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COCKROACH CONTROL



CIRCULAR 72

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Cockroach Control

H. D. Tate and E. C. Klostermeyer

COCKROACHES are among the most annoying and objectionable of household pests. They are a menace to sanitation, and their filthy habits result in the destruction and pollution of food. Not only may they become numerous in homes, but also in restaurants, hotels, grocery stores, dairies and other places where food is prepared or stored. Since they are active mostly at night, large numbers may develop in a building before they are known to exist.

Cockroaches will eat almost any kind of food material. When more preferred articles of diet are lacking, they will attack such things as soap, the bindings of books, wallpaper, the glue in cartons and boxes, clothing and leather articles. They also eat the dead bodies of cockroaches and other insects. Cockroaches destroy more than they eat by fouling with excrement the material over which they run, and they leave food, dishes and other objects contacted by them with a disagreeable and characteristic roachy odor which can be detected readily by anyone familiar with the habits of these pests. In addition, they often spoil wallpaper, books and similar items with a brownish, foul-smelling liquid emitted from their mouths.

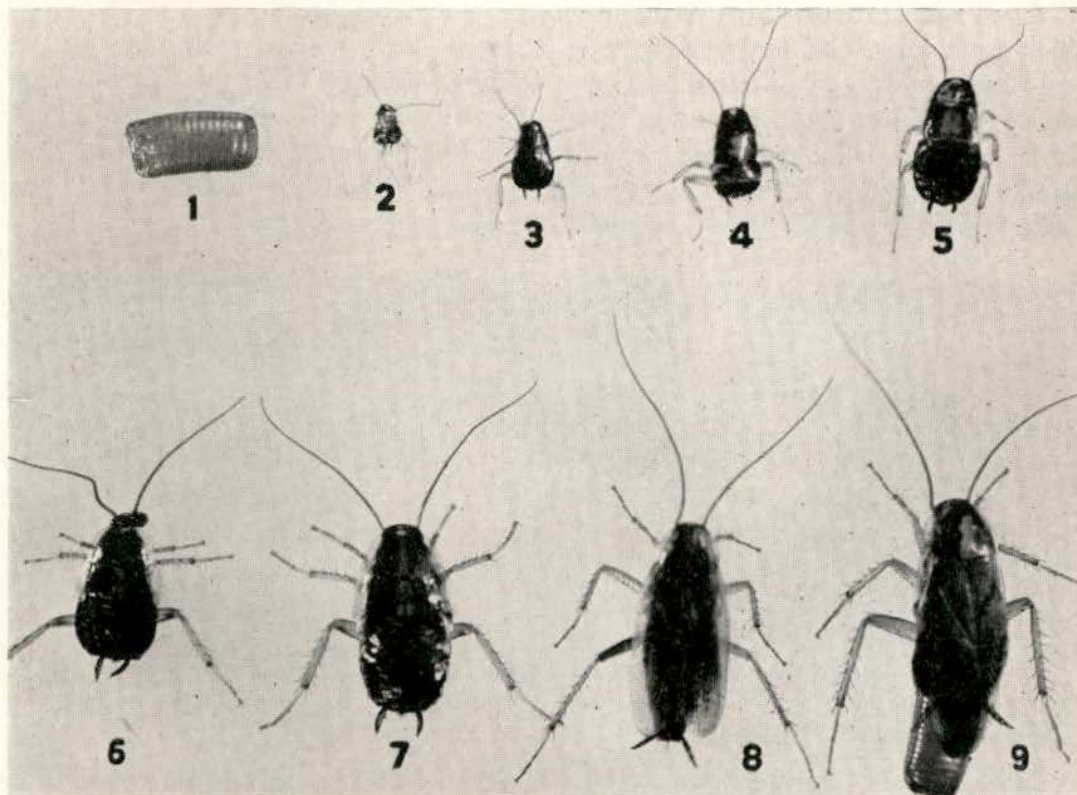


FIGURE 1. German cockroach. 1—egg case; 2 to 7 inclusive—immature stages; 8—male; 9—female.

