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COCKROACHES and Their Control

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COCKROACHES AND THEIR CONTROL

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Cockroaches may become troublesome in any establishment. They are notoriously destructive and annoying in the kitchens and pantries of houses, restaurants, and hotels, and in stores, manufacturing plants, libraries, etc. It is not only the food and other possessions, such as bookbindings and fine fabrics, which they eat or disfigure that make them important enemies of man, but the pollution of foods over which they run may place them in the role of disease carriers. Of the large sums spent by owners of apartment houses, hotels, hospitals, and

FIGURE 1.—The American cockroach: *a*, View from above; *b*, from beneath. Enlarged one-third.

business establishments for pest-control services, a very large proportion is for cockroach suppression; and thousands of dollars are spent annually by the American public to fight roaches in the home. While cockroaches can be controlled without great difficulty by home owners, commercial exterminators are available in most cities for such work.

Kinds of Cockroaches

Five kinds of cockroaches are frequently found in American homes. The American cockroach (*Periplaneta americana* L.) (fig. 1) is the

largest; it is from $1\frac{1}{2}$ to 2 inches long when full-grown. It is light brown. All of the adults have long, powerful, reddish-brown wings.

FIGURE 2.—The Australian cockroach: a, Male with wings spread; b, female; c, nymph. All life size.

The Australian cockroach (*Periplaneta australasiae* F.) (fig. 2) resembles very closely the American cockroach, but is seldom more

FIGURE 3.—The oriental cockroach: a, Female; b, male; c, side view of female; d, half-grown specimen. All natural size.

than $1\frac{1}{4}$ inches long and is easily identified by a bright-yellow heavy line on the outer edge of the basal half of the wing.

The oriental cockroach (*Blatta orientalis* L.) (fig. 3), or "black beetle", is entirely black, or deep brownish black, attains a length of about $1\frac{1}{4}$ inches, is the most sluggish in its movements, and thrives best in very damp places. The female is almost wingless and cannot fly.

The German cockroach (*Blattella germanica* L.) (fig. 4), "croton bug", or "water bug", never more than five-eighths of an inch long, is one of our smallest roaches. It is light brown and is marked on the back between the head and wings with two dark parallel stripes. The wings are of a uniform light-brown color.

FIGURE 4.—The German cockroach: a, First stage; b, second stage; c, third stage; d, fourth stage; e, adult; f, female with egg case; g, egg case (enlarged); h, adult with wings spread. All natural size except g

The tropical cockroach (*Supella supellectilium* Serv.) (fig. 5), a more recent pest of cities in the Gulf coast region, is slightly smaller than the German cockroach, many females being only three-eighths of an inch long, whereas the males are about one-half inch long. The females have bodies much broader than the males and wings that are reddish brown; the wings of the males are much lighter. Both sexes are distinguished from the German cockroach by two cross bands of light yellow, one at the base of the wings and the other about one-sixteenth of an inch farther back.

FIGURE 5.—A tropical cockroach, *Supella supellectilium*: A, female; B, male. Three times natural size.

How Cockroaches Develop

Cockroaches lay their eggs in leathery capsules, which the mother roach carries for some days partly extruded from her body. She often glues these capsules finally to some object, but sometimes merely drops

them unattached about the places she frequents. The capsules of the croton bug (fig. 4, *g*) and of the tropical cockroach, which are hardly one-fourth of an inch long, often contain from 25 to 30 eggs. Roaches of all species are very small when hatched but so resemble the broad and flattened shape of the parent insect that they can be identified easily as cockroaches. It is only after they reach maturity that the wings are well developed (except in the adult female oriental roach, which has only short wing pads). Cockroaches develop rather slowly and are capable of subsisting under unfavorable food conditions for long periods. As a result, roaches in all stages of growth are usually present at the same time. The German roach may pass through two or three generations a year, but most roaches require about 1 year to become mature.

Habits

Cockroaches are nocturnal in habit. They hide during the day in sheltered, darkened places, where they congregate in large masses. In the home they usually hide near the sink and the drainboard, behind the kitchen cabinet, behind radiators, under the trim of doors and windows, etc. They forage at night, when all is still and dark. If disturbed, they run rapidly for shelter and disappear through cracks, through holes in wall plaster, down along water or steam pipes, and through similar openings. After dark, when they have come out to feed, enter the room suddenly, turn on the light, and watch them run for their hiding places. Knowledge of where they conceal themselves is usually the key to their control.

Roachy Odor

The offensive, sickening, or fetid odor associated with cockroaches is due largely to an oily liquid secreted by scent glands. This oil leaves the characteristic roachy odor wherever the insects are abundant. Food is ruined by it, and dishes over which cockroaches run may seem apparently clean yet give off the odor when warmed unless thoroughly washed in hot water and soap. The pellets of excrement, as well as the inklike liquid emitted by roaches from their mouths, contribute to the development of the nauseating odor.

Control

Cockroach elimination is not difficult if the sources of infestation can be controlled. In loosely constructed buildings or where a mild climate permits roaches to develop outdoors, houses are constantly being reinfested from outside by crawling and flying roaches. No control will keep a house free from roaches continuously if sources of reinfestation exist.

