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EARLY ESTABLISHMENT AND PHOTOCHEMICAL EFFICIENCY OF ORTETS FROM DIVERSE AGROCLIMATES IN A COLD-PRONE ENVIRONMENT

Gitali Das*, Sandeep Kumar *, R. Krishnakumarand James Jacob**[**]

*Rubber Research Institute of India, Regional Research Station, Jalpaiguri-735 225, West Bengal, India

**Rubber Research Institute of India, Kottayam-686 009, Kerala, India

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Ortets selected from polyclonal seedling plantations raised in five different regional stations of RRII were planted at Nagrakata in sub-Himalayan West Bengal in order to evaluate their performance under cold stress. Early establishment and growth in the field as well as maximum (Fv/Fm) and effective (Φ PSII) quantum yield of PSII during post monsoon, pre-winter and post winter period were measured. Among the ortets tested, growth was better for the ortets collected from Guwahati. The survival of leaves at the top whorl was highest for the ortets RRSD 1 and lowest for RRSA 98. The magnitude of depression in Fv/Fm from post-monsoon to pre-winter was the lowest in RRSD 1. The study indicated that based on initial establishment and chlorphyll fluorescence parameters, RRSD 1 would be a highly potential cold tolerant ortet and RRSA 98 was found to be a highly susceptible ortet in the prevailing cold climate of sub-Himalayan West Bengal.

Key words: Cold stress, *Hevea brasiliensis*, Ortet, Photosynthetic efficiency, Cold tolerance

INTRODUCTION

Adaptation of *Hevea*, a tropical plant, to cold climate was well established (Alam *et al*., 2002; Raj *et al*., 2005; *Das et al*., 2013 b). Some plants being well adapted to tropical climate would also show tolerance to chilling stress (Mai *et al*., 2010). Chilling stress leads to alterations in metabolic processes, decrease in enzymatic activities, reduction of photosynthetic capacity and changes in membrane permeability (Alam *et al*., 2005; Sevillano *et al*., 2009; Mai *et al*., 2009; Jing *et al*., 2010; Jacob, 2013). It was observed that tropical and subtropical plants when grown under chilling temperature showed adverse effect (Allen and Ort, 2001). *Hevea* polycross seedling progeny, when grown under lower Brahmaputra valley of Assam (Kamrup) and Terai zone of West Bengal (Jalpaiguri) over years showed variation in adaptation potential (Das *et al*., 2013a). On the basis of performance of polycross seedling trees raised in various regional research stations of RRII, selections were made and the superior performers (ortets) from Nagrakata, Dapchari, Agartala, Tura and Guwahati, were procured and grown in sub-Himalayan climatic condition. The weather pattern of four stations of North East India compared to that of Dapchari, Maharashtra are quite

Correspondence: Gitali Das (Email: gitalidas@rubberboard.org.in)