

Descriptions of New Species of Hymenopterous Parasites of Muscoid Diptera with Notes on their Habits.

BY JOHN COLBURN BRIDWELL.

The Muscoid Diptera play so large a part in the economic entomology of the Hawaiian Islands that any contribution to our knowledge of their enemies has its value. The injuries to fruits by *Ceratitis capitata*, to vegetables by *Bactrocera cucurbitae*, to meats by certain of the *Sarcophaga* species and the annoyance and disease transmission by the house fly; the injury to cattle by *Stomoxys calcitrans* and by *Haematobia serrata*; the benefits in checking the seeding of the lantana by the Agromyzid seed fly; the reduction to harmlessness of the cane borer (*Rhabdocnemis obscura*) by *Ceromasia sphenophori* and the beneficial effects of the attacks of other Tachinidae upon Lepidoptera make it desirable to extend our knowledge of their enemies, particularly since efforts have been made in the past and will doubtless be made in the future to control the worst of the pests through the importation of their enemies. Farther afield are the problems of the cherry, apple and currant fruit flies, the root maggots, the sheep maggots and the screw worms all of which at least suggest the consideration of methods of natural control.

So far as I can learn there are no known hymenopterous parasites of the eggs of Muscoid Diptera. Their enemies aside from predators appear to attack them in either the pupal or larval stages. Several Pteromalids, Chalcidids and Ichneumonoids are known to attack them only in the puparium. For the practical purpose of parasitic introduction, this group of their enemies have seemed of little importance for two reasons: 1st, because they exercise little or no discrimination in their choice of host and, 2d, because the puparia which they attack are hidden away from them and require to be searched for and found, a time consuming operation which

makes it ordinarily impossible for the parasites to reach any large percentage of them. It is the other class of enemies, those which attack the maggot stage, which give promise of being of value in practical efforts to control these pests. The insects described below are all of this type. In all of these the egg is deposited in the maggot but the host is not thereby prevented from completing its growth and forming its puparium. In all these forms the adult parasite emerges from the puparium of the host.

The African insects here described were found and studied while travelling for the Hawaiian Board of Agriculture and Forestry searching for enemies of fruit flies. My travels were interrupted at Cape Town by an attack of malarial fever and the observations upon dung fly parasites were made while recuperating there. Some insects of similar habits which have accidentally entered the Hawaiian Islands and a Japanese Ichneumonid bred by Mr. Muir similar to one of the African insects studied are here described:

ICHNEUMONIDAE, Cryptinae, Stilpnini.

1. *Atractodes Muiri* n. sp.

Radius arising a little beyond the middle of the stigma, areolet open at apex, eyes bare, second tergite without an impressed spiracular line.

Length 8.5 mm., wing 6.5 mm.

♀ Black; mandibles in the middle, second joint of trochanters, femora, and tibiae (basal third of hind tibiae infuscate), and 2d-5th abdominal segments rufous; wing base yellow; wing grayish hyaline, the nervure infuscate.

Head not as wide as thorax, about twice as broad as long above, nearly square as seen from in front; eyes subparallel, a little divergent below; malar space longer than the width of the base of the mandible; genae broader below; mandible punctured at base with the upper tooth a little longer; clypeus a little shining, rather sparsely but definitely finely punctured, the anterior margin rounded, narrowly depressed; face more opaque, protuberant in the middle above the clypeus with strong punctures separated by about their diameter, more shining and more sparsely punctured along the sides; genae nearly bare above, shining, with some scattered punctures; front similar to the face but the punctures less impressed; vertex similar to the genae; ocelli in a low triangle, lateral ocelli about equidistant from the eye margin and from

each other; antennae 20-jointed, stout, with short pubescence, moniliform at apex (5 apical joints); scape punctured, as broad as long; fourth joint about 5 times as long as broad; fifth a little shorter; the others successively shorter to the penultimate which is a very little longer than broad; last joint ovate, a little longer.

