

## Orchid Insects

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In view of the present great interest in orchid cultivation in Hawaii, an account of the insects and other invertebrates which attack the orchid plant, or are commonly encountered in cultivating these plants, may be found useful by orchid growers. Many of these insects are common greenhouse pests and can be dealt with readily by one means or another well known to growers; others are attached to the orchid plant and have to be constantly guarded against, or eliminated if they gain entrance to one's collection of plants, in order to maintain the collection in good condition, for insect species which are specific in their relationship to host-plant are generally serious pests.

Orchids, or plants of the family Orchidaceae, comprise one of the largest groups of flowering plants; the range of their distribution is world-wide. The plants that are grown here as choice ornamentals are all imported plants and have come from many different and widely separated regions; for example, the Orient, the Antipodes, North and South America, and Europe (from collections). It is not unusual in the circumstances that the pest list for orchids is rather full. If all the species encountered in the examination of orchid importations had succeeded in establishing themselves in Hawaii, our pest list would indeed be a lengthy one, but it is believed that most of them have been intercepted and have not got a foothold here. Some, however, have had to be contended with for years, because the nature of their attack is such that difficulty is experienced in discovering them in imported plants; or treatment of plants, when they are discovered, is inadequate to effect their elimination. I refer particularly to the weevils, scale insects, etc. Another consideration, exigent at the moment, is the rapid rate of expansion of collections in recent years. This will undoubtedly result at length in the appearance of many new orchid pests here, for pest accession generally runs proportionate to volume of imports. It is beginning to be evident already.

Detailed discussion of pests will follow in the order of their importance.

### GREENHOUSE PESTS

These include scales and mealybugs, thrips, red spider, aphid (*Cerataphis lataniae* is the only species here, but another species, *Macrosiphum luteum*, has been intercepted many times on Central

and South American orchids at mainland stations), whitefly (none attacking orchids here, but *Aleurodicus guppyi* intercepted as above). Mealybugs commonly found on orchids here are mostly the common greenhouse mealybug, *Pseudococcus longispinus*. *P. lilacinus* is very commonly found on orchids from the Philippine Islands, but as far as is known, it is not established here. *P. maritimus*, which it is believed is established here, has been found on orchids imported from the mainland, but it is not generally found on orchids here.

There is a long list of scales found on orchids. Considering the soft (unarmored) scales (Coccinae) first, the commonest one is *Coccus pseudoheperidum*, which appears to be attached to the orchid plant. Many collections in Hawaii are infested with this scale, which is quite prolific, and very injurious to the plants. Other soft scales reported on orchids are *Saissetia hemisphaerica*, *Coccus hesperidum* and *Coccus capparidis*, but I consider these infestations as more or less incidental. Then there are two odd scales, *Asterolecanium aureum* and *Vinsonia stellifera*, which are commonly found on orchids imported from Central and South America, the former apparently attached to the orchid plant. Hard (armored) scales (Diaspinae) found on orchids include species that are apparently attached to the orchid plant and those that are more or less incidental in their lodgment. In the former category I would place *Diaspis boisduvali*,\* *Furcaspis biformis*, *Parlatoria pseudaspidiotus*, *P. proteus*, *Hemichionaspis townsendi*, *Leucaspis cockerelli*, *Conchaspis angræci*, *Phenacaspis dendrobii*. The first four and the sixth in this list (i.e. *L. cockerelli*) are believed to be established in Hawaii. In the latter category I place the following: *Pinnaspis aspidistræ*, *P. buxi*, *Aspidiotus palmae*, *A. spinosus*, *Chrysomphalus rossi*, *Pseudoparlatoria parlatorioides*, *P. ostreata*, *Pseudischinaspis bowreyi*, *Lepidosaphes tuberculata*. Of these only the two species of *Pinnaspis* and *C. rossi* are well-established species in Hawaii.

