

Antifeedant and antifungal activity of heartwood extracts of tea cultivars against *Glyptotermes dilatatus* Bugnion and Popoff and *Fusarium* sp.

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The low country live wood termite, *Glyptotermes dilatatus* is an economically important insect pest of low grown tea. The termite colony initiated by a pair of alates in rotted tea stumps move to the heartwood by making feeding galleries. They disperse wood rot fungi while feeding on heart wood of tea bush. The damage symptoms vary with the type of cultivar. Objective of the present study is to study the chemical constituents in susceptible and resistant cultivars.

Extracts of the debarked healthy stems of tea cultivars, TRI 2023 & TRI 4042 (susceptible) and TRI 2027 & TRI 4049 (resistant) were evaluated for the antifeedant and antifungal activities against *G. dilatatus* and *Fusarium* sp. which is common in the termite body, termite galleries and rotted tea stems using no choice feeding bioassay and antifungal assay respectively. Extract of TRI 2027 obtained using CHCl₃ showed a higher antifeedant activity (P<0.05, LSD) against *G. dilatatus* than that of TRI 2023, TRI 4042 or TRI 4049. The highest antifungal activity was observed in the extracts of both resistant cultivars (TRI 2027, TRI 4049) than that of susceptible cultivars (P<0.05, Tukeys mean separation test).

Fractionation of stem extract of TRI 2027 indicated that caffeine is one of the major bioactive compounds that showing antifeedant and antifungal activities. Antifeedant and antifungal activities were detected at 160 mg/ mL and 0.8 mg/ mL concentrations respectively. Mean caffeine contents of heartwood of resistant and susceptible cultivars were quantified using colorimetric method. Results revealed that the caffeine content of resistant cultivars TRI 2027 and TRI 4049 (0.52±0.26, 0.34± 0.07 mg/g) were greater (t=3.28,df= 14, P=0.0055) than that of the susceptible cultivars, TRI 2023 and TRI 4042 (0.21±0.08, 0.22±0.01 mg/g) resulting a strong positive correlation between caffeine content and antifeedant and antifungal activities of the extracts of heartwood of tea cultivars. Hence caffeine is proven to be potential biochemical parameter to evaluate resistance of tea cultivars against *G. dilatatus* and *Fusarium* sp.

Key words: Glyptotermes dilatatus, antifeedant activity, antifungal activity, resistance

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