

## Abstract

Experiments were conducted in Kenya to evaluate the variation in leaf anatomy and gas exchange in 25 diploid, triploid and tetraploid clones of tea (*Camellia sinensis* L.). There were significant variations in the different attributes within and between the different groups. The number of stomata and epidermal cells per unit leaf area decreased with increasing ploidy, reflecting larger cells in the tetraploids than in the diploids and triploids. Specific leaf mass (SLM) was also higher in the tetraploids. Net CO<sub>2</sub> assimilation (A) and stomatal conductance (g<sub>s</sub>) were lower in the tetraploids than in either diploids or triploids and lower in triploids than diploids. These changes were related to the lower number of stomata and epidermal cells with a correlation between A and number of stomata ( $R^2=0.58$ ) and number of epidermal cells ( $R^2=0.85$ ). Net CO<sub>2</sub> assimilation and stomatal conductance were also strongly correlated ( $R^2=0.73$ ). Gas exchange was not related to specific leaf mass ( $P>0.05$ ). It is concluded that gas exchange is strongly influenced by leaf anatomy and ploidy level.