INFESTATION OF TEA BY THE SHOT-HOLE BORER, *XYLEBORUS FORNICATUS* EICHH. (COLEOPTERA:SCOLYTIDAE): OVICIDAL EFFECT OF CAFFEINE

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No significant differences were observed in the development of the shot-hole borer beetle, Xyleborus fornicatus of tea, *Camellia sinensis growing in culture media containing caffeine at low concentrations and that growing in its absence. Significant differences were seen when concentration was increased to over 50 ppm. The number of emerging beetles decreased sharply with 50 ppm while hardly any beetles emerged at 100 and 200 ppm.*

When beetles were grown with 100 ppm caffeine and transferred to a caffeine-free medium each day over a thirty day period, it was observed that exposure for even 24 h before transfer decreased sharply the number of emerging beetles. None emerged when exposure exceeded 72 h.

Beetles growing in caffeine media did not lay eggs for up to 12 days, although well developed eggs were found on dissection. The size and number of eggs in the ovaries reduced after 12 days but eggs and ovaries atrophied after 17 days. Caffeine appears to have irreversible ovitoxic effects on the beetle.

The concentration of caffeine in tea was found to be significantly more in the bark than in the stem where galleries are made. There was significantly higher caffeine in the susceptible cultivar compared with the resistant cultivar and the caffeine content in all parts of both cultivars was greater in infested stems, suggesting that caffeine plays a role in a defense mechanism against beetle attack. However the higher caffeine content in the susceptible cultivar and a concentration in excess of 50 ppm being present in all parts of the infested stem in both cultivars suggests that there are other factors involved which permit the beetle to be more tolerant of caffeine in the living tea stem.

Keywords: *Shot-hole borer beetle,* Xyleborus *fornicatus,* Camellia sinensis, *caffeine, ovitoxicity, quantification.*