

## Chapter 1 : Life cycle of a Cockroach – KHMER CLEANING SERVICES

*The length of the American cockroach's life is dependent upon environment, diet and other conditions. Favorable conditions lead to rapid population growth, while unfavorable conditions cause adult cockroaches to develop more slowly or to die prematurely.*

**Distribution**[ edit ] Despite the name, none of the Periplaneta species is endemic to the Americas ; P. They are thought to have emerged on the supercontinent Pangaea , or on Gondwana , the daughter continent of Pangaea. The cockroach made many adaptations over the years to be able to survive the major die-offs to which many species succumbed. **Characteristics**[ edit ] Of all common cockroach species, the American cockroach has the largest body size; molts 6–14 times mostly 13 times before metamorphosis; and has the longest lifecycle, up to about days. Immature cockroaches resemble adults except they are wingless. The cockroach is divided in three sections; the body is flattened and broadly oval, with a shield-like pronotum covering its head. A pronotum is a plate-like structure that covers all or part of the dorsal surface of the thorax of certain insects. They also have chewing mouth parts, long, segmented antennae, and leathery fore wings with delicate hind wings. The third section of the cockroach is the abdomen. It is considered one of the fastest running insects. **Morphology**[ edit ] The American cockroach shows a characteristic insect morphology with its body bearing divisions as head, trunk, and abdomen. The trunk, or thorax, is divisible into prothorax, mesothorax and metathorax. Each thoracic segment gives rise to a pair of walking appendages known as cursorial legs. The organism bears two pairs of wings. The fore wings, known as tegmina, arise from mesothorax, and are dark and opaque. The hind wings arise from the metathorax and are used in flight, though cockroaches rarely resort to flight. The abdomen is divisible into 10 segments, each of which is surrounded by chitinous exoskeleton plates called sclerites, including dorsal tergites, ventral sternites, and lateral pleurites. **Lifecycle**[ edit ] American cockroaches have three developmental stages: On average, females produce 9–10 oothecae, although they can sometimes produce as many as After about two days, the egg cases are placed on a surface in a safe location. Egg cases are about 0. Immature cockroaches emerge from egg cases in 6–8 weeks and require 6–12 months to mature. After hatching, the nymphs feed and undergo a series of 13 moultings or ecdysis. Adult cockroaches can live up to an additional year, during which females produce an average of young. The American cockroach reproductive cycle can last up to days; [8] it is capable of reproduction through facultative parthenogenesis. Genetically, the American cockroach is closer to two termite species, Zootermopsis nevadensis and Macrotermes natalensis, than it is to the German cockroach. The genome codes for a large number of chemoreceptor families, including taste receptors and olfactory receptors. The taste receptors comprise the largest number found among insects for which genomes have been sequenced. About of the taste receptors are involved in bitter taste perception. **Habitat**[ edit ] American cockroaches generally live in moist areas, but can survive in dry areas if they have access to water. These cockroaches are common in basements, crawl spaces, cracks and crevices of porches, foundations, and walkways adjacent to buildings. In residential areas outside the tropics, these cockroaches live in basements and sewers, and may move outdoors into yards during warm weather. **Relationship with humans**[ edit ] **Risk to humans**[ edit ] The odorous secretions produced by American cockroaches can alter the flavor of food. Also, if populations of cockroaches are high, a strong concentration of this odorous secretion can be present. House dust containing cockroach feces and body parts can trigger allergic reactions and asthma in certain individuals.

### Chapter 2 : Life Cycle of Cockroaches: Lifespan, Stages, & Development

*The overall life span of cockroaches differs as well -- some live only a few months while others live for more than two years. Cockroaches generally prefer warm, humid, dark areas. In the wild, they are most common in tropical parts of the world.*

