

## I. HYMENOPTERA ACULEATA<sup>1</sup>.

### § 1. General considerations on the Aculeata.

THE Aculeate Hymenoptera of the Hawaiian Islands form an important part of the fauna, nearly 200 species being at present known. Each of the large divisions of the group, excepting the Heterogyna or Ants, is represented by many endemic species. The Fossores include 34 species, divided between four sub-families; the Diploptera are well represented by 88 species in two sub-families, the Anthophila or bees by 56 species in three sub-families. The total number of species in these groups as represented in the islands, is therefore 178, but of these some are known to have been introduced in recent times from other countries, while others from various kinds of evidence we can be tolerably certain are also to be regarded as having been imported by man. To arrive at a true understanding of the peculiarities of the fauna, it is necessary to consider each family in detail.

i. In the Fossores the Sphegidae are represented by a single species of *Pelopæus*, an American insect, known to have been introduced.

The Trypoxylonidae have two species of the genus *Pison*. Although both of these were described from the islands yet one of them is also known to inhabit Fiji. It is an abundant species, generally being found about houses, and nests in the woodwork of which these are built, and is never found at any great distance from towns or settlements. The second species was found only in Honolulu some twenty years since. There is little doubt that both these species are importations, and I suspect that *P. iridipennis* after arrival has failed to establish itself.

The Mimesidae have 10 species divided equally between two genera, both of which are endemic. The two genera are certainly allied, and have probably arisen by divergence from a common ancestor, and evolved species side by side, the one not being a direct off-shoot of the other.

The Crabronidae are represented by 21 species in two genera, of which one containing 6 species is endemic, as also are all of the 21 species. It is probable however that the 15 endemic species now referred to the sub-genus *Solenius* of

<sup>1</sup> By R. C. L. Perkins; except Heterogyna (or Ants): this is by Prof. Aug. Forel of Zürich. Hymenoptera Parasitica has been undertaken by Dr L. O. Howard and Mr Ashmead, of Washington. There are no Hymenoptera Sessiliventre in this Fauna.

*Crabro*, will themselves ultimately form one or more peculiar genera, the species being closely related to one another, and also to the endemic genus *Nesocrabro*.

Putting together the results of this analysis it will be seen that the foreign element includes 3 species of two genera, representing two sub-families, two of the species and both genera being known from elsewhere, while the third species has only been taken in the city of Honolulu, a fact which alone would mark it as foreign. This gives an average of 1.5 species to the genus. The endemic species also represent two sub-families, with four genera, and 31 species. Three of the genera are endemic and all of the species, and there is an average of 7.75 species to a genus.

ii. In the true Wasps, or Diploptera, the Vespidae have two species of *Polistes*, both foreign forms, and known to have arrived since the settlement of white men on the islands. There is no doubt that both were introduced by man, and it is remarkable that a parasitic *Stylops* should have been brought with them.

The Eumenidae are represented by the single genus *Odynerus*, which is extremely rich in species, no less than 86 distinct species having occurred. All the species are endemic and form a most remarkable assemblage, exhibiting a great variety of form, although all belong to one section of the genus. Some of the species might readily be separated as distinct genera, were this course advisable, so great are their peculiarities, but as this would still leave the bulk of the species in *Odynerus*, and dissociate what appears to be really a natural series, it seems better to leave them intact, until they can be separated as a whole.

iii. In the Anthophila, or Bees, the Obtusilingues have 52 species all belonging to one genus, which, so far as is known, is endemic. These again form a remarkable series, and some of the species at first sight would hardly be recognized as belonging to the section to which they are assigned. Nevertheless when studied as a whole they are seen to be intimately related to one another, widely different as the extreme forms of the series may appear.

The Acutilingues are very poorly represented by a single *Xylocopa*, known to have been imported, and three species of *Megachile*, two of which are recent introductions, although not identified from elsewhere. They have greatly increased in numbers, and extended their range over the islands during the last few years. The third species is very possibly endemic, and is probably becoming scarcer, being now a rare insect, or at least excessively local.

Thus of the Fossores, Bees, and Wasps together, there are 170 endemic species in 7 genera, four of the latter being also endemic, with an average of over 24 species to a genus, while there are 8 introduced species representing 5 genera, giving an average of less than two species per genus.

The arrival of *Megachile* in the islands, presuming that *M. diligens* is really an endemic species, was no doubt very recent, compared with the remote periods at which the first representatives of the Fossores, Odyneri and the blunt-tongued Bees

reached them. Yet both Dipterous insects and Lepidoptera must have been well established before the arrival of the predatory wasps. The *Megachile* amongst the endemic aculeates occupies a position similar to that of the solitary species of *Corvus*, and *Buteo* amongst the endemic land-birds.

iv. The Heterogyna, or Ants, form a striking contrast to the other groups of the Aculeata. Twenty species are at present known, and these are distributed amongst twelve genera. Nearly all of these are to be found most numerous in the neighbourhood of houses, although some have now spread very widely over the country, and still are spreading. The only one that has any claim to be considered endemic is a species of *Ponera*, (*P. perkinsi*), which is found only in the mountain forests under logs, and beneath the stones on the margins of the mountain streams. Two other species are not at present known from elsewhere, but of these one, (a *Prenolepis*), is known to have been introduced in boxes of earth containing plants, and the other (*Ponera kalakauae*) has been only taken near settlements, where endemic insects were absent, and it also occurs in the middle of the city of Honolulu. Of the rest, several species form races now described for the first time, but as the exact locality whence they have been imported is unknown, it is quite uncertain whether these races have been formed since the time of their importation. We have known a single box of imported plants to contain the winged sexes of three different species of ants. It is not unlikely, however, that the *Leptogenys* is a natural immigrant, and has arrived in drift-wood, for it frequently nests in the interior of tree-trunks, or beneath tightly-fitting bark. The *Ponera*, which is alluded to above as being probably endemic, may be classed with the endemic *Megachile*, as a recent form compared with the rest of the native Aculeates.

*Insular endemicity.* The species of *Megachile* that is probably endemic has been found on several of the islands, and the endemic *Ponera* is also distributed over the whole group. Excluding the non-endemic species (amounting to about 27), the two species just mentioned and five *Odynerus* the localities of which are unknown, there is still left a total of 164 species of endemic Aculeata.

The proportion of peculiar species to the total number found varies greatly in the case of the different islands, as shown in the following table.

	Peculiar species	Total of species	Percentage of peculiar species
Kauai	30	33	90·9
Oahu	22	33	66·6
Molokai	10	38	26·3
Maui	17	49	34·6
Lanai	2	26	7·6
Hawaii	44	54	81·4

Thus Kauai stands easily first in the peculiarity of its species, and it may further

be remarked, that in the case of two of its three species which are found also on other islands, the Kauai form is by no means identical with that occurring elsewhere, but exhibits well-marked variation. Hawaii with far the largest area of any of the islands, has the greatest number of species, and ranks next to Kauai in the proportion of those peculiar to it. Maui with the second highest total of species has a much smaller proportion of peculiar ones than Oahu. In general the more remote is a given island from its neighbours the greater is the peculiarity of its fauna. The fact that Hawaii and Kauai are placed at either end of the chain of islands would tend to increase the endemic at the expense of the total number of their species, since they give and receive emigrants in one direction only. It is true that the island of Niihau lies to the west of Kauai, but it is a small and unimportant island with no considerable mountains, which can never have possessed more than a scanty fauna, and being now a pasturage for sheep was not visited by me. The Aculeata of the three adjacent islands Maui, Molokai and Lanai are much more nearly related, and a large number of species are common either to two, or to all of them. The mountains of West Maui yield some of the species which otherwise are quite peculiar to Molokai. That Maui surpasses Molokai in the number and in the peculiarity of its species is due to the much greater size and much more varied conditions of the former island. Its two widely separated mountain masses each yielding peculiar species, the great elevation of Haleakala, of which the region above the forest-belt has a special fauna, and the extensive low sandhills, dividing its eastern and western mountains, and favourable for Hymenoptera, give it a great advantage. Hawaii, as might be expected from the extreme difference in climate between the leeward and windward sides, and the very great height of its mountains, is very rich in species, and its position is favourable for a high percentage of forms peculiar to it. Oahu has the advantage of two separate mountain-ranges, each with some peculiar species, but the mountains are only of moderate height. Only two of its species are the same as those of Kauai, but it has seven identical with those of the less distant island of Molokai. Apparently not a single one of the species tabulated above extends its range over the whole group, although two or three are found on all the islands from Oahu to Hawaii.

With regard to the affinities of the endemic Hawaiian species, with those of other countries I think, in the present state of our knowledge, that there is little to be said. F. Smith expressed the opinion that they were most nearly related to the North American aculeates. Probably he based this opinion partly on the occurrence of certain well-known American species (of *Xylocopa*, *Polistes*, *Pelopæus*), and partly on the statement of de Saussure that certain of the *Odynerus* belonged to groups found in N. America. As I have mentioned above those American species that are known to occur also in the islands, have certainly been introduced by man, and therefore cannot be taken into account in deciding the affinities of the fauna. De Saussure's opinion on the *Odyneri* is open to suspicion, because he assigns the Hawaiian species

that he examined to several of his groups of American *Odynerus*, whereas after an examination of the complete series of species described in this work, it appears that these are in reality intimately related to one another. As a matter of fact the Aculeata are a group but ill-adapted for throwing any light on the derivation of the Hawaiian fauna. *Odynerus*, the most numerous in species of this group, is a genus almost ubiquitous over the world, with vast numbers of species described, and no doubt vast numbers still uncollected. Although these display an extraordinary diversity of form and appearance, they have so far defied any satisfactory classification. The Crabronidae are almost as unsatisfactory, and have been certainly still less completely collected. Nevertheless the fact that the Hawaiian species all belong to one of the sections, in which the males are remarkable for their 12-jointed antennae, will no doubt greatly aid ultimately in deciding their affinities. The Mimesidae likewise are a widely distributed group of obscure insects, but little collected. The bees of the genus *Prosopis*, from which I have now dissociated the Hawaiian species under a new generic name, are of world-wide distribution, and are peculiarly difficult to study, and certainly great numbers of existing species are still unknown. The structure of the terminal (concealed) abdominal segments of the male is of paramount importance in this group, yet they have been entirely ignored in the majority of species described. These structures in the Hawaiian species are very distinctive, and differ greatly from such American and European *Prosopis* as I have been able to dissect, and I suspect that the affinities of *Nesoprosopis* will prove to be rather with the species of *Prosopis* found in New Zealand or Australia than with the others.

So far as one can judge from a study of the relationship of the endemic species to one another, all the Mimesidae, Crabronidae, Eumenidae, and the Bees of the genus *Nesoprosopis* could have been evolved from four species which reached the islands at some very remote period, one of the four species of course representing each group. The total absence of any representative of so many groups of the Aculeata, certainly not less fitted to pass over the great distances between the islands and other lands, and for which the country is admirably adapted, is a point greatly in favour of the view that the numerous species of each of the families represented arose from a single immigrant species, and the examination of the structures of the species themselves greatly supports this view. How rarely an immigrant can have arrived from without, can be judged from the great number of species which fail to cross the short distances between the islands themselves.

In the fragmentary condition of their Hymenopterous fauna the Hawaiian islands considerably resemble New Zealand, but in the case of the latter country it is less extreme. At the present time the Aculeata of New Zealand have been too much neglected to make any detailed comparison of value, but few species of this group having been collected there.

An important fact in connection with the Hawaiian species is their variability. This is most noticeable in the Bees, Crabronidae, and Mimesidae, a great many of the

species in these groups being in a very unstable condition. The variation is not confined to differences in size, colour, &c., but affects important structures, in which it is unusual to find any noticeable variability, and to this is due the extreme difficulty of determining and describing the numerous species, the specific characters frequently having to be taken from structures which are obviously variable.

In striking contrast with the groups above mentioned are the species of *Odynerus*. Very few of the 86 species exhibit any variation of note, and this when it occurs is nearly always of an unimportant character (e.g. colour). From this one would infer that the Odyneri have now reached the maximum of species that the islands can support, in the present condition of the Lepidopterous fauna, on which, as they prey on caterpillars, they are dependent. The Bees on the other hand are not similarly restricted, for with flowers abundant at all seasons, the islands so far as one can see, are capable of supporting much greater numbers of these than of Wasps. The Fossores, which like the wasps are predatory, living on Dipterous insects, are very variable, but the total number of species of these is insignificant compared with that of the Odyneri.

The coloration of the Aculeata of the islands is very remarkable. No one examining an extensive collection of these could fail to remark the general blackness of these insects. In the majority of the endemic species the wings are dark, with blue, violet, or purple iridescence, and such species are found in each division of the group, and in every genus. For this reason many of the Fossores, Bees, and Wasps, when on the wing, greatly resemble one another and can hardly be distinguished except by differences in their flight. It is not probable that this similarity of appearance has any protective significance, for some of the species which are clear-winged and of ordinary appearance are amongst the most abundant, and birds which alone could be their enemies, neglect both alike.

In the case of the genus *Odynerus* the coloration of the species presents some remarkable features. Thus excepting one coast species, all the Kauai forms are similarly coloured, having two white or yellow abdominal bands. On all the other islands only a very few species are found with these markings, and in general the bands, when they occur, are much less conspicuous. In spite of the identity in general appearance of the Kauai insects they are often structurally very remote from one another. Thus *O. nigripennis*, a black-bodied Wasp of large size, found on all the islands from Oahu to Hawaii, is represented on Kauai by *O. radula*, with the yellow bands characteristic of the species inhabiting that island. Again *O. heterochromus*, a black species found on Hawaii and very remote structurally from *O. nigripennis*, is also represented on Kauai by a species with two yellow bands, and so on in other instances. On Molokai a very large number of species have red markings. Two species found in company on Oahu, *O. oahuensis*, and *O. pseudochromus*, are excessively alike in superficial appearance, and unlike any other species, being both remarkable for their hyaline wings, and peculiar red markings; yet structurally they are not allied to

one another. It might be supposed that the local peculiarities of coloration have a protective value, but as I have pointed out in the Proceedings of the Cambridge Philosophical Society all the evidence is opposed to this view.

Another noteworthy point about the endemic aculeates is the general feebleness of their sculpture. Of the large number of species of *Odynerus* there are certainly a good many in which the puncturation is strong and even coarse, but in many it is very feeble or nearly entirely effaced. The bees are nearly all remarkable for their fine and shallow puncturation, as also are the Mimesidae, while in the Crabronidae the general tendency is to effacement of the sculpture.

The literature relating to the Hawaiian aculeata is as follows:—

Fabricius, *Ent. Syst.* II. p. 269.

De Saussure, *Etud. fam. Vesp.* III. *Mon. Masar. et Suppl.* p. 289.

Smith, *Cat. Hym. Ins.* I. p. 23. *Id. op. cit.* IV. p. 421.

Holmgren, Eugénies Resa, *Zool.* VI. p. 441.

Smith, *J. Linn. Soc.* XIV. pp. 674—685.

Blackburn and Kirby, *Ent. Mo. Mag.* XVII. pp. 85—89.

Cameron, *Trans. Ent. Soc.* 1881, p. 562.

Blackburn and Cameron, *P. Manchester Soc.* XXV. (Session 1885—86), pp. 134—176.

Dalla Torre, *Wien. Ent. Zeitg.* VIII. (1889), p. 124 *et seq.* (also *Cat. Hym. Ins. passim*).

Perkins, *Proc. Phil. Soc. Cambridge*, Vol. IX. Part VII. (1897), p. 378.

Altken, *Ent. Nachr.* XXIV. (1898), p. 340.

## § 2. Systematic account of the Hymenoptera Aculeata.

### FOSSORES.

The Fossorial Hymenoptera of the islands are represented by only six genera, and of these probably two have no place in the autochthonous fauna. All the genera belong to that section, which comprises the insects with short prothoraces, and they represent four distinct sub-families. The truly endemic species however belong entirely to the Mimesidae and Crabronidae, and all prey on Dipterous insects; the members of the former family, so far as I have observed, provisioning their cells invariably with species of Tipulidae, while those of the latter prey not only on these, but also on other Flies. In some cases at any rate a species of Crabro will take Flies of very different species, by no means confining its attention to the capture of one particular kind. Some of the species of this genus are very abundant, and may sometimes be seen in great numbers around a dead animal, to which they are attracted by the abundance of their prey.

## SPHEGIDAE.

(1) *Pelopœus caementarius*.

*Sphex caementaria*, Drury, Exot. Ins. I. p. 105.

