

PAPER READ.

Another Banana Leaf-roller [Lep.].

BY OTTO H. SWEZEY.

Omiodes maia n. sp.

Male, female, 28-30mm.; head, thorax and abdomen dark fuscous much mixed with ferruginous scales, especially on the abdomen; apical margins of abdominal segments ochreous; antennae fuscous above, pale beneath, basal joint fuscous; palpi fuscous, whitish below with a slight ferruginous tinge anteriorly; femora and tibiae fuscous largely suffused with ferruginous; tarsi ochreous. Forewings dark fuscous suffused with ferruginous on costa, and less densely so near termen, a few ferruginous scales scattered in some other parts of wing; a whitish ochreous dash in middle near base; first line ochreous, angulated outwardly (nearly at right angles) at middle, upper portion indistinct, lower portion very distinct; roundish black orbicular; two blackish discal spots transversely placed (mostly contiguous) followed by a few ochreous scales; second line ochreous, sinuate outwardly beneath costa, below middle forming an acute triangular projection outwards; both lines often ferruginous mixed; veins marked with ochreous or ferruginous ochreous; cilia fuscous, darker at base. Hind wings medium fuscous, a darker discal spot and terminal dark fuscous line; a paler postmedian line with acute projection outwardly below middle, a few pale ferruginous scales in its dorsal part, a few also just before terminal dark fuscous line, which is usually interrupted by pale ferruginous scales on the veins; cilia as in fore wings.

Very similar to *O. musicola*, but the latter is paler fuscous. and has ochreous suffusions and markings where *maia* is ferruginous.

I bred a series of moths on three different occasions, from caterpillars found on bananas growing in two different gulches at the head of Manoa Valley: Jan. 23, March 10* and May 2*, 1909, respectively. In one of the gulches, I found the caterpillars quite numerous.

Full-grown caterpillars are just like those of *musicola*. Some have darker markings than others; markings of head quite black, and wider black margins to cervical shield, the longitudinal black bar joining it in front and behind, which gives the cervical shield a very blackish appearance. Caterpillars just hatched have heads entirely black; those one-third grown have most of the tubercles black.

Pupa similar to *musicola*.

* These observations were made after paper was presented to Society.

This makes four species of *Omiodes* now known to feed on banana: *blackburni* on all the islands, *meyricki* on Hawaii, *musicola* on Maui, *maia* on Oahu. They are closely related, all having similar pattern on wings and no doubt have evolved from a common ancestor. In a previous article I have mentioned differences in color and degree of angulation of first line of forewings. I have measured this angle in several specimens of each species with the following results: In *blackburni* it is 52°, in *meyricki* 56°, in *musicola* 85°, and in *maia* 80°.

APRIL 1st, 1909.

The fiftieth meeting of the Society was held in the usual place.

On account of his removal to accept a position in the Bureau of Entomology at Washington, D. C., Mr. D. L. Van Dine tendered his resignation as Vice-President. It was accepted, and Mr. F. W. Terry was elected to fill the office vacated.

NOTES AND EXHIBITIONS.

Mr. Terry presented notes on the Insects of Hong Kong and exhibited specimens.

PAPER READ.

A Conspectus of the Fulgoridae of the Hawaiian Hemiptera.

BY G. W. KIRKALDY.

The Fulgoridae are all apparently endemic, and belong to two genera, *Iolania* and *Oliarus*, both belonging to the tribe of Cixiini.

Three longitudinal keels on the mesonotum; costal margin of tegmina strongly granulate.....*Iolania*

Five longitudinal keels on the mesonotum; costal margin of tegmina not (or obscurely) granulate.....*Oliarus*

Iolania Kirkaldy.

1902, Faun. Haw., III, 118, Pl. 5, f. 3.

A reexamination of this genus presents only one species, *perkinsi*; the ground colour of the male tegmina is much yellower than in the other sex. I separate off, as a variety (*notata*), the form with a large brown blotch at the base of the tegmina of the male.

Oliarus Stal.

So far as concerns the structure of the legs, the Hawaiian forms all belong to the typical subgenus, but I separate them off under the name *Nesoliarus*, on account of the great plasticity of those characters which are of specific value in the exotic forms, and on account of the sexual dimorphism, which is more or less apparent—mostly considerably so—in the pattern and colouring of the tegmina. As it would not be possible to include these Hawaiian forms in a general table of species, owing to the above-mentioned plasticity, it is convenient to group them under a special subgeneric name (type *tamehameha*).

