INSECTS OF HAWAII, JOHNSTON ISLAND AND WAKE ISLAND

BY

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AND COLLABORATORS

BERNICE P. BISHOP MUSEUM

BULLETIN 31

TANAGER EXPEDITION
PUBLICATION NO. 3

HONOLULU, HAWAII
PUBLISHED BY THE MUSEUM
1926.

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INTRODUCTION

By

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GENERAL RELATIONS

Although the insect fauna of the principal islands of Hawaii is as well known as that of any islands in the Pacific, hitherto little has been reported concerning the insects of the small islets and rocks lying west and northwest of Kauai. Previous to 1923 systematic collecting had been undertaken only on Laysan Island. This island was visited in 1896 by Schauinsland,[1] who reported on the plant and insect life. Insects were collected there also by G. P. Wilder[2] in 1905, by W. A. Bryan[3] in April, 1911, and by David T. Fullaway in December 1912. The species captured by these three collectors are listed by Fullaway.[4]

In 1923 the Tanager Expedition[5] made a scientific survey of the islands extending northwestward from Kauai and also of Johnston and Wake islands. (See fig. 1.) During April, with David T. Fullaway as entomologist, the expedition visited Laysan, Ocean, and Midway islands and Pearl and Hermes Reef. During May, Dr. Stanley C. Ball and Major C. Grant collected insects on Laysan and Lisiansky islands, Pearl and Hermes Reef and Gardner Rock. During June, July, and August E. H. Bryan, Jr., served as entomologist on the visits of the Expedition to Nihoa, Necker, Johnston, and Wake islands, and French Frigate Shoals.

Several degrees of insect life were met with on these expeditions. On each island the insect fauna seems to have developed up to the limit of its environment. The limiting factors seem to be: the variety and extent of

[1] Schauinsland, H., Drei Monate auf einer Koralleninsel; Bremen, 1899.

[2] Perkins, R. C. L., [List of Midway and Laysan Insects collected by G. P. Wilder]: Hawaiian Ent. Soc. Proc., Vol. 1, pp. 33-34, 1905.

[3] Dill, H. R. and Bryan, W. A., Report on an expedition to Laysan Island in 1911: U. S. Dept. Agric., Biol. Survey, Bull. 42, 1912.

[4] Fullaway, D. T., List of Laysan Island insects: Hawaiian Ent. Soc. Proc., Vol. 3, pp. 20-24, 1914.

[5] Gregory, H. E., Report of Director for 1923: B. P. Bishop Museum, Bull. 10, pp. 19-23, 1924.

the flora, the presence or absence of fresh or brackish water, and the number and character of other animals present.

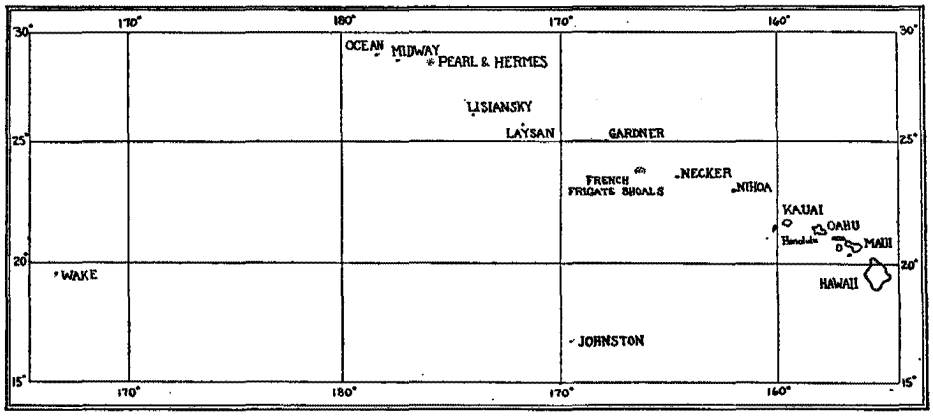

FIGURE 1. Map showing islands visited by the Tanager Expedition.

The poorest type of insect fauna, as might be expected, was that found on the low sand islets, with a strictly limited flora, and without fresh, or even brackish water. Johnston Island, Lisiansky Island, Pearl and Hermes Reef, two islets of Ocean Island, and the wandering sand spits of French Frigate Shoals are of this type. In this class also might be placed Gardner Rock and La Perouse Rock, which are almost bare of vegetation.

A more advanced type of insect life was found on the larger coral and sand islets, such as the two islets of Midway, the main islet of Ocean, and Laysan (as it was formerly). These possess a few shrubs in addition to the usual herbs and grass. Laysan, which at present is nearly bare of vegetation, at one time supported a much heavier flora, as is shown by the remains of sandalwood trees, and by records of former Pritchardia groves. In 1912, Mr. Fullaway caught a much greater variety of insects than in 1923, among them several endemic species. Brackish water was found on Laysan and Midway islands and possibly could have beeen obtained on Ocean Island.

The high islands, Necker and Nihoa, possess an even more extensive flora, with its accompanying insect fauna. Nihoa has about twenty-two species of plants, including a few native Hawaiian forms and small groves of Pritchardia palms. Here in addition to the usual immigrant species of insects, were found what might be termed "native remnants."

The insect fauna of Wake Island was markedly different from that of the other islands visited. Both the fauna and the flora of this island are

South Pacific in character and closely resemble similar coral atolls to be found clear across the Pacific from the Carolines to the Tuamotus.

Not only are the insects closely associated with definite plants, or the presence or absence of certain types of vegetation; the presence of some species is dependent upon the presence or absence of certain other animals. Such species as *Dermestes cadaverinus,* various ants, diptera larvae, earwigs, and other scavangers, are found feeding on dead birds. Where the carcasses are cleaned up by hermit crabs, as on Wake Island these species are absent. The Mallophaga and Hippoboscidae are associated with different species of live birds.

Most of the insects found are forms widespread in the Pacific. Of the endemic insects, those on the outlying islands, except Wake Island, are related to species on the larger Hawaiian islands. Many of these native Hawaiian insects are quite distinct from forms found elsewhere, but they appear to have some affinity with the endemic species of the southwest Pacific islands.

ECOLOGICAL FIELD NOTES

From the field notes made by D. T. Fullaway, the following comments have been taken:

> On Laysan Island there is an absence of grass, sedge or tall bushes of any kind, except two half dead hau bushes, some stunted ironwood trees, and two small coconut palms near the house, all of which are used by nesting birds. There are some patches of Sesuvium along the lake, and a few sprouting bushes of Scaevola, for the most part flattened and dead, and a large patch of wild tobacco. Grass clumps could be found by digging in the sand.
>
> It was apparent at once that a great change had come about on the island since 1912, or even 1916. Young Schlemmer said it was due to a severe sand storm. . . I believe the destruction of vegetation has been due to the rabbits.

Insects were collected from birds' nests, carcasses, under driftwood and rocks, about the dilapidated house, and on the Scaevola and tobacco. Mallophaga were found on the noddy tern, gray-back tern, sooty tern, and wedge-tailed shearwater. Hippoboscid flies were obtained from frigate bird nests.

Ocean Island is made up of three islets, the largest about 1300 yards long by 300 to 800 yards wide. It is low and sandy, with a barrier fringe of Scaevola surrounding a flat covered with low shrubs and herbs. The other two islets, at the southwest, are only sand spits.

Eastern islet of Midway Island is somewhat like Ocean, having a fringe of Scaevola enclosing a central open space. A grove of ironwood trees (*Casuarina equisitifolia*) had been planted at the eastern end, and a herd of donkeys live on the island.

Sand Island has been reclaimed and planted to trees and gardens with the help of soil imported from Honolulu. This fact and the presence of a small colony of persons at the cable station explain the presence of several species of insects undoubtedly introduced from Honolulu.

Pearl and Hermes Reef encloses three small islets. On the flat southeastern islet a number of rabbits and the remains of a camp were found. The vegetation includes two kinds of grass, patches of Sesuvium, some Tribulus vines, and three other species of small herbs. The two islets to the westward have patches of Scaevola and a slightly greater variety of plants, including Tribulus, Lepidium, Capparis, Sesuvium, two kinds of grass, and four or five other species of low plants.

On the islands of Laysan, Lisiansky, Pearl and Hermes Reef, and Gardner Rock, Dr. Ball and Major Grant obtained a few specimens, which indicated that the insect fauna of Lisiansky and Gardner is similar to that of other islets with scanty vegetation and no fresh water.

Lisiansky is a low, flat sand and coral island, similar to, but somewhat smaller than Laysan. In its center is a shallow depression, a dry lagoon. It is bare of vegetation except at the north end, where grows a small crescent-shaped patch of broad-leaved bunchgrass, in which were a few weeds. Rabbits, found on the island, were probably the cause of the denudation.

Gardner Rock consists of two nearly bare rocks, probably parts of a volcanic core. They rise in three small peaks, the highest of which is about 170 feet. The steep slopes are bare of vegetation except for small pockets of Sesuvium, and algae on the moist surfaces. Mites, spiders, centipedes and isopods were found among the rocks, and the cases of case-bearing moths were found attached to bare rock faces. Two small flies and an earwig were also procured.

Nihoa is a rocky, volcanic island, rising about 900 feet in a fairly steep slope on the south side, falling abruptly in a sheer cliff on the north side. It is about 1500 yards long (east and west), and from 300 to 1000 yards wide. The south slope has been eroded into a series of seven valleys, which lead into three small bays. This south slope is well covered with low vegetation: Chenopodium below, Sporobolus (bunch grass) above, with scattered areas of scrubby Euphorbia, Tribulus, Sida, and other shrubs and herbs, about twenty-two in all. Some of the valleys contain small groves of Pritchardia palms. Small terraces, house sites, and the remains of walls, suggest former occupancy by man.

Lying about 120 miles W. N. W. of Kauai, Nihoa Island possesses the greatest number of endemic species found on any island visited by the Tanager Expedition. The close relationship of these species to forms on

Kauai is suggestive. The bulk of the specimens were obtained from the bunch grass, Euphorbia and Sida, although the palms yielded a few species and some collecting was done on all the plants, on dead birds, under stones and in the dirt. The cases of numerous Microlepidoptera (genus Hyposmocoma) were found on rock faces, but the prevailing high wind made night collecting with a light fruitless, the few specimens captured being much rubbed.

Necker Island, which lies 150 miles W. by N. of Nihoa, is about 1300 yards long and 200 yards wide, and reaches a height of 275 feet in a series of undulations. Like Nihoa, Necker Island is rocky and of volcanic origin. Its sides are steep, with terraces, some of them artificial with rows of stones set up by man. The surface is partly bare rock, and partly covered with sparse vegetation including bunch grass, Chenopodium, Tribulus, and Sesuvium. Insect life is abundant, but of very few species. Spiders, centipedes, and a native Elaterid beetle were found under stones. Several species of moths are present. And the Chenopodium is badly infested with a Nysius bug. The Rhyncogonus weevil is abundant about the roots of bunch grass, a situation similar to that in which another species is found on Nihoa Island.

French Frigate Shoals consists of a single steep rock, La Perouse Rock, bare of vegetation, covered with bird guano, about 120 feet high; and thirteen small sand spits, enclosed in a crescent-shaped reef. Most of the sand spits have one or more species of plants on them, although one or two of them are bare. The vegetation consists of Lepturus (bunch grass), Boerhaavia (creeper), Portulaca (pig weed), Tribulus, Chenopodium (low shrub), and Ipomoea (morning glory vine). The usual insects were found associated with the plants and dead birds. Crickets, spiders, and centipedes were found in a pile of rotting boards. The sand islets have the appearance of being washed from place to place within the reef, and most of them could easily be washed over by heavy seas at time of storm. These islets lie 80 miles W. by N. of Necker.

Johnston Island is a low sand and coral island, 717 miles W. S. W. from Honolulu. It is 800 yards long, about 200 yards wide, and reaches a height of 48 feet at one end. A mile and a half to the N. E. lies a small sand island, 200 yards in diameter. Both islets are enclosed by a semicircular reef, nearly continuous on the north, but open to the south. The vegetation consists of dry, brown bunch grass (Lepturus), with patches of Tribulus and a few plants of Boerhaavia.

Wake Island is an atoll, made up of three islets, which lie in a horseshoe curve, the two ends connected by a reef. The whole atoll measures about

two and a half miles by five miles. Behind a broad beach of sand and broken coral, with numerous coral boulders, rises a dense stand of low trees and shrubs. Among these are *Tournefortia argentata* Linn., *Pemphis acidula* Forst., *Cordia subcordata* Lam. (the Hawaiian kou), *Scaevola frutescens* (Mill.) Krause, *Pisonia grandis* (?) (the "Buka" tree of the south Pacific), and several shrubs and herbs. Most of these plants, and the accompanying insects, are to be met with on a typical South Pacific atoll. The islands are overrun by hermit crabs, which accounts for the scarcity of scavenger insects. The remains of wooden huts may help to explain the presence of certain flies and other insects associated with man. A few new species of insects were found on Wake Island, but the bulk of the insect fauna was of a widespread, South Pacific character.

ACKNOWLEDGMENTS

It is a pleasure to recognize the generous helpfulness of specialists who have shared in the task of identifying the extensive collections made on the Tanager Expedition. Among those to whom thanks are due are:

Dr. J. M. Aldrich, Associate Curator, Division of Insects, U. S. National Museum; Prof. R. V. Chamberlain, Curator of Myriopoda, Arachnida and Vermes, Museum of Comparative Zoology, Harvard University; Mr. E. T. Cresson, Jr., Assistant Curator, Academy of Natural Sciences, Philadelphia; Mr. Morgan Hebard, Research Associate, Academy of Natural Sciences, Philadelphia; Prof. Arthur P. Jacot, Professor of Biology, Shantung Christian College; Mr. J. R. Malloch, Assistant Biologist, United States Biological Survey; Mr. F. Muir, Entomologist, Experiment Station, Hawaiian Sugar Planters' Association; Dr. R. C. L. Perkins, Consulting Entomologist, Experiment Station, Hawaiian Sugar Planters' Association; Prof. A. Petrunkevitch, Professor Comparative Zoology, Yale University; Dr. R. C. Shannon, Entomologist, Instituto Bacteriologico, Buenos Aires; Mr. O. H. Swezey, Entomologist, Experiment Station, Hawaiian Sugar Planters' Association; Mr. P. H. Timberlake, Assistant Professor of Entomology, University of California Graduate School of Tropical Agriculture; Mr. R. H. Van Zwaluwenburg, Assistant Entomologist, Experiment Station, Hawaiian Sugar Planters' Association; Prof. William Morton Wheeler, Dean, Bussey Institute, Harvard University.

DISTRIBUTION OF INSECTS

KEY TO COLLECTORS

R. Recorded by Hon. W. Rothschild.....1894
S. Collected by H. Schauinsland.....1896
W. Collected by G. P. Wilder.....1905
B. Collected by W. A. Bryan.....1911
F. Collected by D. T. Fullaway.....1912
K. Collected by Dr. Wm. Kerr.....1914
T. Collected by Tanager Expedition.....1923

	Nihoa	Necker	French Frigate	Laysan	Lisianesky	Gardner	Pearl & Hermes	Midway	Ocean	Johnston	Wake
HYMENOPTERA											
FORMICIDAE											
Ponera kalakauae Forel		T	T	T							
Monomorium minutum Mayr		T		F				T			
Monomorium floricola (Jerdon)	T										T
Monomorium pharaonis (Linn.)			T							T	T
Monomorium destructor (Jerdon)				T							
Monomorium gracillimum (Sm.)				F							
Pheidole megacephala (Fabr.)								T			
Cardiocondyla nuda var. minutior Forel.		T	T					T			
Tetramorium guineense (Fabr.)	T	T		T			T	T	T		
Tapinoma melanocephalum (Fabr.)	T			F				T	T		
Prenolepis longicornis (Fabr.)	T										
Prenolepis bourbonica hawaiiensis Forel.								T			T
BETHYLIDAE											
*[6]Sclerodermus nihoaensis Timberlake	T										
HYLAEIDAE											
*Nesoprosopis perkinsiana Timberlake	T										
ICHNEUMONIDAE											
Angitia blackburni (Cameron)	T										
BRACONIDAE											
Ischiogonus pallidiceps Perk	T										
Chelonus blackburni Cameron				F			T	T			
Chelonus sp.											T
ENCYRTIDAE											
Pauridia peregrina Timberlake								T			
Anagyrus swezeyi Timberlake								T			
EUPELMIDAE											
*Eupelmus nihoaensis Timberlake	T										
*Eupelmus pacificus Timberlake											T
Eupelmus sp.				F							
*Lepideupelmus robustus Timberlake	T	T									
*Lepideupelmus bryani Timberlake	T										
Ectroma sp.				F							

[6] *Indicates species described in this Bulletin.

	Nihoa	Necker	French Frigate	Laysan	Lisianasky	Gardner	Pearl & Hermes	Midway	Ocean	Johnston	Wake
EULOPHIDAE											
Secodella metallica (Ashmead)	T										
*Elachertus advena Timberlake								T			
*Pseudopheliminus vagans Timberlake	T										
TRICHOGRAMMATIDAE											
*Aphelinoidea oceanica Timberlake											T
MYMARIDAE											
Polynema reduvioli Perkins								T	T		
Mymarid				F							
Doubtful Identification											
Phaenopria sp.				F							
Tropidopria sp.				F							
COLEOPTERA											
CARABIDAE											
Undetermined species				T							
STAPHYLINIDAE											
Medon debilicornis Wollaston									T		
Atheta coriaria Kraatz	T										
Undetermined species								T			
Undetermined species				T							
COCCINELLIDAE											
Coelophora inaequalis (Fab.)	T										
Pullus kinbergi (Boh.)	T	T	T	F			T		T		
Nephus sp. near bipunctatis (Kug.)	T										
Scymnus debilis Lec.				F							
CUCUJIDAE											
Cryptamorpha desjardinsi Guen.	T			S			T		T		
Silvanus surinamensis Linn.				T							
DERMESTIDAE											
Dermestes cadaverinus Fab.	T	T	T	SBTF	T		T	T		T	
Dermestes vulpinus Fab.	T	T									
Attagenus plebius Sharp				B							
Labrocerus sp.	T	T									
HISTERIDAE											
Carcinops 14-striata Steph.										T	
ELATERIDAE											
*Itodacnus novicornis Van Zwaluwenburg		T									
Monocrepidius exsul Sharp								T			
CLERIDAE											
Necrobia rufipes De Geer	T										
ANOBIIDAE											
Lasioderma serricorne (Fab.)										T	

	Nihoa	Necker	French Frigate	Laysan	Lisianasky	Gardner	Pearl & Hermes	Midway	Ocean	Johnston	Wake
SCARABAEIDAE											
Saprosites pygmaeus Har.									T		
Psammodius nanus De Geer.				T					T		
CHRYSOMELIDAE											
Epitrix parvula (Fab.)	T										
CERAMBYCIDAE											
Clytus crinicornis Chevr.				S							
TENEBRIONIDAE											
Alphitobius piceus (Olivier) ?				T			T			T	
Alphitobius diaperinus Panz.				F							
Undetermined species	T	T							T		
Tribolium ferrugineum (Fab.)				SFT							
ANTHRIBIDAE											
Araeocerus fasciculatus (De Geer)	T	T							T		
Undetermined species											T
CURCULIONIDAE											
Dryophthorus distinguendus Perk.				T							
Dryotribus mimeticus Horn			T	T						T	T
Dryotribus wilderi Perkins			T	T			T	W	T		
*Dryotribus solitarius Perkins							T				
*Pentarthrum halodorum Perkins								T	T		
Pentarthrum blackburni Sharp				T							
*Pentarthrum pritchardiae Perkins	T										
Macrancylus immigrans Perkins				T						T	
*Oodemas neckeri Perkins		T									
*Oodemas breviscapum Perkins	T										
Oodemas laysanensis Fullaway	T	T		F				T			
*Oodemas erro Perkins	T										
*Rhyncogonus exsul Perkins	T										
*Rhyncogonus biformis Perkins		T									
Rhyncogonus bryani Perkins[1]				B							
*Rhyncogonus fallax Perkins											T
*Sphaerorhinus pallescens Perkins											T
*Sphaerorhinus sordidus Perkins											T
*Acalles wilkesii Perkins											T
Calandra oryzae Linn.				F							
PROTERHINIDAE											
*Proterhinus bryani Perkins	T										
*Proterhinus abundans Perkins	T										
DIPTERA											
CHIRONOMIDAE											
Undetermined species				T							T
MYCETOPHILIDAE											
Neosciara molokaiensis (Grimshaw)								T	T		

[1] Perkins, R. C. L., A new species of Otiorhynchine beetle of the genus Rhyncogonus Sharp from Laysan Island; Ent. Mo. Mag. p. 4, 1919.

	Nihoa	Necker	French Frigate	Laysan	Lisianshy	Gardner	Pearl & Hermes	Midway	Ocean	Johnston	Wake
STRATIOMYIDAE											
Undetermined species				T							
PHORIDAE											
Aphiochaeta scalaris Loew				F	T		T				
ASILIDAE											
Undetermined species											T
DOLICHOPODIDAE											
Psilopus patellifer Thomson								T	T		
Hydrophorus praecox Lehm				TF							
Paraphrosylus sp.	T	T	T		T						T
Undetermined species								T	T		
SYRPHIDAE											
Simosyrphus grandicornis (Macq.)										T	
TACHINIDAE											
Frontina archippivora Williston	T										
SARCOPHAGIDAE											
Undetermined species	T	T	T	T			T	T		T	
MUSCIDAE											
Synthesiomyia nudiseta Van der Wulp											T
Musca vicina Macquart				TF			T	T		T	
CALLIPHORIDAE											
Lucilia sericata Meigen	T										T
*Lucilia graphita Shannon				TF			T	T	T		
ANTHOMYIDAE											
Fannia canicularis Linn.									T		
Ophyra chalcogaster Wiedemann								T			
Lispe sp.[?]				F							
EPHYDRIDAE											
Canace nudata Cresson					T						T
Hecamede sp.											T
Scatella sexnotata Cresson	T	T		FT							
BORBORIDAE											
Limosina venalicia Osten-Sacken				T							
Leptocera spp.				T	T			T			
DROSOPHILIDAE											
Undetermined Asteinae	T										
AGROMYZIDAE											
Milichiella lacteipennis (Loew)							T	T			
Agromyza pusilla Meigen	T									T	
Undetermined Milichiinae							T				T
Undetermined Milichiinae	T					T					
SAPROMYZIDAE											
Sapromyza sp.											T

	Nihoa	Necker	French Frigate	Laysan	Lisianasky	Gardner	Pearl & Hermes	Midway	Ocean	Johnston	Wake
OSCINIDAE											
Hippelatus nigricornis var. flavus Thomson					T			T	T		T
CHLOROPIDAE											
Microneurum signatum Wollaston	T	T	T		T						
HIPPOBOSCIDAE											
Olfersia spinifera Leach	T	T	T	T	T					T	T
LEPIDOPTERA											
NYMPHALIDAE											
Hypolimnas bolina Linn.											T
LYCAENIDAE											
Lycaena boetica (Linn.)		T									
SPHINGIDAE											
Herse convolvuli (Linn.)											T
ARCTIIDAE											
Utetheisa pulchelloides Hampson											T
NOCTUIDAE											
Chloridea obsoleta (Fab.)	T	T									
Agrotis saucia (Hübner)				W							
Euxoa kerri Swezey			KT								
*Euxoa bryani Swezey	T										
Euxoa eremioides (Meyrick)				SW?							
				BF							
Euxoa procellaris (Meyrick)				SW?							
				F							
Feltia dislocata (Walker)				FT							
Peridroma fasciata Roths.				R				R			
Peridroma evanescens Roths.				R							
Cirphis unipuncta (Haw.)				R	T						
Prodenia laysanensis Roths.				R							
Prodenia litura (Fab.)?							T	W?			
Spodoptera mauritia (Boisduval)			FT				T				
Nesamiptis laysanensis Swezey				F							
Plusia chalcites Esp. (verticillata Guen.)								W	T		
Achaea melicerta (Drury)											T
PHYCITIDAE											
Ephestia elutella Hüb.				T							
CRAMBIDAE											
Talis hyacinthina Meyrick	T										
PYRAUSTIDAE											
Hymenia recurvalis Fab.	T	T	T	SWF							
Omiodes laysanensis Swezey				F							
Pyrausta dryadopa Meyrick				F							

	Nihoa	Necker	French Frigate	Laysan	Lisiansky	Gardner	Pearl & Hermes	Midway	Ocean	Johnston	Wake
PTEROPHORIDAE											
Trichoptilus oxydactylus (Walker)	T		FT	W?						T	
GELECHIIDAE											
Stoeberhinus testaceus Butler								T			
TORTRICIDAE											
Crocidosema plebiana Z.		T	T	F							
PLUTELLIDAE											
Plutella maculipennis Curtis							T	T	T		T
HYPONOMEUTIDAE											
Hyposmocoma arenella Walsm.	T										
" mimica Walsm.		T									
" quinquemaculata Walsm.	T	T									
" notabilis Walsm.				F							
" sp.	T	T									
" spp.						T					
TINEIDAE											
Tineola uterella Walsm.			T	T						T	
Monopis meliorella (Walker)		T				T					
*Ereunetis kerri Swezey			FKT	F							
*Ereunetis incerta Swezey				T			T			T	
*Comodica fullawayi Swezey									T		
Gracilaria marginestrigata Walsm.	T										
CYGNODIIDAE											
Petrochroa dimorpha Busck	T	T		F				T	T		T
*Petrochroa neckerensis Swezey		T									
HEMIPTERA											
GERRIDAE											
Halobates sericeus Esch										T	
ANTHOCORIDAE											
Triphleps persequens White	T			F				T	T		
MIRIDAE											
Opuna hawaiiensis Kirkaldy											T
Oromiris hawaiiensis Kirkaldy				F							
Unidentified species	T										
NABIDAE											
Reduviolus capsiformis (Germ.)	T		T		T			T	T	T	
" kahavalu Kirkaldy	T										T
" blackburni (White)				F							
LYGAEIDAE											
Nysius delectus White		T									
Nysius spp.	T		T	F	T		T	T			
Nysius sp.											T

	Nihoa	Necker	French Frigate	Laysan	Lisiansky	Gardner	Pearl & Hermes	Midway	Ocean	Johnston	Wake
HOMOPTERA											
CICADELLIDAE											
Nesosteles spp.	T	T									
Jassid											T
Jassid											T
DELPHACIDAE											
Kelisia paludum Kirkaldy							T	T	T		
ALEYRODIDAE											
Aleyrodid											T
APHIDAE											
Aphis medicaginis Kock.			T	F?	T					T	T
ORTHOPTERA											
TETTIGONIIDAE											
Conocephalus saltator (Sauss.)								T			
*Banza nihoa Hebard	T										
GRYLLIDAE											
Gryllus oceanicus Le Guillou			T								
Litogryllus flavipes (Sauss.)											T
BLATTIDAE											
Eoblatta notulata (Stal)									T		
Blatella germanica (Linn.)				T							
Cutilia soror (Brunner)	T			F					T	T	T
Periplaneta americana (Linn.)	T	T	T	F				T		T	
Periplaneta australasiae (Fab.)	T								T		
Pycnoscelus surinamensis (Linn.)	T		T	F			T		T	T	T
DERMAPTERA											
Euborellia annulipes (Lucas)	T	T	T	F			T	T		T	
Anisolabis maritima (Gene)			T	TF	T	T	T		T	T	T
THYSANURA											
Undetermined species	T	T		T				T			T
COLLEMBOLA											
Undetermined species								T			
ISOPTERA											
Cryptotermes sp.?				T							
Unidentified species											T
NEUROPTERA											
Chrysopa sp.							T	T	T		
CORRODENTIA											
Psocids	T	T						T	T		T

	Nihoa	Necker	French Frigate	Laysan	Lisiansky	Gardner	Pearl & Hermes	Midway	Ocean	Johnston	Wake
THYSANOPTERA											
Thrip									T		
EMBIIDINA											
Oligotoma insularis McLach.?	T	T		T							
CHILOPODA											
LITHOBIIDAE											
*Onebius moananus Chamberlin									T		
SCHENDYLIDAE											
*Nyctungius bryanus Chamberlin		T									
ORYIDAE											
Orphnaeus brevilabiatus (Newport)											T
GEOPHILIDAE											
*Honuaphilus alohanus Chamberlin				T			T		T	T	
MECISTOCEPHALIDAE											
Mecistocephalus spissus Wood		T									

HYMENOPTERA[8]

By
P. H. TIMBERLAKE

The Hymenopterous fauna of the small leeward islands of Hawaii is evidently very meager and, except on Necker and Nihoa islands,[9] consists of a few nearly cosmopolitan species of ants and a few hardy parasitic species belonging to the Ichneumonoidea and Chalcidoidea that have been introduced in recent years, probably from Honolulu. On Nihoa Island is an endemic fauna of a few species closely allied to corresponding species of Kauai. The fauna of Necker Island has at least one endemic Eupelmid, which, however, is conspecific with one of the Eupelmidae found on Nihoa. Wake Island is so distant that its fauna shows no affinity whatever with that of Hawaii. Aside from several introduced ants only three species of Hymenoptera were found on Wake Island, these being a species of Chelonus, a Eupelmus, and an Aphelinoidea; none of these is known to occur in Hawaii, and presumably they were introduced to Wake Island from some other source.

