

Some Notes on Hawaiian and Other Bethyridae (Hymenoptera) with Descriptions of New Species.

BY JOHN COLBURN BRIDWELL.

1. *PERISIEROLA EMIGRATA* Rohwer

This species has been previously known as a predator upon the Pink Bollworm (*Pectinophora gossypiella*), having been bred from that species by Mr. Fullaway in 1911 and later by Swezey, Busck, Timberlake, Pemberton and Willard. On May 30, 1918, while examining pods of klu (*Acacia farnesiana*) I found it abundantly associated with the lepidopterous larvae feeding there. Here were found *Cryptophlebia illepida*, *Myelois ceratoniae*, *Pyroderces rileyi*, and *Ereunetis minuscula*. Of these the two former were found attacked under natural conditions while the latter was readily attacked when confined with *Perisierola* and eggs were laid upon the paralyzed larva. *Cryptophlebia* and *Myelois* when full grown are usually too powerful for the *Perisierola* and destroy her with their mandibles when attacked. The smaller ones are, however, usually mastered. The female stings them in three places, in the head region at the throat, and near the middle and at the anal extremity ventrally. Each operation results in violent struggles of the larva during which the *Perisierola* hangs on desperately by means of her mandibles, middle and hind legs and by curving her body tightly about the caterpillar. When one portion of the body is mastered she manipulates portions of it apparently with the object of feeding on its juices.

Oviposition was not observed but apparently takes place an hour or two after she has mastered the larva. The eggs are long elliptical nearly or quite three times as long as broad. They are usually laid flat against the body with their length parallel with it. The number laid seems to bear some proportion to the size of the caterpillar, two eggs having been laid on the little *Ereunetis* larva while eight is a common number

to be placed on the larger caterpillars of *Cryptophlebia* and *Myelois*.

In captivity when placed with other caterpillars the *Perisierola* will attack almost any others besides these. In this way it was bred experimentally from *Ephestia elutella* and *Crocidosema lantanae* and it oviposited upon larvae of *Amorbia emigratella* and *Ereunetis minuscula*. The adults also mastered young Noctuid larvae, the young larva of *Scotorythra rara* and *Hymenia recurvalis*, the larva of *Archips postvittanus* and of *Adenoneura rufipennis*, and the grubs of the Anthribid beetle *Araecerus fasciculatus* and the Bruchid *Caryoborus gonagra*. Upon all of these the adults fed, manipulating the larvae with their mandibles and sucking their juices. If several adults were placed with a small larva they did not oviposit but fed upon them until they were sucked dry.

One female placed with a half-grown larva of *Cryptophlebia* which had already been paralyzed on the evening of May 30 had by the next day laid eight eggs upon its dorsal surface. By June 3rd the larvae hatched from these had practically consumed the caterpillar and had reached full growth.

The larva of *Pyroderces Rileyi* was observed vigorously attacking a *Perisierola* placed with it, using its mandibles to bite the abdomen of the wasp. One bit a small *Sclerodermus* placed with it so viciously as to stun it and several with which some *Sierola* had been placed destroyed most of them in a night. Several *Perisierola* placed with a mixed lot of caterpillars from klu pods were destroyed overnight and I have repeatedly had the same thing happen with *Sierola* and *Sclerodermus* placed with other lepidopterous larvae. Lepidopterous larvae do not submit tamely to the attacks of Bethylidae but fight gamely if they have any opportunity.

The Bethylids are cautious in attack and it is probable they frequently attack during the quiescent period at the moults of the caterpillars and thus avoid danger of injury. One female was observed attacking the slender larva of *Ereunetis*. After investigating the head and biting at it and possibly stinging, she

pounced upon its middle and stung it there. This resulted in vigorous contortions of the caterpillar particularly of the anal end. Later she returned to feed at the wound inflicted by the sting. She afterward began working about the thoracic region and apparently succeeded in inflicting a ventral sting near the middle legs after several apparently fruitless efforts in the head region she proceeded to the anal region, where her efforts to sting created another great commotion and contortions, during which she hung on by use of her legs and mandibles and made many attempts to sting but apparently unsuccessfully. She then returned to the head and made several efforts to sting there both dorsal and ventral. The struggles seemed to exhaust her but she remained with the larva which became quiescent. Two hours later she had deposited two eggs.

