Report of work of the Experiment Station of the Hawaiian Sugar Planters' Association.
Honolulu :Hawaiian Sugar Planters' Association,1905-1909
https://www.biodiversitylibrary.org/bibliography/15692

no. 6-12 1909-13: https://www.biodiversitylibrary.org/item/53055

Article/Chapter Title: Parasites of the family Dryinidae
Author(s): Perkins, R.C.L.
Subject(s): Hemiptera, Auchenorrhyncha, Dryinidae, Hymenoptera
Page(s): Text, Text, Page 6, Page 7, Page 8, Page 9, Page 10, Page 11, Page 12, Page 13, Page 14, Page 15, Page 16, Page 17, Page 18, Page 20, Text, Illustration, Text, Text, Text

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EMTOMOLOGICAL SERIES. BULLETIN No. 11

REPORT OF WORK
OF THE
EXPERIMENT STATION
OF THE
HAWAIIAN SUGAR PLANTERS' ASSOCIATION

PARASITES OF THE FAMILY *DRYINIDAE.*

BY R. C. L. PERKINS

HONOLULU, HAWAII.
1912.

PARASITES OF THF FAMILY *DRYINIDAE.*

By R. C. L. PERKINS.

In Bulletin I (p. 3-69 and p. 483-499) and Bulletin IV (p. 5-55) an account was given of the interesting parasites of the family *Dryinidae*. A number of figures was prepared by Mr. W. E. Chambers to illustrate these Bulletins, but as they were not completed until long after the letter press, they have never been published. I have, therefore, completed the working out of the material at present available and added some further general remarks, in order that the former bulletins may be rendered more complete, and that these excellent plates may now be published.

In 1907 a classification of the *Dryinidae* by Dr. J. J. Kieffer was published in "Wytsman's Genera Insectorum," wherein the family was divided into three subfamilies, *Dryininae, Gonatopodinae,* and *Anteoninae.*

The characteristics there given for the separation of the subfamily *Dryininae* are based on the shape of the stigma of the front wings, which is narrow or lanceolate, and on the fact that the hind angles of the pronotum do not reach back to the tegulae. In the males of the *Dryininae,* however, as in all *Dryinidae,* the prothoracic angles reach the tegulae, and I suspect that this is the case in some females assigned to the subfamily, e. g., *Bocchus* and *Chelothelius*, though I have seen no specimens of either genus, unless my *Eukoebeleia* be synonymous with the former. *Phorbas* Ashm. must certainly have the pronotal angles and tegulae meeting together. As to the form of the stigma, some genera have this in a condition more or less intermediate between the narrow, lanceolate-shaped ones and the large oval. This is the case with *Chelothelius* and the females of *Deinodryinus,* the former of which should, I think, be removed from Kieffer's Dryininae and placed in his Anteoninae, where *Deinodryinus* belongs, as is clearly proved by its male, which has a larger stigma and a form of antennae characteristic of the Anteon group. *Chelothelius* is probably parasitic on one of the *Jassoidea* (as evidenced by the structure of its chelae), a habit at present unknown in the winged *Dryinini.*

The small group *Emboleminae* of Ashmead should be placed as a subfamily of *Dryinidae.* Although the nervures of the

wings in *Dryininae* and *Aphelopinae* are often for a large part effaced and colorless, their position can easily be made out. A comparison of the figures of such diverse genera as *Labeo, Embolemus* and *Aphelopus,* as drawn by Haliday (Ent. Mag. IV, Pl. XVI, Art. LIII), those of Ashmead (Mon. Proct.), of Brues (J. New York Ent. Soc. XVIII, p. 15), and those given in this Bulletin, show the complete identity of the neuration throughout the *Dryinidae.* In some species of *Aphelopus,* where the distinct neuration is most reduced, even the line indicating the transverse cubitus is easily seen.

As I have previously stated, I consider the genus *Gonatopus s. l.* to be made up of groups entirely distinct phylogenetically, and the description of the remarkable Gonatopus-like creature, *Dryinopsis simplicipes* Brues, with 12-jointed antennae and simple front tarsi, confirms me in this opinion.

Little is known at present of the habits of the *Emboleminae,* but my Australian genus *Harpagocryptus* was bred from *Orthoptera* (Grylloids) and as similar, but quite distinct, larvae of *Dryinidae* have been found on very different *Orthoptera* in other parts of the world, it is possible that most, if not all, of the members of the *Emboleminae* are parasites on *Orthoptera.* It is interesting to note that the elongate larval sac of *Harpagocryptus* and *Aphelopus,* so different from those of all other *Dryinidae,* is correlated with the possession of simple front tarsi in the females. I have tabulated the few known genera of *Embolemininae* (so far as the females are concerned), but have omitted *Pedinomma,* the position of which is quite doubtful. *Algoa* of Brues must be extremely close to my *Harpagocryptus.* The condition of the labial palpi I consider to be of great importance in the wingless *Dryininae* of the Gonatopiform series, and consequently members of this series fall into different tribes.

It is clear that the classification of the *Dryinidae* must at present be based chiefly on the female structure, though the males, where known, are useful, as affording a clue to affinities. Of many species of *Gonatopus s. l.* males are very rarely obtained by breeding, so that many hundreds of the females may be raised without a single male appearing. Some, however, produce males more or less freely, while of some no males have yet been obtained. In America Mr. Koebele bred and captured many examples of various species of *Eugonatopus* and *Agonatopus,* but not a single male was disclosed.

TABLE OF GROUPS OF *DRYINIDAE*.

1. (12) Front tarsi of both sexes simple not chelate.
2. (11) Wingless or subapterous, or if winged with median submedian and discoidal cells distinct, stigma small or narrow; labial palpi 3- or 4-jointed, antennae with 12 or 13 joints.....*Emboleminae*

   Females:
3. (6) Antennae 13-jointed.
4. (5) Fully winged ..... *Embolemus* West.
5. (4) Wings rudimentary ..... *Olixon* Cam.
6. (3) Antennae 12-jointed.
7. (8) Thorax as in *Gonatopus,* with a median stalk.... ..... *Dryinopsis* Brues
8. (7) Mesonotum small, but not forming a narrow stalk,
9. (10) Apterous ..... *Algoa* Brues
10. (9) With rudimentary wings ..... *Harpagocryptus* Perk.
11. (2) Winged, with large ovate or subtrigonal stigma, only the subcostal and radial nervures well defined; antennae 10-jointed, labial palpi 2-jointed. .....*Aphelopinae*
12. (1) Front tarsi of females chelate, antennae always 10-jointed ..... *Dryininae*
13. (14) Stigma large, ovate, chelae rarely fully extensile front trochanters small, not elongated but almost like those of the other legs, (labial palpi 3-jointed), chelar claw always without denticles..... .....*Anteonini*
14. (13) Stigma narrow or lanceolate; front trochanters always different from the others, being elongate, and often very long, chelae perfectly extensile, chelar claw in many genera with lamellate denticles; apterous species very numerous.
15. (16) Labial palpi 3-jointed ..... *Dryinini*
16. (15) Labial palpi 2-jointed ..... *Gonatopodini*

The males of the *Emboleminae* are little known, but in two of the genera they resemble the *Dryininae* in venation and in

having only ten joints to the antennae. In the other groups they are distinguished as follows:

Subcostal and radial veins distinct, but no median, submedian or discoidal cells clearly defined; labial palpi 2-jointed, stigma very large ..... *Aphelopinae*

Basal cells generally and frequently discoidal cells distinct or if the basal cells are defined only by hyaline nervures the the stigma is narrow or lanceolate ..... *Dryininae*

Stigma large and more or less ovate (labial palpi 3-jointed) ..... *Anteonini*

Stigma narrow or lanceolate, labial palpi 2- or 3-jointed.

Labial palpi 3-jointed; head never so strongly excavated posteriorly ..... *Dryinini*

Labial palpi 2-jointed; head always deeply emarginate posteriorly ..... *Gonatopodini*

The males of the *Anteonini* are further generally easily separated by the rather different nature of the insertion of the scape of the antennae on its basal pedicel. The males of *Dryinini* and *Gonatopodini* are sometimes extremely similar, so that males of *Dryinus* and *Gonatopus* have been described by Ashmead under one Genus *Labeo*. This latter genus was characterized by Haliday as having short palpi, the maxillary three-jointed. I have males of *Gonatopus s. l.* with these characteristics, but *Labeo* of Kieffer is placed in his table under genera with "palpes maxillaires longs" and "palpes maxillaires de cinq articles." He remarks further that I state that the male of *Gonatopus s. l.* (i. e. *Labeo s. l.*) has bare eyes, but I find no such statement of mine, and have always known the eyes to be conspicuously hairy. As to *Chalcogonatopus*, I have discriminated this by its longer palpi, the labials being three-jointed, whereas the males of *Gonatopus* s. l. in Bulletin I (p. 22 and p. 33) are shown to have shorter palpi and the labials only two-jointed. Consequently the foot-note in Kieffer's work, p. 13, should be deleted. The male of *Chalcogonatopus* was not described at length because it could not be with certainty referred either to *C. optabilis* or *C. decoratus* (though doubtless belonging to one of these), and I did not care to give it a name, destined to become a synonym.

