

Fauna regarded as pests in the Maltese islands -1

The Cockroaches

By Arnold Sciberras

Many people hate insects. Although this is a very wrong way to see the creatures that $\frac{3}{4}$ of the earth ecosystem thrives on, that's just the way it is and only education may one day eradicate most phobias and superstitious beliefs. Sure that this is that the most hated of them all are the cockroaches.

This order of amazing insects scientifically known as Blattaria consists of around 4,000 species world wide, of which 30 species are associated with human habitations and about 4 species are well known as pests.

Although world wide these insects have a bad reputation, many cockroaches live in warm, tropical areas and feed on decaying wood and leaves. They help break down this organic debris; in the process, they add nutrients to the soil through their waste. They're also a food source for small reptiles and mammals. In other words, cockroaches are an important part of many ecosystems. Whether they're digesting wood pulp in a rainforest or hiding under a refrigerator, cockroaches are fascinating. They're primitive insects, they existed millions of years before dinosaurs did and have evolved very little since then. In spite of their unchanging nature, they've survived when other species have not. For example, dinosaurs became extinct 65 million years ago, but cockroaches have thrived for 320 million years.

In fact, in many parts of the world, just one or two species are responsible for most infestations. Unfortunately, people take much of the blame for this worldwide prevalence. Most cockroach pests have spread across the planet by hitchhiking on boats, airplanes, trucks and even in moving boxes and grocery bags. Cockroaches live in a wide range of environments around the world. Pest species of cockroaches adapt readily to a variety of environments, but prefer warm conditions found within buildings. Many tropical species prefer even warmer environments and do not fare well in the average household.

Cockroaches have a broad, flattened body and a relatively small head. They are generalized insects, with few special adaptations, and may be one of the most primitive living insects. The mouthparts are on the underside of the head and include generalised chewing mandibles. They have large compound eyes, two ocelli, and long, flexible, antennae. The first pair of wings are tough and protective, lying as a shield on top of the membranous hind wings. All four wings have branching longitudinal veins, and multiple cross-veins. The legs are sturdy, with large coxae (parts of the leg) and five claws each. The abdomen has ten segments and several cerci. The spines on the legs were earlier considered to be sensory, but observations of their locomotion on

sand and wire meshes have demonstrated that they help in locomotion on difficult terrain. The structures have been used as inspiration for robotic legs. Cockroaches leave chemical trails in their feces as well as emitting airborne pheromones for swarming and mating. Other cockroaches will follow these trails to discover sources of food and water, and also discover where other cockroaches are hiding. Thus, cockroaches can exhibit emergent behavior in which group or swarm behavior emerges from a simple set of individual interactions.

Female cockroaches are sometimes seen carrying egg cases on the end of their abdomen; the egg case of most cockroach species holds about 30 to 40 long, thin eggs, packed like frankfurters in the case called an ootheca. The eggs hatch from the combined pressure of the hatchlings gulping air and are initially bright white nymphs (young) that continue inflating themselves with air, becoming harder and darker within about four hours. Their transient white stage while hatching and later while molting (shedding their outer skin) has led to many claims of glimpses of an albino cockroach. Locally it is believed that the “white roach” is a separate super species that lives only underground and commands other cockroach species to do the jobs for them. An example is getting them food and cleaning them. We also have a tendency to distinguish all cockroach nymphs and smaller species by referring to them as ‘Kokroc’ while the large ones and adult with wings as ‘Wirdiena’

Now let’s take a look at our household occupiers! Locally 7 species are known to share the Maltese islands with us. These are The American Cockroach (*Periplaneta americana*) Wirdiena Hamra, German Cockroach (*Blattella germanica*) Kokroc tal-Faxx, The Oriental Cockroach (*Blatta orientalis*), Wirdiena tad-Djar, The Brown-banded Cockroach (*Supella longipalpa*) Kokroc Isfar, The Egyptian Cockroach (polyphaga aegyptiaca) Wirdiena Sewda, The Field Cockroach (*loboptera decipiens*) Wirdiena ta’l-Ghelieqi and The Wood Cockroach (*Ectobius kraussianus*) Wirdiena tal-Buskett.



