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PAPERS FROM THE HOPKINS STANFORD GALA-
PAGOS EXPEDITION, 1898-1899.

I.

INTRODUCTION.

IN the fall of 1898, Messrs. G. W. Kneass and W. Johnson fitted out, in San Francisco, a sealing schooner, the *Julia E. Whalen*, for a cruise to the Galapagos Islands. Thanks to the generous coöperation and liberality of Mr. Timothy Hopkins, Stanford University was enabled to transform this proposed sealing voyage, in part at least, into a naturalists' voyage. It was arranged that Capt. W. P. Noyes, who commanded the schooner, should take on board two representatives of Stanford University, together with their outfit, should land them on the various islands in the Galapagos group as also upon Cocos and Clipperton Islands, should afford them opportunities to make collections of plants and animals, and should then bring them and their collections back to San Francisco. Dr. C. H. Gilbert, head of the zoölogical department in Stanford University selected as collectors on this voyage, Robert E. Snodgrass and Edmund Heller, advanced students in his department, who had had experience as collectors. Everything was carried out as planned. Snodgrass and Heller with their outfit on board, sailed from San Francisco with Captain Noyes on Oct. 25, 1898, touched at Guadalupe Island, November 5, were at Clipperton Island, November 23d and 24th and reached the Galapagos Islands, December 8, 1898. Here they remained about six

months collecting in the various islands till June 23, 1899, and then sailed to Cocos Island where they remained five days, June 29th to July 3d. Thence they sailed homeward and after touching at Clarion Island, in the Revillagigedo group, on August 2, they arrived in San Francisco on August 15, 1899.

Their collections include mammals, birds, reptiles, fishes, insects, mollusks, arachnida, crustacea, echinoderms and plants in all of which departments they strove to make full collections. Most of the material will be permanently retained in Stanford University. The spiders and insects have been sent to Dr. L. O. Howard, in Washington, for distribution to and study by the government specialists in the various orders. All the collections are to be studied and reported upon by specialists and the results published in these proceedings under the general heading *Papers from the Hopkins Stanford Galapagos Expedition, 1898-1899.*

ENTOMOLOGICAL RESULTS (1):

HEMIPTERA.

BY OTTO HEIDEMANN.

U. S. DEPARTMENT OF AGRICULTURE.

IN the collection of hemipterous insects brought back from the Galapagos Islands by Mr. R. E. Snodgrass, in 1899, I find two species new to science. These are described in this paper. Several others, though previously known, had not been previously reported from or collected in the Galapagos.

Family PENTATOMIDÆ.

1. *Podisus sordidus* Stal.

Podisus sordidus STAL, Freg. Eug. Resa, Ins., p. 221, 1859.

Charles, May 10, 1899. Indefatigable, April 28, 1899. Chatham, May 25, 1899. Albemarle, March 11 and 23, 1899.

Six specimens and five specimens in larval stage; three males and females. Stal's type came from the Galapagos Islands.

2. *Mutica grandis* Dallas.

Canthecona grandis DALLAS, List I, Hemipt., p. 91, 1852.

Charles, June 25, 1899.

One specimen, a female. This species is found in the West Indies, Mexico and Brazil. It is also recorded from Florida.

3. *Nezara viridans* Stal.

Nezara viridans STAL, Freg. Eug. Resa, Ins., p. 128, 1859.

Albemarle, February 1, 1899.

A single specimen, a male. The species also occurs in Peru and Panama. It had previously been recorded from Chatham Island in the Galapagos archipelago by Mr. P. R. Uhler (Scien. Res. Expl. Fish Comm. Steamer Albatross).

4. *Thyanta perditor* Fabricius.

Cimex perditor FABRICIUS, Ent. Syst., IV, p. 102, 1794.

Albemarle, June 9, 1899. Chatham, May 25, 1899.

Two specimens; male and female. It belongs to the group which has the spines on the lateral margin of the thorax shorter.

Family COREIDÆ.

5. *Anasa obscura* Dallas.

Anasa obscura DALLAS, List II, Hemipt., p. 505, 1852.

Chatham, May 25, 1899.

Two specimens, male and female. Originally described from the Galapagos Islands.

6. *Jadera sanguinolenta* Fabricius.

Cimex sanguinolenta FABRICIUS, Syst. Ent., p. 721, 18, 1775.

Wenman, December 18, 1889.

Four specimens, males and females. Two are of the brachypterous form. This species occurs in the West Indies, in Brazil, and is also found in Paraguay.

7. *Stenocephalus insularis* Dallas (?).

Stenocephalus insularis DALLAS, List II, Hemipt., p. 482, 1852.

Indefatigable, April 28, 1899.

A single specimen. It seems to agree with the description by Dallas, but the specimen is too soiled to allow a definite determination.

The type specimen came from the Galapagos Islands.

8. *Harmostes serratus* Fabricius.

Coreus serratus FABRICIUS, Ent. Syst. IV, p. 133, 1794.