A female placed with the grub of *Araecerus fasciculatus* after a time attacked it vigorously, the grub making the most violent contortions in its attempts to dislodge the *Perisierola*. She had attacked it at the anal extremity and was keeping hold with her mandibles and hind legs and was constantly attempting stinging. Both finally became exhausted and when the grub was becoming quiescent the *Perisierola* attempted to pierce the skin of the mid-ventral region and apparently succeeded and fed and then rested for some time on the grub now straightened out on its back. From time to time she would abandon the grub and run away, but always returned.

2. SIEROLA ATTACKING THE LARVAE OF CRYPTOPHLEBIA VULPES IN THE YOUNG PODS OF ACACIA KOA.

Where the ridge leading from Punchbowl to Mt. Tantalus joins the latter and the sharp ascent up to the Tantalus peak begins there are a number of koa trees upon which I have never failed to find adult *Sierolae* whenever looked for, but until June 23, 1918, I had not been able to find to what lepidopterous larvae they are attached. Sweeping the foliage and opening the young pods of the koa then revealed the presence of four species of *Sierola* upon the *Acacia koa* and one at least

of these is attached to the larva of *Cryptophlebia vulpes* as a predator. This moth lives as a larva in the immature pods of the koa, feeding at the expense of the young seeds. During its development the larvae frequently cut their way out of the green pods and enter fresh ones. They finally pupate in the pods from which they have eaten out the seed. The *Sierola* enters the cavity in which the caterpillar has devoured the seed and oviposits upon the larva after stinging it and stupefying it. The larvae completely destroy the caterpillar and from five to seven of them can find food from one larva. Upon reaching full growth they spin silken cocoons within the empty seed cavity and the adult *Sierolae* emerge about the time the pods begin to ripen and change color. In all the pods where *Sierola* larvae and cocoons were found were openings apparently made by the *Cryptophlebia* larvae in entering one pod from another. While I have not been able to make out the details of the stinging of the *Cryptophlebia* larva, the general aspect of the conflict between them is much like that between *Perisierola* and its prey, the *Sierola* attacking with great fury and hanging to the prey with legs and mandibles. They also feed on the juices of the prey as do the other Bethyliidae observed. I have seen no indication that they linger with the prey during the larval development.

The koa pods are also injured by the larvae of *Cryptophlebia illepida* and of *Adenoneura rufipennis*. *C. illepida* is too large to be readily mastered by the *Sierola* but doubtless the larvae are occasionally utilized.

The larvae of the species of *Cryptophlebia* attack the koa pods in a later stage of development than *Adenoneura*. The larvae of the latter emerge from the pods and hide elsewhere to pupate. They are also probably used occasionally by the *Sierola*.

A larva supposed to belong to *C. vulpes* was mastered by the *Sierola* and five eggs laid by June 25. These eggs are elliptical in outline perhaps $2\frac{1}{2}$ times as long as broad and rather large in proportion to the mother insect. They are con-

siderably stouter than the egg of *Perisierola* but are more slender than those of *Sclerodermus manoa*, and *S. immigrans*.

While four species of *Sierola* were represented in the material secured from the koa, only one of these has been surely associated with the *Cryptophlebia* larvae in the pods. Much of the material taken from the foliage of the koa belonged to another species which was taken frequently enough to assure its association with some koa insect but no indication was found as to which one.

Another species of *Sierola* was bred (2 ♀ and 1 ♂) on June 5, 1918, from a lepidopterous larva living within the hollow twigs of recently dead *Clermontia kakeana*.* The material was taken as full fed larvae on May 26, along the Manoa cliffs trail on the side of Tantalus in the S. E. Koolau Mountains of Oahu. These spun their cocoons on May 27. The cocoons are elliptical rich brown in color and are rather closely woven. They lie nearly touching attached to the inner surface of the wood in the pith cavity.

These species of *Sierola* are in the hands of Mr. Fullaway who is revising the Hawaiian species.

3. SCLERODERMUS IMMIGRANS Bridwell.

One ♀ was found on June 11, 1918, at the type locality and on being placed with *Caryoborus* larva showed much interest and attacked it with its mandibles. The details of the attack were not noted at the time but the *Sclerodermus* was seen to gnaw at the larva in the mid-ventral region apparently with the object of starting a flow of juices. There was a marked preference for the active, full-fed larva over the prepupal stage. Though eggs were seen laid up to June 12, but some were laid after that date and the larvae reached full growth, but no adults were bred out from them. This female was kept alive until July 24, being fed exclusively upon the juices of the larvae of *Caryoborus* and other larvae.

