ABSTRACT

Tea (*Camellia sinensis*) is a major cash crop in Kenya that suffers economic losses due to *Brevipalpus phoenicis* and *Oligonychus coffeae* infestations during droughts. Pesticides use on tea is prohibited and pests control is through cultural and agronomic practices. Resistance/susceptibility of imported and new cultivars to mites is unknown. Plants release overhead volatile organic compounds (OVOCs) that attract or repel insect pests. Some tea cultivars are preferred while others are resistant/tolerant to mites attack. Indeed even in the susceptible clones, infestations seem to be influenced by seasons, nitrogenous fertilizer rates and region of production. The purpose of the research was to investigate how OVOCs compositions/levels are influenced by seasons, region and the agronomic practices. The study was superimposed on ongoing clonal trials at Kangaita, Kipkebe and Timbilil and fertilizer trial on clone TRFK 6/8 at Timbilil A randomized complete block design was used. Mites were extracted using mite brushing machine and counted under dissecting microscope. OVOCs were trapped by adsorbents then analysed by GC and GC-MS. Mites responses to VOCs were tested on Y-tube olfactometer. There were significant ($p \leq 0.05$) variations in clonal mite infestations. Sixteen clones were resistant/tolerant while five were susceptible to mites. Kangaita recorded higher ($p \leq 0.05$) infestations than Kipkebe and Timbilil. Mites levels directly correlated to maximum temperature ($r = 0.81$, $P \leq 0.05$) and inversely correlated to relative humidity ($r = -0.73$, $P \leq 0.05$) and rainfall ($r = -0.184$, $P \leq 0.05$). The infestations were linearly correlated GLVs and inversely correlated with most aromatics and terpenoids. Susceptible and resistant clones released high amounts of GLVs and both aromatics and terpenoids respectively. More and high levels of OVOCs were released during dry season, declined in rainy and slightly increased during cold season. There were significant ($p \leq 0.05$) variations in mite population due to N- rates. High infestations occurred on 0 and 300 while low levels on 150 - 225 kg N/ha/year. All GLVs increased while some aromatic and terpenoid compounds decreased with increase in N- rates. Mites were significantly ($P \leq 0.05$) attracted by GLVs and repelled by aromatics and terpenes. These results indicate that high levels of GLVs (in dry season and at high fertilizer rates) predispose cultivars to mites infestations while aromatics and terpenes (in resistant cultivars and at recommended Kenyan fertilizer rate) induce resistance. Resistant cultivars are recommended for commercial exploitation in mite prone areas while breeding/selection programmes should incorporate OVOCs profiles to develop tea cultivars that resist mites attack.