*Pelopœus caementarius*, Blackburn and Cameron, P. Manch. Soc. xxv. p. 173.

HAB. Very abundant all over the islands, but not extending to great altitudes on the mountains. An introduced species, common in North America. Preys on Spiders.

## MIMESIDAE.

The Hawaiian Mimesidae form two distinct genera, the females of which are very unlike one another, but the males in some cases can only be distinguished by slight characters. In the genus *Nesomimesa* the males of the several species are excessively difficult to separate, but the females afford better characters. All the species are remarkable for the feebleness of their thoracic sculpture. The genal spines of the ♀, although subject to excessive variation in most species, nevertheless afford useful characters, as also does the condition of the surface of the anterior area of the propodeum, and the colour of the spines of the anterior tarsi. In the genus *Deinomimesa* also the females afford the better characters. These are chiefly found in the form of the clypeus, but the carinated pedicel of the basal abdominal segment, although variable in structure in some species, is of considerable assistance in the determination of the species. The Hawaiian species of the family, so far as they have been observed, prey entirely on Tipulidae. They usually burrow in the ground, but have occasionally been seen entering burrows in dead trees.

*Nesomimesa*, gen. nov.

Forma gracili, elongata, capite a fronte transverso. Palpi maxillares longi, pilosi, articulo 2° et 3° fortioribus, 4° elongato lateribus parallelis, 5° forma praecedentis sed longiore, 6° perlongo et gracillimo. Palpi labiales articulo apicali perlongo. Antennae longae, ♂ evidenter, ♀ subfortiter clavatae. Tibiae posticae spinis brevibus armatae. Tarsorum articulus apicalis ♀ in basali parte spinis utrinque fortioribus armatus, ad apicem spinis longis, gracillimis. Abdominis segmenti primi pars petiolata parte apicali evidenter longior. Armatura genitalis ♂ duabus appendicibus angustis et elongatis apice instructa. Caput ♀ utrinque spinis genalibus armatum; area pygidialis triangularis, punctata, setis decumbentibus vestita.

Allied to *Mimesa*, having a similar neuration. Both sexes have long clavate antennae, but the thickening of the apical joints is more pronounced in the ♀. The third joint is much longer than the fourth, which is about equal in length



to the scape. In the ♀ the cheeks beneath are prolonged into a large spine, which differs in form in the different species, and is very variable in examples of the same species. This sex is also remarkable in having the last joint of the tarsi armed on either side towards the base with somewhat stout spines; at the apex there are longer and very fine ones. The pygidial area is flat, punctured, and carinated at the sides, and bears appressed setae of a spinose character, which give it an appearance of being strigose. The stipites of the ♂ genital armature are rounded at the apex, and there bent inwards, and fringed with hairs; a little before the apex they each give off a long thin process, set with short hairs, and the one crossing the other. The spine of the apical ventral segment is long, strong, and slightly curved upwards.

(1) *Nesomimesa kauaiensis*, sp. nov.

Nigra, elongata, antennarum articulis apicalibus subtus, tarsisque ♂ anterioribus plus minusve pallidis; clypei ♂ margine antico plus minusve distincte tridentato; genis ♀ post oculos in spinam validam productis. Alae subinfusatae. ♂♀. Long. 8.5—13 mm. (Plate I. figs. 1—1 c.)

Male black, the front tarsi testaceous, the apical joints of the antennae pale beneath. Clypeus with dense silvery pilosity, its apical margin more or less distinctly tridentate. Antennae long, subclavate, extending back as far as the apex of the basal segment of the abdomen, the third joint considerably longer than the scape. The front and vertex of the head are dull, without evident puncturation. Mesothorax less dull than the head, with very feeble scattered punctures, the surface with an exceedingly fine reticulation of raised lines; wings more or less infusate. Anterior area of the propodeum smooth except for the minute surface sculpture (which is like that of the mesothorax), not defined by a raised line, but rendered distinct by the absence of the pubescence which covers the rest of the propodeum. Spines of the front tarsi pale. Abdomen impunctate or nearly so, the petiole long and narrow, much longer than the apical part of the segment, usually rounded above at least on its basal portion, but somewhat compressed in some examples.

Female generally larger and more robust than the ♂, but with similar sculpture. The apical joints of the antennae more or less fulvous beneath. Head large and wide, mandibles very long, the anterior margin of the clypeus angulately produced in the middle, the cheeks behind the eyes produced into a strong spine, which continues their outline, the antennae more strongly clavate than those of the ♂, their third joint very long and slender. Anterior tarsi with much longer pale spines, and the posterior and intermediate tibiae and tarsi with the spines much more strongly

developed. Apical dorsal segment of the abdomen carinated at the sides, punctured, clothed with appressed hairs, which give it a strigose appearance.

HAB. Kauai (2500—4000 ft.); common, burrowing in the hard ground in bare spots in the forest.

(2) *Nesomimesa sciopteryx*, sp. nov.

Praecedentis forma; alis totis piceis, clypeo subtiliter griseo-pubescente distinctissima. ♀. Long. 11 mm.

Female very like that of the preceding in form. The wings are entirely of a pitchy colour, and have a slight violet iridescence. The face below the antennae is clothed with a fine greyish pubescence, instead of the appressed silvery pilosity of all the other Hawaiian species. The posterior calcaria are testaceous, and the petiole of the abdomen is stouter, and its dorsal surface more strongly curved.

HAB. Halemanu, Kauai (4000 ft.); very rare, 1 ♀ only taken.

(3) *Nesomimesa antennata*.

*Mimesa antennata*, Smith, Cat. Hym. Ins. iv. p. 431.

*N. kauaiensis* simillima; ♀ spina genali ad basim contorta, ♂ clypei margine apicali haud evidentiter tridentato distinguendus. ♂ tarsis anticis testaceis, ♀ propodei area antica haud nitida, tarsorum spinis anticorum pallidis. ♂ ♀. 7—13 mm.

Very like *N. kauaiensis*, but generally the ♀ is less robust and has the head smaller. It may be at once distinguished by the form of the spine on the cheek, which, instead of continuing the outline of the face behind the eyes, is raised at the base, and somewhat twisted, so that, in a lateral view of the head, the spine presents a sharp edge. The apical margin of the clypeus is produced into a small median tooth. In well-developed examples the facial spines are very long, more or less pointed at the apex, and their margins sinuate. The mesothorax is somewhat shining, the scutellum distinctly so, the anterior area of the propodeum very dull, as compared with the scutellum. The wings are sometimes more or less clouded, often almost entirely clear. The spines of the anterior tarsi are pale.

The ♂ differs from that of *N. kauaiensis* only in the shape of the anterior margin of the clypeus, which is not evidently tridentate, although somewhat produced in the middle.

HAB. Mountains of Oahu (2000 ft. and upwards).

(4) *Nesomimesa nitida*, sp. nov.

Praecedenti simillima; ♀ area propodei antica nitida, ♂ tarsis anterioribus infuscatis distinguendus. ♂ ♀. Long. 7—12 mm. (Plate I. figs. 1 and 1a.)

Extremely like the preceding species. The ♀ is distinguished readily by the form of the spine on the cheeks, when this is well developed. In such examples, when the head is viewed from in front the spines are widely, and more or less obliquely, truncate at the apex, and the margin is there reflexed. When the spines become reduced in size this distinction is lost, in which case the smoother anterior area of the propodeum, which is but little less shining than the scutellum, will separate the two species. The wings are entirely, but not very deeply, infuscate, and often have a blue iridescence. The spines of the tarsi are for the most part pale.

The ♂, which varies greatly in size, can only be distinguished, so far as I can see, by the darker anterior tarsi.

Var. *a*. Abdomen red. (♀.)

HAB. Molokai, Lanai, and Maui (2000—5000 ft.). It is possible that the examples from Maui, of which I have seen only one or two, may be distinct.

(5) *Nesomimesa hawaiiensis*, sp. nov.

Duabus spp. praecedentibus simillima; ♀ spinis genalibus plerumque brevioribus, acutis; area propodei antica opaca; tarsorum spinis piceis vel nigricantibus distinguenda. Tarsi ♂ anteriores obscurati; area propodei antica haud nitida. ♂ ♀. Long. 6.5—13 mm.

Female similar to those of the two preceding in general appearance. The spines on the cheeks apparently do not ever attain to so great a length as in well developed examples of those species. In front view they are acute at the apex, and divergent, but sometimes are so short as to be invisible in this aspect. The thorax is altogether duller than in the allied species, the anterior area of the propodeum being quite dull. The spines of the tarsi are dark.

The ♂ is extremely similar to that of *N. nitida*, but the duller surface of the anterior area of the propodeum will usually distinguish them.

HAB. Mountains of Hawaii (4000 ft.); widely distributed.

*Deinomimesa*, gen. nov.

Genus *Nesomimesae* cognatum. Genae ♀ inermes; clypeus fortiter elevatus, labro patente; antennae fortiter clavatae. Abdominis segmenti primi (♂ ♀) pars petiolata distinctissime carinata.

The species for which this genus is formed are evidently allied to those of the genus *Nesomimesa*, but the females present peculiar and striking characters, and the males are not difficult to distinguish. In the former sex the antennae are more strongly clavate, the cheeks are not armed with spines, the clypeus is greatly raised, and exposes the whole or a great part of the large labrum, and the posterior tibiae and tarsi are much more densely spinose. In both sexes the petiole of the abdomen is very distinctly carinated, and in some of the species is extraordinarily developed. The males may further be known by the greater development of the raised lines on the propodeum.

(1) *Deinomimesa ferox*, sp. nov.

Nigra, sparsim minus distincte punctata, antennarum articulis apicalibus subtus fulvescentibus, alis subinfuscatis. Mesopleurae subopacae. Abdominis segmentum primum fortiter et acute carinatum. Clypeus ♀ in medio margine fortiter emarginato. ♂ ♀. Long. 8—13.5 mm. (Plate I. figs. 3—3 b.)

Male black, the face below the antennae, and the base of the mandibles, with appressed silvery pubescence; above, with longer pale hairs, the surface dull, without definite puncturation. Antennae long, clavate. Mesothorax with some very feeble indefinite punctures, scutellum somewhat shining, the mesopleurae dull. Wings more or less clouded, the marginal cell and apical portion more deeply. Propodeum rugose. Abdomen with the petiole flattened above at the sides, and with a sharp median carina from base to apex, its surface dull, finely rugulose. The rest of the abdomen shining, and impunctate.

Female more robust than the ♂, the clypeus strongly raised, and exposing the large rugose labrum. The apex of the clypeus is deeply emarginate in the middle, the mandibles are strongly curved. Antennae with the club more definite than that of the ♂, the apical joints very wide in proportion to their length, the third joint slender, and very long. Mesothorax with feeble indistinct punctures, the mesopleurae dull. Propodeum more or less rugose, but the raised lines are not numerous, the posterior concavity is large and deep and bounded by strongly raised lines. Intermediate and posterior tibiae with dark spines, the posterior metatarsi spinose above, beneath, and outwardly. Abdomen with the petiole very wide, dull and rugulose, raised in the middle into a great carina, which (at least towards the base), is not very sharp above as is that of the ♂, and is gradually raised from the base to the apex. Behind the petiole the segment is generally longitudinally grooved, but not in all examples, and its surface is very smooth, shining and impunctate. Pygidial area as in the genus *Nesomimesa*.

HAB. Mountains of Kauai (3000—4000 ft.).

(2) *Deinomimesa cognata*, sp. nov.

Praecedenti cognata; ♂ mesopleuris laevioribus et nitidis; ♀ clypeo (desuper aspecto) levissime lateque emarginato, distincta. ♂ ♀. Long. 9—12 mm. (Plate I. figs. 4—4 b.)

Female of more slender form than the preceding species. The anterior margin of the clypeus, as seen from above, is not deeply and dentately emarginate, but only very lightly and widely so. The petiole of the abdomen is differently formed, its dorsal surface being very narrow, with the margins parallel and straight, but the sides beneath are extended outwardly, and so are visible from above, and form the outline of the segment in a dorsal view. The carina itself is much less elevated and almost of even height throughout its length. On the ventral side the basal segment lies in two planes, the basal part being sub-horizontal, the apical inclined. The latter occupies more than half the segment. In the preceding species the formation of the basal ventral segment is on a similar plan, but the inclined posterior portion is relatively much smaller.

The male is much more difficult to distinguish, but the petiole is narrower in proportion to its length, and the mesopleurae are smoother and more shining.

HAB. Kauai (4000 ft.). Local and rare.

(3) *Deinomimesa hawaiiensis*, sp. nov.

Praecedentibus minor, abdominis segmenti primi parte pedicellata carinam mediam linearem ferente: ♀ clypei margine antico (desuper viso) fortissime rotundato, haud emarginato. ♂ ♀. Long. 7—8 mm. (Plate I. fig. 5.)

Allied to the preceding species, but not very closely. It is of considerably smaller size. The petiole is very slender in both sexes and the carina appears as a median raised line.

In the ♂ the anterior area of the propodeum is traversed longitudinally by numerous distinct but very fine raised lines. In the ♀ the clypeus is raised, its front margin seen from above is very strongly rounded, and not at all emarginate; the basal segment of the abdomen beneath is simple, not formed as in *D. cognata*.

HAB. Kona and Kau districts on Hawaii (4000 ft.); several examples taken, but only one ♀.

(4) *Deinomimesa punae*, sp. nov.

Praecedenti simillima; ♀ scutello minus opaco, clypeo magis abrupte elevato, margine desuper viso antice subangulato, distinguenda. ♀. Long. 9 mm.

This species resembles *D. hawaiiensis* in general appearance, and in the form of the petiole of the abdomen. The clypeus is very abruptly raised, and in a front view of the face nearly the whole surface of the labrum is exposed, which for the most part can only be seen in an apical view in the preceding species. Seen from above the apical margin of the clypeus is angulate in the middle. The scutellum has a median depression and the surface is in that region somewhat shining.

HAB. Oloa, Hawaii (2000 ft.); 1 ♀ taken in June, 1895.

(5) *Deinomimesa haleakalae*, sp. nov.

*D. kona* simillima; ♂ parte abdominis segmenti primi pedicellata supra compressa, et carinata. ♂. Long. 8—9 mm.

Male very similar to that of *D. hawaiiensis*, but a larger insect. It may be easily distinguished by the form of the petiole of the abdomen which is compressed above from the sides into a median carina, whereas in *D. hawaiiensis* this part is flattened above and has a raised line down the middle. The front tarsi outwardly are more or less infusate.

HAB. Haleakala, Maui (4000 ft.); a few ♂♂ taken in May, 1896.

This species in the ♂ approaches most nearly to the genus *Nesomimesa*, but the distinct carination of the abdominal petiole, and the much more rugose propodeum, assign to it the allied one; and the ♀ will no doubt be found to have the characteristic form of clypeus, when that sex is discovered.

TRYPOXYLONIDAE.

(1) *Pison iridipennis*.

*Pison iridipennis*, Smith, J. Linn. Soc. XIV. p. 676.

HAB. Honolulu (Blackburn). I have never met with this species. I suspect it of being an introduced species, which apparently has failed to establish itself.

(2) *Pison hospes*.

*Pison hospes*, Smith, *l. c.* p. 676.

HAB. Abundant all over the islands, especially about houses. No doubt an introduced species. I have received examples from Fiji.

## CRABRONIDAE.

*Crabro* (*Solenius*).

The fifteen species which I have referred to the sub-genus *Solenius* of *Crabro* fall naturally into three groups, which are readily distinguished by structural characters in the ♂, but the females present no special distinctions in the two groups, in which this sex is known. In the first group the sixth joint of the ♂ antennae is produced into a rather long prominent tooth at its apex; in the second it is emarginate, but only slightly produced. The third group contains only two species (one of which I have never seen), the ♂ only being known, remarkable for the form of the ventral abdominal segments. Possibly, however, Blackburn's *C. abnormis* does not really belong to this group, and *C. curtipes* is the only representative. Although I have referred these Hawaiian species to the sub-genus *Solenius*, I have no doubt they will ultimately form one or more peculiar genera. The pygidial area of the ♀ is flatter, less elongate and excavated than in typical *Solenius*, and there are other differences. The punctuation is very similar in most of the species, and is generally feeble and shallow, often subobsolete. The chief characters for specific distinction are found in the antennae of the ♂, differences in sculpture of the thorax, the colour of the pilosity of the clypeus, of the antennae, mandibles, &c., and in the form and sculpture of the second ventral segment of the abdomen.

(1) *Crabro* (*Solenius*) *monticola*, sp. nov.