**Cockroach Eggs** Several different species of cockroaches inhabit the New England area. The life cycles of all of these species are similar. All cockroaches begin as eggs, which hatch into nymphs, and develop into adults over varying lengths of time. Adult female cockroaches start the reproductive cycle by laying multiple eggs housed within a single, protective ootheca, or case. Typically ranging from five to 10 millimeters long, cockroach egg cases are easily visible to the naked eye and generally resemble kidney beans in shape. Each case contains an average of 16 to 37 eggs, with the prolific German cockroach often producing up to 40 eggs at a time. Though large enough to be seen, egg cases frequently escape human detection, as female cockroaches either carry the oothecae until just before the eggs hatch or lay the capsules in sheltered areas like cracks, crevices, and debris on the floor. Brown-banded cockroaches even glue their egg cases to ceilings, doors, picture frames, and the undersides of furniture. Cockroach eggs hatch after incubating for a period of time ranging from about two weeks to two months. Newly hatched cockroaches are called nymphs and look like smaller, wingless adults. Nymphs grow by shedding their skin, or molting, multiple times during the early stages of development. The most common species of cockroach found in New England, the German cockroach, molts six or seven times before developing into an adult in about three months. Brown-banded cockroaches mature within a few months, while other New England cockroach species, such as American and Oriental cockroaches, can take longer than a year to reach adulthood. The presence of molted cockroach skins, even in the absence of the actual insect, is often evidence of an infestation. Adult cockroaches vary in size according to species. American and Oriental cockroaches are the largest cockroach species found in New England as both exceed an inch in length as adults. German and brown-banded cockroaches are generally about a half-inch long. The American cockroach typically lives the longest, with a lifespan often lasting up to three years from egg to adult. Oriental cockroaches frequently live longer than a year as well, while the life expectancies of German and brown-banded species usually fall within a year or less. Need Help with Pests? Contact Waltham Services Now! Waltham Pest Services offers complete, environmentally responsible pest management solutions designed to protect your home, family and pets. Proudly serving homes and businesses in New England: For a free estimate, call today. Find a location near you [Careers](#).

### Chapter 3 : Cockroaches: Life Cycle and Control - Pestrol NZ

*The entire life cycle of a cockroach from the egg to the adult stage can last up to days. After each molt, the nymph gets closer and closer to the adult stage. In the final nymph stage, the roaches for one will have wings which were absent there before, or rather hidden.*

Image courtesy Amazon Most pest control experts recommend two primary methods for controlling roaches. First, seal off any cracks or holes that roaches could use to get into your home. For this reason, completely blocking all roach entrances can be very difficult. Determining which species of roach has entered your home can help you narrow down which parts of your home to focus on. The University of California has descriptions of the main pest species of cockroach and information on how to identify them. Second, keep your home clean. Even spotless homes can become infested with roaches, but leaving food or garbage out in the open is likely to attract pests. Cover and seal all of your food, and wipe down counters and tables after eating. Sweep or mop your floor after cooking, and eat only in your dining area. Always wash dirty dishes promptly, since even tiny spots of food or grease can become food for roaches. If these steps do not reduce the cockroach population in your home, the next step is to use traps to kill the roaches. This can help you figure out where the roaches are coming from and where to focus spray or powder treatments if they become necessary. Many people prefer not to use poisons in their homes. However, experts caution that many natural devices for cockroach control, like ones that emit sound, do not really work. Fortunately, studies have shown that some natural substances can repel cockroaches: Nepetalactone, which is present in two forms in catnip Ceneole, also known as eucalyptol, which is present in bay leaves Osage orange oil, although scientists have not determined the exact active ingredient Some infestations respond only to chemical deterrents or poisons. Your best bet may be to contact an exterminator who can determine exactly which species of cockroach is present and which chemicals to use to kill it. The University of California has more information about which chemicals are best to use on which species of cockroach. Check out the links below for lots more information on cockroaches, insects and related topics. One common perception is that cockroaches will outlive humans, even in the event of a full-scale nuclear war. Opinions differ about whether this is the case. Some studies have shown that cockroaches, while hardier than humans, are more susceptible to radiation than other insects [source: Regardless of whether roaches could survive the initial blast, their need for warmth and moisture makes it unlikely that they could survive nuclear winter.

## Chapter 4 : Cockroach Facts | Western Exterminator

*Life Cycle of a Cockroach. The life cycle of American cockroach has generally three life stage and those are the egg, nymph, and adult. The life cycle of a Cockroach between on average egg and adult is days.*