FORMICIDAE

1. **Ponera kalakauae** Forel.

French Frigate Shoals, June 22-26, 1923 (Bryan): 24 workers. Necker Island, June 19, 1923 (Bryan): 1 male. Laysan, April 9, 1923 (Fullaway): 10 workers, in woodwork of old shacks.

2. **Monomorium minutum** Mayr.

Midway Island, April, 1923 (Fullaway): 3 workers with the head, thorax and petiole yellowish brown and the gaster blackish. Necker Island, June 19-20, 1923 (Bryan): 4 workers, wholly blackish in color.

3. **Monomorium floricola** (Jerdon).

Nihoa Island, June 11-15, 1923 (Bryan): large series including 1 ergatoid female and 4 males collected on Pritchardia, Euphorbia and Sida. Wake Island, July 28-August 2, 1923 (Bryan): large series of workers, some of them found in a log.

[8] This paper is listed also as Paper No. 133, University of California Graduate School of Tropical Agriculture and Citrus Experiment Station, 1926.

[9] The Encyrtid, *Xanthoencyrtus laysanensis* Timberlake, collected on Laysan Island in December, 1912, by Mr. Fullaway, is probably endemic to that island. It, however, was not found by the Tanager Expedition, and may have become exterminated by the domestic rabbit, which in the meantime had stripped the island of almost all vegetation.

4. **Monomorium pharaonis** (Linnaeus).

French Frigate Shoals, June 22-26, 1923 (Bryan): large series of workers. Wake Island (including Peale and Wilkes islands), July 27 to August 2, 1923 (Bryan): large series of workers. Johnston Island, July 11-20, 1923 (Bryan): large series, including 10 females and 23 males, mostly from dead birds but also from a rotten log and bunch grass. The workers from Wake and Johnston islands are considerably darker than the typical form of *M. pharaonis,* and some of the specimens have the dorsal surface of the head distinctly brownish. The sculpture also appears to be considerably more distinct, although I believe this is largely if not wholly due to the dark coloration. Wheeler, who has examined specimens of this form from Johnston Island, believes that it should be separated as a new subspecies of *pharaonis.*

5. **Monomorium destructor** (Jerdon).

Laysan Island, April 9, 1923 (Fullaway): 1 worker, in woodwork of old shacks.

6. **Pheidole megacephala** (Fabricius).

Midway Island, April, 1923 (Fullaway): large series, including 4 soldiers and 2 wingless females.

7. **Cardiocondyla nuda,** var. **minutior** Forel.

Midway Island, April, 1923 (Fullaway): 3 workers. Necker Island, June 19, 1923 (Bryan): 2 workers. French Frigate Shoals, June 22-27, 1923 (Bryan): 14 workers and 3 females.

8. **Tetramorium guineense** (Fabricius).

Nihoa Island, June 11-15, 1923 (Bryan, Cooke and Thaanum): large series of workers, pupae, and 4 females. Necker Island, June 18-20 and 27, 1923 (Bryan): 16 workers, 6 females, and 1 male. Midway Island, April, 1923 (Fullaway): 22 workers. Laysan Island, April 9, 1923 (Fullaway): 1 worker. Pearl and Hermes Reef, April 27, 1923 (Fullaway): 18 workers. Ocean Island, April, 1923 (Fullaway): 28 workers.

Two of the workers from Nihoa Island, taken on June 11 (Bryan), are very small, but I believe that they belong to this species without doubt. One of the females from Necker Island is a very peculiar gynandromorph, being similar to the male in the structure of the head, but having the thorax and abdomen like those of the normal queen, with the sting well developed. (See description by Wheeler, pp. 44-45.)

9. **Tapinoma melanocephalum** (Fabricius).

Nihoa Island, June 11-15, 1923 (Bryan): 15 workers. Midway Island, April, 1923 (Fullaway): 4 workers. Ocean Island, April, 1923 (Fullaway): 6 workers.

10. **Prenolepis longicornis** (Fabricius).

Nihoa Island, June 11-15, 1923 (Bryan): 21 workers.

11. **Prenolepis bourbonica hawaiiensis** Forel.

Midway Island, April, 1923 (Fullaway): 7 workers. Wake Island, July 27 to August 5, 1923 (Bryan): 43 workers, 17 males, 4 females, on Cordia and Pemphis and found in a log.

BETHYLIDAE

Bryan collected two specimens of a species of Sclerodermus on Nihoa Island which is closely allied to species found on the large island of Hawaii. In fact, it is very feebly differentiated from *S. immigrans* Bridwell, but owing to its isolated habitat, the chance of its being connected by intergraduations seems remote. Bridwell considered *S. immigrans* to be an adventive species in Hawaii, but it seems to be too closely allied with certain other Hawaiian species for this view to be entertained, and I am consequently inclined to regard it as a true endemic species.

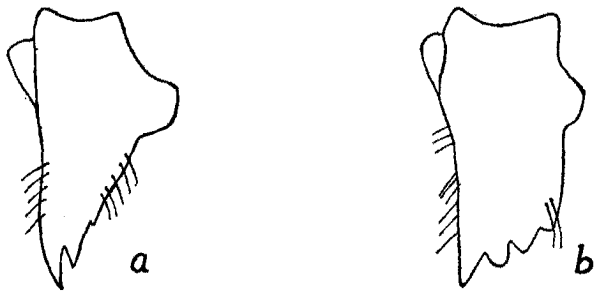

FIGURE 2. *a*, Mandible of *Sclerodermus immigrans* Bridwell (this figure will serve almost as well for *S. nihoaensis* Timberlake); *b*, mandible of *Sclerodermus semnoprepiae* Bridwell.

The following key will separate most of the described Hawaiian species of Sclerodermus except certain ones described by Ashmead:[10]

1. Mandibles with less than four teeth (fig. 2, *a*) 6
   Mandibles with four teeth arranged along the tolerably oblique apical margin, the sides of mandible subparallel from the base of the inner tooth to the basal condylar enlargement (fig. 2, *b*); clypeus strongly produced in front of the antennal sockets 2
2. Thorax at least partly or wholly testaceous 3
   Wholly or nearly all black or piceous species ..... **polynesialis Bridwell (not Saunders).**
3. Abdomen mostly or wholly testaceous 4
   Abdomen largely black or piceous, head very wide and not much longer than wide, clypeus strongly produced and tectiform, its anterior margin

[10] Ashmead, W. H., Hymenoptera parasitica: Fauna Hawaiiensis, Vol. 1, pp. 283-286, 1901.

distinctly angulate; head black, the rest of body, except prothorax, piceous with the mesonotum, disk of propodeum and dorsum of abdomen more or less shaded with dark castaneous brown, the prothorax, legs and scape testaceous; reticulate sculpture very fine but tolerably distinct.....**euprepes Perkins.**

4. Clypeus strongly tectiform, either emarginate or angulate at apex..... 5
   Clypeus weakly arched or almost flat across anterior margin, which is slightly rounded, the basal part tectiform; ocelli fully developed; whole body including head testaceous, but abdomen with brown or piceous markings along the sutures at the sides and especially at the apex; reticulation of the head very minute and indistinct....**manoa Bridwell.**

5. Clypeus angular in front; ocelli absent or represented by minute scars; head, mesopleura and pleura of propodeum brownish piceous, the side of abdomen suffused with brown; reticulate sculpture very delicate but distinct.....**chilonellae Bridwell.**
   Clypeus angularly emarginate in front; ocelli rudimentary or absent; head piceous, the thorax and abdomen testaceous, the latter with the sutures more or less fuscous or brown, reticulation of head extremely delicate, visible only at high magnification under favorable light....**semnoprepiae Bridwell.**

6. Wholly black, piceous or dark castaneous species..... 7
   Species with at least the thorax in part testaceous or yellow..... 9

7. Clypeus but little or not at all emarginate..... 8
   Clypeus only shortly produced and rather deeply emarginate, tectiform; head about one-fourth to one-half longer than wide, very slightly narrowing anteriorly; eyes placed about two-thirds of the length of the head from the posterior margin; ocelli rudimentary or fully developed in the alate phase; legs brown to piceous; reticulate sculpture distinct and surface rather shiny; large species, about 3.0-4.0 mm. long.**perkinsi Ashmead.**

8. Large species of Oahu, about 3.5-4.0 mm. long; clypeus strongly tectiform and apparently about squarely truncate at apex; ocelli absent or present in alate phase; legs piceous; reticulate sculpture distinct.....**polynesialis Saunders.**
   Small species of Hawaii, about 3.0 mm. long, clypeus strongly tectiform and transverse at apex; ocelli absent; reticulation of thorax very distinct, but the head is smoother, more shiny and delicately reticulate.....**muiri Bridwell.**

9. Clypeus only slightly produced in front of antennae, its length no greater than the thickness of the bulla or radicle of the scape..... 10
   Clypeus distinctly produced 12

10. Head not more than one-third longer than wide; the eyes placed less than thrice their own length from the occipital margin..... 11
    Head fully one-half or a little more longer than wide; the eyes rather small, distinctly more than thrice their own length from the occipital margin and somewhat more than twice their own length or about four times their own width apart; head, thorax, legs and antennae brownish testaceous, the head suffused with piceous anteriorly, the abdomen piceous suffused with testaceous at the base and along the sutures; reticulate sculpture fine but considerably more distinct than in *S. immigrans*.....**sophorae Perkins.**

11. Eyes about two and one-half times their own length from the occipital margin and a little less than twice their own length apart; head and abdomen brown to piceous, the thorax testaceous with the mesothorax more or less suffused with brown or piceous; reticulate sculpture

extremely minute and delicate, the head appearing smooth and polished under considerable magnification.....**immigrans** Bridwell.

Similar to *S. immigrans* but the reticulation much more distinct, the head and abdomen almost black, the thorax except mesothorax testaceous.....**nihoaensis n. sp.**

12. Head distinctly longer than wide by about one-fourth to one-third of the length, reticulate sculpture feeble yet distinct..... 13

Head hardly longer than wide, piceous above and nearly black anteriorly, castaneous on sides and beneath, the thorax testaceous with the mesothorax and pleura of propodeum suffused with brown, the abdomen piceous black; reticulation more distinct.....**tantalus** Bridwell.

13. Head about one-fourth longer than wide, brown to piceous, the abdomen piceous, the thorax testaceous with the mesothorax and propodeum more or less brown or fuscous.....**poecilodes** Perkins.

Head about one-third longer than wide; head, thorax, legs and antennae testaceous, the abdomen brown.....**chlorodes** Perkins.

12. **Sclerodermus nihoaensis** new species

Very similar to *S. immigrans* Bridwell and practically the same in all structural characters except sculpture.

Female

Head about one-fifth longer than wide, the sides subparallel, the posterior corners strongly rounded; eyes small and a little less than twice their own length apart and nearly two and one-half times their own length from the posterior margin of head; ocelli absent; clypeus very shortly produced in front of the antennal sockets, about as long as the diameter of the sockets, and as seen perpendicularly from above appearing transverse, but as seen from in front and below appearing distinctly tectiform. Scape clavately expanded towards apex, a little more than three times as long as its greatest width and moderately arched beneath; joints of the flagellum short, transverse but increasing somewhat in size distad, the penultimate and antepenultimate joints not much wider than long, the apical joint or club about equal to the two preceding joints combined and a little longer than the pedicel. Mandibles with the inner margin strongly oblique as far as the subbasal condylar process and provided with three teeth including the apex, the other two teeth decreasing in size inward, the innermost one being very small.

Thorax of usual structure, the wings absent; propodeum slightly widening for two-thirds of its length from base toward apex and as seen from the side with the dorsal outline gently arcuate. Abdomen somewhat longer than head and thorax combined.

Integument rather duller than in *S. immigrans* and microscopically reticulate, more faintly on the head and most distinctly so on the thorax, this sculpture being discernible at a magnification of 30 diameters, which is hardly the case with *S. immigrans;* pronotum, pleura and basal half of propodeum more strongly reticulate than the other parts of thorax.

Head, mesothorax, and abdomen rather dark brownish piceous in the type, with the legs including coxae nearly as dark, the antennae, prothorax, and propodeum testaceous, the abdomen nearly uniformly dark with the apical margins of the tegites hardly paler, although the lateral corners of the basal tergite are somewhat testaceous. In the paratype the head is brownish and considerably more testaceous beneath than above, the mesothorax except the pleura not much darker than the rest of the thorax, the legs wholly testaceous, and the abdomen more brownish

piceous, with the basal tergite and apical margins of the other tergites distinctly paler and more or less testaceous.

Length of body, (2.21 to) 2.54 mm.; length of head, 0.511 mm.; width of head, 0.419 mm.; width of space between the eyes, 0.231 mm.

Described from 2 females (holotype and paratype) collected on Euphorbia, Nihoa Island, June 15, 1923 (Bryan).

This species and *S. immigrans* are very similar to *S. sophorae* Perkins, but *S. sophorae* has a much longer head. The sculpture is about the same in *S. sophorae* and *S. nihoaensis* and distinctly weaker in *S. immigrans*.

Type: Cat. No. 225, Bernice P. Bishop Museum.

HYLAEIDAE

13. **Nesoprosopis perkinsiana** new species.

This species is closely allied to *N. hirsutula* Perkins of Kauai and hardly distinct except for appreciable differences in the male genitalia.

Male

Black, slightly shiny, the clypeus and supraclypeal area yellow, the yellow on the latter acutely angled dorsad and reaching just opposite to the middle of the antennal sockets, the yellow also usually extending (in three of four specimens) onto the face as a narrow mark along each side of the clypeus and extending from the puncture in the clypeal suture dorsad to the supraclypeal area; a minute dot on clypeus surrounding the puncture in the suture, and the narrow oral margin of clypeus, except medially, black. Flagellum duller black, sometimes becoming somewhat brownish beneath. Mandibles wholly black or sometimes a little reddish brown at apex. Legs black, the tarsi appearing somewhat browner, this paler appearance due for the most part apparently to the yellowish pubescence, the claws, however, distinctly brownish; the front tibiae more or less yellowish brown on the inner side; base of the hind tibiae with an indistinct, narrow, yellowish ring about its own width from the knee joint, or the ring may be reduced to a small yellowish spot on the anterior side, or wholly absent. Wings grayish, subhyaline, the veins blackish.

Cheeks extremely short, the eyes reaching almost to the base of the mandibles; supraclypeal plate somewhat wider than long, the lateral sutures being about three-fourths as long as the anterior suture; head somewhat wider than long, the face nearly as wide as in *N. hirsutula*, the width between the anterior ends of the eyes being somewhat greater than the length of the clypeus; the latter about as long as its greatest width. Scape gradually widening from base to apex, about thrice as long as the apical width and moderately arched beneath.

Integument on most parts of the body very finely or microscopically reticulate, but the sides of the face below the antennae are equally finely and obliquely lineolate with the lines more or less wavy; head, except face below antennae, and most of the thorax punctured, the punctures being rather deep and very close on the frons, but sparser and shallower on the thorax, the puncturation being nearly of the same character as in *N. hirsutula* although slightly closer and a little more deeply impressed on the mesoscutum and scutellum; propodeum rugose with longitudinal wrinkles on the anterior part, the sides sparsely and shallowly punctured like the rest of the pleura; abdomen rather more shiny than the rest of the body, micro-

scopically reticulate, and impunctate except for extremely minute or microscopic setiferous punctures.

Pubescence about as in *N. hirsutula,* being rather long and dense, but rather browner on the thorax, although appearing sufficiently grey in some aspects.

Genitalia very similar to *N. hirsutula,* with the stipites produced far beyond the sagittae; the stipites, however, are distinctly narrower than in *N. hirsutula,* more vertical in position, with the inner margin straight and the apex rounded, not angulate; the seventh and eighth ventrites as in *N. hirsutula.*

Length of body, 6.0-7.0 mm.; length of head (in largest specimen), 1.73 mm.; width of head, 1.90 mm.; width of face between lower ends of eyes, 0.77 mm.; greatest width of clypeus, 0.69 mm.; length of clypeus, 0.70 mm.

Female

Similar to the male except in the usual sexual characters, the face and legs wholly black, the face and clypeus with sparse, very shallow punctures, the sixth segment of abdomen with rather dense mostly fuscous pubescence; also extremely similar to the female of *N. hirsutula* and hardly distinguishable except in having the wings subhyaline grayish instead of fuscous.

Length of body, 7.0-7.5 mm.; length of head (of larger specimen), 1.87 mm.; width of head, 2.16 mm.; width of face between lower ends of eyes, 1.02 mm.; greatest width of clypeus, 0.87 mm.; length of clypeus, 0.82 mm.

Described from 4 males and 2 females (holotype male, allotype, and paratypes), Nihoa Island, June 13-14, 1923. One male was taken by Cooke on June 13, and the other specimens by Bryan on the following day. They were found on Sida at the summit and presumably were visiting the flowers of Sida. One of the males has a few pollen grains adhering to the propodeum.

Type: Cat. No. 226, Bernice P. Bishop Museum.

ICHNEUMONIDAE

14. **Angitia blackburni** (Cameron)

Nihoa Island, June 11-14, 1923 (Bryan and Grant): 7 females and 1 male. One of the females was reared from an unidentified caterpillar on Chenopodium.

BRACONIDAE

15. **Ischiogonus pallidiceps** Perkins

Nihoa Island, June 13, 1923 (Bryan): 1 female.

16. **Chelonus blackburni** Cameron

Midway Island, April, 1923 (Fullaway): 6 females. Pearl and Hermes Reef, April 27, 1923 (Fullaway): 4 females.

17. **Chelonus sp.**

Wake Island, July 27 to August 3, 1923 (Bryan): 3 females and 1 male.

ENCYRTIDAE

18. **Pauridia peregrina** Timberlake

Midway Island, April, 1923 (Fullaway): 1 female.

19. **Anagyrus swezeyi** Timberlake

Midway Island, April, 1923 (Fullaway): 8 females and 11 males.

EUPELMIDAE

On Nihoa, Bryan collected three species of Eupelmids which are undoubtedly endemic to the island, and one of these species in a slightly modified form was also taken on Necker Island. Five male Eupelmids were also taken on Nihoa Island by Bryan, representing apparently two species. As it is impossible to associate them with the proper females, I have passed them over in the following descriptions.

20. **Eupelmus nihoaensis** new species

The antennae of the unique type were unfortunately lost during remounting of the specimen, but not until it was noted that the scape was obscurely paler or yellowish at base and that the flagellum was similar to the great majority of Hawaiian species. The species runs, therefore, to either *E. oreias* or *E. xanthodorus* in Perkins' table of the Hawaiian species and, except in the much less distinctly yellowish base to the scape, is decidedly more like *E. xanthodorus*.

From *E. xanthodorus* it differs in having the head considerably thinner fronto-occipitally, the frontovertex not much more than one-third longer than wide instead of about twice as long as the least width; coloration very similar throughout except that the hind femora are dark metallic green except at base and apex, and the ovipositor is mostly brownish although yellowish at extreme apex, black at base and fuscous above.

Female

Head considerably wider than long, moderately thin fronto-occipitally, the greatest thickness equal to about one-half the width; frontovertex about one-third longer than wide, the inner orbits only slightly diverging anteriorly and strongly diverging behind the ocelli; ocelli in an equilateral triangle, the posterior pair very slightly behind the middle of the frontovertex and about their own diameter from the eye margins; scrobal impression moderately deep, broad and oval, not much narrowed above nor triangular as in *E. xanthodorus*, the facial prominence between antennae oval and convex. Mandibles with three nearly equal teeth, the middle tooth the most acute, the inner one somewhat shorter and blunt.

Thorax of the usual structure, the abdomen somewhat longer than the thorax and head combined, depressed above, elongate elliptical in shape, not much narrowed at the base, the sides nearly parallel, the apex rounded, the venter strongly compressed especially towards the base; ovipositor protruded for a length somewhat less than that of the hind tarsi. Wings long and narrow, the disk densely pubescent throughout, the speculum very obscure; marginal vein distinctly longer than the

submarginal, the stigmal and postmarginal veins about equal, the former curved and clavate.

Frontovertex rugulously reticulate, the sides of the face more coarsely rugulose, the face below the scrobes and the cheeks smoother and reticulate, the cheeks exterior to the genal suture being more coarsely and longitudinally reticulate; prominence between antennae and lower part of the scrobes next to the antennal sockets smooth; upper part of the scrobal impression transversely, rugulosely wrinkled but not so densely as in *E. xanthodorus;* frontovertex and sides of the face also with fine punctures which are not so prominent as in *E. xanthodorus;* thorax and abdomen rather finely scaly-reticulate; the mesopleura coarsely reticulate at posterior end and with a central smoother area where the reticulations change gradually to extreme fineness as in apparently most if not all of the Hawaiian Eupelmus.

Coloration, nearly uniformly, very dark metallic green; scrobal impression rather distinctly greenish, the face and cheeks with a brassy and greenish luster or somewhat coppery in certain aspects; frontovertex in direct view rather dull, but viewed obliquely it shows a rather strong brassy luster and a reddish luster along the orbits; notum rather strongly brassy and coppery, the pleura and sternum more greenish and mostly with a greenish luster; basal tergite of abdomen bright green or coppery in some aspects, the last two tergites, including the parts reflexed onto the venter beyond the apical ventrite, coppery or rosy, the rest of the abdomen dark metallic purplish black. Ovipositor fuscous above and black at base, the sides and under surface distinctly brownish except at base, and somewhat paler or yellowish at extreme apex. Antennae blackish, the base of the scape obscurely yellowish for a short distance. Front and hind coxae and hind femora except at base and apex concolorous with body, the remainder of the legs brownish yellow, with the first joint of the middle and hind tarsi and apex of hind tibiae paler yellowish; apex of the last joint of the tarsi fuscous. Wings nearly hyaline, the veins yellowish.

Length of body, 2.62 mm.; length of head, 0.634 mm.; width of head, 0.815 mm.; thickness of head, 0.401 mm.; width of vertex at ocelli, 0.273 mm.; width of mesoscutum, 0.589 mm.; length of ovipositor sheaths, 0.457 mm.; length of fore wing, 1.918 mm.; width of fore wing, 0.680 mm.

Described from 1 female (holotype) collected from Sida, June 14, 1923, Nihoa Island (Bryan).

Type: Cat. No. 227, Bernice P. Bishop Museum.

21. **Eupelmus pacificus** new species

This species from Wake Island is very similar to Hawaiian species in structure but differs from all species that I have seen from Hawaii in having a part of the yellow coloration of the legs and ovipositor of a purer, brighter tone.

Female

Head distinctly wider than long, moderately thick fronto-occipitally, the greatest thickness being hardly more than one-half of the width; frontovertex about two-thirds longer than the width at the ocelli, the inner orbits very slightly diverging anteriorly and strongly diverging behind the ocelli; ocelli in an equilateral triangle, the posterior pair about at the middle of the frontovertex and hardly more than their own diameter from the eye margins; scrobal impression moderately deep, triangular, the facial prominence between the antennal sockets oval, convex, and reaching about half way from the sockets to the upper limit of the scrobal impression. Antennae moderately long and slender; the first funicle joint as long as wide, the second about twice as long as the first and somewhat shorter than the pedicel,

the following joints gradually shortening and increasing somewhat in thickness; the club about as long as the last two funicle joints combined and indistinctly jointed. Mandibles with three teeth, the two outer teeth acute, the inner one not distinctly visible in the type.

Thorax of the usual structure; apex of scutellum rounded and gradually sloping down to the level of the metanotum; the latter transverse, very short at the middle, its anterior margin broadly and roundly emarginated; propodeum short and transverse, provided with a convex prominence on each side which bears the spiracle and is bounded on the inner side by a longitudinal sulcus; middle portion of the propodeum thus set off is about four times as wide as long and bears near the posterior margin a curved carina which touches the margin at the middle; propodeal spiracles proportionately rather large and nearly circular. Abdomen depressed above, compressed and tectiform beneath in the basal two-thirds, narrowly oval in shape as seen from above and somewhat more than twice as long as wide or as long as the head and thorax combined; first five tergites with the usual median emargination on the posterior margin; length of protruded part of ovipositor about equal to the length of the hind tarsi.

Wings rather short and moderately wide for an Eupelmus; the disk densely pubescent, the speculum very narrow but distinct and extending not more than one-half the distance to the posterior margin; marginal vein about one-fifth longer than the submarginal, the stigmal and postmarginal veins subequal, the former not attenuated toward the base and but little enlarged at apex which is slightly curved toward the costal margin; setae on the submarginal vein a little longer than the width of the costal cell.

Head finely rugulosely sculptured with fine distinct reticulations on the front-overtex at and in front of the ocelli, and on the cheeks and lower part of the occiput; scrobal impression of face smoother and finely subhexagonally reticulate, the facial prominence still smoother yet reticulate; clypeal margin with two distinct small foveae about two-thirds as far apart as the antennal sockets. Thorax above finely rugulosely reticulate much like the head, the axillae and scutellum more smoothly reticulate, the metanotum and propodeum smooth and somewhat polished; pleura and sternum finely reticulate, the areoles on anterior part of the mesopleura fine and very uniform in size and mostly subquadrate in shape, medially they become very minute and posteriorly they become very much coarser and longitudinally lengthened especially next to the dorsal margin, where it is very evident that the reticulation is formed by raised lines. Abdomen mostly with reticulation similar to that of the anterior part of the mesopleura, but the basal half of the first tergite and the first ventrite are smooth and polished, and the fifth ventrite is very finely transversely lineolate.