* From material of the same origin brought down at the time Mr. Swezey bred *Thyrocopa* sp. and *Neelysia* sp.; he has also bred from similar material *Opogona aurisquamosa* (Butler).

4. SOME ENDEMIC HAWAIIAN SPECIES OF SCLERODERMUS
LATREILLE.

The first species of this genus was described in 1809 under the name of *Sclerodermus domesticus* (Latreille Gen. Crust. & Ins., 4:119 ♀) and the genus described the following year under the same name (Consid. General, etc., 314). It was altered by Westwood in 1839 to *Scleroderma* in which alteration he has been followed by subsequent writers. We here revert to the original spelling believing that emendations, except for names specifically stated by the author to be misprints, are never admissible.

The first species of the genus from the Hawaiian Islands was described by Sir Sydney S. Saunders under the name *Scleroderma polynesiensis* (Tr. Ent. Soc. Lond. 1881:116 ♀). In 1901 Ashmead described as new five (Fauna Hawaiiensis 1:283-286) and tabulated the six supposed species. Dr. Perkins in 1910 (*Op. cit.* 2:612-614) added four more species and the present writer in 1918 added an immigrant species (these Proceedings 3:484). All these species with the exception of one of Ashmead's appear to be valid, though they are uncommon and not easily discriminated. In the course of recent years a number of specimens have been taken, and a few bred, some of these appearing to be new. At present I can say but little of the distribution of the species on the various islands since there appear to be but three individuals in the collections here besides those taken on Oahu. Of these one is the immigrant *S. immigrans* Bridwell, the second appears to be *S. polynesiensis* Saunders, while the third is distinct from anything known from Oahu.

In the mountains of the Hawaiian Islands are found numerous elongate caterpillars which have the aspect of Cerambycid beetle larvae and have somewhat the same habits usually affecting wood which has reached a condition of white dry rot. These belong to the genera *Semnoprepia*, *Hyperdasys*, and *Hyposmocoma*. Being somewhat difficult to breed in the low-

lands our knowledge of them is somewhat limited. It is from these caterpillars that all our endemic *Sclerodermus* have been bred.

***Sclerodermus polynesiensis* Saunders.**

I am unable to distinguish Ashmead's *S. Perkinsi* from this species, the supposed differences being apparently due to the difference in the conditions of the specimens, the length of the abdomen and the color of the sutures differing with the condition of the specimen.

If my determination is correct this is the species most commonly found on Oahu and has been frequently bred by the author from wood-boring lepidopterous larvae. I have at hand 19 ♀ of this species, all but one of which were secured in the mountains back of Honolulu, one by W. M. Giffard, one by D. T. Fullaway, two by O. H. Swezey and the remainder by the author. I have also a single ♂ bred out with females of this species. A single ♀ was taken by Mr. Swezey in Iao Valley, Maui. The type locality of *polynesiensis* was Mt. Haleakala, Maui.

The species is quite variable in size. The thorax is dark piceous but the coloration of the insect is such that it seems black considerably darker than any other of the species I have seen from Oahu.

There is no trace of ocelli in this species.

***Sclerodermus poecilodes* Perkins.**

There are before me two taken in Waialae Nui, Oahu, by Mr. Swezey and two from Tantalus (Bridwell), both lots associated with larvae supposed to be those of *Semnoprepia*, in the dead stems of *Smilax*.

***Sclerodermus kaalae* Ashmead.**

There is before me a single ♀ which I doubtfully refer to this species in which the head and thorax are piceous, the legs and antennae brownish yellow and the abdomen appears black. The margins of the tergites are testaceous but so closely ap-

plied to the following tergites as to show no difference in color. This resembles *polynesiensis* but the clypeus is less produced and the abdomen is distinctly tessellate but more feebly so than the thorax. The head also seems more strongly tessellate than in the other species. There is no trace of ocelli.

One ♀, Mt. Kaala in the Waianae Mts., Oahu (Bridwell).

***Sclerodermus manoa* n. sp.**

♀ This species differs from any wingless female *Sclerodermus* known to me except *semnoprepiae*, by its fully developed ocelli. These are arranged in an acute triangle, the hind ocelli distant from the occipital margin about as far as from the anterior ocellus and about six times that distance from the eye margin.