Cockroach *Periplaneta americana* is one of the large-sized insects. The cockroach is cosmopolitan in distribution and found mainly in tropical and damp climates. These usually inhabit kitchen, bakeries, godowns, store-rooms and sewage channels. They are nocturnal and omnivorous. Dorsal body surface is covered by wings which are darker than body itself. The body of a cockroach is differentiated into 3 distinct regions- head, thorax and abdomen, and a small neck or cervicum connects the head with thorax fig. This is triangular, somewhat flattened and bent downwards in hypognathus position, i. It can be moved upon the mobile neck in all directions. On each lateral side, it bears a large and blackish compound eye. Close to each eye, on dorsal surface, there is a small, light-coloured area called fenestra or ocellar spot. These spots are regarded undeveloped simple eyes by some and functional ocelli by others. At its pointed end, the head bears a mouth. The cavity of the head posteriorly communicates with that of the neck by means of a large occipital foramen. This is the small, broad and harder part of body located behind the neck. It is comprised of three segments- prothorax, mesothorax and metathorax. Each thoracic region bears three pairs of walking legs; the last two thoracic segments bear a pair of wings each. Relatively more flattened and softer, it is the largest and broadest part of body behind the thorax. It bears the anus at its posterior end. Reproduction and Life cycle: In cockroach sexes are separate i. The female cockroach is distinguished from the male by the following characters: Male reproductive organ consists of a pair of testes, a pair of vas deferentia, originating from testes, utricular gland situated at the junction of vas deferentia, ejaculatory duct, phallic gland and phallogeres fig. The female reproductive organ is comprised of a pair of oviducts, vagina, collateral gland, gonapophyses and spermatheca fig. The female cockroach emits a specific, volatile, odorous sex attractant or pheromone to draw the male to her for mating. These attractants are detected by the chemoreceptors located in the antennae of the male. Reproduction in cockroach involves the following steps fig. Copulation generally takes place in dark, during night. Spermatophore formation and insemination: Spermatozoa produced by the testes of the male pass into the seminal vesicles for storage. At the time of copulation these pass into the ejaculatory duct and get mixed with a nourishing fluid. The spermatophore now becomes tough, pear-shaped, with a simple opening. During copulation it is transferred into the genital pouch of the female where its opening lies in close contact with the spermathecal opening, so that the sperms leave the spermatophore to enter the spermatheca. The spermatophore, when empty, drops down. Fertilization and formation of ootheca: Fertilization takes place within the vestibulum of the female genital pouch. The collateral glands pour their secretions over the inner surface of the vestibulum to form the ootheca. Sixteen eggs are laid into a single ootheca. The eggs are arranged in a double row, assisted by the ovipositor valves, very much like cigarettes in a cigarette case. The sperms, stored in the spermatheca, fertilize the eggs when they pass from the vagina into the vestibulum for inclusion in the ootheca. More and more secretions from the collateral glands harden the ootheca which is first white in colour but becomes pink later on. The ootheca is oblong in shape with a keel on its outer dorsal fringe. The female cockroach carries the ootheca, protruding from the tip of the abdomen, for several days, till it is deposited in a warm, sheltered and dark place. The ootheca which is laid at a suitable place by the female cockroach contains fertilized eggs. These are slightly curved, concave on one side and convex on the other. Each contains a diploid nucleus and yolk, the food for embryonic development. Each egg first undergoes cleavage resulting in a blastula, which is followed by a gastrula formation. The gastrula is differentiated into an early embryo which gets separated from the blastoderm by an amniotic cavity. Its three germ layers the ectoderm, mesoderm and endoderm the various parts of the nymph. When hatching occurs, the dorsal keel of the ootheca splits and the nymphs emerge out leaving the egg membranes within the ootheca. The freshly-hatched nymphs are delicate, transparent and almost colorless creatures with black eyes. They possess nearly all adult characters but differ in size and colouration, in being sexually immature and lacking wings. Immediately after hatching, the nymphs undergo first moulting or ecdysis and then five or six successive

moult follows. As nymphal development proceeds, the wing pads arise, body increases in size, colouration becomes darker and ultimately it takes its form with fully developed wings and genitalia. Cockroaches are carriers of helminthic worms, pathogenic bacteria, virus, fungi, and protozoans. Cockroaches are also aesthetically displeasing because they can soil items with their excrement and regurgitation.

### Chapter 5 : Cockroach Life Cycle: Cockroaches at Egg, Nymph & Adult Stages

*Life Cycle of a Cockroach American cockroaches generally live in moist areas, but can survive in dry areas if they have access to water. They prefer warm temperatures around 29 Å°C (84 Å°F) and do.*

