable photosynthesis system (LICOR, Model, LI-6400). These measurements were made between 10.00 AM to 12.00 noon.

Stomatal frequency refers to the number of stomata per unit leaf area. It was measured by the leaf impression method. The quick fix solution was smeared thinly on the adaxial and abaxial surfaces of the third leaf from top. After drying, the thin film on the leaf surface was peeled off and mounted on a slide with cover slip and observed under microscope at 40x magnification. The number of stomata was counted on both adaxial and abaxial surfaces and expressed as number of stomata per mm<sup>2</sup> leaf area.

The interveinal distance and vein load frequency in leaf tissue were determined by following the method of Crookston and Moss (1974). The distance between the veins was expressed

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