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United States Department of Agriculture,

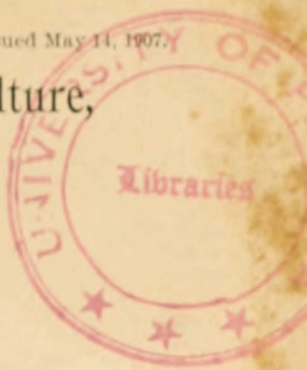
BUREAU OF ENTOMOLOGY,

L. O. HOWARD, Entomologist and Chief of Bureau.

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THE TERRAPIN SCALE.

(*Eulecanium nigrofasciatum* Pergande.)

By J. G. SANDERS, Assistant.

From every State east of the Mississippi River, and from Missouri, Arkansas, Louisiana, Texas, Minnesota, and the Province of Ontario, Canada, the terrapin scale has been reported and authentic specimens have been received by this Office. It is noteworthy that this species of scale, more conspicuously marked than any other of the genus, is the most generally injurious one. In consequence of its wide range of food plants, including both wild and cultivated trees, it must be considered a dangerous pest, which may be controlled but never eradicated.

This scale insect can be recognized and identified especially well in the hibernating winter stage (fig. 1), when it appears as a reddish hemispherical scale 2 mm. in length, mottled with radiating streaks of black which are especially conspicuous about the margin. Sometimes these radiating streaks coalesce, forming a subdorsal dark band surrounding the central reddish boss. Occasionally individuals are found which are entirely red or black.

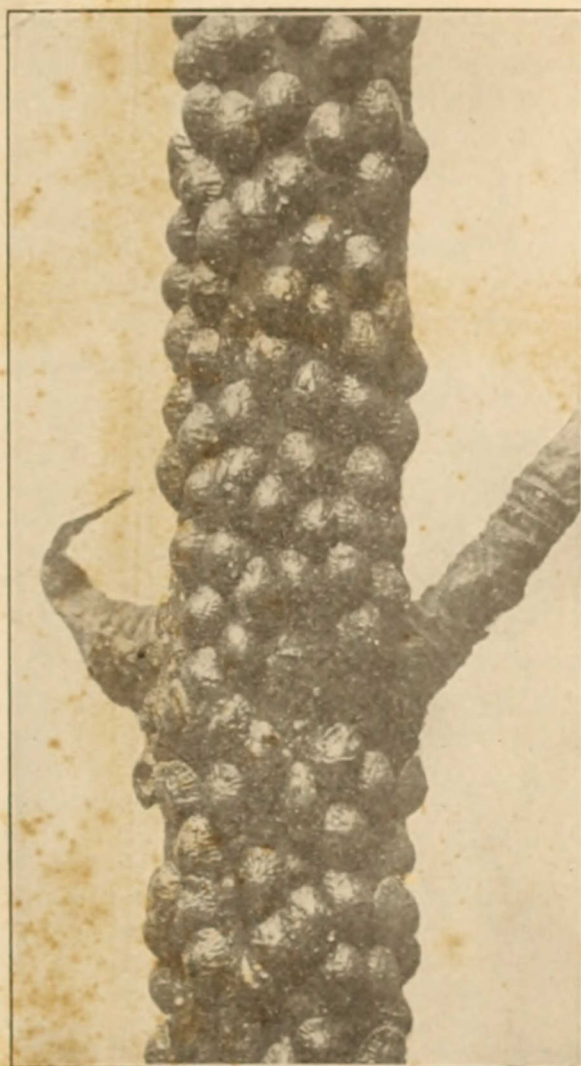


FIG. 1.—Terrapin scale (*Eulecanium nigrofasciatum*). Adult females on twig of peach. Enlarged about three times (original).

Although this species was not described until 1898,^a the describer, Mr. Theodore Pergande, of this Office, had known it since 1872, when it was found upon peach trees at Hillsboro, Mo.