The structure of the thorax of the *Dryinidae* has been misunderstood both by Ashmead and Kieffer. Thus the latter, in referring to the *Dryininae*, in which the posterior pronotal angles

do not reach to the tegulae, remarks that "les propleures les atteignent." The prothoracic pleura, however, are far removed from the tegulae and contribute largely to a lengthening of the prothorax anteriorly, while the space between the hind angle of the pronotum and the tegulae is occupied by the anterior part of the mesopleura, almost exactly as in some *Sphegidae*. In his figures showing the structure of *Gonatopus,* Kieffer, as did Ashmead in his descriptions, mistakes the hind lobe of the pronotum, when this sclerite is divided by a transverse furrow, for a part of the mesonotum. But the latter is formed in front solely by a narrow stalk, easily separable from the pronotum, which is movable upon it, and posteriorly a small scutellum is sometimes defined, articulating with the propodeum (or fused metathoracic and first abdominal segment) and also separable at the articulation. As a matter of fact, the large pronotum of *Gonatopus* is almost identical in structure with that of some winged forms, and its development is correlated with the great development in length of the front legs. It is interesting to note that in the winged *Dryinini* the mesonotum, though wide for the most part, is anteriorly narrowed into a small neck fitting into the pronotum, which is movable upon it. In some genera the parapsidal furrows extend back from this neck, and if the parts of the mesonotum exterior to the furrows be left out, a thorax extremely similar to that of *Gonatopus* results. But in full-winged forms, as is natural, no such reduction of the mesonotum ever takes place.

The close alliance of the tribes that I have recognized in the *Dryininae* is shown by the extreme resemblance of males of such forms as *Neodryinus* to those of some *Gonatopus s. l.;* and *Eukoebeleia* makes a great approach in some respects to the Anteonini. In making these studies I have critically examined about seventy species of *Gonatopus s. l.* and about fifty species of winged forms, in addition to a large number of European forms, winged and wingless. The greater number of these having been bred, I would specially refer to two points: (1) The variability of some species in color or sculpture, or both; (2) the importance of the form and armature of the claw of the chelae, which in the Gonatopiform species at once enables the parasite to be determined as to whether it attacks a Jassoid or Fulgoroid Homopteron. All the literature known to me on these insects has also been examined.

The arrangement of genera described in the Bulletins of this Station is as follows:

APHELOPINAE.

Aphelopus.

DRYININAE.

Anteonini.

Anteon, Paranteon, Chelogynus, Deinodryinus.

Dryinini.

Neodryinus, Paradryinus, Hesperodryinus, Chlorodryinus, Perodryinus, Thaumatodryinus, Eukoebeleia, Apterodryinus, Eucamptonyx, Agonatopoides, Chalcogonatopus, Agonatopus.

Gonatopodini.

Echthrodelphax, Gonatopus, Dicondylus (Gonatopus m.), Pachygonatopus, Epigonatopus, Pseudogonatopus, Paragonatopus, Haplogonatopus.

In my table of genera (Bull. IV, p. 9) the following corrections should be made:

4. (7) Labial palpi 3-jointed.
5. (6) Maxillary palpi 6-jointed.

a. (b) Chelar claw normal, with minute ante-apical tooth. ..... *Apterodryinus*

b. (a) Chelar claw strongly bent on the apical portion..... ..... *Eucamptonyx*

6. (5) Maxillary palpi 5-jointed ..... *Agonatopoides*

10. (11) Pronotum divided by a transverse impression..... ..... *Paragonatopus*

11. (10) Pronotum not so divided ..... *Haplogonatopus*

On page 40 (seventh line from the bottom), for "fourth" read "fifth."

DRYININI

Paradryinus terryi sp. nov.

Black, the apex and sides of clypeus, the scape of the antennae, their three apical joints and most of the one preceding these, pale yellowish. Front coxae yellowish brown, dark at the sides, the tips whitish, trochanters dark at the base, red apically. Front femora red above, and beneath dark at the sides, tibiae pale

above. Middle and hind coxae and femora dark reddish, the tibiae dull blackish; metatarsi more or less infuscate, the more apical joints testaceous; apex of abdomen more or less pale. Wings with only two dark fasciae, the narrow middle one being confluent below with the basal one, the submedian cell being entirely dark on its apical portion, the median cell clear at the apex.

Head dull, longitudinally rugose and with minute surface sculpture; third antennal joint about twice as long as the fourth, the latter and the fifth notably widened, the following ones being considerably thinner. Pronotum longitudinally rugose, very finely so on the disc, more strongly at the sides, and in front with a lateral smooth, polished area. Mesonotum very dull, with extremely fine sculpture medially between the parapsidal furrows, which are distinct, and much more roughly sculptured outside these. Propodeum above with regular longitudinal wrinkles, posteriorly and laterally strongly reticulate. Abdomen black or nearly so, not red basally, very smooth and shining. Length 8 mm.

Somewhat resembles *P. gigas,* but very distinct by the color of the wings, antennae and abdomen, and the quite different mesonotal sculpture.

Hab. China, Hong Kong; a single example collected by the late Mr. F. W. Terry.

Paradryinus javanus sp. nov.

Black, the face below the antennae pale, the scape and second joint of the antennae in front yellow, the following joints brownish or brownish testaceous, the apical joint clear testaceous. Legs brown or testaceous, the hind and middle tarsi pallid, paler than the tibiae. Pronotum rufescent along the hind-margin and at the sides, the anterior margin very narrowly pale. Wings with the usual three transverse fasciae distinct, the basal one being well separated from the narrow median one by the hyaline apical portions of the median and submedian cells.

Head dull, densely sculptured and with some fine longitudinal wrinkles. Pronotum with dense, fine sculpture, mesonotum dull with dense sculpture, distinctly smoother and sometimes a little shining in the middle between the fine parapsidal furrows.

Propodeum reticulately rugose. Basal joint of front tarsus distinctly longer than the fourth. Abdomen very smooth and shining, the apex rufescent. Length 3-4 mm.

Judging from the three specimens that I have seen, this species varies somewhat in sculpture and in the color of the antennae and legs, the smallest example having the antennae of a testaceous yellow and very little darkened. It is closely allied to the Australian *P. leptias,* but that is easily known by the four pallid apical joints of the antennae strongly contrasted with the dark preceding ones, the less distinct separation of the basal and median fasciae of the wings, and the very dark femora and tibiae of all the legs, while the middle and hind tarsi are also fuscous above.

Hab. Java, Pekalongan (Muir); bred from nymphs of *Thanatodictya* (No. 317, 367 and 295).

GONATOPODINI

Pseudogonatopus nudus sp. nov.

Face, mandibles, and two basal antennal joints pale yellowish, head above and the thorax bright brown, the mesonotal constriction evidently paler or yellowish, femora more or less sordid brown, the hind and middle tibiae and tarsi and all the trochanters more pallid. Abdomen with the petiole black, a ferruginous area behind this, the rest nearly black.

Head above concave, somewhat shining; antennae moderately long and slender, third joint thin and very much longer than the fourth, the apical joint dark. Pronotum with distinct transverse furrow, shining, very feebly sculptured and without hairs, mesonotal constriction dull, with very dense microscopic surface sculpture; propodeum smooth and shining on the disc, posteriorly at the sides very feebly transversely rugulose, the wrinkles less definite in the middle, without erect hairs. Abdomen glabrous and polished. First and fourth tarsal joints of front legs subequal, the claw with about six well developed lamellate denticles. Length 2.75 mm.

Hab. Java, Pekalongan (Muir); bred from a *Dicranotropis* (No. 349); larval sac nearly uniform dark fuscous, placed near the base of the abdomen of the leaf-hopper.

Pseudogonatopus hospes sp. nov.

Black, the face below the antennae and two basal joints of these pale, the pale color of the face continued above the antennae in the middle line and along the inner orbits. Front, middle

and hind coxae dark above, pale beneath and at the apex, front trochanters more or less brown above on the thickened portion, tibiae testaceous, the front ones darkened in front and behind, tarsi testaceous; apex of abdomen pale; the hind femora have a paler area between the darkened base and apical portion, while the front ones except at the extreme apex are nearly uniformly dark brown.

Head strongly concave between the eyes, minutely microscopically sculptured, so as to be not much shining; antennae longish and slender, the third joint one and two-thirds the length of the fourth, or rather longer still, black the extreme base only pale, the fourth hardly wider than it. Pronotum very distinctly divided, with dense surface sculpture, appearing punctate under a strong lens, mesonotal constriction with similar dense sculpture, behind which the propodeum in front of the spiracles is transversely rugose, as also on its posterior surface, while between these areas it is sculptured much like the pronotum. The whole thorax is without any erect pubescence. Front coxae very long, three times as long as high, the trochanters with long thin basal stalk, the chelae normal for the genus, the claw bearing about eight or ten well developed lamellate denticles, the anteapical marginal tooth of the lower side distinct. Abdomen with minute, but distinct, microscopic sculpture, so that it is not highly polished, almost without pubescence, the apical margins of the segments generally more or less paler. Length 4 mm.

Hab. Java, Pekalongan, and China (Muir). This species was established in the islands from cocoons sent from China.

Paragonatopus nigricans P.

To this genus and species must be referred the unique specimen described as *Pseudogonatopus melanacrias*. Mr. Muir has taken this in Fiji, the original locality, and I have dissected out and examined the palpi. It varies in color, the usually black propodeum being sometimes red on the disc, while one example, which appears specifically identical, has the whole thorax of a bright ferruginous yellow.

GONATOPUS.

According to Kieffer this genus has four-jointed maxillary palpi and is therefore the same as my *Neogonatopus*, while the

species of *Gonatopus* previously described by me should be referred to *Dicondylus* Hal.

Gonatopus anomala sp. nov.

Face pale, the mandibles and front of scape, yellow, the head above dark brown, two basal joints of antennae pale, third infuscate, the rest dark fuscous or black. Thorax brown, the propodeum of darker shade than the pronotum, tarsi pale testaceous, the femora and middle and hind tibiae darker, sordid. Abdomen blackish, paler basally behind the petiole.

