ABSTRACT

Brassica napus is an economically important oil crop which is used globally. Present study evaluated the Na+ and K+ ions flux and their effects on physio-anatomical parameters of two cultivars of *Brassica napus* (Sandal canola and Super canola). Various concentrations of NaCl and salicylic acid were applied to both cultivars at seedling stage. The objective was to observe the comparative responses of both cultivars under NaCl stress for which the parameters like growth, biomass, physiology and anatomy were measured. It was found that NaCl uptake at 450 mML-1 concentration significantly reduced the studied parameters such as height of the plants, number of leaves, leaf area, number of stomata, fresh and dry biomass of plant, and weight of seeds compared to the control. Physiological parameters such as rate of photosynthesis ranged from 17 to 10 µmolm-2. s-1 in cv. sandal canola and 11 to 8 µmolm-2. s-1 in cv. super canola, rate of transpiration ranged maximum from 1.98 to 0.89 mmolm-2. s-1 in cv. sandal canola while 1.67 to 0.77 mmolm-2. s-1 in cv. super canola and stomatal conductance ranged from 0.64 to 0.32 mmolm-2. s-1 in cv. sandal canola while, 0.59 to 0.28 mmolm-2. s-1 in cv. super canola. Hence, negative and significant relationship was found between physiological parameters and NaCl concentration. Na+ uptake was found highest in roots, ranged from 46 to 61 g/kg, while minimum in the seeds, ranged from 6 to 9 g/kg in both cultivars from T0 to T3 respectively. Similarly, K+ uptake was found highest in stem, ranged from 52 to 71 g/kg and lowest in seeds i.e., from 9 to 17g/kg in cv. sandal canola while K+ uptake was found highest in root, ranged from 46 to 64 g/kg and lowest in seeds from 7 to 13 g/kg in cv. super canola from T0 to T3 respectively. The K+/Na+ ratio was significantly reduced in different organs of plant such as in leaves, stems, roots and seeds at 450 mML-1 NaCl concentrations. This study concludes that sandal canola and super canola cultivars of *Brassica napus* can tolerate Na+ stress up to 450 mML-1. These findings can help to cultivate cv. sandal canola and cv. super canola in NaCl stressed areas by absorbing excessive Na+ and other soluble ions from the soil. Salicylic acid imparted positive results by enhancing overall resistance against NaCl stress in both cultivars. Hence, this study can promote the biodynamic farming in saline and arid region.