Eyes bare; head otherwise with sparse, very fine inconspicuous pubescence; thorax with fine, whitish, rather thin pubescence, moderately conspicuous and present on pronotum, mesoscutum, prepectus and sides of the anterior part of the mesosternum; axillae and scutellum with a few similar setae, the metapleura with much denser longer setae, the angles of the triquetrous hind coxae also provided with fine white hair; abdomen bare above, but the reflexed sides of the tergites and the ventrites provided with numerous white retrorse setae about like those of the mesoscutum.

General color aeneous green, this color being most evident on the head and anterior half of the thorax; scrobal impression of face and the prominence between the antennae shining purplish blue, face below antennae and the cheeks next to the mouth with a golden and rosy luster, the same luster also apparent on the elevated parts of the mesoscutum; posterior half of the notum including the axillae darker and not at all greenish, the axillae and scutellum with a dark reddish luster;

mesopleura dark greenish but gradually changing to nearly piceous at the posterior end, the metapleura bright green; mesosternum especially on the sides of the anterior part metallic bluish. Abdomen blackish or about concolorous with posterior half of the thorax, with a weak reddish and golden luster especially on the dorsal parts of the first three tergites, but the polished basal half of the first tergite with a brilliant green, golden and reddish luster, the fifth tergite also with a greenish and aeneous luster and the first ventrite not metallic although shiny; ovipositor piceous, provided with a broad yellow ring which is closer to the base than to the apex and about equal to the dark apical part, the yellow on the dorsal side being brighter colored. Antennae black, the scape with an evident greenish luster; mandibles black; palpi yellow. Front and hind coxae metallic green, the middle coxae fuscous, not metallic; all trochanters brownish yellow; all femora dark, shading into brownish yellow narrowly at base and apex, the front pair appearing brown to piceous in different aspects, the middle pair piceous on the outer side and brownish to brownish yellow on the inner surface, the hind pair metallic bluish; tibiae and tarsi mostly brownish yellow, the apical joint of all the tarsi fuscous, the front tibiae largely fuscous except narrowly at base and rather broadly at apex, the dark part appearing metallic bluish on dorsal side, the middle tibiae slightly darker or more brownish in the middle, and the hind tibiae with a distinct fuscous ring at the middle, nubilous at the margins and occupying about one-third of the length of the tibiae, the yellow basad of the dark ring of a purer bright tint than on the rest of the legs. Wings hyaline, slightly tinted with fuscous, the veins yellowish.

Length of body, 2.72 mm; length of head, 0.598 mm.; width of head, 0.764 mm.; thickness of head, 0.399 mm.; width of vertex at ocelli, 0.255 mm.; length of antenna, 1.193 mm.; width of mesoscutum, 0.516 mm.; length of ovipositor sheaths, 0.765 mm.; length of fore wing, 1.764 mm.; width of fore wing, 0.669 mm.

Male

Of the usual Eupelmid structure; head subhemispherical, rather thick fronto-occipitally, somewhat wider than long; eyes nearly circular and strongly convex; frontovertex about as long as wide and fully one-half as wide as the whole head; ocelli in a slightly obtuse angle, the posterior pair a little more than their own diameter from the eye margins and the anterior ocellus about the same distance from the anterior margin of the frons; scrobal impression of face broadly semi-oval, reaching well upward between the eyes, its margin broadly rounded above; prominence between antennae small and extending but a short distance above the sockets; the latter small, circular and placed a short distance below the ocular line; face below the sockets strongly arched from side to side. Scape, short, reaching but little beyond the scrobal impression, fusiformly thickened, convex on inner side, flattened on the ventro-exterior surface and a little excavated near apex; pedicel about thrice as long as thick and a little longer than the two following joints combined; funicle eight-jointed, thinner at base than the diameter of the pedicel and increasing somewhat in thickness distad, the first joint as long as wide, the second about twice as long as wide, the following joints gradually shortening, the eighth as long as wide; club solid, somewhat longer than the last two funicle joints combined, sunken in on the ventro-exterior surface, rounded at apex but appearing rather acutely pointed when seen from the side.

Thorax widest across the middle or at the posterior margin of the mesoscutum; parapsidal furrows very shallow but complete; scutellum about three-fourths as long as the mesoscutum, strongly convex, rounded at apex where it is well elevated above the metanotum, the sides also elevated and strongly declivous; propodeum transverse, about three times as wide as long, provided with a median carina which forks at a point a little more than one-half the distance from the base to the apex;

spiracles of propodeum small, circular and situated close to the basal margin; mesopleura with a shallow, broad rather indefinite, longitudinal furrow next to the ventral margin. Abdomen nearly as long as the thorax and distinctly narrower, strongly depressed and somewhat concave above, oval in shape as seen from above and about two and one-half times longer than wide.

Legs slender, the femora moderately thickened; spur of middle tibiae very slender and about as long as the first tarsal joint. Wings similar to those of the female except that the speculum is represented by a large broad hairless area beneath the basal half of the marginal and apex of the submarginal vein; the area beneath the rest of the submarginal vein nearly bare but with a row of setae at a point half way from the vein to the posterior margin; setae on submarginal vein no longer than the width of the costal cell.

Head smoothish except on the sides of face bounding the scrobal impression where there is a rather coarse reticulation formed by raised, mostly longitudinal lines, and on the vertex behind ocelli and on the upper part of the occiput where there is similar reticulation with transverse lines; cheeks finely reticulate; mesoscutum coarsely reticulate with strongly raised lines producing a rugulose effect; axillae, scutellum and hind coxae finely reticulate; mesopleura smooth except in the longitudinal furrow which is minutely shagreened; propodeum and abdomen smoothish.

Body in general shiny blackish or piceous with a slight greenish and bronzy luster on the lower part of the face and the cheeks and to a less extent on the posterior part of the vertex; pronotum and mesoscutum with a comparatively strong green and brassy luster; propodeum and base of abdomen slightly greenish. Antennae piceous, the scape shiny but without a distinct metallic luster. Coxae and the femora on the dorso-exterior surface bluish, femora otherwise piceous except next to the articulations; trochanters, extreme base and apex of femora except apex of hind pair, base and apex of tibiae except apex of hind tibiae and basal joint of the tarsi, brownish yellow, but the basal joint of middle tarsi somewhat whitish; remainder of tibiae and tarsi fuscous. Wings faintly tinted with fuscous or almost hyaline, the veins brownish yellow.

Length of body, 1.13 mm.; length of head, 0.326 mm.; width of head, 0.386 mm.; thickness of head, 0.221 mm.; width of vertex at ocelli, 0.192 mm.; length of antenna, 0.631 mm.; width of mesoscutum, 0.307 mm.; length of fore wing, 0.867 mm.; width of fore wing, 0.378 mm.

Described from 1 female (holotype) collected July 31, 1923, and 1 male (allotype) collected August 3, 1923, Wake Island (Bryan). This male is presumed to belong with the female as there seems to be little or no reason to believe that more than one species of Eupelmus inhabit Wake Island.

Type: Cat. No. 228, Bernice P. Bishop Museum.

LEPIDEUPELMUS new genus

This genus is closely allied to Eupelmus Dalman, but the expanded scape, very robust form and the squamiform pubescence will distinguish it. It is apparently endemic to the Hawaiian islands and is probably strictly autochthonous.

Genotype: *Eupelmus setiger* Perkins.

Female

General form very robust. Head thin frontooccipitally, the face strongly inflexed; in dorsal view appearing very broadly elliptical, nearly three times as wide as thick,

transverse in front and broadly shallowly emarginate along the occipital margin, as seen from the side appearing lenticular, with the greatest thickness at the middle, or a little above the middle in *L. bryani;* as seen from in front a little wider than long, well rounded on the sides above, the vertical margin transverse, the cheeks strongly converging towards the mouth; eyes more or less strongly protuberant below, rather large, very broadly oval, being about one-third to one-half longer than wide, their inner orbits strongly diverging below; occiput moderately concave; frontovertex in dorsal view of head about as long as wide and varying from a little narrower to a little wider than the eyes, the occipital margin rounded; ocelli in a nearly equilateral triangle, the posterior pair remote from the occipital margin and somewhat less than their own diameter from the eye margins; cheeks somewhat shorter than the width of the eyes, yet well developed and provided with a distinct genal suture; scrobes shallow and converging above where they unite more or less perfectly to form a common scrobal impression; antennal sockets situated moderately far apart, about half way between the oral margin and the ocular line.

Antennae thirteen-jointed, the scape large, with a moderately wide ventral exfoliation, the pedicel about two and one-half to three times as long as thick, as long or longer than the following two joints combined; flagellum slightly clavately cylindrical; funicle eight-jointed, the first joint shortest and about as long as thick, the third and fourth joints longest and nearly twice as long as wide, the following joints gradually becoming shorter and wider, the eighth about as wide as long; club three-jointed, shorter than the three preceding joints but longer than two of them combined. Mandibles tridentate, the two outer teeth acute, the inner one somewhat blunt. Maxillary palpi moderately long, four-jointed, the apical joint subfusiform and a little shorter than the three preceding joints combined; labial palpi three-jointed, the middle joint small, the apical joint oval and nearly as long as the other two combined.

Thorax of normal Eupelmid structure; axillae separated from the scutellum by a distinct suture, fully as long as wide and having the form of a right-angled triangle with the hypotenuse against the sides of the scutellum; the latter slightly longer than wide, its very acute base contiguous to the posterior margin of the mesoscutum, its apical margin more or less broadly rounded; propodeum rather short medially, longer at the sides and there slopingly declivous, the median part with a transverse carina just in front of the apical margin, the area basad somewhat excavated; spiracles of propodeum oval and rather large; sternopleural suture complete.

Abdomen as long as the thorax, or fully as long as the head and thorax combined in *L. bryani,* depressed and oval; apical ventrite reaching to apical third, the ovipositor protruded less than one-half of the length of abdomen; first four tergites incised medially on apical margin, the fifth entire, the sixth concealed by the preceding, the seventh divided medially above the base of ovipositor.

Legs short, stout and practically as in Eupelmus, the middle tarsi very strongly incrassate at base. Wings typically deeply infuscated except at base, but wholly dark in *L. bryani,* the discal setae very dense and rather long, the speculum obsolete or very obscure; marginal vein considerably longer than the sub-marginal, except in *L. bryani* which has abbreviated wings, the stigmal and postmarginal veins subequal.

Sculpture throughout densely reticulato-punctulate with only the middle of the propodeum and base of first tergite smoothish, the abdomen above, however, except around the margins, is reticulate. All parts of the body except scrobes, mesopleura, mesosternum and dorsum of abdomen excepting the margins, covered with numerous short, white scale-like setae, which are not dense enough to obscure the surface; eyes rather densely hairy.

Male unknown or not distinguished from the males of Eupelmus.

From the genotype species, *L. setiger* (Perkins), I am unable to separate *L. subsetiger* (Perkins) satisfactorily and believe that the small differences noted by Perkins are due to local variations. Besides the types of both species I have seen the following additional material: 1 female, Kalihi, Oahu, about 300 ft., June 15, 1919 (Timberlake); 1 female, Kolekole Pass, Oahu, about 1700 ft., on Artemisia, Nov. 19, 1922 (Swezey); 1 female, Olokele Canyon, Kauai, about 1500 ft., Sept. 5, 1920 (Swezey); and 1 female, Kokee, Kauai, on *ohia lehua,* Aug. 25, 1921 (Swezey).

The three species of Lepideupelmus known to me may be distinguished as follows:

1. Wings fully developed or reaching to or slightly beyond apex of abdomen and deeply infuscated except at base.....2
   Wings small or reaching only to the middle of abdomen and wholly infuscated; antennae short, the flagellum wholly black, thorax dark coppery green, the abdomen reddish coppery; scale-like pubescence somewhat denser than usual and present over most of the abdomen.....**bryani n. sp.**
2. Flagellum wholly dark although the first five funicle joints are light metallic green, mostly on the dorso-exterior side, beneath a dense silvery white pubescence; legs for the most part dark metallic.....**setiger (Perkins).**
   First five funicle joints pale brownish yellow and covered with a fine white pubescence; legs except coxae wholly brownish yellow; body dark coppery or reddish coppery.....**robustus n. sp.**

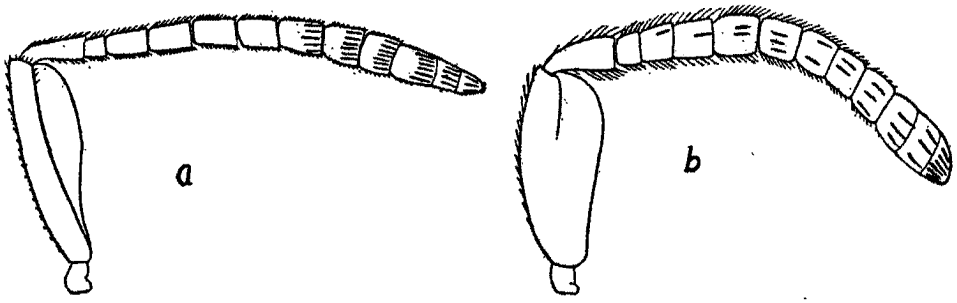

FIGURE 3. *a,* Antenna of female *Lepideupelmus robustus* Timberlake; *b,* antenna of female *Lepideupelmus bryani* Timberlake.

22. **Lepideupelmus robustus** new species

Female (fig. 3, *a.*)

In structure practically identical with *L. setiger* (Perkins) and agreeing with the generic description; antennal scrobes in the form of shallow grooves separated below by the triangular prominence between the antennal sockets, converging and uniting above and reaching somewhat more than one-half the distance from the sockets to the anterior ocellus; antennal sockets placed somewhat further apart than the distance from either to the oral margin, and about as far apart as the distance from either to the nearest point of the eye; frontovertex, or space between

the eyes in dorsal view of head, about as long as wide and slightly narrower than width of eyes.

Mesoscutum shallowly impressed medially on the posterior half, the sides of the impression very obscurely carinated, the triangular area in front depressed or hardly preceptibly convex and reaching to the middle; this triangular area and the posterior impression not separated by sutures but by very slightly impressed, indistinct, rather wide grooves, which converge toward the middle of the scutum but do not meet, then extend more faintly to the posterior margin, and which are sometimes rendered more distinct by a difference in the metallic luster and by being bare of the squamiform setae. Abdomen as in *L. setiger* except that the ovipositor is slightly longer. Discal pubescence of wings very dense and somewhat longer on the pale area at base; costal cell rather densely pubescent; the only bare area of wings situated on the posterior margin at the base; submarginal vein, including the apical thickened part, about four-fifths as long as the marginal; postmarginal short, about one-fifth as long as the marginal; stigmal vein slightly longer than the postmarginal, a little curved and widened towards the apex, the spur on the dorsal side near apex slender and bearing four minute pustules in a line and a fifth and smaller pustule out of alignment with the others; setae of submarginal vein about ten in number, rather shorter than the width of the costal cell (as long or longer than width of cell in *L. setiger*); hind wings rather broad, the costal cell very narrow, the marginal fringe short, the discal pubescence of ordinary density.

Sculpture as in *L. setiger,* the mesoscutum with dense reticulate punctures nearly uniform in size (more or less coarser medially in *L. setiger*); mesopleura much more finely punctulate in the middle and distinctly more coarsely punctulate on the posterior third; head more finely punctulate than the thorax and rather distinctly transversely shagreened on the vertex behind the ocelli; front and hind coxae punctulate like the body, the middle coxae finely and delicately reticulate. Pubescence showing the same distribution and rather greater density than in the type of *L. setiger* (but agreeing closely with other specimens of *L. setiger*) and distinctly less squamiform.

In the type and paratype from Nihoa Island the body is very strongly and nearly uniformly reddish coppery, rather bright reddish in one specimen and dark, more purple red in the other; in the two paratypes from Necker Island the body is colored as in *L. setiger,* or much darker and more greenish coppery, but one of these is reddish coppery, or shows a reddish luster, on the axillae, scutellum, mesosternum, mesopleura and on the sides, apex and venter of abdomen. Base of first tergite of abdomen with a brilliant red and golden luster; ovipositor pale yellow but very briefly fuscous at extreme base of the protruded part and briefly brownish at apex; front and hind coxae concolorous with body, the remainder of the legs nearly uniformly brownish yellow, the tarsi sometimes paler with the apical joint more or less fuscous. Palpi yellowish, the apical joint of the maxillary pair fuscous in the two specimens from Nihoa. Scape brownish yellow, gradually changing to dark brown or fuscous more or less extensively at apex; pedicel fuscous; next five joints pale brownish yellow, the last one of these sometimes considerably infuscated, all five covered with fine appressed whitish pubescence; last three funicle joints and club blackish. Wings practically as in *L. setiger,* being dark fuscous from the break or apical thickening of the submarginal vein to the apex, the base yellowish white, but the callosity at the extreme base of wing half way between the posterior margin and the vein is more or less infuscated; discal pubescence fuscous on the dark part of disk, pale brownish on the pale area at base; veins yellowish, the setae on the submarginal vein pale in color (fuscous or black in *L. setiger*); hind wings wholly hyaline, the veins yellow.

Length of body, 2.57 to 3.09 mm.; length of head, 0.825 mm.; width of head, 1.044 mm.; thickness of head, 0.443 mm.; width of vertex, 0.306 mm.; length of

antenna, 1.69 mm.; width of mesoscutum, 0.773 mm.; length of ovipositor, 0.537 mm.; length of fore wing, 1.91 mm.; width of fore wing, 0.855 mm.

Described from 2 females (holotype and paratype) from Nihoa Island, one on Euphorbia, June 12, 1923, the other at light on June 14 (Bryan); and 2 females (paratypes) from Necker Island, June 19 and 29, 1923 (Bryan).

Type: Cat. No. 229, Bernice P. Bishop Museum.

23. **Lepideupelmus bryani** new species

Female (fig. 3, *b*.)

In general structure very similar to *L. robustus*, eyes much smaller, the fronto-vertex in dorsal view of head wider than the eyes and somewhat wider than long; cheeks as long as the width of the eyes; head as seen from the side thickest a little above the middle; scrobes confluent in the form of a small shallow depression, reaching a little above the lower corners of the eyes and less than half way to the anterior ocellus; antennal sockets placed somewhat further apart than distance from either to the oral margin or to the nearest point of the eyes. Antennae much shorter than in *L. setiger* or *L. robustus*; scape excluding radicle not much more than twice as long as wide, about as long as pedicel and first four funicle joints combined; pedicel about twice as long as thick; first funicle joint much shorter and narrower than the following; the seven following joints about equal, the third to fifth slightly longer than wide and the last two a little wider than long; club as long as the two and one-half preceding joints combined, slightly wider than the preceding joint, and obliquely rounded at apex.

Thorax with the mesoscutum much less impressed medially than in the other species, the anterior triangular prominence faint, the grooves which are faintly discernible in *L. robustus* and *L. setiger* not apparent in this species. Abdomen as in the other species except that it is much less depressed, more cylindrical and rather narrower than the thorax, the ovipositor about as long as the first four joints of the hind tarsi.

Wings small, reaching about to the middle of the abdomen or slightly beyond the middle, yet normal in shape and with the venation fully developed; submarginal and marginal veins equal in length, the former distinctly broken just before joining the marginal; stigmal and postmarginal veins equal, each about one-third as long as the marginal; submarginal vein provided with rather coarse setae, the marginal and postmarginal veins with finer, shorter setae; disk of wing hardly developed beyond the apex of the venation and rather densely covered with extremely short fine pubescence. Hind wing not developed beyond the hooklets, the apex broadly rounded, the costal cell almost absent.

Dense reticulate puncturation nearly uniform throughout, except that it is distinctly finer at the center of the mesopleura and much coarser at the posterior margin of the same, the front and hind coxae with similar punctures. Head and other parts of the body except mesopleura and the sternum rather densely covered with squamiform pubescence, the setae being much flattened and widened towards apex; dorsal, outer anterior and ventral margins of the hind coxae with similar but somewhat longer setae, the femora with similar but distinctly finer setae, sternum with rather sparse very fine normal setae.

Head and body generally for the most part rich dark reddish coppery, the head except face sometimes greenish, the pleura usually distinctly green at least in part; the coppery coloration most distinct on the abdomen, where it is varied in part

with greenish and dark purplish fuscous; in some specimens the latter color is evident on the sternum, on the ventral margin of the mesopleura and on the venter of abdomen mediâlly; the coloration although rich is not at all brilliant on account of the dense puncturation and pubescence. Scape and pedical concolorous with the face, the flagellum black and not covered in part with glistening pubescence as in the other species. Palpi yellow, the apical joint of maxillary pair black. Mandibles very dark or reddish piceous. Legs mostly dark; the front pair with the coxae concolorous with body, otherwise fuscous, hardly or not at all metallic, the trochanters and knee joints brown or yellowish brown, the second and third tarsal joints yellowish brown; middle legs similar but with the femora, except the dorsal margin, the base of tibiae and the tibial spur, brownish yellow, the tarsi wholly dark; hind legs mostly concolorous with the body, but the tibiae less metallic than the femora, the trochanters, knee joints, tips of tibiae narrowly and the second and third tarsal joints brownish yellow, the remainder of the tarsi blackish. Ovipositor wholly blackish. Wings deep fuscous, mottled with paler spots or areas as follows: a slender streak directly beneath the marginal vein along its whole length, another below the submarginal vein; two somewhat oval or elongate oval spots at apex of stigmal vein, one extending basad from the vein, the other extending toward and almost reaching the apex of wing; another spot between stigmal and postmarginal veins and extending beyond them; rest of disk not quite uniform in tint but the principal paler areas are as given above; setae on submarginal vein black, these on the marginal and postmarginal veins somewhat paler. Hind wings rather less deeply fuscous and paler beneath the vein at base and on the apical half. Pubescence of body glistening white, the fine pubescence of mesosternum whitish.

Length of body, 1.68 to 2.14 mm.; length of head, 0.573 mm.; width of head, 0.740 mm.; thickness of head, 0.311 mm.; width of vertex, 0.287 mm.; length of antenna, 1.081 mm.; width of mesoscutum, 0.452 mm.; length of ovipositor, 0.394 mm.; length of fore wing, 0.851 mm.; width of fore wing, 0.311 mm.

Described from 6 females (holotype and paratypes) collected on Euphorbia, Nihoa Island, June 12, 14, and 15, 1923 (Bryan).

Type: Cat. No. 230, Bernice P. Bishop Museum.

EULOPHIDAE

24. **Secodella metallica** (Ashmead)

Nihoa Island, June 13, 1923 (Bryan): 1 male. This species, described as *Omphale metallica,* is very common on all of the larger islands of Hawaii and appears to be an adventive species.

25. **Elachertus advena** new species (fig. 4)

This species is apparently very distinct from any other described species of Elachertus, as I find no mention in the literature of any species possessing such peculiar subflabellate antennae in the male sex, although I am acquainted with a similar species from California. Unquestionably *E. advena* is a recent immigrant to Hawaii and was first taken on Oahu in 1917.

Female (fig. 4, *a*)

Head somewhat wider than the thorax, moderately thick fronto-occipitally, considerably wider than long; occiput moderately concave; frontovertex about twice as

wide as long, the occipital margin acute and distinctly rimmed; ocelli in an obtuse angle, the posterior pair close to the occipital margin and remote from the eye margins; eyes large, ovate, much narrower at the lower end, the inner orbits parallel in frontal view, but strongly divergent posteriorly in dorsal view of head, the outer orbits strongly rounded and protuberant; cheeks short or distinctly less than one-

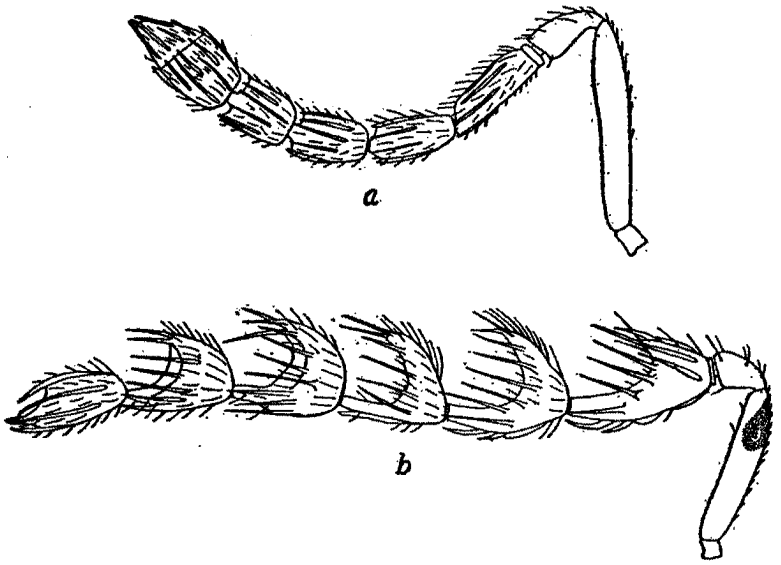

FIGURE 4. *a*, Antenna of female *Elachertus advena* Timberlake; *b*, antenna of male.

half the width of the eyes; face longitudinally concave or grooved to form a common scrobal impression; antennal sockets situated slightly above the ocular line, rather close together, yet not far distant from the oral margin, the space between them equal to about one-half of the distance from either to the oral margin; the latter slightly emarginate medially thus producing a short rounded lobe on each side.

Antennae nine-jointed; scape slender, cylindrical and about as long as the following four joints combined; pedicel about twice as long as thick at apex, considerably shorter than the first funicle joint; one very short ring joint present; funicle four-jointed, the first joint much the longest and about three times as long as wide, the following joints gradually decreasing in length and increasing in width distad, the fourth about one-fourth longer than wide; club two-jointed, slightly wider than the preceding joint and as long as the last two funicle joints combined, the basal joint somewhat longer than the apical joint and about equal to the third funicle joint; flagellum clothed with fine, short setae, numerous but not dense; the club and funicle joints each provided with several linear, elongate, raised and corneous sensoria, which shortly project as sharp points at the apices of the joints.

Mandibles with two acute, subequal outer teeth which are deeply divided and followed by an inner obliquely truncate margin which is minutely crenulate with twelve bluntly rounded denticles somewhat decreasing in size inwardly. Maxillary and labial palpi two-jointed and one-jointed, respectively.

