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| Lect. No. |  4 |
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| Order Dictyoptera , Blattaria , Blattodea 1**Common** **name**: **cockroach**  |  |

  

Identifying characteristics for the order Blattaria include:

* Body usually flattened and oval.
* Head somewhat concealed from above by the pronotum.
* Antennae long, filiform.
* Legs long and slender, often spiny, adapted for running; tarsi 5 segmented.

**Classification of the Blattaria**

* Family Cryptoceridae -- brown-hooded cockroach.

 The one species in the United States does not occur in Florida.

* Family Blattidae -- oriental, American, and other cockroaches
* Family Polyphagidae -- sand cockroaches and others
* Family Blattellidae -- German, brown-banded, and wood cockroaches
* Family Blaberidae -- Surinam cockroach and others

**Family: Blattidae**

***Species characteristics***

**Oriental Cockroach** *(Blatta orientalis)*

Adult, 20-24mm long; colour, dark-brown, nearly black; wings of male cover two-thirds of abdomen, wings of female are vestigial; can climb rough but not smooth vertical surfaces.

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**German cockroach ( :** Steamfly) *(Blattella germanica)*

Adult, 10-15mm long; colour, yellowish-brown with two longitudinal dark marks on pronotum;

wings well-developed in both sexes; can readily climb rough and polished vertical surfaces.

The German cockroach is particularly successful for the following reasons :

1. a large number of eggs per capsule;

2. the female protects the egg capsule, by carrying it until just before hatching;

3. short development period to hatching and maturity;

4. small size, therefore readily conceals itself.

***Other species***

**American cockroach** *(Periplaneta americana)*

Adult,28-44mm long; colour, red-brown with yellow border around pronotum; no yellow sub

marginal stripes on forewings; last segment of cerci, twice as long as wide.

**Ausrallian cockroach** *(Periplaneta australasiae)*

Adult, 30-35mm long; colour, light brown with ivory-yellow circular band enclosing large,

distinct, bilobed black spot; yellow sub marginal stripe at base of forewings.

*Nymphs*

The nymphs of all species are similar in appearance to the adult but smaller. Immediately

after hatching or moulting the nymphs are white, but the cuticle soon darkens to the normal

colour.

**common name: American cockroach
scientific name: *Periplaneta americana* (Linnaeus) (Insecta: Blattodea: Blattidae)**

**Introduction**

The American cockroach, *Periplaneta americana* (Linnaeus), is the largest of the common peridomestic cockroaches measuring on average 4 cm in length. It occurs in buildings throughout Florida especially in commercial buildings. In the northern United States the cockroach is mainly found in steam heat tunnels or large institutional buildings. The

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 American cockroach is second only to the German cockroach in abundance.

**Distribution**

Forty-seven species are included in the genus *Periplaneta*, none of which are endemic to the U.S.). The American cockroach, *P. americana*, was introduced to the United States from Africa as early as 1625 The American cockroach has spread throughout the world by commerce. The cockroach is often found residing indoors as well as outdoors. It is found mainly in basements, sewers, steam tunnels, and drainage systems . This cockroach is readily found in commercial and large buildings such as restaurants, grocery stores, bakeries, and where food is prepared and stored. The American cockroach is rarely found in houses, however after heavy rain infestations of the cockroach can occur in homes. They can develop to enormous numbers, greater than 5,000 sometimes being found in individual sewer manholes .

American cockroaches are found in moist shady areas outdoors, in yards, hollow trees, wood piles, and mulch. They are occasionally found under roof shingles and in attics. The cockroaches dwell outside but will wander indoors for food and water or during extremes in weather conditions. In Florida, areas such as trees, woodpiles, garbage facilities, and accumulations of organic debris around homes provide adequate food, water, and harborages for peridomestic cockroaches such as the American cockroach . Mass migrations of the American cockroaches are common. They migrate by crawling or flying into structures often entering houses and apartments from sewers via the plumbing, by trees and shrubs located alongside buildings or trees with branches overhanging roofs facilitate the entry of cockroaches into the home. During the day the American cockroach, which responds negatively to light, rests in harborages close to water pipes, sinks, baths, and toilets, for example, where the microclimate is suitable for survival .