Mesonotum shining, finely hairy, sparsely punctured; parapsidal furrows fine, rather shallow, parallel, not reaching more than half the length of the sclerite; prescutellar fovea rather deep with raised transverse lines at its bottom; scutellum subtriangular, protuberant, shining, sparsely, finely punctured; mesopleura shining, with fine scattered punctures, the anterior and posterior marginal sulci consute. Basal area of propodeum trapezoidal with about 15 punctiform pits occupying its surface; petiolar area strongly concave, reticulate above transversely ridged below; external areas smooth basally, reticulate along the costula; dentiparal area more or less irregularly reticulate; spiracular area reticulate, the spiracles small; pleural areas transversely striate or sulcate, reticulate next the coxae.

Post petiole somewhat aciculate, the spiracles a little nearer the apex than to each other; remainder of abdomen smooth, shining and highly polished; unguis slender, elongate; subdiscoial nerve arising from the middle of the nervellus; subdiscoial nerve of hind wing arising far below the middle of the nervellus.

Described from one ♀ bred from the puparium of an undetermined species of *Sarcophaga* living in decaying fish used as fertilizer in the field. Okitsu, Japan, Jan. 1913. (F. Muir). Type in the author's collection.

2. *Atractodes Mallyi* n. sp.

Very similar to *A. Muiri*.

Mandibles entirely black; 2d joint of trochanter black; fifth segment of abdomen dark; the coloration otherwise as in *Muiri*.

Anterior margin of clypeus not depressed, a little produced in the middle, smooth and shining at apex; front and vertex very highly polished and shining, with only a few scattered minute punctures; ultimate joints of antennae not so distinctly moniliform.

Mesonotum more highly polished and shining; the parapsidal furrows more distinct, reaching farther to the rear, punctures minute, indistinct, scattered; median elevated area of metanotum trifid in front (simple in *Muiri*); sides of pronotum imperfectly striate (only the posterior margin consute in *Muiri*); basal area of propodeum transverse, irregularly rugose or shagreened.

Spiracles of first tergite about as far from each other as from the apex, post petiole less expanded.

♂ Abdomen not at all compressed, rounded at apex, tergites 2-5 rufous or all but 3d blackish. Antennae 25-jointed not all moniliform. Length 6.5 mm., wing 5.5 mm.

Described from 29 ♀♀ and 8 ♂♂ bred at Cape Town from an undetermined *Sarcophaga* living in human excrement and experimentally from other species of *Sarcophaga* living in carrion. The habits of this species were discussed under the name of *Allothypa* sp. in these Proceedings 3:492-493, 1918.

The type ♀ and allotype ♂ will be placed in the South African Museum; paratypes in the collection of the Hawaiian Board of Agriculture and Forestry, in the collection of the Hawaiian Sugar Planters' Association and in the private collections of P. H. Timberlake and of the author.

Named in appreciation of Charles W. Mally, Cape Entomologist, and his works upon the biology and economics of fruit flies and the house fly including studies of their natural enemies.

BRACONIDAE, Vipioninae.

3. *Microbracon Terryi* n. sp.

♀ Black, mandible in the middle, sides of all the tergites (more broadly in front so that the first and second are only dark spotted discally or are entirely yellow), the ovipositor (but not the sheaths), knees, front femora apically more or less, hind tibiae basally more or less, and calcaria yellow, the pale markings suffused and their limits indefinite, mouth more or less reddish, wings and venation fuscous subhyaline.

Highly polished and shining, the second tergite feebly rugose behind the median area of the first, its anterior furrow interrupted medially about one-half the width of the median area of the first, suture of the connate second and third tergites smooth.

Antennae about 28-jointed, longer than the head and thorax. Ovipositor longer than the head, thorax, and abdomen together.

Length 3 mm., ovipositor 4 mm., wing 3.5 mm.

♂ Similar to the female, the abdomen sometimes entirely dark.

Described from 24 ♀♀ and 18 ♂♂ from the Hawaiian Islands: Honolulu (Terry, Timberlake) Oahu Sugar Co.

Plantation (Timberlake); Maui, Kipahulu (Swezey); Hawaii, Pahala (Swezey).