Niger, clypeo argenteo-piloso, abdomine flavo-notato, alis subhyalinis. ♂ antennarum articulo sexto fortiter dentato. ♂ ♀. Long. 5.5—9.5 mm. (Plate I. figs. 6 and 6 a.)

Male black, second segment of the abdomen with a yellowish-white fascia at the base, sometimes reduced to a round spot on either side. Third segment black, or with a spot on each side; fourth sometimes with an entire fascia, more often an interrupted one, sometimes only a spot on each side, or entirely black; fifth with an entire fascia, often very broad, as also the sixth segment. Head and mandibles black, the clypeus with appressed silvery pubescence; antennae with the fifth joint of the flagellum emarginate beneath and strongly produced at the apex into a projecting tooth; vertex dull, the surface rugulose with very shallow and obscure subobsolete punctuation. Mesothorax dull, clothed with thin pale pubescence, the surface densely rugulose, with very feebly impressed punctures. Propodeum longitudinally rugose in front, the surface dull, clothed with pale hairs. Abdomen subovate shining, with very fine indistinct punctures; second ventral segment very finely, but not closely punctured, except on a round area on either side, where the punctures are

fine and dense; third segment beneath slightly, fourth more distinctly, fifth and sixth strongly depressed.

Female with the mandibles in front (except at the apex), the front of the scape of the antennae, a fascia at the base of the second segment of the abdomen (often widely interrupted, or reduced to two round lateral spots), sometimes a spot on either side of the third and fourth segments, and a complete band on the fifth, yellowish-white. In one example a small round spot on either side of the second segment is the only abdominal marking. Sculpture very much as in the ♂, the puncturation of the thorax generally rather more distinct, the mesothorax posteriorly and the front of the scutellum more or less shining, but variable in this respect. Abdomen generally rather stouter than that of the ♂; sixth dorsal segment distinctly punctured, the surface shining; second segment beneath hardly shining, finely and remotely punctured, except on the circular lateral pubescent spots, where the puncturation is fine and very dense; the following segments with an apical row of punctures, otherwise impunctate; apical ventral segment subcarinated, and closely punctured on either side. Posterior tibiae with pale spines. Wings subhyaline in both sexes.

HAB. Mountains of Kauai (3000—4000 ft.). Mountains of Oahu, both ranges.

OBS. The Oahuan examples agree with those from Kauai in structure, but show a stronger tendency to a decrease in size or obliteration of the pale markings on the abdomen.

(2) *Crabro (Solenius) molokaiensis*, sp. nov.

Niger, ♂ antennarum articulo sexto fortiter dentato, ♀ articulo primo antice cum mandibulis flavis. Clypeus argenteo-pilosus. Abdomen nigrum. ♂♀. Long. 6.5—10 mm.

Allied to the preceding species, the ♂ entirely black, except the front tibiae which are testaceous inwardly, the ♀ with the mandibles (except at the apex) and the scape of the antennae in front yellowish-white. Clypeus with silvery pubescence in both sexes. Male with the fifth joint of the flagellum of the antennae strongly produced at the apex into a prominent tooth. Vertex of head in the mesothorax with obscure subobsolete puncturation, the scutellum, more or less, slightly shining. Abdomen beneath dull, the second segment with fine punctures, the lateral pubescent spots very finely and densely punctured; fourth and following segments deeply concave. Female with the mesothorax much more distinctly punctured than that of the ♂, dull in front but more or less polished behind, where the puncturation is less shallow and more distinct; scutellum entirely shining, not depressed in the middle, distinctly punctured; propodeum dull, rugulose, with very short longitudinal rugosity in front. Abdomen with the pygidial area of the sixth segment shining, distinctly punctured, its sides raised; second



segment beneath hardly shining, remotely and finely punctured, except on the lateral pubescent spots, where there is the usual very fine and close puncturation.

Wings in ♂ with distinct blue iridescence, which is generally less evident, and sometimes wanting in those of the ♀.

HAB. Mountains of Molokai (3000 ft.), 1893. Haleakala, Maui (5000 ft.), 1 ♂.

(3) *Crabro (Solenius) mauiensis*.

*Crabro mauiensis*, Blackburn and Cameron, P. Manch. Soc. Vol. xxv. p. 165 (1885—86).

Resembles *C. affinis* in the golden pubescence on the clypeus, but the more deeply canaliculated front of the head, and the coarser facets of the eyes, would (the ♂ being unknown) rather associate it with *C. monticola*. That species, however, has the clypeus clothed with bright silvery pubescence.

HAB. "A single female occurred on Maui, near Wailuku, flying over flowers." (Blackburn.)

(4) *Crabro (Solenius) haleakalae*, sp. nov.

Niger, clypeo aureo-piloso, mandibulis nigris, antennarum articulo primo antice albedo. Mesonotum postice cum parte scutelli anteriore laeve ac nitidum. Abdominis segmentum 2 ventrale nitidissimum, et circa medium parcissime punctatum. ♀. Long. 10 mm.

Female greatly resembling *C. molokaiensis* in general appearance but with the mandibles entirely black and the clypeus clothed with golden pubescence. Posterior part of the mesothorax and the scutellum in front with the surface smooth shining and distinctly punctured, the latter dull posteriorly. Abdomen with the second ventral segment highly polished all over the middle portion, with a very few scattered punctures, at the sides with the usual circular pubescent spots and dense fine puncturation. Spines of posterior tibiae dark, and stronger than those of the preceding species. Wings almost clear.

HAB. A single ♀ taken on Haleakala, Maui, at an elevation of 4000 ft. May, 1896.

(5) *Crabro (Solenius) hawaiiensis*, sp. nov.

Niger, clypeo argenteo-piloso, alis infuscatis, subcaeruleo-iridescentibus, mandibulis articuloque antennarum primo nigris. ♂ antennarum articulo sexto fortiter dentato. ♂♀. Long. 6—10 mm.

Both sexes entirely black, the wings infusate, and in the ♂ with a distinct blue iridescence; clypeus with silvery pubescence.

Male with a prominent tooth at the apex of the fifth joint of the flagellum of the antennae, as in the preceding species.

Head and thorax entirely dull with very shallow subobsolete puncturation, hardly visible in some examples. Female with the thoracic puncturation, and especially that of the scutellum, much more distinct than that of the ♂, the mesothorax posteriorly and the scutellum more or less shining, but variable in this respect. Second ventral segment of the abdomen with the surface exceedingly finely rugulose, not highly polished, in the ♂ with very fine indefinite punctures about the middle, in the ♀ with remote but larger ones.

HAB. Hawaii, various localities; common at an elevation of about 4000 feet.

OBS. This species is variable in size and sculpture; the ♀ is at once distinguished from *C. molokaiensis* by the black scape and mandibles, the ♂ is very similar but the scutellum and the mesothorax posteriorly appear to be always quite dull.

(6) *Crabro (Solenius) tumidoventris*, sp. nov.

Praecedenti simillimus, sed abdominis segmento secundo ventrali fortiter convexo, mandibulis ♀ ex majore parte pallidis distinguendus. ♂ antennarum articulo sexto fortiter dentato. ♂♀. Long. 7—9.5 mm. (Plate I. fig. 7.)

Very like the preceding in general appearance; ♂ with the scape and mandibles black; ♀ with the scape of the antennae black, the mandibles white; ♂ rarely with some indication of a pale spot on the mandibles.

Fifth joint of the flagellum of the antennae produced into a prominent tooth at the apex in the ♂, the front of the head and the mesothorax with very shallow rugose puncturation; propodeum more or less longitudinally rugose in front, and in this sex usually with a few fine transverse raised lines above the insertion of the abdomen. Second ventral segment of the abdomen very convex longitudinally and transversely, the surface shining, finely and rather remotely punctured about the middle, more closely towards the sides, and very densely and minutely on the circular pubescent spots; fourth and fifth segments generally strongly depressed, sometimes the fourth less strongly, and the fifth and sixth more so. Basal joint of the front tarsi unusually wide, about twice as long as its greatest width.

Female very like the ♂, except for the white mandibles and sexual differences. Mesothorax and scutellum quite dull; second ventral segment shaped as in the ♂, finely and distinctly punctured in the middle, densely and very finely on the pubescent spots. Apical dorsal segment very narrow between the lateral carinae, more or less

largely and rugosely punctured. Wings of the ♂, and often of the ♀ with blue iridescence.

HAB. Both mountain ranges of Oahu; Molokai, Lanai and Maui. Examples (at least of the ♀) from Oahu appear to have a less distinct blue iridescence on the wings than those from Molokai &c.

*Crabro (Solenius) tumidoventris* var. *leucognathus*.

Forma praecedentis, ♂ mandibulis, ♀ mandibulis, antennarumque articulo basali antice albis; abdomine nonnunquam albo-notato.

This form on Hawaii corresponds to *C. tumidoventris* on the four islands named above. A single ♀ from Oahu appears to hardly differ from the Hawaii form, and a few ♂♂ from Maui are somewhat intermediate. For the most part, (and I have examined many of both forms) the two are readily distinguished. The variation of the var. *leucognathus* appears to be very different to that of the typical form, since in the ♂ the abdomen not infrequently is spotted at the sides of the 5th and 6th abdominal segments, (or on one of these), and rarely also on the 2nd segment; one ♀ has small lateral whitish spots on this segment, and on the 4th, and an interrupted band on the 5th.

HAB. Island of Hawaii; Kona (2000—3000 ft.); Kilauea (4000 ft.); Olaa (2000 ft.).

(7) *Crabro (Solenius) affinis*.

*Crabro affinis*, Smith, J. Linn. Soc. xiv. p. 677; Blackburn and Cameron, P. Manch. Soc. Vol. xxv. (1885—86), p. 165.

Niger, alis subhyalinis, abdomine plus minusve flavo-notato. ♂ clypeo argenteo-piloso, antennarum articulo sexto haud fortiter dentato; ♀ clypeo aureo-piloso, antennarum articulo basali antice, mandibulisque plus minusve flavescentibus. ♂♀. Long. 6.5—11 mm. (Plate I. fig. 8.)

Male with the scape of the antennae and mandibles dark, in the ♀ they are more or less yellowish. Abdomen in the ♂, with the 2nd, 4th, and 5th, rarely the 3rd, with pale markings. Sometimes these markings form entire bands, or they may be reduced to lateral spots. Female with a band on the 2nd, 4th, and 5th segments, often similarly reduced in size, those on the 2nd and 5th sometimes wanting, so that probably an entirely black variety may be found.

Male, clypeus clothed with silvery hairs; antennae with the 5th joint of the flagellum emarginate beneath, very little produced at the apex, beyond the base of

the following joint, so that it does not form a conspicuous prominent tooth, as in all the preceding species. Front of the head with rough, shallow puncturation, smoother on the vertex behind the ocelli. Mesothorax and scutellum dull, with shallow obsolete puncturation, but the punctures are more distinct in some examples than in others. Mesopectus at the sides posteriorly with the carinae strongly elevated, forming a stout prominent tooth when viewed from in front. Abdomen above somewhat shining; second ventral segment shining, remotely and distinctly punctured about the middle; 4th and following segments flattened and depressed.

Female with the clypeus clothed with golden hairs. Puncturation much as in the ♂, but generally more definite, the mesothorax posteriorly and the front of the scutellum being often more or less polished and shining. Abdomen with the second segment above hardly shining, very finely, but rather distinctly punctured; beneath it is very highly polished, and has only a few scattered punctures on the middle portion, and a very dense and minute puncturation on the lateral pubescent spots. Apical dorsal segment nearly flat above, its margins very slightly raised, the surface more or less rough, and punctured. Posterior tibiae with the spines well developed, and dark. Wings subhyaline in both sexes.

HAB. Kauai, abundant from the coast to 4000 ft.

(8) *Crabro (Solenius) notostictus*, sp. nov.

Niger, clypeo argenteo-piloso, pronoto cum postscutello abdominisque segmento secundo flavo-notato, antennarum articulo sexto haud fortiter dentato. ♂. Long. 6.5—8.5 mm.

Var. Abdominis segmento secundo nigro.

Male allied to the preceding, having the antennae similarly formed. Mandibles and scape of the antennae black, clypeus with silvery pubescence. Prothorax with yellow spots, the postscutellum with a transverse one. The second segment of the abdomen has a yellow band, sometimes broken into two spots or altogether absent; the other segments always black. The front of the head has the puncturation nearly obsolete and shows, in certain positions, distinct but very fine strigosity. The mesothorax is dull and rugulose with hardly visible puncturation. The second ventral segment of the abdomen with the surface evidently but very finely rugulose, and a few scattered, rather large, subobsolete punctures about the middle, the sides with the usual dense and minute puncturation. The following segments with their surface quite dull.

Female unknown.

HAB. Mountains of Oahu, taken on several occasions.

(9) *Crabro (Solenius) mandibularis*, Smith.

*Crabro mandibularis*, Smith, Proc. Linn. Soc. xiv. p. 677 ♀.

*Crabro denticornis*, Smith, (♂) *l.c.* p. 678.

*Crabro mandibularis*, Blackburn and Cameron, P. Manch. Soc. Vol. xxv. (1885—86), p. 167.

Niger, ♂ clypeo argenteo-piloso, postscutello (nonnunquam etiam pronoto, tuberculis, abdominisque segmento secundo) flavo-notato, antennarum articulo sexto haud fortiter dentato; ♀ antennarum articulo basali, mandibulis plus minusve, pronoto, tuberculis, et postscutello flavo-notatis, clypeo aureo-piloso. ♂♀. Long. 7—10 mm.

Black, the ♀ with the front of the scape of the antennae, the mandibles more or less, a spot on each side of the prothorax, its tubercles, and a transverse spot on the postscutellum, yellowish; the ♂ generally has only the spot on the postscutellum, rarely also the tubercles and prothorax and the sides of the second abdominal segment with yellow markings.

Male with the sixth joint of the antennae formed much as in the preceding species, being but little produced at the apex. Clypeus clothed with silvery hairs, the head above the antennae generally distinctly strigose and feebly punctured, but in small examples the strigosity is sometimes obsolete, or nearly so. In the region of the ocelli the puncturation is generally distinct though shallow; the surface of the mesothorax is smoother than that of the preceding species, the puncturation very feeble. Surface of the abdomen very finely rugulose, and with hardly visible puncturation; second ventral segment with the surface finely rugulose, and not highly polished, with sparse scattered punctures.

Female, clypeus with golden hairs; head in front strigose and punctured, smoother on the vertex posteriorly, with shallow but distinct punctures between and at the sides of the ocelli. Mesothorax with shallow punctures, the surface somewhat smooth, especially posteriorly, where it is even slightly shining (or at least less dull than in front), as also the scutellum. Abdomen with grey pubescence; second segment not shining, rugulose, without distinct puncturation, beneath the surface is distinctly rugulose and very sparsely punctured, except at the sides. Apical dorsal segment flat, its margins but little raised, dull towards the apex, punctured, and more or less smooth between the punctures towards the base. Wings quite infuscate in the ♂, less so in the ♀.

HAB. Molokai, Lanai, and Maui, on the coast and in the mountains at an elevation of 3000 ft.

This species is very closely allied to *C. notostictus* ♂, but the puncturation of the vertex of the head is more distinct, and the mesothorax smoother. The normal

coloration of the two is different, the Oahuan species having, in typical examples, the prothorax and also the second abdominal segment spotted, whereas in *C. mandibularis* individuals so marked are found only as very unusual varieties.

(10) *Crabro (Solenius) fulvicrus*, sp. nov.

Niger, clypeo aureo-piloso, tibiis anticis femoribusque (plus minusve) intus fulvotestaceis; ♂ articulo antennarum sexto haud fortiter dentato, abdominis segmento 4° et 5° (vel uno ex his) nonnunquam albo-notatis; ♀ mandibulis et antennarum articulo primo plus minusve albo-flavescentibus. ♂♀. Long. 8—12 mm.

Black, ♂ with the anterior femora almost entirely, and the anterior tibiae inwardly, bright fulvotestaceous; ♀ with the colour of the femora often much obscured. Abdomen black in the ♀, in the ♂ sometimes with a whitish spot on the sides of the 4th and 5th segments, or on the 5th only, and sometimes an entire band on the latter. Scape of the antennae in front and the basal part of the mandibles yellowish in the ♀. Clypeus of both sexes with golden pubescence, of a very pale tint in the ♂.

Scape of the antennae in the ♂ often more or less fulvous, the fifth joint of the flagellum very little produced at the apex, hardly dentate. Head in front very shallowly, rugosely punctured, mesothorax with feebly impressed puncturation. Abdomen with the second segment above rather shining, very finely, but evidently punctured; beneath, with the surface shining, and finely and remotely punctured about the middle.

