

Insects Emerging from Prepared Timber in Buildings

By G. J. SPENCER

Several instances have come to my attention, in the last four years, of beetles emerging from floors and walls of wooden buildings in this Province. I am aware that mention of this type of emergence has been made in literature, but the only record I can locate in the scanty literature available to me, is in Graham's "Principles of Forest Entomology," in which he refers to beetles emerging from furniture twenty years after it was manufactured. Unfortunately, he is not specific as to the species of beetle and of the wood concerned, and he gives no references.

In the instances under consideration at the moment, beetles of the Family **Buprestidae** are chiefly concerned; one is of the family **Cerambycidae**. Of the life-history habits of the Buprestidae, Stebbing, in his "Indian Forest Insects," gives the fullest accounts I can find of several species of several genera. A typical life-history, as he represents it, is as follows:—the female beetles, moving mostly in bright sunlight, oviposit in cracks and crevices of the bark and the larvae hatching from the eggs tunnel through the bark to the bast, whereon they feed. Some feed principally in the bast or in the cambium where they sculpture the surface of the wood and then enter the sap-wood, or else work down directly into the sap-wood, where they complete the latter stages of larval growth. In these tunnels of larval development, sawdust of chisellings and frass is tightly packed. The mature larva just before pupating, lives in a tunnel free from sawdust. Having cut a passageway to nearly the surface of the wood, the larva pupates in the burrow. Rarely does Stebbing mention a larva entering the heartwood; most feed in the bast and those of genus **Chrysobothris** in the cambium.

H. E. Burke, of the United States Department of Agriculture, states that (1917) "Eggs (of the **Buprestidae**) are deposited by the mother singly or in a mass on the bark or are tucked in some crevice in the bark or wood or under the bark at the edge of some wound. Each larva mines the inner bark or wood until it reaches maturity."

Essig, of California, mentions that the larvae of genus **Chrysobothris** feed on the cambium to the sap-wood and down to the heart-wood but most larvae of the family work in the sap-wood. He mentions only one beetle, **Buprestis gibbsi Lec**, as mining straight down to the heartwood—and Leng does not record this species for this Province.

The consensus of opinion seems to be that the larvae of all species feed for awhile in the bark or bast or cambium and either complete their growth there or barely enter the sap-wood, or enter the sap-wood

deeply; a very few develop largely in heartwood. Wherever they develop later, bark, bast and cambium form their food for the first part of their lives.

As to the host trees and their condition:—most species of these beetles in North America, at any rate, attack injured or dying trees, some dead trees, while a few, especially of the genera **Melanophila**, **Anthaxia**, **Trachykele**, **Chrysobothris** and **Agrilus**, attack perfectly healthy trees or those just beginning to die.

As far as I can find out, in most cases the life cycle of the **Buprestidae** under natural out-door conditions, occupies one year only. In one instance I find it recorded as two or three years. The life cycle of the **Cerambycidae** or long-horned borers, occupies one year, two, or three years. I have had a larva of **Prionus** in captivity for two years and it has neither grown perceptibly nor shown any signs of pupating in that time.

I wish now to record instances of beetles emerging from prepared timbers in houses that have been built for some time.

Case No. 1. Beetles emerging in May from the floor of a church on Mayne Island, B. C. The insect is **Buprestis aurulenta** Linn. I cannot find out how long the church has been built.

Case No. 2. Beetles emerging in summer from the floor of a verandah of a house near Nanaimo. The house was 18 years old when the insects emerged. The beetle is **B. aurulenta** Linn.

Case No. 3. Beetles emerging on Christmas day, 1929, and for two weeks afterwards, from a house in Haney. The house is 20 years old. The insects, **B. aurulenta** Linn. again, emerged (a) from an inside wall one inch from the ceiling and 29 inches from an outside wall on a western exposure. The outside boards show weathering cracks. (b) The second emergence two weeks afterwards, was from the same wall between two rooms nine and a half feet from the outside wall and just above the base-board.

Case No. 4. A beetle was captured alive in the corridor of the Applied Science Building of the University on February 9, 1930. It may have emerged from the timber of the building which was erected in 1925. Since February 9 was a cold day, it is unlikely that the beetle flew in from outside. The insect was **B. aurulenta** Linn.

Case No. 5. Mr. Ralph Hopping, of the Dominion Entomological Branch, has given me permission to mention an instance which came to his attention on one occasion, of a Buprestid beetle emerging from a door some years after the latter had been hung. The door must have been practically bone-dry.

Case No. 6. Beetles emerging, as the owner of the house told me, "in swarms" from the split-log fir beams of a house in Chilcotin in June,

1929. The owner dug some larvae out of the beams, allegedly the larvae of the beetle, which is **Phymatodes dimidiatus** Kirby, a longicorn of continent-wide distribution. The house was six years old when the beetles emerged.

