

## **The influence of nutrients and phenolic compounds of cabbage collard green, lettuce and spinach on the biology of cabbage aphid *Brevicoryne brassicae*(h) and peach potato aphid *Myzus persicae* (SULZ)**

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Defence of plants against pests may depend on texture and composition of the plant surface, absence of nutrients required by the pest and production of toxins or deterrents (Levin, 1971). Majority of toxins or deterrents already identified comprise of plants secondary constituents. One of the most important groups of plants secondary constituents playing a defensive role against insect pests are phenolic compounds. Using Folin-Denis assay, cabbage, collard green, lettuce and spinach were shown to contain a significantly different mean concentration of total phenols, followed by collard green, lettuce and spinach were shown to contain a significantly different mean concentration of total phenols, followed by collard green, cabbage while spinach had the lowest concentration. Experiments on the identification of phenolic compounds using Thin Layer Chromatography (TLC) method revealed that cabbage, collard green, spinach and lettuce contained seven, ten, eight and nine phenolic compounds respectively. Laboratory experiments showed that lettuce and spinach could not successfully support a culture of *Brevicoryne brassicae* (L.) and all the nymphs that were fed on the leaves of the two test cultivars died ten hours after introduction. Further treatment of the spinach and lettuce leaves with cabbage extract had no effect and the two test cultivars even after treatment with cabbage extract still could not successfully support a culture of *B. brassicae*. Results on the treatment of cabbage leaves with spinach and lettuce extracts revealed that the extracts had no effect on the survival of *B. brassicae*. The mean numbers of *B. brassicae* nymphs found surviving seven days after introduction to feed on cabbage leaves treated with spinach and lettuce extracts were not significantly different from the mean numbers of the nymphs introduced to feed on untreated cabbage leaves. *B. brassicae* fed and reproduced successfully on cabbage and collard leaves. The results of this experiment showed that the mean maturity, fecundity and post-reproductive period of *B. brassicae* on cabbage and collard green were not significantly different. However, the mean longevity and reproductive period of *B. brassicae* on collard green were significantly longer than on cabbage. Experiments on *Myzus persicae* (Sulz) reared on cabbage, collard green leaves showed that the mean maturity and longevity of aphid on the three test cultivars were not significantly different. However, the mean fecundity, reproductive periods and post-reproductive periods were significantly different. The highest mean fecundity was recorded on lettuce followed by collard green while cabbage had the lowest. The longest mean reproductive periods and post-reproductive periods were significantly different. The highest mean fecundity was recorded on lettuce followed by collard green while cabbage had the lowest. The longest mean reproductive period was recorded on collard green while cabbage had the shortest. The differences between the mean reproductive period on lettuce and cabbage were not significant and so were those between collard green and lettuce. The mean post reproductive period was longest on lettuce followed by cabbage while the shortest was on collard green. The mean

concentration of nitrogen, phosphorous, sulphur, calcium and magnesium in all the four cultivars were not significantly different. However, the mean concentration of potassium, copper, manganese, iron and zinc showed some significant differences. The mean concentration of potassium was highest in lettuce and lowest in cabbage. The differences between the mean concentration of potassium in cabbage, collard green and spinach were not significant and so were those between spinach and lettuce. The mean concentration of copper was highest in spinach and lowest in cabbage. The differences between the mean concentration of copper in cabbage, collard green and lettuce were not significant and as were those between spinach and lettuce. The mean concentration of manganese was highest in spinach followed by lettuce, cabbage while collard green had the lowest. The mean concentration of iron was highest in lettuce followed by spinach and cabbage while collard green had the lowest. The mean concentration of zinc was highest in spinach and lowest in lettuce. The differences between the mean concentration of zinc in cabbage, collard green and lettuce were not significant.