

and to estimate how far isolation has been the cause of the origin of species.

Personally I believe that "isolation", together with the comparative absence of "Natural Selection", owing to the simple conditions of the biological environments, has been the chief agent in the production of species of our insect fauna.

NOTE:—The above notes were written before I had the pleasure of reading Dr. R. C. L. Perkins' "Introduction" to the Fauna Hawaiiensis. It was of great interest to me to read his conclusions, founded upon so detailed a study of the insect fauna, on several of the subjects that I have touched upon. One of the great values of this work is that it is the first time that an isolated tropical island, or group of islands, has been anything like thoroughly worked and then analyzed. The results are of great value, the volume forming the most important of recent contributions to biology. Those who have the pleasure of a personal acquaintance with the author regret that he has not more fully entered into many of the questions discussed, and drawn more fully from his wealth of observations, in a manner that makes his personal discussion of these subjects so interesting.

(On Some Derbidae from Formosa and Japan.*

BY F. MUIR.

During a short trip to Formosa in December, 1913, the writer was only able to get three days collecting in the forest, one of which was wet. It was therefore not possible to do very much work, but several new Derbidae were among the Homoptera. Thanks to the kindness of Messrs. I. Nitobe, M. Maki and M. Ishida, he was able to procure several interesting specimens, and to examine others. Besides the species mentioned below there were also female specimens of three species of *Rhotana*, one *Goneokara* near to *pullum*, one *Sikaiana* and one *Herpis*. This indicates that when more fully worked the Derbidae of Formosa are likely to be numerous.

Thanks are also due to Prof. S. Matsumura for the loan of certain Japanese specimens.

The types of the following new species are in the collection

* This contribution from Mr. Muir was received at a later date, but it seems desirable to publish it at this time.—Ed.

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of the Hawaiian Sugar Planters' Experiment Station, Honolulu, except where otherwise stated.

Klappan is in Northern Formosa, Horisha and Mt. Ari in Central Formosa.

HERPIS.

(1) *H. brunnea* sp. n. (♂ ♀).

♂ Light brown, darker on scutellum, abdomen and genitalia. Tegmina light brown, veins slightly darker; wings light fuscous with brown veins.

Pygophor with ventral and lateral edges straight, ventral surface with a median, transverse, broad, depression making it concave in lateral view; anal segment fairly large, longer than broad, sub-lanceolate in dorsal view, the apex rounded, anus situated about middle *on ventral side*, anal style arising from beneath apex of segment, flattened, broadened from base, apex produced into two fine points with acutely angular emargination between, bent ventrally from about middle; genital styles large, narrowest at base, roundly emarginate near apex, a ridge running from the inner rounded apical corner to outer edge near base; penis very large and complex.

♀, The female I associate with this male is the same in size and color. The abdomen and styles darker brown. Pregenital ventral plate angularly and evenly produced from sides, with the apex rounded; anal segment small.

There is another female specimen larger and darker in color which may be the rightful spouse of this male. In it the pregenital plate is evenly and angularly produced, the apex rounded, a deep transverse constriction runs across the middle, the plate in the middle, anterior of the constriction, elevated into a rounded knob; anal segment small with anus *on ventral side*, anal style flattened, rounded at sides and angularly emarginate at apex. The shape of the anal segment and style would indicate that this is the true female, but the size and color is in favor of the other.

Length of type 2.5 mm.; tegmen 4 mm.

Length of second female 2.75 mm.; tegmen 5 mm.

Hab. Mt. Ari, April (I. Nitobe); Shinten, June (I. Nitobe); Klappan, December (F. Muir).

This species is congeneric with *vulgaris*, the tegmen being broad, the subcosta and radia separate from near base, the ver-

tex short and wide and the subantennal keel large. The situation of the anus on the under side of anal segment and the development of anal style is peculiar.

VEKUNTA.

(1) *V. albipennis* sp. n. (♂ ♀).

Salmon color, abdomen and genitalia fuscous, a black spot on pleura, tip of labium fuscous. Tegmina and wings hyaline, opaque with waxy secretion, very slightly infusate at end of costal cell, veins yellowish.

