

INSECTS AND OTHER ARTHROPODS IN BUILDINGS IN BRITISH COLUMBIA

G. J. SPENCER

Department of Zoology, University of British Columbia, Vancouver, B.C.

This paper consists of a series of brief records of certain insects, sowbugs and mites which have come into my hands in the last ten years in this Province; the buildings mentioned are dwellings either permanently or temporarily occupied, and in a couple of instances, are greenhouses. Insects and mites infesting stored products in mills, factories and warehouses are not included; they have been written up by the late Kenneth Jacob in a paper of some length which the department of Zoology of this University hopes to publish before long.

Of the very large number of arthropods that might come into dwellings, some are indigenous, most are accidental and a fair number are introduced species infesting materials in the houses. This list is confined to those native and introduced and doubtful species about which complaints or enquiries have come to me over a period of years or those which I have intercepted myself; the common species of domestic pests attacking food-stuffs, of which we have a very large number, are omitted and mention is made only of those not hitherto recorded for the Province or of special interest otherwise, which have become established here or are accidental intruders. In a few cases some are mentioned which are conspicuous by their absence.

Of Arthropods not Insects

Acarina. Two heavy infestations of mites were sent in during the autumn of 1941, one *Aleurobius farinae* Degeer infesting a large warehouse for imported cheese, where the mites had suddenly become so plentiful that they formed a heavy dust around the bases of the cheeses. It was not possible to order fumigation and clean-up measures involved two thousand 80 to 90-pound cheeses; by experiment I found that the

finest spray with the mosquito repellent "Sta-way" instantly wetted the greasy mass of dead and living mites, so I suggested that the operators try it out with all due care to its possible poisoning the cheeses or affecting their flavour. They reported entirely in its favour.

The other mite was *Glycyphagus domesticus* Degeer sent in from Nanaimo where it was reported by a medical man as producing an irritating rash on human beings. This mite is the cause of the so-called "Grocer's itch" in England; as far as I can determine, this is the first record of it in Canada.

Isopoda. Up to the present I have collected only five species of sow-bugs in buildings, though a sixth, *Lygidium gracile* (Stimpson) is common in certain lands and woods near and on the University campus.

Up to the last two or three years, the only ubiquitous sowbug that invaded homes every autumn was *Porcellio scaber* Latreille, though I recovered *Porcellio rathkei* Brandt in October 1929 at the University. Recently, however, *Oniscus asellus* Linn. has increased tremendously, is abundant in neighboring wild lands near Vancouver and last autumn (1941) occurred in gardens of West Point Grey. It is the largest sowbug to be found locally and is a very active species. I first found it here in 1929, in the Stanley Park greenhouse, and have taken it occasionally since, but it is common now and widespread. Also in greenhouses, have cropped up *Armadillidium vulgare* (Latr.) and *A. quadrifrons* Stoller; the latter is very abundant in one of the Fraser Valley greenhouses where it tunnels readily into flower pots, eats away root systems of plants and will not respond to control measures that keep down the other species, *P. scaber*, which also

occurs in these houses. These two species of *Armadillidium* roll up into a ball when disturbed.

Chilopoda. The house centipede *Cermatia (Scutigera) forceps* (Raf.) has twice been brought in—once from an abattoir where there was an active colony in one of the partitions between two rooms, and the second on April 10, 1939 when a large, healthy specimen was caught in a beer parlor in the city.

The garden centipede *Scutigera immaculata* (Newport) has also twice been reported—once in small numbers in an outdoor compost heap in Vancouver, and in January, 1942, from certain large greenhouses near Langley where it was destroying 8-inch-high tomato plants in 100 yards of hot house.

Araneida. This province is a paradise for spiders and offers a most promising field for collecting and systematic work. House spiders of several species are a curse to the housekeeper at the Coast; they invade dwellings in swarms every autumn and spin webs for the next six months. They are best detected by noting the location of the spiderless web by day, and at night, suddenly flicking on the electric light or a flashlight, when the culprit can readily be seen and killed with a fly swatter before it runs to cover. A certain restraint is necessary when hitting them because the large juicy ones leave a conspicuous mark on wallpaper or kalsomine if squashed with too much enthusiasm.

The black widow spider *Latrodectes mactans* Fab. is widely distributed in, and apparently restricted to, the dry belt of the Interior and the drier portions of south eastern Vancouver Island and the Gulf Islands. It seldom enters houses but is very common in woodsheds, outdoor toilets and machine sheds. In the Nicola area at about 2900 feet, I have found its webs completely covering the corners and back of a carriage shed. In the Kamloops area it occurs up to 3100

feet only and seems to extend down the Fraser Canyon to just below Lytton.