In the europæan fauna, the male genitalia have been extensively used in the differentiation of species. I have, however, not been able to do this with the Hawaiian species. The form of the parts is not very evident without dissection, and I have not had sufficient material except in a few species. Moreover, the form of the genital styles (the "claspers" of Scott), appears to be much the same in all, being not very dissimilar to those of *Cixius stigmaticus* when viewed from below (cf. Ent. Mo. Mag., VII, fig. I, p. 293), except that the stalks are straighter. With more material, I may be able in the future to investigate further.

The venation, which in the Australian and Fijian species I found so characteristic, is highly variable in the Hawaiian forms. The place of forking of the radial and brachial veins, and the place of union of the two claval veins, which characters seem to be of specific value in exotic forms, are inconstant and of no value here.

The tabular form under which I now proceed to describe the Hawaiian forms is, I think, sufficient for the present—till I can obtain more material in certain of them—to differentiate them apart from one another: at the same time, it is, in most cases probably, not sufficient to distinguish them from the species of other countries. As, however, the endemic forms here are not at all likely to occur elsewhere, this will be of little account.

The Hawaiian species are usually found among Ferns, *Sadleria*, *Cibotium*, *Gleichenia*, etc. Swezey (1) has described the nymphs of *O. kaonohi* (2), which he found in "decaying leaf-bases and fibrous matter of tree-fern trunks."

(1). 1907. P. Haw. E. S., I, 83.

(2). I identified this for Mr. Swezey as my *koanoa*, but the species seem to be different.

The following is a preliminary arrangement of the Hawaiian forms: (3).

- 1(2). Tegmina short and broad, costal margin thickened and arched at the base; apical and margin of wings fuliginous. LANAI; HAWAII, (Kona). F. H. 120 and 122, Pl. 4, f. 6...
.....4. *hevaheva* Kirkaldy.
- 2(1). Tegmina not specially thickened, nor arched at the base; more elongate, at least in the larger species.
- 3(8). Expanse of tegmina more than $17\frac{1}{2}$ mill.
- 4(5). Mesonotum brownish testaceous; tegmina immaculate (male), somewhat maculate (female); wings apically not fuliginous. KAUAI, F. H., 120, Pl. 4, f. 4.....
.....1. *tamehameha* Kirkaldy.
- 5(4). Mesonotum black; wings apically fuliginous.
- 6(7). Tegmina hyaline, immaculate (male), a narrow median transverse stripe, often faint, (female). OAHU, (Tantalus); MOLOKAI, 4000 ft., (a fragment); MAUI, (Haleakala); HAWAII, (Kilauea and Olaa). F. H., 120 and 121, Pl. 4, f. 5..
.....2. *kanakanus* Kirkaldy.
- 7(6). Clavus, inner 2-5 of corium, and apical $\frac{1}{3}$ of tegmina, suffused with fuliginous. Otherwise as in *kanakanus*. MOLOKAI, (4000 ft.).....3. *kahavalu*, sp. nov.
- 8(3). Expense of tegmina less than $17\frac{1}{2}$ mill.
- 9(36). Males.
- 10(29). Tegmina immaculate, except the veins.
- 11(14). Tegmina, with at least one-third suffused with fuliginous or yellowish-fuliginous.
- 12(13). Basal and apical thirds of the tegmina fuliginous, middle third hyaline. [Rarely the tegmina are partly hyaline apically, cf. F. H., Pl. 4, f. 8.] OAHU, (Koolau and Waianae ranges); MOLOKAI, (4000 ft.); HAWAII, (Olaa and Kohala Mountains).....5. *tarai* Kirkaldy.
- 13(12). Tegmina entirely dark fuliginous (sometimes a very little dilute). MOLOKAI, (4000 ft.); MAUI, (Haleakala, 5000 ft.). F. H., 123, Pl. 4, f. 9.....6. *morai* Kirkaldy.
- 14(11). Tegmina only dark (if at all) on veins, though sometimes partly tinged with yellowish.
- 15(18). Mesonotum pale castaneous; veins on basal two-thirds of tegmina pale.
- 16(17). Veins on basal $\frac{2}{3}$ minutely, but distinctly granulated with brown. Differs from *koanoa* by the longer and narrower tegmina and pale mesonotum. Length, 6 mill. OAHU, (Koolau ranges, all over); HAWAII, (Kilauea, on tree-ferns; ferns; and *Freyinetia*).....7. *kaonohi*, sp. nov.
- 17(16). Veins on basal $\frac{2}{3}$ not, or very obsolete, granulated; otherwise like *kaonohi*. HAWAII, (Naalehu, on fern, O. H. S.).....8. *filicicola*, sp. nov.
- 18(15). Mesonotum black. [In some examples, the keels are dark castaneous].
- 19(24). Veins on basal $\frac{2}{3}$, black, or largely so.
- 20(23). Veins partly pale.
- 21(22). Tegmina shorter and broader. Length, 6 mill. OAHU, (Kohala, O. H. S.).....9. *procellaris*, sp. nov.

