

## Tick Infestation

Ticks cause injury to man by introducing their toothed hypostome into the skin to suck blood. The bite is painless, and the wound rarely requires medical attention if the tick withdraws its capitulum. It is best to anesthetize the tick with ether, to suffocate it with gasoline, oil, glycerin, or kerosene before removing it, or to apply a hot match (not burning) or a lighted cigarette to its posterior end. It will then withdraw. Forceps should be used or gloves worn, so that the fluids of the tick do not contaminate the skin (possible rickettsial or spirochetal infections). The site of the tick bite often continues to itch for several weeks, even though the capitulum was removed. Some persons experience recurrence of itching for a year or two.

If the tick is pulled out by force, the teeth of the hypostome which point

backwards anchor in the skin and the mouth parts may break off. Wounds with the decomposing capitulum in the tissue fester and require surgical treatment.

To prevent tick paralysis from having serious effects, early removal of the tick (*Dermacentor andersoni* or *D. variabilis*) is necessary. Since rickettsial infections are prevented if the tick is removed within the first two or three hours, frequent search of the body, particularly of the neck, for ticks is indicated for persons exposed in tick-infested areas. When a tick of a species known to carry human disease has been removed, it is advisable to observe the person for early manifestations of tick-borne diseases.

A good repellent is dimethylphthalate. It acts against the nymphs (less against the adults) of ticks. Clothes are immersed in a solution of 5 per cent dimethylphthalate and 2 per cent soap and dried. Impregnated clothes remain repellent for a month or two even though laundered.

The most effective clothing treatment to repel hard-bodied ticks (and fleas and chiggers) is benzene hexachloride (see p. 275). When impregnated into clothing at the rate of 2 Gm. of the gamma isomere (= 20 per cent of the technical grade) per 1,000 sq. cm., it retains its effectiveness over 20 launderings in hot soapy water. However, benzene hexachloride has a musty odor, and skin irritation may occur with such high dosage.

Ticks (*D. variabilis* and *Amblyomma americanum*) can be controlled with benzene hexachloride (see p. 275). A 1 per cent solution of technical benzene hexachloride (containing 10 per cent benzene hexachloride) in fuel oil is used as a field spray, 1 kg. per 4,000 sq. m. Against ticks on dogs a 5 per cent solution is sprayed, or the powder is dusted, into the hair. It is effective, although it is slow in knockdown and has only little residual action. Benzene hexachloride has a disagreeable odor and leaves a taste in exposed food.

Chlordane sprays (see p. 274) are effective against some species of ticks (e.g., *A. americanum*). For the control of ticks on dogs (*Rhipicephalus sanguineus*, *D. variabilis*), an emulsion concentrate containing 10 per cent piperonyl butoxide and 1 per cent pyrethrin is used. The dilution for spraying on dogs is 1:100, for kennels 1:10. The eyes should be protected during the application.

Soft-bodied ticks (*Ornithodoros*) are controlled by rodent-proofing of houses and DDT sprays which, however, act only on the larval stages.

## INSECT REPELLENT

Dimethylphthalate . . . . .	6 parts
Indalone (butyl mesityl oxi-oxalate) . . . . .	2 parts
Rutgers 612 (2-ethylhexanediol-1,3) . . . . .	2 parts

These are mixed mechanically. One-half teaspoonful is poured into the palm of the hand; the hands are rubbed together, and a thin layer is applied to face, neck, ears, hands, and wrists (but not into eyes or mouth). The application on the skin is effective for two to four hours. In addition to mites, it repels immature ticks, mosquitoes, gnats, and flies.

The application on garments is more lasting. It is sprayed or applied by hand and remains effective for a number of days.

The impregnation of clothes with dimethylphthalate lasts still longer. They are immersed in a solution of 5 per cent dimethylphthalate and 2 per cent soap and dried. Clothes remain repellent for a month or two even though laundered.

Chlordane sprays (see p. 274) are effective in the field control of chigger mites for a month or more. One kilogram is used per 4,000 sq. m.