Kinds of Cockroaches and Their Habits

Three species of cockroaches are commonly found in homes in Nebraska, and two others occasionally are numerous. The German cockroach (*Blattella germanica* L.) (fig. 1) probably is the most common species in Nebraska and it is the kind most frequently found in kitchens, pantries, beneath tables, behind door and window casings, and in similar places where food is present. Its small, flat body enables it to establish itself in the cracks and crevices frequently found in kitchen cupboards, on the underside of tables, behind door and window casings, sinks and baseboards. This roach is about five-eighths of an inch long and is light brown in color with two darker, parallel stripes between the head and wings. The eggs are laid in a capsule containing about 30 eggs (fig. 1), which is carried by the female roach until shortly before the eggs hatch. The young, or nymphs, which shed their skins six times, mature in from three to five months. Adults may live as long as six months and each female may produce more than 250 young during her lifetime. Consequently, a few roaches are sufficient to build up a large infestation within a short time.

The Oriental cockroach (*Blatta orientalis* L.) (fig. 2), though it enters the kitchen and other parts of the house in search of food, prefers to breed in damp, dark places, such as basements, sewers and garbage cans. Because of its preference for damp places and because it is frequently seen about basement drains, this species is often called the "water bug." During the summer months it may be found living out of doors, and hence may move from house to house, eventually infesting the whole community. The Oriental cockroach is about one and one-fourth inches long when full grown and is brownish black in color. The males have two pairs of short wings while the females are nearly wingless. Neither sex is capable of flying. This species develops slowly, requiring about a year to attain maturity, and the adults live for about three months. The eggs are deposited in hard, bean-shaped capsules, each usually containing 16 eggs which are dropped where the cockroaches run. Each female produces about ten such capsules in her lifetime.

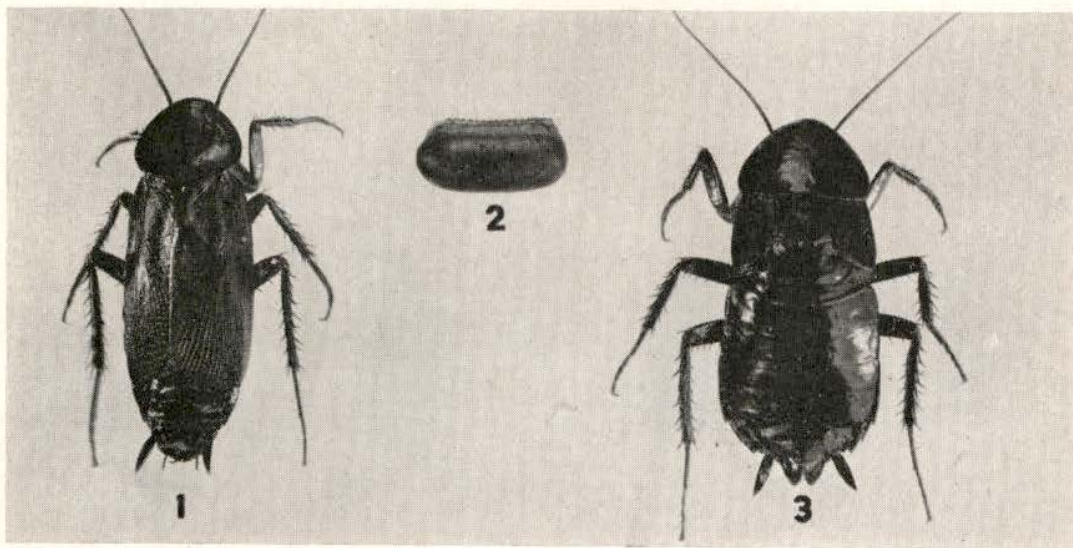


FIGURE 2. The Oriental cockroach or "water bug." 1—male; 2—egg case; 3—female.