(3). "F. H."=Fauna Hawaiensis, III. The "length" is taken from apex of vertex to apex of closed tegmina.

- 22(21). Tegmina elongate. Length, $8\frac{1}{2}$ mill. KAUAI, (2000-3000 ft.).....10. *pluvialis*, sp. nov.
- 23(20). Veins black, or at least the median brachial, and apical ones). Length, 7 mill. KAUAI, (Halemanu, 4000 ft.).....11. *nubigenus*, sp. nov.
- 24(19). Veins on basal $\frac{2}{3}$ pale, sometimes with dark granules.
- 25(28). Costal margins of tegmina more parallel.
- 26(27). Exterior keels of mesonotum subparallel with the interior pair. Length, 5 mill. OAHU, (Konahuanui, O. H. S.).....12. *silvicola*, sp. nov.
- 27(26). Exterior keels of mesonotum straight, angulate basally. Length, 6-7 mill. HAWAII, (Kilauea and Olaa); MAUI, (Lahaina coast).....13. *montivagus*, sp. nov.
- 28(25). Costal margins of tegmina well rounded. Length, 7 mill. OAHU, (Kawailoa gulch); MOLOKAI, (4000-14500 ft.); HAWAII, (Hualalai, 5000 ft., Olaa, Kilauea). F. H., 120 and 124, Pl. 4, f. 11.....14. *koanoa* Kirkaldy.
- 29(10). Tegmina maculate.
- 30(33). Vertex truncate apically.
- 31(32). Mesonotal keels castaneous; tegmina scarcely more than twice longer than wide, hyaline, veins on basal $\frac{2}{3}$ pale, granules pale brown, tegmina sparingly spotted with pale brown. Length, 5 mill. OAHU, (Kaala, 3500 ft., on *Acacia koa*).....15. *acaciae*, sp. nov.
- 32(31). Mesonotal keels black. Tegmina veins almost entirely black! clavus with 3 black spots, rest of tegmen spotted with yellow fuliginous. Length, 9 mill. MAUI, (Haleakala, 5000 ft.).....16. *haleakalae*, sp. nov.
- 33(30). Vertex rounded or subangular apically.
- 34(35). Costal margins pale brown; tegmina veins particolored on basal half; tegmina scarcely more than twice as long as broad, on basal half; tegmina scarcely more than twice as long as broad. Length, 6 mill. MAUI, (Haleakala, 5000 ft.).....17. *monticola*, sp. nov.
- 35(34). Tegmina about $2\frac{1}{2}$ times as long as broad; costal margins black and white alternately (also radial, etc.) Length 8 mill. OAHU, (Tantalus).....18. *kaohinani*, sp. nov.
- 36(9). Females.
- 37(42). Tegmina more or less fuliginous, or at least strongly yellowish; not speckled.
- 38(44). Mesonotum at least dark castaneous, generally blackish.
- 39(40). Tegmina dark fuliginous, except a small part of the costal area.....6. *morai* Kirkaldy.
- 41(38). Mesonotum pale castaneous; tegmina varying from yellowish to dark fuliginous.....13. *montivagus*, sp. nov., and 7. *kaonohi*, sp. nov.*
- 42(37). Tegmina not fuliginous, or only spottedly so.
- 43(50). Tegmina immaculate.
- 44(47). Length not less than 7 mill.
- 45(46). Veins on basal $\frac{2}{3}$ of tegmina pale brown, granules dark. KAUAI, (4000 ft.).....19. *silvestris*, sp. nov.