Image courtesy CDC As with many animals, cockroach reproduction relies on eggs from a female and sperm from a male. Usually, the female releases pheromones to attract a male, and in some species, males fight over available females. But exactly what happens after the male deposits his sperm into the female varies from species to species. In these species, the mother roach carries her eggs around in a sac called an ootheca, which is attached to her abdomen. The number of eggs in each ootheca varies from species to species. Many female roaches drop or hide their ootheca shortly before the eggs are ready to hatch. Others continue to carry the hatching eggs and care for their young after they are born. But regardless of how long the mother and her eggs stay together, the ootheca has to stay moist in order for the eggs to develop. Other roaches are ovoviviparous. Ovoviviparous and viviparous species give birth to live young. Oootheca and nymph of the oriental cockroach Image courtesy Paul M. Choate, University of Florida Whether mother roaches care for their young also varies from one species to another. Some mothers hide or bury their ootheca and never see their offspring. Others care for their offspring after birth, and scientists believe that some offspring have the ability to recognize their mothers. The number of young that one roach can bear also varies considerably. A German cockroach and her young can produce , more roaches in one year. An American cockroach and her young can produce a comparatively small new roaches per year. Newly hatched roaches, known as nymphs, are usually white. Shortly after birth, they turn brown, and their exoskeletons harden. They begin to resemble small, wingless adult roaches. Nymphs molt several times as they become adults. The period between each molt is known as an instar. Each instar is progressively more like an adult cockroach. In some species, this process takes only a few weeks. In others, like the oriental cockroach, it takes between one and two years. Cockroaches generally prefer warm, humid, dark areas. In the wild, they are most common in tropical parts of the world. They are omnivores, and many species will eat virtually anything, including paper, clothing and dead bugs. A few live exclusively on wood, much like termites do. Although cockroaches are closely related to termites, they are not as social as termites are. Termite colonies have an organized social structure in which different members have different roles. Cockroaches do not have these types of roles, but they do tend to prefer living in groups. A study at the Free University of Brussels in Belgium revealed that groups of cockroaches make collective decisions about where to live. When one space was large enough for all of the cockroaches in the study, the cockroaches all stayed there. But when the large space was not available, the roaches divided themselves into equal groups to fit in the smallest number of other enclosures. Another study suggests that cockroaches have a collective intelligence made up of the decisions of individual roaches. European scientists developed a robot called InsBot that was capable of mimicking cockroach behavior. The researchers applied cockroach pheromones to the robot so real roaches would accept it. Scientists theorize that similar robots could be used to herd animals or to control cockroach populations. In addition to robotic intervention, there are several steps that people can take to reduce or eliminate cockroach populations.

### Chapter 6 : Cockroach Information for Kids: Cockroach Facts for Kids

*The cockroach life cycle starts with the production of eggs. Adult females produce between 10 and 40 eggs at a time, which they carry in specialized cases called ootheca. Adult females produce between 10 and 40 eggs at a time, which they carry in specialized cases called ootheca.*

Introduction Back to Top The German cockroach is the cockroach of concern, the species that gives all other cockroaches a bad name. It occurs in structures throughout Florida, and is the species that typically plagues multifamily dwellings. In Florida, the German cockroach may be confused with the Asian cockroach, *Blattella asahinai* Mizukubo. While these cockroaches are very similar, there are some differences that a practiced eye can discern. Adult female German cockroach, *Blattella germanica* Linnaeus, with ootheca. Photograph by James Castner, University of Florida. Distribution Back to Top The German cockroach is found throughout the world in association with humans. They are unable to survive in locations away from humans or human activity. The major factor limiting German cockroach survival appears to be cold temperatures. Studies have shown that German cockroaches were unable to colonize inactive ships during cool temperatures and could not survive in homes without central heating in northern climates. The availability of water, food, and harborage also govern the ability of German cockroaches to establish populations, and limit growth. Description Back to Top Egg. Eggs are carried in an egg case, or ootheca, by the female until just before hatch occurs. The ootheca can be seen protruding from the posterior end genital chamber of the female. Nymphs will often hatch from the ootheca while the female is still carrying it. A typical egg case contains 30 to 40 eggs. The egg case is a tiny, brown, purse-shaped capsule. It is about 8 mm long, 3 mm high, and 2 mm wide. Oothecae egg cases of the German cockroach, *Blattella germanica* Linnaeus. First instar nymphs emerging from the oothecae egg case of a German cockroach, *Blattella germanica* Linnaeus. The nymphal stage begins with egg hatch and ends with the emergence of the adult. Nymphs are dark brown to black in color, with distinct dark parallel bands running the length of the pronotum. Nymphs do not possess wings. The number of molts required to reach the adult stage varies, but the most frequently reported number of molts is six. The stage between molts is called an instar. At room temperature nymphs complete development in about 60 days. All developmental stages actively forage for food and water. Third instar nymph of German cockroach *Blattella germanica* Linnaeus. Newly molted adult German cockroach, *Blattella germanica* Linnaeus. Within a few hours the cuticle will harden and darken. The adult is 10 to 15 mm long, brown to dark brown in color with two distinct parallel bands running the length of the pronotum. The sexes can be distinguished by the following characteristics: Adult male German cockroach, *Blattella germanica* Linnaeus. Koehler, University of Florida. Adult female German cockroach, *Blattella germanica* Linnaeus. Life Cycle Back to Top The German cockroach has three life stages typical of insects with incomplete metamorphosis: The entire life cycle is completed in about days. However, factors such as temperature, nutritional status, and strain differences may influence the time required to complete a life cycle. German cockroaches breed continuously with many overlapping generations present at any one time. Under ideal conditions, population growth has been shown to be exponential. Actively growing field populations are comprised of 80 percent nymphs and 20 percent adults. The German cockroach is omnivorous, eating table scraps, pet food, and even book bindings. Medical and Economic Significance Back to Top German cockroaches adulterate food or food products with their feces and defensive secretions, physically transport and often harbor pathogenic organisms, may cause severe allergic responses, and in extremely heavy infestations have been reported to bite humans and feed on food residues on the faces of sleeping humans. In addition, some scientists suggest that German cockroach infestations may cause human psychological stress and that the stigma associated with infestations alters human behavior. For example, people with infested houses do less entertaining, and avoid the kitchen at night for fear of encountering a cockroach. Action Threshold Back to Top Since the German cockroach is considered an aesthetic pest, the action threshold for this insect depends upon the tolerance of the people living in the infested dwelling. However, most people associate cockroach infestations with poor sanitary conditions and typically go to excessive lengths to eradicate them from their houses. Management Back to

