



Review Paper

The Snail Spurt- An Issue of Concern

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Abstract

Achatina fulica, a moisture dependent, nocturnal snail has made its presence known in the warm and humid tropical regions of the globe and established itself as a serious pest causing severe agricultural and economic losses. Widespread attack of the giant African snail in Kariavattom campus premises destroying the banana plantations raised my concern. The factors influencing the snail spurt, its impacts and control measures are discussed.

Keywords: *Achatina fulica*, pollution, bioindicator.

Introduction

The group of snails commonly referred to as Giant African land snails belong to Phylum Mollusca, Class Gastropoda, Subclass Heterobranchia, Order, Pulmonata, Infra Order Stylommatophora, Family Achatinidae, and Subfamily Achatininae¹. Native to Africa, the family achatinidae is represented by about 200 species in 13 genera, most of which have attained pest status in habitats modified for human habitation and cropping. *Achatina fulica*, a moisture dependent, nocturnal snail has made its presence known in the warm and humid tropical regions of the globe².

Its hardy nature, wide host range and geographic distribution, has made *A. fulica* one among the worst invaders in the Global Invasive Species Database. Attaining adult size in six months time, they are capable of aestivating for upto 3yrs and have a life span of nearly 10 years. Trade and transport for food, research and medicinal purposes as well as tourism happens to be the prime channels for its spread³.

Reason of concern

In spite of establishing an endemic population in India for more than 30 years⁴, the widespread attack of the giant African snails was noticed only around decade ago, which is becoming more pronounced each year. These snails made their presence greatly felt at the Kariavattom campus, University of Kerala (8°33'54"N 76°53'22"E) crawling off the circulars and bulletins stuck onto the campus walls. The agricultural crops and weeds were also heavily infested with the snails since the first summer showers in April 2014 (figure 1 and figure 2).

Impacts

The giant African snails are growing at an alarming rate posing serious risks to the native plant species and causing large scale economic loss to the state as far as agricultural farms and

cardamom plantations are concerned. The competition of *A. fulica* with native species and the resultant increase in food provisions for predators have led to prominent food chain alterations⁵. In 1982, Klikset *al.* reported an outbreak of eosinophilic radiculomyeloencephalitis that was related to eating giant African snails (*Achatina fulica*)⁶. Hence the role of these snails in facilitating the spread of diseases to native organisms and even man through faeces and mucous trails³ cannot be ruled out.

Factors of influence

Climate is a strong predictor of the growth and impact of *A. fulica*⁷. Other abiotic factors playing important roles in growth and reproduction of land snails are light, photoperiod and temperature⁸. For example, in the garden snail *Limicolaria flammea*, Egonmwan reported that long day (L: D 16:8) promoted faster growth and maturation of the gonad⁹.

The tremendous increase in the endemic population of *A. fulica* established years before could be attributed to the drastic environmental changes that have been happening in India. The growing use of pesticides and fertilizers, the fast spreading industrialization and urbanization along with its consequences might pose a cause for the "snail spurt". The possibility of the *A. fulica* turning out to be a bioindicator cannot be ruled out.

Various studies have proved that the quality of water in most water bodies has deteriorated due to the effects of industrialization, urbanization and human intervention¹⁰⁻¹⁴. Aquatic, terrestrial and atmospheric pollution causes disturbances in the ecological balance. As the hydrosphere, atmosphere, lithosphere are interconnected, pollution in any of them implies that the other two are also contaminated. Contamination of terrestrial environment by trace elements leads to an increasing uptake of metals by soil invertebrates, including land snails, and hence to adverse effects to toxic

elements. It has been established that land snails exhibit the highest capacity for metal accumulation throughout the animal kingdom. Land snails are therefore very important as biological

indicators and used for assessing levels of environmental stress and as biomarkers of environmental pollution¹⁵⁻¹⁶.

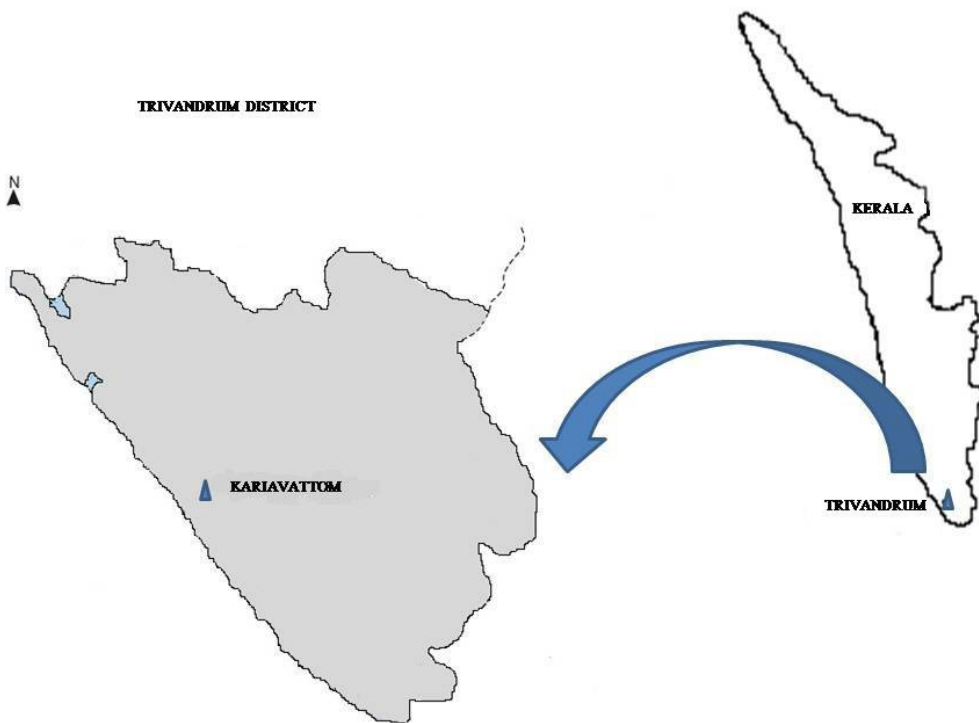


Figure-1
Site map showing Kariavattom in Trivandrum district of Kerala, India



Figure-2
The giant African snail infestation in banana trees in Kariavattom campus

Control

The various ways to combat the snail menace include spraying salt, lime, copper sulphate, potassium permanganate, mercuric chloride, kerosene, TDCS mixture (tobacco decoction- copper sulphate), neem extract,¹⁷ calcium arsenate, Actara (nicotine base pesticide), cupric ricinoleate, metaldehyde, methuicarb and iron phosphate; but some among them alters the soil pH too. Reducing the snail's food availability by killing the surrounding weeds using glyphosate is another measure employed³.

Biological control of agricultural pests can indirectly benefit native wildlife through the reduction of pesticides released into the environment because of natural enemy suppression of economically important targets. Biological control using predatory snails (*Gonaxis quadrilateralis*, *Euglandina rosea*, etc), predatory flatworms (*Geoplanaseptemlineata*, *Platydemus manokwari*), predatory insects, hermit crabs, rats and ducks has been suggested. The use of wet gunny bags and papaya leaves as bait has been deployed to collect and destroy the snails³. The best, most economic and effective means to eradicate the snail pest is yet to be studied on.

Conclusion

Achatina fulica, the giant African invader snail is spurting out in enormous numbers affecting the native species, crop, plantation as well as the health of all living beings. This issue needs to be tackled at the earliest else it may turn out from a nuisance to a matter of great threat to the environment itself. Increased awareness campaigns and programs on the control of this pest has to be implemented and more research on economic and effective pesteradication techniques needs to be promoted.

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