The American cockroach (*Periplaneta americana* L.) (fig. 3) is occasionally found in houses, but more frequently infests warehouses, packing plants, boiler rooms of large buildings, manholes adjacent to buildings and similar places. It only rarely becomes established in kitchens, although it may become numerous in damp basements. The American cockroach is the largest of the house cockroaches, attaining a length of one and one-half to two inches when full grown. It is reddish brown in color with fully developed wings, and occasionally it flies. The eggs are deposited in capsules, each normally containing 16 eggs, the capsule usually being glued to woodwork and covered with debris. Approximately a year is required for this species to mature, and the adults may live for a year or more, each female producing about 60 egg capsules in this time.

The brown-banded cockroach (*Supella supellectilium* Serv.) (fig. 4) was first found in Nebraska in Lincoln in 1929, and a few infestations have since been found in Omaha, but it has not yet become as widely established in the state as the other species. Unlike other cockroaches, this species does not confine itself to kitchens or basements but spreads throughout the house, seeming to prefer high locations such as behind pictures and picture molding. It also commonly infests furniture, and the movement of infested furniture may be responsible for its rapid spread in the United States. It differs from the other cockroaches in that it flies readily when disturbed. The brown-banded cockroach is somewhat similar in appearance to the German cockroach, but is smaller, rarely exceeding one-half inch in length. The adults are dark brown

in color with the wings lighter brown and crossed by two pale stripes. The females are broader than the males and have shorter wings. The nymphs are dark brown and strikingly marked with two light cross-stripes. The eggs are deposited in capsules about one-fourth inch long, each normally containing 18 eggs. The nymphs mature in four to eight months and the adults live for six months, each female producing about 15 egg capsules during her life.

The Pennsylvania woods-roach or common woods cockroach (*Parcoblatta pennsylvanica* DeGeer) (fig. 5) normally lives under the bark of trees but may occasionally be brought into houses with firewood. It is doubtful whether this species ever becomes established in houses as do the other roaches. The adults are from three-fourths to one inch long with the front half of the body and wings margined with yellow. These roaches mature in about a year.

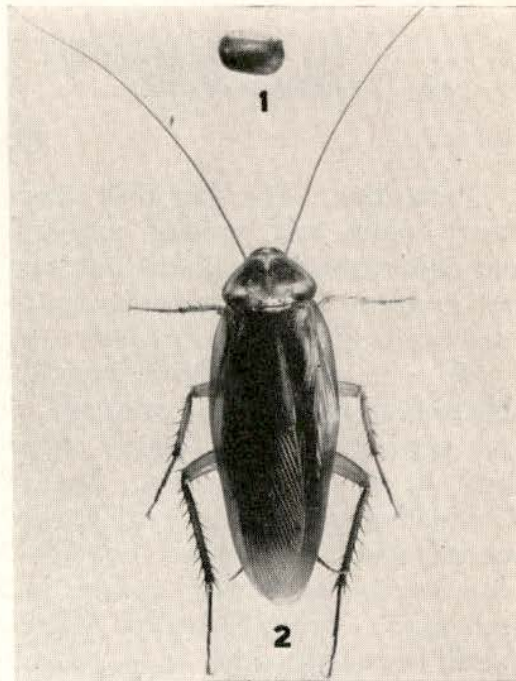


FIGURE 3. The American cockroach.
1—egg case; 2—adult.

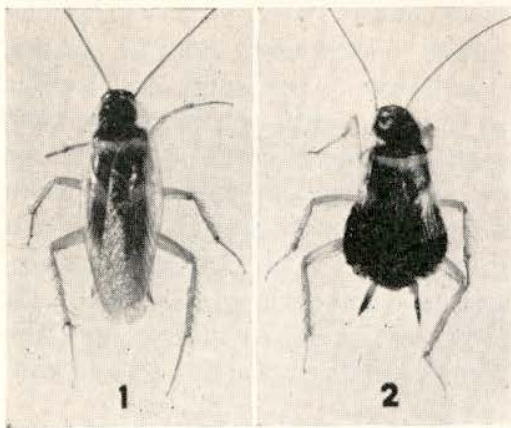


FIGURE 4. The brown-banded cockroach. 1—male; 2—female.

