

Achatina fulica

Introduction

The Giant African Snail, *Achatina fulica* (Bowditch) (Fig 1), is native to East Africa. Since the eighteenth century it has spread eastward largely assisted by man. In the Caribbean, it was first observed in Guadeloupe in 1983 and later in Martinique in 1987. Since then, it has spread to St. Lucia and Barbados (2001). It has gained serious pest status in the Caribbean states where it is present and is of quarantine significance for the non-infested areas of the region.



Fig. 1: Giant African Snail (GAS)

Identity

FAO (1989)

Authority : Bowditch, (1822)

Classification

Kingdom : Animalia

Phylum : Mollusca

Class : Gastropoda

Order : Pulmonata

Family : Achatinidae

Genus : *Achatina*

Species : *fulica*

Synonym : *Achatina fulica* (Ferussac)

Common names: Giant African Snail (GAS), Agate snail, snail, Schnecke, African snail, African giant, Kalutara, Caracol gigante africano, Acatina africana, Gran caracol africano, Escargot géant africain, Achatine de madagascar, Achatine foulque, Achatine mauritanienne, Grosse achat, Riesenschnecke, Afrikanische, Acatina africana, Acatina dell'Isola maurizio, Agaatslak, Slak

Role : Pest

Signs & Symptoms

FAO (1989)

The snail hides during the daytime but can be seen at night with the aid of artificial lighting e.g. flashlight, ideally in moist and sheltered places. Plant material showing extensive rasping (scraping), defoliation, slime trails, or ribbon-like excrement are signs of GAS.

Morphology

R.A. MEAD (1979)

Eggs

Eggs are yellow or cream in colour and 4.5 - 5.5 mm in diameter.

Adult

The adult snail is very large and can measure up to 20 cm with a shell length of about 6 - 12.5 cm and can weigh up to 1 kilogram. The shell is distinctive as it is relatively long, narrow and conical in shape. It may reach a length of 20 cm but it is not uncommon to see a snail with a shell 5-10 cm in length. The shell is usually light brown with reddish-brown and light, yellowish, vertical streaks. The body of the snail is dark-brown. The skin is humid and has a rubbery texture. The head has two pairs of tentacles: a pair of short lower tentacles and a large pair of upper tentacles with round eyes situated at the tips (Fig 1).

Biology & Ecology

R.A. MEAD (1979)

Life cycle

The Giant African Snail is a hermaphrodite but reproduction requires cross fertilisation. The snail starts laying eggs when it is about one year old. Under optimum conditions, it lays its eggs four times a year in batches of about 150 (50 to 200). Eggs hatch in 3-15 days. The snail is a nocturnal feeder, but may remain active during the day in cloudy or rainy weather. In dry weather, it burrows into the ground or crawls under shelter where it can remain for several weeks or months.

The snail is nocturnal; i.e. it goes in search of food at night and hides away before daylight. When conditions are unfavourable the snail burrows into the ground or crawls under shelter, seals off the opening of the shell with a calcified membrane and can stay in this mode for several years until environmental conditions improve.

Food crops and flower gardens provide ideal breeding grounds for this pest

Dispersal/vectors

R.A. MEAD (1979)

The eggs can be transported with plant material and soil, while the adult can “hitch-hike” on/in vehicles, machinery, equipment, cargo containers, and packing material or through direct introduction of snails.

It presents a risk to many cultivated plants and has also been implicated in transmitting plant diseases such as *Phytophthora palmivora* (E. J. Butler), *P. colocasiae* Rac. and *P. parasitica* Dast.

Cultural Control

Good field sanitation, including the removal of mulches and other organic matter, will provide some control by reducing the number of breeding sites.

Chemical Control

The Giant African Snail can be baited with metaldehyde. This chemical is marketed in the form of pellets under such brand names as Blitzem (New Zealand, 1.5% and 1.8% metaldehyde), Durham metaldehyde (USA, 7.5% metaldehyde), Slug Out (Australia, 1.8% metaldehyde) and Trails End (USA, 7.5% metaldehyde). The chemical is poisonous to the snail if it eats the bait; and also if it comes into contact with the snail's foot, causing the snail to dehydrate. If conditions are wet, the snail may recover from sub-lethal doses of metaldehyde. The higher concentration formulations give better control, as they are more likely to be quickly lethal to the snail. The pellets should be spread evenly on the ground around crops in doses of 2.0-20 grams per square metre, depending on the metaldehyde concentration of the product. Scattering on non-crop areas is not very effective. Baits should be checked every few days and renewed as necessary.