Female with the head above the antennae finely and densely punctured, the mesothorax posteriorly more or less smooth, and generally (as also part of the scutellum) somewhat shining. On this smoother portion there is a shallow but evident puncturation. Abdomen with the second segment above as in the ♂; beneath about the middle very smooth and shining with sparse and rather large puncturation. Sixth dorsal segment flat, its margins slightly raised, the surface rough and punctured.

Wings of ♂ infusate generally with more or less blue iridescence, the wings of the ♀ clearer.

HAB. Kona, Hawaii (4000 ft.); Olaa (2000 ft.).

(11) *Crabro (Solenius) polynesiensis*.

*Crabro polynesiensis*, Cameron, Trans. Ent. Soc. 1881, p. 562. Blackburn and Cameron, P. Manch. Soc. xxv. (1885—86), p. 168.

Praecedenti simillimus, niger, clypeo aureo-piloso, ♂ antennarum articulo sexto haud fortiter dentato, ♀ mandibulis, antennarumque articulo basali, plus minusve

flavescentibus. Tibiis anticis femoribusque haud fulvo-testaceis, mesonoto (♀) postice haud distincte punctato, abdominisque segmento 2 ventrali ruguloso, minus nitido distinguendus. ♂♀. Long. 7—12 mm.

Very like the preceding in most respects, but the ♂, so far as I know, never has the abdomen spotted with white.

Both sexes may easily be distinguished by their dark front femora and tibiae, and the ♀ by the mesothorax being duller posteriorly, and without the distinct puncturation of the preceding on that part. The second ventral segment also is evidently less highly polished, its surface being evidently rugulose.

HAB. Mountains of Hawaii (4000 ft.). Common generally.

(12) *Crabro (Solenius) unicolor*.

*Crabro unicolor*, Smith, Cat. Hym. Ins. iv. p. 421. Blackburn and Cameron, P. Manch. Soc. Vol. xxv. p. 169 (1885—86).

Niger, alis infuscatis, et caeruleo-iridescentibus, mandibulis utriusque sexus cum articulo basali antennarum nigris, clypeo argenteo-piloso. ♂ articulo antennarum sexto haud fortiter dentato. ♂♀. Long. 7.5—13 mm.

Black, the wings infuscate and with a steely-blue iridescence. Mandibles and scape of the antennae black in both sexes, and the clypeus clothed with silvery pubescence. Calcaria of the posterior tibiae bright testaceous in the ♀.

Male with the sixth joint of the antennae very little produced at its apex beyond the base of the following joint; head in front with shallow, close and rugose puncturation. Mesothorax with very shallow punctures, the surface somewhat smooth about the middle. Propodeum longitudinally rugose in front. Abdomen with the second ventral segment finely and not very closely punctured about the middle on its basal portion, towards the hind margin densely and very minutely; third segment somewhat depressed except at the base; the following segments deeply depressed.

Female like the ♂ in most respects. The mesothorax posteriorly towards the middle is smoother and more or less shining. Propodeum very finely longitudinally rugose to the brow, at its anterior margin the rugosity is not so fine. Abdomen with the second segment very finely but densely and quite distinctly punctured; beneath very highly polished on its middle portion and sparsely and clearly punctured, very finely and densely on the lateral pubescent spots. Apical dorsal segment nearly flat, its margins slightly raised, the surface somewhat rough, and punctured.

HAB. Oahu, Molokai, Lanai and Maui; abundant on the coast and in the mountains to an elevation of 4000 ft. or more. Preys on Tachinids &c.

(13) *Crabro (Solenius) atripennis*, sp. nov.

Praecedenti forma facieque simillimus, mandibulis antennarumque articulo basali albescentibus facile distinguendus. ♂♀. Long. 8—13 mm.

Very like the preceding in form and sculpture, but in neither sex is the mesothorax posteriorly as smooth, nor is the surface in that region at all shining. The calcaria of the posterior tibiae are darker, and the front of the scape of the antennae and the mandibles are yellowish-white. Wings deeply infusate and with a steely iridescence, and the sixth joint of the antennae but little produced at the apex, as in the preceding species.

HAB. Common generally on Hawaii from the lowlands to an elevation of 5000 ft. Preys on Tachinids, and also sometimes enters houses and carries off the introduced house-fly.

(14) *Crabro (Solenius) curtipes*, sp. nov.

Niger, alis infuscatis, antennarum articulo sexto haud fortiter dentato, clypeo argenteo-vel pallidissime aureo-piloso, abdominis segmento primo pubescentia longa nigraque vestito, segmento 2 ventrali subdepresso, dense punctato, segmentis caeteris peropacis et depressis. ♂. Long. 6—11 mm. (Plate I. fig. 9.)

Male black, the wings infusate and with little iridescence. Head, thorax, and basal segment of the abdomen with erect dark pubescence, clypeus with silvery, or faintly golden, appressed hairs. Antennae with the fifth joint of the flagellum of the antennae emarginate beneath, but little produced at its apex. Head very densely rugosely punctured in front, less so on the vertex posteriorly. Mesothorax dull, rugosely punctured. Propodeum with excessively short wrinkles at its anterior margin, behind these with shallow subobsolete punctures. Abdomen with the basal segment extremely finely punctured, and clothed with long dark hairs; second and following finely closely and evenly punctured. Beneath, the second segment is flattened, closely punctured, and inclined, the third flattened or slightly depressed and inclined in the opposite direction to the second, so that the two meet at an obtuse angle. The surface of the third and of all the following (which are depressed) is very dull, having an appearance of granulation or dense puncturation, which is due to a dense meshwork of raised lines. Posterior tarsi very short in proportion to the tibiae, all the joints taken together hardly being equal to the latter in length.

HAB. Kona, Hawaii, about 4000 ft.; 1 ♂, Aug. 1892. Olaa (2000 ft.), and Kilauea (4000 ft.), several ♂♂ in 1896. I do not know the ♀ of this remarkable species, which might well form a distinct genus, should the other sex present any striking characters.



(15) *Crabro* (*Solenius*) *abnormis*.

*Crabro abnormis*, Blackburn and Cameron, P. Manch. Soc. Vol. xxv. p. 168 (1885-86).

This remarkable species is perhaps allied to *S. curtipes*, and probably might well be separated generically from the other Hawaiian species. It differs from all these in the abruptly incrassate fifth joint of the antennae, and the extremely long tooth on the sixth. Although I repeatedly searched for it in the locality specified, I never had the good fortune to meet with a specimen.

HAB. Konahuanui, Oahu (2500 ft.); 1 ♂ taken by Mr Blackburn. The ♀ which he suggests as belonging to this ♂ is more probably that of *C. tumidoventris*.

*Nesocrabro*, gen. nov.

Caput inter oculos latum, haud fortiter concavum. Fossae antennales ab oculorum marginibus spatio distincto disjunctae. Clypeus pilis suberectis (haud metallicis) vestitus. Antennarum ♂ articulus sextus subtus emarginatus, apice haud fortiter producto. Alarum cellula submarginalis longe post medium, apicem versus, venam recurrentem accipiens. Area propodei antica haud definita. Tibiae posticae spinosae, tarsorum articulus ultimus fortissimus. Area pygidialis ♀ elongata, angustissima, utrinque fimbriata.

The species for which this genus is proposed appear to be allied to those which are provisionally placed under the subgenus *Solenius* of *Crabro*. The face is unusually wide between the eyes, and but little concave. The antennal fossae are separated from the latter by a considerable space. The facets of the eyes in front are comparatively fine. The clypeus is clothed with a fine suberect pubescence, instead of the appressed silvery or golden hairs, so usual in Crabronidae. In the ♂ the 6th joint of the antennae is emarginate beneath, and slightly produced at the apex. The ocelli form a triangle, much widest at the base. In the wings the recurrent nervure is received far beyond the middle (towards the apex) of the submarginal cell. The anterior area of the propodeum is not defined. The front tarsi are simple, the posterior tibiae spinose, the claw joint of the tarsi very large. Pygidial area of the ♀ elongate and very narrow, fringed on each side with long hairs, its sides carinated.

(1) *Nesocrabro compactus*, sp. nov.

Niger, thorace et abdomine albido-notatis, alis subhyalinis, abdominis segmentis apicalibus haud rufo-pubescentibus. ♂ antennarum articulo sexto subtus emarginato, apice vix dentato. ♂♀. Long. 7.5—9 mm. (Plate I. fig. 10.)

Male black, the prothorax often with two spots on the hind-margin and a small one on the tubercles, a transverse spot on the postscutellum, a band usually broad and entire on the second abdominal segment, a spot or line on each side of the third or fourth, a wide band on the fifth, and one on the sixth, yellowish-white. Basal segment also sometimes with an apical spot.

Female with a line on the scape of the antennae, the basal part of the mandibles, two spots or a band on the prothorax, a transverse spot on the scutellum and postscutellum, a broad band on the second abdominal segment, a narrower one on the third and fourth, sometimes also a line on the posterior and intermediate tibiae beneath, a spot at the apex of the front tibiae, on each of the posterior coxae and trochanters, and a small one on each side of the second ventral segment of the abdomen, yellowish-white.

These markings are very variable.

Male, with the fifth joint of the flagellum of the antennae emarginate beneath, hardly produced at the apex. Head in front, and the mesothorax with dense and rugose but shallow puncturation. Propodeum more or less longitudinally rugose. Abdomen with the second segment extremely finely punctured; beneath, somewhat strongly convex, and finely punctured; fourth ventral segment flattened or slightly depressed, fifth and sixth depressed. Apical dorsal segments with inconspicuous pale pubescence, and the puncturation almost obsolete.

Female very like the ♂ in general sculpture, but the puncturation usually slightly weaker. Posterior tibiae roughened, the asperities with short pale spines. Apical dorsal segment elongate and very narrow, coarsely punctured at the base, and sparsely fringed with pale hairs. Second ventral segment sparsely punctured about the middle, very minutely and densely on the lateral pubescent spots. Wings subhyaline in both sexes.

*Nesocrabro compactus* var., *lanaiensis* var. n.

Male with a large spot on the scutellum, as well as the postscutellum, yellowish-white; the band on the second abdominal segment narrow and interrupted. In the ♀ this band is less wide than in the typical specimens. The surface of the head on the vertex is smoother and less dull in both sexes, and the surface of the mesothorax posteriorly in the ♀ somewhat smooth and shining between the punctures.

HAB. Mountains of Kauai (2500—4000 ft.), preying upon Diptera of moderate size, and forming burrows in trodden pathways and bare banks in the forest. Var. *lanaiensis*. Mountains of Lanai (above 2000 ft.). Not common. In the ♂ the tendency seems to be to an increase of thoracic, and decrease of abdominal marking, as compared with the Kauai series.

(2) *Nesocrabro bidecoratus*, sp. nov.

Niger, mandibulis, antennarum articulo basali, thorace, et tibiis flavo-notatis, abdomine fasciis flavis ornato; segmento quinto cupreo, dense punctato, pubescentia aureo-rufa vestito, sexto pilis ejusdem coloris fimbriato. ♀. Long. 10 mm.

Female black, with the basal half of the mandibles, a line on the scape of the antennae, an interrupted band on the prothorax, a transverse spot on the scutellum and postscutellum, a spot at the base of all the tibiae beneath, and a band on each of the first four segments of the abdomen, yellow. Fifth segment of a somewhat metallic copper colour, densely punctured, and clothed with dark golden-red pubescence, the elongate sixth segment fringed with similar hairs, its surface somewhat smooth, and strongly, but not densely, punctured. Head in front with shallow dense punctures, the vertex with dark pubescence. Mesothorax clothed with black pubescence, the surface dull, the puncturation shallow, and by no means coarse. Propodeum with grey pubescence, and with short longitudinal rugosity at the extreme front; behind this dull, the surface roughened. Abdomen with the second segment densely and finely punctured; beneath, about the middle, it is impunctate; towards the sides distinctly punctured, very densely and minutely on the lateral pubescent spots. This segment and the basal have a pale yellow spot on their ventral surface. Posterior tibiae with pale reddish spines, the calcaria bright fulvo-testaceous. Wings subhyaline, somewhat clouded towards the base.

HAB. A single ♀ taken at Kilauea, Hawaii, in September 1895. In spite of its extremely distinct appearance I suspect it may prove to be a variety of the following species.

(3) *Nesocrabro rubrocaudatus*.

*Crabro rubrocaudatus*, Blackburn and Cameron, P. Manch. Soc. Vol. xxv. p. 172 (1885-86).

Niger, abdomine nigro, segmentis apicalibus rufo-pubescentibus; ♂ thorace opaco, haud flavo-notato, alis infuscatis, caeruleo-iridescentibus, ♀ thorace (antice saltem) opaco, alis subhyalinis minus fortiter infuscatis. ♂♀. Long. 7.5-10 mm. (Plate I. fig. 11 and 11a.)

Male black, the wings deeply infuscate and with bright blue iridescence; the 5th, 6th, and 7th abdominal segments densely clothed with red pubescence. Female with the 5th segment so clothed and the sixth with a fringe of the same colour, the prothorax and postscutellum sometimes spotted with yellow, wings much less dark than those of the ♂, subhyaline or lightly infuscate, sometimes with more or less blue iridescence.

Antennae of the ♂ with the 6th joint but little produced at the apex; front of the head dull and subobsoletely punctured, clothed with dark hairs and in some

examples distinctly longitudinally strigose amongst the punctures. Mesothorax dull, with dense surface rugulosity and shallow puncturation. Propodeum more or less rugose, more strongly in some examples than others. Second segment of the abdomen very finely punctured above; beneath very finely and densely punctured towards the apex, less so towards the base, the punctures distinct; the apical ventral segments lightly depressed, and fringed with golden-red hairs.

Female, except for the differences given above, very like the ♂. The mesothorax posteriorly is slightly smoother, and less dull, the longitudinal rugosity of the propodeum extremely short. The second ventral segment of the abdomen, about the middle, has at the most a few somewhat large and very shallow punctures, its surface is excessively finely rugulose, and not very shining; the apical dorsal segment is very narrow, and coarsely punctured. There is a rather conspicuous pale pubescence on the segments preceding the two apical ones.

HAB. Various localities on Hawaii (from 2000—4000 ft.). Not very abundant.

(4) *Nesocrabro daemonius*, sp. nov.

Niger, alis infuscatis, haud evidenter caeruleo-iridescentibus, mesonoto minus opaco, plus minusve flavo-maculato, abdominis segmentis apicalibus pubescentia rufa ornatis, segmento ♀ 2 ventrali nitido, laevissimo, in medio fere impunctato; fronte pilis nigricantibus, tibiis anticis pubescentia brevi et obscura vestitis. ♂♀. Long. 8—12 mm.

Black, the wings infuscate (less so in the ♀), but with little or no blue iridescence. The prothorax and postscutellum usually both bear yellow spots in the ♂, but they are variable in this respect; in the ♀ these spots are much larger, and the scutellum also has a large transverse one, as well as the first and second ventral segments of the abdomen. The latter may also be present in the ♂, as also spots on the scutellum. The apical segments are clothed with golden-red hairs as in *N. rubrocaudatus*, and the preceding segments in the ♀ with dense and fine whitish pubescence. From that species the much less dull surface of the whole insect will readily separate the present one, as well as the much more distinct puncturation of the front of the head and the mesothorax; the surface of the latter in the ♀ being altogether smooth and shining between the punctures. In the ♂ the second ventral segment of the abdomen is densely and distinctly punctured all over, in the ♀ its surface about the middle is nearly or quite impunctate, smooth, and shining.

The fifth dorsal segment of the ♀ is aeneous and very densely punctured. Front of the head, and the front tibiae with dark pubescence, very short on the latter.

HAB. Mountains of Molokai (3000—4000 ft.). Iao Valley, Maui.

(5) *Nesocrabro adspectans*.

*Crabro adspectans*, Blackburn and Cameron, P. Manch. Soc. Vol. xxv. p. 171 (1885-86).

I have not seen this species. It is very closely allied to *N. daemonius*, but differs from that species in having the front of the head clothed with golden-red pubescence, and long hairs of the same colour on the front tibiae.

HAB. Haleakala, Maui (5000 ft.). A pair were taken by Mr Blackburn 15 or 20 years ago.

(6) *Nesocrabro stygius*.

*Crabro stygius*, Kirby, Ent. Mo. Mag. xvii. p. 88. Blackburn and Cameron, P. Manch. Soc. Vol. xxv. p. 170 (1885-86).