Albemarle, February 25, 1899.

Two specimens, male and female. The specimens have the principal characters of *Harmostes serratus* Fabr., but differ somewhat in having a shorter rostrum; they belong to the pale variety.

Family BERYTIDÆ.

9. *Jalysus (Metacanthus) tenellus* Stal.

Jalysus tenellus STAL, Freg. Eug. Resa, Ins., p. 236, 1859. Enum. Hem., iv, p. 128, 1874.

Chatham, May 27, 1899.

One specimen, which agrees very well with Stal's description, differing only in the length of the fourth joint of antennæ, which is much shorter than the second.

Family LYGÆIDÆ.

10. *Nysius marginalis* Dallas.

Nysius marginalis DALLAS, List II, Hemipt., p. 556, 1852.—STAL, Freg. Eug. Resa, Ins., p. 252, 1859.—BUTLER, Proc. Zool. Soc. London, p. 85, 1877.

Two specimens; male and female. This species has never been reported from any place outside of the Galapagos Islands.

Family CAPSIDÆ.

11. *Miris lineata* Butler.

Miris lineata BUTLER, Proc. Zool. Soc. London, p. 89, 1877.

Albemarle, June 12, 1899.

Two specimens, one is a larva. The adult specimen agrees very well with Mr. A. G. Butler's description of a *Miris* from Charles Island (Galapagos Islands) except that it is somewhat larger.

Family REDUVIIDÆ.

(Subfamily Harpactoridæ.)

12. *Cosmoclopius (Harpactor.)* sp.?

Albemarle, June 12, 1899.

One specimen in the larval condition. Probably *Harpactor nigro-annulatus* Stal.

(Subfamily Nabidæ.)

13. *Nabis punctipennis* Blanchard.

Nabis punctipennis BLANCHARD: GAY, Hist. de Chili, Zool., VII, p. 161, 1852.—SIGN, Ann. Soc. Ent. de France, Ser. 4, III, p. 577.

Charles, May 10, 1899. Albemarle, March 23, 1899.

Two specimens; male and female. It very closely resembles the common species *Nabis ferus* Linné.

(Subfamily Emesidæ.)

14. *Ghilianella galapagensis* sp. nov.

A female.—Body slender, color brown, abdomen mottled with darker brown. Head nearly three-fourths the length of prothorax, sparsely granulated, eyes moderate; the usual porrect frontal spine is reduced to a blunt tooth. Antennæ light brown, first and second joints equal; the terminal joints are wanting in the specimen. Front legs ochraceous, comparatively short and stout, the large spine near base of femora tipped with black; tibiæ faintly annulated with brown, front tarsi claw-like, equal in length with the tibiæ; femora of the middle legs about as long as abdomen, but the femora of the hind legs longer; the tibiæ annulated, at base pale ochraceous. Mesothorax and metathorax equal in length; prothorax a little longer and ornamented with two oval-shaped spots, and a longitudinal line in the middle, pale ochraceous, also a streak on the sides near apex; above densely covered with small brown granules, less so below. Mesothorax and metathorax have a flat surface, the sides obsoletely granulated and sharply edged, and a longitudinal, raised line in the middle; a well defined carina on the underside of the body runs from the base of mesosternum down to the apex of sixth segment of abdomen. The abdomen is gradually inflated from the end of second segment to the fifth and then narrowing slightly towards apex; the lateral margins are a little raised, more so on the last segments; the first genital segment is slightly sloping, and the apex rounded off, the second abruptly declivous; dorsal part of abdomen flat, under side much rounded; first and second segments, seen from above, equally long; the third, fourth and fifth gradually become shorter, the sixth segment is shortest; at sides of second segment a little behind its base are two small erect spines, also small tubercles at apex in the middle of nearly all the segments, the one on the fourth segment is more prominent. The under side of abdomen is beset with small, stiff, golden hairs, which are irregularly arranged. Length 13 mm.

Type.—No. 4931, U. S. Nat. Mus.

One specimen, collected on Hood Island, May 8, 1899, and one larva collected on Albemarle Island, March 15, 1899. This insect seems so distinct from the other species of the genus, that I have ventured to describe a new species from but one specimen. It somewhat resembles *G. gibbiventris* Champ. and also *G. fliventrīs* Spin., but differs from both in length of meso- and metathorax, which are equally long, and in the structure of the abdominal segments. The

species can be easily distinguished by the reduced frontal spine and by the pale ornamental spots on the prothorax.

Family SALDIDÆ.

15. *Salda rubromaculata* sp. nov.

