

PHYSIOLOGICAL AND BIOCHEMICAL ASPECTS OF STOCK-SCION INTERACTION IN *HEVEA BRASILIENSIS*

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Rootstock-scion interaction effects on certain physiological and biochemical parameters were studied in five clones of *Hevea brasiliensis*. Photosynthetic CO₂ assimilation rate (A) and stomatal conductance (gs) were measured in 18-month-old polyclonal rootstock seedlings before budding and 18 months after budgrafting them with the scions. The photosynthetic CO₂ assimilation rate was found to be a clonal character. Existence of a strong positive correlation between A of the stock plants and scion indicated that A is also being influenced by the rootstock. No significant relationship existed between gs and instantaneous water use efficiency (A/gs) of the stock plants and scion. Very high CV was observed among plants within the scion clones in gs and A/gs, may be due to stock-scion interaction. The considerable CV observed between the individual plants within a clone in total soluble sugars, reducing sugars, phenol and amino acid contents, indicated the existence of stock-scion interaction.

Key words : *Hevea brasiliensis*, Photosynthetic CO₂ assimilation rate, Stock-scion interaction, Stomatal conductance.

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INTRODUCTION

Budgrafting, a well accepted practice of vegetative propagation in *Hevea brasiliensis*, has some definite advantages. This technique is an effective means of rapid and true to type multiplication of desired genotypes. But wider genetic differences between rootstock and scion could lead to incompatibility in the budgrafted plants. Rootstock-scion interaction is a complex phenomenon (Hartman and Kester, 1978; Andrews and Marquez, 1993). The influence of rootstock on scion cultivars is well documented in many plant species (Hartman and Kester, 1978; Singh, 1980; Lockard and Schneider, 1981; Rom, 1987).

Influence of rootstock or existence of rootstock-scion interaction on growth and yield in *Hevea* were reported by Templeton (1960), Buttery (1961), Ng *et al.* (1981),

Seneviratne *et al.* (1996) and Sobhana (1998), but there are only very few reports on physiological and biochemical aspects of rootstock-scion interaction (Teng and Pushparaja, 1974; Sobhana *et al.*, 1980). The objectives of the present experiments were to evaluate the effect of rootstock/scion on gas exchange by leaves and on the biochemical composition of the scion leaves.

MATERIALS AND METHODS

Five clones of *Hevea brasiliensis* viz. RRII 105, RRII 208, RRIM 600, CT 1 and GI 1 were selected for the present study. These clones were budgrafted on eighteen month old seedling rootstocks raised from heterogeneous polyclonal seeds in large cement pots containing about 40 kg soil. To avoid any possible plant-to-plant variation, buds were selected from a given budwood plant for each clone. After the grafts were