Achatina fulica 简体中文 正體中文

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Animalia	Mollusca	Gastropoda	Stylommatophora	Achatinidae

Common name Afrikanische Riesenschnecke (German), giant African snail (English), giant African land snail (English)

Synonym *Lissachatina fulica* , (Bowdich 1822)

Similar species

Summary *Achatina fulica feeds on a wide variety of crop plants and may present a threat to local flora. Populations of this pest often crash over time (20 to 60 years) and this should not be percieved as effectiveness of the rosy wolfsnail (Euglandina rosea) as a biocontrol agent. Natural chemicals from the fruit of Thevetia peruviana have activity against A. fulica and the cuttings of the alligator apple (Annona glabra) can be used as repellent hedges against A. fulica.*

view this species on IUCN Red List

Species Description
Achatina fulica has a narrow, conical shell, which is twice as long as it is wide and contains 7 to 9 whorls when fully grown. The shell is generally reddish-brown in colour with weak yellowish vertical markings but colouration varies with environmental conditions and diet. A light coffee colour is common. Adults of the species may exceed 20cm in shell length but generally average about 5 to 10cm. The average weight of the snail is approximately 32 grams (Cooling 2005).
Please see PaDIL (Pests and Diseases Image Library) Species Content Page *Non-insects Giant African Snail* for high quality diagnostic and overview images.

Notes
The Achatinidae gastropod family is native to Africa. The family is represented by about 200 species in 13 genera (Raut & Barker 2002). Several species of Achatinidae have attained pest status within their native range when the habitat has been anthropomorphically modified as a crop system including *A. fulica* (Raut & Barker 2002). Within the Achatinidae , four species are classified as giant African snails: *Achatina achatina*, *A. fulica*, *Archachatina marginata*, and *Limicolaria aurora* (Smith and Fowler 2003, in Venette & Larson 2004).
Some island systems appear to be resistant to invasion by *A. fulica*. The low abundance of *A. fulica* on some Pacific atolls may be due to the sandy soils and predation by hermit crabs (*Coenobita perlatus* and *Birgus latro*) (Schotman 1989, in Raut & Barker 2002). The omnivorous crab *Gecarcoidea natalis* provides biotic resistance to invasion by *A. fulica* on Christmas Island (Lake and O'Dowd 1991, in Raut & Barker 2002).
Meyer and Shiels (2009) hypothesise that reduction or eradication of *Rattus rattus* populations may cause an ecological release of some nonindigenous snail species where these groups coexist. As such, effective restoration for native snails and plants may not be realised after *R. rattus* removal in forest ecosystems as a consequence of the complex interactions that currently exist among rats, nonindigenous snails, and the rest of the food web.

Lifecycle Stages
Eggs hatch in anything from a few hours to 17 days. Snails mature at around 5 to 15 months, depending on the temperature (with cold winter temperatures inducing hibernation and delaying sexual maturity). *Achatina fulica* lifespan can be up to 9 years, with 5-6 years being the norm (Mead 1961) (Raut and Barker 2002).

Uses
A. fulica has an economic importance as a medicinal and protein source (Muniappan 1990). With the emergence of Achtinidae as a tradable edible product captive breeding has been established for various species including *A. fulica* around the world (Mead 1982, Upatham *et al*. 1988, Runham 1989, Monney 1994, in Raut & Barker 2002). Considerable amounts of *Achatina* meat are exported to Europe and America from Taiwan, China and other Asian countries (Mead 1982, in Raut & Barker 2002). Interest in *A. fulica* as an edible snail has lead to its establishment in regions of Brazil, such as Sao Paulo, Rio de Janeiro, Minas Gerais, Parana and Santa Catarina (Teles *et al*. 1997, J. Coltro pers. comm. 2000, in Raut & Barker 2002). In addition to farming for meat, several species of Achatinidae, including *A. fulica*, are maintained in temperate regions outside Africa as laboratory animals (eg: Nisbet 1974, Plummer 1975, in Raut & Barker 2002).