Head above shining and concave between the eyes, the antennae with the third joint one and a half times as long as the fourth, or more. Pronotum with some sparse erect hairs, feebly sculptured, in side view simply convex above, the transverse division being absent. Propodeum with very sparse, but distinct, erect, longish hairs, shining above both in front of and behind the spiracles, its posterior face distinctly transversely rugose. All the femora with distinct, erect, pale hairs, first and fourth joints of front tarsi subequal, chelae normal for Jassid parasites. Abdomen polished, clothed sparsely with distinct pale hairs. Length 3 mm.

This species is remarkable for the simple pronotum and is doubtfully placed under the genus *Gonatopus*. The maxillary palpi are very short, and perhaps there is only one joint beyond the flexure.

Hab. Fiji, bred from Jassid (Muir).

Dicondylus perpolitus sp. nov.

Deep black, for the most part highly polished. Face below the antennae, and for a short way above these along the eye margins, and the mandibles, pale. First three antennal joints testaceous or the third more or less dark. All the coxae black or nearly so and clothed with sparse pale hairs, the trochanters and tibiae paler, the tarsi quite pale testaceous.

Head above with excessively minute microscopic reticulation, which does not prevent it from being shining, the vertex with sparse, short, white hairs.

Antennae moderately stout, the thin third joint about one and a half times as long as the fourth. Pronotum with well marked transverse division, very highly polished, the hind lobe with fine indefinite punctuation; mesonotal constriction rugulose, the tho-

rax behind the constriction with evident pale hairs beneath and at the sides, but above almost glabrous, posteriorly finely transversely rugose, on the disc highly polished. Femora with short, inconspicuous, pale hairs. Basal joint of front tarsi about equal to the fourth joint, thin basal portion of front trochanters short, chelae normal for Jassid parasites. Abdomen very smooth and shining, with a few short and inconspicuous hairs. Length 3 mm.

Hab. Java, Pekalongan (Muir).

Dicondylus plebeius sp. nov.

Brown or ferruginous, the head above generally darker brown, the abdomen black, but with a ferruginous spot behind the pedicel; mandibles (more or less) and front of scape yellow, second and usually more or less of the third joint of antennae testaceous, the following joints black. Pronotum and other parts of the thorax sometimes with darker markings. Front femora and sometimes the tibiae more or less darkened, the apices of the former pallid. Mesonotal constriction evidently paler than the adjoining parts of the thorax.

Head above concave, usually not highly polished, though more or less shining, clothed with erect hairs posteriorly. Third joint of antennae about one and a half times as long as the fourth, the latter considerably stouter. Pronotum and disc of the propodeum highly polished, the mesonotal constriction dull, the thorax bearing scanty erect hairs; the propodeum posteriorly very finely transversely rugulose.

First and fourth joints of anterior tarsi subequal, chelae of the usual type in Jassid parasites. All the femora with distinct clothing of sparse erect hairs. Abdomen shining, sparsely clothed with distinct erect hairs. Length 3 mm.

Closely allied to *Gonatopus australiae*, but distinguished by the ferruginous propodeum with shorter hairs, and the distinct abdominal pubescence, which is not confined to the base.

Hab. Java, Pekalongan (Muir); bred from nymph of Jassid; larval sac dull black, placed ventrally on the abdomen of the leafhopper.

Dicondylus javanus sp. nov.

Black, the face below the antennae, and the scape in front yellow, the following antennal joints testaceous, the three or four apical ones dark fuscous or black; trochanters, tibiae and tarsi

of all the legs pale, the front tibiae browner outwardly, the trochanters sometimes marked with brown, apex of hind tibiae darkened, the tip of all the femora pale.

Head above strongly concave, very minutely and closely sculptured, so that it is not very shining, with a distinct fine median raised line. Third antennal joint long and slender, one and a half times the length of the fourth or rather more, fourth distinctly longer than the fifth, eighth about two and a half or three times as long as wide. Pronotum transversely grooved before the middle, densely minutely sculptured, much more strongly than the head; behind the transverse groove dull or nearly so, as is the mesonotum and the propodeum, the latter finely transversely rugulose posteriorly and also on the part in front of the stigmata, without erect hairs on its dorsal surface. Front tarsi with the fourth joint very little shorter than the first, fifth beneath with two rows of lamellate denticles on the apical part of its thickened portion and the apical curved part also armed with denticles; claw with a few fine hairs beneath, as usual in Jassid parasites. Legs without erect pubescence. Abdomen very smooth and shining with a very few short appressed hairs, the extreme apex more or less red. Length 3-3.5 mm.

Hab. Java, Pekalongan (Muir); bred from *Deltocephalus;* larval sac abdominal on mature leaf-hoppers, dark fuscous, dull and densely sculptured, or minutely shagreened, more or less variegated with pallid color.

ANTEONINI

Chelogynus cognatus P.

This species is synonymous with *Prosanteon chelogynoides* (*op. cit p.* 66).

The chelae being obscured with gum in the single carded specimen, I misunderstood the true nature of the front tarsi, until recently, when these were cleaned. This example differs a little in color from the type of *P. chelogynoides* and was bred from a different genus of Jassidae, but the differences seem too small to be of specific value.

CHALCIDOIDEA

ENCYRTIDAE

Echthrogonatopus hawaiiensis sp. nov.

Metallic green, the abdomen except at the base, the pleura and propodeum purple. Front and middle tarsi, apical joints of the hind tarsi and apex of middle tibiae yellow. Apex of middle and sometimes of front femora and extreme base of their tibiae also more or less pale. Antennae entirely dark. Front wings blackish fuscous from near the base of the marginal vein to the apex, the dark part including a large hyaline costal spot, originating (on the basal side) at the apex of the post-marginal vein and extending longitudinally nearly half the distance from this vein to the tip of the wing, but transversely not reaching its middle; opposite this on the dorsum is an elongate hyaline area. At the extreme base the wing is again dark. A distinct bare line runs obliquely from beneath the marginal vein in the dark portion of the wing to become lost in an extensive bare area in the hyaline portion.

Head dull, with minute surface sculpture, and a single row of shallow punctures on each side bordering the inner margin of the eyes. Antennae with the second, third and fourth joints small transverse, fifth and sixth distinctly larger and also transverse, club nearly as long as the funicle. Mesonotum shining, with excessively fine microscopic surface sculpture, and a few feeble punctures, thinly clothed with pale hairs; scutellum similarly clothed, darker and duller than the mesonotum; pleura shining. Abdomen with the usual group of long setae on each side towards the base, which is very shining. Length 1.5 mm.

Allied to *E. exitiosus* of Australia, but very distinct. The hairs on the eyes are very indistinct, if not altogether absent.

Hab. Hawaiian islands, Oahu; parasitic on *Pseudogonatopus perkinsi.*

Cheiloneurus javanus sp. nov.

Face, scutellum, the axillae, propodeum, pleura, and the middle of the abdomen yellow and in parts whitish yellow; head above sordid, the pronotum and mesonotum dark fuscous, submetallic in some aspects, head behind the eyes and cheeks distinctly metallic, base and tip of abdomen dark, the former brightly metal-

lic. Antennae pale yellow or whitish, with black club. Wings hyaline at the base, infuscate from the base of the marginal vein apically, but the dark part with a hyaline margin of irregular width extending round from the region of the post-marginal vein to the dorsum opposite this vein. The infuscation itself is darker in some parts than others. Legs pale, the hind femora generally a little darkened at the apex.

Ocelli in an isoceles triangle, of which the sides are about twice the length of the base, the surface of the head between the eyes dull, densely microscopically sculptured. Mesonotum densely clothed with silvery short pubescence; scutellum sparsely clothed and with the usual tuft of erect black hairs; mesopleura dull. Abdomen shining metallic at the base. Length 1 mm.

Hab. Java, Pekalongan (Muir); parasitic on *Paradryinus*. (No. 352).

Obs.—In my description of *C. gonatopodis* (Bull I, p. 261, line 14), for "basal half" read "apical half."

EXPLANATION OF PLATES.

Plate I.

1. *Gonatopus haplothorax,* female (Bull. Ent. H. S. P. A. Exp. Station IV, p. 35).
2. *Agonatopus synchromus,* female (Bull. IV, p. 33).
3. *Haplogonatopus apicalis* (?), male (Bull. I, p. 39).
4. *Haplogonatopus americanus,* female (Bull. I, p. 40).
5. *Agonatopus ferrugineus,* female (Bull. IV, p. 30).

Plate II.