Thorax somewhat more than twice as long as wide; pronotum well developed, subconical, nearly as long as wide, its posterior margin concavely arcuate. Parapsides

convex, the middle lobe of the scutum about as long as its anterior width, the parapsidal sutures distinct, separated at their posterior ends by about one-third of the total width of the scutum, and anteriorly running into a strong depression at each corner of the scutum, the posterior margin of the scutum straight for the most part but curved backward on each side for a short distance toward the tegula; axillae of moderate size and well separated. Scutellum slightly longer than the mesoscutum and slightly convex, the dorsal grooves slightly bowed in close to the base of the scutellum, then diverging somewhat as they approach the apex where they abruptly curve inward but do not quite meet; metanotum very short and transverse. Propodeum somewhat shorter than the scutellum, much longer medially than at the sides as it is produced into a distinct neck; medially there is a distinct carina with four or five oblique carinae branching from it on each side herringbone-like; sublaterally provided with a rather deep, irregular longitudinal depression or groove, broadest at the anterior end and curving somewhat mesad at the other end where it is continuous with the lateral margin of the neck; propodeal spiracles minute and oval, situated close to the basal margin on a prominence just exterior to the sublateral groove.

Abdomen oval or narrowly oval, varying somewhat in different specimens, acute at apex, depressed and about as long as the head and thorax combined; its petiole very short or about as wide as long; basal tergite of gaster convex and about one-half as long as the following tergites combined.

Wings moderately narrow; discal setae fairly dense and short on the apical half and gradually becoming sparser and longer toward the base, the speculum absent; marginal fringe short but dense. Submarginal slightly shorter than the marginal vein, the apex of the latter placed considerably beyond the middle of the wing; postmarginal vein about one-half as long as the marginal but much attenuated distad and forming a very acute angle with the stigmal; the latter long and slender yet distinctly shorter than the postmarginal vein, triangularly knobbed at apex, and provided with a prong which is directed toward the costal margin and which bears four pustules; setae borne by the submarginal, marginal and postmarginal veins rather numerous (about 12, 13, and 8, respectively) but not much coarser or longer than the discal setae at base of the wing. Costal cell rather narrow, the setae composing its marginal fringe much longer than those in the fringe at the apex of wing, yet as fine, the cell also provided with a few fine discal setae.

Legs slender; hind coxae conico-triquetrous and rather large, or more than twice as large as the middle coxae and more than one-half as long as the hind femora; apical spur of all the tibiae single, slender, small on front and hind legs, and about two-thirds as long as the first tarsal joint on the middle pair; tarsi slender, cylindrical, about two-thirds as long as their respective tibiae, the first three joints of the middle and hind pairs subequal to each other, the fourth or apical joint shorter.

Head finely subrugulosely reticulate, the bottom of the scrobal impression smooth in its dorsal half; pronotum and mesoscutum rather rugulosely, reticulately wrinkled and provided with minute setigerous punctures; axillae and scutellum smoother, being finely hexagonally reticulate with depressed lines, the axillae more finely sculptured; dorsal grooves of scutellum with deep close punctures, and the posterior margin of the metanotum medially provided with a row of close punctures; propodeum smooth for the most part excepting the herringbone carinae and a fine rugosity on each side of the neck close to the apex. Pleura mostly smoothish, but the rugosity of the pronotum extends in the form of oblique rugae onto the propleura; a large depressed area on the side pieces of the prepectus is sculptured much like the axillae and the same is true for the area just above the middle and hind coxae.

Eyes densely pubescent with fine erect short setae; head otherwise with numerous moderately long suberect fine setae most prominent on the frontovertex and on

the dorsal and lateral parts of the occiput. Dorsum of thorax with similar but somewhat longer reclinate hairs, among which are scattered some much longer setae or bristles as follows: a fringe on the posterior margin of pronotum, the lateral pair of which is very conspicuous, two pairs on the posterior margin of the mesoscutum, one pair of these on the middle lobe and one bristle on each parapsis, and two pairs on the exterior margin of the dorsal grooves of scutellum. Exterior margin of propodeum also bears a fringe of long setae; abdomen mostly bare except on the apical third and along the lateral margins; legs provided with fine setae, densest on the tibiae and tarsi.

Head and thorax very dark aeneous green, with sometimes a slight purple tinge on the scutellum and lateral margins of the propodeum; face with a distinct golden and sometimes reddish luster in part, except at the bottom of the scrobal impression; abdomen piceous, shining but not metallic, the basal half or a little more, both dorsally and ventrally, distinctly brownish except at the lateral margins, the brown and piceous parts shading indefinitely into each other. Scape yellow, pedicel yellowish brown, flagellum brownish on the two basal joints and gradually becoming fuscous at apex. Legs including coxae wholly yellow. Wings hyaline, the veins yellowish.

Length of body, (1.27 to) 2.25 mm.; length of head, 0.495 mm.; width of head, 0.636 mm.; width of vertex at anterior ocellus, 0.327 mm.; length of antenna, 0.943 mm.; width of mesoscutum, 0.530 mm.; length of fore wing, 1.515 mm.; width of fore wing, 0.643 mm.

Male (fig. 4, *b*)

Similar to the female but the head is somewhat thinner fronto-occipitally, the frontovertex proportionately wider, the ocelli considerably larger; the abdomen much smaller, not much more than one-third as long as the thorax, suboval, depressed and truncate at apex as the apical segments become retracted. Antennae decidedly different and longer; the scape similar but shorter or no longer than the pedicel and first funicle joint combined, and provided near its apex and near dorsal margin on the inner side with a round pore bearing several pustules; pedicel about one-half longer than thick; ring joint absent, although the pseudanellus has a large discoid capitulum; flagellum six-jointed and subflabellate, each joint except the apical one provided with a short stout basal expansion or branch, longest on the second, third and fourth joints (fig. 4), the sixth also somewhat expanded on the dorsal side and provided with rather long spur or nipple at apex; flagellum provided with rather long setae and spine-like sensoria especially on the margin of the branches as shown in the figure.

Coloration as in the female, but the abdomen is concolorous with the thorax and without a basal pale spot; antennae yellowish brown with the flagellum slightly duskier.

Length of body, (1.06 to) 1.61 mm.; length of head, 0.471 mm.; width of head, 0.561 mm.; width of vertex at anterior ocellus, 0.337 mm.; length of antenna, 1.28 mm.; width of mesoscutum, 0.499 mm.; length of fore wing, 1.52 mm.; width of fore wing, 0.683 mm.

Described from 11 females and 6 males (holotype female, allotype, and paratypes) collected in April, 1923, on Midway Island (Fullaway); 1 female (paratype) collected on Mt. Tantalus, Oahu, June 10, 1917 (Bridwell); 1 female (paratype) collected at Waihee, Maui, September 4, 1919 (Bryan); 1 female (paratype) reared from Hypothenemus larvae in monkey-pod twigs, Honolulu, about June, 1918 (Crawford); and 1 female

(paratype) reared July 4, 1922, from an unknown host on sugar-cane collected in the upper part of Manoa Valley, Oahu (Swezey and Fullaway).

Type: Cat. No. 231, Bernice P. Bishop Museum.

PSEUDOPHELIMINUS Girault.

As here recognized Pseudopheliminus is equivalent in part to Sympiesis of Ashmead's[11] classification (1904) and of other authors but not of Förster. In Pseudolpheliminus the antennae are nine- or ten-jointed, with only one true ring joint, the funicle compressed and four-jointed, the basal joints much longer than wide, the club usually two-jointed; and in the male the antennae are ramose and typically Eulophine. The male of Sympiesis Förster has the antennae eight-jointed, non-ramose, the funicle five-jointed with the first three of these joints shorter than the following and about as wide as long or even transverse as is given in Ratzeburg's[12] figure of *S. laticornis*. The female has antennae similar to the male but slenderer according to some of the European authorities, but according to Masi's[13] description the female is hardly distinguishable from the same sex of Pseudopheliminus.

Dimmockia Ashmead, Asympiesiella Girault, Notanisomorphella Girault, and Notanisomorphomyia Girault are all closely allied to Pseudopheliminus and so far as known all have ramose antennae in the male. On account of the very numerous species belonging to this group it would not be surprising if all these genera were ultimately found to be linked together by annectent forms, in which case perhaps only the oldest genus, Dimmockia, could be recognized. Until this intergradation is proved, however, by a thorough revision of the group, I believe it would be better to recognize these genera as separate entities. Pseudopheliminus is used therefore for those Sympiesis-like species which have the abdomen moderately long and pointed at apex, and the propodeum without carinae and sculptured about like the rest of the thorax, and which have ramose antennae in the male sex.

26. **Pseudopheliminus vagans** new species (fig. 5)

This species is very close to (Smypiesis) *P. substigmatus* (Girault) and *P. stigmatus* (Girault) but it is more similar to *P. stigmatus*. It differs from *P. substigmatus* in having the scape entirely dark metallic and the abdomen longer, the sixth tergite in *P. substigmatus* being no longer than the basal width, but considerably longer in both *P. stigmatus* and *P. vagans*.

[11] Ashmead, W. H., Classification of the Chalcid flies. . . .: Pub. Carnegie Museum, ser. 21, Carnegie Museum Mem. vol. 1, no. 4, pp. 225-551, 1904.

[12] Ratzeburg, J. T. C., Die Ichneumonen der Forstinsecten in forstlichen und entomologischen Beziehung, vol. 2, p. 162, 1848.

[13] Masi, L., Contribuzioni alla conoscenza dei Calcididi Italiana: Lab. Portici Boll. vol. 1, p. 255, 1907.

The legs of *P. vagans* are much darker than those of *P. stigmatus,* with a slightly larger metallic green spot at the base of hind coxae, and with the middle coxae metallic on the dorso-posterior surface, whereas in *P. stigmatus* the middle coxae have only a slightly metallic streak on the outer side. The abdomen also has much less extensive yellow markings in *P. vagans.* About the only structural difference between *P. vagans* and *P. stigmatus* is that *P. stigmatus* has a much more definite sulcus on the propodeum extending backward from the spiracles, the inner margin of the sulcus somewhat simulating a lateral carina or fold.

It appears that *P. vagans* is a very recent immigrant to Hawaii, as it was first detected as late as November, 1922. Yet it must have been present for

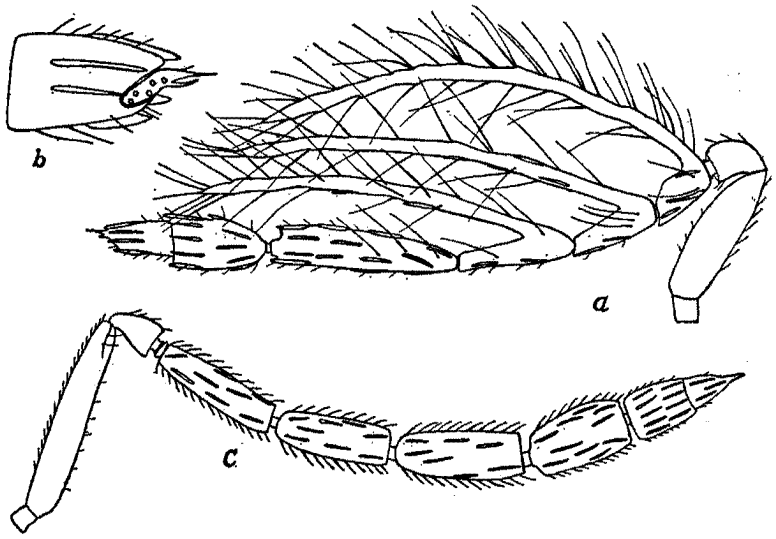

FIGURE 5. *a,* Antenna of male *Pseudopheliminus vagans* Timberlake; *b,* apex of club, more enlarged; *c,* antenna of female.

several years before that date to account for its distribution, as it was taken almost simultaneously on Oahu and Maui and but a few months later on Kauai and Nihoa.

Female

Head distinctly broader than long, if not shrunken; as seen from above it appears transverse, with a deep triangular emargination between the eyes, the sides broadly rounded, the occipital margin nearly straight; as seen from the side it is sublenticular, as seen from in front it has the dorsal margin slightly rounded, the sides including outline of the eyes fully rounded, each eye appearing as a semicircle, and the cheeks converging strongly towards the broad oral margin. Eyes rather strongly protuberant, moderately large, a little longer than wide, their margin fully rounded dorsally and on each side and much more acutely rounded anteriorly, vertex much broader than long, comprising slightly more than one-half of the whole

width of the head; ocelli in a small and obtuse-angled triangle, the posterior pair placed slightly nearer to the eye margins than their own distance apart. Face above the antennae provided with a deep impression which emarginates the frons and reaches almost to the anterior ocellus, the sides of the impression sloping gradually upward and outward from the median line towards the inner margin of the eyes, the face below the antennae moderately strongly convex from side to side; antennal sockets small, almost circular and placed close together just above the ocular line; cheeks short or no longer than half the width of the eyes, the genal suture fine but distinct.

Antennae nine-jointed; scape slender, cylindrical, as long as the pedicel, first funicle joint and nearly one-half of the second funicle joint combined, and reaching to the ocelli; pedicel about one-half longer than thick and not more than one-third as long as the first funicle joint; ring joint transverse, the capitulum closely joined to it and extremely thin; first funicle joint nearly four times as long as wide, the next two subequal, each about a fifth shorter than the first, the fourth about a third shorter than the first, somewhat wider and about two and one-third times longer than wide; club about equal to the fourth funicle joint in length but considerably narrower, tapering to the acute apex, the basal joint comprising nearly two-thirds of the length, the apical spur or nipple short, small and not articulated; all parts of the antennae including scape rather densely provided with short stiff very sharply pointed setae. Right mandible with five teeth, the left with six.

Thorax about twice as long as wide, widest at the base of the mesoscutum and tapering forward to the neck, the dorsum rather depressed; pronotum shortly conical, the collar not discrete; mesoscutum with very faint indication of parapsidal lines anteriorly; scutellum nearly as broad as long, strongly depressed, its surface continuous with that of the elevated median part of the metanotum; the latter about one-fourth as long medially as the scutellum; propodeum medially about one-half as long as the scutellum, provided with a fine only slightly raised but distinct median carina, but otherwise without carinae or sulci excepting a small transverse depression on each side close to the apical margin, which extends obliquely forward as a very shallow furrow to the spiracle.

Abdomen considerably narrower than the thorax and not quite twice as long, strongly acuminate at apex, strongly depressed on the whole, but with the venter slightly convex from side to side especially towards the base, the tergum sunken in behind the first tergite (or third morphological segment) excepting on the two apical segments and a part of the fifth; ovipositor shortly protruded at apex, the length of the protruded part about equal to the length of the seventh tergite.

Legs long and slender, the hind tibiae with two distinct apical spurs. Wings with submarginal vein somewhat shorter than the marginal, the stigmal nearly one-third as long as the marginal vein and the postmarginal vein about one-half as long as the marginal.

Head smooth and polished; almost the whole thorax with a rather fine close thimble-like puncturation, but a small triangular area on each mesopleuron beneath the hind wings and also a small, almost foveated, transversely oval area on each side of the metanotum at the posterior margin just in front of the propodeal spiracles are smooth and highly polished; puncturation of thorax on the whole very uniform in size yet becoming distinctly coarser on the middle of the mesoscutum and on the prepectus; mesosternum posteriorly with the same sculpture but anteriorly the punctures become shallower and gradually change into equally fine reticulations, the areoles of which are in part somewhat transverse; hind coxae above at base with a fine puncturation like the thorax, but the sculpture of the remaining part of these and of the other coxae inclines more to reticulation; abdomen throughout very finely reticulate.

Head with a few small black setae around the margins of the occiput and along the occipital margins of the cheeks and a few shorter ones on the anterior surface of the cheeks and sides of face; posterior margin of the pronotum with about five rather long black setae, the mesoscutum with about five pairs of similar setae and the scutellum with two pairs situated near the anterior and posterior corners; lateral margins of the propodeum with a sparse fringe of fine whitish hair; sides of abdomen and apical half of dorsum provided with rather short fine hair, most abundant towards the apex where it is blackish but becoming whitish on the sides towards the base.

Face, cheeks and frons metallic purple; rest of the head and the thorax rather dark metallic green, the thorax with a brassy luster which is strongest on the propodeum, abdomen metallic green, the apical tergite usually somewhat purplish, an elongate spot on each side of dorsum just in from the margin and covering the second to fourth and base of the fifth tergite yellowish, the intervening medial area nearly twice as wide and more or less purplish; venter of abdomen brownish yellow on the basal two-thirds, except medially where it is more or less fuscous, the last two segments and sides of the preceding segment dark metallic green. Scape metallic green, the pedicel and flagellum dull blackish. Legs brownish yellow; a small spot at the base of hind coxae above metallic green; the exterior surface of middle coxae usually more or less distinctly and extensively metallic green but sometimes yellowish; tibiae more or less distinctly brown or even fuscous on dorsal surface or entirely so towards apex, the tarsi fuscous; the spurs of middle and hind tibiae whitish or pale yellowish. Wings hyaline except for a small roundish fuscous spot at apex of the stigmal vein, which varies considerably in size and intensity; veins of wings fuscous, the submarginal much paler. Mandibles dark brown. Protruded part of the ovipositor sheaths almost black with a purplish luster.

Length of body, (1.80 to) 3.15 mm.; length of head, 0.514 mm.; width of head, 0.702 mm.; width of vertex at posterior ocelli, 0.344 mm.; length of antenna, 1.56 mm.; width of mesoscutum, 0.589 mm.; length of fore wing, 2.16 mm.; width of fore wing, 0.832 mm.

Male

Similar to the female except in regard to the antennae and abdomen, and except that the legs are darker and the wings without a substigmal spot.

Antennal sockets situated just above the ocular line and placed about their own diameter apart. Antennae nine-jointed and triramose, scape considerably shorter and wider than in the female, yet still linear and reaching to the ocelli; pedicel a little longer than thick and distinctly shorter than the first funicle joint; capitulum distinct and discoidal but no true ring joint present; funicle four-jointed, the first joint about twice as long as wide, the following joints greatly increasing in length successively, the third about twice as long as the first, the fourth about equal to the second and third combined; first three funicle joints provided with a long dorsal ramus, the first one inserted at the base of the joint, the third at about one-third of the length of the joint from the base, the second about intermediate in this respect between the first and third; the rami with numerous but well scattered long setae which are somewhat longer than the first funicle joint, the joints themselves, especially the fourth joint, provided with a few similar but somewhat shorter setae; the rami also decreasing successively in length, the first one reaching about to the base of the club, the third reaching almost to the middle of the basal club joint; club elongate oval, distinctly but not greatly shorter than the fourth funicle joint, three-jointed, the basal joint much thicker than the following joint and comprising somewhat more than one-half the whole length of club; apical joint composed of a small nipple with its basal expansion imbedded in the apex of the second joint; flagellum provided with rather numerous, linear, projecting, corneous sensoria which are most numerous

on the fourth funicle joint and on the first two joints of the club, and are present also on the second and third ramus but not on the first.

Abdomen about as long as the thorax and considerably narrower, somewhat narrowed towards the base, the venter distinctly plicate medially, the apex except for exserted genitalia somewhat rounded.

Coloration similar to that of the female but a little darker and duller, the abdomen with a rather large subbasal yellowish spot both above and beneath. Legs considerably darker, the coxae concolorous with the thorax, or the front and middle pair more or less piceous; front and middle femora except at apex, hind femora, apical half of hind tibiae and the hind tarsi more or less piceous or blackish, the hind femora also with a more or less distinct greenish luster; front tibiae near middle and middle tibiae near apex with a suffused and faintly dusky ring; front and middle tarsi except the basal joint more or less piceous especially above; trochanters, apex of front and middle femora and remaining parts of the tibiae and tarsi brownish yellow, the tibial spurs whitish or pale yellowish. Wings wholly hyaline, the veins fuscous, with the submarginal paler.

Length of body, (1.07 to 1.95), 1.70 mm.; length of head, 0.377 mm.; width of head, 0.497 mm.; width of vertex at posterior ocelli, 0.268 mm.; length of antenna, 1.09 mm.; width of mesoscutum, 0.424 mm.; length of fore wing, 1.367 mm.; width of fore wing, 0.610 mm.

Described from 7 females and 19 males (holotype female, allotype and paratypes) reared from *Gracilaria marginestrigata* Walsingham, on *Sida cordifolia,* Kaimuki, Oahu, January 25 to March 3, 1924 (Timberlake); 1 female and 2 males (paratypes) from the same caterpillar on Sida, Pearl Harbor Peninsula, Oahu, March, 1923 (Timberlake); 1 male (paratype) collected on Waialae ridge, Oahu, Nov. 26, 1922 (Swezey); 1 female (paratype) collected on lantana blossoms, Wailuku, Maui, Dec. 9, 1923 (Swezey); 1 female (paratype) reared from *Gracilaria hauicola* Swezey on hau tree, Hanalei, Kauai, May 16, 1923 (Swezey); and 1 female (paratype) collected on Nihoa, June 14, 1923 (Bryan). Paratypes in the collection of the author, of the Hawaiian Entomological Society and of the United States National Museum.

Type: Cat. No. 232, Bernice P. Bishop Museum.

TRICHOGRAMMATIDAE

27. **Aphelinoidea oceanica** new species (fig. 6)

Female

Antennae nearly as in *A. semifuscipennis* Girault and *A. xenos* Timberlake; the pedicel considerably longer than the basal joint of the club; the latter with a transverse groove on the ventral side slightly beyond the middle of the joint, the suture between the two joints of the club nearly straight, not deeply angularly emarginate on the outer surface as in *A. semifuscipennis.*

Fore wing more as in *A. semifuscipennis* than in *A. xenos,* the marginal fringe shorter than in either, the longest setae being about one-eighth as long as the greatest width of the disk; the latter proportionately slightly wider than in *A. semifuscipennis* but the discal setae of about the same density, there being approximately 25 to 28 lines of setae across the widest part of the disk. Marginal vein distinctly

fusiform, being considerably wider at the middle than at either end, the stigmal vein very inconspicuous because of its transparency but about as long as wide; submarginal vein distinctly broken and with a short branch projecting obliquely basad from the distal portion, this probably representing a vestigial basal vein; submarginal provided with four coarse setae, two of these being on the distal part beyond the break; the marginal vein provided with five similar setae, of which one is placed at base and apex respectively and two opposite each other at the middle, and with several much smaller setae.

Upper part of occiput with close very fine transverse lineolations, the fuscous part of occiput with sparser, more irregular longitudinal lines; pronotum transversely lineolate, with a few coarse reticulations near the middle; sculpture otherwise appar-

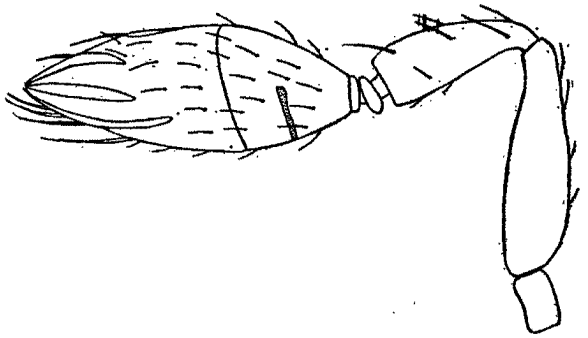

FIGURE 6. Antenna of female *Aphelinoidea oceanica* Timberlake.

ently wholly microscopically alutaceous.

General color rather bright orange yellow in balsam mounts, the scutellum, metanotum, a triangular basal mark on propodeum, and sometimes a part of the mesoscutum appearing whitish by reflected light; lower half of the occiput and the cheeks fuscous, the lower part of the face more dilutely fuscous or dusky; prothorax including prosternum also fuscous; antennae and legs concolorus with body, the front coxae and base of hind coxae dusky. Eyes and ocelli bright carmine. Wings hyaline, the area beneath the venation only slightly clouded with fuscous, except in a vertical band suspended from the stigmal vein and apex of the marginal, which is much more distinctly fuscous; within this more infuscated area lies a vertical, extremely narrow, slightly curved hyaline line; submarginal vein pale yellowish, the marginal fuscous, the stigmal nearly colorless. Hind wings without a distinct clouded area across the base; the veins yellowish, but the apex of the marginal slightly dusky.

In dry mounts the coloration is about the same but in some specimens two oval, pale brownish spots are apparent, placed longitudinally on the anterior half of the mesoscutum.

Length of body, 0.562 to 0.695 mm.; length of antenna, 0.267 mm.; length of scape, 0.097 mm.; length of pedicel, 0.053 mm.; length of pedicel and flagellum, 0.169 mm.; length of club, 0.105 mm.; length of basal joint of club, 0.038 mm.; length of fore wing, 0.475 mm.; width of fore wing, 0.209 mm.; length of marginal fringe of fore wing, 0.027 mm.

Male

Very similar to the female, the antennae slightly shorter and slenderer, the coloration usually but not always somewhat darker, with the under parts of the thorax, the coxae and lateral margins of the abdomen more or less infuscated, the femora

except at apex somewhat dusky; wings practically as in the female except that the marginal fringe is somewhat longer.

Length of body, (0.545 to) 0.669 mm.; length of antenna, 0.223 mm.; length of scape, 0.081 mm.; length of pedicel, 0.042 mm.; length of pedicel and flagellum, 0.133 mm.; length of club, 0.080 mm.; length of basal joint of club, 0.037 mm.; length of fore wing, 0.466 mm.; width of fore wing, 0.196 mm.; length of marginal fringe of fore wing, 0.034 mm.

Described from 8 females and 9 males collected on Wake Island, July 28 and August 3, 1923 (Bryan).

Type: Cat. No. 233, Bernice P. Bishop Museum.

This species belongs to a group containing *A. semifuscipennis* and *A. xenos,* which is distinguished by having the fore wings comparatively narrow, and provided with setae on the disk only as far basad as the apex of the venation; the hind wings very narrow, acuminate at apex and provided with only three lines of discal setae. The species belonging to this group may be separated as follows:

1. Antennae unicolorous, the basal joint of club not conspicuously paler 2
   Antennae with the basal joint of club whitish, forming a conspicuous pale ring; wings narrow, with about eighteen lines of discal setae at widest point, the basal cloud not extending into the pubescent area of disk ... **weismanni Girault.**
2. Wings deeply infuscated at base, the cloud extending more or less into the pubescent area of disk. 3
   Wings more faintly clouded at base, the cloud not extending into the pubescent area of disk, except at the posterior margin, where not more than three or four setae lie in the infuscated area; coloration of body almost wholly yellow, the legs and antennae practically concolorous. ..... **oceanica Timberlake.**
3. Wings broader with denser discal setae, the marginal fringe equal to about one-seventh of the width of the disk; body mostly piceous in color. 4
   Wings comparatively narrow with about twenty discal hair lines at the widest point; marginal fringe equal to about one-fifth of the width of the disk; body mostly yellowish brown ..... **xenos Timberlake.**
4. Wings with about twenty-five lines of discal setae at widest point; general color piceous, with upper part of face, antennae, legs in part, parapsides, metanotum, base and apex of abdomen dusky yellow, the vertex and upper part of occiput brighter yellow. ..... **semifuscipennis Girault.**
   Like *semifuscipennis* but with the antennae and legs paler and more yellowish, the marginal fringe of fore wing finer and shorter, and the discal setae somewhat denser. ..... **semifuscipennis albipes Girault.**

MYMARIDAE

28. **Polynema reduvioli** Perkins

Midway Island, April, 1923 (Fullaway): 2 females. Ocean Island, April, 1923 (Fullaway): 1 female.

A GYNANDROMORPH OF TETRAMORIUM GUINEENSE FABR.