Bred from *Tephritis crassipes* breeding in the heads of *Bidens* by the late F. W. Terry, Honolulu, Jan. 1906, by P. H. Timberlake, Honolulu, July 1918, and by J. C. Bridwell, Wailuku, Maui, Aug. 1918.

This species is an immigrant, doubtless arriving with its host, from what country we can only conjecture. The habits of the species were studied by Mr. Terry in Jan. 1906, and Mr. Swezey's material from Maui was taken the same year. This is doubtless the *Bracon* recorded by Dr. Perkins in the introduction of the Fauna Hawaiiensis as attacking *Tephritis*.

Type ♀ and allotype ♂ in the collection of the Hawaiian Entomological Society; paratypes in the U. S. National Museum, in the collection of the Hawaiian Sugar Planters' Association and in the private collections of P. H. Timberlake and of the author.

Opiinae.

4. *Opius lantanae* n. sp.

♀ Length 2 mm.

Black; the legs, including coxae, palpi, clypeus and mandibles in part, scape and pedicel (and usually the first tergite and the anterior half of second) yellow; tegulae brownish; wings hyaline, the nervures brown.

Smooth and shining, highly polished except the face, which is very slightly microscopically roughened; propodeum and first tergite rugose; second tergite slightly aciculate sublaterally; the suture of the connate second and third tergites finely crenulate or almost smooth.

Head a little more than twice as broad as long; mandibles entire beneath, widely separated from the clypeus; the malar space as long as the width of the mandible; face with a rounded median ridge; clypeus not twice as broad as long; eyes oval, parallel; posterior orbits not narrowed below, narrower than the width of the eye; lateral ocelli about four times their width from the eye margin; antennae about 23-jointed, inserted above the middle of the eyes; first joint of the flagellum about three times as long as broad, second and following joints successively shorter, all as long as broad.

Mesonotum evenly convex, not impressed; parapsidal furrows indicated as deep rounded impressions at the anterior margin; mesopleural impressions imperfectly crenulate.

Stigma lanceolate; the radius arising near its basal third, first abscissa of radius less than half as long as the width of the stigma, one-fifth the length of the second, second abscissa one-half longer than the first transverse cubitus, a little less than half the length of the third abscissa; recurrent nervure joining the second cubital cell, which is five-sided.

Second tergite finely longitudinally aciculate antero-laterally; suture between the connate second and third tergites evident, usually finely crenulate, the highly polished median triangular area of second tergite separated from the lateral areas by imperfectly defined, percurrent, feebly aciculate, diverging impressions; third tergite smooth and highly polished; second and third tergites subequal in length, the third widest and three times as broad as long; ovipositor exerted, nearly one-half the length of the abdomen.

♂ The sculpture of the abdomen in the males varies greatly; some have the second and following tergites smooth, the suture of the second and third tergites not evident, not at all crenulate, while in others the entire second tergite is aciculate. Antennae 20-24-jointed, usually 22 or 23.

Described from 51 ♀ and 36 ♂ specimens bred from the Lantana-seed *Agromyzid* (still undetermined) by O. H. Swezey, P. H. Timberlake and J. C. Bridwell upon the island of Oahu. First bred by Mr. Swezey from material collected by him May 12, 1913.

Type ♀, allotype ♂ and paratypes in the collection of the Hawaiian Entomological Society; paratypes in the collection of the Hawaiian Sugar Planters' Association, in the U. S. National Museum, and the private collections of P. H. Timberlake and J. C. Bridwell.

This runs in Gahan's carefully elaborated tables of the North American species of *Opius* (Proc. U. S. Nat. Mus. 49: 68-72) to *Opius oscinidis* (Ashmead) known only in the male sex from material bred from an *Oscinis* breeding in the leaves of *Plantago major* at Washington, D. C. Our species differs but little in the characters given in Ashmead's description. The suture at the base of the scutellum is certainly not unate in our species, nor are the lower parts of the head (except the mandibles and the clypeus) yellow. Doubtless our species is distinct and more differences will be found when the ♀ of *oscinidis* is studied.