A male.—Body blackish, pubescent, with fuscous and yellow markings. Head stout, black between the eyes, in front yellow; two short, black lines running sideways to the cheeks, which are yellow; tylus testaceous, polished, prominent, and much curved downwards; underside of head yellowish, on the middle of the throat a black mark; the occiput carries behind the ocelli two orange-yellow, round dots, which are quite conspicuous. Antennæ yellowish, the ultimate joints more fuscous. Rostrum yellow, at tip blackish, reaching the intermediate coxæ. Pronotum twice as wide as long, slightly narrowing anteriorly to nearly the same width as the head; the callosities, forming the anterior lobe, convex, not reaching the sides, rounded by an impressed, transverse line, which is deeper in the middle; the anterior margin straight, narrow, yellow, behind it a round, sunken line; posterior margin very concave; the lateral margins straight, narrow, flattened, somewhat reflexed, anteriorly rounded; the humeral angles rectangular, with an oblong tubercle near the sides; color of the thorax yellow, except the anterior lobe, which is black, a little shining, but shows on front of the sides a small forked yellow streak. Scutellum large, twice the length of the thorax, hollowed out a little, before the middle, margins and apex yellow. Hemelytra flat, sericeous; clavus yellow with a black line in the middle, and a brown dot near the apical part; corium yellow, the inner side towards apex dark fuscous, maculated with reddish-brown; near costal margin a darker streak with a black spot behind the middle, also one at apex of corium and base of membrane; the discal and apical areoles more pale yellow; sutures and nervures blackish; costal margins narrow and entirely yellow. Membrane pale, with five long areoles; veins are brownish. Legs yellow, the femora above a little infuscated, coxæ fuscous. Sternum black, with broad yellowish-white margins. Abdomen dark brown, densely covered with fine hairs; the segments edged with yellow, the genital segment yellowish at apex.

Length, 3.5 mm.; width, 1.5 mm. Type—No. 4930, U. S. Nat. Mus.

One specimen from Albemarle Island, January 23, 1899. This new species belongs to the group, having membrane consisting of five cells. Judging from the descriptions of *S. ventralis* Stal, and *S. argentina*

Berg, it seems to approach these. In size and color, it more nearly resembles the latter, but differs in the arrangement of the spots on the corium and membrane, and in having costal margins entirely yellow.

Family GERRIDÆ.

16. *Halobates Wuellersdorffi*, Frauenfeld.

Halobates Wuellersdorffi FRAUENFELD, Verh. Zool. Ges., v, 17, p. 418.—B. WHITE, Challenger Exp. Zool., v, VII, p. 40.

Seven specimens, three males and four females, were taken between Clarion and Clipperton Islands, November 2, 1898. Other specimens were previously found near James Island, Galapagos Islands (Proc. U. S. Nat. Museum, v, XIII, p. 194), and in the North Pacific near the California coast. In this lot of *Halobates* was one female, which carried a few eggs on her under side, attached to the last segments of the abdomen. This bug must have been captured in the very act of egg-laying, as one egg is protruding from the ovipositor. The following notes on the subject of egg-laying are from Professor Buchanan White in his report on the Pelagic Hemiptera (Challenger Exp. Zool., v, VII, p. 71). He says: "No observations have been made as to when and where the eggs are deposited. The statement, that the female carries them about, attached to the abdomen, after they have been extruded, Professor Moseley informs me is a mistake."

Dr. E. Witlaczil in his treatise on *Halobates* (Wiener Ent. Zeit., Vol. v, p. 233, 1856) mentions, that, during the voyage of the *Pisani* a feather of a bird was fished out from the ocean, off the southwest coast of the Galapagos Islands, entirely covered with eggs of a reddish color. Doctor Witlaczil prepared them for microscopical examination, and could distinctly observe the embryos of a *Halobates*.

17. *Halobates* sp.?

Albemarle, January 2, 1899.

Five specimens, four females and one male. Doubtless a new species. The material, however, is in such condition that it can not be satisfactorily described. The middle tarsi of all the specimens are more or less damaged. This oceanic bug closely resembles *Halobates sericeus* Eschscholtz in shape of body and in color; also to *Halobates hayanus* B. White in form of antennæ and front tarsi. But it resembles more closely *Halobates germanus* B. White in the structure and color of the abdominal and genital segments, and differs only in the terminal joints of antennæ, of which the third and fourth are nearly equal, and the second a little longer than the fourth, whilst in

that species the fourth joint is longer, and the third comparatively smaller. In the front tarsi the second joint is shorter, being half the length of the first joint. The insect also shows some affinities to *Halobates regalis* Carpenter, and *Halobates incanus* Wtlaczil.

SUBORDER HOMOPTERA.

Family FULGORIDÆ.

18. *Mycterodus productus* Stal.

Mycterodus productus STAL, Freg. Eug. Resa, Ins., p. 278, 1859.

Albemarle, January 23, 1899.

Nine specimens, varying in color.

19. *Jassus (Deltocephalus)* sp.?

Albemarle, January 23, 1899.

One single specimen, not quite mature.

20. *Jassus* sp.?

Albemarle, January 1, 1899.

One specimen; mutilated beyond recognition.

21. *Cicada* sp.?

A single specimen, in the first or second pupal stage, found on Cocos Island, February 2, 1899. It burrows in the ground and may be found in that stage of development about two feet beneath the surface