Testaceous yellow; eyes black, tips of mandibles, sutures of flagellum above, extreme base of first tergite very slightly, sublateral patches on its disc, submedian lateral triangular area on either side the second, and similar basal lateral areas on third and fourth, the sixth entirely and the sixth sternite basally slightly infusate.

Clypeus produced about as long as broad, tectiform, its apex nearly truncate, simple, the sides straight.

Head more finely tessellate than the thorax and a little more shining. Thorax subopaque from the strong tessellations, sides of pronotum and of propodeum longitudinally lineolate tessellate; the mesopleura with finer tessellations similar to those of the dorsum. Propodeum distinctly narrowed at base, the declivity obliquely truncate.

Abdomen elongate ovate broader than thorax about as wide as the head, highly polished and shining, the hind margin of the first tergite in the arc of a circle, the tergite not quite as wide as the second, measuring where the suture touches the lateral margins.

Length about 3 mm.

This *Sclerodermus* was found in a cavity in a small stub of white rotten wood, probably the remains of a bush of *Scaevola chamissoniana* along the Manoa cliffs trail in the mountains back of Honolulu on May 26, 1918. It was there associated with a limp immobile lepidopterous larva supposed to be that of a species of *Semnoprepia*. The *Sclerodermus* and the caterpillar were placed in a glass tube and brought in for observation. On the next day she had laid five eggs scattered about on the glass of the tube. The eggs were short ellipsoidal, perhaps twice as long as broad, very large in proportion to the size of the adult, and the poles were very slightly different.

On May 29, only four of the five eggs could be accounted for. One had hatched and the larva was attached to the *Semnoprepia* larva and this one alone of the progeny reached full larval growth and it failed to spin its cocoon and transform. A second larva had hatched and was transferred from the glass but failed to develop; this was true of the third larva as well and the fourth egg was unhatched and did not hatch.

The female *Sclerodermus* showed much interest in the caterpillar, the egg and the young larvae, working over them all with her maxillae and palpi. At one time she appeared to be trying to remove the egg from the glass to the caterpillar. More than once she seemed to be trying to bite into the caterpillar for the young larvae. It seems probable though that she was attempting to feed on the juices exuding from the wound made by the feeding of the young larva. By May 31, three new eggs had been laid and only a single larva remained from the first lot of eggs. This was feeding from the abdomen of the caterpillar just in front of the first pair of prolegs. The effects of the adult *Sclerodermus*' feeding was seen in the shrinking of the caterpillar, which was considerably greater than the feeding of the larva would account for. By June 3 the larva was nearly fullgrown and the eggs had not hatched. The caterpillar was greatly shrunk-en in the middle as the result of the feeding of the *Sclerodermus* larva. The adult was still living and was removed and placed with a larva of *Cryptophlebia illepida* which had been stung by *Perisierola*. She began to examine the anal extremity of the larva with her mandibles and seemingly finding it too active, since it gave a sharp but slight jerk, she reversed and attempted clumsily and slowly to sting it while straight, a posture well adapted to the natural host caterpillar in its burrow but not for the caterpillar lying free in the tube. This operation was repeated several times in a few minutes.

On June 9 a larva* of apparently another genus but the same wood-boring type was brought from the mountains and

* This larva was injured or partly drowned.

placed on June 10 with the ♀ *Sclerodermus*. She showed great interest in it and attempted stinging it but did not succeed while under observation. Her efforts at this time were more of the type of the *Perisierola* than previously. It is evident that sucking the juices of the larval prey is her means of subsistence. By June 13 three eggs had been laid. The larva from the former lot of eggs which reached full growth failed to spin a cocoon or pupate. The female remained alive from May 26, when she was taken, until June 29 feeding readily upon the juices of any caterpillar given her but ovipositing only upon her natural prey. These were always given her paralyzed as a precaution against injuring her. Had circumstances permitted securing proper food for her and her larvae I have no very great doubt that she might have remained alive much longer and that her young might have been bred through to maturity. She did not even refuse to feed upon the juices of the larva of the Bruchid *Caryoborus gonagra*.

Described from a single ♀. Manoa cliffs trail, Mt. Tantalus, Oahu, Hawaiian Islands, May 26, 1918 (Bridwell). Type in the collection of the Hawaiian Entomological Society.