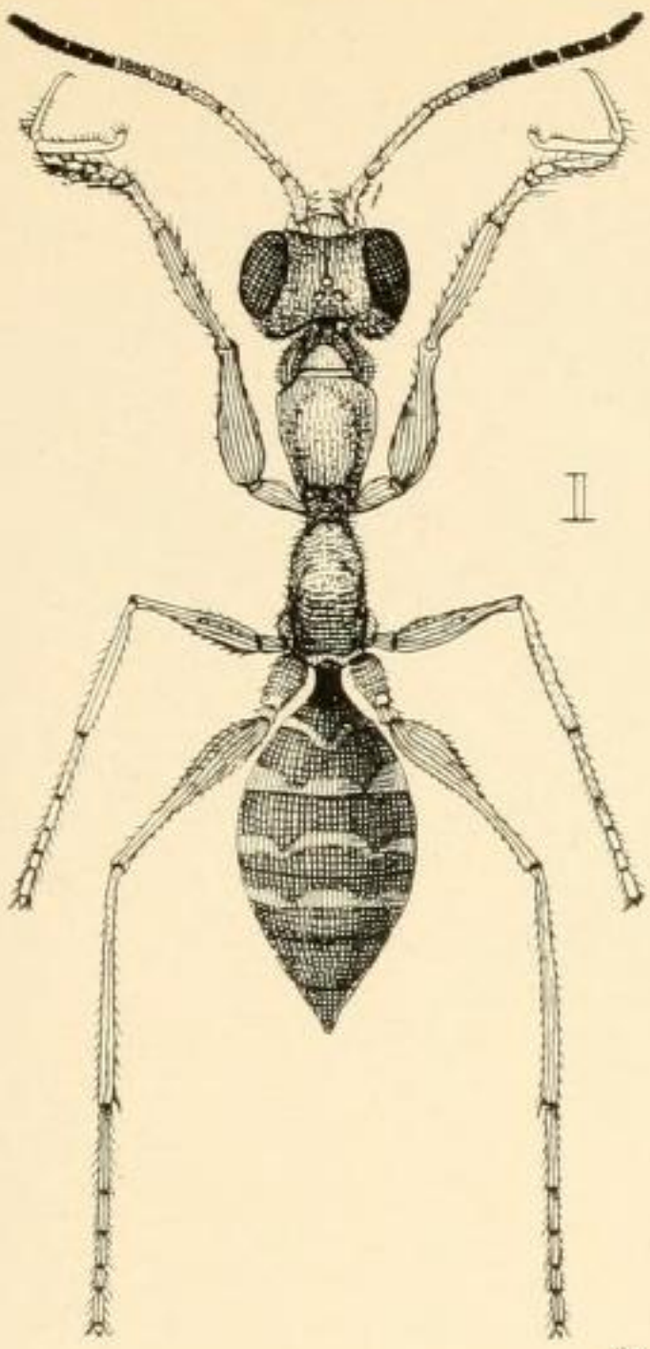
1. *Paradryinus venator,* female (Bull. I, p. 55).
2. *Neodryinus koebelei,* male (Bull. I, p. 51).
3. *Echthrodelphax bifasciatus,* female (Bull. I, p. 49).
4. *Paradryinus venator,* male (Bull. I, p. 55).
5. *Neodryinus koebelei,* female (Bull. I, p. 51).

Plate III.

1. *Hesperodryinus arizonicus,* male (Bull. IV, p. 42).
2. *Chlorodryinus pallidus,* male, (Bull. I, p. 57).
3. *Chlorodryinus pallidus,* female (Bull. I, p. 58).
4. *Hesperodryinus amphiscepae,* female (Bull. IV, p. 41).
5. *Echthrodelphax fairchildii,* female (Bull. I, p. 49).

Plate IV.

1. *Chalcogonatopus leptias,* female (Bull. IV, p. 17).
2. *Paranteon myrmecophilus,* female (Bull. IV, p. 46).
3. *Deinodryinus paradoxus,* female (Bull. IV, p. 46).
4. *Chelogynus typicus,* female (Bull. I, p. 61).
5. *Apterodryinus torvus,* female (Bull. IV, p. 14).



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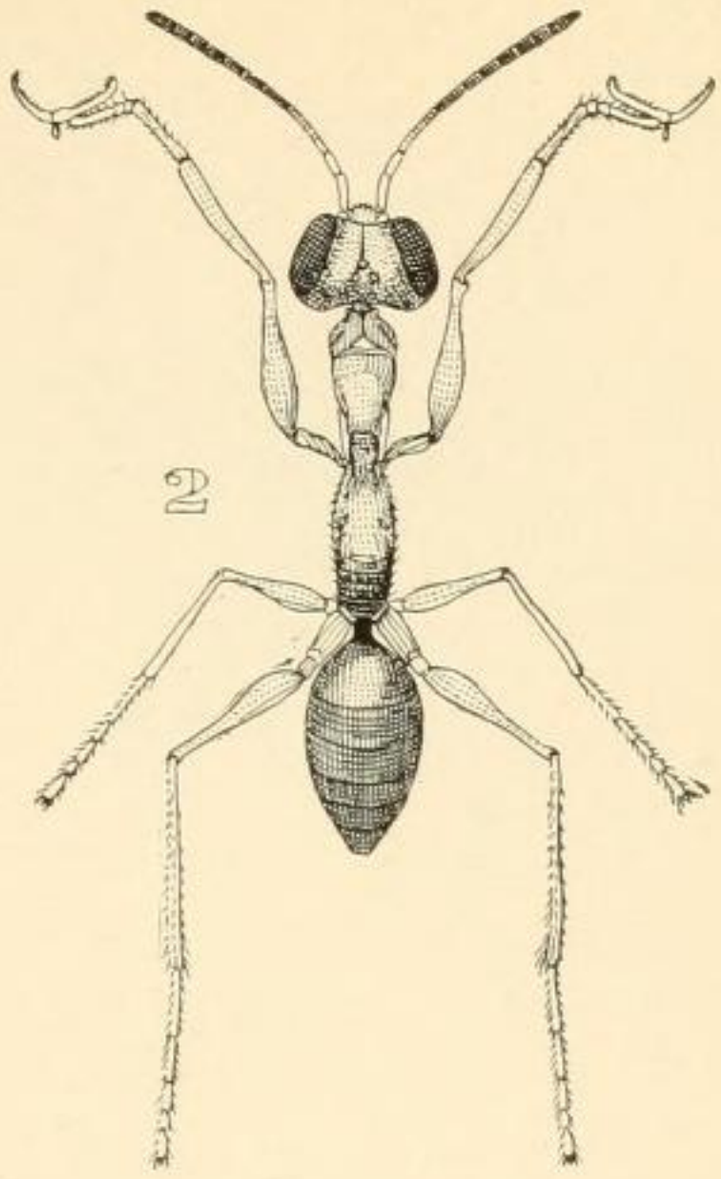

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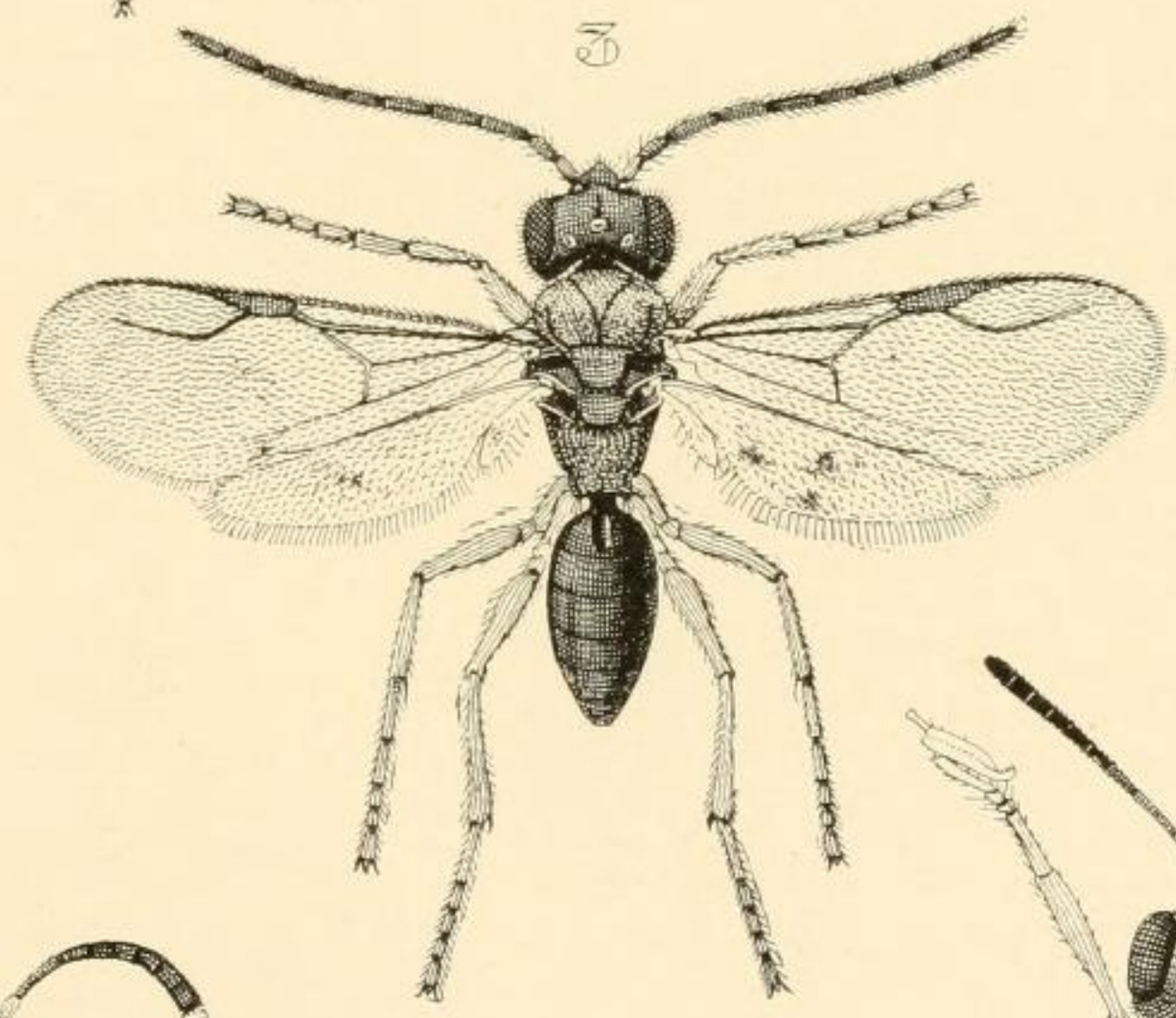