Top Insecticides in the organophosphorous, carbamate, pyrethroid, amidinohydrazone, insect growth regulator, inorganic, microbial, and botanical classes are available for controlling German cockroaches. Insecticide treatments are available in a wide variety of formulations including baits, sprays emulsifiable concentrates, wettable powders, microencapsulated , dusts, and powders. Insect Management Guide for cockroaches. Non toxic and low toxic alternatives for German cockroach control are available. Sticky traps can be used to monitor or reduce population size. Improving sanitation by eliminating food and water sources and clutter can have a significant impact on reducing the chances of infestation population size. Finally, exclusion practices such as sealing cracks and crevices will reduce harborage space and also negatively impact population size. Toxicity of commercially available household cleaners on cockroaches, *Blattella germanica* and *Periplaneta americana*. *Advances in Urban Pest Management*. Van Nostrand, New York. *The Cockroach*, Volume I. Hutchinson of London, London. Durier V, Rivault C. Improvement of German cockroach *Dictyoptera: Blattellidae* population control by fragmented distribution of gel baits. *Journal of Economic Entomology* Their species composition and suppression. *Journal of Medical Entomology* Rearing improvements for the German cockroach *Dictyoptera: Understanding and Controlling the German Cockroach*. Oxford University Press, Oxford. James Castner and Philip G. Koehler, University of Florida Web Design:

## Chapter 7 : Cockroach - Wikipedia

*The life cycle of the cockroach includes three stages: egg, nymph and adult. These same three stages are common to insects that do not undergo metamorphosis.*

Mantodea Mantises Termites were previously regarded as a separate order Isoptera to cockroaches. This hypothesis was originally based on similarity of the symbiotic gut flagellates in termites regarded as living fossils and wood-eating cockroaches. McKittrick noted similar morphological characteristics between some termites and cockroach nymphs. Such measure preserves the classification of termites at family level and below. They have a relatively small head and a broad, flattened body, and most species are reddish-brown to dark brown. They have large compound eyes , two ocelli , and long, flexible antennae. The mouthparts are on the underside of the head and include generalized chewing mandibles , salivary glands and various touch and taste receptors. The external surface has a tough exoskeleton which contains calcium carbonate and protects the inner organs and provides attachment to muscles. It is coated with wax to repel water. The wings are attached to the second and third thoracic segments. The tegmina , or first pair of wings, are tough and protective, lying as a shield on top of the membranous hind wings, which are used in flight. All four wings have branching longitudinal veins, and multiple cross-veins. The front legs are the shortest and the hind legs the longest, providing the main propulsive power when the insect runs. The structures have been used as inspiration for robotic legs. Segment ten bears a pair of cerci , a pair of anal styles, the anus and the external genitalia. Males have an aedeagus through which they secrete sperm during copulation and females have spermathecae for storing sperm and an ovipositor through which the ootheca is laid. Many live in leaf litter, among the stems of matted vegetation, in rotting wood, in holes in stumps, in cavities under bark, under log piles and among debris. Some live in arid regions and have developed mechanisms to survive without access to water sources. Others are aquatic, living near the surface of water bodies, including bromeliad phytotelmata , and diving to forage for food. Most of these respire by piercing the water surface with the tip of the abdomen which acts as a snorkel , but some carry a bubble of air under their thoracic shield when they submerge. Others live in the forest canopy where they may be one of the main types of invertebrate present. Here they may hide during the day in crevices, among dead leaves, in bird and insect nests or among epiphytes , emerging at night to feed. Some species secrete these in their feces with gut microbial symbionts being involved, while others use glands located on their mandibles. Pheromones produced by the cuticle may enable cockroaches to distinguish between different populations of cockroach by odor. The behaviors involved have only been studied in a few species, but German cockroaches leave fecal trails with an odor gradient. Thus, cockroaches have emergent behavior , in which group or swarm behavior emerges from a simple set of individual interactions. In , the role of one of these proteins, pigment dispersing factor PDF , was isolated and found to be a key mediator in the circadian rhythms of the cockroach. Many tropical species prefer even warmer environments. Cockroaches are mainly nocturnal [34] and run away when exposed to light. An exception to this is the Asian cockroach , which flies mostly at night but is attracted to brightly lit surfaces and pale colors. When a sufficient number of individuals a "quorum" exploits a food source, this signals to newcomer cockroaches that they should stay there longer rather than leave for elsewhere. A study used specially-scented roach-sized robots that appear to the roaches as real to demonstrate that once there are enough insects in a place to form a critical mass , the roaches accepted the collective decision on where to hide, even if this was an unusually light place. In one study, isolated cockroaches were less likely to leave their shelters and explore, spent less time eating, interacted less with conspecifics when exposed to them, and took longer to recognize receptive females. Because these changes occurred in many contexts, the authors suggested them as constituting a behavioral syndrome. In addition, group personality is not simply the sum of individual choices, but reflects conformity and collective decision-making. Lihoreau and his fellow researchers stated: The Madagascar hissing cockroach produces its sound through the modified spiracles on the fourth abdominal segment. Several different hisses are produced, including disturbance sounds, produced by adults and larger nymphs, and aggressive, courtship and copulatory sounds produced by adult males. They have been observed