The present species is of very great interest from its bearing upon the control of *lantana* by insects, the *Agromyzid* attacking the seeds being one of the most significant of the insects introduced into the Hawaiian Islands from Mexico for that purpose. We must consider it almost certain that it will hereafter play a very restricted part, since recent breedings from *lantana* berries in Honolulu give many more parasites than flies. In the country districts of Oahu, apparently, the parasite is as yet not so numerous and it has not yet been found on the other islands.

Mr. Pemberton and Mr. Timberlake have made preliminary studies of the biology of this species, not yet published. Mr. Pemberton has found that the first stage larvae are like those found by him in the *Opiine* parasites of the fruit flies. Mr. Timberlake has found that this species, like some of the *Opiine* fruit fly parasites, may pass considerable time dormant in the larval stage. From material collected on January 12, 1918, parasites emerged from January 15 to February 6, and again in October. This period of dormancy will need to be considered in future work in the introduction of this *Agromyzid* into other countries, for not unfrequently material supposed to have had all the insects bred out from it may still contain parasites which may escape through negligence.

***Hedylus desideratus* n. sp.**

Head black; clypeus and mandibles piceo-testaceous; antennae reddish infusate; palpi, maxillae and labrum yellowish; thorax above dark rufous or piceous, the lateral lobes usually blackish; legs yellowish; abdomen yellowish-ferruginous; ovipositor sheaths black; wings hyaline, the nervures brownish.

Head broader than the thorax, about twice as broad as long above; clypeus and inner orbits with sparse white hairs and strongly punctured, more sparsely so above; vertex in front of anterior ocellus transversely irregularly rugose; genae margined above nearly to the summit of the eyes, a little broader below, with a single series of feeble punctures; malar space about as broad as long; mandibles separated from the clypeus by a narrow space, simple beneath; clypeus a little less than twice as wide as high, with a rounded process in the middle; tectiform with a median ridge; eyes roundish oval, a little divergent below; posterior

ocelli five times as far from the eye margin as the distance between them; vertex and front shining, with a few lateral punctures; antennae about 43-jointed; joints 1-4 of flagellum subequal, the remainder successively shorter, all much longer than broad.

Mesonotum with deep crenulate parapsidal furrows converging behind and meeting a little in front of the prescutellar sulcus; anterior margins of the lateral lobes with a shallow crenulate marginal furrow; mesopleura with an anterior crenulate sulcus meeting the crenulate sternopleural sulcus at right angles; prescutellar sulcus divided into 4-6 pits by carinae; propodeum reticulate-areolate, with a longitudinal median carina imperfectly indicated for its anterior third.

Abdomen smooth and shining, slightly compressed, about as long as the head and thorax together, its sides nearly parallel; first tergite about twice as long as wide at apex, with a median area limited for about two-thirds of its length from the base by carinae, smooth basally, aciculate apically; the rest of the tergites smooth and highly polished, shining, only the anterior sulcus of the second distinct, this smooth and very narrowly interrupted in the middle; connate second and third tergites about one and one-half times as long as broad, about as long as the rest of the abdomen beyond; ovipositor about as long as the head, thorax and abdomen together.

Length 3.5, ovipositor 3.5, wing 3.75 mm.

♂ similar to the ♀; apical segments of the abdomen often blackish. The apex of the abdomen is rounded, not widened to the apex and truncate as in *H. habilis*.

Described from 29 ♀ and 4 ♂ bred, with many others, from various fruit flies of the genera *Dacus* and *Ceratitis* at Oloke Meji, Ibadan Nigeria, August-November, 1914.

Type ♀, allotype ♂ and paratypes in the collection of the Hawaiian Board of Agriculture and Forestry; paratypes in the author's collection.

It is with some hesitation that this species and the following are referred to *Hedylus*, since the female of *H. habilis* Marshall is still undescribed and there is some little divergence in the abdominal characters of that species from *desideratus*, *clypeatus* and *Giffardi* Silvestri. The stigma is broadly lanceolate; the first abscissa of the radius is about one half the length of the second; the cubitus is continued beyond the second cubital cell the discoidal cells are completely closed. The parapsidal furrows are stronger and crenulate in the African species and the petiole is by no means sublinear. However, they

agree in the two extremely important characters of the long maxillary palpi and the short second abscissa of the radius.