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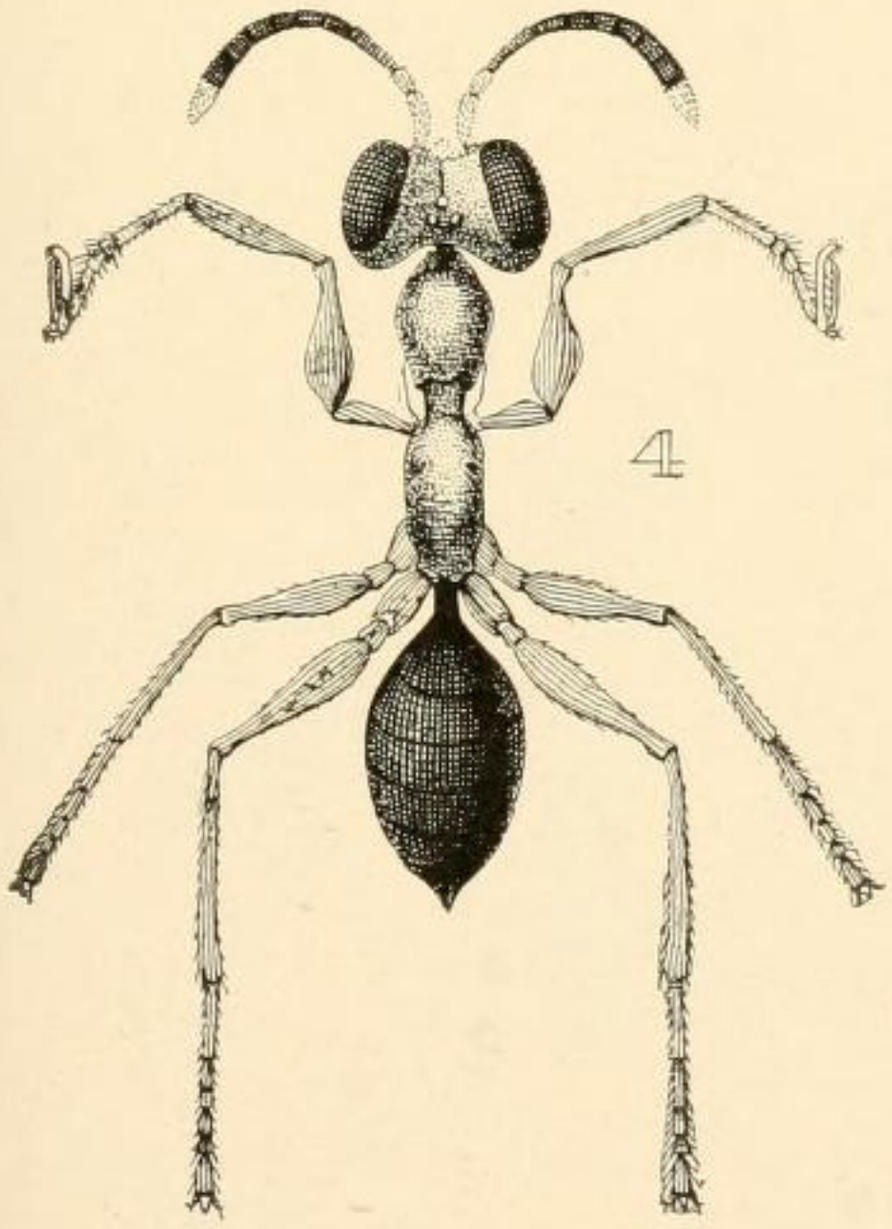

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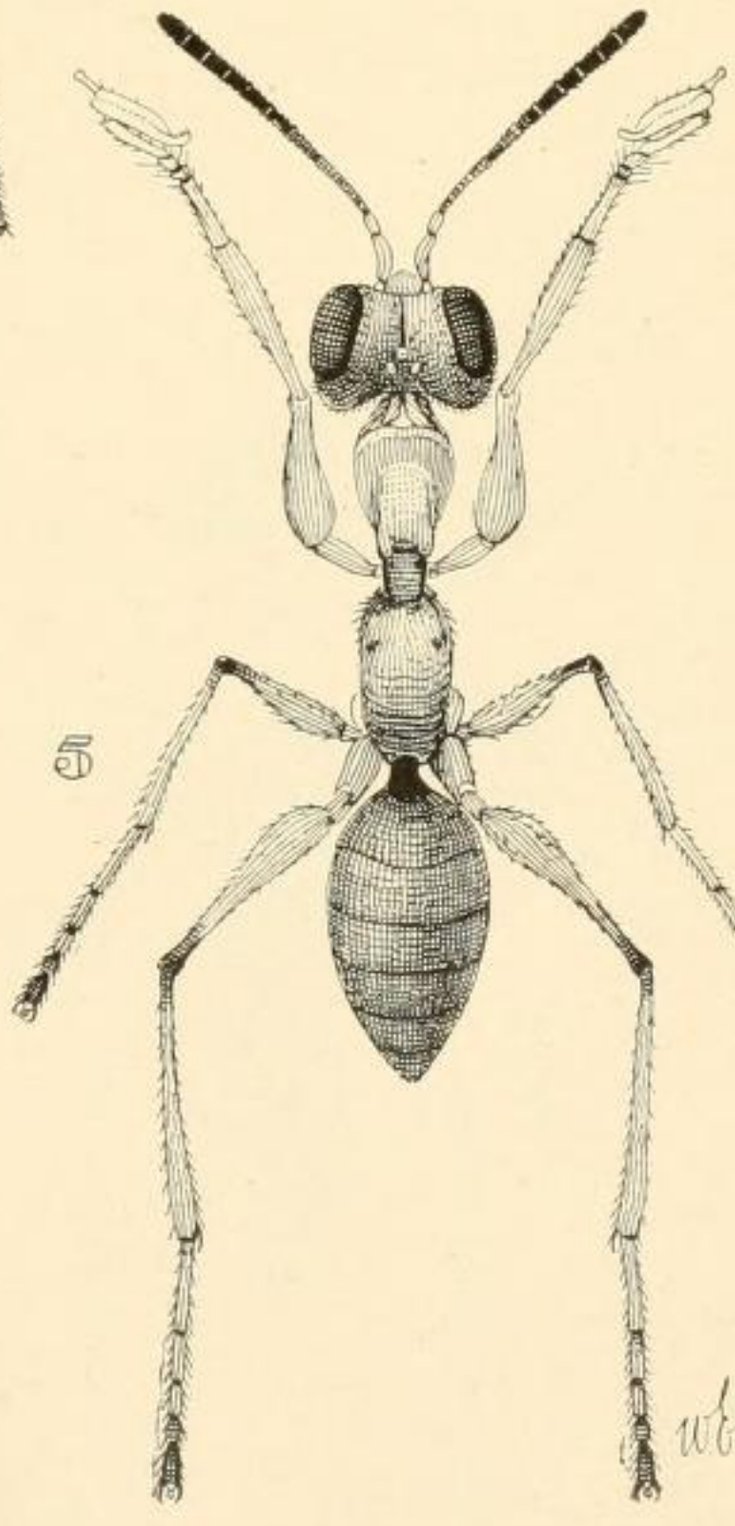