Many species of thrips have been found on orchids also, but as far as I know only one is attached to the orchid plant, namely, *Anaphothrips orchidii*. Two others found on orchids in Hawaii are *Hercothrips femoralis* and *Taeniothrips xanthius*. The following have been intercepted: *Hoplandrothrips nigricestus*, *Parthenothrips dracaenae*, *Heliothrips errans*, *Aplothrips melaleuca*, *Frankliniella sp.*, *Amblythrips sp.*, *Neophysopus sp.* and *Liothrips sp.*

Treatment recommended for these insects is nicotine sulphate solution: strength 1-400/600.

Mites or red spiders are often troublesome in greenhouses. The species concerned are not well known but most of the interceptions on orchids are referred to either *Tenuipalpus* or *Stigmaeodes*. Mite infestations respond quickly to treatment. Sulphur dust is indicated, but must be used with caution.

\* This species is often associated with a disease (soft rot) which ruins many plants.

Ants are often a nuisance in greenhouses, but with proper equipment and attention can be easily controlled. Slugs and snails and isopods (sowbugs) also. Cockroaches often do damage to root-tips, buds and flowers. They are usually controlled by placing out poisoned bait—phosphorus paste or arsenic on slices of bread. Spiders, centipedes, millipedes, collembola, psocids and other verminous forms are often encountered in the peat about the roots of orchid plants, but one can readily dispose of them so they are not of much consequence, except when they use the orchid plant as a hide-out and are transported with the plant into new territory.

There are many instances on record of other insects being carried from one region to another in this manner, e.g. termite communities, ant communities, orthopterous egg-masses, embiids, heteropterous bugs, and so forth.

#### WEEVILS

There are a number of rhynchophorous forms which are specifically attached to the orchid plant. Recently five of these, pertaining to the Oriental region, were shown to be closely related forms, and were all referred to the newly-erected genus *Orchidophilus*. One of these species, *O. aterrimus*, has been coming into Hawaii in orchid plants from the Philippines and other oriental regions, particularly on orchids of the genus *Phalaenopsis*, for thirty or forty years, and may be considered established here, although its status is doubtful, since it is impossible in most cases to determine whether the few individuals collected are from recently imported or older plants. They are usually taken as adults, and one giving close attention to the care of his plants can generally rid the collection of this pest in time. The larva or weevil is a borer, generally found working near the stem base, where injured and discolored tissue or die-back indicates its presence. The weevil should be removed, when discovered, by excision, the wound being sterilized with a fungicidal application, alcohol or sulphur dust, to prevent further necrosis. Bait traps may be set for the adult insects. Orchid growers claim this beetle may be easily trapped by maintaining a few orchids with exposed roots (*Oncidium*s, for example) in the infested orchid house. The beetles are attracted to the tender tissue at the root tips and can be captured there and destroyed.

The South American species, *Diorymerellus laevimargo*, has not been known here so long, but since 1934 has attained nearly the same status as *Orchidophilus aterrimus*, and as many of the shipping firms on the mainland now have this weevil firmly established in their houses, it is expected it will be increasingly difficult to prevent its establishment here. The species seems to some extent to be partial to *Dendrobium*s, and is often referred to by growers as the dendrob weevil, although it has been observed to attack several other kinds of orchids. As compared with *Orchidophilus aterrimus*, the adult beetle is much smaller (less than 2 mm. long), smooth and

shining black instead of rough and dull black, the elytra each with six pitted longitudinal lines or grooves instead of eight as in *aterri-mus*. Its damage to the plant is generally confined to new and tender growth of stem and leaf or buds and flowers and is quite characteristic. The larva is hatched from an egg inserted in the stem base, and bores in the stem or larger roots, considerably weakening the plant. This insect was studied in greenhouses in New Jersey by Hamilton, who found the best control measures to be hand-picking. Use of paradichlorobenzine was also recommended; treatment of individual pots for 24 hours with 4 gm. paradichlorobenzine scattered uniformly over the peat of a four-inch pot resulted in 95-100% mortality, even 2 gm. often gave a satisfactory "kill".

