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**MULTIPLE MATING AND MATE CHOICE IN
SITOPHILUS ORYZAE (L.) (COLEOPTERA:
CURCULIONIDAE)**

**A thesis presented in partial fulfilment of the requirements
for the degree of**

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Abstract

The rice weevil, *Sitophilus oryzae* (L.) (Coleoptera: Curculionidae) is a major pest of stored grains throughout the world. A recent study found a reduction in fecundity and fertility in females that are exposed to multiple males. However, the mechanism behind this is unknown. In the first experiment we examined female *S. oryzae* fitness decline and behaviour in response to male density (i.e. 1, 5 and 10 males) maintained with a single female. Results show that female fecundity and longevity significantly decreased with increased male density ($P < 0.01$). However there was no significant effect of male density on fertility. Mating time significantly increased with male density ($P < 0.01$) but feeding and foraging time decreased from male density 1 to male density 5 and 10 ($P < 0.03$). The decrease in fecundity under high male density is proposed to be caused by increased damage by male reproductive organs. The second experiment examined precopulatory sexual selection in *S. oryzae*. Results show that both sexes select for large genitals. In addition males select for the number of mature eggs in females. These traits may directly affect the reproductive fitness of these insects. In the final experiment we examined how multiple mating affected female reproductive fitness in the laboratory. Results indicate that over sixty days females permanently paired with males, mated twice with different males and four times with the same males did not suffer from significant fertility decline while females mated once, twice with the same males and four times with different males had significant fertility declines. It is suggested that mating once or twice with the same males is not enough for females to maximise their reproductive fitness. The significant fertility decline in females that mated with four different males may be caused by reproductive organ damage or other factors which decreases their fertility due to excessive polyandry.

KEY WORDS oviposition, multiple mating, rice weevil, *Sitophilus oryzae*, Curculionidae.

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