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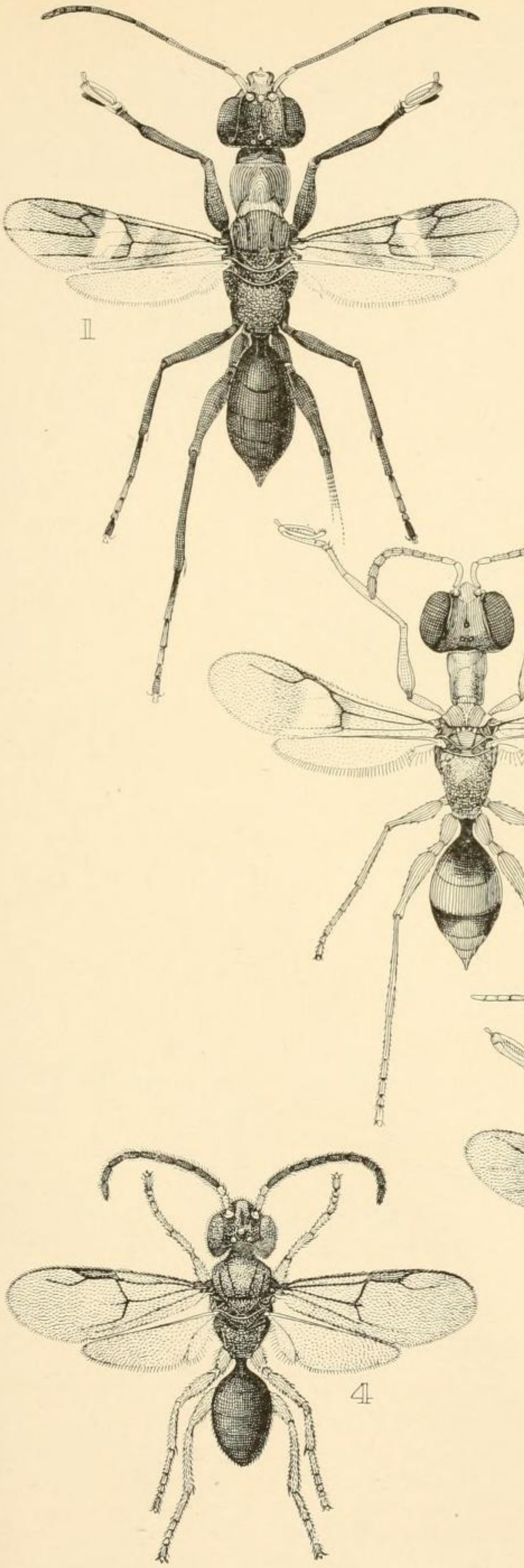
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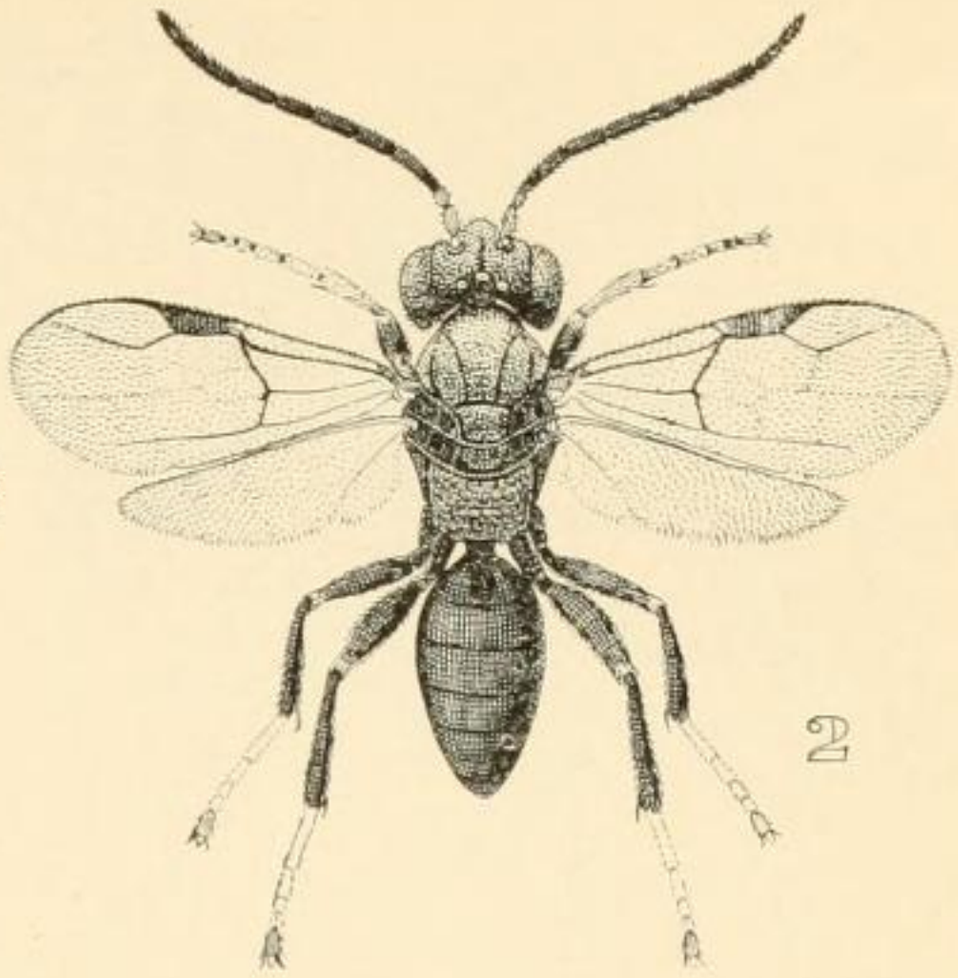
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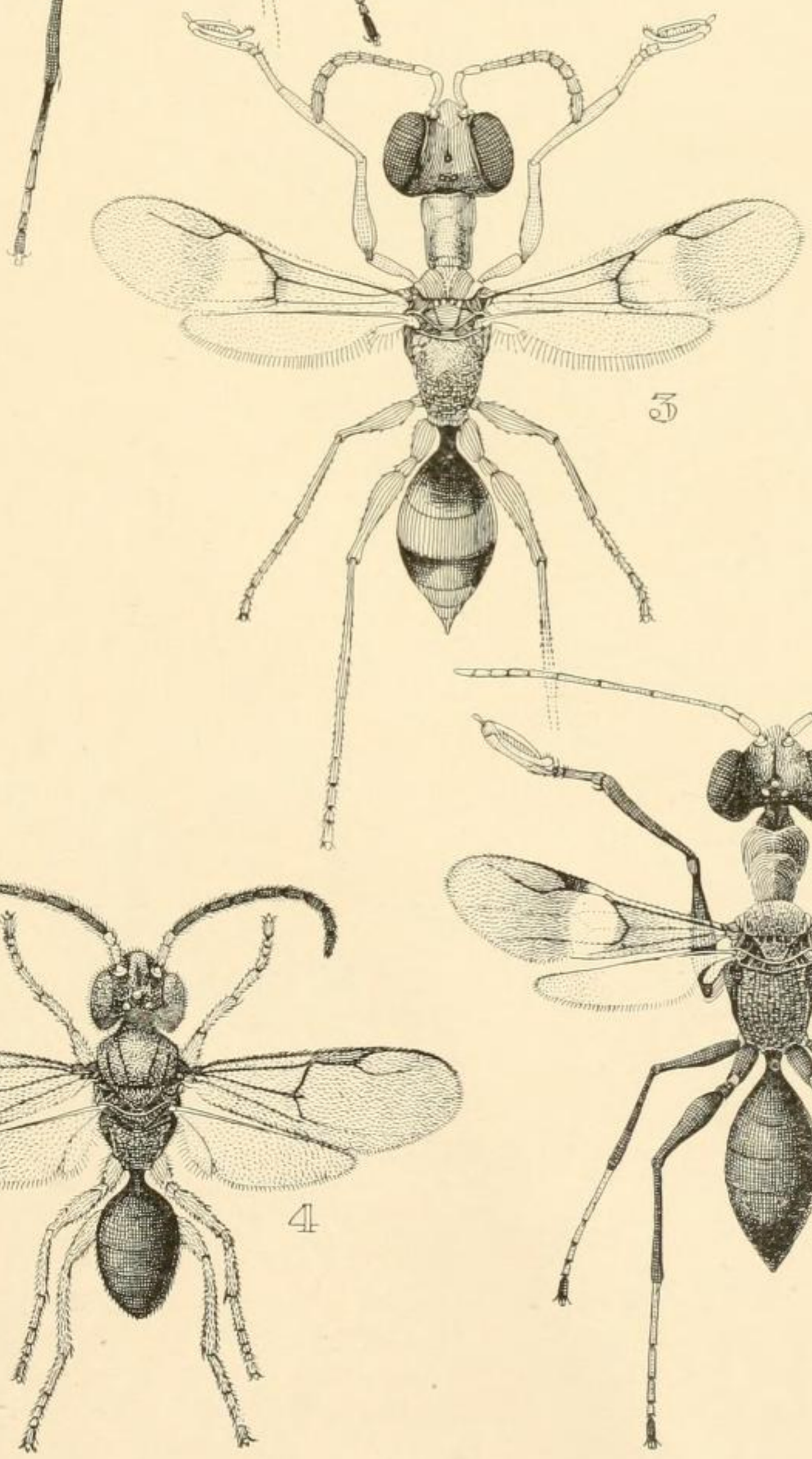
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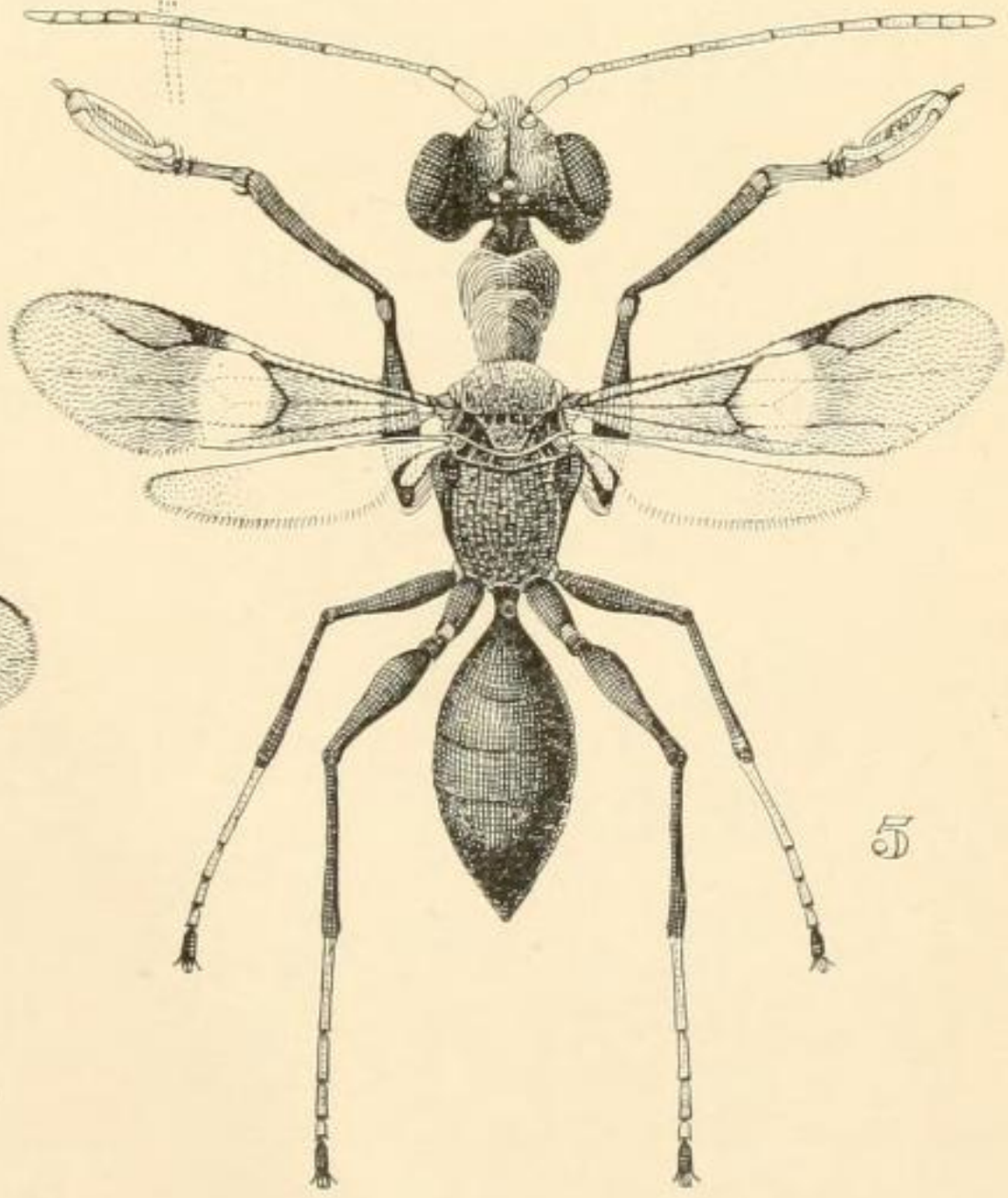
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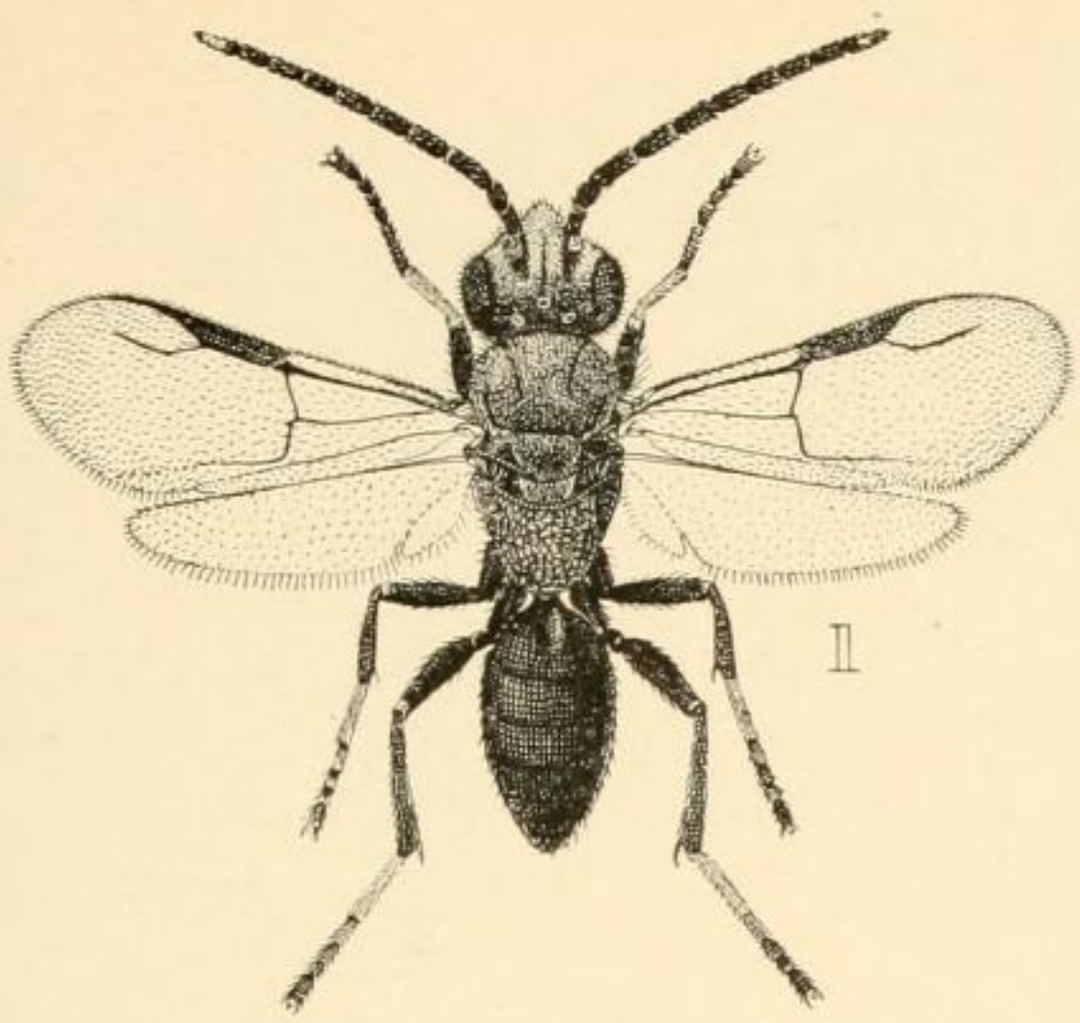