FOOD PLANTS.

For many years the terrapin scale has been considered a specific enemy of the peach and has been confounded by many entomologists and others with *Eulecanium persicæ* (Fab.), the preeminent peach soft scale of Europe. At present we know it as infesting a large number of host plants, including many varieties of peach and cultivated plum; various species of wild plums and cherries; *Prunus simonii*; apple; pear; quince; several species of *Cratægus*; three species of maple, particularly *Acer saccharinum*; oriental and western sycamores; Carolina poplar; olive; blueberry (*Vaccinium* sp.); *Bumelia*, and spice bush (*Benzoin benzoin*).

DESCRIPTION.

The following technical description is inserted to facilitate the determination of this species by entomologists, or anyone who may have access to a compound microscope.

Adult female (fig. 2).—Nearly hemispherical, small, length 3 to 3.5 mm., exhibiting many of the superficial characters of the hibernating form described above, though showing a tendency to fade rapidly after oviposition until by the autumn she is plain dull yellow or terra-cotta color. Fresh unrubbed specimens are covered by a thin glassy secretion of wax which scales off readily. When cleared by boiling in a solution of potassium hydroxid, the derm is left quite colorless, excepting the brown chitinized anal lobes and a narrow chitinized area surrounding the lobes. Antennæ (fig. 3, *b*) composed of six segments; segment 3, which occasionally shows a pseudo-joint, is equal in length to 4, 5, and 6 together; next in order of length come segments 2 and 1 in order. The antennæ exhibit the ordinary chaetotaxy. Legs well developed; tibia slightly longer than tarsus, bearing a pair of long, knobbed tarsal digitules and a pair of long expanded unguinal digitules. There are irregular rows of

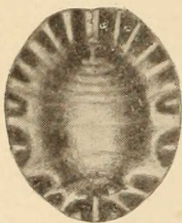


FIG. 2.—Terrapin scale (*Eulecanium nigrofasciatum*): Adult female. Enlarged (after Pergande).

many pores leading from the spiracles to the spiracular spines (fig. 3, *c*) on the margin of the body. The median spiracular spine of each group is robust and about 50 mm. long, three times the length of the two shorter spines; marginal spines (fig. 3, *d*) slender, about equidistant, except four, which are closely crowded at the anterior median point.

The distinguishing microscopical characteristic of this species is the irregular single or double mid-dorsal row of 25 to 40 low, subconical appendages (fig. 3, *e*), appearing like pores, extending from near the anal lobes to nearly above the sucking mouth-parts. These pores are usually quite evident in a mounted specimen and serve to separate this species surely from all others. The thick anal plates (fig. 3, *a*) are quite symmetrical, somewhat longer than broad, with the posterior lateral margin rounded and thickened. Each plate bears two minute apical and two subapical

^a Bul. 18, n. s., Div. Ent., U. S. Dept. Agric., pp. 26-29.

longer setae. There are four fringe setae, the inner pair about one-half the size of the outer pair.

Male.—The male of this species is a minute, delicate, two-winged insect which appears about August 1. The filmy, iridescent wings have an expanse of about 4 mm. The body is rose-red, with some dark markings and a heavy brown thoracic band.

This species should not be confounded with *Eulecanium prunastri* (Fonsc.), a small, very convex, dark-red, shining species, which has a group of many (200 to 300) pores with interspersed spines, extending from the anal lobes to near the anterior margin; the spiracular spines are nearly uniform in length, being scarcely longer than the marginal spines. The latter species was first recorded from the United States in November, 1894, when it was sent to this Office from Columbia, Pa., on plum twigs. Europe is its original home, whence it must have been exported to the United States on nursery stock or cuttings.