In *H. Giffardi* the second tergite is striate back to the sulcus, differing in that respect from *habilis* and *desideratus*.

This species resembles very closely *Biosteres caudatus* Szepilgeti from the same region, but differs by the longer maxillary palpi, the more elongate stigma with the radius arising distinctly beyond the middle and by the structure of the pre-scutellar sulcus.

This species was by far the most numerous in individuals of the fruit fly parasites bred at Oloke Meji and attacked a greater number of host insects and in a greater variety of fruits than any others. It was carried in a living condition to South Africa, but was unfortunately lost during the time the author was confined in a hospital there.

Like *Diachasma Tryoni* Cameron, *D. Fullawayi* and *Opius lantanae*, this species may pass a considerable period dormant in the last larval instar.

6. *Hedylus clypeatus* n. sp.

♀ Resembles *H. desideratus*, but the mandibles are flattened and expanded basally; the clypeus has a semicircular impression at apex; the clypeus is a little produced in the middle above the impression and at either side of it, giving a somewhat tridentate appearance, it is somewhat tectiform about twice as wide as long; the facial ridge is flattened and shining and the face is more strongly punctured than in *desideratus*; the (true) metanotum is dentate in the middle and the first tergite is nearly smooth and shining, the thorax above is rufo-testaceous. The antennae of the unique specimen are missing.

Described from 1 ♀ specimen taken at Oloke Meji, Nigeria, July 27, 1914, upon the fruit of an unknown vine, which it was examining apparently with the intention of ovipositing. These fruits contained fruit fly larvae, which unfortunately failed to breed out, and no more were obtained.

Type in the collection of the Hawaiian Board of Agriculture and Forestry.

This species might be considered to run to *Sudylus* Buysson in Gahan's table of the genera of *Opiinae* (lc. 66-67), but the maxillary palpi in that genus are said to be short and three-jointed. It is certainly, in my judgment, congeneric with the other African species described as *Hedylus*.

Alysiinae.

7. *Alysia lusoriae* n. sp.

Length 6 mm., wing 4.75 mm. to 5 mm.

Rufo-testaceous, highly polished and shining; tips of mandibles, antennae from the third joint, eyes, ocelli, last joint of front tarsi, middle tarsi, sheaths of ovipositor and wing venation black or infusate; 9-15 joints from the apex of antennae white; clypeus and mandibles, except apex, and palpi pale testaceous; wings subhyaline.

Head broader than the thorax; maxillary palpi 6-jointed, reaching the apex of the front coxae; labial palpi 4-jointed, a little longer than the three basal joints of the maxillary palpi; clypeus produced from its base, almost fusiform, somewhat tectiform, the apex a little rounded; face above the clypeus a little rugose, not distinctly ridged, hirsute, consute at the sides beneath the antennae; a consute or crenulate transverse furrow between the antennae; posterior ocelli in front of a line connecting the summit of the eyes, about four times as far from the eye margin and the occiput as from each other, connected by a furrow with the occiput, eyes orbicular, separated in front by about four times their apparent width; genae about as wide as the eye seen from the side; antennae 33-jointed, third joint shorter than fourth, the remainder successively shorter, but all longer than broad.

Thorax broader than the abdomen; parapsidal furrows strong, crenulate, converging behind and meeting before the prescutellar sulcus, antero-middle portion parallel, abruptly directed outwardly in front, joining the crenulate marginal furrow of the lateral lobes, median lobe strongly declivous anteriorly, not arched transversely in front; prescutellar sulcus large, about twice as broad as long, divided in the middle by a straight fine carina and laterally by some three or four irregular ones or subreticulate; the lateral pits of the scutellum with longitudinal carinae or striae; metanotum laterally crenulate projecting in a trifid costate-carinate mass in the middle; sides of pronotum consute; an oblique subvertical consute impression not joining the longitudinal sulcus on the mesopleurae, the longitudinal sulcus abruptly narrowed in front and more gradually behind, broad with many transverse lines or carinae; median ventral line of mesothorax crenulate; propodeum areolate, a median carina at base more or less interrupted at the beginning of the declivity and continued as two carinae below, some transverse broken carinae at the declivity and an irregular transverse costate carina above the insertion of the abdomen; the spiracles small and circular.