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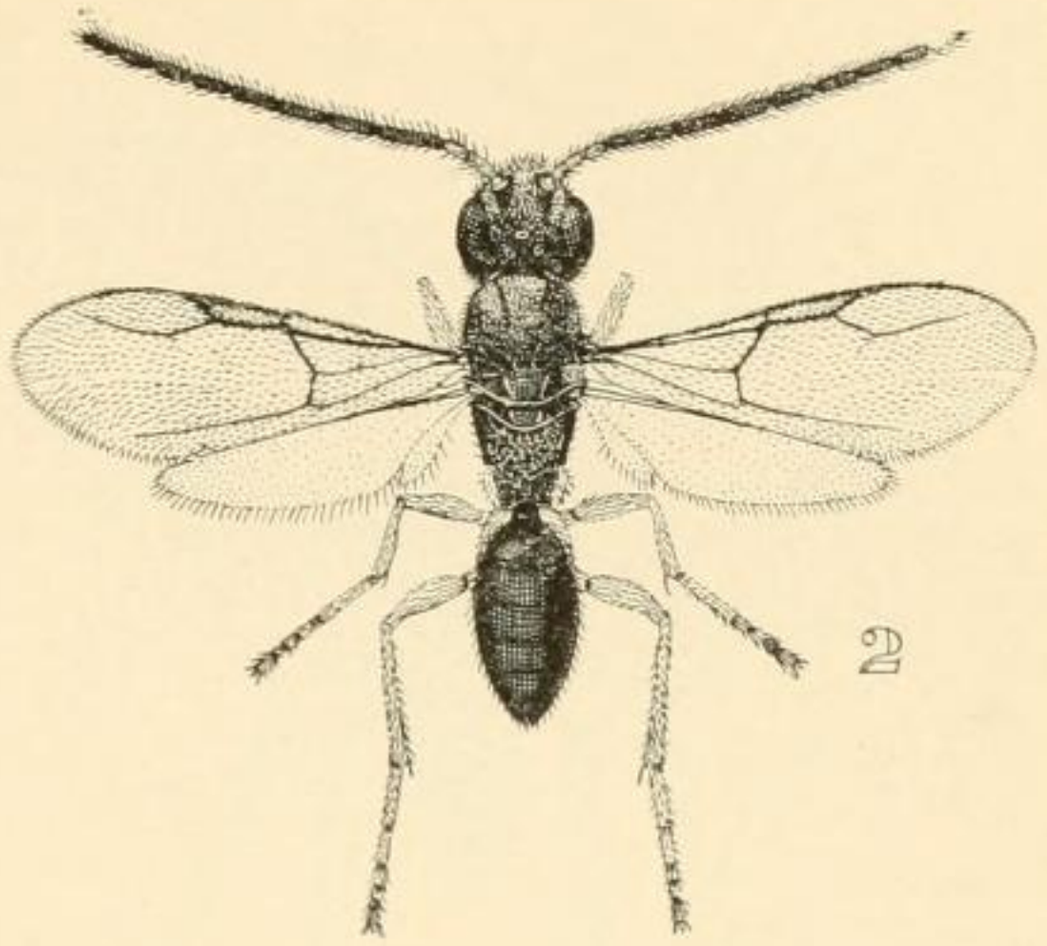

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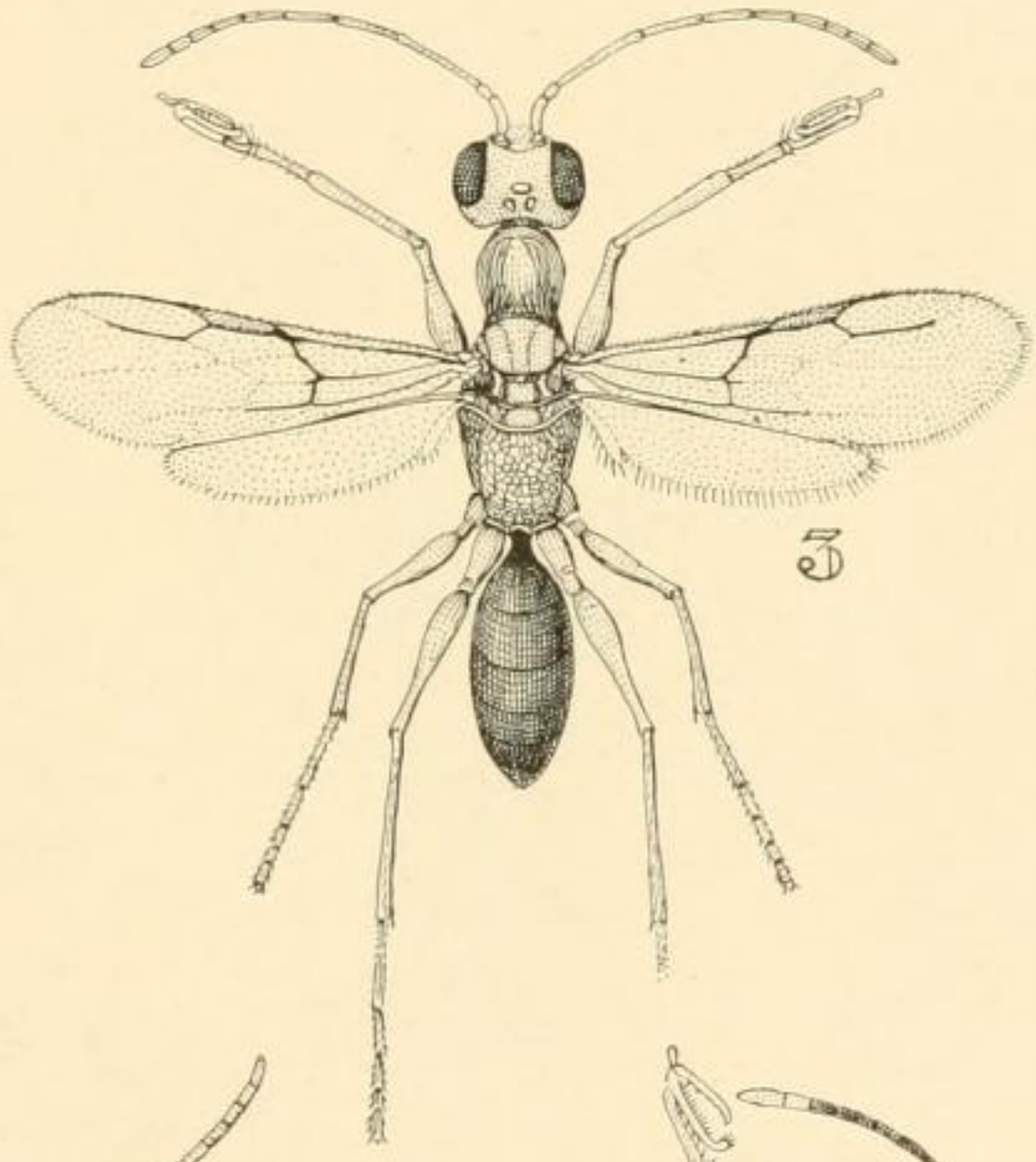