By

WILLIAM MORTON WHEELER

Mr. P. H. Timberlake has kindly sent to me a very interesting gynandromorph of the common tropicopolitan ant, *Tetramorium guineense* Fabr., which was collected June 19th, 1923 by Mr. E. H. Bryan, Jr. on Necker Island. Unlike the previously recorded ant-gynandromorphs, this insect is a pure example of the anteroposterior type, the head being male, the remainder of the body female, with perfectly developed wings (fig. *7a*). I can detect no deviation in the structure of the head (fig. *7b*) from that of the normal male. The antennae are perfectly developed and ten-jointed, and the details of the sculpture, pilosity and color of the normal male are accurately reproduced. The head of the normal female, shown in fig. *7c*, is, of course, very different. The thorax, however, is precisely like that of the normal female, except that it is slightly less robust with the mesonotum a little less flattened dorsally and that the metasternal spines are undeveloped. The thorax of the male *T. guineense* is very different from that of the female, since it lacks the epinotal spines as well as the mesasternal spines, has a more convex mesonotum and mesosterna and the former has Mayrian furrows. The color is also darker and the surface much smoother and very differently sculptured from that of the female. The legs, petiole, postpetiole and gaster of the gynandromorph are precisely as in the normal female, even the sting, which is fully exserted, being of the same length and structure. The sculpture, pilosity and color are also as in the normal female, the thorax, legs and pedicel being yellowish ferruginous, the gaster very dark brown or blackish, with its extreme base and tip yellowish brown. There is every reason to assume that the internal reproductive organs are those of the normal female. The wings are whitish hyaline, with colorless veins and pterostigma, as in the normal female.

On looking over the specimens of *Tetramorium guineense* in my collection I find one male from Cagues, Porto Rico with an 11-jointed left antenna. The right antenna is broken so that the number of its joints can-

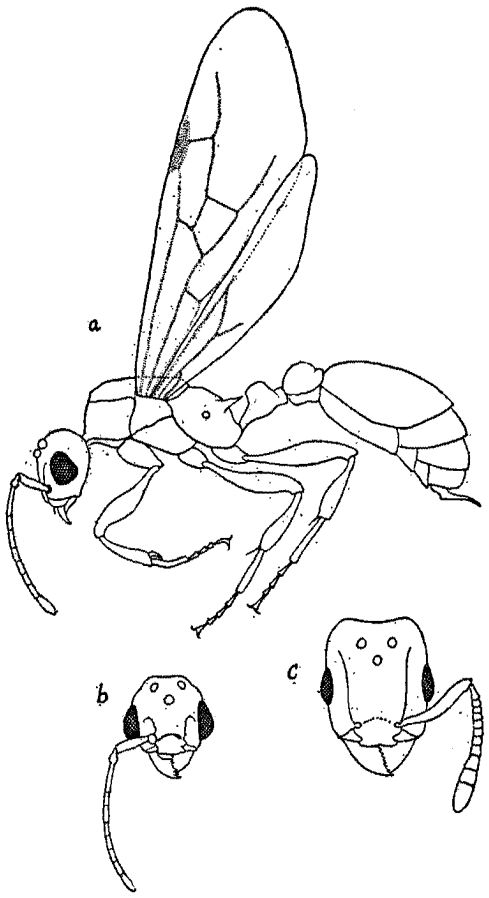

FIGURE 7. Gynandromorph of *Tetramorium guineense* Fabr.: *a*, lateral view; *b*, head of same, dorsal view; *c*, head of a normal female.

not be ascertained. This and similar specimens, which one finds occasionally in Tetramorium and other ant-genera, are probably to be regarded as exhibiting "intersexual" rather than gynandromorphic traits since the number of antennal joints is intermediate between the ten of the normal male and the twelve of the normal female.

COLEOPTERA

By
E. H. Bryan, Jr.

CARABIDAE

Two specimens of a small species found under rotting grass clump at edge of lagoon, Laysan Island (Fullaway). Specimens sent to Dr. E. C. Van Dyke for determination.

STAPHYLINIDAE

Medon debilicornis Wollaston

Ocean Island, April, 1923 (Fullaway).

Atheta coriaria Kraatz

Nihoa Island, June 11-15, 1923 (Bryan).

This small black species was found in abundance on bunch grass, Euphorbia, moist algae along a trinkle of water in one of the valleys, and even about camp.

Two other small species of Staphylinidae, as yet unidentified, were found: one species on Midway Island, April 23, 1923 (Fullaway); the other on Laysan Island, April 11, 1923 (Fullaway).

COCCINELLIDAE

Coelophora inaequalis (Fab.)

Nihoa Island, June 11, 14, 15, 1923.

No live specimens seen, but several elytra found in bunch grass sweepings (Bryan and Cooke).

Pullus kinbergi (Boh.) (Determined by Timberlake)

Nihoa Island, June 11-15, 1923. Abundant on the Pritchardia palms, Euphorbia shrubs, Sida, Chenopodium, and bunch grass. Specimens also captured about camp. Necker Island, June 17-20, 1923, on *Sesbania tomentosa,* Lepturus, Chenopodium and bunch grass. French Frigate Shoals, June 22-26, 1923, on Lepturus, Chenopodium and Boerhaavia (Bryan). Pearl and Hermes Reef, April 27, 1923 (Fullaway). Ocean Island, April, 1923 (Fullaway).

Nephus species near **bipunctatus** (Kug.) (Determined by Timberlake)

Nihoa Island, June 13 and 15, 1923, on Euphorbia (Bryan).

CUCUJIDAE

Cryptamorpha desjardinsi (Guer.)

Pearl and Hermes Reef, April 27, 1923 (Fullaway). Ocean Island, April (Fullaway). Nihoa Island, June 11 to 15, 1923 (Bryan) on Pritchardia.

Silvanus surinamensis (Linn.)

Laysan Island, in corn meal (Fullaway).

DERMESTIDAE

Dermestes cadaverinus Fab.

Nihoa Island, June 11-14, 1923, from dead birds (Bryan, Schlemmer, and Cooke). Necker Island, June 15, 1923 (Judd), June 17 and 29 (Bryan). French Frigate Shoals, from dead birds, June 25-27 (Bryan). Laysan Island, April, 1923 (Ball, Fullaway, Grant). Also bred from seal's skull from Laysan Island (Bryan). This is probably the species which Dill and Bryan[14] report so abundant, "the larvae of which devoured everything that was not well poisoned." It is probably also the *"Dermestes domesticus* Garm. in ganz ungeheuren Mengen vorkommend," recorded by Schauinsland.[15]

Lisiansky Island, May 16-17, 1923, from the grass patch at the northeast corner, and from the deserted guano camp (Grant). Pearl and Hermes Reef, April 27, 1923 (Fullaway). Midway Island, April 23, 1923 (Fullaway). Johnston Island, July 12-17, from dead birds (Bryan).

Dermestes vulpinus Fabr.

Nihoa Island, June 11-15, 1923, and Necker Island, June 18-20, 1923 from dead birds (Bryan).

D. cadaverinus and *D. vulpinus* being readily distinguished, special care was taken to note their distribution. Whereas *D. cadaverinus* was found wherever there were the carcasses of dead birds, *D. vulpinus* seemed to be confined to the high islands of Nihoa and Necker. There were no scavenger insects on Wake Island, as hermit crabs quickly cleaned all carcasses.

Labrocerus sp.

Nihoa Island, June 13-16, on Euphorbia; Necker Island, June 18, 20, 1923 (Bryan).

HISTERIDAE

Carcinops quatuordecimstriata Steph.

Johnston Island, July 12-18, 1923, from dead birds (Bryan).

[14] Dill, H. R. and Bryan, W. A., Report on an expedition to Laysan Island in 1911; U. S. Dept. Agric., Biol. Sur., Bull. 42, p. 10, 1912.

[15] Schauinsland, H., Drei Monate auf einer Koralleninsel: p. 102, Bremen, 1899.

ELATERIDAE

Itodacnus novicornis new species (Description by Van Zwaluwenburg. See pp. 50-52.)

Necker Island, in dirt and loose stones (Bryan).

Monocrepidius exsul Sharp

Larva from Midway Island (Fullaway). (See p. 52.)

CLERIDAE

Necrobia rufipes De Geer

Nihoa Island, June 14, 1923, in dead bird (Bryan).

ANOBIIDAE

Lasioderma serricorne (Fab.)

Johnston Island, July 18, 1923 (Bryan).

SCARABAEIDAE

Saprosites pygmaeus Har. (Determined by Swezey.)

Ocean Island, April 1923 (Fullaway).

Psammodius nanus De Geer (Determined by O. H. Swezey.)

Ocean Island, April, 1923; Laysan Island, April, 1923, under dead grass (Fullaway).

CHRYSOMELIDAE

Epitrix parvula (Fab.) (Determined by P. H. Timberlake.)

Nihoa Island, June 11-13, 1923, some specimens on Pritchardia palms, some on Euphorbia (Bryan).

TENEBRIONIDAE

Alphitobius piceus (Olivier)?

Laysan Island, April 11, 1923 (Fullaway). Pearl and Hermes Reef, April 27, 1923 (Fullaway). Johnston Island, July 12-18, 1923, abundant about the carcasses of dead birds (Bryan).

Smaller, glossy black species; specimens sent to Dr. E. C. Van Dyke, but as yet undetermined. Ocean Island (Fullaway); Nihoa Island, June

11-14, about camp and on the Pritchardia palms; Necker Island, June 19, 1923 (Bryan).

Tribolium ferrugineum (Fabr.)

Laysan Island, in corn meal, April 9, 1923 (Fullaway).

ANTHRIBIDAE

Araeocerus fasciculatus (De Geer) (See page 64.)

Ocean Island (Fullaway). Nihoa Island, June 11-16, on Euphorbia (Bryan). Necker Island, June 16-20, 1923 (Bryan).

A larger, as yet undertemined species, Wake Island, on Sida, July 31, 1923 (Bryan).

ITODACNUS NOVICORNIS, A NEW ELATERID SPECIES

By

R. H. VAN ZWALUWENBURG.

Itodacnus novicornis new species (fig. 8)

Male

Fairly slender and elongate; 14.00 mm. long, 4.0 mm. wide; head dark brown; pronotum reddish brown with two dark brown vittae; elytra Van Dyke brown; beneath, dark brown with irregular pallid areas on prosternum and pallid on posterior margins of abdominal sternites. Legs flavous. Pubescence short, golden brown.

Fourth antennal joint distinctly longer than second and third together (about 1.0-1.3-3.9 mm). Joints 4 to 10 subequal in length. Antennae fairly elongate, exceeding the tip of the posterior angle of the prothorax by about 3 antennal joints.

Prothorax about as long as wide, along the center line. Sides of prothorax nearly straight from about their middle, diverging moderately toward the rear. The posterior angles in the same line as the sides of the prothorax, except for their tips which diverge slightly more. From the middle of the side the prothorax is gently rounded to the anterior angles. Punctation of pronotum coarse, umbilicate, slightly less coarse on disc, especially on posterior half, where occur also finer and simple punctures among the umbilicate punctures. Punctation finer and less distinct toward the posterior angles.

Posterior angles strongly unicarinate; carina diverging strongly from the lateral margin, nearly bisecting the angle. Notum transversely convex; vague median depression on posterior half. Sulci obsolete.

Scutellum longer than wide, suboval, depressed near tip. Elytral striae consisting of single series of well-impressed circular punctures; the interstrial spaces flat and finely punctulate. Elytra as wide at base as posterior angles of the prothorax, their outer sides parallel nearly to the middle, thence conjointly narrowed to apex. No humeral carina.

Outer lobe of posterior coxal lamina prominent, but not acute.

Female

More robust and less slender than male; 17.0 mm. long 4.7 mm. wide; pronotum and elytra more convex. Antennae shorter than in male, the tenth antennal joint attaining to about the apex of the posterior angle. Elytra with sides parallel for about two-thirds their length, thence narrowed to the apex. Otherwise similar to male.

The coloration varies from Van Dyke brown to Cologne earth (see Smith's glossary), and in some specimens the vittae on the pronotum are suffused and confluent, the rest of the pronotum losing its reddish brown color. The pallid areas on the under side of the coloration of the legs are also somewhat variable.

The males vary in length from 14.0 to 16.0 mm. and the females from 16.0 to 17.0 mm.

Described from 6 males and 4 females, all from Necker Island, collected June, 1923 by Bryan, Judd (1 male), and Cooke and Thaanum (1 female).

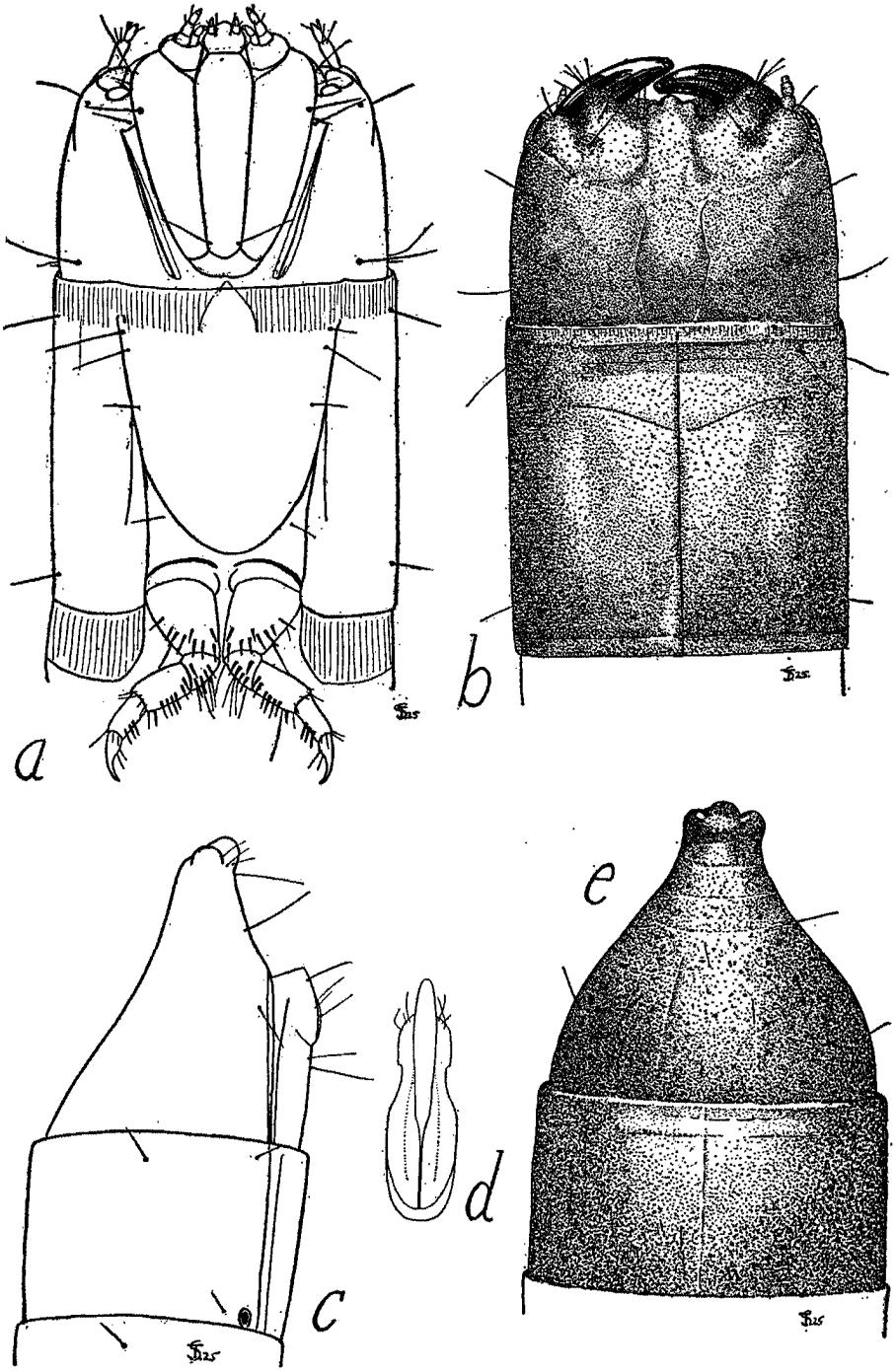

FIGURE 8. *Itodacnus novicornis* new species: *a*, ventral view of head, first segment and first pair of legs of larva; *b*, dorsal view of head and first segment of larva; *c*, lateral view, last two segments of larva; *d*, male ædeagus; *e*, dorsal view of last two segments of larva.

Type: Male, allotype, 3 male paratypes and 3 female paratypes, Cat. No. 234 Bernice P. Bishop Museum; 1 male paratype in collection of H. S. P. A. Experiment Station; and 1 male paratype in U. S. National Museum.

This interesting species, so distinct from, but so evidently related to its congeners in the other Hawaiian islands, is probably the result of isolation upon this remote island, some 300 miles away from Kauai, the nearest land known to support native Elaterid species.

As distinguished from all other species of the genus seen by the writer, *I. novicornis* has the fourth antennal joint distinctly longer than the second and third together. In all the species described heretofore, the combined length of the second and third joints is subequal to that of the fourth. In all other respects it possesses the distinctive characters of the genus. Its erection into a new genus on a single character seems unjustifiable, especially since this antennal character is one that ranges so widely in certain genera of the family, for example, Melanotus.

This species has the fascies of an enlarged *I. gracilis* Sharp with pronounced pronotal vittae; in size it more nearly approaches *I. major* Sharp. The exterior lobe of the posterior coxal lamina is rounded, being in this respect more like *I. major* than like *I. gracilis,* in which the lobe is pronounced and acute.

The aedeagus of the male (fig. 8, *d*) is of the typical elateroid 3-lobed type; the lateral lobes are not entire but instead distinctly angulate. The aedeagus of *I. gracilis* has the lateral lobes entire and more slender than *I. novicornis;* in *I. sordidus* the lateral angles of the aedeagus tend more toward the angled type. I have no male of *I. major* available for comparison of the aedeagus.

What are presumably the larvae of *I. novicornis* seem to differ in no important particular from those of known Itodacnus from the other Hawaiian islands. They have the body subcylindrical; the mandible unidentate; the fronto-clypeal plate bluntly 3-lobed with the median one most prominent and broadly rounded; the submentum broad (not acute) caudad; the ninth abdominal segment entire ending in 3 blunt points, the median one directed ventrad; no anal armature. (See fig. 8.)

Associated with the larvae of *I. novicornis* on Necker Island, under stones, was a single larva belonging to the Steatoderini, a tribe hitherto not known from Hawaii. The tribe includes the genera Parallelostethus, Crigmus, Orthostethus, Dolopius.

A single larva, indistinguishable from the larva of *Monocrepidius exsul* Sharp was collected on Midway Island (Fullaway).

COLEOPTERA, WEEVILS

By

R. C. L. PERKINS

This paper deals with the Rhyncophorus beetles, also with a single species representing each of the families Cerambycidae and Cioidae. The collection, though consisting of only 23 species, is of great interest. It is evident that nearly all these species are intimately related to forms already known on the larger Hawaiian islands. The few species described as new from Wake Island are, however, entirely different in character, as might be expected, for neither the highly abnormal Rhyncogonus nor the minute Acales found there is in any way related to Hawaiian species, while Sphaerorhinus, which is also found in Samoa, is unknown in Hawaii.

One of the most interesting conclusions to be drawn from a consideration of the Curculionid fauna of these small outlying islands is that the very extensive areas of coast and lower mountain country of the main islands—areas which now have practically no such native fauna, although such factors as vegetation appear most favorable, must have possessed a very extensive and important series of species before foreign importations had exterminated them.

Of the 23 species, here considered, 16 appear to be undescribed, while 2 other endemic species have been previously described, *Dryotribus wilderi* Perk. and *Oodemas laysanensis* Fullaway. A Rhyncogonus (*R. bryani* Perk.),[16] previously collected on Laysan Island, was not found by the Tanager Expedition. It is known only from a single specimen, and *R. exsul,* described here from many specimens collected on Nihoa Island, might, if we had a series of the Laysan insects, prove to belong to the same species.

CERAMBYCIDAE

Plagithmysus nihoae new species

Rufous; the antennae, slender bases of the femora, tibiae and tarsi paler, or testaceous.

Head mostly covered with whitish ochreous, decumbent hairs, leaving a median facial line bare. Apical joint of the antennae a little longer than the preceding. Pronotum with the medium crest broad, divided into an anterior and posterior part, the former with a curved or subangulated elevated line in front, the latter with a

[16] Perkins, R. C. L., A new species of Otiorhynchine beetle of the genus Rhyncogonus Sharp from Laysan Island: Ent. Mo. Mag. p. 4, 1919.

slightly curved one in front, and a second one behind this. The surface of the crest has only a scanty clothing, especially in the more elevated portions, and on each side of it the pubescence becomes dense, so as to form two distinct longitudinal vittae on the outer edge of which it again becomes less dense and then externally to this again more dense. The hairs of the scutellum are dense round the margins, the rest with sparse, fine hairs. Elytra, on about the apical two-thirds of their length, flat along the suture, so that two slight ridges are formed between the flattened part and the deflexed outer surface, the former densely clothed so as to form two vittae, broad at the base and gradually narrowing to the apex, the latter (or deflexed) part much less regularly and densely clothed and almost bare along the defining ridges. The basal part of the elytra is copiously but irregularly flecked with the same whitish ochreous hairs as form the rest of the clothing. At the sides the abdominal segments are marked by a large, dense, quadrate patch of pale appressed hair, each containing a smooth glabrous area, which on the more anterior segments divides the patch except at the base. Hind femora widening gradually from the slender base, being nearly parallel sided for a distance about equal to the length of the adjoining abdominal segments, but of a pallid color for a still further distance, the tibiae well clothed with pale hairs, the tarsi above still more densely clothed. The metepistoma are hidden beneath dense clothing which is continued foreward on to the mesopleura. The abdominal segments are continued almost in the plane of the metasternum, as is usual in females, but sometimes occurs in males, and I am not certain as to the sex of the specimen without dissecting it.

Length: 8.5 mm.

Habitat: Nihoa Island. A single specimen on Euphorbia, June 15, 1923 (Bryan).

Type: Cat. No. 235 in the Bishop Museum.

CURCULIONIDAE

Dryophthorus distinguendus Perk.

This common Hawaiian species was found by Fullaway on Laysan Island, where it may have been introduced from Honolulu. It is often abundant in boards and in the wood of boxes in which small plants are raised. Whether it is really endemic in Hawaii is very doubtful.

DRYOTRIBUS

This genus is of great interest apart from its structural characters on account of the wide distribution of its typical species, which is found on the coast of Florida, in the West Indies, in driftwood in Hawaii, including its remote outlying islands. It will probably be found throughout the Pacific, as it has been reported from Australia and China.

In Hawaii the species was first found by me[17] about 30 years ago on the island of Lanai—not Kauai as stated by Kirkaldy,[18] or Kanai as printed by Champion[19]—and described as a new genus and species under the name *Thalattodora insignis*. The insect at that time was unknown to Dr. David

[17] Perkins, R. C. L., Coleoptera: Fauna Hawaiiensis, Vol. 2, p. 146, 1900.

[18] Kirkaldy, G. W., Note on the synonomy of two Hawaiian beetles: Hawaiian Ent. Soc. Proc. Vol. 2, p. 84, 1909.

[19] Champion, H. G., Notes on Cossonidae: Ent. Mo. Mag., pp. 103-104, 1909.

Sharp to whom I submitted it. Rather more than twenty years ago I again came across this beetle on the coast of Oahu beyond Diamond Head, but I seem no longer to have specimens from this locality, though a small colony was found there. In 1906 the species was found in driftwood on the coast of Oahu at Waianae, also in a small colony, and three examples of these, which I still have, and which were compared with a specimen from the West Indies, have been used for comparison with the specimens from the outlying islands of Hawaii. In 1915 I briefly described a new species,[20] *D. wilderi,* for a single specimen captured on Midway Island, by Gerrit P. Wilder. In an earlier list[21] this specimen had, without an opportunity for comparison with others, been listed as *"T. insignis"* (i. e. *D. mimeticus*).

The series of the two species recently captured by the Tanager Expedition in my opinion fully confirms the validity of *D. wilderi* as a distinct species, though both are variable. *D. wilderi* is generally easily distinguished by its more elongate and narrow form, and, when cleaned, by the different sculpture of the elytra, which in *D. mimeticus* is rougher, so that the interstices viewed from the side have a strongly shagreened or even subserrulate outline. In *D. wilderi* the antennae are more slender and elongate, the scape of *D. mimeticus* being evidently stouter.

How far the two species are found in actual company is not evident from the specimens collected, but it is certain that either may occur in some numbers apart from the other. Thus Fullaway collected about 18 examples (which I have critically examined) on Pearl and Hermes Reef, all belonging to *D. wilderi* except one very remarkable specimen, which appears to be a third species. On Laysan he collected 10 examples on April 11th, all *D. mimeticus;* and on April 9th, 5 examples, all *D. wilderi.* His few specimens from Ocean Island are also all *D. wilderi.* On French Frigate Shoals, Bryan found both species; on Johnston Island and Wake Island only *D. mimeticus.* The specimens from Wake Island have shorter elytra than those from the other islands.

Dryotribus mimeticus Horn

Habitat: Laysan Island, April 11, 1923 (Fullaway); French Frigate Shoals (Bryan); Johnston Island (Bryan); Wake Island (Bryan). Naturally the species might occur on any of the islands in drift logs.

Dryotribus wilderi Perkins

Habitat: Not yet obtained on the larger Hawaiian islands, so far as I know. It was originally described from Midway Island. Laysan Island,

[20] Perkins, R. C. L., Some new Hawaiian Coleoptera; Hawaiian Ent. Soc. Proc. Vol. 3, p. 250, 1915.

[21] Perkins, R. C. L., Hawaiian Ent. Soc. Proc. Vol. 1, p. 33, 1905.

April 9, 1923 (Fullaway); Ocean Island (Fullaway); French Frigate Shoals (Bryan); Pearl and Hermes Reef (Fullaway).

Dryotribus solitarius new species

The single example here distinguished was probably found dead, as when relaxed the head and prothorax became separated from the rest of the body. Its red color may be due to exposure to strong sunshine after death and before it was found, rather than to immaturity. The sculpture of pronotum and elytra is much as in typical *D. wilderi,* the serial punctures of the elytra very coarse and very clearly defined, the interstices distinct and nearly smooth. The rostrum is shorter than in the other species, hardly narrower behind the antennae than in front of these, which have the scape much shorter and stouter than in *D. wilderi.*

Habitat: Pearl and Hermes Reef, April 27, 1923 (Fullaway).

Type: Cat. No. 236, Bernice P. Bishop Museum.

Pentarthrum halodorum new species

Black, or almost black, the rostrum more or less reddish, the legs red or dark red, as also the antennae, the funicle joints generally darker than the scape and club. In general somewhat like *P. obscurum* Sharp of the main islands, but a smaller and less elongate species.

Head with the rostrum a little wider at the tip than basally, and extremely finely punctured, the punctures become comparatively large between the eyes, which are convex and coarsely facetted. Antennae with the scape almost as long as the funicle, of which the first joint is larger than the second, the latter being also subtriangular, appearing subelongate, though hardly longer than its apical width, much longer than the short transverse third joint, the two following also strongly transverse and increasing slightly in width, the club at least as long as the three preceding joints together.

