

Ecology, Biology and Management of Giant African Snail

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Introduction:

One of the greatest threats to global biodiversity, agriculture, livelihoods, human and animal health, and forestry is invasive alien species. Gastropoda is the only class of Molluscs which successfully invaded land. Within modern India's boundaries 1129 species of land snails have been recorded. The Giant African Snail is a highly invasive terrestrial snail native to East Africa. An invasive species of the snail family has caused widespread havoc in farm areas in parts of Marathwada, damaging crops on 72,491 hectares during the current *kharif* season. A considerable chunk of the soybean crop along with cotton, among other *kharif* crops, have been damaged by the Giant African Snail. More than 1.18 lakh farmers in Latur, Beed and Dharashiv districts of Marathwada have been affected by the snail attack.

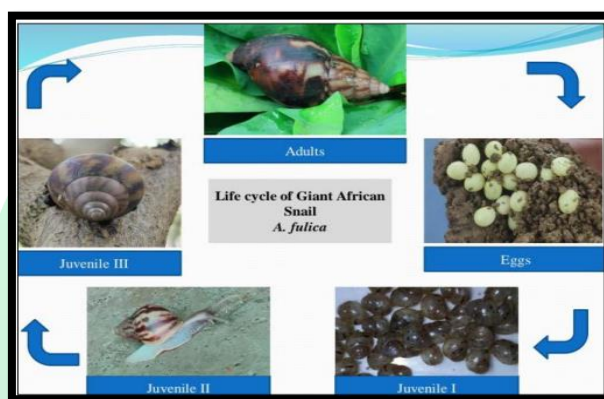


Ecology:

Achatina fulica is tolerant of a wide variety of environmental conditions. A mild temperature of 15-25°C is best for snail reproduction, though most species can stand a wider range of temperature. When the temperature falls below 7°C, snails hibernate and under 12°C they become inactive. When the temperature raises much above 27°C or more, snails undergo aestivation. They thrive in damp but not waterlogged environments and thus a well-drained soil is required. Eggs are susceptible to all reducing temperature. 80 per cent air humidity is

the most favourable conditions. Soil organic matter and other micronutrients like calcium, magnesium, potassium etc. play an important role in increasing the size of the snail. Snails are found in greater abundance at an optimum pH range from 6.3-6.7 and P_2O_5 concentration (0.002-0.004%). 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.

Biology:



Reproduction:

Achatina fulica is a hermaphrodite each individual has both testes and ovaries and is capable of producing both sperms and ova. Mating behaviour includes bringing heads and front parts against each other. Courtship can last upto 30 minutes, while actual transfer of gametes can last for two hours. Transferred sperm can be stored within the body for up to two years. A snail may lay 5-6 clutches per year, with 200 eggs per clutch. Eggs are laid in damp places. Eggs are yellow or cream in colour and 4.5 - 5.5 mm in diameter. Thus, it breeds rapidly, out-competes native species of snails and reaches large numbers in short periods due to their prolific breeding habits.

Host plants:

A. fulica feeds on more than 500 plant species. In India, some of the preferred host plants are banana, bean, cabbage, cassava, cotton, soybean, eggplant, papaya and pumpkin etc.

Damage:

Loss of crop yield from feeding mainly on papaya fruits. Death of papaya plants from snails feeding on the fruit-bearing, green portion of the stems. Increased fruit and stem blight caused by *Phytophthora palmivora* as the snail spreads the pathogen. Altered nutrient cycling ensues in ecosystems due to the large volumes of plant material that passes through the snail's

gut. The calcium carbonate in snail shells neutralizes acidic soils, potentially altering soil properties and the types of plants that can grow in the soil. Transmits human parasites and pathogens in slime trails or when infested snails are eaten raw or undercooked. One such pathogen is rat lungworm, which causes *eosinophilic meningoencephalitis* in humans.

Management:

- The locations of hiding places and snails are to be destroyed.
- Hand collection and destruction in early phase
- Cut pieces of papaya stems may be placed for attracting and trapping the snails.
- Use wet gunny bags and papaya leaves as bait to collect and destroy them.
- Marigold can be raised as trap crop around vegetable field.
- Lime or bleaching powder may be sprinkled in the infested area.
- Common salt may also be spread on the snail infested area.
- Spread the bait mixture of rice bran and metaldehyde (5%) to cover the paths of snails or sprinkle 5 per cent metaldehyde pellets around the infested plants.
- Bands of thin copper sheet around tree trunks prevent snails from climbing. This method must be combined with skirt pruning and control of under-canopy vegetation to stop snails getting into the trees by other routes.

Snails have many natural enemies:

- Ground beetles, toads, turtles, birds, snakes, rodents and pathogens.
- Ducks and geese in particular love to snack on snails and slugs.