Nervulus nearly its own length beyond the basal; the recurrent joining the second cubital cell, the latter therefore five-sided; radius originating beyond the middle of the broadly oblongate stigma, its abscissae angulate on each other, the second more than twice as long as the first, shorter than the first transverse cubitus, radial cell barely falling short of the extreme apex of the wing; second cu. cell not noticeably narrowed apically, the second transverse cubitus distinctly indicated but obsolescent; subdiscoidal nervure interstitial; hind wings with a *post nervellus* (as Gahan uses the term), the submedian cell more than one-third and less than half the length of the median.

Abdomen fusiform, nearly three times as long as broad, first tergite less than twice as long as broad at apex, longitudinally sulcate with carinate margins, a median area indicated on the basal two-thirds by strong longitudinal carinae; the median area has some irregular transverse carinae basally and a median longitudinal one subapically to which some oblique carinae converge, remainder of abdomen smooth; sulcus of first suture fine narrowed in the middle but scarcely interrupted; fused second and third tergites with the suture scarcely indicated, longer than broad, nearly half the length of the abdomen; ovipositor nearly as long as the head, thorax and abdomen together.

Described from 34 ♀ collected at Fish Hoek, Simon's Bay, near Cape Town, upon cow droppings or bred from the puparia of *Musca lusoria*, breeding in cow dung there, April, 1914 (Bridwell). No males were seen or bred.

The eggs of *Musca lusoria* are deposited scattered on the surface of fresh cow droppings and hatch within a few hours; the larvae reach full growth in about five days and enter the earth to pupate. The eggs of *Alysia lusoriae* are deposited in the larvae apparently on the second day and the adults emerge from the puparia.

In Ashmead's tables* this species might be considered to run to *Asyntactus* Marshall, but in that genus the second tergite is punctured and opaque. However, if we consider the second transverse cubitus as distinct, and it is distinctly indicated though obsolescent, it would run to *Goniarcha* Foerster. The type species of this Foersterian genus is *Alysia lucicola* Haliday, from which this species differs, aside from color, in the much longer ovipositor, the subdiscoidal nervure being interstitial, and in the shorter first tergite.

* Proc. U. S. Nat. Mus. 23:104, 1900.

In Marshall's table† it runs to *Idiasta* Foerster, but the second cubital cell cannot be said to be quadrangular, nor the radial cell lanceolate; the recurrent is received by the second cubital cell and the subdiscoidal nervure is interstitial. The ovipositor is much longer.

In Szepligeti's table‡ it runs to *Alysia*, section *Goniarcha*. Pending a thorough revision of the genera of the Alysiinae I have considered it as well to describe this species under *Alysia*.

The type will be deposited in the South African Museum at Capetown. Paratypes in the collection of the Hawaiian Board of Agriculture and Forestry and in the author's collection.

8. *Aphaereta sarcophagae* n. sp.

♀ ♂ Very much like *A. muscae* Ashmead as represented in the Hawaiian Islands, but with the prescutellar sulcus more profound, smooth with a single median raised line at the bottom of the sulcus; the surface of the propodeum below the transverse carinae usually less rugose than in *muscae*; sculpture of the first tergite exceedingly variable, but the segment seems to be always shorter, more triangular, the spiracles less prominent and the sublateral carinae more convergent posteriorly, and the second tergite has the sides more divergent behind.

This species, so far as the material before me goes, averages considerably larger than *muscae*, with the number of antennal joints averaging less. In both species they vary from 19-23. The largest ♀ is about 3.5 mm., while the smallest is only about 1.75 mm.

Described from 82 ♀ ♀ and 22 ♂ ♂ bred with many others from an undertermined *Sarcophaga* breeding in human excrement at Fish Hoek, on Simon's Bay, near Capetown, in April and subsequently on board ship in May and June from the same material.