Niger, alis subhyalinis, vix infuscatis, pronoto ♀ nonnunquam flavo-notato, segmentis ♂ apicalibus pubescentia pallida ♀ pubescentia rufa vestitis. ♂. Long. 8 mm.

This species is very closely allied to *N. rubrocaudatus*, but the ♂ may be at once distinguished by the subhyaline and very faintly infuscated wings, the pubescence of the apical abdominal segments, which is of a pale golden colour, the more distinctly subrugosely punctate front of the head, and the shining surface of its vertex.

From *N. daemonius*, the dull and less smooth surface of the mesothorax and scutellum, the unspotted thorax and the clearer wings, from *N. adspectans*, the obscurely coloured pubescence of the head and front legs (as well as the characters which distinguish it from *N. daemonius*), will readily separate it.

I have not seen an example of the ♀.

HAB. Mountains of Oahu (Blackburn). Head of Pauoa Valley (March 1895).

## DIPLOPTERA.

## VESPIDAE.

(1) *Polistes aurifer*.

*Polistes aurifer*, Saussure, Mon. Guêpes Soc. p. 78.

HAB. Very abundant all over the islands. Stylopized examples taken on Lanai and Hawaii.

(2) *Polistes hebraeus*.

*Polistes hebraeus*, Fab. Mant. Ins. 1. p. 292.

*Polistes macaensis*, Fab. Syst. Piez. p. 272.

HAB. Oahu and Kauai; on the plains. Oloa, Hawaii (2000 ft.).

## EUMENIDAE.

This group is represented by a large number of species of the genus *Odynerus*, no less than 86 species being known to me. These *Odynerus* are of great interest and importance, and exhibit a great diversity of structure in the various species, and will no doubt, at some future period, themselves form several distinct genera. In striking contrast to other Hawaiian aculeates (the Mimesidae, Crabronidae, and *Nesoprosopis*) the specific structural characters, (and even the coloration if a few species are excepted), are remarkably constant. These characters are chiefly found in the general sculpture of the insect, the form of the clypeus, the shape of the dorsum of the second segment of the abdomen, but especially in the structure of the ventral plate of this segment. This ventral segment normally consists of three distinct parts, (1) a smaller basal portion, (2) a transverse sulcature traversed by longitudinal costae, (3) a larger apical portion, with a more or less distinct depression. Each of these parts may furnish useful characters; the basal portion in some species is large and tumid, the costae may be of great length, moderate, or entirely obsolete, the apical portion may be flattened to the level of the costae or greatly and perpendicularly raised above them, and the depression may be wide, narrow, deep, or obsolete. The habits of the species are of interest. All those that I have been able to observe prey on the larvae of moths (Pylalidae, Noctuidae, and Micro-Lepidoptera), so that the number of caterpillars destroyed must be immense, especially as the wasps appear to be on the wing at all seasons of the year. Their cells are sometimes formed in the ground, often in the wood of dead trees, and in the case of many species in the cavities of the porous blocks of lava. A few build solitary cells of mud, attached to leaves of trees, but these I have only found when the leaf has been rolled up by a spider, the nest of the latter and the cell of the wasp being fixed side by side. That very abundant species *O. nigripennis* is very partial to houses, forming its cells in cavities in woodwork, or unused locks. It also frequently occupies the empty cells of *Pelopæus*.

All the Hawaiian species of the genus belong to the section formerly known as *Leionotus*. As in the Fossores and Anthophila I have described afresh all the species previously known, whenever I have had specimens for examination, the large

number of new forms rendering the old descriptions of little use. The measurements of *Odynerus* are taken from the front of the vertex of the head to the apical margin of the first abdominal segment, instead of to the apical extremity of the abdomen.

(1) *Odynerus venator*, sp. nov.

Niger, minus robustus, fronte inter antennis flavo-maculata, segmenti primi abdominis margine apicali saepe pallido, alis infuscatis et violaceo-iridescentibus. Clypeus leviter dentato-emarginatus. Mesonotum minus fortiter densissime rugosopunctatum. Segmentum abdominis secundum a basi fortiter elevatum. Long. (a fronte usque ad apicem segmenti 2<sup>i</sup> abdominis) ♂ 7—9, ♀ 9—12 mm.

Black with a small yellow spot between and just behind the points of insertion of the antennae, and another behind each eye near the vertex; the apical margin of the basal segment of the abdomen often narrowly yellow, or testaceous. Clypeus with the apex dentately emarginate very feebly in the ♀, more strongly so in the ♂; head above the antennae with shallow rugose puncturation. Mesothorax dull, somewhat finely and very closely rugosely punctured; wings infuscate, with violet iridescence. Propodeum quite dull, impunctate or nearly so. Abdomen with the basal segment shallowly punctured, rather more deeply and closely in the ♂ than the ♀; second much raised from the base, the highest point being about one-third the length of the whole segment from the basal margin, finely, evenly and remotely punctured to near the apical margin, where the puncturation becomes close, coarse and shallow, as on the following segments; beneath, with its depression triangular and somewhat deep, meeting the apices of the costae; at the sides the segment is raised from their apices to about the height of its basal portion.

HAB. Hawaii, Kona and Kau districts (2000 to 4000 ft.).

(2) *Odynerus erro*, sp. nov.

Praecedenti forma et puncturatione simillimus, sed thorace toto nitido distinctissimus. ♀. Long. 11 mm. (Plate I. fig. 12.)

Black and shining with a median spot just behind the antennae, another behind each eye near the base, and the sides of the apical margin of the basal segment of the abdomen, pale. Clypeus with the apex dentately emarginate; head above the antennae dull with shallow, close and rugose puncturation. Mesothorax shining; densely, subrugosely punctured, the puncturation consisting of scattered larger punctures (which are not coarse), and a system of smaller punctures which in this species is extremely strongly developed, so that the difference between the two systems is much

less than usual; wings with violet iridescence. Propodeum with feeble subobsolete punctures, sometimes hardly visible. Second segment of the abdomen strongly raised from the base, the depression beneath not so deep as in the preceding species. ♀.

HAB. Oahu, Waianae Mts. and coast. Haleakala, Maui (5000 ft.)? A single ♀ only taken in each case. I think it probable that the latter locality is erroneous.

(3) *Odynerus naiadum*, sp. nov.

Niger, alis infuscatis, caeruleo-iridescentibus, fronte, mesopleuris, postscutello (maris etiam pronoto) rubro-notatis; segmento primo abdominis postice rubromarginato. ♂ clypeus fortiter, ♀ minus fortiter sed distincte dentato-emarginatus. Mesonotum haud nitidum, subtilius subrugoso-punctatum. Abdominis segmentum secundum elevatum; subtus, depressione sat lata et alta. ♂ ♀. Long. 9—10 mm.

Black, the wings infuscate and with blue iridescence. The front of the head behind the antennae, the mesopleurae, the postscutellum, and in the ♂ the prothorax also, have red markings. The apical margin of the basal segment of the abdomen has a red band, dilated at the sides. Clypeus deeply dentately-emarginate in the ♂, less deeply, but distinctly so in the ♀. Head closely and rugosely punctured. Mesothorax dull, with two systems of puncturation. The larger punctures are not coarse and on the posterior half of the thorax somewhat irregular, the minute interstitial punctures are unusually strong, especially in the ♀, and both kinds have a tendency to run into each other, giving the thorax a subrugose appearance. Propodeum with subobsolete shallow puncturation, the posterior concavity subrugose. Basal segment of the abdomen shallowly punctured; second strongly raised from the base in the ♂, somewhat less so in the ♀; beneath, with the depression distinct and deep.

HAB. Molokai mountains (3000 ft.); local and scarce. Iao Valley, Maui, 1 ♀.

(4) *Odynerus erythrognathus*, sp. nov.

Niger, minus robustus, mandibulis rufis, alis caeruleo-iridescentibus. Clypeus ad apicem depressus, vix emarginatus. Mesonotum opacum sparsim subtilissime punctatum, puncturatione fere obsoleta. Abdominis segmentum secundum elevatum, subtus depressione lata. ♂ ♀. Long. 8—10 mm.

Black, the mandibles red, the wings with blue iridescence. Apex of clypeus (as in nearly all the Hawaiian species) depressed from the sides, giving it a dentate appearance, very slightly emarginate, or truncate; head above the antennae very dull, with fine feebly impressed punctures. Mesothorax dull, very finely and obscurely



punctured, scutellum impunctate or nearly so; wings infusate with blue iridescence. Propodeum dull, impunctate, or with faint traces of almost obsolete punctures. Basal segment of the abdomen dull, with shallow punctures, second raised from the base but not very strongly, more so in the ♂ than the ♀; beneath, with the depression wide and deep; the segment at the sides, raised up abruptly and rather strongly from the apices of the costae, prominent on either side of the depression at its base.

HAB. Kilauea, Hawaii (4000 ft.).

(5) *Odynerus melanognathus*, sp. nov.

Niger, minus robustus, alis caeruleo-iridescentibus. Clypeus ♂ fortiter, ♀ evidenter dentato-emarginatus. Mesonotum opacum, sparsim subtiliter punctatum. Propodeum puncturatione levissime impressa, fere obsoleta. Abdominis segmentum secundum subtus depressione lata. ♂ ♀. Long. 9—11 mm.

In general appearance very like the preceding, but easily known by the following characters. Mandibles dark, apex of clypeus of ♂ deeply, of ♀ distinctly, though less strongly, dentately-emarginate. Mesothorax rather more distinctly punctured, the propodeum in front with very shallow but evident punctures. Second abdominal segment beneath rather less prominent on either side of the depression in front.

HAB. Kona, Hawaii (1500 ft. and above). Rare. 1♂ 2♀ taken.

(6) *Odynerus cyphotes*, sp. nov.

Niger, alis caeruleo-iridescentibus. Mesonotum opacum subtilissime sparsim punctatum. Segmentum abdominis secundum fortiter subitoque tuberculato-elevatum, subtus depressione minus lata. ♂ ♀. Long. 8—10 mm. (Plate I. fig. 16.)

Mandibles dark, apex of clypeus hardly emarginate, head above the antennae dull, evenly and very shallowly punctured. Mesothorax dull, with fine sparse punctures, sometimes nearly obsolete, and an exceedingly minute and close puncturation between these. Wings infusate, with blue iridescence. Propodeum sometimes with a very feeble indication of shallow punctures. Abdomen with the basal segment slightly depressed along its apical margin, and shallowly punctured; second very strongly and abruptly raised from the base into a tuberculate form above; beneath, with the depression rather narrow, the segment at the sides rising abruptly from the costae to a height as great or rather greater than that of its basal portion.

HAB. Kona and Kau districts of Hawaii (4000 ft.).

(7) *Odynerus vulcanus*.

*Odynerus vulcanus*, Blackburn, P. Manch. Soc. Vol. xxv. (1885-86), p. 152.

Niger, alis caeruleo-iridescentibus. Clypeus leviter emarginatus vel subtruncatus. Mesonotum cum scutello peropacum, subaequaliter distincte punctatum. Propodeum (plerumque reticulatim) rugosum. Abdominis segmentum secundum (praecipue maris) fortiter elevatum. ♂ ♀. Long. 8—10 mm.

Black, the mandibles dark, the wings with blue iridescence. Clypeus with the apex depressed and slightly emarginate, sometimes truncate. Front of the head densely and distinctly punctured. Mesothorax with the surface quite dull, somewhat closely and evenly punctured, posteriorly about the middle the punctures generally are sparser. Scutellum dull and distinctly punctured. Propodeum with rugose sculpture generally reticulate. Abdomen with the basal segment closely and largely punctured; second segment strongly and abruptly raised from the base, especially in the ♂; beneath, the depression wide but not deep, so that even at the sides the segment rises not at all strongly from the level of the apices of the costae.

HAB. Hawaii, widely distributed and not rare.

(8) *Odynerus hiloensis*, sp. nov.

Praecedenti simillimus, sed mesonoto minus opaco, densius ac grossius punctato, abdominis segmento secundo subtus minus late depresso distinguendus. ♂ ♀. Long.  $7\frac{1}{2}$ — $10\frac{1}{2}$  mm.

Extremely like *O. vulcanus* but may be known at once by the almost or quite shining surface of the thorax between the punctures. The mesothoracic puncturation is also closer and coarser, and the depression of the second ventral segment evidently less wide.

HAB. Hawaii, not rare on the windward side of the island, in the forests above Hilo (2000 ft.) and at Oloa.

(9) *Odynerus konanus*, sp. nov.

Niger, alis caeruleo-iridescentibus. Clypeus levissime emarginatus vel truncatus. Mesonotum nitidum, distincte aequaliter punctatum. Propodeum rugosum. Segmentum abdominis secundum elevatum, subtus depressione lata, late costarum apices antice attingente. ♂ ♀. Long. 9—11 mm.

Black, the wings with blue iridescence. Clypeus depressed at the apex, slightly

emarginate or truncate. Head in front densely and distinctly punctured, shining between the punctures. Thorax shining, mesothorax strongly and evenly punctured, rather more largely and closely in the ♂ than the ♀. Propodeum rugose in front. Abdomen with the second segment raised from the base (more strongly in the ♂); beneath, the depression wide but not deep, meeting the apices of the costae widely at its base.

HAB. Hawaii, Kona district (600 to 2000 ft.). A single example (♀) taken in the mountains of Molokai (3000 ft.) nearly agrees with the Hawaii specimens, as also one from the mountains of West Maui.

(10) *Odynerus orbis*, sp. nov.

Niger, mandibulis rufis, alis caeruleo-iridescentibus. Capitis vertex incrassatus. Clypeus ad apicem depressus, levissime emarginatus. Mesonotum haud nitidum, distincte (nec grosse) punctatum. Propodeum obscure punctatum. Abdominis segmentum 2 a basi elevatum, subtus depressione lata et alta, lateribusque suis post costas subfortiter elevatis. ♀. Long. 10—11 mm. (Plate I, fig. 17 and 17 a.)

Black, the mandibles red, the wings with blue iridescence. Clypeus with a depression at the apex, which is very slightly emarginate. Head above the antennae distinctly and closely punctured, the vertex somewhat strongly incrassate. Mesothorax dull, distinctly but not coarsely punctured; scutellum with fine and feeble puncturation. Propodeum with some evident but very feebly impressed coarse punctures. Abdomen with the second segment, raised from the base but not at all abruptly, beneath with the depression wide and deep, the segment at the sides rising abruptly and rather strongly above the apices of the costae.

HAB. Hawaii, Kona (2000 ft. and upwards). Rare. Kilauea (4000 ft.). 1 ♀.

(11) *Odynerus caenosus*, sp. nov.

Niger, alis infuscatis caeruleo-iridescentibus, abdominis segmenti primi et secundi margine apicali flavo-albido. Frons capitis densissime rugoso-punctata. Mesonotum cum scutello fortiter denseque punctatum, subnitidum. Propodeum rugosum. Abdominis segmentum secundum a basi elevatum, subtus depressione haud lata, lateribusque suis abrupte supra costarum apices subfortiter elevatis. Long. 8—9½ mm.

Black, the two basal segments of the abdomen with an apical creamy-white band, the second being the wider of the two. The front of the head is very densely rugosely punctured, the mesothorax coarsely and closely punctured, the surface shining. The propodeum is rugosely sculptured. Basal segment of the abdomen shining, coarsely

and closely punctured; the second raised from the base above; beneath, the depression is narrow and hardly meets the apices of the costae, the segment at the sides being abruptly raised from these to about the height of its basal portion.

HAB. Mountains of Kauai. Halemanu and elsewhere on the high plateau.

(12) *Odynerus leucozonias*, sp. nov.

Praecedenti simillimus, et eodem colore, sed mesonoto magis nitido, propodeo laevi (punctato), et abdominis segmento secundo fortius et abruptius elevato, bene distinctus. ♂ ♀. Long. 8—10 mm.

Very similar to the preceding in form and colour.

The surface of the head in front, the mesothorax and scutellum, are very smooth and shining between the punctures, the system of minute punctures between the larger ones on the mesothorax being hardly observable, instead of very distinct. The propodeum is much smoother, with shallow but distinct punctures, and the second segment of the abdomen is more strongly and abruptly raised from the base.

HAB. Kauai (2000—3000 ft.). Found also on the high plateau.

(13) *Odynerus eludens*, sp. nov.

Praecedenti simillimus, margine apicali segmenti abdominis primi angustissime pallido. Mesonotum nitidum fortiter punctatum, interstitiis evidenter minutissime punctatis. Propodeum laeve, antice sparsim subobsolete punctatum, concavitate fere impunctata. Abdominis segmentum primum (a latere visum) a basi usque ad marginem apicalem aequaliter curvatum. ♀. Long. 9.5 mm.