Prevention

One of the best ways to prevent roaches from becoming established in a home is to watch carefully all baskets or boxes of food supplies and laundry brought into the house. Roaches hide among packages and about clothing and are frequently carried from place to place. Kill these stray roaches with a fly swatter, or, if they are encountered unexpectedly and no weapon is at hand, crush them underfoot. Trade at roach-free stores.

Fumigation

For the immediate elimination of roaches in tight rooms there is nothing better than a thorough fumigation by a professional fumigator. Fumigations are expensive, however, and in congested areas, where reinfestation is apt to take place quickly, the expense is seldom warranted. In more loosely constructed buildings the fumigant usually escapes so fast that the eggs of roaches, protected in the egg capsules, are not killed, and a second fumigation about 3 or 4 weeks later may be necessary.

Crack Fillers

Crack fillers, such as putty, plastic wood, or plaster of paris, can be used effectively in closing many openings used by roaches as avenues of escape to hiding places. These cracks and openings can be located by watching the roaches run for concealment. Fill all cracks about water and steam pipes passing through floors, cracks leading to spaces behind baseboards, door and window trim, etc. This is particularly important if roaches are coming into the room from adjoining apartments, through wall spaces, along the plumbing, or beneath doors.

Sodium Fluoride Powder

Sodium fluoride powder is the best all-round cockroach remedy. It is poisonous to man if taken internally in sufficient amounts, and it should be kept out of food and away from children and pets, but if used carefully in roach control, no harm will follow. It may be applied with a small duster or bellows, or, better, with a modern electric power duster with an extension rod so shaped that the powder can be blown into the hiding places rather than about the room. It can be sprinkled by hand along the back of shelving, drainboards, etc., where roaches run most frequently, but dusting the hiding or congregating places affects more roaches at one time, and they die rapidly when the powder is blown directly upon them. However, when the powder is placed where the roaches run over it, it kills chiefly as a stomach poison. It sticks to their bodies, and in cleaning themselves after running over it they transfer the powder to their mouths and thus swallow it. As a stomach poison it is slow but sure. Sodium fluoride powder is the basis of most effective roach powders sold under various trade names. It remains effective indefinitely in dry situations but in very damp places it may cake over and become useless. Applying the powder in the evening is advised, and it is best not to clean it up for 2 or 3 days. The application should be repeated at intervals of a week or two until all roaches disappear. Usually one or two thorough treatments are sufficient.

Pyrethrum Powder

Pyrethrum powder, used in the same way as sodium fluoride, is excellent when thoroughly applied to the hiding places or to the roaches themselves. It quickly stupefies the roaches. They usually turn on their backs, and although they live for some time, they eventually die if thoroughly treated. The stupefied roaches should be swept up and destroyed several hours after treatment before those least affected can revive. Pyrethrum powder is a safe remedy and will not injure man or pets. Upon exposure to air it loses its effectiveness after some days, and only fresh, finely ground powder should be used. It can be most thoroughly applied by means of an electrically operated dusting machine.

Borax

Borax powder can be used in the same manner as sodium fluoride and pyrethrum powders. It is not poisonous and is not so effective, but when used in office rooms or elsewhere where there is little food for roaches, borax, either as a powder or made with inert materials into tablets, has usually given satisfactory results.

Phosphorus Pastes

Phosphorus pastes, obtainable at drug stores, are excellent for the control of roaches, particularly the larger species and the tropical roach. They are ideal when roaches are not numerous. If the paste is spread on a small piece of flexible cardboard, which is then rolled into a cylinder with the paste on the inside, and with the cylinder held firm with a rubber band or string, it can be inserted behind books, etc., without danger of soiling anything; or the cylinders or other containers can be tacked to the back of cabinet drawers, the interior framework or springs of upholstered furniture, or in other situations where they will not be seen. They are especially effective in very damp climates.

Sprays

Sprays consisting largely of kerosene oil and pyrethrum extract are excellent for killing roaches. They kill only by contact; hence the roaches must be hit and made wet by the spray. As roaches run rapidly, sprays are not so easily applied to isolated specimens. If possible, the liquid should be sprayed into the hiding places, where more of the roaches can be hit at one time. Much good can be done by applying sprays with a hand sprayer, but the liquid can be introduced into hiding places more effectively with a power sprayer.

Vaporizing Machines

There are on the market today various makes of machines, operated by electricity, which break up oil-pyrethrum preparations and some other sprays into a fine mist that can be made to fill a room. This mist is very irritating to roaches and causes them to run out of their hiding places into the open, where they die if a sufficient amount of the spray particles comes in contact with their bodies. By repeated applications roaches can be controlled by the spray from these machines in modern tight rooms. Vaporizers have a tendency to drive roaches into surrounding rooms; hence, before using them, all openings to the exterior should be closed so that the roaches cannot escape from the room under treatment. When loosely constructed rooms are infested, many roaches are in the surrounding wall spaces, and the irritating vapors penetrate these only sufficiently to annoy the roaches and drive many to parts of the building to which they normally would not spread, thus complicating the problem of control.