Of Insects

Thysanura. A house-infesting Thysanuran, the silver fish, *Lepisma saccharina* L., has turned up a few times in the last decade but seems unable to form successful colonies, while the fire brat, *Thermobia domestica* Pack., is widely but thinly distributed in Vancouver. Every now and then small colonies are reported, chiefly from apartment houses, but neither of these species attains the density of numbers acquired by them in Toronto, Ontario.

Orthoptera. Of house-frequenting Orthoptera, *Ceuthophilus agassizi* (Scud.) occurs frequently in basements in autumn, apparently coming in from gardens, but seems unable to survive the winter drying-out and soon disappears. I have one unusual record of the giant cave-cricket *Tropidischia xanthostoma* Scudder being taken in one of the upstairs draughting rooms of the engineering department of the University in July, 1941; it must have climbed up an outside wall and hopped in.

The European house cricket *Gryllus domesticus* Linn. has never materialized as a pest in this city as we thought it would do eight years ago when it was first discovered, although it still persists in small numbers in the basement of a local golf clubhouse.

Atropidae. Of the Atropidae or book lice, two species are widespread, occurring in basements of very many homes but rarely increasing sufficiently to become a nuisance. A small pale-coloured one is very general and may become a pest, but the second is more interesting, being larger, nearly black and possessing rudimentary fore wings (only). Now the world-wide *Liposcelis (Troctes) divinatorius* (Muller) is nearly black but is wingless so this local one may be undescribed or a species of *Clothilla*.

Hemiptera. I need mention only two species, *Leptocoris trivittatus* (Say), the

box-elder bug which has been sent in with enquiries in increasing frequency from the Okanagan Valley in the last five years, with complaints of its invading rooms, and the big Coreid, *Leptoglossus occidentalis* Heid. which is either increasing in this vicinity or is coming more into public attention. Personally, I think it is increasing because I have collected it several times the last few years in December when it seeks shelter in the house and up to five years ago I had never taken it locally; it is also being sent in with enquiries. It either feeds upon or shelters in holly, whence it can sometimes be obtained by beating.

Lepidoptera. Only a few house-infesting moths need be mentioned. Since 1938 I have found Purina manufactured "Fox-pelting Chow" biscuits to be the best medium for raising clothes moths that I have yet come across. One large culture in a crock has been going continuously for nearly 3½ years without any additions of food; in the last 2 years it has become infested with the spider beetle *Ptinus ocellus* Brown and still produces numbers of both insects the year round. For two years the moths (*Tineola biselliella* Hummel) were the largest and healthiest specimens I have yet raised but the food supply now seems to be running low and the size of moths is decreasing.

The scavenger bulb moth or brown house moth *Borkhausenia pseudopretella* Stainton is a very persistent but never plentiful intruder, the larva feeding usually on dried forgotten carrots in the basement but there are indications that it eats animal products such as woollens, as do the clothes moths.

The white-shouldered house moth *Endrosis lacteella* Schiff. flourishes enormously in commercial blood-meal for gardens; I have had a colony going for two seasons in this medium, which yields clouds of moths in late summer and early autumn. The caterpillars may be taken from it all through the year. This

species, like the preceding, is generally regarded as a decaying-vegetable feeder so its success on blood meal seems unusual.

I have only once encountered the tapestry moth, *Trichophaga tapetiella* (Linn.) emerging in numbers from an ancient couch in a rest room in a garage at Spence's Bridge. The infestation probably came in and died out with the couch.

Conspicuous by its rarity is the meal snout moth *Pyralis farinalis* Linn.; I have encountered it only once in 15 years, in the buildings of the biological station at Nanaimo. Mr. H. B. Leech has found the larvae numerous in man-gers in a horse barn at Salmon Arm.

Coleoptera. Of the large number of beetles that invade dwellings, the majority are stored product pests. Some, however, come in for hibernation and of these some seek shelter but remain active all winter. Of those merely seeking winter quarters, the weevils *Brachyrhinus sulcatus* (Fab.), the black vine weevil, and *B. ovatus* (Linn.) the strawberry root weevil, are common every year and sometimes very abundant and this last year the clay coloured weevil *B. singularis* Linn., recently recorded in Victoria by Messrs. Downes and Andison, has made its appearance in West Point Grey, entering homes for hibernation. Of stragglers that seek shelter but remain active all winter, the ground beetles *Pterostichus* sp. and *Pemphus* (*Scaphinotus*) *angusticollis* (Fischer) are the chief; the latter eats dead or disabled sowbugs and is a regular nightly attendant at the dish from which household pets are fed, coming out when the first rush is over.