Pronotum shining (but the sides dull) usually conspicuously flattened and often evidently depressed on the disc, the sides rounded to the anterior constriction, which is marked in the middle by a change from the coarse deep punctures of the disc to a fine puncturation. At the sides in some specimens fine, decumbent, pale hairs may be seen under a strong lens.

Elytra shining, rather more than twice as long as the pronotum and also more than twice as long as wide, the striae bearing close and coarse punctures, the interstices with a single line of fine ones. Basal ventral segments of abdomen with large, deep and remote punctures, the sutures of the three last segments deep and as if costate from a row of coarse punctures in the grooves, the two small intermediate segments not otherwise visibly punctured (under a strong lens), the apical segment finely punctured and pilose.

Length: about 3 mm.

Habitat: Midway Island, April, 1923, a few specimens, and Ocean Island, 17 or 18 specimens, in the same month (Fullaway).

Type: Cat. No. 237, Bernice P. Bishop Museum.

Pentarthrum blackburni Sharp

Two or three specimens of this species, which occurs in and near Honolulu and has the appearance of an introduced form, were found on Laysan by Fullaway, April, 1923.

Pentarthrum pritchardiae new species

Very narrow and elongate, depressed, testaceous or ferruginous in color. The rostrum widens conspicuously to the apex, where it is notably wider than near the base, and is very finely punctured, the head in front with larger and more remote punctures, the eyes very little convex. Antennae with the first funicle joint subtriangular, being much narrower at the base and about as long as its apical width, notably larger and longer than the second, which is also narrowed at the base so as to be subtriangular and longer than the third; the latter and the two following very short and transverse and of increasing width (towards the apex) the club about equal to the four preceding together.

Prosternum elongate, smooth, shining, with distinct, fine punctures which are moderately evenly distributed and though copious leave much smooth surface between them; the sides are rounded and subconvergent so that the width at the front angles is only about half the greatest width; along the front margin narrowly the surface is smooth and impunctate in the middle, but toward the sides punctured right to the actual margin and at the front angles there are some short outstanding setae.

Elytra more than twice as long as the pronotum and about three times as long as wide, rather narrower than the widest part of the pronotum, the serial punctures fine and with a row of closely set finer punctures along each side of the sutural margin; the interstices not, or hardly, convex and traversed by extremely fine grooves or wrinkles. Long, fine, pale, erect setae clothe the apical fourth or fifth of the elytra, and at the sides may extend still further toward the base. On the basal segments of the abdomen beneath the punctures are very distinct and usually rather closer towards the small intermediate segments than basally; the apical segment is dull and densely clothed with erect hairs.

Length: (rostrum included) 3-4 mm.

This species has little resemblance to the preceding species, but appears more related to the well known *P. prolixum* Sharp, so common in tree ferns on the main islands. Probably like the latter it is subject to the same large development in the male sex, since one specimen (probably found dead and discolored, the hind legs being absent) exceeds all the others in size, and has the rostrum much larger. Only five examples were obtained and without dissection I am unable to be certain whether the smaller ones are females or less developed males, but I think both sexes are present.

Habitat: Nihoa Island on Pritchardia; two on June 13th and three on June 15th, 1923 (Bryan).

Type: Cat. No. 238, Bernice P. Bishop Museum.

Macrancylus immigrans Perkins

This species, which is found, sometimes in numbers, in drift logs on the coasts of the main Hawaiian islands was captured on Laysan Island (Fullaway) and on Johnston Island (Bryan).

Oodemas neckeri new species

A narrow, oval and elongate species of dull brassy color with red legs and antennae.

Rostrum with the sides parallel or almost so, finely and distinctly punctured, but to a greater or less extent tending to run into one another, usually considerably less close on the basal part. Eyes convex but not strongly so. Antennae with the scape about as long as the width of the rostrum between the points of their insertion, first funicle joint elongate and when fully seen longer than the second, which is subelongate, the third and following all very short, nearly round. Pronotum dull, with fine and distinct, but shallow, nearly even puncturation. Second joint of front tarsi in the male much larger than in the female, but not equal in width to the lobate third joint. Elytra dull from the very dense microscopic sculpture of the surface, the punctures in the rows not at all coarse, the interstices with very feebly impressed fine punctures, flat in some examples and at most only slightly convex, the convexity more marked towards the ends of the rows of punctures, which on the apical portion are evanescent or subobsolete; the minute white setae which spring from the interstitial punctures are very short, and not at all dense, but easily seen under a strong lens.

Apical ventral segment of the male (viewed from the apex) with a slight median emargination on each side of which is a very short erect seta, differing from the minute hairs which clothe the general surface.

Length: 4-5 mm.

Habitat: Necker Island. Apparently rare. June 18, 2; June 19, 3; June 20, 2 (Bryan); June 17, 1 (Thaanum), and June 17, 1 (Cooke and Thaanum).

Type: Cat. No. 239, Bernice P. Bishop Museum.

Oodemas breviscapum new species

Long-oval, aeneous, the elytra often with a coppery tint, dull or only slightly shining, owing to the very fine microscopic sculpture of the surface.

Rostrum short, the sides slightly convergent, so that it becomes evidently narrowed toward the apex, finely, more or less confluently or strigosely punctate. Eyes only slightly convex, so that they are hardly at all prominent. Antennae very short, the scape only about half as long as the width of the rostrum between the points of their insertion; the second joint short and stout, the third slender basally and usually appearing subelongate, the following joints all very short, the club as long as the four preceding joints and not much shorter than the scape.

Pronotum copiously, finely and regularly punctured. Elytra with the series of large punctures placed in shallow, but evident grooves, and becoming finer or subobsolete on the apical portion, the interstitial punctures very fine and shallow, but in most specimens distinct and numerous, the pale setae which they bear are very minute. Front tarsi with the second joint small, transverse or at least as broad as long, only about half as wide as the lobate third joint measured across the apex of the lobes. Metasternum with coarse punctures, the intercoxal process of abdomen with similar or rather less coarse punctures, behind this the punctures become finer, shallower and remote. The apical segment has a fine and dense puncturation.

Length of pronotum and elytra: 4-5.25 mm.

Like all Hawaiian Oodemas this species is somewhat variable, and in one or two examples the scape is abnormally short, the basal slender portion being shorter than the thickened apical part.

Habitat: Nihoa Island, in June. Many specimens collected from bunch grass (Cooke and Thaanum) others from Euphorbia (Bryan), and some without special habitat.

Type: Cat. No. 240, Bernice P. Bishop Museum.

Oodemas laysanensis Fullaway

This species was originally described from specimens captured on Laysan Island, where apparently it was not found in 1923. On Nihoa Island it was taken in some numbers from Euphorbia (Bryan) in June and one from bunch grass (Thaanum). Two or three specimens were found on Midway Island (Fullaway) and the same number on Necker Island (Bryan).

The species is quite variable, but only in the manner usual in other species of the genus. Probably the range of the species once extended to the lowlands of the main Hawaiian islands, or at any rate to the more northern of these.

Habitat: Laysan Island (Fullaway), Midway Island (Fullaway), Nihoa Island (Bryan and Thaanum), Necker Island (Bryan).

Oodemas erro new species

Robust, brassy black, or in very fresh specimens brassy brown, legs and antennae more or less rufescent, at least the tibiae and tarsi of the former.

Rostrum distinctly widened on the decurved apical part, densely, finely and rugulosely punctured, the punctures becoming more remote basally. Eyes distinctly convex, the antennae with the scape long, longer than the width of the rostrum at the intersection of the antennae, the two first joints of the funiculus subequal, the first being the wider at the apex, the following joints all very short and subglobular.

Pronotum sometimes quite shining in the male, generally duller in the female, very distinctly, almost evenly, copiously and finely punctured; second tarsal joint of the front and middle tarsi dilated in the male, being as wide as the lobate third joint, in the female much narrower and less wide than this joint. Elytra shining in the male, probably as a rule dull in the female, with series of very coarse punctures, which become fine toward the apex, the interstices more or less convex and with conspicuous fine and remote punctures, which bear very short, but quite evident, pale setae. In the male the elytra posteriorly are vertical or slightly inflexed. Beneath, the basal abdominal segment has at the base large, somewhat deep punctures like those of the metasternum, but posteriorly these become feeble or obsolete, as are those of the second segment, which is nearly impunctate.

Length: 4-5 mm. (rostrum included).

This species is allied to *O. nivicola* Blackburn, so common on the upper open country on Haleakala, Maui, but is readily distinguished by the more convex eyes, shorter third antennal joint, and much coarser serial punctures on the elytra.

Habitat: Nihoa Island. Apparently rare, as only 7 specimens were obtained: 1 dead and discolored from Euphorbia on June 16, a fresh pair on June 14, also from Euphorbia, and 1 from the body of a dead bird on June 14 (Bryan). On June 11 3 were obtained from bunch grass (Cooke).

Type: Cat. No. 241, Bernice P. Bishop Museum.

Rhyncogonus exsul new species

Black, the scaly clothing varying from white to yellowish or ferruginous, the male much flattened in form, the female more convex. The clothing is similar in the sexes, but as the sculpture is more striking in the female, one of this sex has been chosen as the type and the description is mainly drawn up from a fresh and normal specimen, since

there is much variation in size and other characters in the long series that has been examined.

Head including the rostrum clothed with scale-like hairs mixed with fine ones, forming a denser patch around the inner margin of the eyes which are strongly prominent. In abraded examples the sculpture is seen to be strigose-punctate, the punctures becoming more distinct, but dense, posteriorly. The second and third joints of the antennae do not differ greatly in length, the former seen at its full length rather longer, the fourth shorter than the third. The pronotum is densely squamose on each side, the middle part with scattered scales and minute setae, rugosely punctured and with a smooth median line sometimes extending throughout the whole length or more or less broken, sometimes reduced to a small discal spot or almost obsolete. Scutellum marked with a very dense spot of appressed pale setae, plainly visible to the naked eye as distinct from the rest of the clothing. Elytra well covered with scales in fresh examples, and with the fourth and eighth interstices and pseudepipleural margin elevated (the fourth generally less strongly) the latter in dorsal aspect subangulate some distance behind the base. The second and sixth interstices are also sometimes slightly raised, the tenth more conspicuously so, the elevation beginning at a point near where the angulation of the edge of the elytra is placed. Between the pseudepipleural margin and the raised 8th interstice at the base a deep depression is formed. The pseudepipleura are densely squamose, at least on the basal half; the femora very densely clothed to the tips on the apical half. In abraded specimens the interstices of the elytra are granulate or furnished with series of small tubercles. Basal segments of the abdomen with copious large punctures and some fine ones intermixed, the two small intermediate segments strongly inclined, so as to form deep sutures between each other and with the adjoining segments; apical segment subtriangular, densely, finely and subrugosely punctured, not very densely hairy.

The male differs usually in its flatter elytra, the interstices sometimes hardly noticeably raised (though in other specimens more like the female), the much less depressed area at the base adjoining the pseudepipleural margin, the basal abdominal segment beneath is more concave, the first of the two small intermediate ones is flat, not inclined, and the apical segment wider at the apex and much more densely hairy.

Length: 9-13 mm.; most specimens not less than 11 mm.

Habitat: Nihoa Island, June, 1923 (Bryan, Cooke, and Thaanum). Most of the specimens were taken in bunch grass.

This species is certainly very closely allied to *R. bryani* from Laysan, and may prove to be not really distinct. The latter is known only by the unique type, which is much smaller than any except one or two dwarfed examples of *R. exsul,* and does not altogether agree in other characters with any individual of the large series of the latter.

Type: Cat. No. 242, Bernice P. Bishop Museum.

Rhyncogonus biformis new species

Black or dark blackish-fuscous, antennae or at least the club joints and the tarsi and often the legs to a large extent red or reddish. Male conspicuously flattened in form, the female more convex, the elytra in fresh specimens densely clothed with pale scales and with erect setae which are longer in the male. In this sex in dorsal view the thorax and elytra are fringed on each side with long outstanding fine hairs in a very conspicuous manner, while in the female there is no approach to this clothing.

Rostrum rugosely punctured, the punctures of the head adjoining the pronotum usually finer and more distinct, the clothing denser between the strongly prominent eyes than in front of them; second joint of the antennae longer than the third, and

this distinctly longer than the fourth. Pronotum coarsely and rugosely punctured, its extreme front margin smooth and the smooth surface generally slightly extended in the middle, while in the middle of the disc there is usually another smooth space, as if formed by the absence of one or two punctures. The clothing is conspicuously denser along the sides than on the middle portion, and consists largely of hairs more or less dilated at their base, those towards the sides being generally coarser or more approaching a scale-like form than the others. In most specimens the fourth and eighth interstices of the elytra are slightly raised either throughout or posteriorly; the scutellum bears only very minute, fine hairs and appears bare compared with the elytra, the pseudepipleura in fresh specimens are well clothed and not maculate, the dividing edge forming a sharp keel. In the male, the femora and tibiae are clothed with long, fine, outstanding hairs, while the femora of the female bear a covering of depresses pale setae, and the hairs of the tibiae are much less developed. On the ventral surface the two basal segments are copiously and as a rule densely punctured, the first more depressed in the male, in which sex the first of the two small intermediate segments is almost in the plane of the preceding, the second strongly inclined; in the female both these intermediate segments are very strongly inclined. Apical segment in the male wider at the apex than in the female, clothed thickly with erect or suberect hairs, but these are not dense enough to conceal the sculpture, which is much finer than on the basal segments.

Length: 9-12 mm.

Habitat: Necker Island in June, 1923 (Bryan, Cooke, Thaanum, and Judd).

One very fine male has the squamosity of the elytra more maculate, the tibiae more densely hirsute and the sculpture of the head and pronotum somewhat different. Owing to its fresh condition and absence of excretions, the 12 or 14 rows of punctures on the dorsal surface of the elytra for the most part stand out very distinctly.

In abraded specimens the punctures in the rows appear coarse and are each furnished with a small seta; externally to the eighth or ninth row from the suture they become more or less confused to form irregular depressions and it is probable that the carinate edge really represents the twelfth interstice.

In the sereis of specimens examined there are about twice as many females as males.

Type: Cat. No. 243, Bernice P. Bishop Museum.

Rhyncogonus fallax new species

Entirely of a sordid red color, with the antennae and legs, especially the latter, of a brighter red. Of narrow, elongate form, clothed with fine, pale hairs, the pseudepipleural portion of the elytra not marked off by a distinct sharp ridge at any point.

Head including the rostrum thinly pubescent, the hairs about the inner orbits rather more conspicuous, subrugosely punctured, the punctures finer towards the pronotal margin, the eyes strongly convex; second antennal joint rather longer than the third, and subequal to the fourth and fifth together, the club slender, its first joint about twice as long as wide, the second also elongate and hardly shorter than the first in some aspects, narrower on its basal portion. Pronotum almost evenly clothed with pale hairs, distinctly shining, with shallow and copious punctures, which are uneven in size and with a bare, smooth space on the disc. On the scutellum the

hairs are thicker than the general clothing and form a pale spot, distinct to the naked eye. Elytra evenly pubescent over the whole surface, with rows of shallow punctures which are finer than is usual in this genus, the sides almost evenly curved, not at all suddenly or conspicuously attenuated toward the apex. Legs with pale pubescence, that on the femora not very different from the elytral clothing. Abdomen beneath shining, the basal segment irregularly depressed, the punctures coarser than on the second, but mostly ill-defined; the third and fourth segments finely and remotely punctured, not at all uptilted, so that there are no deeply impressed sutures, and together much longer than the second segment, the clothing sparse. Apical segment shining, feebly and not densely punctured, thinly clothed with pale hairs.

Length: 8 mm.

Habitat: Wake Island, Aug. 4, 1923. The unique example was collected by Bryan, on Tournefortia.

Without dissecting it, I am uncertain of the sex of this very abnormal species, which has a facies quite different from any of the Hawaiian forms and at first sight appeared to be another genus. On critical examination, however, no important differences from Rhyncogonus could be found, all of its peculiarities being approached by one or other of this genus. The specimen was submitted to Dr. Guy A. K. Marshall, who very kindly examined it with me, and also came to the conclusion that in spite of its different facies, the species presented no salient character to distinguish it from the Hawaiian genus.

Type: Cat. No. 244, Bernice P. Bishop Museum.

Sphaerorhinus pallescens new species

Almost the whole insect is covered with dense, pale, appressed scales, the color of the type is red, with the legs and antennae paler, but in some fragmentary specimens the color is much darker or nearly black, perhaps from discoloration.

Rostrum in front punctured, between the antennae and posteriorly covered with pale scales which clothing is continued on to the head behind the rostrum. Scape of antennae covered with pale scales and bearing also fine, but not very conspicuous hairs, about equal in length to the rest of the antennae, the first and second funicle joints elongate and subequal (the first rather stouter) and the second about equal to the two following joints together, which are short, and the more apical ones nearly globular.

Pronotum gently rounded at the sides, about as long as its basal width, densely covered with mostly pale yellowish scales, which appear somewhat shining, the puncturation coarse and fairly even over the whole disc, the punctures well separated by the scaly intervals; viewed from the side, some extremely short setae can be seen. Elytra widening to a point about a quarter of their length from the base, densely clothed with pale, dull yellowish scales, with here and there a few whiter and some dark ones; the punctures in the fine striae appear considerably finer than those of the pronotum; posteriorly some lines of rather long, fine setae (shorter ones also being present) are quite conspicuous, while a few similar ones may be seen much farther forward. The femora and tibiae are covered, at least for the most part, with pale scales, the latter also with short erect setae. Metasternum and basal abdominal segments covered with pale, round scales, among which rather large remote punctures can be seen, and fine pale setae are also evident. The small intermediate segments

apparently bear only a few fine setae, the wide apical segment is truncated and covered with small scales of unequal size.

Length of type specimen: 4.5 mm.

Habitat: Wake Island, found dead under stones and debris (Bryan); type specimen, July 31st, 1923. Other specimens apparently referable to this species, "Wilkes I." (of Wake Island group).

Other fragmentary specimens agree more or less with this type and the longer setae of the elytra are sometimes more numerous than in the latter. Others possess hardly a trace of setae, which may have been abraded. Some that in superficial appearance are apparently alike, are much narrower than others.

Type: Cat. No. 245, Bernice P. Bishop Museum.

Sphaerorhinus sordidus new species

Like *S. pallescens,* but much darker, the pronotum and elytra covered mostly with sordid yellowish or blackish fuscous scale. At the base of the pronotum on each side is a patch of much whiter scales. The erect setae on the hinder part of the elytra are numerous, but all short. The scape of the antennae and the tibiae are clothed with dark scales, the former conspicuously pilose, the femora for the most part covered with whitish scales so as to be conspicuously different in color from the general clothing.

The type is wider than any other individual of this genus collected by Bryan and its elytra are very notably flattened on the dorsum. A second example, which in the dark scaling and short elytral setae seems to agree with it, is very much narrower, but it was found in much broken condition, while the type, when cleaned, formed a very good specimen.

Length of type: 5 mm.

Habitat: Wake Island, found dead under a stone, July 29, 1923 (Bryan).

Type: Cat. No. 246, Bernice P. Bishop Museum.

Acalles wilkesii new species

Two examples of this minute species were found, one of which is in very perfect condition, but with the appendages unexpanded; the other was largely abraded, exhibiting the sculpture of the integument in part, but even after relaxation the condition of the limbs, etc., was so wiry and the parts so difficult to expand, that I did not care to interfere with the natural appearance of the other.

The insect is covered with a muddy or somewhat scaly pale yellowish excretion, through which the numerous erect setae project. On the front of the pronotum these are numerous and conspicuous, but elsewhere few and very short; on the elytra they are fairly numerous and generally distributed, but on the declivous apical portion they become longer and very conspicuous and practically white in color. The head and legs bear a white, appressed, pruinose covering, and on the legs the short, projecting, white setae are very conspicuous.

The following characters are taken from the abraded specimen: The color is dark reddish, the legs and antennae paler. Rostrum widening considerably to the apex, about twice as long as its greatest width, seen from the side its outline is gently curved above; from the middle it is impunctate, smooth and shining and appears somewhat carinate, on each side of the smooth part distinctly punctured.

Pronotum not wide and without longitudinal elevations, but a little uneven from the fact that more than the posterior half is of greater convexity than the anterior part; the punctures under a very strong lens are somewhat large, with a tendency to rugosity. The elytra are ovate, with the humeral angles rounded off, the serial punctures very coarse, none of the interstices forming elevations, though the inner series of punctures and the one next to this appear to be placed in deeper grooves than the outer series. The first funicle joint of the antennae is much longer and stouter than the second, fully as long as the next two together, the second longer than the third, and these are more closely connected together at the articulation, than are the others, which are short and transverse, increasing in width to the apical one, the club about equal to the five preceding joints.

Length of pronotum and elytra about 1 2/3 mm.

Habitat: Wake Island, July 27, 1923, 2 specimens found on Sida (Bryan).

Type: Cat. No. 247, Bernice P. Bishop Museum.

ANTHRIBIDAE

Araeocerus fasciculatus (de Geer)

A few specimens of this abundant insect, no doubt imported into Hawaii, were included amongst the Proterhinus from Nihoa.

PROTERHINIDAE

Proterhinus bryani new species

A small narrow species, rufescent, the squamosity white, the antennae short and black, only the two basal segments red or reddish and sometimes obscurely so.

Eyes small, antennae short, with the two first joints strongly incrassate, clothed with white scales or thickened setae, in the female a little less wide than in the male, the following joints comparatively very slender, the club two-jointed since the ninth is not at all conspicuously different from the eighth. Rostrum of the female a little narrower basally, shining, with the punctate line on each side of the middle distinct.

Pronotum more or less unevenly clothed, a denser patch extending foreward from the hind angles, and often a longitudinal stripe on either side of the middle line. Elytra narrow, simple, the squamous covering broken up into spots or patches, generally most extensive on the basal portion especially towards the sides; round the margins and on the posterior part erect setae, which are white and short, are conspicuous. The color of the elytra is red with parts more or less infuscated. The tibiae bear erect setae similar to those on the wing-cases.

In one evidently immature specimen the clothing is flavescent rather than white or silvery. Several examples were entirely covered with a muddy excretion which was removed with difficulty.

Only seven or eight examples of this species have been examined, but after comparison with all the others of the difficult *deceptor-navita* group it appears to be really distinct from any of these.

Length: about 2 mm.

Habitat: Nihoa Island, a few specimens (June 12, 14, 15, 1923) on Euphorbia (Bryan).

Type: Cat. No. 248, Bernice P. Bishop Museum.

Proterhinus abundans new species

Color varying from piceous to ferruginous, the antennae entirely red. The species is broad in form with the elytra wide at the base, as in several of the Kauai species and a few others.

Head wide, clothed with golden squamosity, with a fine median line bare, the eyes prominent and of moderate size, the rostrum of the female smooth, and with a fine clear longitudinal punctate line on each side of the middle; antennae slender, the basal joint elongate, subtriangular, not differing much in the sexes, second short and stout, roundish or ovate, the next two or three elongate but decreasing in size, the following joints moniliform, the ninth larger than the eighth, but not so noticeably as the tenth is larger than the preceding, so that the antennal club is not conspicuously three jointed.

Pronotum strongly rounded at the sides and without conspicuous impressions, often subcircular, unevenly clothed with golden squamosity, which tends to form a pattern, densely punctured and rugulose or roughly sculptured between the punctures. Elytra wide at the base, with the lateral angles distinct, subrectangles, almost simply convex, without longitudinal ridges, but sometimes with more or less of an elevation or tuberculation on either side of the scutellar region. The color is generally red with a number of dark areas or spots, which are free from the pale squamosity, so that the latter tends to form more or less numerous maculations and often a number of whitish spots posteriorly. Erect setae are almost or altogether absent both from the elytra and the legs.

Abdomen beneath with the basal segment strongly punctured, more densely in some specimens than in others. Lobes of the tarsi of moderate size, not differing much in the sexes.

Length: 2-4 mm.

The size is variable, the smallest individual appearing to be about one quarter the bulk of the largest and in the very large series of examples there are, as usual in the genus, specimens eberrant in various parts of structures. Nevertheless the species appears to be quite distinct from any other, the wide elytra and the absence of erect setae greatly facilitating its recognition.

Habitat: Nihoa Island, June, 1923, a very large series collected by Bryan, from Euphorbia.

Type: Cat. No. 249, Bernice P. Bishop Museum.

CIOIDAE

CIS

The Hawaiian species of Cis are many of them notably variable and difficult and I describe below the individuals found on Nihoa as a new species with some diffidence. It is evidently closely allied to the form determined as *C. setarius* Sharp. Blackburn sent to Sharp three specimens from the island of Hawaii under one number considering them to belong to a single species. Sharp described each of these as a distinct species and Blackburn then agreed that there were two. I[22] adopted Blackburn's original idea that all belonged to one variable form, from which opinion Sharp, who saw all the specimens, did not dissent. *C. tabidus* Sharp very closely ap-

[22] Perkins, R. C. L., Coleoptera: Fauna Hawaiiensis, Vol. II, p. 260, 1900.

proaches some of the specimens I referred to *C. setarius,* but is entirely distinct from *C. bicolor* Sharp under which it was sunk (with doubt) as a variety in the final catalog drawn up by these authors. Some years ago I revised my own collection of this genus, finding many specimens, as I consider, wrongly determined, but *C. concolor* and *C. apicalis* were left as varieties of *C. setarius.* I now think, however, that *C. setarius* may really include more than one species, but as I hope to again revise this genus and describe one or two new species in my collection, I need state only that the Nihoa form approaches most closely to a specimen from Kauai referred by me to *C. setarius.* The types of Sharp's three allied species all came from the island of Hawaii and I do not think, after a careful examination of many specimens from that island, that the Nihoa specimens can be considered the same as any of these, though further material from Kauai might show that it occurs there. Unfortunately, a large amount of material of Cis, Proterhinus and Brachypeplus, especially collected by me by hand with the object of comparing the variation of individuals found in company, was dispersed in mounting and labelling before I arrived in England. Specimens so collected are naturally of great value to any one working with these difficult genera.

Cis vagans new species

Black, the legs and antennae red, the pronotum more or less reddish black or pitchy, paler on the front margin, the elytra apically also more or less red.

Head dull, with a dense microscopic sculpture and feebly impressed punctures. Pronotum broad, seen from above with well-rounded sides and obtuse hind angles, as long in the middle as its width at the base, but considerably shorter than its greatest width. The surface is densely microscopically sculptured almost all over, as is easily seen with a very strong lens, this sculpture extending to the side margins and it is also almost evenly punctured, the punctures being very shallow, but quite distinct. Viewed from the side it can be seen to bear excessively short, erect hairs. Elytra convex, broad and shining, about twice as long as the basal width, the sides somewhat rounded; the sculpture varies, but consists of shallow punctures and rugulosity, which become evanescent posteriorly. Around the margin, at least apically, there are sparse and excessively fine hairs, which no doubt are very easily abraded.

I have seen only four examples of this species, one quite immature and much paler when mature.

Habitat: Nihoa Island on Euphorbia, June, 1923 (Bryan).

Type: Cat. No. 250, Bernice P. Bishop Museum.

DIPTERA

By
E. H. Bryan, Jr.

