

Influence of Elevated CO₂ on Growth and Development of Beet Armyworm, *Spodoptera exigua* Hub. (Noctuidae: Lepidoptera) on Chickpea

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ABSTRACT

Changes in quality of host plants under elevated CO₂ conditions likely in future can affect the survival, growth and its development and population dynamics of insect herbivores. The present study is aimed to examine the growth and development of *Spodoptera exigua* (Hubner) (Noctuidae: Lepidoptera) chickpea grown under elevated CO₂ condition in open top chambers at CRIDA, Hyderabad. Significantly lower leaf nitrogen, higher carbon, higher relative proportion of carbon to nitrogen and higher tannins, lower proteins and amino acids and higher carbohydrates were observed in the chickpea foliage grown under elevated CO₂ conditions. This alteration in food quality significantly affected the growth parameters of *S. exigua* in the form of increased food consumption, more fed leaf area, gain in larval weight and more faecal matter production due to extended larval duration and pupal duration. This resulted in reduced fecundity, particularly in *S. exigua* raised under elevated CO₂ conditions compared to ambient conditions. Further feeding indices were recorded and revealed increased approximate digestibility and relative consumption rate of *S. exigua* under elevated CO₂ condition coupled with reduced efficiency of conversion of ingested food and digested food. As a result, the relative growth rate was decreased under elevated CO₂ conditions. In nutshell, it can be concluded that elevated CO₂ concentrations altered the quality of chickpea foliage and has the negative effect on the growth and development of *S. exigua*.

Key words: *Chickpea, CO₂ concentration, Climate change, Feeding indices, Spodoptera exigua.*