An accidental intruder but one which comes into buildings in summer is the notorious Stink beetle *Nomius pygmaeus* Dej., probably the most concentratedly malodorous animal for its size in the world. For some years now I have checked up reported flights of this beetle and find that their presence in towns can be associated with forest fires; when the

horizon is blotted out by smoke, these stinkers may arrive. Apparently they are forest dwellers which are driven out by the fires and may then travel long distances, scattered by the smoke. In the summer of 1938 a very extensive fire ravaged the Campbell River area on Vancouver Island and the beetles appeared again and were reported from several spots in Vancouver. They gathered under timber in one down-town lumber yard and remained there several weeks. A workman of the place told me of their potency, of their restricted area of temporary shelter and of the complete peace in which the men left them. He remarked on the fact that they did not scatter through the mill or invade nearby residences. It is possible that the particular block of lumber beneath which they sheltered happened to be in a certain degree of sap fermentation which was attractive to the beetles and held them until they either died out or returned to the woods when the fires died down. They were probably carried to Vancouver by the then-prevailing westerly winds, flying high over the pall of smoke. Dr. M. H. Hatch (1931. Monthly News Letter [Puget Sound Academy of Science] 3 (9), issue of September 1) has also recorded it as a household pest, and has given a summary of its habits.

Of the many beetles attacking stored products in this province I mention only a few, conspicuous for one reason or another.

The meal worms *Tenebrio molitor* Linn. and *T. obscurus* Fab. are relatively rare; the rice weevil *Sitophilus oryzae* Linn. occurs ten times for one infestation of *S. granarius* Linn.; the spider beetle *Ptinus ocellus* Brown and the saw-toothed grain beetle *Silvanus surinamensis* Linn. elicit more enquiries from harassed citizens than any other beetles, both of them, especially the spider beetle, flooding over an entire house, feeding on a wide range of cereal foodstuffs. I have raised the saw-toothed beetle on raisins

and walnuts besides cereals. Of the flour beetles, *Tribolium confusum* J. du Val. occurs five times for one infestation of *T. castaneum* Herbst., the rust red beetle; *T. madens* Charp. I have recovered only once—from Departure Bay, Nanaimo. Along with the first two of these flour beetles, for the last three years I have had a colony of *Gnathocerus cornutus* Fab., the broad-horned flour beetle. An infestation of *Tribolium* is very hard to eradicate and requires most persistent house-cleaning. The varied carpet beetle *Anthrenus verbasci* Linn. and the buffalo carpet beetle *A. scrophulariae* Linn. have become established in Vancouver in the last 5 years; the former is becoming serious, the latter occurs very little.

Occasionally the minute cucujid beetle *Laemophloeus pusillus* (Schoen), which is usually an elevator pest, occurs in houses especially those in which old chicken feed or other broken grain is stored in the basement.

Some of these beetles need further comment. Of the Ptinidae, I have reared *Sphaericus gibboides* Boieldieu from saffron, cayenne pepper, curry powder and fish meal. With all these foodstuffs, the colonies die out in 2 to 3 years irrespective of the amount of food present. *Trigonogenius globulum* Sol. has turned up twice in a dwelling, breeding in woollen fluff and trash. *Niptus hololeucus* Fald. was found in numbers in the basement of a hardware store at Fernie, B.C. (January 4, 1936. H. B. Lecch). *Ptinus fur* Linn. the white-marked spider beetle seems to occur more in Victoria than in Vancouver; odd specimens are not infrequently found in Vancouver homes and are sent in. I have reared it on a variety of cereals but it soon dies out. *Ptinus ocellus* Brown (*tectus* Boiel.) is one of the most widespread and most complained-of pests in Vancouver. It was first sent to me from Prince Rupert in 1926 by a student, Dick Pilsbury, who reported it as occurring in devastating numbers on a fish-meal wharf; to clear the wharf and

its buildings of the pest, the workmen shovelled it into the sea with their fish-meal scoops and threw a great deal of the infested meal after it. Brown reported it (Can. Ent. **72** (6): 120, June, 1940.) first from Victoria, remarking that its discovery there by Mr. W. Downes in 1927 and 1928 was the first time it was found in America. It is now painfully common all over the lower Fraser Valley having apparently been spread by shipments of infested fish or other meal from Vancouver. I have reared it in a wide range of kitchen cereals, dried casein, buttermilk powder, blood and bone-meal and in commercial garden fertilizers which contain fish meal. This latter material, stored in basements, is the greatest single breeding place of this pest, whence it spreads out all over a home. Removing the host meal carries away the infestation and stray beetles soon die out.