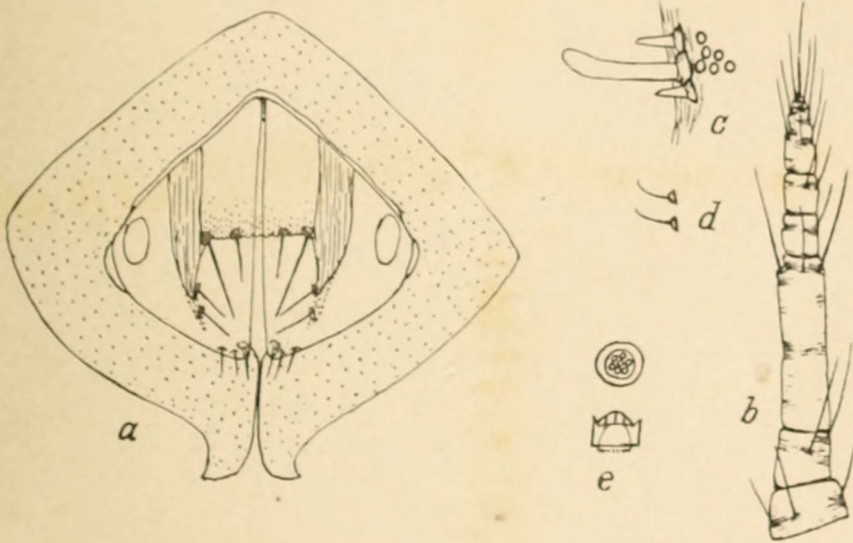


FIG. 3.—Terrapin scale (*Eulecanium nigrofasciatum*): a, Anal lobes and surrounding chitinous area; b, antenna; c, spiracular spines; d, marginal spines; e, conical, compound pore. All greatly enlarged (original).

PARASITES.

Very small, parasitic four-winged flies of the genus *Coccophagus*, family Chalcididae, are our greatest benefactors in the control of this scale insect.

REMEDIES.

Unfortunately the lime-sulphur wash, which is such an excellent remedy for the San Jose scale and which at the same time controls the peach leaf-curl, is worthless for treating the terrapin scale. Numerous experiments in the use of the lime-sulphur wash against this scale on various host plants have produced only negative results.

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Kerosene emulsion has proved to be the most effective remedy for the control of this pest. This emulsion, when properly made according to the formula below, can be sprayed with safety on any tree during the dormant period—in winter or early spring before the buds open—at a strength of 20 to 25 per cent. A nozzle throwing a fine spray should be used. Care should always be exercised to prevent the liquid from running down the trunk of the tree and collecting about the roots, as the oil, which will be retained by the soil around the roots for an indefinite period, might seriously injure or kill the tree.

KEROSENE EMULSION.

Stock solution (66 per cent oil).

Kerosene (coal-oil, lamp-oil)	gallons..	2
Whale-oil or laundry soap (or 1 quart soft soap)	pound..	$\frac{1}{2}$
Water	gallon..	1

Dissolve the soap in boiling water, *then remove from the fire*, add the kerosene immediately and thoroughly agitate the mixture until a creamy solution is obtained. This can be done by pouring the mixture into the tank of a spray-pump and pumping the liquid through the nozzle back into the tank. This is a stock solution which must be diluted before using. In order to make a 20 per cent emulsion, add to each gallon of the stock solution about $2\frac{1}{3}$ gallons of water and agitate thoroughly before using. For a 25 per cent solution add to each gallon of the stock solution $1\frac{2}{3}$ gallons of water and agitate thoroughly. This strength will kill a large percentage of the hibernating females, without injury to the trees.

If a good naphtha soap can be obtained the preparation of the emulsion will be simplified. It will be unnecessary to heat the solution, since the kerosene will combine readily with the naphtha and soap and form a perfect, cold, milky-white emulsion when the mixture is thoroughly agitated. If naphtha soap is used, double the amount called for by the formula, and emulsify in soft (rain) water.

Approved:

JAMES WILSON,

Secretary of Agriculture.

WASHINGTON, D. C., *April 3, 1907.*

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