

THE LECANIUM SCALE OUTBREAK IN VANCOUVER, B. C.

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Summary of the Outbreak

In the late summer of 1923 the attention of the Dominion Entomological Branch was directed by the Superintendent of Parks, for Vancouver, Mr. W. S. Rawlings, to important injury to maple trees in Stanley Park. The trees were very unsightly, the leaves being shrivelled and were dropping prematurely. Examination showed this condition to be due to a very severe attack of a scale insect.

Stanley Park is one of the finest natural parks in North America; its great charm lying in the luxurious growth of coniferous and deciduous trees, of which maples constitute a large part.

It was seen that immediate steps would be necessary if the charm of this mecca of tourists and residents alike, was to be saved.

In the spring of 1924 certain of the worst infested areas in the Park were sprayed with a proprietary oil emulsion as an experiment, with satisfactory results.

During the following summer the city authorities received numerous complaints from several parts of the city regarding the state of the shade trees along the boulevards. These complaints were caused by the copious sticky exudation from the maturing females which dropped on pedestrians and covered the sidewalks.

At the request of the city authorities the whole area was scouted in the fall of 1924, and it was found that practically the whole of the boulevard trees in the west end of the city, lining some twenty-five miles of roadways, were badly infested with the scale.

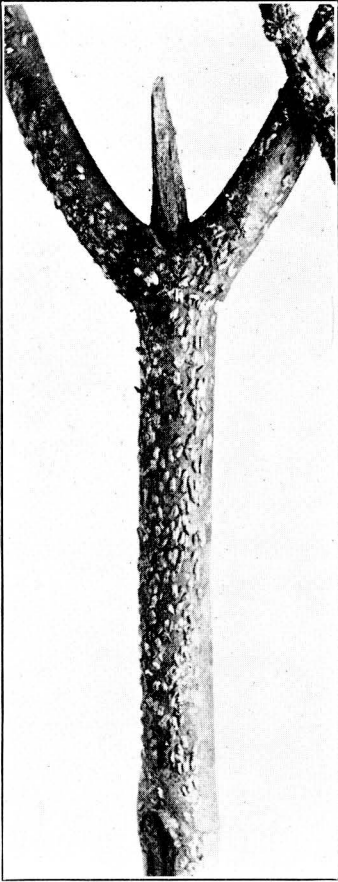
On the recommendation of the Dominion Entomological Branch, the city purchased a powerful solid stream spray machine, and in the fall of 1924 and spring of 1925 some 3000 boulevard trees along the streets of Vancouver, and about five miles of roadside trees in Stanley Park, were treated with an oil emulsion spray.

The result of this work was most satisfactory, and although the pest has not been exterminated, the situation was greatly relieved, and it will not be necessary to spray so large an area in 1926.

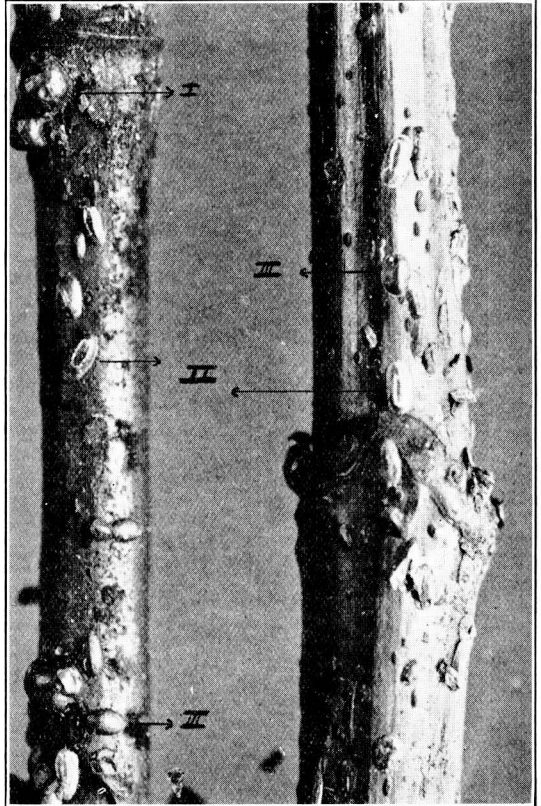
Appearance and Life History Notes

This insect passes the winter in an immature stage on the twigs and smaller branches of its host. In this wintering condition it is a small, flat, oval-shaped object, 1.5 mm. long by .75 mm. broad, and pale brown

LECANIUM CAPREA L.