Within the last year I have encountered three infestations in homes, of furniture beetles. The first trouble was caused by *Anobium punctatum* Degeer, which completely riddled the back of a china cabinet and part of the sides. I have all the wood in a cage and grubs are still working in it. The citizen who brought me the wood thought the cabinet had been bought at an auction. The second and third infestations of apparently this beetle occur in New Westminster in a piano which was brought round Cape Horn 50 years ago, and in a table imported from England 18 months ago; in both cases sawdust is being pushed out from holes which are appearing one after another in the wood. In the case of the piano, the infestation is of recent origin and must have arisen locally. The beetle would appear to have become established in this area.

The drug store beetle *Stegobium paniceum* (Linn.) (*Sitodrepa panicea*) crops up now and then at intervals in spices—cayenne pepper, all-spice and curry powder. I have a strong culture nearly 2 years old, in dried ginger.

Beetles of the family Dermestidae are well represented in British Columbia; I have 24 species so far. Some are very common, chiefly in the dry interior of the Province, and some are becoming common at the Coast.

Three species of fair size are equally numerous around Kamloops, freely entering unscreened houses. In my cabin above Kamloops at 3100 feet, all three turned up frequently, namely *Dermestes talpinus* Mann., *D. signatus* Leconte and *D. lardarius* Linn.; they were much attracted to drying bacon and to bread which was apparently fermenting in the heat in the bread box. Often a couple of beetles of one or other of these three species would arrive overnight and hide away under the bread. I have reared all three from larvae feeding upon dried insects or incompletely picked skulls and especially *D. signatus* from the trash at the bottom of used and vacated swallows nests. *D. lardarius*, especially, very readily lays eggs on, and the larvae develop in, a box of insects exposed for drying.

Attagenus piceus Oliv. was reared from a supply of casein powder recently received from Australia; *Anthrenus scrophulariae* (which is very common as far north as the Chilcotin) from trash on the floor of a public dance hall and from sweepings from the corners of a room, from dead insects, and once I raised two small larvae on a piece of old cow horn and secured the adult beetles; and *Orphilus niger* (Rossi) from dry insects.

Two dermestids need special mention here: *Anthrenus verbasci* Linn. the varied carpet beetle, and *Perimegatoma vespulae* Milliron.

Concerning *A. verbasci* the varied carpet beetle. Larvae of this insect turned up in the University collections, so I assembled them and cultured them out with a supply of dried insect bodies in a 3-inch diameter glass-covered tin box, on March 24, 1934. They kept on breeding in this tin until January 20, 1937, when the food supply was ex-

hausted and the larvae present had consumed even the dried bodies of their dead parents. So the mass was discarded and the larvae re-cultured with a supply of buttermilk powder. They thrive on this medium and by April 10 many beetles had emerged from the pupae. They were allowed to increase again until May 15, 1939, when another mass of debris consisting of frass, exuviae and dead beetles had accumulated; many larvae were present so more buttermilk powder was added without cleaning out the tin. By spring 1941 the colony had died out. Apparently the last generation of beetles was infertile or the young larvae met hostile conditions because the dead bodies of many adults were present, unchewed by larvae. Thus this colony had been going in a 3-inch diameter tin for five years. This was the only trace of these beetles I had received in the Province.

Suddenly in November 1940 enquiries came in from five homes in Vancouver about large numbers of larvae which turned out to be those of the varied carpet beetle, appearing in clothes closets and in some cases all over the house. Most stringent clean-up measures were recommended and the potentiality for evil of these larvae was heavily stressed. Up to last autumn 1941, however, specimens of these larvae continued to come in from homes widely scattered over this city and from New Westminster. Apparently this beetle has become established as a household pest.

I have reared the larvae successfully on dried insects, on broken grains of wheat and chiefly on Purina Fox-chow biscuits which I use as a basic food for all household pests. The adults eat Fox-chow and raisins.