producing hisses and whistles from air forced through the spiracles. Furthermore, in the presence of a potential mate, some cockroaches tap the substrate in a rhythmic, repetitive manner. In many species, these vibrations may be essential if the insect is to utilize cellulose; however, some species secrete cellulase in their saliva, and the wood-eating cockroach, *Panesthia cribrata*, is able to survive indefinitely on a diet of crystallized cellulose while being free of micro-organisms. It may be that  $N_2$ . When the carbon dioxide level in the insect rises high enough, valves on the spiracles open and carbon dioxide diffuses out and oxygen diffuses in. The tracheal system branches repeatedly, the finest tracheoles bringing air directly to each cell, allowing gaseous exchange to take place. Like many insects, cockroaches mate facing away from each other with their genitalia in contact, and copulation can be prolonged. A few species are known to be parthenogenetic, reproducing without the need for males. She drops the capsule prior to hatching, though live births do occur in rare instances. The egg capsule may take more than five hours to lay and is initially bright white in color. The eggs are hatched from the combined pressure of the hatchlings gulping air. The hatchlings are initially bright white nymphs and continue inflating themselves with air, becoming harder and darker within about four hours. Their transient white stage while hatching and later while molting has led to claims of albino cockroaches. Cockroaches live up to a year, and the female may produce up to eight egg cases in a lifetime; in favorable conditions, she can produce to offspring. Other species of cockroaches, however, can produce far more eggs; in some cases a female needs to be impregnated only once to be able to lay eggs for the rest of her life. Some species, however, are ovoviviparous, keeping the eggs inside their body, with or without an egg case, until they hatch. At least one genus, *Diploptera*, is fully viviparous. Development is generally slow, and may take a few months to over a year. The adults are also long-lived, and have survived for as much as four years in the laboratory.

### Chapter 8 : German Cockroach - German Cockroach Control

*American cockroach life cycle* The American cockroach is the largest house-infesting roach. A female American roach lays about 16 eggs at a time and will produce about six to 14 oothecae during her lifespan, with an average incubation period of 44 days.

**German Cockroach Scientific Name:** This is because it produces a higher number of eggs, develops from hatching to adulthood more rapidly, the eggs are carried inside the female protecting them from environmental hazards that destroy eggs, and finally, the smaller size of German cockroach nymphs enable them to conceal themselves in cracks and crevices more easily than other species causing German cockroach populations to burgeon quickly out of control. German cockroaches have resistance to many insecticides and it to their offspring. This cockroach cannot sustain flight. The German cockroach is often confused with the Asian cockroach. It is seen during daylight hours more often than other species. It emits a nasty smell when excited or scared. They are medium yellow-brown, tan, brown, or nearly black in color. A German cockroach can be differentiated from other cockroach species by two dark, parallel stripes on the dorsal part of the thorax. Males have slender bodies with tapered posterior abdomens and no leathery outer wings. Females have stout bodies with rounded abdomens covered by leathery outer wings. Nymphs are black and or dark brown with dark parallel bands that run down the length of the pronotum. They usually molt 6 times before reaching adulthood.