Another orchid pest in this group of insects is the ambrosia beetle, *Xylosandrus morigerus*, which has been intercepted many times in *Dendrobium* shipments from Australia. As far as I know it is not established here. The larvae or weevils are stemborers and their excavations greatly weaken the plant. The adult beetle is a typical shot-hole borer, about 1 mm. long, brown or black and shining, without an extended snout such as the previously mentioned species have, and with short, compact, hairy body, short, clubbed antennae. The species is believed to be attached to the orchid plant and might be a serious pest if it became acclimatized here.

Other rhynchophorous beetles intercepted on orchids occasionally are *Tadius erirhinoides*, *Cholus cattleyae* and *Baris* sp.

#### MOTH BORER AND CATERPILLARS

Not much is known about lepidopterous pests of orchids, as none occur in Hawaii to my knowledge. In South America the giant *Castnias* often attack bulbous plants and in the Philippine Islands there is said to be a tortricid which attacks flower stems and damages blooms considerably.

#### BUGS

There are many heteropterous bugs reported as orchid pests, mostly mirids. One species, *Mertila malayensis*, is commonly found on orchids imported from the Orient; another, *Tenthecoris bicolor*, is common on South American orchids. The latter species was once intercepted here on a plant from Brazil, with developmental stages present, proving beyond doubt that the species is attached to the orchid plant and was not incidental to that particular shipment. As usual with bug infestations, the population was composed largely of nymphs, and as the infestation was heavy, the plant was badly damaged.

#### MIDGES, FLIES

The only dipterous insect found on orchids to my knowledge is the midge *Parallelodiplosis cattleya*, which has been taken a number

of times on imported Cattleyas. Apparently the pest is of South American origin. The larvae are usually found in the roots and are quite destructive to the root tissue. As far as I know the pest has not become established here.

The bloom of certain orchids becomes an attractant of the melon fly (*Chaetodacus cucurbitae*), probably on account of the scent thrown off, as males of these flies seem to be drawn by odors. No damage to the plant results from the visits of the flies, as far as I have been able to learn.

#### THE SO-CALLED "CATTLEYA FLY"

There is still another common insect pest of Cattleyas which has been brought into Hawaii many times but as far as I know is not established here—that is the so-called "cattleya fly." This insect, however, is not dipterous; it is a small black eurytomid wasp (*Isosoma orchidearum*), which is attached to the orchid plant, and is believed to emanate from South America. The larvae are phytophagous in habit and very harmful to plants which they infest. They attain a length of 6 mm., feed in the bulb, stems, leaves and buds of many kinds of orchids besides Cattleyas and can only be got rid of by the complete destruction of the infested portions of the plants, or possibly by vacuum fumigation.

### New Species from the Bishop Museum Collection of Samoan Parasitic Hymenoptera

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#### ICHNEUMONINAE

#### *Ichneumon samoanus* n. sp.

*Female*.—12 mm. long, wing expanse 20 mm. Head (including antennae) and thorax (including legs) reddish brown to black or blackish, abdomen reddish brown, pedicellate 1st segment slightly infuscate, 2nd and 3rd tergites marked with black—a median longitudinal line on 2nd extending apically from base more than half the length, a median spot basally on 3rd; wings infumate.

Head transverse, only half as thick as wide, length from vertex to apex of clypeus equals or slightly exceeds width, coarsely punctate or rugose except on occiput which is smooth and shining with minute pin punctures, hairy clothing sparse and fine except on clypeus, labrum and parts of face; eyes large and bulging slightly, hardly emarginate, ocelli arranged in an obtuse triangle, lateral members a little further from eye than distance between same, vertex and face comparatively flat, front excavate, a slight median elevation or tubercle on anterior margin, separation of face and clypeus indistinct but clypeal fossae rather deep, anterior margin of clypeus barely curved, genae and occiput quite wide, latter sloping outwardly, mandibles stout, fairly wide at base and acute apically, bidentate, upper tooth twice as long as lower, maxillary palpi