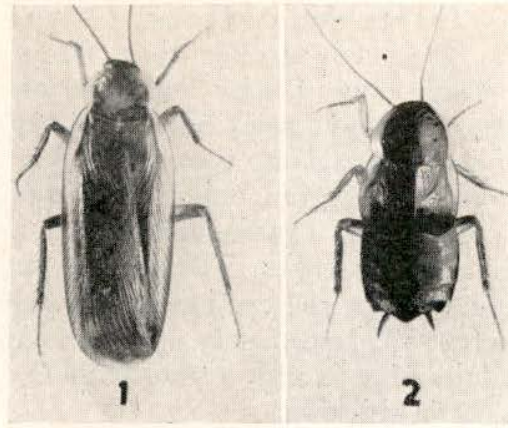


FIGURE 5. The woods-roach. 1—male; 2—female.

Control

Prevention. The fact that roaches are more or less permanent pests in many homes, and business establishments such as grocery stores, restaurants and dairies can be attributed, at least in part, to a failure to give the pest-control problem due consideration in the original plan of the building. Giving attention to this in construction would aid in preventing infestations.

To successfully establish themselves in buildings, roaches must have favorable hiding places and an adequate food supply. If these are available, vigorous and persistent control efforts through the use of insecticides may reduce them to a low population, but eradication is difficult if not impossible. Elimination of conditions which favor their development should receive first consideration in cockroach control. Cracks and crevices in floors, walls, behind baseboards, in door casings, in lighting and plumbing fixtures and other such places should be sealed. Kitchen furniture, cupboards and other objects should be constructed so as to reduce hiding places to a minimum. Food should be kept in tight containers, and garbage and waste food materials of all kinds removed daily to roach-proof cans.

Once a home or other establishment has been freed of cockroaches, care should be taken to prevent reinfestation. Frequently these pests are brought into homes with deliveries of groceries, laundry, and other supplies. Potatoes and other foods that are sacked up and allowed to stand in grocery stores for several days often become infested with roaches. Farm homes may become infested as a result of roaches concealed in empty poultry egg cases that have been returned from market. Since a single egg capsule or a single female is sufficient to start an infestation, supplies should be watched carefully while being unpacked and any roaches destroyed. Managers of restaurants and similar businesses may find it advantageous to employ a pest control operator to make regular treatments of infested premises. Such pest control services are available in the larger towns and cities.

Because of its summer migrating habits, the Oriental roach often infests an entire neighborhood with the result that its eradication in one home is only temporarily effective. Under such conditions, cooperative control effort on the part of neighboring families is desirable.

Dusts and Powders

Sodium fluoride. Probably the most effective means of eliminating a heavy infestation of cockroaches is by the use of insecticidal dusts. Of these, sodium fluoride is one of the most effective known at present, and when properly applied under favorable circumstances even the most persistent infestation can be eradicated. A majority of those dusted with the powder die within two or three days. Sodium fluoride usually can be secured from drug-stores or other establishments which sell insecticides. **Because of its poisonous nature, it should be plainly labeled as poison, and stored where it will not be confused with food or drugs.** In its natural state, sodium fluoride is a white powder, but the commercial product frequently is a greenish blue color, due to the addition of a coloring agent. If available, sodium fluoride that has been conspicuously colored should be secured.

Pyrethrum. Although sodium fluoride alone is effective, tests have shown that combining pyrethrum powder with it greatly increases the rate of action and the per cent of kill over that of sodium fluoride alone. The combination dust has an additional advantage in that the pyrethrum quickly irritates the roaches, causing them to move into the open, thus revealing their hiding places and also the extent of the infestation. A mixture of three parts sodium fluoride and one part pyrethrum by weight has been found to be about the most practical. Pyrethrum alone produces a comparatively low kill, but it has the advantage of being non-poisonous to man and domestic animals and if it is used frequently an infestation can be controlled.