***Sclerodermus semnoprepiae* n. sp.**

♀ Head piceous black; the mandibles piceous, the antennae, thorax, abdomen and legs pale yellow testaceous, flagellum, front coxae and the propleura in front of them and the sutures of the thorax above, sometimes very slightly, petiole, the basal margins of tergites 2-7 seen through the hyaline margins, sting sheath, margins of sternites 2-5 similarly and rest of venter except the last tergite slightly infusate.

Clypeus triangularly emarginate, the sides not so strongly produced as in *polynesiensis*. Ocelli well developed in an equilateral triangle, the posterior ocelli a little further from the eye margin than from the front ocellus and about six times as far from the eye margin.

Head shining tessellate; dorsum of thorax a little less shining more strongly tessellate; sides of pronotum and propodeum longitudinally, mesopleura, vertically lineolate-tessellate; abdomen with the tergum transversely lineolate-tessellate.

Propodeum similar to that of *manoa* but shorter.

Length about 3.25 mm.

♂ Black; legs and antennae infusate, the margins of the tergites testaceous; wings subhyaline apically slightly grayish, the veins yellowish translucent.

Antennae 13-jointed, the joints of the flagellum except the last subequal a little broader than long, the last nearly as long as the two preceding joints together. Posterior ocelli about as far from the occipital margin as from the anterior ocellus and about three times as far from the eye margin. Eye about one and one-half its length from the occipital margin.

Pronotum strongly narrowed anteriorly about as long as the mesonotum; mesonotum without furrows; scutellum with a transverse suture at base; propodeum about as long as the scutellum and mesonotum together. Wing with a closed median cell the submedian entirely open behind; transverse median interstitial with the basal, there is no trace of venation beside the subcosta, median, and these, which are well developed. Length 2.5 mm.

Described from 12 ♀ and 7 ♂ bred Dec. 1916 from sticks of the living wood of *Coprosma longifolia* attacked by the larvae of an as yet undescribed species of *Semnoprepia* brought down from the windward side of Mt. Konahuanui, Oahu (O. H. Swezey). The species was ascertained to be a predator upon the larvae of this moth.

Type and allotype ♂ in the collection of the Hawaiian Entomological Society. Paratypes in the collection of the Hawaiian Sugar Planters' Association and in the private collections of P. H. Timberlake and of the author.

This species is closely related to *manoa* but the dark head will easily distinguish it. The structure of the clypeus is also different.

The undescribed ♂ of *polynesialis* is very similar but in that species the antennal joints are longer, the abdominal markings are more extensively pale and the venation less strongly developed.

Sclerodermus chilonellae n. sp.

♀ Very similar to *semnoprepiae* but the ocelli rudimentary, the sides of the mesothorax and propodeum the extreme base of first tergite and sides of the abdomen dark, the legs and antennae clear pale yellow. The head varies from reddish to nearly black.

The clypeus is round in front and somewhat expanded. Length about 3 mm.

♂ Similar to that of *semnoprepiae* but the general coloration piceous, legs yellow, antennae yellow infusate, two yellowish suffused spots on

the base of the scutellum; sutures of the abdomen broadly pale. Length about 3 mm.

Described from five ♀ and 1 ♂ bred by O. H. Swezey from the larva of *Hyposmocoma chilonella* in the rotten wood of *Pipturus* on the Manoa Cliffs trail, Mt. Tantalus, Oahu, May 13, 1909, and from five ♀ bred with others from rotten wood by D. T. Fullaway on Tantalus probably from the same host and even the same tree.

Type ♀ and allotype ♂ in the collection of the Hawaiian Entomological Society; paratypes in the collection of the Hawaiian Sugar Planters' Association, and in the private collection of D. T. Fullaway and of the author.

Sclerodermus Muiri n. sp.

♀ A black appearing species closely resembling *S. polynesiensis*, the propodeum less narrowed basally and the clypeus less produced, slightly emarginate in the middle. The sculpture much like that of *manoa*. Head without any trace of ocelli. Length about 2.5 mm.

Described from one ♀ collected at Kilauea, Hawaii (F. Muir) from the collection of W. M. Giffard. Type in the collection of the Hawaiian Entomological Society.

Sclerodermus tantalus, n. sp.

♀ Head testaceous brown, thorax yellow the mesonotum, mesopleurae and sides of propodeum brownish, abdomen piceous black, the margins of the tergites translucent, legs and antennae yellowish.

