Performance of the newly invasive fall armyworm Spodoptera frugiperda on different food plants

Li-Li Huang[1], Fangsen Xue[2], Jianchun Wan[3], Jianjun Tang[2], Yuyong Liang[4], and Hai-Min He[2]

[1]YuZhang Normal University
[2]Jiangxi Agricultural University
[3]Technology Centre of Nanchang Customs
[4]Jiangxi Academy of Agricultural Science

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Abstract

The influence of four food plants (corn, peanut, soybean and sugarcane) on life-history traits of the fall armyworm (FAW) Spodoptera frugiperda was examined in the laboratory at 25±1 °C and a photoperiod of L:D 15:9 (15 h light:9 h dark). The leaf contents of the total flavonoids, reducing sugars, sucrose and C/N ratio were also tested. The FAW fed on corn leaves showed significantly shorter larval and pupal development times, larger body weight, higher growth rate, lower weight loss, smaller SSD, shorter preoviposition period and higher fecundity than those fed on peanut, soybean and sugarcane leaves. However, FAW successfully completed its whole life cycle and exhibited higher fecundity in peanut, soybean and sugarcane. The FAW showed a protogyny phenomenon because the pupal development stage was significantly longer in males than females. There was a positive relationship between pupal weight and fecundity. However, the relationships between larval development time and pupal weight and between fecundity and longevity were different among different food plants. The leaf contents of the total flavonoids, reducing sugars, and sucrose and the C/N ratio differed significantly among the different food plants. We discuss the influences of these leaf nutritional contents on larval development time and pupal weight. These findings can help us to better understand the variation in life-history traits of the FAW and may be critical for the development of strategies to predict infestation levels.

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