During rainy weather, when snails are most active and protection is urgently needed, normal pellets are rapidly broken down and the metaldehyde is washed away. Pellets may be protected from rain by using simple bait containers made from tin cans or planted material. Also, Blitzem is now available in a more rain-resistant formulation.

Care must be taken to ensure that livestock and pets do not eat the bait or poisoned snails.

Biological Control

Biological control using natural enemies of the GAS has been used in several countries.

The natural enemies include: Insects fire ant (*Solenopsis geminata* Rufa), common ant *Tetramorium caespitum*. Beetles species of Lampyridae (Coleoptera) and Carabidae.

Snails a number of predator snails such as *Euglandina rosea*, *Gonaxia quadrilateralis* and *G. kibweziensis* and *Edentulins ovoidea*. Flatworms *Geoplana* sp. and *Platydemus manokwari*;

Crustaceans: hermit crabs. Birds; centipedes.

Pest Significance and Phytosanitary Risk

A. fulica can also act as a vector of the human disease, eosinophilic meningitis, which is caused by the rat lungworm parasite, *Angiostrongylus cantonensis* [*Parastrongylus cantonensis*]. The parasite is passed to humans through eating raw or improperly cooked snails or freshwater prawns. It is, therefore, advisable to wash one's hands after handling the snail. It has also been implicated in transmitting the plant disease, *Phytophthora palmivora*, and related diseases (Schotman, 1989).

Host notes

R.A. Mead (1979)

The GAS is a polyphagous pest and has been reported as a pest of many cultivated plants. Although the adult snails prefer to feed mainly on decaying organic matter, the young snail may cause severe damage on most vegetables, but especially those belonging to the Cruciferae, Cucurbitaceae and Leguminosae, cover crops and fruit crops like banana, papaya, citrus and cacao. *Leucaena* and rubber trees are also attacked.

A. fulcina is also a potentially serious agricultural pest, very destructive with a high reproductive capacity. It has reached extremely high population densities after introduction in some islands in the Pacific and Hawaii.

Distribution

R.A. Mead (1979)

The Giant African Snail is native to the coastal areas of East Africa (Kenya and Zanzibar) and Madagascar, and during the early 1900 s it spread to South East Asia and the Pacific Islands excluding the Cook Islands. It is now established in American Samoa, Federated States of Micronesia, French Polynesia, Guam, Marshall Island, Palau, Papua New Guinea, Samoa, Vanuatu and Wallis and Futuna. More recently, this mollusc has been observed in the Caribbean in the Islands of Guadeloupe (1988), Martinique (1989), St. Lucia and Barbados (2001).

Inspection Procedures

Plant quarantine inspection of imported material and soil as well as incoming carriers and cargo at international points of entry is required. Thorough pre-departure quarantine inspection from countries where the snail occurs should also be carried out.

Bibliography

- AQIS (1997) Giant African Snail, *Plant Quarantine Leaflet No.3*.
- FAO/RLAC (1989) Plant Quarantine Action Programme. *Food and Agriculture Organization of the United Nations Santiago (1989)*.
- FAO (1989) Data sheet on the Giant African Snail.
- Gallo, G. (1984) El Caracol: Cria y Explotacion. *Ediciones Mundi Prensa, Madrid, 2da. Ed.* 179pp..
- Kono, T., Papp, Ch. S. (1977) Handbook of Agriculture Pests. *California Dept. Food & Agriculture*, 205 pp..
- Mead, A.R. 1979 Economic malacology with particular reference to *Achatina fulica*. In V. Fretter & Peake, J. (eds.), *The Pulmonates, Vol. 2B. Academic Press, N.Y.*
- Rousselet, M. (1986) Cria del Caracol. *Ediciones Mundi-Prensa, Madrid*, 144pp..

South Pacific Commission (1993). *Giant African Snail (2nd edition) Pest Advisory leaflet No.6.*

South Pacific Commission (1996) *Introduction of Giant African Snail to various Pacific Islands. Ag Alert No.15*

van Dinther J.B.M. (1973) Molluscs in Agriculture and Their Control. *World Crops November/December 25(6).*

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