



Ministry of Agriculture & Forestry Plant Protection & Quarantine Services

Giant African Snail, *Achatina fulica* Bowdich

A NOTIFIABLE PEST IN THE COMMONWEALTH OF DOMINICA (Act 10 of 1986)



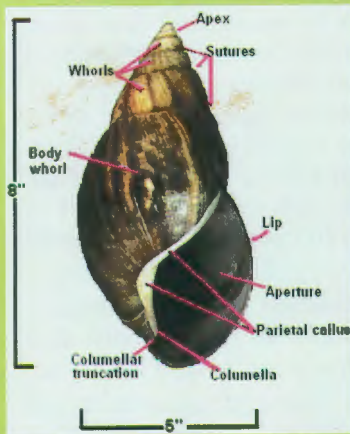
Images:
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Scientific Name: *Achatina fulica* Bowdich

Other Common Names: giant African snail, escargot Géant, Achatine, Caramujo

Description: *Achatina fulica* is a very large snail that can weigh as much as 1kg. The body varies from pale cream to dark brown. The foot sole is flat. The shell can reach up to 20 cm (8") in length and 12 cm (5") in diameter. The shell is conically spired and narrowed at the apex. It has seven to nine rounded whorls (rarely ten) with moderately impressed sutures between the whorls. The shell colour can vary due to environmental conditions and diet, from light coffee to reddish-brown with cream to light yellow vertical streaks. As the snail ages the colours in the whorls at the apex fade appearing lighter, and those in the body whorl become darker. The shell surface is relatively smooth, with faint axial growth lines. The columella and the parietal callus are white or bluish-white with no trace of pink. The columella is generally concave, truncated and present throughout the life of the snail. The aperture is ovate-lunate and relatively short. The lip is sharp, convex, thin and evenly curved. In calcium-rich areas shell of adults tend to be thicker and opaque. Juveniles are similar to adults, but have a thinner, translucent shell that is more brittle. Upon emergence, the juvenile shell is about $\frac{1}{6}$ " inch long. Eggs are oval, yellowish-white to yellow and $\frac{1}{4}$ " long.



Impact: *Achatina fulica* is known to feed on over 500 plant species incurring substantial losses to agriculture and tourism. It is also a vector of the rat lungworm, *Angiostrongylus cantonensis* causing eosinophilic meningitis in humans.

Ecology: Achatinids are native to tropical and subtropical Africa south of the Sahara. *Achatina fulica* is very adaptable and can be found as far north as 30° latitude with temperature (minimum 34°), moisture and availability of calcium (soil pH of 7.0-8) restricting its range. It prefers areas that are rich in calcium carbonate, such as limestone, marl, and developed areas with an abundance of cement or concrete. It is nocturnal. During the day it avoids direct sunlight and can be found near heavily vegetated areas; under rocks, boulders, logs, flower pots, planters, leaves and ledges; and in crevices, broken concrete, damp leaf litter, compost piles, rubbish heaps, or in the "heart" of compact plants, such as lettuce or cabbage.

Distribution/Spread: *Achatina fulica* is native to East Africa (Kenya and Tanzania). It further spread to **AFRICA:** Ethiopia, Somalia, and Mozambique (unknown); Madagascar (prior to 1800); Mauritius (ca. 1800); Seychelles (1840); Morocco (1987); Ivory Coast (1988); Ghana (1994); Annobón and São Thomé (1994); **ASIA:** India (1847); Ceylon (1900); Malaya (1911); Taiwan (1932); Vietnam (1935); Sumatra and Java (1925), Bali, Sulawesi, the Moluccas, Flores, Timor and Irian Jaya (1964); Japan (1935); Hong Kong (1937); China (by 1959); Bangladesh (prior to 1962); Thailand (1964); **AUSTRALASIA:** Bougainville (1970), New Guinea (1945), New Ireland and New Britain (1949), Papua (1960s), New Caledonia (1972), Australia (1977 - eradicated); **PACIFIC:** Hawaiian Islands - (Oahu (1936), Hawaii (1958), Maui (1960),



Molokai (1960))- Marianas (1936-1938); Bonin (1937); Caroline Islands (1938); Guam (1943); Wake (prior to 1962); Society Islands including Tahiti (1967); Vanuatu (1972); Cook Islands (1972); American Samoa (1978); Western Samoa (1990); Micronesia (1998); **NORTH AMERICA:** USA (Arizona - 1959 and Florida -1966-eradicated); only intercepted in California; **WEST INDIES:** Guadeloupe (1984), Martinique (1988); St. Lucia (2000); Barbados (2000); Antigua and Trinidad (2008); **SOUTH AMERICA:** Brazil (1996).

Biology: *Achatina fulica* can live up to 9 years with an average life span of 3-5 years. It is hermaphrodite (has both male and female sexual organs). Snails reach sexual maturity in less than one year. The male organs mature first at the age of 5-12 months. Copulation is reciprocal and is required to produce viable eggs. This snail stores sperm, and is able to lay fertilized eggs repeatedly after just a single mating. Individuals lay viable eggs from 8-20 and up to 382 days after mating. Snails begin laying eggs at 5-6 months old. Individuals produce from 10-500 eggs, averaging 300-1000 eggs in 3 to 4 batches yearly. Eggs are laid in cool, moist soil and under objects. In the tropics, eggs hatch after 11 days. After hatching, juveniles burrow and remain underground for 5-15 days eating their eggshells, unhatched eggs and debris. Upon emergence, they establish a home range within 2 months, and feed on plants. At least 500 plant types are attacked. Adults feed on plants, but may become detritus feeders as they age. *Achatina fulica* is nocturnal and extremely sensitive to high rates of evaporation. It has the ability to aestivate. During unfavorable periods, it buries itself 10-15 cm (4-6") deep in soft soil or attach to objects and begins aestivating within 24 hours. It may remain inactive for up to a year losing 60% of its weight.

Control: There are no effective, ecologically safe biological control organisms available for the control of *Achatina fulica*. Control and eradication is achieved through quarantine, cultural and chemical means. Eradication measures must be continued for 2-4 years after last snail sighting; and monitoring for a further two years to ensure snail free status. Preventative means include: inspecting and ensuring materials are free from snails: plants, vehicles, machinery; cessation of movement of soil/debris from snail infested areas to non-infested areas; and prohibition of rearing/moving live snails. Cultural means include: sanitation - that is, destruction of snail habitats by clearing underbrush, leaves, flowers, stems, stalks, rotting or fallen fruit/vegetables; eliminating refuse piles and other debris; and removal of loose boards and boulders - and capturing and killing snails by crushing or drowning in boiling water or salt water, or rubbing alcohol or ethanol. Sanitation is a continual process during an eradication campaign. Chemical treatment may include the application of recommended molluscicides to the soil (within the drip line of food plants and resting places) 200 yards beyond the nearest infested property. The main groups of molluscicides are:

- Metaldehyde – which is the most widely used active ingredient in snail baits. Metaldehyde baits come in many formulations with various attractant systems. Baits containing 4% metaldehyde are significantly more effective than those products containing only 2%. Metaldehyde products formulated with carbaryl should not be used as they are toxic to soil-inhabiting beneficial organisms, such as ground beetles and earthworms. Examples of methaldehyde available in Trinidad is Bio Slug & Snail Killer, a 3% Bayer™ pellet bait;
- Methiocarb - This is a carbamate chemical. Methiocarb produces better kill than metaldehyde under wet conditions;
- Iron Phosphate – This is considered safe for the environment, pets and other non-target animals. Snails ingest the bait, cease feeding and die 3-6 days later.

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