Types ♀ and allotype ♂ and paratypes in the South African Museum; paratypes in the collection of the Hawaiian Board of Agriculture and Forestry and in the private collection of P. H. Timberlake and of the author.

† Tr. Ent. Soc. Lond. 1894:499-500.

‡ Gen. Jus. Braconidae. 200-202, 1904.

The larvae of the *Sarcophaga* are deposited and the *Aphaereta* oviposits in them the same day, the adults emerging from the puparia which form after the larvae have buried themselves in the ground. Several individuals of the *Aphaereta* emerge from a single puparium.

Ashmead described *muscae* as without a longitudinal median impressed line on the occiput behind the ocelli, but in the form found in the Hawaiian Islands such a line is present.

The European *A. minor* is described as having no sulcus at the base of the scutellum. It is singular that the South African species should resemble the North American species so much more closely than the European.

In this connection it may be well to record definitely that *A. muscae* in the Hawaiian Islands attacks *Sarcophaga pallinervis* Thompson, a species known only as breeding in cow dung. It has been repeatedly bred from this host by Mr. Swezey and Mr. Timberlake.

CYNIPIDAE, Eucoilinae.

9. *Bothrochacis stercoraria* n. sp.

♀. Black, highly polished and shining; mandibles in the middle, antennae, legs and abdomen dark rufous; the wings brownish yellow fading to hyaline in the radial cell and below, apically. Antennae 13-jointed, the seven apical joints larger, moniliform; third joint longer than fourth, twice as long as broad; pedicel globular; scape pyriform.

Pronotum truncate in front; collar costate, the carina emarginate in the middle; three or four longitudinal radiating striae in the superior angle of the side of the pronotum where it joins the collar carina; below this is a dense brush of fulvous hairs as in *Eucoila*; mesopleura as in *Eucoila*; mesonotum entirely without furrows, ridges or punctures; fovea of the base of the scutellum divided by the carina at the base of the cupuliferous elevation, the cupule on the posterior face of the elevation; back of the fovea is a small oval shallow impression on either side. Second tergite with a ring of dense pubescence at base.

Wings with median, transverse median, basal and radial veins fully developed; brown; second abscissa of radius straight, at right angles with the first; from the angle of the radius obscure vestiges of veins extend in a curve apically and basally. The radial cell is open about its apical two-thirds on the wing margin, wings entirely without pubescence, apical margin entire and rounded. Length 3.5 mm., wing 3 mm.

♂. Similar to ♀; antennae nearly as long as the body, 15-jointed, a little more slender apically, the joints beyond the fourth subequal in length, the fifth about three times as long as wide; third and fourth a little shorter, subequal.

Described from 10 ♀♀ and 2 ♂♂ from cow dung in the vicinity of Capetown, April, 1915, or bred from the puparia of *Musca lusoria* and *Lasiopyrellia cyanea*. (Bridwell.)

The *Lasiopyrellia*, like the *Musca*, breeds in cow dung and emerges to pupate in the soil. They feed in colonies in the more putrescent portions of the dung and scatter when ready to emerge. The *Bothrochacis* enters the dung through interstices and attacks the full-fed larvae ready to emerge from the dung.

Type and allotype is the South African Museum; paratypes in the collection of the Hawaiian Board of Agriculture and Forestry and in the authors' collection.

From the description I was at first inclined to identify this with *Bothrochacis erythropoda* Cameron (Albany Museum Records 1:164 ♂, 1904), also from the Cape, but the radius of that species is said to have the second abscissa roundly curved.

In Kieffer's tables (Gen. Ins. Cynipidae 1902), this species would run to *Lytosema*, but Cameron's genus seems to differ from Kieffer's by the position of the cupule.

This species does not appear to be able to parasitize any great percentage of the larvae of its hosts, since its movements are slow and uncertain.



Bridwell, John Colburn. 1919. "Descriptions of new species of Hymenopterous parasites of Muscoid Diptera, with notes on their habits." *Proceedings of the Hawaiian Entomological Society* 4, 166–179.

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