Periplaneta americana (American Cockroach)

Order: Blattodea (Cockroaches)
Class: Insecta (Insects)
Phylum: Arthropoda (Arthropods)

Fig. 1. American cockroach, *Periplaneta americana*.

[http://nathistoc.bio.uci.edu/orthopt/Periplaneta.htm, downloaded 12 March 2016]

TRAITS. The American cockroach is one of the largest common cockroach species. The adults grow to a length of approximately 35-50mm and a height of 7mm. They possess a reddish-brown colour, except the margin of the pronotal shield (region behind the head), which is yellowish (Fig. 1). Young cockroaches look like adults, but do not obtain wings until maturity (Fig. 2). The body is typically oval in shape and flattened, with a plate structure (pronotum) which typically shields the thorax. The body of the cockroach has three sections; head, thorax and abdomen. The head has mouthparts for chewing, antennae that are long and segmented and one pair of large compound eyes (consisting of more than 2000 lenses per eye) (Fig. 3). The thorax is divided into three segments, prothorax, mesothorax and metathorax, and each segment has a pair of legs. The tegmina (forewings) are leathery, opaque and attached to the mesothorax. The hind wings are delicate, used for flight and attached to the metathorax. The wings of the male cockroach extend 4-6mm over the tip of the abdomen, as a result the males are usually longer than females. At the very end of the abdomen are a pair of cerci (sense organs) which are jointed and slender and are

possessed by both male and female cockroaches. Another pair of processes (styli) is present between the cerci of the male but absent in the female.

DISTRIBUTION. *Periplaneta americana* was brought into the Americas in 1625, originally from Africa. They are currently very common and basically worldwide in distribution due to global commerce (Bell and Adiyodi, 1981).

HABITAT AND ACTIVITY. Mainly found in moist areas such as sewers, drainage systems, tunnels and basements. American cockroaches are ectothermic and do not tolerate the cold, they prefer warm areas, especially where food is stored and prepared, which may include supermarkets, restaurants and homes. Areas with woodpiles, garbage facilities and trees around a home provide efficient refuges, water and food for cockroaches (Hagenbuch et al., 1988).

FOOD AND FEEDING. *Periplaneta americana* is an omnivore and an opportunistic eater. It consumes rotting organic materials, and is also a scavenger, which eats almost everything. They prefer sweets, fermenting food and decaying organic materials and feed on bread, paper, books, fruit (Fig. 4), boots, hair, cloth and dead insects (even their own kind) (Bell and Adiyodi, 1981).

POPULATION ECOLOGY. They multiply into large numbers; sometimes more than 4500 are found in manhole sewers (Rust et al., 1991). They migrate into homes and commercial buildings through plumbing from sewers, and trees branches hanging over buildings. They negatively respond to light, so they nests in toilets, sinks and other dark warm areas around the house. The movements, age and size of the American cockroach were studied in sewers in Malaysia, where 2717 females and 2177 males were marked and released over 13 months. Of the 1030 females and 783 males which were recaptured, 25% and 19%, respectively, travelled through the sewer. Of those, 90% travelled 2-20m from their original release site, and one male travelled 192m, the furthest distance travelled. The minimum daily temperature was correlated with the amount of movement through the sewer (Tee et al., 2011).

REPRODUCTION. The female American cockroach produces multiple sex pheromones, these may include chemicals such as hexanoic-acid, phenol, periplanone A and B and many others. These appealing chemicals draw in males for mating. The transfer of sperm takes place by the use of membranous sacs of sperm (spermatophores). The female then forms an egg sac (ootheca) (Fig. 2) once the process of fertilization is completed. The ootheca is red-brown in colour and is approximately 1cm long. It is placed in a safe place most likely next to a food source. Within 6-8 weeks, young (nymph) cockroaches hatches from their egg sacs and mature within 6-12 months. The nymphs go through the process of moulting thirteen times. Adults live for approximately 400 days and a female produces approximately 150 nymphs in her entire life as an adult (Bell and Adiyodi, 1981).

BEHAVIOUR. Cockroaches will spend 3/4 of the day choked into slim cervices and cracks to keep safe. They prefer refuges that are in close proximity to sources of water and food, and of high humidity and warmth (Smith and Whitman, 1992). They are considered as pests because they invade homes and commercial buildings were food is prepared and stored in search for food, water and to shade from weather conditions that are too extreme. They react negatively towards light and are active mostly in the night.

APPLIED ECOLOGY. The American cockroach is highly considered as a pest and very harmful to the health of humans. They have the ability to transmit diseases because they are common in places that are extremely unsanitary such as dumps, drains and sewers. Their then move into homes and commercial building where they feed and contaminate food and items which are then used by humans, who may now develop a disease through contraction of a number of bacteria, fungi and viruses that were previously transmitted by the cockroaches. Cockroaches are also a common allergen. Cockroaches are a source of food for some species such as spiders (Fig. 5), frogs and lizards. In some areas lizards were kept in homes as a pest control for roaches. An alternative control of cockroaches are prevention, inspections, good sanitation and the application of insecticides.

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Fig. 2. Ootheca (egg sac) and four different stages of nymphs of *Periplaneta americana.*

[http://entnemdept.ufl.edu/creatures/urban/roaches/american_cockroach.htm, downloaded 12 March 2016]

Fig. 3. The large compound eye and segmented antennae of the American cockroach.

[http://nathistoc.bio.uci.edu/orthopt/Periplaneta.htm, downloaded 12 March 2016]

Fig. 4. American cockroach feeding on fruit.

[http://www.walthamservices.com/pest-control/cockroaches/american-cockroach/, downloaded 12 March 2016]

Fig. 5. Spider attacking an American cockroach.
[https://www.flickr.com/photos/48991563@N06/8168756273, downloaded 12 March 2016]