Accepting these records as very much delayed larval or pupal periods, we infer that the beetles named must be capable of developing in dressed timber after the lumber has been some years in use in buildings. If the larvae passed through the normal developmental routine of the family Buprestidae, they must have escaped certain hazards, as follows:— the eggs must have been laid normally on the bark; the larvae must have fed normally on bast and cambium and must have penetrated sap-wood and heart-wood for further development; they must have escaped the saws in a thin slice of timber such as a floor- or a wall-board of not over one inch in thickness and must have tunnelled straight upwards within these narrow limits. This suggests a fortunate escape from death and means that larvae can develop in almost bone-dry wood.

On the other hand, the larvae **may** have developed in 2 x 4 wall-studs, in floor beams of the church or in large-diameter posts under the verandah, mentioned above, and may have finished their pupation in those places, the adults eating their way out through boards.

The whole situation assumed another aspect when I watched adults of **B. fasciata** Fabr, phase **langi** Mann: (the female of the western phase of **B. fasciata** Fabricius ((Garnet R. 1918))) on a hot afternoon in August, 1929, going through oviposition movements on the giant flag pole at the University, which is dressed and is seasoning out-of-doors, lying prone on supporting blocks. The beetles moved by rapid spasmodic jerks over the surface of the timber, inspecting the wide cracks in the wood, and on several occasions, backing down the cracks where they remained a minute or so with extended ovipositors. I carefully examined many yards of cracks where the insects had been working to see if eggs had actually been laid, but could not discover any. The cracks were irregular and quite deep, and the chances of finding eggs or not in them were about even. This incident led me to wonder if beetles of genus **Buprestis** could develop in wood without passing through bark, bast and sap-wood (Essig and Hardy state that **B. aurulenta** develops in heart-wood of Douglas fir.)

As if to substantiate this thought, Miss Lucas, of the Department of Zoology at the University, has since informed me that late last summer (1929) many adults of "golden-green beetles," of the family Buprestidae, were observed on the verandah of a new building of the Biological Station at Departure Bay, Nanaimo, apparently ovipositing in cracks in the floor of the verandah. The verandah was of new lumber, which had been laid last spring and had been painted. The new wood, on drying, opened freely at the junction of the boards and the beetles were apparently ovipositing in these cracks. They were watched for some

time by several persons who captured some and trod on the rest. The beetles had ovipositors extended nearly half an inch—but actual eggs were unfortunately not especially looked for. Miss Lucas told me that the beetles were very common and that she crushed at least a dozen herself.

From her description, I gather that the species was either **B. aurulenta**, which I have taken freely at the Station myself, or **B. fasciata langi**.

TO SUMMARIZE

1. Records are provided of:— The Buprestid beetle **B. aurulenta** emerging from buildings as much as 20 years old, leaving oval holes where they emerge.

2. One record is provided of the Longicorn **Phymatodes dimidiatus** emerging from split fir rafters in a house six years old.

3. Adults of **B. fasciata langi** (and presumably **B. aurulenta**) apparently ovipositing in cracks in newly-laid verandah boards and in a seasoning flag pole two years old.

4. The suggestion is offered at this time that these beetles do not necessarily escape several hazards to pass through a greatly protracted larval and pupal period amounting in one case to 20 years, **BUT** are capable of developing from eggs laid in cracks in prepared lumber, even of heart-wood, without feeding first on bark, bast, cambium or sap-wood.

ADDITIONAL NOTE. **Case No. 7.** Added February, 1931.

One more instance of delayed emergence of beetles has since come to my attention, in a 14-year-old house near Duncan, B.C., where a Douglas fir flooring was found to be infested in the area covered by a small rug. In May, 1930, the first complaint was received together with an adult of **B. aurulenta** which had been dug from a tunnel in the floor, and during this winter two of the worst-infested boards were removed and brought to me by Mr. James Kay, of the Hillcrest Lumber Co. The boards are 1" x 4", dressed to $\frac{3}{4}$ " x 4", edge grain fir, oiled and polished and contain six tunnels, of which one leads to an emergence hole of a beetle, while three are irregular openings on the upper oiled surface, two of these being made by larvae which are still in the board, because they have ejected sawdust from these holes since the boards were given to me.

I have dug out the highly-compressed sawdust from the tunnels and find some borings running parallel to the surface of the wood and so close to it that there is only a paper-thickness remaining intact. It is remarkable that the larvae concerned have tunnelled so close to the

outside world across 4" strips, without cutting through. It is still more remarkable that one of the tunnels contains packed sawdust in which fibres of wool of several colours occur freely well over an inch from the opening, showing that the larva had chewed the rug and had dragged threads back into its borings.

It is not possible to tell from the two boards alone, how extensive the tunnelling has been in the floor, because the holes run right across these boards. But from the fact that, of the six openings in two contiguous 4"-strips one enters from the underside, it seems possible that the infestation, in one instance anyway, may have come up from a floor-beam below. There was no basement to the house, so Mr. Kay could not determine this fact for me.

I am indebted to Mr. Hugh Leech, student at the University, for indentifying one species for me and giving me some of his unpublished notes on the feeding habits and host plants of genus **Buprestis**. Also to Mr. James Kay, of the Hillcrest Lumber Company, for his painstaking and exact notes in connection with the infestation in the floor of the house at Duncan.

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