A. Immature scales hibernating on Maple twig.
(Original)



B. Condition in March.

- I. Adult females of previous season (dead).
- II. Young male scales.
- III. Young female scales.

(Original)

in colour. The sexes at this time cannot be separated macroscopically. These young scales gradually increase in size during March, and early in April the male scales reach their full size and may be distinguished from the females by their greyish appearance.

The females remain brown and swell with great rapidity during April till they are the size of a pea. They are fully grown by the second week in May and are then greenish brown in colour.

The males emerge from their pseudo-pupal stage at this time and fly freely, mating with the sedentary females. These males are dark brown fragile insects, 1.5 mm. long in body, with an alar expanse of 4 mm. They are very much more numerous than the females, the proportion of the sexes being about 3 to 1.

After mating has taken place, the males die and the females turn chocolate brown, the eggs as they mature filling the whole of the body cavity under the scale. During June the maturing females secrete a copious sticky exudation and then die. This exudation ordinarily is the sole means of dispersal by causing the dead egg-filled body of the female to adhere to the feet of perching birds, which then carry them to other trees.

The eggs hatch during late June, July and August, and the young scales, pale brown in colour and measuring .3 by .5 mm., crawl freely to the underside of the leaves of their host, feeding there until the leaves begin to turn in September. They then migrate to the twigs, young branches, and tender places on the trunks, such as new cambium growth caused by an injury. They then ensconce themselves for the winter and, except in the case of the males when they fly, they do not again change their position during life.

Identity of the Species and Mode of Introduction

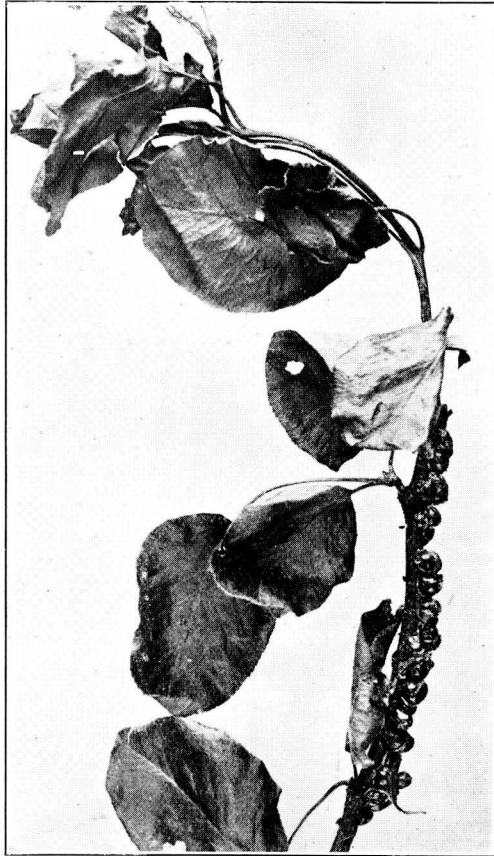
The species under discussion somewhat resembles *Pulvinaria innumerabilis*, for which it was at first mistaken, but it has not the cottony exudation of that species.

Specimens sent to the Dominion Entomologist, Ottawa, for determination were submitted by him to the Imperial Bureau of Entomology, and, through the kindness of the Director of the Bureau, were identified as *Lecanium capreae* L. by Mr. F. Laing.

Mr. G. F. Ferris has some notes and drawings of this species in the Canadian Entomologist for September, 1925, and which he states is now considered synonymous with *L. coryli* L.

We have no positive information as to the date or mode of introduction into British Columbia, but in 1903 a large shipment of shade trees arrived in Vancouver from England, and a scale, presumably the same,

LECANIUM CAPREAE L.