Head without any trace of ocelli, the occipital distance more than twice the length of the eye, antennae not at all elongate as compared to *poecilodes*.

Head feebly tessellate, thorax more strongly so, abdomen feebly tessellate more strongly on the declivity of the first tergite. The tessellations of the sides of the pronotum are not so long as those of *polynesiensis*, the mesopleura coarsely tessellate but the lines bounding the tessellation are not so much impressed as those on the dorsum; sides of propodeum lineolate-tessellate.

The clypeus is not so strongly produced as in *polynesiensis* and the anterior margin is inclined to be reflexed. Length about 2.25 mm.

I was at first inclined to identify this as *euprepes* but that is evidently a larger species with the antennae longer and the occipital distance less.

Described from one ♀ collected on Mt. Tantalus, Oahu (Bridwell). Type in the collection of the Hawaiian Entomological Society.

5. TWO CEPHALONOMIA SPECIES IN STORED FEEDS.

Cephalonomia hyalinipennis Ashmead.

What is believed to be this species was found abundantly in the Grove Farm mill, Haiku, Maui, in August and September 1918 upon rolled barley recently imported from California. All the examples taken proved to be ♀'s.

Cephalonomia gallicola Ashmead.

A yellow wingless ♀ found upon the same barley in much smaller numbers agrees with the description of this species and of *C. Xambeui* Giraud. The former was originally bred from galls in Florida and the latter from *Ptinus fur* in a mattress in France. Probably they are the same species. This species and the former when placed with small Tenebrionid larvae taken from the feeds and with the caterpillars of *Ephestia elutella* from the same feeds showed no interest. They were decidedly interested in and attacked the larvae of *Bruchus quadrimaculatus* and *Calandra oryzae* but did not oviposit upon them. They were possibly preying upon the larvae of *Sitodrepa panicea*, adults of which emerged in small numbers from the bags of barley.

6. A NEW PHILIPPINE GONIOZUS.

Goniozus Williamsi n. sp.

Closely related to and resembling *Goniozus triangulifer* Kieffer by the description but the metanotum with parapsidal furrows and the scutellum with small basal pits on either side and the subcosta, parastigma, and stigma yellowish translucent. The lateral areas of the superior face of the propodeum are finely obliquely aciculate.

♂ The anterior femora of the male are pale brownish yellow and the eyes are larger than in the ♀.

Lenth 2.5 mm.

Described from 4 ♀ and 1 ♂ bred by Mr. F. X. Wil-

liams from a group of lepidopterous larva, probably Pyralid, taken from the foliage of a plant, Los Banos, P. I., Jan. 1917. The cocoons which have been preserved in spirits are stramineous and are spun together in a compact mass 2 x 8 mm.

Type ♀ and allotype ♂ in the author's collection; paratypes in the collection of the Hawaiian Sugar Planters' Association.

7. A SUBAPTEROUS BETHYLID FROM CALIFORNIA.

Arysepyris californicus n. sp.

♀ Black; antennae yellow infusate from the middle of the flagellum on, mandibles piceous at apex, middle and hind trochanters, all the tibiae and tarsi (the middle and hind tibiae suffused with fuscous in the middle) yellow, first tergite with a lateral subapical suffused piceous spot on either side.

Head much broader than the thorax, a little narrowed behind, the occipital distance about equal to the length of the eye; ocelli in an isosceles triangle, the hind ocelli much nearer the occipital margin than to each other and about five times as far from the eye margin; face carinate between the eyes, the carina not reaching beyond the posterior margin of the lateral (antennal) depressions of the face.

Head and dorsum of thorax strongly and coarsely (microscopically) tessellate, the head evenly punctured with distinct shallow punctures removed from each other about five times their diameter.

Pronotum about as long as the mesonotum and scutellum together, the propodeum a little longer; mesonotum transverse twice as broad as long; scutellum with a narrow transverse sulcus at base, propodeum with the superior face rounded down to the declivity, the microscopic sculpture of the superior face radiating from a longitudinal, smooth area, those on the declivity malleate in appearance. Wings reaching nearly to the middle of the superior face of the propodeum, subovate, rounded at apex, with a costa.

Tergites of abdomen highly polished and shining, with faint transverse lineolations. Length about 4 mm.