Ventral edge of pygophor very slightly and roundly produced, lateral edges produced into small angle, the lower edge of angle sinuous, the upper edge even; anal segment long, rounded at apex, anus in middle, lateral edges produced into a small blunt ventrally-turned spine slightly before middle; genital styles long, reaching to end of anal segment, basal two-thirds with straight, parallel sides, then slightly widened and curved upward, apex rounded, on inner side near base a bluntly-pointed process.

Posterior edge of last abdominal segment of female broadly and angularly produced, the apex rounded, the length of the production about same width at base, slightly asymmetrical on right side at base; anal segment small, little longer than wide, rounded, anus in middle.

Length 4. mm.; tegmen 6.5 mm.

Hab. Horisha (M. Maki); Mt. Ari (I. Nitobe).

(2) *V. nigrolineata* sp. n. (♀).

Yellow to light salmon; a round black spot on pleura, slightly fuscous on keels of face and clypeus, a brown mark down each side of scutellum, abdomen fuscous brown. Tegmina hyaline, opaquely white with waxy secretion, white veins, black along hind margin to end of clavus and along costa to end of costal cell, fuscous over tips of cubital and median veins, a black mark over subcostal and tip of costal cells, wings opaquely white with white veins.

Posterior edge of last abdominal segment broadly and angularly produced, apex rounded, length of production greater than width of base; anal segment round, little longer than wide, anus in middle.

Length 4 mm.; tegmen 6.5 mm.

Hab. Horisha, May (M. Maki); December, on sugar cane (F. Muir); Klappan, December (F. Muir).

Unfortunately, there is no male to compare with *albipennis*.

(3) *V. ishidae* sp. n. (♀).

Dark fuscous brown; legs, labium (except tip) and antennae yellowish, hind femora fuscous, a white, waxy secretion over head, thorax and tegmina. Tegmina dark brown with brown veins, a yellow patch along costa from base of radia to end of costal cell; wings fuscous, veins dark.

Last ventral abdominal plate large, swollen across the middle, the posterior process in side view at right angles to the swollen median portion; posterior edge produced into a flat, subangular, process with rounded apex, its length slightly less than its width at base; anal segment small, slightly longer than wide, subquadrate, apex truncate.

Length 2.5 mm.; tegmen 4.5 mm.

Hab. Daimokko, Formosa, on sugar cane (M. Ishida).

(4) *V. makii* sp. n. (♂).

Light reddish brown; legs and ventral surface yellowish, dorsal surface, especially of abdomen, fuscous, a round black spot on pleura, keels of face and vertex slightly fuscous; tegmina very light brown, veins slightly darker; wings light fuscous, veins darker.

Ventral edge of pygophor truncate or very slightly rounded, lateral edges roundly produced; length of anal segment slightly more than twice the breadth, subparallel-sided, apex truncate, anus a little before middle, lateral edges produced into a fine, downward-pointing spine about middle; styles reaching to end of anal segment, edges even, subparallel, slightly curved upward, apex pointed and turned inward, a rounded process on inner side near base.

Length 3. mm.; tegmen 5. mm.

Hab. Horisha, May (M. Maki).

(5) *V. okadae* sp. n. (♂ ♀).

♂, Stramineous to light brown; darker down each side of scutellum, a round black spot on pleura; abdomen fuscous, especially the male. Tegmina fuscous brown with lighter hyaline spot on costa at end of costal cell; wings fuscous, veins dark.

Ventral edge of pygophor truncate, lateral edges angularly produced, each side of anal segment; anal segment large, length three times the breadth, anus slightly before middle, sides subparallel, apex drawn to a small point; styles large, reaching beyond anal segment, widest about middle, upper edge nearly straight, lower edge curved outward about middle, apex slightly emarginate, two small protuberances on inner surface near base and a small curved spine near them. The shape of these styles is very near to *V. hyalina*, but the

apices are not so broad and the protuberances on inner surface differ.

♀, Medio-ventral portion of last ventral abdominal plate swollen, ventral edge produced in middle, on left side edge of production even, right side angular at base, apex rounded; anal segment small, as wide as long, apex rounded, anus in middle.

Length 3.5 mm.; tegmen 5 mm.

Hab. Japan; Kamakura, September, common on oak; Okitsu, October, on oak.