The latter two are never met in household as one is restricted to one locality and the other is restricted to garuige habitat. The Oriental, Brown-banded and Egyptian roaches are rarely met

with as they prefer human disturbed areas but away from them. The latter might be attracted to a very dusty area such as an abundant garage but it is harmless and females are easily consumed with very large woodlice and males are confused with moths. Other species are also locally being studied by the author.



On the other hand the American and German cockroaches can be very loyal to our houses especially our kitchens and these are the ones that should be treated as pests

American cockroach adults grow to an average length of around 4 centimeters and about 7 millimeters high They are reddish brown and have a yellowish margin on the body region behind the head. Immature cockroaches resemble adults except that they are wingless. These insects can travel quickly, often darting out of sight when someone enters a room, and can fit into small cracks and under doors despite its fairly large size. It is considered one of the fastest running insects. In an experiment carried out in 1991, a this species has registered a record speed of 5.4 kilometers per hour , about 50 body lengths per second, which would be comparable to a human running at 330 km an hour. It has a pair of large eyes each having over 2000 individual lenses thus making it a very active night animal that shuns light.

This species generally lives in moist areas, but can survive in dry areas if they have access to water. They prefer warm temperatures around 28-32 degrees and do not tolerate cold very cold

temperatures. In residential areas, these cockroaches live in kitchens, basements and sewers, and may move outdoors during warm weather. They have been known to fly during mating season. To aid its resistance the latter is also scavenger that feeds on decaying organic matter and a variety of other foods. It is particularly fond of fermenting foods. Females produce egg cases and carry them protruding from the tip of the abdomen for about two days. Egg cases are then generally placed on a surface in a hidden location. Egg cases are about 0.9 centimeters long, brown, and purse shaped. Immature cockroaches emerge from egg cases in 6 to 8 weeks and require 6 to 12 months to mature. Adult cockroaches can live up to one year, during which females produce an average of 150 young. Despite its name this species originated from Africa and was spread through human agency.

The German cockroach is a small species , measuring about 1.3 centimeters to 1.6 centimeters long; however, they are known to get bigger. It can be tan through brown to almost black, and has two dark parallel streaks running from the head to the base of the wings. Although it has wings, it is unable to sustain flight. This insect is one of the most common and prominent household cockroaches in the world, and can be found throughout many human settlements. These insects are particularly fond of inhabiting restaurants, food processing facilities, hotels, and nursing homes. In colder climates, they are found only near human habitats, since they are not very tolerant to cold. The German cockroach is originally from Asia, it is very closely related to the Asian Cockroach (*Blattella asahinai*), (not found locally) and to the casual observer they appear nearly identical and may be mistaken for the other. This cockroach can be seen in the day occasionally, especially if there is a large population or if they have been disturbed. However, sightings are most commonly reported in the evening hours as they are most active at night.

A female of this species carries an egg capsule containing around 40 eggs. She drops the capsule prior to hatching, though live births do rarely occur. Development from eggs to adults takes 3 to 4 months. Cockroaches live up to a year. The female may produce up to eight egg cases in a lifetime; in favorable conditions, it can produce 300 to 400 offspring. Other species of cockroach, however, can produce an extremely high number of eggs in a lifetime, but in some cases female needs to be impregnated only once to be able to lay eggs for the rest of her life.

Cockroaches are among the hardiest insects on the planet. Some species are capable of remaining active for a month without food and are able to survive on limited resources like the glue from the back of postage stamps. Some can go without air for 45 minutes. In one experiment, cockroaches were able to recover from being submerged underwater for half an hour.

It is popularly suggested that cockroaches will inherit the earth if humanity destroys itself in a nuclear war. Cockroaches do indeed have a much higher radiation resistance than vertebrates, with the lethal dose perhaps 6 to 15 times that for humans. However, they are not exceptionally radiation-resistant compared to other insects, such as the Fruit Flies, family Drosophilidae

It is no wonder why the latter two are disliked by the majority of the human population. It is a known fact that the mentioned pest species carry also diseases which finally affect us. They can spread bacteria like *Salmonella* and *Shigella* from place to place. As they walk, they leave trails

of fecal matter, which they use to find their way around. On top of dirtying the location, these trails can cause stains and odors. The proteins in cockroach saliva and waste can also cause allergies and aggravate asthma.

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