Described from one ♀ collected in the sand dune district of San Francisco, Cal., Sept. 8, 1910 (Bridwell). Type in the author's collection.

Arysepyris as a convenience genus established for the reception of subapterous forms which cannot be referred to *Goniozus* and its allies the characters of these genera being mainly venational.

8. ANOTHER PHILIPPINE CHLOREPYRIS.

Chlorepyris similis n. sp.

♀ Resembling closely and closely allied to *C. flavipennis* Kieffer but differing in the more shining integument of the head and thorax and the finer and sparser puncturation of the head, largely impunctate behind the ocelli, the finer and sparser puncturation of the pronotum, the shorter pronotum and propodeum, and paler, more elongate stigma of the wings, and the paler flavo-piceous tibiae and tarsi. Length 7 mm.; wing 5.5 mm.

♂ The male closely resembles the female. The antennae and legs are more slender and the abdomen smaller, as is characteristic for males.

Length 7 mm.; wing 5 mm.

Described from one ♀ and one ♂ collected at Los Banos, Luzon, Philippine Islands (F. X. Williams). Type and allotype in the author's collection.

9. A NEW PEREGRINE SCLEROGIBBINE BETHYLID GENUS FROM THE HAWAIIAN ISLANDS.

Lithobiocerus n. gen.

Apparently related to *Mystroconemis* Kieffer but with the mesothorax strongly contracted into two unequal lobes and with the legs differently developed.

Head flattened above, suboval in the dorsal aspect, truncate behind. The eyes coarsely faceted, rounded, hairy, reaching to the occiput and diverging anteriorly; ocelli none; front produced over base of antennae concealing the antennal sockets and clypeus, its anterior margin revealed snoutlike between the bases of the antennae; antennae inserted between the frontal process (anteriorly) and the clypeus (posteriorly); clypeus declivous, tectiform, carinate at its extreme base, swollen in the middle, its base anterior to its apex. Antennae stout, tapering, 25-jointed, the joints broader than long; labial palpi elongate 6-jointed.

Prosternum massive plane, declivous in front; pronotum arcuately emarginate behind, narrowed behind, about twice as long as broad at base, a little longer than the propodeum, twice as long as the mesonotum; mesonotum contracted before the middle. Propodeum broader posteriorly, obliquely truncate without ridges or carinae. Front tibiae and femora strongly incrassate; hind and middle tibiae about the length of their femora, the front tibiae about one-third as long as its femur and somewhat spoon-shaped. Anterior tarsus with large conspicuous pulvillus between the ungues, inconspicuous on the hind and middle legs; ungues with a subapical tooth; calcaria feeble 1-1-2, those of hind legs unequal. Type *Lithobiocerus vagabundus* Bridwell.

Lithobiocerus vagabundus n. sp.

Front of head and antennae reddish testaceous, the flagellum above infusate toward the apex; rest of head black, thorax and legs yellowish testaceous, abdomen black, the margins of the tergites, apical tergite, and the margins of the sternites broadly reddish testaceous.

Impunctate and without visible sculpture, the entire body including the eyes, antennae and legs covered with fine rather close short pile.

Length 3.5 mm.

Described from one ♀ collected on the veranda of a house beneath which some mixed feed had been stored in Kaimuki, Honolulu, Dec, 23, 1916. Type in the author's collection.

Undoubtedly an immigrant, possibly from the Orient, where some of its allies are found. Whether it is in any way related to the winged male imperfectly described generically by Ashmead as *Probethylus Schwarzi* will require investigation. It is to be hoped that this form, one of but two ♂'s known in the subfamily, will be described by one of the hymenopterists who have access to Ashmead's material.

10. CLEPTES FROM THE PACIFIC COAST.

The genus *Cleptes* has been variously referred to the Chrysididae and the Bethylidae and to a family of its own related to the two. Certainly it seems more similar to Bethylidae than to the Chrysididae, differing from them largely by the greater development of the true metanotum and the reduction of the apical segments. On the other hand they are about as far removed from the true Chrysididae in the development of the metathorax and the abdominal segments as they are from Bethylidae.

The habits of none of our North American species have been observed. The European species so far as known attack the larvae of saw flies after they have cocooned.

Cleptes aliena Patton.

One ♂ collected June 8, 1910, Josephine Co., Oregon (F. W. Nunenmacher).

Cleptes Blaisdelli n. sp.