C. Adult females on pear.
(Original)



D. Winged male. 8X.
(Original)

was noticed on them a year or two later. By 1910 increased abundance led to efforts being made to stamp it out, and although a large number of trees were destroyed, the insect had by that time become firmly established on the native maples in Stanley Park and elsewhere.

Host Plants and Economic Importance

This species has a remarkable number and variety of hosts. It occurs most abundantly on horse-chestnut, broad-leaved maple (***Acer macrophyllum***) and vine maple (***Acer circinatum***).

It also freely infests common laurel (***Cerasus laurocerasus***), English hawthorn (***Crataegus oxyacantha***, and vars.), and rose bushes.

Other hosts of lesser importance are alder, elm, birch and the several species, of ***Pyrus***, ***Prunus***, ***Tilia***, ***Ribes*** and ***Rubus***, including the native salmonberry and thimble-berry, ***Rubus spectabilis*** and ***R. parviflorus***. It has been noted only sparsely on poplars and willows. It does not seem to attack conifers, rhododendrons, hollies, elders or acacias.

The chief injury caused in the present outbreak in Vancouver has been to the horse-chestnuts and maples on the boulevards, and to the vine maples in Stanley Park. These latter suffered severely in 1924, numerous dead limbs being seen as the result of the immense number of scales on the young branches.

In addition to the above there is the previously mentioned drip which caused so many complaints and so much enquiry.

Control Measures

This species of Lecanium is one more example of an insect, introduced into a new environment, unaccompanied by any parasites and their consequent controlling influence, becoming a greater pest in its new home than in its old one. In Europe, it is not a pest of major importance; but in Vancouver, in the two years that it has been under observation, no natural control forces whatever have been noticed. Artificial control measures therefore have had to be resorted to.

In the case of this insect, which infests such large trees as the broad-leaved maple, growing to a height of 90 to 100 feet, the first difficulty in control was adequate machinery to reach the tops of these trees, and a 25 h.p. solid stream spray pump, similar to those used for gipsy moth and elm beetle control in the eastern States, was obtained.

Two proprietary oil emulsions were used at 8, 10 and 12½ per cent. strengths, and both were effective at these dilutions. A small area was also sprayed with the emulsion at a 5% dilution, but only about a 40% kill was obtained. Well over 90% control was effected by the stronger emulsions.

The spray was applied in December and during February and March, up to the time that the buds were bursting. No difference was noticed in effectiveness between these two times of application. The end of March in an average year is practically the latest date when a dormant strength oil spray can be safely used.

Certain oil emulsions were used on the evergreen laurels without any injury resulting.

On the boulevard trees, an average of four to six gallons of spray was used per tree. The chief difficulty experienced with the solid stream nozzles, which were necessary to reach the taller trees, was in covering completely without undue waste or harmful amounts of oil running down the trunks.

Several acres of vine maples in Stanley Park which were sprayed both in 1924 and 1925 with oil show no damage from its use, and in fact have improved greatly in health since the scale was eliminated.

Experiments were conducted with a summer spray, using nicotine sulphate and whale oil soap at standard strength.

This was quite effective in killing the newly hatched scales, and should be applied during the first week in September. If applied earlier, some of the young scales will be missed, as all the eggs have not hatched before that date.

There is no doubt but that this pest is here to stay and will from time to time cause trouble.

It has not spread very rapidly, but at present is found in West Vancouver and North Vancouver, as well as in Vancouver itself, where Stanley Park and the west end of the city are generally infested. There are also isolated infestations in the suburbs at Kitsilano, Fairview and Grandview. These districts are within a two-mile radius of the original infestation.

Owing to the impossibility of private people possessing adequate spray machinery to cope with this pest, it will always be a municipal control project.

THE POPLAR SAWFLY (*Trichiocampus viminalis* (Fallén))

By W. DOWNES

During the month of August the Lombardy poplars in all parts of the city of Victoria, B. C., have in recent years been defoliated by numbers of small yellow and black caterpillars, which later on would descend the tree trunks and swarm over nearby fences and buildings. At first this insect was thought to be a new species, and was described as such by