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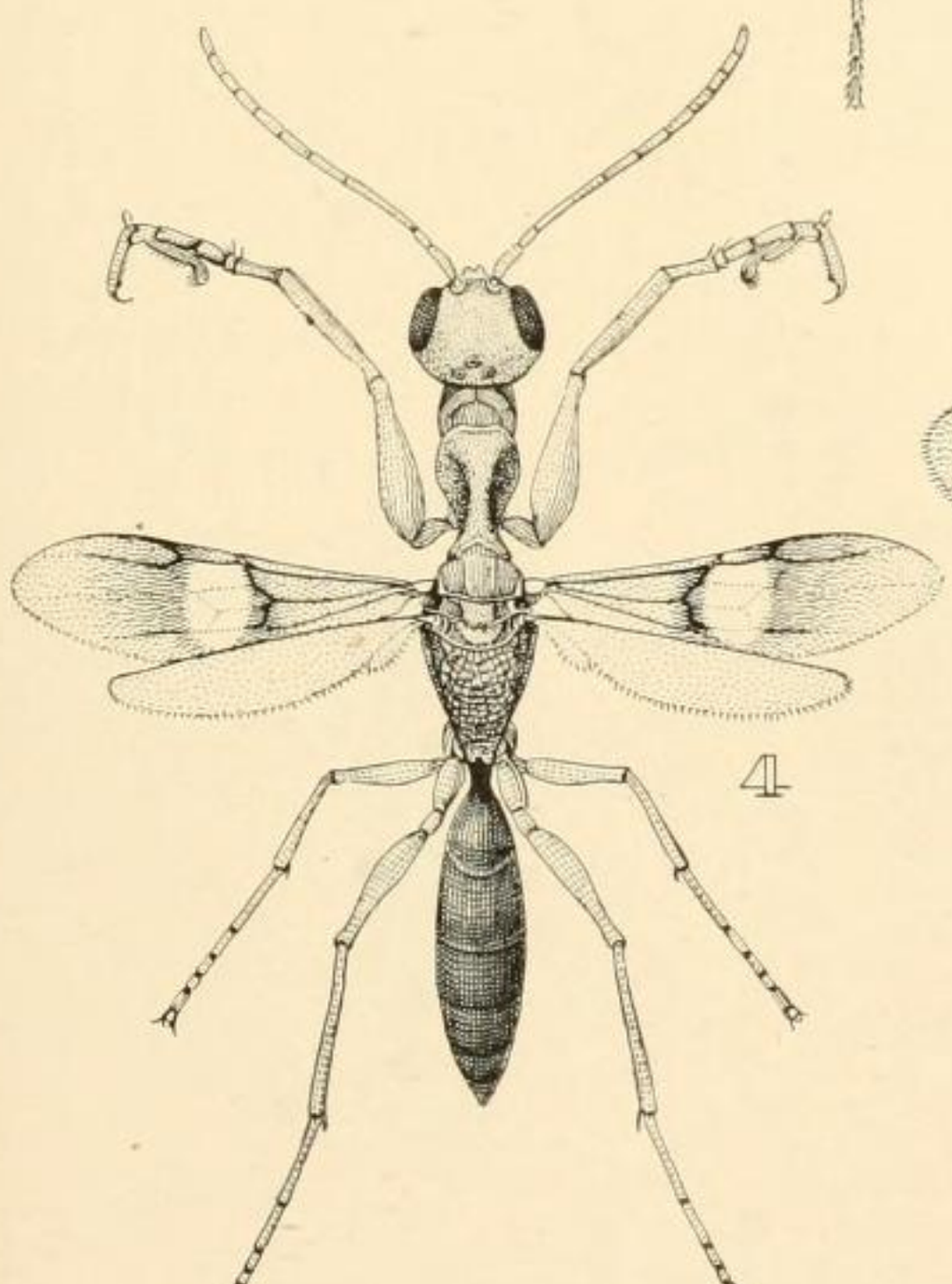

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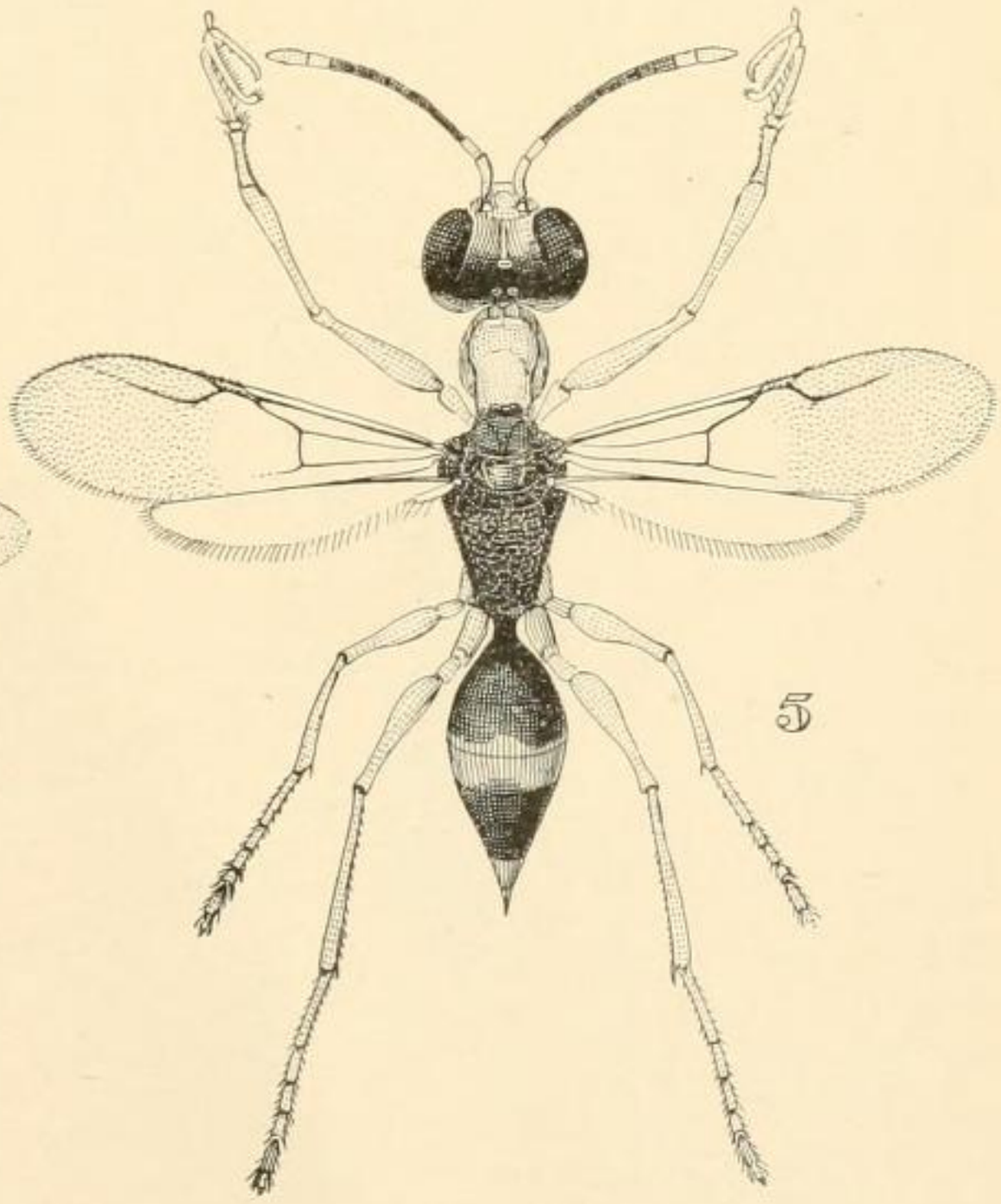

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PLATE III.

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Plate IV.