I name this species after Mr. Okada, from whom I received the first specimen.

(6) *V. umbripennis* sp. n. (♂).

Light reddish brown; tip of labium and round spot on pleura black, a dark brown mark over each side of scutellum, abdomen fuscous, hind margin of ventral plates yellowish. Tegmina fuscous brown, a small lighter hyaline spot on costa at end of costal cell, veins darker; wings fuscous, veins dark.

Ventral edge of pygophor truncate, lateral edges angularly produced, apex pointed; anal segment large, length more than twice the breadth, a small projection in middle of base, apex slightly emarginate, sides sub-parallel, anus about middle; styles large, reaching beyond anal segment, widest about middle, upper edge straight till near apex where it curves upward, lower edge convex, turned upward near tip, apex deeply emarginate; two rounded processes on inner surface near base.

Length 3.5 mm.; tegmen 5.5 mm.

Hab. Horisha, Formosa, May (M. Maki); December (F. Muir).

DEVADANDA.

(1) *D. perplexa* sp. n. (♂).

The antennae of this species differs somewhat from the description and figure of the type of this genus. The first joint is very small, second joint consisting of two portions, a small sub-globose portion, from which the arista arises, and from the base of this a longer, cylindrical, portion bearing long, narrow "scales" or "sense organs" irregular in position. Face in profile not produced so much as in *D. pectinata*.

Edge of vertex and face black, a black mark from eye to edge of face, rest of face and vertex transparent; clypeus, pronotum, scu-

tellum, abdomen and femora black tinged with red, especially on abdomen; labium, tibiae and tarsi yellow. Tegmina brown with red veins; a white mark across middle of costal cell; median, radial and subcostal apical veins lighter red and bordered with white, an irregular triangular dark mark on base of first and second apical and median cells; wings brown, veins dark.

Ventral edge of pygophor truncate, lateral edges slightly and roundly produced; anal segment large and broad, narrowed slightly toward the truncate apex, ventral surface excavate, anus near apex; genital styles extending slightly beyond anal segment, narrow, apices rounded, in ventral view the middle of the inner edge produced into a small point, which on the inner surface stands up as a small flattened process.

Length 2.5 mm.; tegmen 4 mm.

Hab. Horisha; Klappan, December (F. Muir).

NESOKAHA.

(1) *N. infuscata* sp. n. (♂ ♀).

In profile the angle at junction of vertex and face nearly obliterated.

Light yellow; keels on face and vertex tinged with brown, a brown mark from back of eye over the sides of pronotum and scutellum, tegulae dark brown, abdomen and genitalia brownish. Tegmen brown, veins red, apical half of subcostal cell, second and third median apical cells, the greater portion of clavus and between the cubital veins, yellowish. In the female the yellow is more extensive, spreading from clavus into cubital, median and radial cells; wings brown, veins dark.

Ventral edge of pygophor truncate, thickened; lateral edges very slightly and angularly produced; anal segment large, long, straight-sided, narrowing slightly towards apex where each corner is produced into a downward-turned point, anus at apex, ventral surface excavate; styles large, as long as anal segment, apices drawn out into upward turned point, in ventral view outer edges nearly straight to near tip where it curves, inner edge produced into a broad spine slightly beyond middle.

Last ventral abdominal plate produced angularly in middle, compressed laterally so that it appears longitudinally ridged; anal segment very short, apex truncate, each corner being produced into a small point.

Length 3. mm.; tegmen 5.5 mm.

Hab. Horisha, Formosa, December (F. Muir).

KAMENDAKA.

Nicertoides Matsumura, Schäd, und Nützl. Insec. Zucker. Formosa, p. 14, 1910.

Mr. W. L. Distant has kindly compared *N. saccharivora* with the type of *Kamendaka* and informs me that he cannot separate these two genera.

(1) *K. saccharivora* (Mats.).

♂ Pygophor laterally compressed; ventral edge produced into a long, pointed, median process about half the length of genital styles; lateral edges slightly rounded; anal segment nearly as long as genital styles, narrow, sides straight, slightly converging towards apex, anus near apex, apex rounded; genital styles large, broadest about middle, upper edge straight, lower edge convex, apex turned inward and upward slightly.