CHIRONOMIDAE

An undetermined species was found on Wake Island in the shadow of rocks on the moist lagoon flat at low tide, July 28-30, 1923 (Bryan). A single specimen, beyond recognition, was captured on Laysan Island under drift, April 11, 1923 (Fullaway).

MYCETOPHILIDAE

Neosciara molokaiensis (Grimshaw)?

Ocean Island, April 1923; Midway Island, April 24, 1923 (Fullaway).

These specimens agree closely with specimens of this species from the main Hawaiian islands. So far but one species of this genus has been identified in Hawaii. It is not unlikely that more species will be found when this difficult group of flies has been carefully worked up.

STRATIOMYIDAE

Laysan Island, near the lagoon, April 13, 1923 (Fullaway).

An undetermined species, unlike any other known from the Hawaiian islands.

PHORIDAE

Aphiochaeta scalaris Loew

Pearl and Hermes Reef, April 27, 1923 (Fullaway). Lisiansky Island, in camp, May 16, 1923 (Grant).

ASILIDAE

Wake Island, June 30 to August 5, 1923 (Bryan).

A small, dark species, as yet unidentified, flying rapidly above moist sand along the lagoon. A species with similar habits occurs throughout the south Pacific.

DOLICHOPODIDAE

Psilopus patellifer Thomson

Ocean Island, April, 1923; Midway Island, April 24, 1923 (Fullaway).

Hydrophorus praecox Lehm. (Determined by Aldrich)

Laysan Island, April 8 and 13, 1923 (Fullaway).

Paraphrosylus sp.

Lisiansky Island, northeast corner, on ulva, May 17-19, 1923 (Grant). Nihoa Island, from pools of salt water, June 11-13, 1923 (Bryan). Necker Island from pools of salt water, June 18, 1923 (Bryan). French Frigate Shoals, about a tidal pool at the base of La Parouse Rock, June 27, 1923 (Bryan). Wake Island, June 30 to August 5, 1923, on moist sand (Bryan).

SYRPHIDAE

Simosyrphus (Xanthogramma) grandicornis (Macquart)

Johnston Island, July 11-18, 1923 (Bryan). Wake Island, July 31, 1923, specimens were seen about the remains of the Japanese camp, but none were captured (Bryan).

TACHINIDAE

Frontina archippivora Williston

Nihoa Island, single specimen captured on summit of "Miller Peak," June 14, 1923 (Bryan).

SARCOPHAGIDAE

Genus and species new.

Midway Island, April 23, 1923 (Fullaway). Pearl and Hermes Reef, April 26, 1923 (Fullaway). Laysan Island, bred from seal's skull (Bryan). Nihoa Island, June 11-15, 1923 (Bryan). Necker Island, June 17-20, 29, 1923 (Bryan). French Frigate Shoals, June 22-26, 1923 (Bryan). Johnston Island, July 17-20, 1923 (Bryan).

This species, unknown to all dipterists to whom it has been sent, was the dominant muscoid of the outlying islands of Hawaii, yet not known on the main islands of the group. It bred in numbers in dead birds, fish, and other decaying animal remains, and was a nuisance about camp, much as is the housefly in other localities. It has so much the appearance of a Tachinid, that it is quite likely the "Tachinid" captured and reported by Wilder and Fullaway[23] on Laysan.

MUSCIDAE

Synthesiomyia nudiseta Van der Wulp

Wake Island, July 31, 1923, found in ruins of Japanese shack (Bryan).

Musca vicina Macquart

Laysan Island, May, 1923 (Ball). Pearl and Hermes Reef, April 26, and on S. E. islet, April 27, 1923 (Fullaway). Midway Island, April 23, 1923 (Fullaway). Johnston Island, July 17, 1923 (Bryan).

This is the oriental housefly with the narrow fronted male, found in

[23] Fullaway, D. T., List of Laysan Island insects: Hawaiian Ent. Soc. Proc. Vol. 3, p. 21, 1914.

Hawaii. It was comparatively scarce on the outlying islands, and some individuals might have gone ashore from the "Tanager," on which specimens were found.

CALLIPHORIDAE

Lucilia sericata Meigen

Nihoa Island, June 11-13, 1923 (Bryan). Wake Island, Aug. 4, 1923, a single specimen (Bryan).

Lucilia graphita new species (Described by Shannon. See p. 72.)

Pearl and Hermes Reef, April 26, and S. E. islet, April 27, 1923 (Fullaway). Midway Island, April 23, 1923 (Fullaway). Ocean Island, April, 1923 (Fullaway). Laysan Island, bred from seal's skull, May, 1923 (Bryan).

This distinct species was not found southeast of Laysan Island, although very abundant north-west.

ANTHOMYIDAE

Fannia canicularis Linn.

Ocean Island, April, 1923, rather abundant (Fullaway).

Ophyra chalcogaster Wiedemann

Midway Island, April 23, 1923 (Fullaway).

EPHYDRIDAE

Canace nudata Cresson (Determined by Cresson.)

Lisiansky Island, northeast corner, on ulva, May 19, 1923 (Grant). Wake Island on moist sand, July 30, 1923 (Bryan).

Hecamede sp. (Determined by Cresson)

Wake Island, July 28 to Aug. 5, 1923 (Bryan).

Scatella sexnotata Cresson (Determined by Cresson.)

Laysan Island, April 8-9, 1923 (Fullaway). Nihoa Island, June 13, 1923, in pool of stagnant water (Bryan). Necker Island, June 18 and 29, 1923, from pools of salt water (Bryan).

BORBORIDAE

Limosina venalicia Osten-Sacken

Laysan Island, April 8, 1923 (Fullaway).

Leptocera sp. near **ferruginata** Stenh.

Laysan Island, April 8, 1923 (Fullaway). Midway Island, April 23, 1923 (Fullaway). Lisiansky Island, May 18, 1923, from seaweed (Grant).

Aldrich, to whom specimens were submited, states that the specimens from Laysan and Lisiansky islands are different.

DROSOPHILIDAE-ASTEINAE

Genus and species new?

Nihoa Island, June 13, 1923 (Bryan).

AGROMYZIDAE

Milichiella lacteipennis (Loew)

Midway Island, April 24, 1923 (Fullaway). Pearl and Hermes Reef, April 27, 1923 (Fullaway).

This species which is abundant about manure and decaying vegetable matter on the main Hawaiian islands, might easily have been carried to Midway and Pearl and Hermes Reef on sampans or other vessels.

Agromyza pusilla Meigen

Nihoa Island, June 13, 1923, rather rare about Tribulus blossoms (Bryan). Johnston Island, July 13-18, 1923, abundant about Tribulus blossoms (Bryan).

Undetermined Milichiinae

Pearl and Hermes Reef, April 27, 1923 (Fullaway). Wake Island, July 27 to Aug. 5, 1923 (Bryan).

Undetermined Milichiinae

Nihoa Island, June 13-14, 1923, some captured on Sida (Bryan). Gardner Island, May 22, 1923 (Ball).

SAPROMYZIDAE

Sapromyza sp.

Wake Island, July 30 to Aug. 4, 1923, attracted to carcasses of dead birds hung up in trees, out of reach of hermit crabs (Bryan).

OSCINIDAE

Hippelatus nigricornis var. **flavus** Thomson (Determined by Aldrich.)

Ocean Island, April, 1923 (Fullaway). Midway Island, April 24, 1923 (Fullaway). Lisiansky Island, May, 1923 (Ball). Wake Island, July 30 to Aug. 5, 1923, on Sesuvium and other plants (Bryan).

CHLOROPIDAE

Microneurum signatum Wollaston (Determined by Aldrich.)

Nihoa Island, June 12-14, 1923, some specimens on Sida (Bryan). Necker Island, June 17 and 29, 1923 (Bryan). French Frigate Shoals, June 22-26, 1923 (Bryan). Lisiansky Island, May, 1923 (Ball).

This cosmopolitan species is abundant on these islands. It occurs throughout tropical regions, but is scarce on the main larger Hawaiian islands.

HIPPOBOSCIDAE

Olfersia spinifera Leach (Determined by Malloch.)

Laysan Island, April-May, 1923 (Fullaway and Ball). Lisiansky Island, May 18, 1923 (Ball). Nihoa Island, June 11-15; Necker, June 18-20. French Frigate Shoals, June 26 (Bryan). Johnston Island, July 11-20 (Bryan). Wake Island, July 28 to Aug. 1, 1923 (Bryan).

This species is a troublesome parasite of frigate birds, especially on the young birds. It is abundant on the birds and about their nests. Featherless nestlings were seen to be attacked by a dozen or more of the large black flies, which appeared to cause great distress. Few adult birds were free from them.

A NEW LUCILIA FROM HAWAII

By

RAYMOND C. SHANNON

CALLIPHORIDAE

Lucilia graphita new species

Differs from all other Lucilia in its unique coloration, which is very dark bronzy green, nearly the color of graphite.

Male

Head somewhat higher than broad (frontal aspect), well rounded above, face somewhat protruding downwards; front opaque black, parafrontals contiguous, silvery pruinose; bucca black, rest of face brownish yellow; parafacials equal to about one-third the distance between oral vibrissae; facial ridge setose nearly one-half its length; beard black. Face a little produced foreward along oral axis. Antennae yellowish brown, arista a little longer than length of antenna, long plumose. Mesonotal chaetotaxy as in *L. caesar* (two post acrostichals, etc.); parasquamal patch of setae present; tympanic tuft dense, long and black, located in the pit; mesopleura with coarse stiff hairs; metasternum bare. Abdomen with scarcely a trace of pruinescence; post margin of second (third actual) tergite with row of appressed bristles extending nearly half way across following tergite; hypopygium small; forceps rather small; outer forceps placed in plane at right angles to inner ones, of uniform breadth, nearly five times as long as broad, apex broadly rounded, pile rather short and fairly dense; inner forceps paralleled, fairly slender, sharply pointed, pilose. Wings faintly tinged; basicostal dark brown; subcostal sclerite setose; squamae darkened, bare.

Length: 9.5 mm.; wing, 8 mm.

Female

Front twice as long as wide; uppermost frontorbital in line with frontals. Pile on metasternum represented by two fine hairs.

Length: 9.5 mm.; wing, 8 mm.

Described from one male and one female reared from seal's skull, Laysan Island, May, 1923 (Bryan).

Type: Cat. No. 28275, U. S. Nat. Mus. Also collected on Ocean Island, Midway Island, and Pearl and Hermes Reef (Fullaway).

This species represents an extreme form of the genus Lucilia. Its dark color and practically bare metasternum are unique in the genus. Other characters, dark basicostal, setose subcostal sclerite and two post acrostichals, place it close to the *L. caesar* group. The species may be confined to the N. W. outlying islands of Hawaii.

LEPIDOPTERA

By
O. H. Swezey

NYMPHALIDAE

Hypolimnas bolina Linn.

Wake Island, July 28 and 30, Aug. 4, 1923 (Bryan): 4 ragged specimens (1 female, 3 males).

LYCAENIDAE

Lycaena boetica (Linn.)

Necker Island, June 17-29, 1923 (Bryan): 32 specimens.

SPHINGIDAE

Herse convolvuli (Linn.)

Wake Island, July 30-August 5, 1923 (Bryan): 4 live and 3 dead specimens rolled up in spider webs.

This is the nearest to Honolulu that this sphingid is known to occur. It also occurs in Samoa. *Herse cingulata* (Fab.), the American species, occurs in Hawaii, but the name *H. convolvuli* has often been used for it in literature and has resulted in confusion in regard to the geographic distribution of the two species.

ARCTIIDAE

Utetheisa pulchelloides Hampson

Wake Island, July 27-August 4, 1923 (Bryan): 63 specimens, including 15 larvae, one labelled "from scaevola." The larvae were found feeding on *Tournefortia argentea,* and some were reared.

NOCTUIDAE

Chloridea obsoleta (Fab.)

Nihoa Island, June 13, 1923 (Bryan): 1 specimen. Necker Island, June 17-20, 1923 (Bryan): 9 specimens, 5 larvae, 1 pupa.

Euxoa kerri Swezey

French Frigate Shoals, June 22-26, 1923 (Bryan): 13 specimens and 2 larvae. Two of the moths were taken on board the "Tanager" two miles off shore.

Euxoa bryani new species

Male and Female

Head and thorax grey mixed with dark fuscous, palpi the same; antennae greyish fuscous, that of the male shortly pectinate for about two-thirds of its length; legs pale greyish, tibiae and tarsi mixed with fuscous; abdomen pale grey, anal tufts slightly yellowish. Forewings grey mixed with fuscous; subbasal, first and second lines indicated by dark fuscous (none of the specimens perfect enough for full description of these); orbicular large, oval, outlined with dark fuscous; reniform large, outlined with dark fuscous, more pronounced anteriorly; sometimes a connection of dark fuscous between orbicular and reniform near dorsal side of cell; claviform large, extending to beyond origin of vein 2, outlined with dark fuscous; cilia greyish fuscous. Hindwings pale greyish with a brownish shade toward termen. Expanse, 45-55 mm.

Resembles somewhat *E. eremioides* from Laysan Island, but the markings of forewings are much more distinct and the ground color is grey, whereas in *E. eremioides* it is of a brownish tinge.

Nihoa Island, June 11-14, 1923 (Bryan): 23 specimens. Mostly collected at lights, and none of the specimens perfect. Nihoa Island, June 11, 1923 (Thaanum): 2 larvae.

Type: Cat. No. 251, Bernice P. Bishop Museum.

Feltia dislocata (Walker)

Laysan Island, April 12, 1923 (Fullaway): 1 specimen reared from a pupa found. Laysan Island, April 13, 1923 (Fullaway): 1 larva in tobacco patch.

Cirphis unipuncta (Haw.)

Lisiansky Island, May 17, 1923 (Grant): 1 specimen collected on ulva and 4 larvae in grass patch.

Prodenia litura (Fabricius)?

Pearl and Hermes Reef, April 27, 1923 (Fullaway): 1 specimen reared from pupa found. The specimen is too much abraded for positive determination, but this species is widely distributed and has been recorded from Hawaii, so that it is very likely the same.

Spodoptera mauritia (Boisduval)

French Frigate Shoals, June 25-27, 1923 (Bryan): 18 specimens. Pearl and Hermes Reef, April 27, 1923 (Fullaway): 2 specimens. French Frigate Shoals, June 22-27, 1923 (Bryan): 41 caterpillars.

Achaea melicerta (Drury)

Wake Island, July 28-August 5, 1923 (Bryan): 18 specimens. Some of the specimens were collected on *Pemphis acidula.* Wake Island (Bryan): 2 caterpillars.

Plusia chalcites Esp. **(verticillata** Guen.)

Ocean Island, April 18, 1923 (Fullaway): 9 caterpillars.

PHYCITIDAE

Ephestia elutella Hub.

Laysan Island, April, 1923, "in Reno's tent" (Ball): 1 larva.

CRAMBIDAE

Talis hyacinthina Meyrick

Nihoa Island, June 13-14, 1923 (Bryan): 6 specimens.

PYRAUSTIDAE

Hymenia recurvalis Fab.

Necker Island, June 17-29, 1923: 17 specimens, 2 larvae. Nihoa Island, June 14, 1923; 1 specimen. French Frigate Shoals, June 22, 1923 (Bryan) 1 specimen.

PTEROPHORIDAE

Trichoptilus oxydactylus (Walker)

French Frigate Shoals, June 22-27, 1923 (Bryan): 54 adults and 1 larva, collected from Boerhaavia. Nihoa Island, June 14, 1923 (Bryan): 7 specimens. Johnston Island, July 11-19, 1923 (Bryan): 7 specimens.

GELECHIIDAE

Stoeberhinus testaceus Butler

Midway Island, April 22, 1923 (Fullaway): 1 larva.

TORTRICIDAE

Crocidosema plebiana Z.

French Frigate Shoals, June 22, 1923: 3 specimens. Necker Island, June 19-29, 1923 (Bryan): 7 specimens.

PLUTELLIDAE

Plutella maculipennis Curtis

Midway Island, April, 1923: 3 specimens. Pearl and Hermes Reef, April 27, 1923 (Fullaway): 3 specimens on Lepidium (also collected at Laysan Island, April 18, but specimens lost). Ocean Island, April 18, 1923 (Fullaway): 19 specimens. Wake Island, July 28-Aug. 1, 1923 (Bryan): 3 specimens.

HYPONOMEUTIDAE

Hyposmocoma arenella Walsingham

Nihoa Island, June 14, 1923 (Bryan): 4 poor specimens collected at lights.

Hyposmocoma mimica Walsingham

Necker Island, June 18-29, 1923 (Bryan): 36 poor specimens, some collected on rocks and some at lights.

Hyposmocoma quinquemaculata Walsingham

Nihoa Island, June 11-14, 1923 (Bryan): 11 poor specimens collected at lights. Necker Island, June 20-29, 1923 (Bryan): 29 poor specimens.

Hyposmocoma sp.

Nihoa Island, June 12-14, 1923 (Bryan): 14 poor specimens collected at lights. Necker Island, June 20, 1923 (Bryan): 8 poor specimens collected at lights. These specimens represent a different species from the others, but they are too imperfect for determination or description.

Hyposmocoma spp.

Gardner Rock, May 22, 1923 (Ball): 3 specimens of one species and one of another, too much abraded for determination.

Hyposmocoma larval cases.

Several kinds of larval cases were collected in different places and situations. Undoubtedly they belong to the species enumerated, but it is hardly possible to associate them properly. At least three kinds of these cases were found on Nihoa Island; two kinds on Necker Island; one similar to *H. notabilis* quite numerous on Laysan Island, April 25, 1923 (Ball). One kind (thorn-shaped) attached to under surface of rocks by hundreds, Gardner Rock, May 22, 1923 (Ball).

TINEIDAE

Tineola uterella Walsingham

Four larval cases of this moth were collected in a shack, Laysan Island, April 29, 1923 (Fullaway): one case in guano pile, Laysan Island, April 25, 1923 (Ball); two larval cases and empty pupae, French Frigate Shoals, June 24, 1923; four larval cases, Johnston Island, July 15-17, 1923 (Bryan).

One larval case similar to *Tineola uterella,* but having a larva that was different was found on Nihoa Island, June 14, 1923 (Bryan).

Monopis meliorella (Walker)

Gardner Rock, May 22, 1923 (Ball): 1 specimen. Necker Island, June 29, 1923 (Bryan): 1 specimen.

Gracilaria marginestrigata Walsingham

Nihoa Island, June 13, 1923 (Bryan): 13 specimens, collected on Sida.

Ereunetis kerri new species

Head, palpi, antennae, thorax, legs and abdomen very pale ochreous. Forewings nearly uniform ochreous, basal third of costa brown; cilia concolorous. Hindwings and cilia whitish. Expanse 12-14 mm.

The type specimen was reared from a larva in dead grass stem collected on French Frigate Shoals, Oct., 1914, by Dr. Wm. Kerr of the U. S. Navy. French Frigate Shoals, June 25-27, 1923 (Bryan): 10 specimens (much abraded). Also 6 larvae and 1 empty chrysalis.

Type: Cat. No. 252, Bernice P. Bishop Museum.

Ereunetis incerta new species

Head, palpi, antennae and thorax whitish, front of head and terminal segment of antennae slightly infuscated. Forewings sordid whitish, slightly sprinkled with fuscous scales and a wide fuscous longitudinal streak in middle of wing (more pronounced in the male, hardly evident in the female); cilia whitish, sprinkled with fuscous, and a patch of fuscous at apex. Hindwings and cilia cinereous. Abdomen and legs whitish, tarsi slightly barred with fuscous. Expanse, 15-16 mm.

The specimens are hardly perfect enough for description, but it is evident enough that this is a different species from any other known in the Hawaiian islands.

Pearl and Hermes Reef, April 27, 1923 (Fullaway): 6 specimens. Johnston Island, July 11-20, 1923 (Bryan): 21 specimens, appear to be the same, but most of them are too abraded for positive determination. A pupa collected from a tobacco stem, Laysan Island, April 9, 1923 (Fullaway), may be this species. The moth died just before issuing, but the coloration of the fore wing as showing through the wing sheaths seems to indicate that it is this moth. Johnston Island, July 12-18, 1923 (Bryan): 12 larvae in bunch grass.

Type: Cat. No. 253, Bernice P. Bishop Museum.

Comodica fullawayi new species

Head, palpi, antennae and thorax ochreous, terminal joint of palpi darker on outer side. Forewings uniform ochreous; basal half of costa dark brown, beyond middle of costa a white streak with brown borders extends obliquely towards termen finally curving to apex, a short, oblique, costal brown bar near apex; beyond middle of costa three brown bars extend obliquely outward, between the first two a white streak extends nearly to termen then curves around a brown spot to apex bordered by brown streak along termen; costal cilia near apex white, a few brown scales in apical cilia, rest of cilia ochreous mixed with grey. Hindwings pale slaty grey, the cilia paler grey. Legs ochreous, fore tibiae and tarsi brown posteriorly, mid tarsi with a brown spot near apex, hind tibiae and tarsi brownish exteriorly. Abdomen brownish above, pale ochreous below, anal tufts ochreous. Expanse, 9-10 mm.

Ocean Island, April 18, 1923 (Fullaway): 14 specimens.

Type: Cat. No. 254, Bernice P. Bishop Museum.

CYGNODIIDAE

Petrochroa dimorpha Busck

Ocean Island, April 18, 1923 (Bryan): 5 specimens. Midway Island, April, 1923: 3 specimens. Pearl and Hermes Reef, April 27, 1923 (Fullaway): 1 specimen. Nihoa Island, June 14, 1923 (Bryan): 9 specimens at lights. Necker Island, June 20, 1923 (Bryan): 1 specimen. Wake Island, July 28 to Aug. 4, 1923 (Bryan): 17 specimens.

Petrochroa neckerensis new species

Antennae greyish fuscous spotted with white. Palpi fuscous spotted with white. Head and thorax greyish fuscous. Forewings greyish fuscous with dark fuscous scales mixed; two white transverse bars, the first about middle of wing, interrupted by fuscous scales at middle, the second beyond three-fourths, curved outwardly in middle and widened towards costa; cilia greyish, darker at base. Hindwings and cilia greyish fuscous. Abdomen greyish fuscous, a few white scales at apex and white below. Legs whitish, tibia and tarsi banded with fuscous. Expanse, 6 mm.

Necker Island, June 18-20, 1923 (Bryan): 3 specimens collected on rocks. Gardner Rock, May 22, 1923 (Ball): 1 specimen. The specimens are too much abraded for proper description, but are readily made out as different from other Hawaiian species. This description is given, with the hope that more material may sometime be available and the description emended.

Type: Cat. No. 255, Bernice P. Bishop Museum.

Tineid?

Laysan Island, April 18, 1923 (Schlemmer): 1 undetermined larva found in tobacco patch.

LIST OF LEPIDOPTERA PREVIOUSLY COLLECTED ON THE OUTLYING HAWAIIAN ISLANDS.

1894. Rothschild, W. (1)[24]
Peridroma fasciata Roths. Midway Island.
Peridroma evanescens Roths. Laysan Island.
Prodenia laysanensis Roths. Laysan Island.
In the description of these three species, the name of the collector and the dates of capture are not mentioned.

1896. Schauinsland, H. (2)
Apamea chersotoides Butler, Laysan Island.
Spaelotis crinigera Butler, Laysan Island.
These species were determined by Dr. Rebel. They were later described by Meyrick (3) as new species, respectively:
Agrotis eremioides Meyrick.
Agrotis procellaris Meyrick.
Zinckenia recurvalis Fab., Laysan Island.
Undetermined Tineid.

[24] The numbers in parentheses refer to the bibliography, p. 79.

1905. Wilder, G. P. (5)
Agrotis saucia, Laysan Island.
Agrotis sp., Laysan Island.
Prodenia sp.? Midway Island.
Plusia verticillata, Midway Island.
Hymenia recurvalis, Laysan Island.
Pterophorid, Laysan Island.

1911. Bryan, W. A.
Agrotis eremioides Meyrick, Laysan Island, April: 6 specimens.
This may be the moth described by Rothschild (1, p. 539) as *Peridoma evanescens*. Specimens agree with his description, which, however, is too meager for positive determination. Rothschild makes no mention of collector, or date of collection, or the place where the specimens are deposited.
Not previously recorded. (Specimens at Hawaiian Sugar Planters' Experiment Station.)

1912. Fullaway, D. T. (6)
Euxoa eremioides Meyrick (4), Laysan Island, 13 specimens.
Euxoa procellaris Meyrick (4), Laysan Island, 1 specimen.
Agrotis dislocata Walker, Laysan Island, 3 specimens.
Agrotis saucia (Hübner), Laysan Island.
Spodoptera mauritia (Boisduval), French Frigate Shoals, 2 specimens.
Nesamiptis laysanensis Swezey (7), Laysan Island, 12 specimens.
Pyrausta dryadopa (Meyrick), Laysan Island, 3 specimens.
Hymenia recurvalis (Fab.), Laysan Island, 9 specimens.
Omiodes laysanensis Swezey (7), Laysan Island, 3 specimens.
Trichoptilus oxydactylus (Walker), French Frigate Shoals, 7 specimens.
Crocidosema plebiana Z., Laysan Island, 9 specimens.
Hyposmocoma notabilis Walsingham, Laysan Island (larval case only).
Ereunetis kerri Swezey, Laysan Island, 1 specimen; French Frigate Shoals, 2 specimens.
Petrochroa dimorpha Busck, Laysan Island, 7 specimens.
Specimens at Hawaii Experiment Station, Honolulu.

1914. Kerr, Wm. (8)
Euxoa kerri Swezey (9), French Frigate Shoals.
Trichoptilus oxydactylus (Walker), French Frigate Shoals.
Ereunetis kerri Swezey, French Frigate Shoals.

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HEMIPTERA

By
E. H. Bryan, Jr. and O. H. Swezey.

GERRIDAE

Halobates sericius Eschscholtz.

Johnston Island, blown up on the sand beach, July 11-12, 1923 (Bryan). This marine water-strider is widespread in the North Pacific.

MIRIDAE

Triphleps persequens White. (Determined by Swezey.)

Ocean Island, April 17, 1923 (Fullaway). Midway Island, April 23, 1923 (Fullaway). Nihoa Island, June 12-13, 1923, on Euphorbia (Bryan).

Opuna hawaiiensis Kirkaldy. (Determined by Swezey.)

Wake Island, July 27 to Aug. 2, 1923, on Sida, Portulaca and Sesuvium (Bryan).

Three other species of Miridae from Nihoa Island, which were sent away for identification, remain undetermined.

NABIDAE

Reduviolus capsiformis (Germ.) (Determined by Swezey.)

Nihoa Island, June 11, 1923 (Bryan). French Frigate Shoals, June 21-27, 1923 (Bryan). Ocean Island, April, 1923 (Fullaway). Johnston Island, July 11-14, 1923, on bunch grass (Bryan).

Reduviolus kahavalu Kirkaldy (Determined by Swezey.)

Nihoa Island, June 11-14, on bunch grass and other plants (Bryan), and on Sida (Cooke). Wake Island, July 31, 1923 (Bryan).

LYGAEIDAE

Nysius delectus White (Determined by Swezey.)