**Description**

**Egg:** Females of the American cockroach lay their eggs in a hardened, purseshaped egg case called an ootheca. About one week after mating the female produce an ootheca and at the peak of her reproductive period, she may form about two ootheca per week. The females on average produce an egg case about once a month for ten months laying 16 eggs per egg case. The female deposits the ootheca near a source of food by either simply dropping it or gluing it to a surface with a secretion from her

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mouth. The deposited ootheca contains water sufficient for the eggs to develop without receiving additional water from the substrate . The egg case is brown when deposited and turns black in a day or two. A typical egg case contains about 14 to 16 eggs. It is about 8 mm long and 5 mm high.

**Nymph:** The nymphal stage begins when the egg hatches and ends with the emergence of the adult. The number of times an American cockroach molts varies from six to 14 . The first instar American cockroach is white immediately after hatching then becomes a grayish brown. After molting instars of the cockroach nymphs are white and then become a uniformly reddish-brown with the posterior margins of the thoracic and abdominal segments being a darker color. Wings are not present in the nymphal stages and wig pads become noticeable in the third or fourth instar. Complete development from egg to adult is about 600 days. The nymphs as well as the adults actively forage for food and water.

**Adult:** The adult American cockroach is reddish brown in appearance with a pale-brown or yellow band around the edge of the pronotum. The males are longer than the females because their wings extend 4 to 8 mm beyond the tip of the abdomen. Males and females have a pair of slender, jointed cerci at the tip of the abdomen. The male cockroaches have cerci with 18 to 19 segments while the female has 13 to 14 segments. The male American cockroaches have a pair of styli between the cerci while the females do not.

**Life Cycle**

The American cockroach has three life stages: the egg, a variable number of nymphal instars, and adult. The life cycle from egg to adult averages about 600 days while the adult life span may be another 400 days. The immatures emerge from the egg case in about six to eight weeks and mature in about six to twelve months. Adults can live up to one year and an adult female will produce an average of 150 young in her lifetime. Environmental factors such as temperature and humidity can increase or decrease the developmental time of the American cockroach. Outdoors the female shows a preference for moist, concealed ovipositon sites .

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**Diet**

The American cockroach is an omnivorous and opportunistic feeder. It consumes decaying organic matter but since the cockroach is a scavenger it will eat most anything. It prefers sweets and has been observed eating paper, boots, hair, bread, fruit, book bindings, fish, peanuts, old rice, putrid sake, the soft part on the inside of animal hides, cloth and dead insects .

**Medical and Economic Significance**

**Transsmiston some desease**

American cockroaches can become a public health problem due to their association with human waste and disease, and their ability to move from sewers into homes and commercial establishments.. The cockroach is found in caves, mines, privies, latrines, cesspools, sewers, sewerage treatment plants, and dumps Their presence in these habitats is of epidemiological significance.

\* At least 22 species of pathogenic human bacteria( Such as ***Salmoella , Shegella , E. coli* ) ;**

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 virus, ( fungi,  ***Aspergillus*** )

 and protozoans, as well as five species of helminthic worms, have been isolated from field collected American cockroaches ;

Cockroaches are also aesthetically displeasing because they can soil items with their excrement and regurgitation. So that able to transsmiton of cyst of**, *Entamoeba histolytica*** and ***Balantidium coli*** which caused dysentery and diarrhea.

**Repulsive Odor.** Most cockroaches produce a secretion or chemical that has a repulsive odor. This characteristic odor can be detected in infested areas.
**Allergy.** Roaches can cause allergic reactions in some people. The response is caused by roach "allergen" that is ingested with contaminated food or inhaled when dried fecal particles and fragments of ground-up bodies of dead roaches are mixed with house dust.
**Anxiety.** The sight of cockroaches can cause considerable psychological or emotional distress in some individuals. Cockroaches usually do not bite, but their heavy leg spines may scratch.
Cockroaches can eat almost anything, but they are especially partial to starchy foods and meat products. They feed on such diverse items as cereals, pastries, chocolate, milk products, beverages, cooked potatoes, glue, book bindings, wall paper, animal food, fresh or dried blood, excrement, dead animals and leather products.