Allied to the two preceding species but with the basal segment of the abdomen (viewed laterally) more evenly and gradually curved from the petiole—not abrupt in front. The mesothorax is smooth and shining between the punctures as in *O. leucozonias*, but the interstices have the minute system of punctures very evident. The propodeum in front is somewhat shining, with some very feebly impressed punctures; the concavity is smooth and almost impunctate. The pale apical band of the basal segment of the abdomen is unusually narrow; the second segment is considerably, but by no means abruptly, raised from the base, the highest point attained (as seen in lateral view) being rather more than one-third of the whole length of the segment from the base. Beneath, the depression somewhat narrow, deeper than in the two preceding species.

HAB. Halemanu, Kauai (4000 ft.). 1 ♀.

(14) *Odynerus homochromus*, sp. nov.

Niger, abdomine fasciis duabus albidis, secunda latiore. Mesonotum fortiter punctatum, interstitiis nitidis, distincte punctulatis. Propodeum opacum subobsolete punctatum, concavitate rugulosa, haud evidenter punctata. Segmentum secundum abdominis fere ad medium subfortiter elevatum, subtus depressione distincta. ♂ ♀. Long.  $8\frac{1}{2}$ — $12\frac{1}{2}$  mm.

Black, with two pale bands on the abdomen. Thorax strongly punctured, mesothorax shining between the punctures, the minute system between these quite distinct. Propodeum dull with shallow puncturation in front, the concavity almost or quite impunctate with finely rugulose surface. Abdomen with the basal segment evenly punctured, subvertical in front; second segment raised from the base but not abruptly, the highest point being nearly at its middle; beneath with a distinct and neither very narrow nor deep depression.

HAB. Mountains of Kauai (3000 ft.). Not common.

(15) *Odynerus kirbyi*.

*Odynerus kirbyi*, Dalla Torre, Wien. Ent. Zeitg. VIII. (1889), p. 125.

*Odynerus extraneus*, Kirby, Ent. Mo. Mag. XVII. p. 86 (nec de Saussure).

Blackburn and Cameron, P. Manch. Soc. Vol. XXV. (1885-86), p. 151.

Niger, abdomine fasciis duabus albidis ornato, secundo latiore. ♂ clypeo albido, apice emarginato, mandibulis albido-notatis. Mesonotum fortiter denseque punctatum. Propodeum rugosum. Abdominis segmentum primum dense punctatum, secundum subtus costis fortibus et longis, depressione nulla. ♂ ♀. Long. 9—12 mm. (Plate I. fig. 18—18 b.)

Black, with two whitish abdominal bands. The ♂ has also the clypeus and more or less of the mandibles of the same colour. The head in front is exceedingly densely punctured, the mesothorax and scutellum are also densely and coarsely punctured, and the surface between the punctures is shining. The entire propodeum is rugose. Abdomen with the basal segment closely punctured, more coarsely in the ♂ than the ♀; second raised from the base rather strongly in the ♂; beneath, the costae are strong and very long and there is no depression beyond their apices.

HAB. Kauai, in the mountains. Not rare.

(16) *Odynerus dilatipes*, sp. nov.

Praecedenti simillimus, eodem modo ornatus, mesonoto fere opaco minus dense et grosse punctato; propodei concavitate laeviori, tantum rugulosa; tibiis posticis ♂ ad

apices fortiter dilatatis, et externe fortiter depresso, bene distinctus. ♂♀. Long.  $9\frac{1}{2}$ —11 mm. (Plate I. fig. 19.)

Extremely like the preceding in general appearance. Male with the head, above the antennae, more finely and shallowly punctured, as likewise the mesothorax and scutellum. The propodeum is much less rugose; its concavity almost smooth, except for the surface rugulosity. Basal segment of the abdomen with the dorsal and anterior faces meeting less sharply, and less coarsely and closely punctured. Female with the head and thorax evidently more finely punctured, and the surface of the latter dull, or almost dull, between the punctures. The posterior concavity of the propodeum is smoother, and the basal segment of the abdomen more finely punctured. The ♂ is further distinct from any other species by the strongly and suddenly dilated apex of the hind tibiae, the dilated portion outwardly being deeply concave.

HAB. Mountains of Kauai (3000 ft.). Not a common species.

(17) *Odynerus conifer*, sp. nov.

Niger, abdomine fasciis duabus albidis ornato. Mesonotum nitidum sparsim subtilius punctatum. Propodeum rugoso-punctatum. Abdominis segmentum primum supra fortiter transversum, antice truncatum, parte antica parti dorsali acute occurrente; segmentum secundum acute conicum, subtus costis longis, depressione nulla. ♀. Long. 9 mm.

Head closely punctured. Mesothorax smooth and shining, somewhat finely punctured, remotely and irregularly on the posterior half. Between these punctures the minute system of puncturation is very distinct. Propodeum with shallow and somewhat rugose puncturation. Abdomen with the basal segment strongly transverse above, depressed, and distinctly punctured, sharply truncate in front; second segment strongly raised into a sharp cone, beneath the middle costae very long, and no depression beyond their apices.

HAB. Kauai, on the high plateau. A very remarkable and rare species, of which only 1 ♀ was taken.

(18) *Odynerus kauaiensis*, sp. nov.

Niger, fasciis duabus albidis ornatus. Mesonotum densissime grosse punctatum. Propodeum fortiter rugoso-punctatum. Abdominis segmentum primum ad basim puncturatione grossissima rugosum; secundum haud elevatum; subtus, costis longis; post has triangulariter deplanatum, vix depressum. ♂♀. Long. 8—10 mm.

Apex of clypeus very slightly emarginate or truncate. Mesothorax and scutellum coarsely and closely punctured, the surface between the punctures shining. Propodeum

with a coarse rugose puncturation. Basal segment of the abdomen very coarsely punctured towards the brow, less so near the apical margin; second segment simple above, not raised from the base, but with only the ordinary longitudinal convexity; beneath with the costae long, followed by no distinct depression, but usually somewhat flattened triangularly in its place.

HAB. Mountains of Kauai. Not common.

(19) *Odynerus peles*, sp. nov.

Niger, peropacus. Mandibulae fere totae nigrae. Clypeus levissime emarginatus vel truncatus. Capitis et mesonoti puncturatio fere obsoleta. Propodeum rugosum vel rugoso-punctatum. Abdominis segmentum secundum haud elevatum, tantum longitudinaliter convexum; subtus, depressione distincta, minus alta. ♂♀. Long. 6—9 mm.

Male black, the abdomen never with yellow bands. Mandibles dark, the extreme apex sometimes reddish or piceous. Apex of clypeus slightly emarginate or truncate.

Head and thorax very dull, with shallow subobsolete puncturation, sometimes almost invisible. Mesothorax not clothed with a silky pile, but with a very short erect pubescence, easily seen in lateral view. Propodeum rugose, generally more or less reticulately so, the rugosities being apparently the interstices between large shallow punctures, hardly now to be recognized as such. Abdomen dull, the basal segment with very shallow punctures; the second simply convex above, not raised from the base, beneath with the depression somewhat wide at its base but not deep.

Female very like the ♂, with obscure puncturation, the interstices between the punctures of the mesothorax very dull, and the minute punctures thereon not very distinct and somewhat scattered and remote from each other.

HAB. Kona and Kau districts (2000—4000 ft.) of Hawaii. Not a rare species.

OBS. This species greatly resembles the following, but the ♂ is abundantly distinct by the form of the clypeus and the different form of the mesothoracic pubescence. The ♀ may be known by the very slightly emarginate or truncate apex of the clypeus and the different sculpture of the surface of the mesothorax, which in the following has the minute system of punctures very dense and distinct.

(20) *Odynerus sociabilis*, sp. nov.

Niger, ♂ sericeo-pubescent. Margo segmenti primi et secundi (vel unius ex his) apicalis saepe anguste flavus. Mandibulae ex maiore parte rufae. Clypeus fortiter dentato-emarginatus. Mesonotum puncturatione obsoleta vel fere obsoleta. Propodeum puncturatione subobsoleta rugosum. Abdominis segmentum secundum subtus depres-

sione lata, minus alta. ♀ minus sericeo-pubescent. Clypeus minus fortiter sed distincte emarginatus. Mesonotum subtiliter remote punctatum (puncturatione nonnunquam fere obsoleta), interstitiis distincte densissime punctulatis. Mandibulae plerumque rufae. ♂♀. Long.  $6\frac{1}{2}$ — $10\frac{1}{2}$  mm. (Plate I. fig. 20.)

Male black, dull, with an appressed sericeous pubescence, often with the apical margin of the first and second abdominal segments narrowly yellow, or with one or other of them so coloured. Mandibles for the most part red. Clypeus very deeply emarginate, the emargination forming rather more than a semicircle. Head above the antennae dull, finely and feebly subobsoletely punctured. Mesothorax and scutellum with an appressed pubescence concealing the surface which is hardly visibly punctured. Propodeum with feeble subobsolete punctures, giving it generally a reticulately rugose appearance in front. Abdomen dull, with sericeous pubescence, and very feebly punctured. Second segment simple above, not raised from the base; beneath with the depression shallow, meeting the apices of the costae widely, the surface dull, somewhat evenly punctured beyond the depression.

Female rather unlike the ♂, much less densely clothed with sericeous pubescence. Mandibles entirely red, or more or less dark. The clypeus, although distinctly dentately-emarginate, is much less deeply so than that of the ♂. Mesothorax dull, with fine sparse punctures, nearly obsolete in some examples, in others more distinct; between these there is an exceedingly close and distinct minute puncturation. Propodeum rugosely punctate as in the ♂. Abdomen less dull, owing to the pubescence being much less dense.

HAB. Mountains of Maui and Hawaii in open localities from 4000—10,000 ft. Common.

(21) *Odynerus scoriaceus*, sp. nov.

Praecedenti cognatissimus. ♂ margine apicali segmentorum 2 basaliū flavo, nonnunquam etiam pronoto postscutello, tegulisque flavo-notatis. Mandibulae rufae. Frons dense subgrosse (nec fortiter) punctata. ♂ mesonoto distinctius punctato, ♀ fronte dense distincteque, scutello evidenter subtiliter punctato, discernenda. ♂♀. Long. 7—11 mm.

Very like the preceding which it exactly resembles in form. ♂ with two basal segments apparently always pale along their apical margins. The prothorax, postscutellum and tegulae are also sometimes spotted with yellow; the mandibles are red. The head above the antennae is more largely and closely and less obsoletely punctured, than that of the preceding, the sericeous pubescence of the thorax is less dense and the puncturation larger and more distinct. In the ♀ the



mandibles are also red, the head above the antennae is closely and distinctly punctured, the mesothorax is less dull, and more strongly punctured, the minute interstitial puncturation less extremely dense, and the scutellum is sparsely and finely but evidently punctured.

HAB. Kona, Hawaii, on the coast and in the mountains (4000 ft.).

(22) *Odynerus molokaiensis*, sp. nov.

Praecedenti simillimus. Fasciae abdominis ♂ 2 pallidae plerumque plus minusve obsoletae. Pronotum cum tuberculis, tegulae, scutellum, postscutellum, et clypeus nonnunquam flavo-notata, vel haec omnia nigra. ♂♀ fronte fortius punctata; ♀ mesonoto nitido, distinctissime punctato, distinguenda. ♂♀. Long. 7—10 mm.

Extremely like the preceding, of similar form and the mandibles red in both sexes. ♂ with the head in front evidently less shallowly punctured. The abdominal bands are generally more or less obsolete, and in a series of specimens much less evident, than in the preceding species. On the other hand sometimes not only the prothorax, tegulae and postscutellum are marked with yellow, but also the clypeus, the tubercles of the prothorax, and the scutellum. The ♀ is quite distinct by the closely and deeply punctured head in front, and the entirely shining surface of the thorax, with its very distinct puncturation.

HAB. Molokai mountains (3000 ft.).

(23) *Odynerus smithii*.

*Odynerus agilis*, Smith, J. Linn. Soc. xiv. p. 681 (nec Smith, op. cit. iii. p. 164).

Blackburn and Cameron, P. Manch. Soc. xxv. p. 162.

*Odynerus smithii*, Dalla Torre, Wien. Ent. Zeitg. viii. (1889), p. 124.

Niger, alis minus infuscatis, haud evidenter caeruleo-iridescentibus. Mandibulae nigrae. Frons post antennas flavo-notata. ♂ fasciis duabus abdominis pallidis distinctis, clypeo fortiter emarginato, mesonoto dense aequaliter punctato. ♀ mesonoto opaco, (antice saltem) dense aequaliter punctato; segmento abdominis 2 ventrali post costas levissime (late tamen) depresso. ♂♀. Long. 6½—9½ mm.

Allied to the several preceding species, but of smaller average size. Black, with a small median yellow spot just behind the antennae. The mandibles are dark. The ♂ has the two basal segments of the abdomen distinctly bordered with yellow along their apical margins, and they are obscurely and very narrowly pale in the single ♀, which I have examined.

♂ clypeus deeply emarginate, head above the antennae dull, closely punctured. Thorax black, entirely dull; mesothorax without sericeous appressed pubescence,

closely, evenly, and distinctly punctured, the interstices with a dense minute puncturation. Scutellum with a very similar puncturation. Propodeum rugose from large subobsolete punctures.

♀ with the head above the antennae closely punctured, the interstices with very distinct minute puncturation. Mesothorax dull, closely and evenly punctured at least on the front half, the minute system of punctures between the larger ones, very dense and distinct. Scutellum more finely, but distinctly punctured. Propodeum as in the ♂. Basal segment of the abdomen with shallow even puncturation, second simple above, beneath, with the depression wide at the base but very faint.

HAB. Lanai, on the coast, and Wailuku, Maui.

The specific name 'agilis' given to this species by Smith had already been used by him for a species of the same genus found in the Aru Islands.

(24) *Odynerus nubicola*, sp. nov.

Niger, opacus, alis subhyalinis, vix iridescentibus; frons cum pronoto plerumque flavo-notata. Abdominis segmentum primum et secundum margine apicali flavo. Clypeus leviter emarginatus. Mesonotum opacum, antice subaequaliter, post medium sparsim, obscure punctatum. Abdominis segmentum secundum haud elevatum, subtus depressione levissima, nonnunquam fere obsoleta. ♂♀. Long. 7—9 mm. (Plate I. fig. 21 and 21 a.)

Black, a median spot behind the antennae, two on the prothorax (rarely absent), and the apical margin of the two basal abdominal segments, yellow. Mandibles dark. Clypeus in both sexes emarginate at the apex, but not deeply, very convex longitudinally. Head above the antennae dull, especially in the ♂, with both systems of puncturation evident. Mesothorax very densely and finely punctured between the larger punctures, which are very shallow and subobsolete, and still further obscured in the ♂ by the appressed fuscous pubescence. The larger punctures themselves are sparse and irregular on the posterior half of the mesothorax, but more regular in front. Abdomen with the basal segment coarsely and shallowly subrugosely punctured; second simply convex above, beneath, with the depression very feeble, often hardly evident except for a median longitudinal impressed line, the segment rising from the apices of the costae only with the slight convexity of its surface. The wings in both sexes are subhyaline with hardly any iridescence.

HAB. Haleakala, Maui. Common above the forest belt up to the summit, and also within the crater.

(25) *Odynerus ecostatus*, sp. nov.

Niger et nitidus, alis caeruleo-iridescentibus. Mandibulae ex maiore parte rufae. Clypeus vix emarginatus. Mesonotum antice aequaliter, postice circa medium sparsim,

distincte punctatum. Abdominis segmentum primum minus dense punctatum; secundum a basi elevatum, subtus, costis obsolete, (vel fere obsolete), sulco nitido. ♂♀. Long. 8—10 mm. (Plate I. fig. 22 and 22 a.)

Black and shining, the wings dark with bright blue iridescence. Mandibles for the most part red. Clypeus very slightly emarginate in the ♂, the head above the antennae densely punctured. Mesothorax shining, with distinct regular punctures in front, which posteriorly towards the middle become scanty. Scutellum punctured, more largely in the ♂ than the ♀; propodeum smooth and punctured. Abdomen shining, basal segment very distinctly, but not densely punctured; the second raised from the base but not abruptly; beneath with the costae obsolete or nearly so, the sulcature very shining, the depression meeting it rather widely, and the sides of the segment rather abruptly raised from it, though not strongly, hardly attaining the height of its basal portion.