As far as a pest in insects collections is concerned, *Perimegatoma vespulae* Milliron is the worst thing I have encountered in this Province. In the summer of 1933 I was working in Upper Hat Creek valley and camping in the forestry cabin in Marble Canyon. As is my custom in summer, all insects col-

lected were pinned out at night on cork strips and allowed to dry for one or two weeks before being transferred to store boxes. During the winter of 1933-34 I found larvae in these store boxes and on March 15, 1934, one pupal case from which a beetle emerged on April 12, 1934. I assembled all the larvae I could find and have cultured them out dozens of times since on every culture medium that I use—several cereal flours, fox-chow biscuits, casein, milk and buttermilk powders, dried lean meat, nut meats, spices of all kinds, and dried insects. They prefer perfect, fully labelled insect specimens, if possible type or paratype material or rare specimens, to everything else. They also feed upon bird skins and dried Crustacea in the museum, doing the best they can on this uninteresting food material.

In all these years of culturing hundreds of larvae, I have never yet brought one successfully to a pupa, much less to an adult. Every colony terminates with a large series of exuviae and, now and then, some dried larvae; frequently only exuviae remain and I cannot understand what happens to the larvae. The only adults I have obtained were accidentally found chiefly on the glass tops of the insect cabinet drawers and twice only in a box of bulk unpinned insects. At present I am culturing the larvae singly in glass-topped tin boxes and, in mass, in great heaps of insect bodies in tin boxes.

In 8 years I have obtained only 11 adults, 9 of them picked up accidentally where least expected and consequently few are perfect specimens.

The capacity of the larvae for entering apparently tight-sealing boxes is disheartening; they freely enter any of our own grooved and tongued cabinet drawers, any of our usual store boxes, they invade skull cabinets, bird and mammal cabinets, mailing boxes of insects, and I have repeatedly found them in ordinary drug-store tin salve boxes of unpinned insects. The larvae hatching from the egg must be infinitely small and capable

of entering very small spaces. I have never captured the adults nor found the larvae in the field, either at the Coast or in the Dry Belt.

Mr. W. J. Brown of Ottawa very kindly named the species for me and referred me to Milliron's description of it (in the *Annals of the Ent. Soc. of America*, **32** (3): 570-574, fig. 1. September, 1939.) In this article, Dr. H. E. Milliron of University Farm, St. Paul, Minnesota, describes it as a new species, reared in 1938 from a 20 to 25 year old demonstration wasp nest—hence the specific name *vespulae*. The only previous record of it in Minnesota was a pinned specimen in the University museum labelled "University farm campus, September 10, 1934."

I submitted a specimen to the late Mr. Ralph Hopping shortly after finding the first adult and he told me it was a *Perimegatoma* but could not name it to species.

Notwithstanding my most strenuous efforts at control, the pest is still very much with us and is constantly cropping up in the collections. Milliron found the species to be parthenogenic which would

account for its prevalence all over our storerooms and its success in becoming established.

Finally, in this catalogue of stray or purposive invaders of dwellings in this area, may be mentioned outbreaks that have occurred several times in the late autumn, of vast numbers of minute pale brown beetles that swarm in basements, appearing suddenly on basement windows in such numbers as to practically shut out the light. They apparently breed on and emerge from wood that is stored for fire places, chiefly alder and coast maple. A series from one house, (November, 1933) yielded the following list (identified by Mr. H. B. Leech):—

Nitidulidae *Epuraca* spp.
 Another genus
 Cryptophagidae *Atomaria* sp.
 2 other genera
 Lathridiidae *Coninomus constrictus* Gyll.
Coninomus nodifer Westw.

Acknowledgments—I am deeply indebted to the following specialists who have named specimens for me over a number of years: Mr. W. J. Brown, Division of Entomology, Ottawa, Ont.; the late Ralph Hopping, and Mr. H. B. Leech, of the Dominion Entomological Laboratory, Vernon, B.C.

THE RESULTS OF FURTHER WORK DONE ON THE CONTROL OF GRAIN MITES IN BRITISH COLUMBIA*

H. F. OLDS

Plant Protection Division, Canada Department of Agriculture, Vancouver, B.C.

The need for conserving products vital to the well being of the British Empire and her allies is being continually stressed by our Governments. Food in all forms comes under the category of vital commodities to such an extent that at the present time some of these products are rationed, not that there is a shortage, but so that an adequate supply will always be available. Steps to conserve food products from deterior-

ation due to insects have been taken by the Department of Agriculture from the beginning of hostilities, and the Division of Plant Protection has assisted other branches of the Service in this work. All elevators, mills, and warehouses where large stocks of grains and cereals are stored have been periodically inspected. During the past season it has been our privilege to assist Mr. Harold Gray, who is in charge of the Stored Product Insect Investigation Division and Dr. Beverley N. Smallman of the Board of Grain Commissioners for Canada,

* Contribution No. 28, Division of Plant Protection, Production Service, Department of Agriculture, Ottawa, Ontario.