**Prevention**
1. Good housekeeping is the most important factor in preventing and controlling cockroach populations.

2. Cockroaches cannot live without food, water and shelter.
Do not allow food particles to remain on shelves or floors.

3. Dishes should not be left unwashed after a meal, particularly overnight.

4. Clean areas under refrigerators, stoves, sinks and furniture regularly to remove bits of food that have accumulated. If pets are fed indoors, do not leave food in their dishes after feeding, especially overnight.

5. Store pet food in tight containers, and clean litter boxes frequently.
6. Keep all food items covered or in a refrigerator at all times between uses. Empty garbage and waste containers frequently and keep refuse in a covered container away from the residence.
7.If possible, prevent cockroach access to water sources.

8. Common sources include leaking faucets and pipes, drains, toilet tanks, wash basins and sink traps, aquaria and water-filled tubs.

9. Pets' water dishes, beverage bottles or cartons, and pipe condensation can provide an adequate water

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**Management**

Several hymenopteran natural enemies of the American cockroach have been found. These parasitic wasps deposit their eggs in the cockroach ootheca preventing the emergence of cockroach nymphs.

 Caulking of penetrations through ground level walls, removal of rotting leaves, and limiting the moist areas in and around a structure can help in reducing areas that are attractive to these cockroaches.

Other means of management are insecticides that can be applied to basement walls, wood scraps, and other infested locations. Residual sprays can be applied inside and around the perimeter of an infested structure. When insecticides and sprays are used to manage cockroach populations they may ultimately kill off the parasitic wasps. Loose, toxic, pellet baits are extremely effective in controlling America cockroach populations.

 **Insecticides**

Apply chemicals at roach hiding places. Enter a dark room quietly, turn on the light and watch where the roaches run. Spot treat these hiding places and known pathways, especially under and behind loose baseboards or molding strips and around pipes or conduits along the walls and through it. Do not treat entire floors, walls, or ceilings. Surfaces where food is prepared should not be treated. Buildings with multiple dwellings usually require the treatment of each unit.

There are numerous cockroach insecticide formulations.

Dusts such as bendiocarb (Ficam D), boric acid powder, pyrethrins (Drione) or silica aerogel (Dri-Die) can be applied with a puff duster into hiding places normally hard to reach with a spray.

Sprays, either oil-based or water emulsion, are applied as spot or crack and crevice treatments. These include propoxur, acephate, chlorpyrifos, diazinon, permethrin or resmethrin. Only the licensed certified pest control applicator may apply bendioarb, propetamphos, trichlorfon, cyfluthrin, cypermethrin, deltamethrin, esfenvalerate, lambda-cyhalothrin, tralomethrin and bifenthrin.

Some of **Insecticides** of cockroch used in Iraq :-

* 1. Perpel ( Permethrin 2. Sniper 3.Terminator
		1. Demon 5.

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**Baits**

 Certain segments of the public such as schools, hospitals, and office buildings may prefer baits to sprays. Baits include pastes, gels, particle baits and bait stations.

* Bait advantages include: low hazard (toxicity) to people; suited for sensitive accounts; IPM oriented; offer effective control. Disadvantages include: high bait cost; precise placement required; not cost effective in heavy roach infestations.

Such as Maxforce

* Sticky traps have openings at both ends with the inside surface covered with a very sticky adhesive and slow-release food attractant. Properly placed traps, to and from roach hiding and feeding areas, can catch numerous adults and nymphs daily, especially brownbanded and German cockroaches. Traps are best used along with preventive and insecticidal applications to monitor populations. Trapping can determine haborage areas and infestation severity, monitor effectiveness of pesticide applications, and detect any roach population increases which may require additional pesticide treatments.

* Fumigation is seldom used but will clean out a cockroach infestation. It must be applied only by a licensed, certified pesticide applicator.

**Life cycle of *Entamoeba histolytica* 9**