HAB. Molokai, Lanai and Maui, in the mountain forests (2000—4000 ft.).

(26) *Odynerus montanus*.

*Odynerus montanus*, Smith, J. Linn. Soc. xiv. p. 680. Blackburn and Cameron, P. Manch. Soc. xxv. p. 158.

Niger, subnitidus, alis caeruleo-iridescentibus. Clypeus vix emarginatus. Mesonotum subnitidum, distincte minus dense punctatum. Propodeum opacum et rugosum. Abdominis segmentum secundum plus minusve (♂ subfortiter) elevatum; subtus, depressione lata, minus alta. ♂♀. Long. 7—11 mm.

Black, somewhat shining, wings dark and brightly iridescent. Clypeus hardly emarginate at the apex. Head above the antennae deeply, closely and distinctly punctured (rather more largely in the ♂). Mesothorax rather shining, distinctly but not coarsely punctured, somewhat remotely in the ♀, more closely and rather more largely in the ♂. The minute interstitial puncturation is shallow and not dense, but very evident. Propodeum dull or nearly so, and rugose. Abdomen with the basal segment distinctly and evenly punctured; second raised from the base, more strongly but not very abruptly in the ♂; beneath, with the depression shallow, but rather wide; the costae well developed.

HAB. Oahu, on the coast and in the mountains.

(27) *Odynerus unicus*, sp. nov.

♂ niger, nitidus, alis caeruleo-iridescentibus. Clypeus levissime emarginatus. Frons minus fortiter punctata. Mesonotum subnitidum, sparsim subtiliter punctatum. Propodeum laeve, antice (ad latera) impunctatum, concavitate sparsim minus fortiter

punctata. Abdominis segmentum secundum elevatum; subtus, costis subobsoletis, a sulco fortiter elevatum, depressione angustula, minus alta. ♂. Long. 7 mm.

Black, shining, wings dark with blue iridescence. Clypeus very slightly emarginate at its apex; head above the antennae rather finely and shallowly punctured. Mesothorax with fine sparse and irregular punctures, between which the minute system is evident, but not dense. Propodeum smooth, impunctate in front, the posterior concavity with some very shallow punctures. Basal segment of the abdomen, viewed laterally, forming an almost even curve from the petiole to the hind margin, above somewhat irregularly and shallowly punctured. Second segment raised from the base; beneath, the depression neither very wide nor deep, the costae subobsolete, and the segment rising at the side from their apices to a height rather greater than that of its basal portion. ♂.

HAB. Mountains near Honolulu. 1 ♂, March 1897.

(28) *Odynerus camelinus*, sp. nov.

Niger, fronte post antennas rubro-notata, tegulis rubris; ♂ clypei apice, mandibulis, pronoto et postscutello nonnunquam rubro-notatis; alis caeruleo-iridescentibus. ♂ clypeus fortiter, ♀ levissime emarginatus. Caput post antennas opacum, distincte punctatum. Mesonotum vix nitidum, sparsim subtiliter obscurius punctatum, densissime etiam et minutissime punctulatum. Abdominis segmentum primum fere impunctatum, secundum fortiter elevatum, coniforme; subtus depressione lata, leviter impressa. ♂♀. Long. 7—10 mm. (Plate I. fig. 23 and 23 a.)

Black, a median spot behind the antennae and the tegulae red. In the ♂ some or all of the following parts are also of this colour; the mandibles, the apex of the clypeus, the apex of the anterior and intermediate femora, the prothorax in front and part of the postscutellum.

Clypeus of ♂ deeply, of ♀ slightly emarginate at the apex. Head above the antennae distinctly punctured, the interstices with very distinct minute puncturation. Mesothorax scarcely shining, very feebly and sparsely punctured, with a very minute and close puncturation between the larger punctures. Propodeum almost dull, smooth and scarcely punctured. Abdomen with the basal segment strongly transverse, with very feeble, ill-defined, and sparse punctures; second segment strongly raised from the base into a conical form; beneath, with the depression wide and very shallow, in the middle the surface depressed even a little below the level of the apices of the costae.

HAB. Molokai Mts. (2000—4000 ft.). Maui, Iao Valley, above Lahaina, and on Haleakala.

(29) *Odynerus dromedarius*.

*Odynerus dromedarius*, Blackburn, P. Manch. Soc. xxv. (1885-86), p. 151.

Præcedenti cognatissimus, sed tegulis atris: mesonoto magis opaco. ♂ apice tibiæ et clypei, mandibulis pronoto et postscutello nunquam rufo-notatis. ♂♀. Long. 8—9 mm.

Differs very little from the preceding except in colour. The ♂ has no red markings except the small median spot behind the antennæ and those behind the eyes. In the ♀ the former is sometimes absent and in both sexes the tegulæ are always dark.

The surface of the thorax is rather more dull, the minute system of puncturation being rather more dense, and generally the puncturation, especially of the scutellum, is slightly better defined.

HAB. Kona, Hawaii (3000—4000 ft.). Kilauea (4000 ft.).

(30) *Odynerus oahuensis*, Dalla Torre.

*Odynerus diversus*, Blackburn, P. Manch. Soc. xxv. p. 161 (nec Walker).

*Odynerus oahuensis* (sic), Dalla Torre, Wien. Ent. Zeitg. VIII. (1889), p. 124.

Niger, alis ex majore parte subhyalinis, haud caeruleo-iridescentibus. Frons, pronotum, tegulæ, mesopleuræ, scutellum, et postscutellum rubro-notata. Abdominis segmentum primum et secundum postice rubro-marginata, hujus etiam lateribus rubromaculatis. Segmenta caetera etiam saepe plus minusve rubro-marginata.

♂ clypeo fortiter, ♀ vix emarginato. Mesonotum subnitidum, fortiter punctatum. Propodeum laeve, parce subobsolete punctatum. Abdominis segmentum primum fortiter transversum: secundum convexum, haud a basi elevatum, lateribus fortiter rotundatis; subtus post costas late triangulariter deplanatum, vix depressum, costis distinctis. ♂♀. Long. 8—10 mm.

Black, with a red median spot behind the antennæ and another behind each eye. The prothorax, tegulæ, mesopleuræ, scutellum and postscutellum are spotted with red. The apical margin of the first and second abdominal segments as well as the sides of the latter are of the same colour, and some of the following segments are more or less red along their apical margins.

Clypeus of ♂ strongly, of ♀ hardly emarginate. Head above the antennæ coarsely and very closely punctured. Mesothorax rather more largely but not quite so closely. Scutellum sparsely punctured. Propodeum with the surface smooth, bearing some very shallow punctures. Abdomen with the basal segment strongly

transverse above; second strongly convex longitudinally, but not raised, its sides strongly rounded; beneath, widely flattened beyond the costae, hardly depressed, not raised up from their apices even at its sides, the costae themselves well developed. Wings subhyaline, the front pair infusate along the anterior margin, but without any blue iridescence.

HAB. Oahu, both mountain ranges. Not common.

(31) *Odynerus rudolphi*.

*Odynerus cardinalis*, Blackburn, P. Manch. Soc. xxv. p. 158 (nec Morawitz).

*Odynerus rudolphi*, Dalla Torre, Wien. Ent. Zeitg. viii. (1889), p. 124.

Niger, nitidus, alis purpureo-iridescentibus. Clypeus vix emarginatus. Mesonotum sparsim subtiliter sed distincte punctatum. Propodeum laevissimum. Abdominis segmentum secundum ventrale haud supra costarum apices ad latera elevatum, costis fortibus, depressione nulla. ♂♀. Long. 7—9 mm. (Plate I. fig. 24 and 24 a.)

Deep black and shining, generally with a minute yellow spot behind the antennae and another behind each eye near the vertex. Wings infusate with extremely bright iridescence.

Clypeus hardly emarginate at the apex; head above the antennae distinctly but not so very closely punctured. Mesothorax finely remotely and distinctly punctured, the surface very highly polished, and the minute system of punctures extremely feeble and almost obsolete. Propodeum very smooth, shining, and with at the most a few very fine punctures. Abdomen with the basal segment, seen from the side, evenly curved from the petiole to the hind margin; second segment strongly convex longitudinally; beneath flat, with no distinct depression, the costae strong, and the segment at the sides not rising up from their apices.

HAB. Mountains and coast of Oahu. Not rare.

(32) *Odynerus brevicostatus*, sp. nov.

♂ niger, mandibulis rufis, alis nitide fuscis, margine antico tantum purpureo-iridescente. Clypeus vix emarginatus. Mesonotum subnitidum, inaequaliter subtiliter punctatum. Propodeum nitidum fere impunctatum. Abdominis segmentum secundum fortiter convexum (haud elevatum); subtus, depressione definita nulla, costis brevissimis, parte sua basali permagna et tumida. ♂. Long. 6½ mm.

♂ black, with the mandibles red, wings infusate with a purple iridescence. Clypeus truncate at the apex. Mesothorax shining, irregularly, sparsely, and finely

punctured, with the minute system of punctures between these larger ones very distinct. Propodeum smooth and shining, hardly punctured. Abdomen shining, basal segment remotely punctured; second not raised from the base except by its longitudinal convexity, which is strong; beneath, with extremely short costae, the basal portion of the segment in front of these very greatly developed, tumid and shining; beyond the costae the segment is nearly flat, not at all raised from their apices, and without any definite depression.

HAB. Molokai mountains (3000 ft.). 1 ♂ taken.

(33) *Odynerus eupteryx*, sp. nov.

♂ praecedenti simillimus, niger, mandibulis atque clypei apice rufis, alis caeruleo-iridescentibus. Clypeus levissime emarginatus. Frons opaca, puncturatione fere obsoleta. Mesonotum opacum subobsolete punctatum. Propodeum dense minutissime rugulosum, opacum, fere impunctatum. ♂. Long.  $7\frac{1}{2}$  mm.

Closely allied to the preceding, having the second ventral segment of the abdomen very similarly formed, but with the costae rather longer and the tumid basal portion of the segment less shining. Otherwise it may easily be distinguished by the following characters. The extreme apex of the clypeus is red, as well as the mandibles, the head above the antennae is very obscurely punctured, the thorax quite dull, the larger system of punctures very feebly impressed, and the minute system much less distinct. The propodeum dull, with a very minute and dense surface rugulosity. The wings are darker with a bright blue iridescence.

HAB. Molokai mountains (3000 ft.). 1 ♂ taken.

(34) *Odynerus purpurifer*, sp. nov.

Niger, nitidus, mandibulis clypeique apice rufis; alis fuscis, purpureo-iridescentibus. Clypeus dentato-emarginatus. Mesonotum nitidum, subtilius minus dense punctatum. Propodeum nitidum, sparsim subobsolete punctatum. Abdominis segmentum secundum (praecipue ♂) subelevatum; subtus, post sulcum transversum fortissime elevatum, costis subobsoletis. ♂♀. Long. 7—11 mm. (Plate I. fig. 25 and 25 a.)

Black and shining, the mandibles and apex of clypeus red, wings shining fuscous with purple iridescence. Head above the antennae closely and distinctly punctured, the vertex in the ♀ somewhat incrassate. Mesothorax with scattered punctures, the surface between them with the minute system very distinct, but not dense. Propodeum in front shining, with a few feebly impressed punctures. Abdomen with the basal segment not densely punctured; second raised from the base in the ♂, but not strongly

or abruptly, and still less so in the ♀; beneath, the costae obsolete or nearly so, the sulcature shining, and the part of the segment beyond it strongly and abruptly raised to a height greater than that of its basal portion, its depression narrow but deep in front.

HAB. Molokai mountains (3000—4000 ft.). Mountains of West Maui in the Iao Valley, and above Lahaina (3000 ft.). Lanai (2000 ft.).

(35) *Odynerus instabilis*, sp. nov.

Niger, mandibulis rufis, alis infuscatis caeruleo-iridescentibus. Caput densissime punctatum. Mesonotum subfortiter punctatum, ♀ postice irregulariter, interstitiis crebre minutissime punctulatis. Propodei concavitas punctata. Abdominis segmentum secundum basi subfortiter elevatum; subtus, post sulcum fortiter elevatum, depressione angusta sat distincta.

VAR. Tegulis rufis vel piceis. ♂♀. Long. 7—9.5 mm.

This species is very variable but quite distinct from any other. The surface in some examples is quite dull, (especially in examples from Molokai), while in others it is very shining. The mandibles are red, the head above the antennae densely, but not very deeply punctured. The mesothorax is distinctly punctured, rather more coarsely in the ♂, and somewhat sparsely and irregularly on the posterior portion in the ♀. The propodeum is not rugose, but the posterior concavity is punctured. The second segment of the abdomen is distinctly raised from the base; beneath, it rises up very strongly from the sulcature to an elevation much greater than its basal portion, and there is a narrow but very distinct median depression. The wings are dark, and have a blue iridescence. In examples from Maui the tegulae are generally red, but in a few examples they are dark, as in the Lanai and Molokai specimens.

HAB. Molokai, Lanai, and Maui, in the mountain forests (2000—5000 ft.).

(36) *Odynerus deinogaster*, sp. nov.

Niger, subnitidus, fronte, pronoto, et nonnunquam postscutello rubro-notatis, alis infuscatis, caeruleo-iridescentibus. Caput, mesonotum, concavitasque propodei dense fortiter punctata. Abdominis segmentum primum dense punctatum; secundum supra convexum, haud a basi elevatum; subtus, sulco transverso nitidissimo, post sulcum fortissime abrupte elevatum, costis et depressione obsoletis. ♂♀. Long. 7—8 mm. (Plate I. fig. 26 and 26 a.)

Black, with a spot behind the antennae, the prothorax in front and sometimes the postscutellum, red. Abdomen entirely black. Wings infuscate and with a blue iridescence. Clypeus hardly emarginate at the apex; head above the antennae densely



punctured. Mesothorax with a somewhat coarse and close puncturation, the surface somewhat shining and the system of minute punctures evident. Abdomen with the basal segment closely and distinctly punctured; second simply convex longitudinally above; beneath, the sulcature shining, without any costae, and the part of the segment behind it very strongly and abruptly raised, subprominent in the middle in front, the depression wanting.

HAB. Molokai mountains (3000 ft.). Rare. 2 ♂ 2 ♀ taken.

(37) *Odynerus homœogaster*, sp. nov.

Praecedenti forma similis, sed antennarum articulo basali antice, et margine segmenti primi abdominis postice, rubris. ♂ ♀. Long. 8—9 mm.

Perhaps only a subspecies of the preceding, but readily distinguished by the red line on the scape of the antennae in front, and the red apical margin of the basal abdominal segment. In the ♀ the abdominal band is interrupted, and less conspicuous than that of the ♂.

HAB. Iao Valley, Maui. 4 ♂ 1 ♀.

(38) *Odynerus heterochromus*, sp. nov.

Niger, opacus, alis caeruleo-iridescentibus. Abdominis segmentum secundum ut in *O. homœogasteri* fere formatum. Thorace opaco et colore bene distinguendus.

VAR. ♂. Segmentum abdominis basale postice flavo-marginatum. ♂ ♀. Long.  $6\frac{1}{2}$ — $8\frac{1}{2}$  mm.

Black, ♂ very rarely with the apical margin of the basal segment of the abdomen pale, and sometimes with a small pale median spot just behind the antennae.

Apex of the clypeus slightly dentately-emarginate; head above the antennae dull with shallow and very close puncturation. Mesothorax dull, rather coarsely punctured in the ♂, in the ♀ the punctures are finer, sparser and less distinct. Scutellum in the ♂ closely punctured, less closely and much more finely in the ♀. Propodeum towards the sides in front rough with large shallow feebly-impressed punctures. Abdomen with the basal segment closely, but not deeply, punctured; second segment above not raised from the base; beneath, exceedingly strongly raised from the sulcature, the costae subobsolete, and the depression wanting, or represented only by a faint longitudinal impressed line.

HAB. Kilauea, Hawaii (4000 ft.). Common; burrows in dead tree trunks. I did not meet with it on the leeward side of the island.

P. F. H.

7

(39) *Odynerus mimus*, sp. nov.

Forma fere praecedentis, niger, abdominis segmentis duobus basalibus postice albido-marginatis, alis infuscatis caeruleo-iridescentibus. Mesonotum nitidum, dense fortiter punctatum. Abdominis segmentum secundum supra haud elevatum, leviter convexum; subtus, post sulcum fortissime elevatum, costis subobsoletis, depressione nulla. ♂♀. Long.  $7\frac{1}{2}$ —9 mm.

