ABSTRACT

Secondary metabolites are bioactive compounds which are synthesized naturally in all plant parts. The quality and quantity of secondary metabolites produced by plants differ depending on the plant and environmental conditions under which they are produced. The purpose of the study was to investigate the effects of nitrogen, phosphorous and potassium (NPK) fertilizer (17:17:17) rates (0, 100, 200, 300 and 400 kg ha-1) on the production of secondary metabolites in field and greenhouse grown pepino melons (Solanum muricatum Aiton). The experimental design was randomized complete block design with five NPK fertilizer treatments replicated three times. Results indicated that an increase in NPK fertilizer rate led to an increase of carotenoids (lutein, lycopene and β-carotene) up to a maximum at 200 kg NPK ha-1 after which the contents decreased in both growing environments and trials. The control (no fertilizer application) favored the accumulation of total phenolic content (TPC) in both growing environments and trials. Greenhouse grown pepino melon fruits which were not supplied with fertilizer (control) had a TPC content of 174.3 and 145.5 mg GAE 100g-1 fresh weight (FW) in trial one and two, respectively. Fertilizers could not enhance production of TPC in pepino melon fruits and application of 200 kg NPK ha-1 is recommended for maximum accumulation of carotenoids (lycopene, lutein and β-carotene).

Key words: Secondary metabolites, NPK fertilizer, greenhouse, field, pepino.