

## EVALUATION OF GARLIC (*ALLIUM SATIVAN*) EXTRACTS FOR MANAGEMENT OF SNAILS IN THE SOUTHERN HIGHLANDS OF TANZANIA

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### Introduction:

Snails are widespread pests that feed on living plants and decaying plant matter, causing a considerable damage to ornamental and vegetable crops. In the Southern Highlands of Tanzania (Mbeya and Songwe regions), it has been reported to be a problem since 2019/20 and is now extending to Coast and Arusha regions. Farmers had taken control initiatives by collecting and destroying the adults and eggs by use of cooking salt (NaCl). Garlic has observed to contains a lot of bioactive compounds that has observed in the literature to manage the snails, such as tannins, alkaloids, triterpenes, steroids, saponins, and cardiac glycosides (Batiha *et al.*, 2020). Objective of this study was to evaluate Garlic, *Allium sativan* as means of formulating an IPM practices.

### Materials/Methods:

Garlic was ground in a mortar with a pestle weighed into portions of 40 Kg, 36 Kg, 32 Kg & 28 Kg mixed with 20 L of water and left to ferment for 24 hours, thereafter the extracts were carefully filtered and applied to the pest (Fig.2). Konokono bait 4% (Metaldehyde 4g/Kg), mixed with fine rice husks was also applied as a standard check & untreated (control) in January 2025. The trial was arranged in RCD, using the modified partitioned wire mesh (50 cm x 50 cm) set in the field, replicated 4 with 10 snails/partition. After 24, 48 and 72 hours' data on mortality rate were counted and summarized on an excel data sheet and subjected to ANOVA by use of GenStart package statistical software

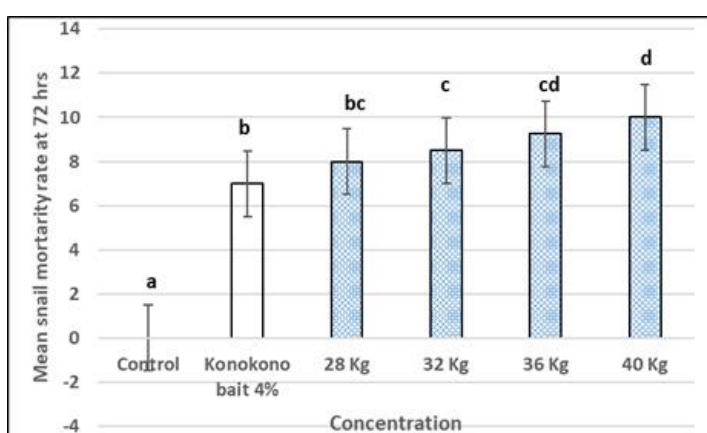


Figure 1: Mean mortality rate of snails at 72 hours



a). Garlic pellets



b). Grounding



c). Sieving



d). Garlic extracts

Figure 2: Preparation of garlic to extract

### Results/Discussion

Results show significant differences ( $P < 0.05$ ) in the mortality rate of snails between garlic concentrations, Konokono bait 4% with the control (untreated). Mortality rate was decreasing in the order 40 Kg > 36 kg > 32 Kg > 28 Kg / 20 mls of water > untreated (control) (Figure 1). No significant differences ( $P < 0.05$ ) were observed in the concentrations between 36 kg, 32 and 28 and between 28 Kg and the standard check (Konokono bait 4%). The percentage mortality rate for the pest at the rate of 40 Kg (100%), 36 Kg (93%), 32 Kg (85%) and 28 Kg (75%) after 72 hours (3rd days). This is inline with Singh (2017) who noted that the allicin is the active component present in the garlic bulb which causes snail mortality. Also Batiha *et al.*, (2020) and Ismail, (2024) noted that garlic contains a lot of bioactive compounds that are mostly toxic to snails, such as tannins, alkaloids, triterpenes, steroids and saponins.

### Conclusion/Perspectives:

Garlic extract at a rate of 28 Kg / 20 L of water is recommended to be used by famers for economic reasons since it does not differ with the standard check (Konokono bait 4%) . Studies to investigate more botanicals with molluscicidal activity on management of snails are encouraged.

### References:

- (1) Singh, V. K (2017). Mollusciciding Agent of *Allium Sativum* (Garlic) Allicin. *Annals of Pharmacology and Pharmaceutics Short, Communication Published: 26 Apr, 2017*
- (2). Ismail, G. H (2024). Use of botanical extracts to control the land snail *Eobania vermiculata* (Gastropoda: Helicidae) under laboratory conditions. *Egypt. J. Plant Prot. Res. Inst.* (2024), 7 (3):344-351.