

to one side of and below hers and endeavors to establish the mating clasp. (The structure of the female abdomen is shown diagrammatically in Figs. 4 and 5). If the female is receptive, the male completely everts the floor of the genital cavity thus exposing the armature of the pseudosternite to the fullest extent, fastens the cephalic hooks of the apparatus around the caudal margin of female sternite VIII and pulls downwards. The hooks fit each side of the egg-guide (Fig. 4 **e.g.**), depress the whole sternite VIII, open the genital chamber or bursa copulatrix (shown partly cut away in Fig. 5 **bur. cop.**) and enable the aedeagus to be inserted into the opening of the receptaculum seminis.

Egg-laying females of *Camnula pellucida* are almost invariably attended by from one to five or six fighting males, one of which establishes the mating clasp immediately after egg-laying is finished and before the female has time to close the egg-laying mechanism (Fig. 6). However, if a female is feeding or has just arrived on the egg bed preparatory to laying, she can close the ovipositor valves and sternite VIII so tightly that no amount of grappling with the pseudosternite hooks will enable the male to establish the mating clasp, although the whole apparatus may be exerted to the full and literally turned inside out. The muscles of this entire structure are apparently in a state of permanent tension and are extended spring-like only at mating time. As soon as the mating clasp is established they return to tension, thus holding the female genitalia in a firm grasp aided, in some species, by the cerci.

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## INSECTS ATTACKING FOREST PRODUCTS AND SHADE TREES IN WASHINGTON AND OREGON IN 1937

by R. L. Furniss

U. S. Department of Agriculture, Bureau of Entomology and Plant Quarantine.

In the course of a year many requests for information concerning the control of insects attacking forest products and shade trees are received at the Portland, Oregon, laboratory of the Division of Forest Insect Investigations. These requests furnish much valuable information relative to the more important pests in these two groups. In addition, records of unusual interest are occasionally obtained from this source. The following discussion summarizes the most noteworthy observations resulting from 91 requests for information concerning insects affecting shade trees and forest products that reached the Portland forest insect laboratory in 1937.

**Insects Attacking Forest Products**—Inquiries concerning the control of ants, particularly those infesting dwellings, were most numerous. The calls, 24 in all, came in every month except January, February, and December. Sixteen of these calls concerned carpenter ants, *Camponotus*. *Camponotus maculatus* subsp. *vicinus* Mayr var. was the only carpenter ant definitely identified, although it is probable that *C. laevigatus* (Smith) was also present. In no case was extensive damage noted. These ants prefer to construct their nests in openings between floors and walls; only occasionally do they mine extensively in building timbers. A survey is needed to determine how much dam-

age is done to buildings by carpenter ants in the Pacific Northwest.

Extensive tests are being made at La Grande, Wash., to determine the most effective of the many measures that have been suggested for control of carpenter ants. These tests are inconclusive at present, but they indicate that control of carpenter ants will not be easy under all the conditions that are encountered in infested buildings.

During the middle of September *Lasius niger* var. *sitkaensis* Pergande swarmed abundantly in several dwellings. In each case emergence of the winged forms occurred on warm days over a period of two or three weeks. Upon investigation of the infested dwellings it was found that this ant had constructed its chambers in very moist, rotten wood that had been thoroughly mined by the damp-wood termite *Zootermopsis angusticollis* (Hagen). Control of *Lasius* in these instances could best be effected by eliminating the rot and termites.

Next to ants in the number of requests concerning control, were termites. Thirteen calls were received, all but one of which concerned *Zootermopsis angusticollis*. This insect was observed chiefly in the foundations of houses and in wooden structures, where it was associated with rot in such a way that structural changes were necessary for control of both rot and termites. This relationship between termites and rot has been commonly observed in the Portland area, where the damp-wood termite has only occasionally been found extending its galleries into sound wood.

The subterranean termite *Reticulitermes hesperus* Banks has long been known to occur in the Pacific Northwest, but apparently it does considerably less damage here than it does farther south. For the first time in the past eight years a record of damage in Portland caused by this insect came to our attention. In this instance a small colony was found behind the baseboard in a room under which there was no basement. Little damage had been done.

Four cases of damage by *Lyctus* sp. were reported, two in furniture and two in oak flooring. Although the records of the Portland laboratory do not disclose this to be an important pest in Oregon, it is apparently becoming more abundant.

*Hadrobregmus gibbicollis* (Lec.) has been reported occasionally as attacking weathered Douglas fir timbers in buildings and bridges in California. The first record of this type of damage in the Pacific Northwest that has come to our attention was on July 30, when William W. Baker, of the laboratory of the Division of Truck Crop and Garden Insect Investigations at Puyallup, Wash., found a heavy infestation in an old, poorly constructed house in that city. An examination of the house on October 15 showed that the entire under portion was so badly infested that replacement of some of the supporting timbers was necessary. Dry, unrotted, Douglas fir wood was attacked. The beetles showed a marked preference for wide grained wood as compared with narrow-grained wood. Sapwood was more seriously affected than heartwood. The extensive damage to this house indicates that *H. gibbicollis* may become a pest of importance in the Pacific Northwest. William G. Mathers, of the Dominion En-

tomological Branch in Vancouver, B. C., has stated in conversation that several infestations of this anobiid have been reported in British Columbia. *H. gibbicollis* is not restricted to coniferous host material. Adults were found on August 6 attacking *Prunus emarginata* near Blaine, Oreg. In June, 1935 it was reared from limbwood of *Acer macrophyllum* that had been collected near Cathlamet, Wash. There are no records at the Portland laboratory of its occurrence on seasoned hardwood products.