♂ Length about 5.5 mm.; width of thorax about 1.5 mm.; length of wing 4 mm.

Abdominal segments 1-3 ferruginous; flagellum, mouthparts, anterior trochanters, knees, tibiae, and tarsi; middle trochanters femora, tibiae, and tarsae, hind trochanters, tibiae, and tarsi, and 5th abdominal tergite nonmetallic, 5th tergite and tarsi more or less piceous, the rest dull black; calcaria testaceous.

Head, thorax and abdomen in general finely and sparsely punctured.

Propodeum coarsely and deeply reticulate at its anterior middle, the ridges evanescent posteriorly and laterally, its posterior margin nearly straight and its angles produced not quite even with the middle, dentiform but not strongly so, sides of propodeum smooth and shining, 1st tergite smooth and shining; 2nd tergite smooth with fine deep evenly placed punctures, 3rd and following finely rugulose with confluent setigerous punctures. Wings brownish, tegulae metallic with a brown posterior discal spot.

Described from one ♂ collected by Dr. F. E. Blaisdell May 15, 1884, at Poway, Cal. Type in the author's collection.

This fine species does not resemble any of the described American species, the red abdomen abundantly distinguishing it.

Cleptes purpuratus Cresson.

The account of this species in Aaron's Chrysididae is misleading. The abdomen of the female is not at all similar in color to the thorax and in the ♂ the reflections are feeble.

♀ Head, thorax and legs to the femora metallic green with various cupreous and golden reflections, the propodeum blue green, antennae legs beneath the metallic reflections and the abdomen piceous brown, the tibiae and tarsi more testaceous.

Head and pronotum rather coarsely and sparsely punctured, the surface between somewhat uneven, but highly polished and shining; the surface of mesonotum smooth highly polished and shining with finer sparser punctures, scutellum much the same, the punctures obsolescent, metanotum with the lateral depressed areas or pits dull, blue, propodeum with the superior face irregularly reticulate throughout with two fine converging carinae about one-third the distance from the sides to the middle, its posterior carina well defined nearly straight, the lateral angles dentiform; mesopleura polished, rather sparsely coarsely punctured, metapleura and sides of propodeum striate.

Abdomen flattened above, highly polished, particularly the impunctate 1st tergite, 2-4 finely, evenly, and closely punctured excepting on the posterior margins. The apical segment of the abdomen is indicated by a tube extending from the 4th segment.

There are some obscure metallic reflections on tergite 4.

Wings brownish hyaline.

♂ Resembles the ♀ but the head smaller, the antennae longer; the propodeum is more golden in coloration, reticulation of the propodeum is more regular in the middle and less complete laterally; the surface is less even and the posterior marginal carina less complete, the lateral angles less acute. The abdomen has greenish reflections on all the tergites at least laterally, the surface is less highly polished and more convex, the punctures are less definite on segments and there is more pilosity on the surface.

Five tergites can be seen, the fifth very small.

The legs have the tibiae dark with greenish reflections and the reflections on the femora are very much stronger.

One ♀ Corvallis, Oregon, Sept. 15, 1907. One ♂ Pamela Lake, Mt. Jefferson, Oregon, July 17, 1907 (J. C. Bridwell).

NOTES AND EXHIBITIONS.

Maui insects.—Mr. Giffard exhibited a collection of insects representing six days collecting by himself and Mr. Fullaway on the island Maui.

Ascyrtus penicillatus.—Mr. Pemberton exhibited a male of this large spider a pair of which he had found on vanilla in Kona, Hawaii. The female had been sent to Washington for determination.

Kelisia.—Mr. Fullaway exhibited eggs of this leafhopper in bunch grass, parasitized by a species of *Anagrus*.

Pseudococcus straussiae.—Mr. Ehrhorn stated that he had collected this mealybug at Kilauea, Hawaii, and that it was parasitized by the same species of *Anagrus* as is obtained from it on Oahu.

Trionymus insularis.—This mealybug was reported by Mr. Ehrhorn as taken on *Deschampsia* at 29 miles, Kilauea, Hawaii.

Pipunculus sp.—Mr. Timberlake exhibited specimens of a species of *Pipunculus* fly, four of which were obtained by Mr. Williams in field 40, Oahu Sugar Co.'s plantation. A fifth specimen was bred by Mr. Rosa from material collected in cane