**German Cockroach Habitat** German cockroaches are mostly found in American kitchens. They prefer damp places with food and water nearby. They like garbage cans, sewers, and other places where disease-causing bacteria thrive. The most successful time for breeding is at the end of the summer. German cockroaches are omnivores and eat crumbs, grease, pet food, gum, wax, left over food in empty cans, glue, and soap. The length of time from egg to maturity is determined by temperature, food availability, and strain of the species. This species of cockroach breeds continually with lots of generations overlapping each other at a time. Chances of survival for the German cockroach are better than other species because the female carries the eggs within the egg case inside her body so they are not susceptible to environmental harm.

**German Cockroaches and Humans** German cockroaches are unsightly spoilers of food and spreaders of bacteria. The waxy, oily substance that makes the German cockroach shiny is also the perfect vehicle for disease. Some of the diseases spread by German cockroaches are cholera, e. German cockroaches are rarely aggressive towards humans during the day, but may bite people as they sleep. Some humans have allergic reactions to cockroaches because of a protein called tropomyosin, also linked to asthma. German cockroach fecal matter is harmful to asthma sufferers for this reason. A professional pest control expert will come to your home and help identify whether or not the insects infesting your home are German cockroaches. A substance toxic to German cockroaches will be mixed with a food source. German cockroach bait may contain attractants and feeding stimulants to draw roaches away from human food. A professional exterminator might use amidinohydrazone, botanic, carbamate, inorganic, insect growth regulator, microbial, organophosphorous, and pyrethoid insecticides. These insecticides can be used in baits, dusts, powders, or sprays. Ground silica gel or boric acid can be distributed into cabinets, cracks and crevices along baseboards, behind fridges, in electrical outlets, under sinks, under stoves, and in walls. The silica gel sticks the wax and oil on the cockroach and causes the cockroach to dehydrate and die. German cockroaches crawl through sprinkled boric acid dust, the boric acid acts as a stomach poison so that when the cockroach grooms itself it eats the insecticide and dies.

**Removal of German Cockroaches:** After treating areas of infestation, the exterminator will vacuum up carcasses and sanitize the area. Seal gaps up around plumbing, switch plates, and wall outlets. This will keep roaches from migrating from one infested dwelling into another. Close windows and doors. If windows are open, make sure they have tightly fitting screens. Run water in seldom used plumbing fixtures because cockroaches like to enter homes through dry drain traps. Cover vent pipes on the roof to keep German cockroaches from coming up sewer connections or getting into attics and windows. Fix plumbing problems and check outdoor sprinklers and spigots for leaks. German cockroaches drink water left in bathtubs, dishwashers, and sinks. Dry them out after use. Wipe the condensation in the area under the refrigerator dry. Empty pet water bowls at night when

animals are indoor and asleep. Sop up areas outside where water has collected, such as cans, holes in trees, old tires, etc. Remove all clutter to eliminate places for cockroaches to breed and harbor. Take trash and debris away from the house. Stack firewood away from the house, cockroaches like to harbor in piles of wood. Fill holes in trees with cement. Trim trees, ornamental trees and shrubs. Remove palm debris and dead or loose branches. Use biological controls, desiccating dusts, and traps. Use sticky traps or jar traps baited with bread soaked in beer. On the outside of the jar put a paper towel around it to provide a climbing surface for roaches. Coat the inside lip of the jar with Vaseline to prevent them from escaping. Fill jars with hot soapy water to kill trapped insects, dump contents into the trash and repeat the process every few days.

## Chapter 9 : Structure and Life Cycle of Cockroach (With Diagram)

*The American cockroach (Periplaneta americana), also colloquially known as the waterbug, but not a true waterbug since it is not aquatic, or misidentified as the palmetto bug (see Florida woods cockroach for the differences), is the largest species of common cockroach, and often considered a pest.*

What do cockroaches look like? Cockroach facts The cockroach is an insect that has been around for a long time. They have been on the earth for hundreds of millions of years and may even pre-date the dinosaurs. Cockroaches continue to be one of the most populous creatures on this planet with over 4,000 different known species worldwide. There are cockroach species that live in both urban and rural areas. The one constant about cockroaches is that they are adaptable, capable of finding food and a way to survive even in some of the harshest environments. The hardy insects have survived global catastrophes and have managed to make homes in virtually every continent. Roaches also have adapted well when transported from their native lands to new regions. At Western Exterminator, we are cockroach experts. We know the difference between the myths and rumors and the truth about roaches. Knowing the difference allows us to provide comprehensive cockroach treatments. Cockroaches are pests and pose health risks to people. Therefore, they have to be clearly understood in order to provide effective cockroach treatment. In the spirit of educating homeowners and business owners about these insects, we are presenting the cockroach facts. If you think that you have a cockroach problem, then call in the experts at Western Exterminator by calling or filling in an online form.

