Eciton burchellii (Army Ant)

Order: Hymenoptera (Ants, Wasps and Bees)
Class: Insecta (Insects)
Phylum: Arthropoda (Arthropods)

Fig. 1. Army ant, *Eciton burchellii*.

[http://www.myrmecos.net/2013/10/11/army-ants-of-darkness-eciton-burchellii-parvispinum/, downloaded 27 February 2015]

TRAITS. Within the colony of *Eciton burchellii* there are three main classes of ant namely the worker ant, the soldier and the queen, i.e. they are polymorphic. Workers range from 3-12mm in size and within this class there are subclasses of workers specialized for their particular task (Wikipedia, 2015). *Eciton burchellii* features long legs and hook-shaped mandibles (jaws). At the end of their feet are tarsal hooks with which they use to hold each other when forming the bivouac. They vary in colour from brown to deep gold (Fig. 1).

DISTRIBUTION. *Eciton burchellii* is found in tropical Central and South America (Fig. 2). They are terrestrial and require very humid and warm climates thus prefer deeply forested areas (Franks, 1982).

HABITAT AND ACTIVITY. Army ants are carnivorous, aggressive and nomadic. The colony exist in bivouacs (they temporary nest in one location) and prefer sheltered spots e.g. between buttresses of forest trees and beneath fallen trees (Dejean et al., 2013). Some of the temporary nest is made with the surrounding soil however the shelter for the queen among other structures are

made with the ant themselves (Fig. 3). They link together their legs and bodies together with their tarsal claws, forming chains of their own bodies that come together until a solid cylindrical structure is formed. The basic activity of the army ant comprises of hunting in the night and stop to rest in the day. Infertile female worker ants forage for food and brings it back to the nest. *Eciton burchellii* are social organisms and as such forage for food in that way. When one meets prey, chemical signals are triggered and soon thousands of ants swarm the prey. Hunting and foraging of the ants are so successful that they must seek new hunting grounds after a period of about a week (nomadic). Smaller worker ants do many functions including helping soldier ants with hunting and tending to the queen's eggs.

FOOD AND FEEDING. *Eciton burchellii* are carnivorous and eat anything from small insects, invertebrates, and lizards to birds and crabs. Their diets differ in the two seasons offered in the tropics; dry season and wet season. In the latter prey are mainly crickets and small insects while in the wet season ant and wasp broods predominate (Franks 1982; Schneirla, 1956). The army ants are group predators and foraging for food during the stationary phase varies; from once a day to once every other day. This all depends on the hatching and development of larvae (Rettenmeyer et al., 2010). Each raid uses one third of the colony, as much as 200,000 members. Raids never occupy the same area to ensure that there are always prey available. Inward bound ants on the trail deliver prey that was captured by the outward bound swarming ants (Wikipedia, 2015). Pheromones are used by the ants to show other members their path and also to signal to others when help is needed. For example if one worker ant encounters a beetle, it secretes the pheromone and others, including soldier ants, arrive (Davies et al., 2012). Soon thousands of ants work together to cut up prey using their powerful mandibles and transport the prey back to the colony.

POPULATION ECOLOGY. The colony is quite large ranging in quantities of 100,000-2,000,000 individuals. Workers lifespan is several days and the queen several years, up to 30. Each colony contains a single queen, her young and a brood of developing larvae. The adult workers make up the majority of the population in the colony with four distinct castes. The queen mates with 10-20 males and this results in a huge number of worker patrilines (Jaffé et al., 2007). As described before, *Eciton burchellii* is nomadic, moving at intervals, carrying their larvae with them (Fig. 4). The cycle usually lasts 35 days in which they temporary nest in bivouacs. Raids occur every other day until the newly born larvae are fully developed (roughly day 20), then they proceed to one raid per day. The queen may lay around 100,000 eggs during this time. Colonies go extinct when the colony becomes too small or the queen dies (Boswell et al., 1998).

REPRODUCTION. The wingless queen of the army ants colony is the only one that can produce eggs. The queen mates with a winged male that is brought back to the colony by foraging workers. The males mates only once in his lifetime as he will die within the next 48 hours. The queen has the ability to store the sperm to fertilize all her eggs after just one mating ritual. Fertilization is internal (Holldobler and Wilson, 1990). She lays as many as 100,000 eggs every three weeks. Eggs are laid all year round. Development encompasses three stages; the egg, followed by a larva and finally a pupa. *Eciton burchellii* brood care is not by the queen, but by smaller ants referred to as minims. Minims move the brood of eggs to various parts of the bivouc in order to keep abiotic factors constant. If factors such as temperature and humidity are threatening, the bivouc itself changes shape in order to maintain favourable conditions (Gotwald, 1995).

BEHAVIOUR. Being social animals the army ant have an alarm mechanism to attack prey or defend against potential threats. They use pheromones produced by mandible glands. The

mandibles have a large surface area thus evaporation of the pheromone is efficient. The pheromone is secreted whenever the mandible is opened for biting prey, but is more rapidly released when the ant's head is crushed, when the colony is attacked (Lalor et al., 2011). *Eciton burchellii* are almost completely blind thus relies on another method to communicate i.e. pheromones, as mentioned above. In addition pheromones (4-methyl-3-heptanone) is used for alarm, detection of a nest mate and food. It is also used to mark foraging trails when the ants go on raids, the need for assistance and control of reproduction within the colony. Together with pheromones, the army ant utilizes vibration and touch (Holldobler and Wilson, 1990).

APPLIED ECOLOGY. There is no current conservation status listed for *Eciton burchellii.* They are not on the IUCN Red List, US Federal list or CITES. The ant rarely come in contact with humans because of their preferred habitat therefore pose no threat in terms of pest control.

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Fig. 2. Army ant geographical distribution.
[http://antark.net/ant-species/army-ant-eciton-burchellii/, downloaded 2 April 2015]

Fig. 3. The bivouac (nest) of *Eciton burchellii*.
[https://wildtropics.wordpress.com/, downloaded 2 April 2015]

Fig. 4. Army ant larvae being carried by workers to a new location.
[http://www.arkive.org/army-ant/eciton-burchellii/image-G68066.html, downloaded 2 April 2015]