Habitat Description
All of the countries in which *Achatina fulica* is established have tropical climates with warm, mild year-round temperatures and high humidity (Venette and Larson 2004). The species occurs in agricultural areas, coastal areas and wetlands, disturbed areas, natural and planted forests, riparian zones, scrublands and shrublands, and urban areas (Moore 2005). These snails thrive in forest edge, modified forest, and plantation habitats (Raut and Barker 2002). Wherever it occurs, the snail keeps to the hot lowlands and the warm temperate lower slopes of the mountains. It needs temperatures well above freezing year round, and high humidity at least during part of the year, the drier months being spent in dormant aestivation. It is killed by sunshine (Venette and Larson 2004). *A. fulica* remains active at a temperature range of 9°C to 29°C, and survives temperatures of 2°C by hibernation and 30°C by aestivation (Smith and Fowler 2003).

Reproduction
Achatina fulica is an obligate-outcrossing hermaphrodite, which means that one externally fertilised snail can establish a population (Smith and Fowler 2003). . *A. fulica* produces large eggs that are 4.5mm to 5.5mm in diameter and only hatch at temperatures above 15°C (Srivastava *et al*. 1985). Snails begin laying eggs at six months of age and fecundity lasts approximately 400 days (Smith and Fowler 2003). Snails lay up to 100 eggs in their first year, and up to 500 in their second year; fecundity declines after the second year, but snails may live up to five years with a total egg clutch of up to 1 000 (Raut and Barker 2002).

Nutrition

Achatinidae are generally regarded as herbivores, feeding primarily on living and decaying vascular plant matter (Raut & Barker 2002). The location of food by *A. fulica* is powered by its sense of smell, being mainly attracted to garden crops (Farkas & Shorey 1976, Gallois & Daguzan 1989, in Albuquerque *et al*. 2008) and species used as refuge needs. Van Well (1948 1949, in Raut & Barker 2002) reported that young *A. fulica* feed on decaying matter and unicellular algae. The major requirement of hatchlings is calcium until their shell reaches the 5mm size (Mead 1961, Mead 1979). Animals with shells between 5 and 30 mm in height were observed to prefer living plants (Raut & Barker 2002). Although not entirely neglecting living vegetation, the maturing snails were found to largely return to a scavenging detritivorous habitat (Raut & Barker 2002). While *A.. fulica* is mainly vegetarian there is recent evidence that it can also act as a predator of other snails (Meyer *et al*. 2008, in).

Achatina fulica has a remarkably broad range of host plants on which it feeds. Young *A. fulica* appear to prefer soft textured banana (*Musa*), bean (*Beta vulgaris*) and marigold (*Tagetes patula*). As the snail matures its dietary preferences broaden to include a larger variety of plants, including brinjal (*Solanum melongena*), cabbage and cauliflower (*Brassica oleracea* v. *capitata* and *botrytis*), lady's finger (*Abelmoschus esculentus*), sponge gourd (*Luffa cylindrica*), pumpkin (*Cucurbita pepo*), papaya (*Carica papaya*), cucumber (*Cucumis sativus*) and peas (*Pisum sativum*) (Raut & Ghara 1989).

General Impacts
For a detailed account of the environmental impacts of *A. fulica* please read: [*Achatina fulica* (Giant African Land Snail) Impacts Information]. The information in this document is summarised below.
Achatina fulica is considered one of the worst snail pests of tropic and subtropic regions. While their small size limits the quantity of plant material consumed per animal the aggregated nature of the infestations can lead to severe damage in infested plants (Raut & Barker 2002). The process of naturalisation may ameliorate the impacts of this invasive species. Mead (1979a) expressed the opinion that "*...the phenomenon of decline in populations of Achatina fulica appears to be inevitable*".
Agricultural: In tropical agriculture the cost of *A. fulica* is fourfold. First there is the loss of crop yield caused by herbivory. Secondly, damage may be caused by the spread of disease through the transmission of plant pathogens. Thirdly, there is the cost associated with the control of the pest and, finally, there are the opportunities lost with enforced changes in agricultural practice such as limiting crops to be grown in a region to those resistant to snail infestation (Raut & Barker 2002).
For a list of "Economically important plants recorded as being subject to losses through damage by *Achatina fulica* Bowdich (Achatinidae) in regions outside of Africa" please see the full Impacts document. Irrespective of crop the seedling or nursery stage is the most vulnerable stage. In more mature plants the nature of the damage varies with the species, sometimes involving defoliation and in others involving damage to the stems, flowers or fruits (Raut & Barker 2002).
Economic/Livelihoods: In the US state of Florida it has been estimated that *A. fulica* would have caused an annual loss of USD 11 million in 1969 if its population had not been controlled (USDA 1982). In India it attained serious pest status, particularly in 1946/1947, when it appeared in epidemic proportions in Orissa and caused severe damage to vegetable crops and rice paddies (Pallewatta *et al*. 2002).
Disease Transmission: *A. fulica* distributes in its faeces spores of *Phytophthora palmivora* in Ghana; *P. palmivora* is the cause of black pod disease of cacao (*Theobroma cacao*); the oomycete which also infects black pepper, coconut, papaya and vanilla (Raut & Barker 2002). *A. fulica* spreads *P. colocasiae* in taro and *P. parasitica* in aubergine (*Solanum melongena*) and tangerine (*Citrus reticulata*) (Mead 1961 1979a, Turner 1964 1967, Muniappan 1983, Schotman 1989).
Ecosystem Change:Costs to the natural environment may include (Raut & Barker 2002) herbivory; altered nutrient cycling associated with large volumes of plant material that pass through the achatinid gut; adverse effects on indigenous gastropods that may arise through competition; and indirect adverse effects on indigenous gastropods that may arise through control of the snail (eg: biological control with the [rosy wolfsnail (*Euglandina rosea*)] or use of chemical pesticides applied against achatinids.
Human nuisance: *A. fulica* are also a general nuisance when found near human habitations and can be hazardous to drivers, causing cars to skid. Their decaying bodies release a bad odor and the calcium carbonate in their shells neutralises acid soils, altering soil properties and the types of plants that can grow in the soil (Mead 1961).
Human health: In many Asian, Pacific and American societies *A. fulica* may play a role in the transmission of the metastrongylus causative agents of eosinophilic meningoencephalitis (*Angiostrongulus cantonensis* and *A. costaricensis*).