♀ Last abdominal ventral plate produced angularly in middle.

NICERTA.

(1) *N. flexuosa* (Uhler).

Otiocerus flexuosus Uhler.

This species has the median sectors in apical third of tegmen, the first cubital joining second, enclosing second cubital cell, therefore it comes into the *Nicerta* group and, except for the more flattened antennae, is congeneric with *N. cruenta*.

In Mr. Nitobe's collection there is a damaged male from Mt. Ari near to this species but quite distinct.

MYSIDIOIDES Mats.

Neocyclometopum Muir. H. S. P. A. Bull. Ent. 12, p. 61, 1913.

This genus is near *Heronax*. In female specimens of *M. sapporensis* the vertex is narrow but truncate at apex, a slight keel divides the vertex from face; in the male the keels of face meet at base, making the apex of vertex angular as in *Neocyclometopum*; the difference in the antennae of *N. sordidum* is not sufficient to establish a genus on.

(1) *M. ariensis* sp. n. (♂ ♀).

In structure this conforms to *Neocyclometopum* in both

sexes, the vertex being sharply angular at apex and the keels of face contiguous from base.

Stramineous; tegmina hyaline, a fuscous mark from base of first median sector down median cross vein and up second cubital vein, forming a wide V mark, fuscous mark on vein in middle of subcostal cell, faintly infusate in apical cells and over apical cross-vein between first sector and first cubital vein.

♂, Ventral edge of pygophor truncate, lateral edges dorsally curving to base of anal segment; anal segment with the apex produced into a long spine which is turned down at right angle to basal portion, basal portion a little longer than broad, subparallel-sided, anus near middle; genital styles reaching to the end of the broad portion of anal segment, apices rounded with a slight emargination, bent upward at a right angle near middle, a rounded projection on the lower edge near angle.

♀, Last ventral plate of abdomen slightly and angularly produced in middle; anal segment very small, narrowed towards rounded apex.

Length 2.5 mm.; tegmen 6. mm.

Hab. Mt. Ari, Formosa, October (Mr. Nitobe).

Type in Mr. Nitobe's collection. There are three other species of this genus, each represented by only a single female, so I have not described them.

DIOSTROMBUS Uhler.

(1) *D. politus* Uhler.

I have both sexes from Formosa, but have not been able to compare them with Japanese specimens.

Male pygophor very short, nearly hidden by preceding segment, anal segment long and narrow, reaching nearly to end of styles, apex drawn out into an acute point, anus about middle, a small, blunt projection over anus. Styles long, spine-like, irregularly curved inward, a small spine on inner side near apex, at base. The upper edge produced into a large quadrate process with a small curved spine at each upper corner. Aedeagus large, surrounded by the basal quadrate projection of styles.

In the female the genital styles are very greatly reduced, but from below them arises a pair of flattened processes, subparallel-sided till near their pointed tips, each side of the preceding segment is produced into a nearly semi-circular plate; anal segment very short. The female of this species is likely to be mistaken for the male on account of these style-like projections.

ZEUGMA.

(1) *Z. makii* sp. n. (♂).

Stramineous; vertex, face, clypeus, middle of pronotum and scutellum red, front legs fuscous; tegmina hyaline, pale, dirty yellow with lighter veins, media and bases of median sectors and cross-veins fuscous.

Ventral edge of pygophor produced into a small median rounded projection; on each side of the anal segment the sides produced into a triangular plate with the base half as long as the sides, the apex turned slightly inward and rounded; anal segment small, about one-third as long as the lateral projections of pygophor, apex roundly emarginate, anus in middle; styles slightly shorter than lateral projections, subparallel-sided on basal half, then slightly narrowing to the blunt apex. The long, narrow lateral projections look like a second pair of styles.

Length 5. mm.; tegmen 10. mm.

Hab. Horisha, October (Maki).

I have named this interesting species after Mr. M. Maki to whom I am indebted for the specimen.

At first I considered this as a distinct genus on account of the narrowness of the vertex and face, but having seen species from the Philippines and Java in which this character is intermediate between *vittata* and *makii* I have placed them together.

ZORAIDA.

(1) *Z. nitobii* sp. n. (♀).