Cockroach lifespan Each species of cockroach has their own estimated lifespan but on average, cockroaches live for about one year. Factors such as food supply, habitat and climate affect lifespan. American cockroaches can live for about one year while German cockroaches are estimated to live for about 6 months. On average, cockroaches can live for a month without food but only a week without water. Cockroaches can feed on a variety of materials so starving cockroaches as a means of pest control is not effective. Cockroach behavior This is what makes roaches particularly difficult antagonists for the pest control industry. Our technicians have to constantly adapt and learn so that they can continue to find ways to eliminate and prevent cockroaches. Cockroaches have been clocked running up to 3 miles an hour, which is very fast for an insect. At Western Exterminator, we are experts in cockroach behavior. We know how to track them down, find where they hide, and get rid of infestations fast. Some of cockroach behaviors include: Cockroaches are everywhere - an indication of their remarkable ability to adapt to all climates. Some estimates say that there are up to 4,000 species and 70 species in the United States. Cockroaches prefer the night - which is why you usually see them when you turn on the lights at night. They prefer the darkness for finding food and mating purposes. Cockroaches reproduce fast - when you see one you will want to call in a professional. There are probably a lot more that you cannot see. Some female cockroaches will only mate once, but then spend the rest of their lives pregnant. Cockroach eggs are small and vary in color, but most cockroaches are very good at hiding their eggs. You can end up with an infestation fast with a large number of cockroach eggs. A cockroach is omnivorous - that means they will eat almost anything, but they have a preference for sweets, meat, and starches. However, you can also find them eating leather or books on the shelf. If an infestation has gotten so bad that their food supply is low, cockroaches have even been known to bite humans. Cockroaches hide - their bodies have adapted to squeezing into tiny crevices and cracks. Their ability to do this also means that even the smallest hole can allow cockroaches access to your building or property and once they are in there, they can be very hard to find. Some cockroaches can live for up to a month without food and for two weeks without water - there have even been cases where a cockroach without a head lived for a week. They want to be warm, have lots of places to hide and want to be close to food and water. Cockroaches are very fast! Cockroach habitat Cockroaches are everywhere - an indication of their remarkable ability to adapt to all climates. Some estimates say that there are up to 70 species in the United States. They want to be warm, have lots of places to hide and be close to food and water. Cockroaches prefer the night - which is why you usually see them when you turn on the light. Cockroach bodies have adapted to squeezing into tiny crevices and cracks which means that even the smallest hole can allow a cockroach entry to your building or property. Cockroach lifecycle All

cockroaches go through three stages of development – cockroach egg , nymph and adult. Eggs are hatched in casings called oothecae, where they develop and are protected from their environment. Once they hatch, they become nymphs and as nymphs, they grow in stages called molts until they become adults. Cockroaches reproduce fast - when you see one, you will want to call in a professional as soon as possible. If you are seeing cockroaches out in the open, then there are probably a lot more infesting your property hidden from sight. What do cockroaches eat? Cockroach diseases Cockroaches do not spend time cleaning up after themselves and they never wash their hands. Things like disease and bacteria that can make people sick. Cockroaches love to infest garbage, decaying matter like food or even rotting flesh. They are also known to travel in sewers and other areas where they might encounter waste materials. A cockroach infestation can result in illnesses such as food poisoning. The question that sometimes gets asked, when you have an insect that seems so willing to take a bite out of everything, is do cockroaches bite people? Labrum - this is the exterior part of the mouth that clasps the food and guides it into the part that does all of the real hard work. Mandibles - these are the real jaws. They chew up and grind the food for digestion. Maxillae - the secondary part of the jaws. They are usually lined with small teeth and are also used to grind and chew the food, but can also act like little hands to hold onto it. Labium - this is what closes up the mouth area so the food gets where it needs to go. Asthma and allergies For nearly 50 years now, experts have known that cockroaches are a major cause of asthma and allergies. The concern comes from their droppings, the skins that they shed and from the saliva they use to digest food. Cockroach skins and saliva release airborne particles that people can have an allergic reaction to especially those who have asthma. In urban areas, one of the major causes of asthma and allergies comes from the presence of cockroaches. Best way to get rid of cockroaches If you think you have a cockroach problem in your home or building, then call us at or use our online contact form. Western Exterminator roach control and roach removal experts know how to find where the pests are getting into your home. We use environmentally sound pest control methods that focus on finding solutions that work and reduce the need for constant chemical treatments.