Management Info
For a detailed account of management strategies *A. fulica* please read: *Achatina fulica* (Giant African Land Snail) Management Information. The information in this document is summarised below.
Preventative Measures: As there is a high risk of *Achatina fulica* being spread via trade routes there is potential to prevent its spread through international quarantine and surveillance activities. Small incipient populations of *A. fulica* have been eradicated at various times from California, USA; Florida, USA; Queensland, Australia; Fiji; Samoa; Vanuatu and Wake Island (Abbott 1949, Mead 1961 1979a, Colman 1977 1978, Muniappan 1982, Waterhouse & Norris 1987, Watson 1985, in Raut & Barker 2002). Control costs can range from USD 60 000 dollars for a 7-month procedure, to over USD 700 000 dollars for the eradication in Florida (Muniappan *et al*. 1986, Smith and Fowler 2003). For the few species in which spontaneous collapse has been repeatedly observed such as *A. fulica*, the possibility of such an event is warranted as a potential rationale for a do-nothing approach to management (Simberloff & Gibbons 2004).
Physical Control: Collection and destruction of the snails and their eggs has been reported to be effective in Guam, Hawaii, Japan and Sri Lanka, Australia, USA (Peterson 1957c, Mead 1961 1979a, Olson 1973, Colman 1977, in Raut & Barker 2002). Physical barriers that prevent movement of snails include the use of a strip of bare soil around the crop, a fence that consists of a screen of corrugated tin or security wire mesh.
Chemical control: Metaldehyde and/or calcium arsenate were used in early attempts to control *A. fulica*. A number of new molluscicidal chemicals are now available. The principal toxic effect of metaldehyde is through stimulation of the mucous glands, which cause excessive sliming, leading to death by dehydration; metaldehyde is toxic to slugs and snails both by ingestion and absorption by the 'foot' of the mollusk (Prasad *et al*. 2004). Sodium chloride (common table salt) is an effective dehydrating agent (Prasad *et al*. 2004). Various molluscicides like metaldehyde are non-selective, thus their use has a chance of endangering the survival of non-target snails, including endemic fauna (Prasad *et al*. 2004). Please see section 2.1.3 of Barker and Watts (2002) for information on the application of molluscicides.
There is much interest in naturally occurring chemicals as molluscicides. Panigrahi and Raut (1994, in Raut & Barker 2002) have demonstrated that an extract of the fruit of *Thevetia peruviana* has activity against *A. fulica*. Prasad and colleagues (2004) found natural softwood cutting fences made of alligator apple (*Annona glabra*) acted as snail repellents to protect the nursery beds.
Biological Control: rosy wolfsnail (*Euglandina rosea*) has been introduced throughout much of the introduced range of *A. fulica* in "biological control programmes" (Mead 1961, Tillier & Clarke 1983, Murray *et al*., 1988, in Gerlach 2001). The failure of these programmes and the devastating effect that *E. rosea* has had on many indigenous species is well known (Tillier & Clarke 1983, Clarke, Murray & Johnson 1984, Hadfield 1986, Murray *et al*. 1988, Cowie 1992, Pearce-Kelly, Clarke & Mace 1994, Coote *et al*. 1999 2000, in Gerlach 2001). Generalist predators such as *E. rosea*, *Gonaxis quadrilateralis* and *Platydemus manokwari* continue to be dispersed to new areas in misguided attempts to control this invasive gastropod.