Necker Island, June 19, 20-29, in large numbers on the leaves and branches of Chenopodium. Also on other plants (Bryan).

Nysius spp.

More or less closely related species of Nysius, as yet unidentified, were found on the other islets. A species from Nihoa Island, one from Lisiansky

Island, one from Pearl and Hermes Reef, and one from French Frigate Shoals all differ from each other and from *Nysius delectus* White in minor markings and structures. A small, dark, quite distinct species was collected on Wake Island, on Portulaca, Boerhaavia, Sesuvium, Cordia, and other plants.

HOMOPTERA

CICADELLIDAE

Nesophrosyne (?) sp.

A Jassid, related to *Nesophrosyne perkinsi* Kirkaldy, collected abundantly on Wake Island, July-August, 1923, on Sida, Portulaca, and Sesuvium. A smaller, light colored Jassid was also found on Wake Island on Sesuvium.

Nesosteles spp.

Nihoa and Necker islands, June, 1923 (Bryan).

DELPHACIDAE

Kelisia paludum Kirkaldy (Determined by Swezey.)

Ocean Island, Midway Island and Pearl and Hermes Reef, April, 1923 (Fullaway).

ALEYRODIDAE

Aleyrodid.

Wake Island, July and August, 1923 (Bryan).

APHIDIDAE

Aphis medicaginis Koch. (Determined by Timberlake.)

French Frigate Shoals, June 23, 1923 (Bryan). Lisiansky Island, May 17, 1923, ex grass patch (Grant). Johnston Island, June 11-18, 1923, on Tribulus (Bryan). Wake Island, July 27, 1923, "Wilkes" (Bryan).

DERMAPTERA AND ORTHOPTERA

By

MORGAN HEBARD

The Dermaptera and Orthoptera obtained by the Tanager Expedition from the small islands west of the principal Hawaiian islands, includes, with three exceptions, species probably introduced by man.

Two of these are crickets, known to have a wide Oceanic distribution: *Gryllus oceanicus* from French Frigate Shoals and *Litogryllus flavipes* from Wake Island. The third is a new and very striking species of the peculiarly Hawaiian genus of katydids, Banza, secured on the little known island of Nihoa.

From an orthopterological point of view it is clear that field work on such Hawaiian islands as Kahoolawe and Molokai, where little collecting has been done, should be rewarded by the discovery of additional new native species, each probably peculiar to the island on which it occurs.

DERMAPTERA

Family LABIDURIDAE

Subfamily PSALINAE

Anisolabis maritima (Géné)

1832. *Forficula maritima* Géné, Ann. Sci. Nat. Regn. Lomb. Venet., Vol. 2, p. 244. [Nice, France; Genoa and Tuscany, Italy; along Mediterranean.]

French Frigate Shoals, June 23 and 26, 1923 (Bryan): 4 males, 10 females, 3 juv. Laysan Island, April 12-18, 1923 (Fullaway and Schlemmer): 4 females. Pearl and Hermes Reef, April 27, 1923 (Fullaway), 2 females, 3 juv. Gardner Rock, May 22, 1923 (Ball): 1 male. Johnston Island, July 17, 1923 (Bryan): 5 males, 12 females, 2 juv., some from dead birds. Wake Island, August 31, 1923 (Bryan): small juv., the only earwig taken on Wake Island.

This cosmopolitan species was probably introduced by the Japanese. The insect is abundant in Japan, but apparently has not yet been introduced to the principal Hawaiian islands.

Euborellia annulipes (Lucas)

1847. *Forficesila annulipes* Lucas, Ann. Soc. Ent. France, ser. 2, Vol. 5, p. LXXXIV. ["Jardin des Plantes, Paris" (probably introduced)].

Nihoa Island, June 11 to 14, 1923 (Bryan): 2 under stones, 1 on Euphorbia, 2 males, 2 females, 6 juv. Necker Island, June 17 to 29, 1923 (Bryan): 6 males, 20 females, 15 juv. French Frigate Shoals, June 22, 1923 (Bryan): 9 females, 1 juv. Laysan Island, April 9, 1923 (Fullaway): 1 juv. Pearl and Hermes Reef, April 27, 1923 (Fullaway): 2 males, 3 females, 1 juv. Midway, Eastern Island, April 27, 1923 (Fullaway): 2 females, 1 male, 2 juv. Johnston Island, July 14 and 17, 1923 (Bryan): 4 females, 1 juv.

This cosmopolitan species, though in some regions not reaching as far northward as *Anisolabis maritima* (Géné), is more generally distributed over its range and usually more abundant than that insect. It has been found generally abundant in Hawaii and has been reported previously from Laysan and Palmyra islands.

Most of the specimens here recorded are normal in coloration, a few have the antennae pale with annulus obsolete, while some specimens from Midway Island and Pearl and Hermes Reef are unusually pale in general coloration, the antennae very pale with no annuli and the limbs showing only faint traces of dark annuli. Most of these pale individuals were immature and all appear to have been teneral when captured, a feature strongly indicated in most specimens and may be the cause of the unusually pale coloration and lack of color contrasts. Like *A. maritima,* this insect was probably introduced by man.

ORTHOPTERA

Family TETTIGONIIDAE

Subfamily COPIPHORINAE

Banza nihoa new species (fig. 9)

This is much the largest species of the genus. It may be further readily distinguished from all previously known species by the great development of the organs of flight, the tegmina surpassing the apex of the abdomen and tapering strongly to their sharply rounded apices.

The brown phase of *B. nihoa* is separable by numerous features of coloration, but in the green phase only the distinctive dark proximal markings of the tibiae persist. These color phases might easily be mistaken for representatives of very differently colored species were the structural agreement not considered and Perkins' observations,[25] in the case of *B. parvula* (Walker), not noted.

Male

Size very large for genus, form robust. Fastigium feebly ascendant, with apex evenly rounded; ventral surface conically produced with apex rounded, not spiniform,

[25] Perkins, R. C. L., Orthoptera Supplement: Fauna Hawaiiensis, Vol. 2, p. 687, 1910.

overhanging the frontal costa and separated from it by a moderate interval. Pronotum moderately elongate, disc widening very feebly caudad; surface heavily and evenly more thickly impresso-punctate than genae and dorsal surface of head (the face is almost smooth), showing no irregular rugae as in other species of the genus. Tegmina surpassing apices of caudal femora by a considerable distance; tympanum opaque, covered by a network of very fine veinlets and its caudal margin bounded by a very delicate vein; lateral margins of tegmina converging strongly distad to the sharply rounded apex. Wings extending to distal portion of abdomen, but incapable of sustained flight. Ultimate tergite broad, with lateral apices produced, divergent, acute-angulate and decurved. Cerci of normal type for genus, each bent sharply

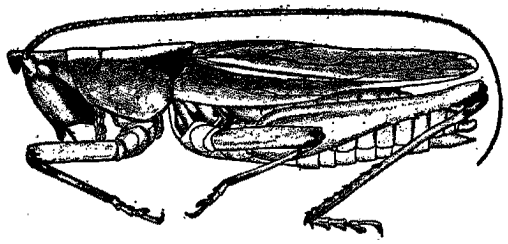

FIGURE 9. *Banza nihoa* new species, Nihoa Island, male, type, lateral view. (X1½)

inward distad with two tapering processes, each of which is armed at apex with a sharp spine, the dorsal process much the smaller, so that the point of its apical spine touches the ventral process mesad. Limbs heavy. Cephalic and median femora armed with a few minute teeth on ventro-cephalic margins. Caudal femora with ventral margins, particularly the internal, supplied with a number of slightly larger teeth. Caudal tibiae supplied with numerous small spines, those on the dorso-internal margins more numerous than those on the dorso-external margins.

Female

Larger and distinctly more robust than male. Tegmina and wings considerably more produced, the former reaches nearly to apex of ovipositor. Ultimate tergite produced in two acute-angulate projections, which are not divergent, with apices blunt and slightly incurved, its surface very deeply concave medio-longitudinally. Ovipositor straight, scarcely narrowed to the almost acute apex, unarmed. Limbs much as in male.

Coloration of brown phase. Type and one male paratype. Generally clay color with all but dorsal surface of fastigium shining blackish mummy brown. Suffusions of this color margin the face, this particularly heavy toward the clypeal suture and laterad below the eyes, the bases of the tibiae also marked with blackish mummy brown. A less decided suffusion of the same on the dorso-caudal portion of the pronotal lateral lobes, while the femora briefly and the tibiae extensively are similarly suffused distad. The median and caudal tibiae show conspicuous flecks of blackish mummy brown at the bases of the ventral spines, those at the bases of the dorsal spines of the former being much less decided.

Coloration of green phase. One male paratype and all females. Generally light grass green (faded to yellowish on body and proximad on limbs). Proximal tibial maculations, flecks at bases of spines and (usually but not always) a decided suffusion across clypeal suture alone remain of the striking brown markings which occur in the other phase.

Type (male): Nihoa Island, June 12, 1923, in bunch grass (Bryan); Allotype (female), Nihoa Island, June 16, 1923, in bunch grass (Bryan).

Type: Cat. No. 256, Bernice P. Bishop Museum.

MEASUREMENTS (IN MILLIMETERS)

	Length of Body	Length of Pronotum	Caudal Width of Pronotal Disk	Length of Tegmen	Length of Caudal Femur	Length Oviposit
MALE						
Type	34.2	10	5.8	28	22.2	
Paratype	32	10	5.8	27.3	22	
Paratype	34.2	10.4	5.9	28.8	23	
FEMALE						
Allotype	37.8	10.8	6.2	36.2	25	19.8
Paratype	38.7	10.7	6.2	35.3	24.3	18.8
Paratype	40.8	11	6.3	34.4	25.2	18.7

In addition to the described pair, there are two male and three female paratypes and an immature female, bearing the same data, except that a pair was collected by Cooke, and one female by Schlemmer.

[A single egg, probably belonging to this cricket, was found by Cooke in bunchgrass, Nihoa Island June 6, 1923. The egg is cylindrical, about 8 mm. long by slightly over 1 mm. in greatest diameter. It is pointed at both ends, one more acutely than the other; and the entire egg is slightly arched, so that one side forms an even bow curve from tip to tip, while the other is very slightly concave, almost straight. The color is close to Ridgway's "Buffy Brown (17''O-Y)"—Editor.]

CONCEPHALINAE

Conocephalus saltator (Saussure)

1859. *Xiphidium saltator* Saussure, Rev. et. Mag. de Zool., ser. 2, Vol. XI, p. 208. [Female, Guiana.]

Midway Island, April, 1923 (Fullaway): 1 male, 1 juv. female.

This insect, recently introduced on the island of Hawaii from tropical America, has rapidly increased its distribution and is now known to occur also on Oahu. It is, however, surprising to find that it has gained a foothold on the remote island from which it is here recorded.

[The carrying of earth from Honolulu, in which to plant trees and gardens at Midway Cable Station, may be responsible for the introduction of *C. saltator* and other common insects and weeds on Midway Island. —Editor.]

Response to a rigorous environment is apparently shown by the decided size reduction in the present specimen which measures as follows: length of

body, 11.9 mm.; length of pronotum, 3 mm.; length of tegmen, 5.4 mm.; length of caudal femur, 11.2 mm. Peruvian material, taken at an elevation of 3,000 feet in the Andes, is nearly but not quite as depauperate.

Family GRYLLIDAE

Subfamily GRYLLINAE

Gryllus oceanicus Le Guillou

1841. *Gryllus oceanicus* LeGuillou, Rev. Zool. 1841, p. 293. [Nukahiva, Marquesas.]

Widespread for a long time in Hawaii, this species is known to have an extensive distribution through Oceania, occurring also in Japan and Borneo.

Subfamily TRIGONIDIINAE

LITOGRYLLUS new genus

The new genus Litogryllus is erected to include three species which were described, as members of the genus Trigonidium Rambur, by Saussure. These are *tahitensis, flavipes* and *haani,* of which *flavipes* is selected as genotype. To this phylum, *I. pacificum* Scudder was also assigned by Saussure, that species being now placed in the distinct genus Paratrigonidium Brunner.

The genus may be separated from Trigonidium by the delicate and much less coriaceous tegmina, which are less convex and show nothing of an ovate tendency, with dorsal field bearing well separated longitudinal veins, connected by a few very feeble cross-veinlets (instead of showing very numerous and closely placed longitudinal veins) and general coloration which is not largely blackish and metallic.

The complete absence of stridulating field or stridulating vein readily distinguishes males of the present genus. Though the male genetalia show general similarity of type to that developed in the genus Paratrigonidium, affinity in most of characters is found to Falcicula Rehn.

The single described species of Falcicula is even smaller than *L. flavipes,* slighly more robust in form, with dorsal veins of tegmina more regularly longitudinal, cross-veinlets subobsolete and caudal tibial spines longer, the longest distinctly longer than the distance from its base to that of the next spine, while the male lacks a stridulating field on the tegmina but shows a distinct, transverse stridulating vein.

In *Litogryllus flavipes* (as shown by the Wake Island material) the tegmina show three lateral and five dorsal longitudinal veins, the two toward the costal margin irregular, due to the more frequent intersection there of cross-veinlets. The genus shows also the following noteworthy characters.

Head with dorsal surface sloping to the well rounded fastigio-facial angle. Maxillary palpi with fifth joint elongate trigonal, its sides straight, its apex transverse truncate. Wings absent. Paired genital valves of male prominent, with straight lateral projection, the dorsal margin rounded distad to the ventral apex. Ovipositor of female decidedly recurved, with apex sharp and margins in that portion very finely serrulate. Cephalic femora without auditory foramina. Caudal tibiae with three internal and three external spines, which are strongly alternating; three external spurs of which the median is the longest; two very much larger internal spurs, of which the dorsal is the longest. Caudal metatarsus approximating length of the two succeeding joints, armed only at apex with two stout spurs.

Great confusion in this subfamily of the Gryllidae is found, due to the supposition that presence or absence of auditory foramina on the cephalic tibiae was a certain index of generic difference. There is now convincing evidence[26] to show that this feature has no generic or even specific significance, and that *Homoeoxiphus insularis* Saussure is actually a synonym of *Litogryllus flavipes* (Saussure). Moreover *Homoeoxiphus tacitus* Saussure is probably a synonym of *Homoeoxiphus tahitensis* (Saussure). In both cases one name was based on the wingless phase (without auditory foramina), the other on the winged phase of the same species (with auditory foramina). We believe, however, that Litogryllus represents a genus distinct from Homoeoxiphus Saussure, with genotype *H. lycoides* (Walker), and is also distinct from the related genus Metioche Stål (synonym, Piestoxiphus Saussure), with genotype *M. vittaticollis* (Stål). As originally defined, however, the characters considered most important for their separation are now seen to be not even of specific value, while the features which are probably of generic importance were treated largely as of no more than specific value, if discussed at all.

General revision of the subfamily is urgently needed, but as yet no one collection contains a sufficient representation of the genotypic species to warrant such action.

Litogryllus flavipes (Saussure)

1878. *Tr[igonidium] flavipes* Saussure, Soc. Geneve Mem., Vol. 25, p. 465, pl. 16, sect. XLVII, figs. 1, *2e*, and *2i*. [Male and female; Fiji; Samoa; Tonga; Australia.]

1878. *H[omoeoxiphus] insularis* Saussure, idtem. p. 470. [Male and female; Fiji; Australia; Java.]

This synonymy is explained in the above generic discussion.

Wake Island, July 31, 1923 (Bryan): 20 males on Boerhaavia, others all on Portulaca; 4 males; 4 females, 10 juv. Wake Island, July 28 to Aug.

[26] Rehn, J. A. G. and Hebard, M., On the genus Anexipha: Ent. News, Vol. 23, p. 411, 1912.

5, 1923 (Bryan): pair on Portulaca and 4 males, 3 females, 6 juv. on Sesuvium; 7 males, 4 females, 6 juv.

In the present series a broad post-ocular suffusion of dark brown is continued caudad, covering most of the pronotal lateral lobes and lateral portions of the tegmina. In one male, however, this appears only as a fleck, ventro-cephalad on the lateral lobes of the pronotum. The antennal joints are usually dark brown. The head is usually marked conspicuously with dark brown, as follows: two longitudinal irregular bands on the occiput (continued on pronotum and there forming irregular maculations on the disk), broad and heavy bands margining the frontal costa and heavy fleck ventrad of the eye. These markings are subject to considerable individual variation, the sub-ocular spots sometimes connected transversely with the frontal costal markings, while a few specimens have the head generally pinkish brown instead of light yellowish buff, with markings much less conspicuous and more suffused.

Saussure originally described a number of color variations, but, though the coloration of the species is subject to decided variation, positive proof is not presented that all of his material, particularly that from Australia, actually represents but a single species, and the Fiji Islands are therefore selected as type locality for *L. flavipes*.

ORTHOPTERA, BLATTIDAE

By

E. H. Bryan, Jr.

Six species of roaches were captured by the Tanager Expedition. All of these species are widespread in the Pacific and might well have been carried on sampans or by other means from Honolulu to the various islands, where they are all well established. The species have been discussed by Hebard[27] and are so well known that only a brief note concerning their distribution need be given. The following determinations were made by comparison with specimens in the Bishop Museum.

Eoblatta notulata (Stål)

Ocean Island (Fullaway)

Blatella germanica (Linnaeus)

Laysan Island (Ball). On board U. S. S. "Tanager" (Bryan). Numerous specimens.

Cutilia soror (Brunner)

Ocean Island (Fullaway). Nihoa Island (Bryan and Cooke), in bunch grass.

Johnston Island (Bryan), about old shack at night. Wake Island (Bryan), numerous, some from rotten logs.

Periplaneta americana (Linnaeus)

Midway Island (Fullaway). Necker Island (Bryan), scarce. Nihoa Island (Bryan), scarce. French Frigate Shoals (Bryan), under timbers. Johnston Island (Bryan), nocturnal, coming out in great numbers about Tribulus blossoms at night.

Periplaneta australasiae (Fabricius)

Ocean Island, nymphs only (Fullaway). Nihoa Island (Bryan and Cooke), nymphs only, on Sida, Pritchardia, bunch grass and about camp.

Pycnoscelus surinamensis (Linnaeus)

Pearl and Hermes Reef (Fullaway). Ocean Island (Fullaway). French Frigate Shoals (Bryan), Nihoa Island (Bryan and Cooke). Johnston Island (Bryan), on Tribulus at night. Wake Island (Bryan).

[27] Hebard, M., Dermaptera and Orthoptera of Hawaii: B. P. Bishop Mus., Occ. Pap., Vol. 7, No. 14, 1922.

OTHER ORDERS

By
E. H. Bryan Jr.

Although most of the specimens of the small and obscure groups of insects collected by the Tanager Expedition are as yet unidentified, a summary of present knowledge concerning them is given in order to make this report as complete as possible.

THYSANURA

Thysanura were collected on Laysan, Midway, Gardner, Nihoa, Necker, and Wake islands. A large species was quite abundant on Nihoa and Necker islands, being found beneath rocks and in loose dirt.

COLLEMBOLA

Two minute specimens were collected on Midway Island, April 23, 1923 (Fullaway).

ISOPTERA

A species of "Cryptotermes" was found about buildings on Laysan Island, April 1923 (Fullaway). A single specimen of termite was also found in the Japanese shack on Wake Island (Edmondson).

NEUROPTERA

CHRYSOPIDAE

Chrysopa sp.

Ocean Island, April, 1923 (Fullaway). Midway Island, April 23, 1923 (Fullaway). Pearl and Hermes Reef, April 26-27, 1923 (Fullaway).

CORRODENTIA

PSOCIDAE

Psocids were captured on Nihoa, Necker, Midway, Ocean, and Wake islands. They are small species, some with conspicuously pictured wings, but are as yet unidentified.

THYSANOPTERA

A single specimen of thrip was captured on Ocean Island, April, 1923 (Fullaway).

MALLOPHAGA

The bird-lice collected on the Tanager Expedition were sent to Prof. G. F. Ferris, Stanford University, who was unable to work on them. They were recently returned, unidentified.

EMBIIDINA

Oligotoma insularis McLachl. (?)

Laysan Island, April 11, 1923 (Fullaway), under phosphate rocks and in trash. Nihoa Island, June 11-15, 1923 (Bryan), in trash, where long silken run-ways had been built, and winged males at lights. Necker Island, June 20, 1923 (Bryan), winged male at light.

ARACHNIDA

A large collection of spiders are at present in the hands of Prof. R. V. Chamberlin.

A number of specimens of Oribatidae are being worked up by Prof. Arthur P. Jacot.

A species of bird tick was found abundantly on Laysan Island, Ocean Island, Pearl and Hermes Reef, Lisiansky, Gardner, Necker, and Nihoa islands, French Frigate Shoals, Johnston and Wake Islands. It no doubt occurs also on the other islands.

Pseudoscorpions were collected on Johnston and Wake islands.

CRUSTACEA-ISOPODA

Sow-bugs were collected on Laysan, Lisiansky, Nihoa, Necker, Johnston, and Wake islands and on French Frigate Shoals. They have not yet been determined.

CHILOPODA

By

RALPH V. CHAMBERLIN

The following is a report upon a small collection of chilopods made by members of the Tanager Expedition upon several of the small islands lying northwest and west of Hawaii. Most of the specimens were collected by E. H. Bryan, Jr.

Family LITHOBIIDAE

ONEBIUS new genus

Antennae short, composed of twenty articles. Eyes consisting of but few (5 or 6) ocelli arranged in two series; the single ocellus smaller than the adjacent ones, not remote. Prosternal teeth 2+2. Posterior angles of none of the dorsal plates produced. Anal and penult legs with dorsal spines 1, 0, 2, 0, 0 and ventral spines 0, 1, 2, 1, 0. Claw of anal legs single, that of the penult double. Ventral spines of first legs 0, 0, 0, 0, 1.

Claw of female gonopods tripartite; the basal spines 2+2.

Genotype.—*Onebius moananus* new species.

Onebius moananus new species

When in full color the body is dark brown or chestnut above with the head of a lighter shade. The anal legs are darker than the others but with the distal portion distinctly lighter, somewhat orange. Antennae short, consisting of twenty articles, which are short excepting the proximal ones and the ultimate one. Ocelli mostly five or six in number; thus, 1+3, 2 and 1+2, 2. The single ocellus smaller than the others, the contiguous one of upper series largest. Prosternal teeth 2+2. Tarsi of all legs excepting the anal ones entire, that of the anal legs biarticulate. Coxal pores small, circular, 1, 2, 2, 2, Ventral spines of first legs 1, 0, 0, 0, 1. Dorsal spines of anal and penult legs 1, 0, 2, 0, 0; ventral, 0, 1, 2, 1, 0. Claw of female gonopods tripartite, the lobes short.

Length: 5.5 mm.

Locality: Ocean Island, Apr. 18, 1923 (Fullaway): 6 females,

Family SCHENDYLIDAE

Nyctunguis bryanus new species

The body mostly light yellowish brown of a greenish cast, lighter yellow anteriorly; the head and prehensors, when in full color, light chestnut. A geminate, dark median dorsal stripe may show through from beneath. The body is attenuated from the middle towards both ends. The cephalic plate longer than wide in about the ratio 45:34. Anterior borders triangular. Prebasal plate exposed. Claws of prehensors when closed attaining anterior margin of head; joints unarmed; anterior margin of prosternum with two low, blunt or truncate dentiform processes which are not darker than the adjacent parts. Labrum with median arc wide, not deep, bear-

ing about ten blunt, chitinous teeth with three or four pectinations on each side of these. Spiracles all circular, gradually decreasing in size caudad. Ventral pores in a conspicuous subcircular area on sternites of anterior, middle, and part of posterior regions, the areas becoming smaller posteriorly. Last ventral plate broad and trapeziform. Coxal pits two on each side, homogeneous. Pairs of legs, 57.

Length, 42 mm.

Locality: Necker Island, June, 1923: 4 specimens taken under stones by E. H. Bryan, Jr., for whom the species is named.

Other species of this genus have been found along the California coast and in the region of the Gulf of California.

Family ORYIDAE

Orphnaeus brevilabiatus (Newport)

Geophilus brevilabiatus Newport, Trans. Linn. Soc. London, 1844, 19, p. 436.
Orphnaeus brevilabiatus Pocock, Weber's Reise, 1894, 3, p. 317.
Orphnaeus brevilabiatus Chamberlin, Bull. Mus. Comp. Zool. 1920, 64, p. 38.

Locality: Wake Island, May 31, 1923 (Bryan): 2 specimens taken "under a stick."

This species is widespread in the Polynesian and Australian region as indicated by the author in the place cited above.

Family GEOPHILIDAE

HONUAPHILUS new genus

No frontal suture present. A well-defined median clypeal area. Labrum tripartite. The median piece large, armed with numerous teeth. Lateral pieces comparatively short, with few pectinations. Outer branch of first maxillae short, its second article reduced; with no distinctly developed lappets. Claw of palpus of second maxillae wholly smooth. Claws of prehensors small, covered by the head in dorsal view, armed at base. Other joints of prehensors and the prosternum unarmed. Ventral pores present in a transverse band in front of caudal margin of sternites. Last ventral plate wide. Coxopleural pores opening into a single large ventral pit on each side. Anal legs with claw well-developed.

Genotype: *Honuaphilus alohanus* new species.

This genus may be readily distinguished from Geophilus by the single cocopleural pits into which the ordinary tubular glands open, as well as by such features as the reduced outer branch of the first maxillae.

Honuaphilus alohanus new species

Body in general yellow, the head and prehensors but little darker. Cephalic plate about equal in length and breadth, its caudal margin wide and truncate, the anterior border obtusely triangular. Frontal suture not present. Median piece of labrum wide, bearing typically seven teeth. Each lateral piece with three or four pectinae. Inner branch of first maxillae longer than outer branch; second article of latter very short, truncate. Claw of palpus of second maxillae small, smooth. Prebasal plate covered. Claws of prehensors small and weak, when closed not fully attaining the front margin of the head. Claws armed at base with a small tooth, the other joints and the prosternum unarmed. Chitinous lines of prosternum weak. Body attenuated

anteriorly and more strongly so posteriorly. Dorsal plates bisculcate. Spiracles circular, very gradually decreasing caudad from the first one. Ventral pores comparatively few, arranged transversely in front of the caudal margin of sternites. Pairs of legs, 45 or 47.

Length: up to about 22 mm.

Localities: Ocean Island (Fullaway): 1 specimen. Laysan Island (Fullaway): 3 specimens; April 21, 1923 (Ball): 1 specimen on beach under dead tern. Pearl and Hermes Reef (Fullaway): 1 specimen. Johnston Island, July 13, 1923 (Bryan): 4 specimens taken under boards on beach; July 18, 1923 (Bryan): 1 specimen taken under dead bird; July 13, 1923 (Bryan): 1 specimen.

Family MECISTOCEPHALIDAE

Mecistocephalus spissus (Wood), Acad. Nat. Sc. Philadelphia Journ., ser. 2, Vol. 5, p. 43, 1863.

Locality: Necker Island, June, 1923 (Bryan): 7 specimens.

This species has previously been reported from the following Hawaiian islands: Oahu or "Kaui," Maui, Molokai, Kauai, and Hawaii. Pocock records it as occurring also in the Indo-Malayan region.