



An Investigation on Effects of Food Sources and Environmental Factors on the Population Size of Giant African Snail (*Achatina fulica*)

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Abstract

Achatina fulica, which is found in all homegardens in many parts of Sri Lanka is an invasive, alien molluscan species. This snail is considered as a destructive pest in crop lands and homegardens as it feeds on live and dead plant matter. It is also important as an intermediate host in transmission of parasites and its empty shells is important as mosquito breeding sites. The size of the snail population will greatly influence the amount of damage and it is determined by factors such as the availability of food, moisture, CaCO₃ and temperature extremes. The present study was designed to investigate whether there is any relationship between density and abundance of *A. fulica* and available food sources and to identify the effects of rainfall and soil moisture content on *A. fulica* abundance and density in study sites. Four abandoned lands (S1;150m², S2:400m², S3;250m², S4: 400m²) at Walgama in Matara district were selected as study sites. At each study site, the data on temperature, soil moisture content and percentages of available food sources and number of snails were collected in twelve months period from February, 2010 to January, 2011. The population size of snails was estimated by placing ten random replicate quadrates (50cmX 50cm) at each site at 6.00 a.m. in each month and, by counting the numbers *in-situ*. Abundance and density of *A. fulica* in four study sites were estimated. Soil moisture content was determined in percentage by comparing the weight of the soil samples at the time of collection with their weight in oven-dry condition at 105^o-110^o C. SPSS-16 statistical software package was used to analyse the data. According to the results, density and abundance of *A. fulica* in all study sites were significantly different (P<0.05) and the highest mean density and the highest mean abundance were recorded in Site 3 (0.92/m² & 2.0 respectively). The soil of Site 1 had the highest moisture content. But the mean density and mean abundance values were 0.85/m² and 1.91 respectively. The lowest mean density and lowest mean abundance values were found in Site 4. The types available food sources for *A. fulica* were herbs and vines, large trees and dry leaves even though the available amounts were different in all four sites. About 90% of area in Site 3, where the highest mean density and abundance were recorded, was covered with herbs and vines. It is concluded that *A. fulica* may prefer green herbs and vines than dry leaves or large trees. Therefore, this invasive, alien snail species can be controlled by clearing abandoned lands.

Keywords: abundance, *A. fulica*, density, foods, soil moisture content



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