DIVERSITY AND HOST PREFERENCE OF TEPHRITID FRUIT FLY SPECIES INFESTING CUCURBIT AND MAJOR HORTICULTURAL CROPS GROWN IN THE LOWER COASTAL KENYA

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DECLARATION

This is my original work and has not been submitted for award of a degree in another university

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ABSTRACT

Tephritid fruit flies are among the notorious pests of horticultural crops in Kenya and have been documented to cause yield losses of 30-100%. Tephritid fruit flies from the *Bactrocera* and *Dacus* genera have been identified on cucurbit farm traps. However, their losses have not been quantified. Therefore, this study was conducted to determine the occurrence, diversity and host preference of tephritid fruit flies infesting cucurbit and other horticultural crops in coastal Kenya. Infested cucurbit and major horticultural crops were randomly sampled and incubated in the laboratory. The emerging adults from the recovered pupae were identified based on their morphology. Host preference tests of the dominant and most prevalent fruit fly species that is *B. cucurbitae*, *D. bivitattus* and *D. ciliatus* were conducted on courgettes (*Cucurbita pepo*), butternut (*Cucurbita moschata*), cucumber (*Cucumis sativus*) and watermelon (*Citrillus lanatus*). Data on the number of pupae recovered, pupae/ml, percent adult emergence, percent deformity, percent sex ratio and tibia measurements of the insects from each host plant was collected. Mass rearing of the dominant fruit fly species was carried out on the suitable and readily available host plant. Pupae recovered, weight of pupae, percent adult emergence, fecundity, percent egg hatch and percent flier were observed to determine the suitability of using butternut in the mass rearing of the three species to enable laboratory studies of these species.

Bactrocera cucurbitae, *Dacus bivitattus*, *Dacus ciliatus* and *Dacus vertebratus* were the major tephritid fruit flies found infesting cucurbit in coastal Kenya. In addition, *B. cucurbitae* and *D. ciliatus* were also found to attack *Solanaceae*, *Rutaceae*, *Myrtaceae*, and *Anarcadiaceae* crops. The most dominant fruit flies identified in cucurbit were *Bactocera cucurbitae*, *D. bivitattus* and *D. ciliatus*. Watermelon, butternut, courgettes and cucumbers were the most preferred crops by

B cucurbitae and *D. bivitattus* while *D. ciliatus* mostly preferred watermelon, courgettes, butternut and cucumber. Butternut was found to be the most suitable host plant for rearing *B. cucurbitae*, *D. bivitattus*, and *D. ciliatus* in the absence of an artificial diet. These findings show that *B. cucurbitae*, *D. bivitattus*, *D. ciliatus* and *D. vertebratus* are significant pests of cucurbit. In addi, *B. cucurbitae* and *D. ciliatus* are also major pests of *Solanaceae*, *Rutaceae*, *Myrtaceae*, and *Anarcadiaceae*. Hence, pest management programs should focus in the management of these tephritid fruit flies in horticultural farms. The host preference study indicated that watermelon was the preferred host plant for *B. cucurbitae*, *D. bivitattus*, and *D. ciliatus*. However, butternut was the suitable host for the mass rearing of *B. cucurbitae*, *D. bivitattus*, and *D. ciliatus*. Therefore, bioecological studies such as developing artificial diet for the mass rearing of these species should consider using butternut as an ingredient in the diet.