A Fact Sheet for Required Space for Mass Culture of Grasshoppers (Acridoidea: Orthoptera) Under Captivity

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Received: October 22, 2022, Manuscript No. JBTW-22-78037; **Editor assigned:** October 25, 2022, PreQC No. JBTW-22-78037 (PQ); **Reviewed:** November 08, 2022, QC No. JBTW-22-78037; **Revised:** February 15, 2023, Manuscript No. JBTW-22-78037 (R); **Published:** February 22, 2023, DOI: 10.35248/2322-3308.12.2.010

Introduction

Insects have various nutritional qualities and have thus been seriously investigated as a potential nutrient source for animal husbandry or human consumption. The commercial mass production of acridity biomass into food and feed products will be a promising move toward economic earning for the public advantage. Accredits can produce a substantial quantity of biomass in a shorter period due to their rapid reproductive cycle, which is one of the primary reasons for selecting acridity species for mass culture. Insect rearing in dense conditions may significantly impact the species' production efficiency in terms of biomass yield. In excessively dense populations, however, insects may die for several reasons, including the lack of food, cannibalism and the lack of growing space etc. On the other hand, space is a significant aspect for breeders when it comes to the commercial mass culture of any cultivable livestock. Since mortality correlates with population density and culture unit space estimating optimal density or determining the ideal space for mass livestock culture is critical. Therefore, farmers need to estimate the optimal space for the mass culture of livestock while keeping mortality rates as low as possible. Unfortunately, there is no information on the density mortality scale for mass production of insect mini livestock. As a result, this study aims to investigate the required space for mass culture of accredits, which will serve as a reference data sheet for commercial insect breeding entrepreneurs.

Description

We conducted a series of density dependent mortality assays on thirty one short horned grasshopper species (Acrid idea: Orthopnea) from 12 subfamilies in laboratory settings. Each species was subjected to five different density levels by compacted the rearing space while maintaining the individual number constant. Under such settings, mortality of each species for each density condition was observed. Based on the experimental results, a 'dose-response' regression model was developed using 'dose' as an independent variable and 'response' as a dependent variable. After that, the Body Mass Index (BMI) of the species was correlated with the level of mortality in the population density [1-4].

The results suggest that acridity mortality varied significantly with altered density levels. The log logistic dose response model reveals that most acridity species followed sigmoidal functions except for a few. Following the species' density dependent mortality assay, five species clusters were constructed, with each cluster providing data on the degree to which different species share characteristics related to mortality. The 'Effective Concentration' (EC) value for each species was calculated separately as an output of our data, illustrating how the mortality of the species is related to density. The correlation between BMI and species mortality was found to be extensively varied between species and density levels. Some accredits' mortality was BMI independent, while others were BMI dependent [5].

Conclusion

Our research shows that cultural space has a significant impact on grasshopper mortality. Their mortality increases significantly when population density rises to a threshold, after which their mortality does not increase even if the density increases further. It stands to reason that species with higher mortality are not ideal for mass culture, whereas those with low mortality under densely packed settings are better for commercial mass production. The EC fact sheet illustrated in our research will aid in the commercial mass farming of grasshoppers.

Acknowledgment

The authors are thankful to head of the department of zoology, university of Calcutta, India for providing necessary facilities for conducting the experiments.

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Cite this article: Das A, et al. "A Fact Sheet for Required Space for Mass Culture of Grasshoppers (Acridoidea: Orthoptera) Under Captivity". J Biol Todays World, 2023, 12(2), 1.