Tegmen with five cubital veins and four median sectors; antennae about as long as head and thorax.

Light brown, slightly darker across base of pronotum and between keels of scutellum, some darker spots on abdomen, pronotum with light granules. Tegmina hyaline marked with fuscous brown, the marking proceeding from base between subcosta and cubitus, forming a broken band across middle of cubital veins to hind margin, and another broken band over bases of sectors and apices of cubital veins to hind margin, and through subcostal cell to apex of costal cell, another dark mark in middle of costal cell; veins all light brown. Wings fuscous, darker along veins which are light brown.

Hind edge of last ventral abdominal plate evenly produced into

obtuse angle, the apex turned upward; anal segment slightly longer than wide, sub-lanceolate, reaching to middle of genital styles, apex round and slightly turned down; anus near base.

Length 5.5 mm.; tegmen 15. mm.

Hab. Mt. Ari, October (I. Nitobe).

Type in Mr. Nitobe's collection.

(2) *Z. pterophoroides* (Westw.) (♀).

The male of this may show it to be specifically distinct from the Indian species.

Hab. Mt. Ari, October (I. Nitobe).

PARAPROUTISTA.

(1) *P. variegata* sp. n. (♂ ♀).

Antennae about as long as face; six median sectors, third furcate; hind tibia with apical, median and basal spines.

Straw color tinged with green; tip of labium, apex of clypeus, dorsal and lateral portion of abdomen and front and middle tarsi fuscous. Tegmina hyaline, subcosta and radia veins yellowish, others mostly white; four or five small reddish spots at end of the transcostal veins; a fuscous spot on hind margin at the end of each vein; the transverse veins between sectors fuscous; a fuscous mark through end of radial cell, along the middle of fourth sector and the bifurcation of third sector, forming an irregular V mark; infusate in cubital and middle of radial cell; wings hyaline with brown veins.

♂, Ventral and lateral edge of pygophor truncate; anal segment medium size, broadly round at apex, anus near apex, widest just before anus, ventral surface excavate; styles short and broad, irregularly rounded, a small angular emargination on lower edge near apex, and a small outwardly turned spine on upper edge near base.

In female anal segment very short, sunk into preceding segment, from below arises a pair of curved spines with upward-turned apices; styles abortive.

Length 3. mm.; tegmen 8. mm.

Hab. Horisha and Mt. Ari; May (M. Maki); October (I. Nitobe); December (F. Muir).

RHOTANA.

(1) *R. unimaculata* sp. n. (♂).

Stramineous, fuscous over pleurae of abdomen. Tegmina vitreous; veins yellow spreading into cells, especially over cross-veins; a fuscous mark through middle and another at apex of costal cell; slightly fuscous over cubital and third and fourth median apical cells, an irregular round, black mark on hind margin between cubital veins; wings white, veins yellowish, a round, black mark on apical margin with black over apical vein anterior to it.

Pygophor laterally compressed; ventral margin truncate, lateral margins acutely angularly produced; anal segment short, anus at apex; styles lanceolate, apex slightly rounded, lower edge more convex than upper, reaching beyond angular production of lateral edges of pygophor.

Length 3. mm.; tegmen 6. mm.

Hab. Mt. Ari; October (I. Nitobe).

MECYNORHYNCHUS.

(1) *M. stramineus* sp. n. (♂).

Stramineous; slightly tinged with red along facial keels, hind margin of pronotum and dorsum of abdomen. Tegmina hyaline, slightly opaque with white, waxy secretion, veins white, a small black triangular mark at base of fourth median sector, slightly infusate over apical veins and cross-veins, and on hind margin at end of cubitus; wings white, slightly opaque with waxy secretion.

Pygophor compressed laterally, ventral edge truncate, lateral edges slightly convex; anal segment very short; styles sub-quadrate, reaching to end of anal segment, longer than broad, apex truncate, slightly constricted near base.

Length 2. mm.; tegmen 4. mm.

Hab. Mt. Ari; October (I. Nitobe).

The clypeus and labium not quite so long as in *kershawi*.



Muir, F. 1914. "On some Derbidae from Formosa and Japan." *Proceedings of the Hawaiian Entomological Society* 3, 42–52.

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