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THE PERFORMANCE OF
URABA LUGENS WALKER (LEPIDOPTERA: NOLIDAE)
IN RELATION TO NITROGEN AND PHENOLICS IN ITS FOOD.

BY

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SUMMARY

The performance of Uraba lugens Walker was investigated in relation to the influence of nitrogen and phenolic components present in its food plants, using fresh and synthetic diets. The seasonal and annual variation of these components in Eucalyptus camaldulensis, a good food plant for U. lugens, was also examined. This was done in order to test the hypothesis that nitrogen is normally a limiting nutrient for phytophagous insects, but may become more available when its food plant is subjected to "water stress", leading to increased survival of early instars and therefore a population increase or "outbreak".

Larvae fed water stressed E. camaldulensis were potentially more fecund, although survival did not increase. For artificial diets incorporating leaf powder of either good (E. camaldulensis) or poor (E. platypus) food plants, the amino acids proline and valine increased larval performance compared with the respective base diets. However, although proline concentrations varied markedly in E. camaldulensis foliage, valine concentrations remained relatively constant throughout the study period.

The major influencing factor on the performance of U. lugens was the phenol quercetin, which decreased nitrogen assimilation to a much greater degree than other phenols studied (caffeic acid, chlorogenic acid and gallic acid).

In the food plant E. camaldulensis total nitrogen and phenols were negatively correlated. Total nitrogen reached its maximum level in early spring and declined to its minimum in winter but total phenols

reached maximum levels in winter and minimum levels in early spring. The variation of individual amino acids in E. camaldulensis foliage was also examined.

The results of this study are discussed in relation to existing hypotheses on insect host / plant interrelations and population dynamics and an alternative hypothesis is proposed.