Pathway
There is a huge risk of the giant African snail (*Achatina fulica*) being spread and introduced into new locations *via* trade routes. It is frequently moved with agricultural products, equipment, cargo and plant or soil matter. The snails ability to store sperm is a distinct advantage and could enable a founding population to form from just one individual.Targeting risk industries such as nurseries, farmers markets, vehicle depots is important to prevent long distance spread of the snail.*Achatina fulica* may be accidentally associated with commerce.*Achatina fulica* has been introduced to new locations for ornamental purposes (Thiengo *et al*. 2007).*Achatina fulica* may be spread to new locations as a novelty fauna addition.Snails may be inadvertently transported with personal belongings.*Achatina fulica* has been introduced to new locations as a novelty pet (Thiengo *et al*. 2007).*Achatina fulica* may attach itself to vehicles and be spread in this way.Small snails and eggs may be inadvertently transported with agricultural, horticultural, and other commercial products and the containers they are shipped in (Thiengo *et al*. 2007).Accidental transport with military equipment may be important (Mead 1961, in Thiengo *et al*. 2007). Much of the later spread of *A. fulica* was related to Japanese activities in the years leading up to and during World War II (Thiengo *et al*<

Principal source: Raut & Barker 2002

Compiler: IUCN/SSC Invasive Species Specialist Group (ISSG)
Updates on management information with support from the Overseas Territories Environmental Programme (OTEP) project XOT603, a joint project with the Cayman Islands Government - Department of Environment

Review: Review of updates under progress.
Dr. Robert H. Cowie, Center for Conservation Research and Training, University of Hawaii

Pubblication date: 2010-03-02

ALIEN RANGE

[2] AMERICAN SAMOA
[1] BANGLADESH
[1] BERMUDA
[1] CHINA
[1] COOK ISLANDS
[2] ECUADOR
[1] ETHIOPIA
[13] FRENCH POLYNESIA
[1] GUADELOUPE
[1] GUYANA
[3] INDIA
[1] JAPAN
[1] KIRIBATI
[1] MALAYSIA
[1] MARTINIQUE
[1] MAYOTTE
[1] MOROCCO
[1] NEPAL
[1] NEW ZEALAND
[9] PALAU
[1] PARAGUAY
[1] PHILIPPINES
[1] SAINT LUCIA
[2] SAMOA
[1] SEYCHELLES
[1] SOLOMON ISLANDS
[2] SOUTH AFRICA
[1] SURINAME
[1] THAILAND
[2] TUVALU
[1] UNITED STATES MINOR OUTLYING ISLANDS
[1] VENEZUELA
[3] WALLIS AND FUTUNA
[1] ANGUILLA
[1] BARBADOS
[1] BRAZIL
[1] COLOMBIA
[1] COTE D'IVOIRE
[1] EQUATORIAL GUINEA
[1] FRENCH GUIANA
[1] GHANA
[1] GUAM
[1] HONG KONG
[2] INDONESIA
[1] KENYA
[1] MADAGASCAR
[2] MARSHALL ISLANDS
[2] MAURITIUS
[9] MICRONESIA, FEDERATED STATES OF
[1] MOZAMBIQUE
[1] NEW CALEDONIA
[6] NORTHERN MARIANA ISLANDS
[7] PAPUA NEW GUINEA
[1] PERU
[1] REUNION
[1] SAINT MARTIN (FRENCH PART)
[1] SAO TOME AND PRINCIPE
[1] SINGAPORE
[1] SOMALIA
[1] SRI LANKA
[1] TAIWAN
[1] TRINIDAD AND TOBAGO
[10] UNITED STATES
[3] VANUATU
[1] VIET NAM

Red List assessed species 1: CR = 1;

Nannoscincus hanchisteus **CR**

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