* At Kilauea (of Hawaii) there is a similarly coloured form, $7\frac{1}{2}$ mill, long; vertex shorter and broader, of which I do not know the male. It may be called var. *volcanicola* nov. (of kaonohi).

- 46(45). Veins on basal $\frac{2}{3}$ alternately dark and pale; HAWAII, (Kilauea)*.....20. *pele*, sp. nov.
- 47(44). Length not more than 6 mill.
- 48(49). Cross veins on tegmina near the apex not suffused.....14. *koanoa* Kirkaldy.
- 49(48). Cross veins suffused. KAUAI, (2000-3000 ft. and Makaweli, 2000 ft.).....21. *kauaiensis*, sp. nov.
- 50(43). Tegmina maculate.
- 51(52). Length less than $6\frac{1}{2}$ mill. Vertex truncate apically, broad and short. HAWAII, (Kilauea), F. H., 120 and 122, Pl. 4, f. 7.....22. *puna* Kirkaldy.
- 52(51). Length more than 7 mill.
- 53(56). Apical third of tegmina not spotted.
- 54(55). Tegmina veins particoloured. MOLOKAI, (4000 ft.); KAUAI, (Halemanu, 4000 ft.); HAWAII, (Kona, 4000 ft.).....20. *pele*, var?
- 55(54). Tegmina veins black.
- 56(53). Apical third of tegmina more or less spotted, or at least some of the apical veins strongly suffused.
- 57(58).
- (a). Face black, lateral margins narrowly castaneous, a pale wedge at the base of the clypeus laterally; vertex scarcely extending beyond the eyes, broad, lateral margins converging towards the apex which is slightly rounded; about twice as broad at base as at apex, and about $\frac{1}{4}$ longer than wide at base. Tegmina hyaline, heavily spotted, at least 4 black spots on the costal area; veins on the basal $\frac{2}{3}$ of tegmen particoloured. Sterna, abdomen, femora, etc., mostly dark piceous or blackish. Length, $10\frac{1}{2}$ mill. MOLOKAI.....23. *paludicola*, sp. nov.
- (b). Face as in the last, but the pale area large vertex narrower, nearly twice as long as broad. Tegmina yellowish hyaline, veins black, except the radial which is partly white; apical third spotted. Underside, legs, etc., dull piceous. Length, $8\frac{1}{4}$ mill. HAWAII, (Hilo, 2000 ft.).....24. *nemorica*, sp. nov.
- (c). Face as in the last: vertex short and broad, much as in *paludicola*. Tegmina hyaline, tinged with yellow, slightly spotted, veins particoloured. Legs brownish-yellow. KAUAI, (4000 ft.). F. H., 120 and 124, Pl. 4, f. 10.....25. *orcno* Kirkaldy.
- [var. *molokaiensis* has tegmina not yellowish more heavily spotted; face blackish. MOLOKAI.]
- [var. *oahuensis* is like *molokaiensis*, but the tegmina are obliquely banded, the pale area on the face larger than in the type. OAHU, Koolau range].
- (d). Vertex narrow, longer, slightly wider basally than apically. Tegmina not strongly spotted, sometimes scarcely so apically, with yellowish fuliginous transverse stripes (sometimes little apparent). Legs yellowish.....8. *kaohinani*, sp. nov.

* Perhaps also from OAHU, (Waianae, 3000 ft.) MAUI, (Kipahulu, O. H. S., and Haleakala, 5000 ft.).

I have to thank Mr. W. M. Giffard for the generous gift of his collections, and Messrs. O. H. Swezey and F. W. Terry for allowing me the loan of their specimens for examination. The foundation of this paper has been the balance of the collections made by Dr. Perkins for the "Sandwich Islands Committee."

The following new forms have been described in this paper:

Iolania perkinsi var. *notata*.

Oliarus kahavalu, *kaonohi*, *filicicola*, *procellaris*, *pluvialis*, *nubigenus*, *silvicola*, *montivagus*, *acaciae*, *haleakalae*, *monticola*, *kaohinani*, *silvestris*, *pele*, *kauaiensis*, *paludicola*, *nemoricola*, spp., and *kaonohi* var. *volcanicola*; and *orono* var. *molokaiensis* and *oahuensis*.