*Opsimus quadrilineatus* Mann. normally breeds in suppressed branches of *Picea*, *Pseudotsuga*, *Tsuga*, and *Abies*. However, on March 11 this cerambycid was reported to be causing severe damage to a rustic house in the Mount Hood recreational area. Adults were reared from riddled Douglas fir wood taken from a window casing in this house. The owner stated that infestation extended throughout the building, which was built seven or eight years ago. So far as the workers at the Portland laboratory know, *O. quadrilineatus* had not previously been recorded as a pest of seasoned-wood products.

Inquiries are received year after year concerning the emergence holes of *Buprestis aurulenta* L. and *B. langii* Mann. in Douglas fir in buildings, particularly in flooring and siding. Although there are many authentic records of greatly retarded development of these buprestid borers in seasoned-wood products, it does not necessarily follow that all beetles emerging from buildings have been in them ever since they were erected. It is likely that in the Douglas fir region where these insects are native they may deposit eggs and rear broods in lumber after it has become part of a building. Early in July *B. langii* emerged in numbers from a large Douglas fir timber that had been in use for 11 years on the municipal docks in Vancouver, Wash..

*Polycaon stoutii* (Lec.) is a native of California and southern Oregon that frequently reaches the Northwest in shipments of furniture. The insect is most often found in the filler layer of plywood, where it may remain unnoticed for years. Four reports of damage to furniture by this bostrichid were received in 1937. In an instance reported from Hoquiam, Wash., February 27, an adult emerged through the top of a hardwood table that had been in use for 10 years.

*Callidium antennatum hesperum* Casey commonly infests ponderosa pine lumber on which considerable wane has been left. On May 17 adults of this cerambycid emerged from the walls of a log cabin in Lakeview, Oregon. The numerous larvae had been discovered from the sound of their boring and from piles of borings on the floor of the cabin.

*Prionus californicus* Motsch. prefers to feed in the roots of deciduous trees but also attacks conifers. In February several large larvae were taken from decaying bridge timbers of Douglas fir in Portland.

**Insects Attacking Shade Trees**—*Cryptorhynchus lapathi* (L.), the poplar and willow borer, has become thoroughly established on native willows near Portland and in many other localities in Oregon and in Washington. Our first record of *C. lapathi* in Oregon was in July 1933.

when J. A. Beal, then of the Portland laboratory, found it heavily infesting willows along the Willamette River. Several years earlier other entomologists had found it in Washington and British Columbia. In 1937 four home owners reported the insect on ornamental willows near Portland. Apparently it is gradually extending its range southward in the Willamette Valley.

Outbreaks of *Galerucella xanthomelaena* (Schr.), the elm leaf beetle, occur in Portland nearly every year. Infestation was exceptionally heavy in 1936, owing to a slackening of control effort the previous year, but was materially reduced in 1937 by an intensive spraying program conducted by the city park bureau.

In September mature grand firs on a country estate near Salem, Oregon, were noted to be heavily infested with *Adelges piceae* (Ratz.). The infestation on these trees is known to have existed since 1932 and is gradually weakening the firs. It causes deformation of the leaf buds and a thinning of the foliage, particularly on the lower branches.

Late in April *Adelges tsugae* Ann. was found to be killing the shaded lower branches of a western hemlock hedge in Portland.

Infestation by the satin moth, *Stilpnotia salicis* (L.), in Washington was light in 1937 in nearly all of the old centers. The introduced parasites *Meteorus versicolor* (Wesm.), *Apanteles solitarius* (Ratz.), and *Compsilura concinnata* (Meig.), are abundantly established and apparently are effectively controlling this pest. A native parasite, *Tachinomyia similis* (Will.), has successfully established itself upon *S. salicis*. Early in July, wilt was noted as a factor of importance in killing nearly full-grown satin moth larvae in Tacoma. Extensive scouting in the Rogue River drainage of southern Oregon failed to reveal the satin moth in that area. *Apanteles solitarius* was recovered in Oregon for the first time, when adults were reared in June from satin moth larvae collected near Gervais.

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## QUARANTINE REGULATIONS IN RELATION TO EXPORTS

by H. F. Olds

Plant Inspection Office, Entomological Branch,  
Canada Department of Agriculture, Vancouver, B. C.

To an agricultural country like Canada, where production exceeds its home consumption by about fifty percent, the value of her export markets cannot be over-estimated, and if we are to hold our present markets and gain new, every effort must be put forth to protect these markets by just as rigid an inspection of all our exports as we would make on imports.

During the past few years this export trade has been gradually increasing. Just to mention a few special lines of exports from British Columbia—during this past year approximately ten thousand rose bushes, twenty-four hundred rhododendron shrubs and over one million bulbous iris were exported. Our fresh fruit exports have also increased. British Columbia produced in apples over five and one-half million