

SCREENING FOR COLD TOLERANCE AT JUVENILE STAGE IN VARIOUS *HEVEA* CLONES GROWN AT COLD STRESS PRONE HIGH ELEVATION CONDITIONS

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A study was carried out to screen *Hevea* clones for cold stress tolerance in a high elevation region. A polybag nursery comprising of 31 *Hevea* clones along with other popular clones was established in a cold stress prone/high elevation region at Mattupetty, Munnar, Kerala while another set grown at Rubber Research Institute of India, Kottayam served as control. Growth parameters (sprouting, survival rate, stem height, number of leaves emerged and leaf length), leaf chlorophyll content and gas exchange parameters such as net CO₂ assimilation rate (A), stomatal conductance (g_s), transpiration rate (E) and instantaneous Water Use Efficiency (WUE_i) were recorded during the cold stress period at Munnar and control conditions at Kottayam. The clones viz. P 202, P 48, P 89, P 68, P 47 and P 201 had better survival and vigorous growth under cold stress conditions. In terms of net CO₂ assimilation rate (A), pipeline clone P 68 was the best performer followed by P 48, P 94, P 180 and P 181 along with check clone RRIM 600. Rank sum analysis revealed the potential inherent cold stress tolerance in clones P 48, P 68, P 168, P 116, P 202 and P 181 during juvenile growth phase. These clones which were superior in terms of better growth and physiological parameters can be evaluated in field to affirm their inherent cold stress tolerance, yield potential and suitability for cultivation in cold stress prone regions.

Keywords: Cold stress, Gas exchange parameters, Growth, *Hevea brasiliensis*, Juvenile screening, Sprouting

INTRODUCTION

Hevea brasiliensis Muell. Arg. commonly known as Para rubber tree belonging to the family Euphorbiaceae is the most important source of natural rubber (NR). It requires warm humid climate (21 to 35°C) with an annual rainfall of not less than 200 cm (Watson, 1989). In India, the most favourable climatic condition for rubber cultivation prevails in Kerala State, some parts of Kanyakumari District of Tamil Nadu and

South Karnataka region where rubber is grown for more than a century. Due to the increased demand for NR in India, rubber cultivation is being extended to other parts of the country which are only marginally suitable for *Hevea*. For instance, the non-traditional areas located in the central part of India such as Maharashtra and Odisha are characterised by severe drought and heat stress during summer while North-Eastern regions like Tripura, Assam and Meghalaya