Borax. If sodium fluoride is not available, or if its poisonous nature is considered an undue hazard, finely ground powdered borax may be used to advantage. Borax is non-poisonous to humans and domestic animals. It is comparatively slow in its action on roaches. In most cases death does not occur until a week or ten days after treatment. Ordinary powdered borax of the type sold for use as a water softener is too coarse for best results, but even this will give some control.

How to Apply Dusts

Cockroach dusts of all kinds can be effectively applied in the home by means of a simple, inexpensive type of hand dust gun. With it the dust can be blown into cracks and crevices concealing the roaches. Special attention should be given to the under-side of drawers, cracks in cupboard shelves, and behind baseboards, doorsills and sinks. Cockroaches frequently become numerous under loose shelf paper and wallpaper. All infested rooms should be treated at the same time, leaving no cracks undusted. When sodium fluoride is being used, care should be taken to prevent its getting into foods or dishes. As long as roaches are present, it is advisable to repeat the treatment every two or three weeks, or more frequently in the case of unusually heavy infestations. **Success in control can be obtained only through persistent effort.**

If no dust gun is available, fair control may be secured by scattering the powder by hand along baseboards, sinks, drains, and other places where roaches are observed to run at night. In the control of the Oriental and American roaches, particular attention should be given to basements. While running through the powder in their nightly wanderings, enough adheres to the bodies of the roaches to cause their death. Except in places where its presence is

especially objectionable, powder should be left out for two or three nights before cleaning up. Sodium fluoride should not be permitted to come in contact with bright metal trimmings or ornaments and glass surfaces, in such places as bathrooms or kitchen sinks, since these materials may be badly damaged if the powder becomes wet.

If only a few roaches are present, satisfactory results may be obtained by placing a small quantity of food materials, such as an over-ripe banana, on a newspaper on the floor at night, and then surrounding this with a light application of sodium fluoride powder. Roaches attracted by the food will become poisoned while moving through the dust. The paper and its contents can be gathered up and burned the following morning.

Other Control Measures

Phosphorus baits. Under some circumstances the use of phosphorus baits may be advisable, and commercial operators frequently employ this method to advantage, particularly when the larger species are present. In damp places or where the use of dusts would be objectionable, and for cleaning up small infestations, these baits may be used advantageously. It is essential that they be placed where readily available, since they do not seem to attract the insects from any distance. Because of the habits of the brown-banded roach, baits are commonly recommended for its control. Phosphorus baits, however, are relatively ineffective for the control of the German cockroach. Such baits are sold under various trade names at most drugstores and by other insecticide dealers, and consist usually of a sweetened paste containing a small percentage of yellow phosphorus. They are poisonous to human beings and should be kept out of the reach of pets and irresponsible persons. A good method of applying the bait is to spread the paste on pieces of thin cardboard which can be rolled into cylinders, with the bait on the inside, and tied with a string. It can then be placed on the floor where roaches are numerous or tacked to the inside of cupboards or other objects. It is important that all foods be removed so that the roaches will be more likely to feed on the poison. Control of an infestation by means of baits is likely to be slower than dusts, but by using them persistently an infestation can be eliminated.

Sprays. Ordinarily household fly sprays will kill cockroaches upon direct contact with them, but they are relatively ineffective for home use because of the difficulties involved in contacting the roaches with sprays and because of their short-lasting effect. Also, they may drive some roaches into other parts of the building, thus spreading the infestation. However, in grocery stores, dairies and similar places where house flies are also a problem, fly sprays may be used to advantage for cockroach control, especially when applied at frequent intervals by means of a power vaporizing machine. Such applications, combined with the sanitary measures recommended above, usually will keep the roach population below the nuisance level.

Fumigation. Although roach infestations in tight rooms can be quickly eliminated by thorough fumigation, this procedure is not considered practical except under very unusual conditions and then only when carried out by an experienced fumigator. The danger and inconvenience, combined with the fact that reinfestation may occur at any time, seldom will justify the expense.