Not a large species, agreeing for the most part in form with the preceding. Black, with the apical margins of the first and second abdominal segments yellowish-white. The first band narrow, the second much wider.

Head and mesothorax densely and coarsely punctured, the surface of the latter shining between the punctures. Propodeum with the surface smooth and shallowly punctured. Basal segment of the abdomen evenly punctured; second simple above, slightly convex longitudinally; beneath, extremely strongly and abruptly raised from the sulcature (the greatest height attained being at the middle), the costae more or less obsolete, the depression wanting, or represented only by an impressed line.

HAB. Mountains of Kauai (3000 ft.).

(40) *Odynerus pseudochromus*, sp. nov.

Niger, capitis fronte, pronoto, mesopleuris, tegulis (saepe), scutello, et postscutello rubro-notatis. Abdominis segmentorum margines apicales, (duorum basalium distinctissime), rubri. Alae fere hyalinae, marginibus anticis et apicalibus infuscatis. Mesonotum cum scutello dense fortiter punctatum. Abdominis segmentum secundum minus elevatum, fortiter convexum; subtus, fortissime post sulcum elevatum, depressione distincta, minus lata. ♂♀. Long. 6— $8\frac{1}{2}$  mm. (Plate I. fig. 27 and 27 a.)

Black, with a median spot behind the antennae, another behind each eye, the prothorax in front, a spot on the mesopleurae, a small one on the mesothorax near the tegulae, one or more spots on the latter, part of the scutellum and postscutellum, the hind margins of most of the abdominal segments (the first and second most widely), and a line on the scape of the antennae of the ♂, red. These markings vary a little but are for the most part constant. Wings nearly clear, except along the margin, and with no trace of blue iridescence.

Apex of clypeus with a depression, but hardly emarginate. Mesothorax coarsely and densely punctured, the scutellum closely but rather less coarsely. Propodeum with shallow puncturation. Basal segment of the abdomen densely punctured; second

somewhat strongly convex, especially in the ♂; beneath very strongly and abruptly raised behind the sulcature, the costae ill defined, subobsolete, the depression very distinct, deep in front, the segment prominent on either side of it.

HAB. Mountains of Oahu, both ranges.

OBS. This species has a most remarkable resemblance superficially to *O. oahuensis*. It is less robust and lacks the red spot on the sides of the second segment of the abdomen. The second ventral segment is as different as it well can be, and there are other important structural differences, so that I believe the two species are not really at all closely related; yet their general appearance is extremely similar, and unlike other Hawaiian species.

(41) *Odynerus leiodemus*, sp. nov.

Praecedenti simillimus, eodem modo rubro-notatus, sed angustior. Mesonotum minus dense punctatum, scutello sparsius ac subtilius. Abdominis segmentum secundum subtus minus fortiter post costas elevatum. ♀. Long.  $7\frac{1}{2}$  mm.

This species is exactly like the preceding in its markings and the colour of the wings, but is evidently narrower in form. The mesothorax is more finely and less regularly punctured and more shining, the scutellum more finely and sparsely. The second segment of the abdomen more strongly convex at the base longitudinally (when seen from the side), while beneath it is evidently less strongly raised from the sulcature.

HAB. Waianae mountains, Oahu. A single ♀ taken.

(42) *Odynerus laevisulcatus*, sp. nov.

Niger, nitidus, alis infuscatis caeruleo-iridescentibus, forma gracili. Clypeus vix emarginatus. Capitis vertex subincrassatus; frons densissime punctata. Mesonotum nitidum, antice aequaliter, postice ad medium subsparsim, fortiter punctatum. Propodeum laeve, concavitate sua dense punctata. Abdominis segmentum secundum subelevatum vel fortiter convexum; subtus, post sulcum transversum, ad altitudinem partis suae basalis (vel magis alte) elevatum, depressione angusta distinctissima, sulco ipso nitido, costis fere obsoletis. ♀. Long. 7—8 mm.

Female black, wings infuscate, with blue iridescence. Apex of clypeus hardly emarginate. Head above the antennae very closely punctured, the vertex incrassate. Mesothorax strongly punctured, evenly in front, posteriorly, at least about the middle, somewhat sparsely. The puncturation of the scutellum is also very distinct, but finer than that of the mesothorax. Propodeum with the surface smooth and shining, distinctly but not deeply punctured, densely so in the posterior concavity. Abdomen

shining, basal segment with distinct nearly even puncturation; second somewhat raised from the base, or at least very strongly convex; beneath, raised above the sulcature to a height rather greater than that of its basal portion, the sulcature itself shining, with indistinct, nearly obsolete costae, the depression narrow but very distinct.

HAB. Haleakala, Maui (5000 ft.). Two ♀ taken in the early part of 1894; probably rare, as it was not met with again on several subsequent visits.

(43) *Odynerus xanthorhoes*, sp. nov.

Niger, nitidus, alis fuscis, nitidissimis. Abdomen fasciis duabus ferrugineo-flavis. Frons, pronotum, mesopleurae, tegulae plerumque, postscutellum, tibiaeque omnes (plus minusve), eodem colore decorata. Mesonotum (♀ praecipue) remote punctatum, minutissime etiam et dense punctulatum. Propodeum fortiter rugosum. Abdominis segmentum primum ad basim grossissime punctatum; secundum in formam conicam fortiter elevatum. ♂♀. Long. 8—9 mm.

Black, with a median spot behind the antennae, another behind each eye, part of the prothorax, a spot on the mesopleurae, the tegulae more or less, the postscutellum in front, the hind margin of the two basal abdominal segments, all the tibiae more or less, of an orange-yellow colour. Mesonotum shining, the system of larger punctures distinct but not coarse, and on the posterior half the puncturation is sparse and irregular. In the ♀ these punctures are finer than in the ♂ and much more sparing, the system of minute punctures occupying the greater part of the surface. Propodeum with coarse rugose sculpture. Abdomen shining, basal segment very coarsely punctured towards the base; second raised near the base into a conical form; beneath beyond the sulcature also raised to a height equal to, or slightly greater than, that of its basal portion, the depression short and narrow, but distinct.

HAB. Mountains of Kauai (2500—3000 ft.). Local.

(44) *Odynerus nivicola*, sp. nov.

Niger, alis infuscatis, caeruleo-iridescentibus, abdominis segmentis duobus basilibus flavo-marginatis. Clypeus distincte emarginatus. Mesonotum plus minusve nitidum, irregulariter punctatum, interstitiis dense subtilissime punctulatis. Propodeum opacum et rugosum. Abdominis segmentum secundum (praecipue maris) abrupte elevatum; subtus, post sulcum fortiter elevatum, depressione angustula. ♂♀. Long. 6—9 mm.

Black, the wings with blue iridescence, the apical margins of the two basal segments of the abdomen pale yellow.

Clypeus distinctly emarginate at the apex; the head above the antennae closely and distinctly punctured. Mesothorax more or less shining, sparsely irregularly and not coarsely punctured (in the ♀ generally more finely and sparsely than in the ♂); between these punctures with a fine and close puncturation, which is generally clearer in the ♀ than in the ♂. Propodeum dull, and more or less rugose towards the sides. Basal segment of the abdomen with shallow punctures; second abruptly and rather strongly raised from the base; beneath, finely punctured, and abruptly raised from the apices of the costae, the depression narrow.

HAB. Haleakala, Maui. In the higher forest, and above it to an elevation of 8000 ft., and also in the summit crater.

(45) *Odynerus dryas*, sp. nov.

Niger, alis infuscatis, caeruleo-iridescentibus, capite, thorace et abdomine rufo-notatis. Pronotum rufo-maculatum. Abdominis segmentorum 2 basali apices rufo-marginati. Mesonotum nitidum, sparsim irregulariter punctatum. Abdominis segmentum secundum elevatum; subtus depressione sat lata. ♂♀. 7—8 mm.

Black, the wings infusate and with blue iridescence. A median spot on the head behind the antennae, two large ones on the prothorax, one below each of the tubercles, sometimes one on each of the tegulae, the postscutellum, two spots sometimes on the scutellum, the propodeum more or less at the sides, of a bright red colour. Basal segment of the abdomen with an apical red band strongly dilated at the sides, and the apical margin of the second of the same colour.

Mandibles black. Clypeus very slightly dentately-emarginate; head above the antennae closely punctured. Mesothorax smooth and shining, somewhat finely irregularly punctured, the surface between these punctures with very minute but quite evident puncturation; scutellum sparsely punctured; propodeum with the posterior concavity closely punctured. Abdomen with the basal segment coarsely and evenly punctured; second raised from the base but not very strongly; beneath, at the sides, raised from the apices of the costae to about the height of the basal portion of the segment, the depression wide but not deep.

HAB. Haleakala, Maui, 5000 ft. 3 ♂ 1 ♀.

(46) *Odynerus erythrostactes*, sp. nov.

Niger, alis infuscatis, caeruleo-iridescentibus, fronte, pronoto, tegulis, mesopleuris et postscutello rubro-notatis. ♂ tibiis anticis saepe, intermediis posticisque rarius, articuloque basali antennarum plus minusve, rubro-lineatis. Abdominis segmentum

primum postice rubro-marginatum. ♂-is clypeus leviter, ♀-ae vix emarginatus. Mesonotum subnitidum, distincte punctatum. Propodeum rugosum. Abdominis segmentum secundum fortiter elevatum, lateribus subcompressis; subtus, depressione post costas distincta, minus alta. ♂♀. Long. 7—10.5 mm.

Black, the wings infusate and with blue iridescence. A median spot behind the antennae, one on either side of the prothorax, nearly united, one or more on the tegulae, one on the mesopleurae, the postscutellum in front, and the hind margin of the basal segment of the abdomen, red. In the ♂ the front tibiae usually, sometimes the intermediate, and rarely the posterior are more or less red, as also a longer or shorter line on the scape of the antennae.

Clypeus of ♂ dentately-emarginate but not deeply. Head above the antennae closely and rugosely punctured. Mesothorax distinctly punctured, less closely and regularly behind than in front, between these punctures with a distinct minute puncturation, the surface more or less smooth and shining. Propodeum rugose. Abdomen with the basal segment largely punctured; second very finely and remotely, except towards the apical margin, strongly raised from the base in both sexes, its sides somewhat compressed; beneath, with the depression distinct, but shallow, rather deeper in the ♀ than in the ♂, the segment at the sides not at all strongly raised from the apices of the costae.

HAB. Molokai mountains (3000 ft.). Iao Valley, Maui, 2 ♂ not quite typical, having the apical margin of the second abdominal segment red at the sides, and below the average size of the species.

(47) *Odynerus montivagus*, sp. nov.

Niger, alis infuscatis, caeruleo-iridescentibus. Caput nigrum, mandibulis rufis. Pronotum rubro-notatum. Abdominis segmentum primum margine apicali late rubro; secundum utrinque rubro-maculatum. Mesonotum subnitidum, distincte punctatum. Propodeum laeve, fere impunctatum. Abdominis segmentum 2 ventrale depressione angustula. ♂♀. Long. 6—7 mm.

Black, the mandibles red. Prothorax with red markings, the rest of the thorax black. Apical margin of the basal segment of the abdomen with a wide red band, second segment with a red spot on either side.

Clypeus distinctly dentately-emarginate at the apex (but not deeply) in the ♂, less distinctly so in the ♀. Head above the antennae more or less shining, very closely and distinctly punctured. Mesothorax and scutellum not coarsely, but somewhat deeply and remotely punctured; propodeum almost smooth, slightly shining, and nearly impunctate. Basal segment of the abdomen hardly shining, with irregular shallow puncturation; second segment rather abruptly, but not very strongly, raised

from the base; on its ventral surface it rises strongly and abruptly from the apices of the costae, its depression short and narrow and rather deep in front.

HAB. Molokai mountains (3000—4000 ft.). 1 ♂ 1 ♀. Iao Valley, Maui. 1 ♀.

(48) *Odynerus microdemas*, sp. nov.

Niger, alis infuscatis, caeruleo-iridescentibus, fronte, pronoto, mesopleuris, postscutello, lateribusque propodei rubro-notatis. Abdominis segmentum primum ex majore parte rubrum; secundum ad latera nonnunquam rubro-maculatum.

Caput supra antennis nitidum, dense punctatum. Mesonotum laeve, grosse fortiterque punctatum. Abdominis segmentum secundum minus elevatum, subtus depressione angustula. ♂ ♀. Long. 5—7 mm.

Black, the wings dark, with blue iridescence. The front of the head, the prothorax, the mesopleurae, postscutellum and sides of the propodeum have red markings. The basal segment of the abdomen is red over the greater part of its surface, and the second is sometimes spotted at the sides.

Head above the antennae closely coarsely and shallowly punctured, the apex of the clypeus hardly emarginate. Mesothorax coarsely punctured, the surface smooth between these punctures and almost (or quite) without the minute interstitial puncturation. Abdomen with the second segment not much raised from the base, shining and shallowly punctured; seen from beneath, its ventral surface is somewhat strongly raised from the costae at the sides, and even in the middle the depressed portion, where it meets these, rises up convexly from their apices; the depression itself not very wide.

HAB. Molokai mountains (3000 ft.).

(49) *Odynerus monobius*, sp. nov.

Niger, alis infuscatis, caeruleo-iridescentibus, fronte, pronoto, mesopleurisque rubro-maculatis; abdominis segmento primo postice interrupte rubro-marginato. Clypeus levissime dentato-emarginatus. Caput supra antennis laeve, distincte punctatum. Mesonotum subfortiter et irregulariter, propodeum in concavitate sua dense punctatum. Abdominis segmentum primum dense et grosse punctatum; secundum evidenter elevatum; subtus, ad latera minus fortiter sed abrupte supra costarum apices elevatum, depressione costis oblique occurrente. ♂. Long. 6 mm.

Male black, wings infuscate, with blue iridescence. A median spot behind the antennae, the prothorax in front, a spot on the mesopleurae, and the apical margin of the basal abdominal segment narrowly, red. Head above the antennae smooth,

and somewhat largely punctured. Mesothorax irregularly punctured, the punctures closer in front and much sparser posteriorly, the surface smooth with minute interstitial puncturation visible, but by no means distinct. Propodeum with the concavity densely punctured. Basal segment of the abdomen coarsely, closely, and rugosely punctured; second evidently, but not very strongly, raised from the base; beneath, the depression shallow, the segment at the sides abruptly raised above the apices of the costae, to a height about equal to that of its basal portion.

HAB. Mountains of Molokai (3000 ft.). 1 ♂.

(50) *Odynerus rubritinctus*.

*Odynerus rubritinctus*, Smith, J. Linn. Soc. xiv. p. 679. Blackburn and Cameron, P. Manch. Soc. Vol. xxv. p. 155.

*Odynerus sandwichensis*, Dalla Torre, Cat. Hym. Fam. Vesp. (nec Saussure).

Niger, pronoto nigro, fronte, tegulis, mesopleuris, scutello saepe, postscutello et propodeo rubro-notatis; abdominis segmento primo fere toto rubro, secundi margine apicali lateribusque rubris. Caput supra antennis cum mesonoto nitidum, et grosse punctatum. Abdominis segmentum secundum convexum, vix elevatum. ♂ ♀. Long. 5—8 mm.

Black, the wings infusate, with a blue or violaceous iridescence. The head in front, the tegulae, mesopleurae, the scutellum often, the postscutellum, and propodeum have red markings. The prothorax is black. Basal segment of the abdomen entirely or almost entirely, the apical margin of the second segment, and its sides, red. Head and thorax shining, coarsely punctured. Basal segment of the abdomen with close shallow punctures; second segment rather strongly convex longitudinally; beneath, at the sides, raised from the apices of the costae, the depression which is moderately wide meeting them obliquely.

HAB. Lanai, on the coast. Haleakala, Maui (4000 ft. or more). Not a rare species. Referred by Dalla Torre in his catalogue to *O. sandwichensis*, but probably distinct.

(51) *Odynerus potamophilus*, sp. nov.

Niger, fronte, pronoto, mesopleuris, tegulis, scutello, postscutello, et propodeo rubro-notatis. Abdominis segmentum primum fere totum rubrum; secundum margine apicali lateribusque suis rubris. Caput supra antennis cum mesonoto nitidum et fortiter punctatum. Abdominis segmentum secundum vix elevatum; subtus, depressione costarum apicibus oblique occurrente. ♀. Long. 7—8.5 mm.



Very closely allied to the preceding but readily distinguished by the red markings of the prothorax. The mesothorax in front is rather less coarsely punctured, the punctures are deeper and more distinct, being more distant. The structure of the second ventral segment of the abdomen is very similar in the two species.

HAB. Haleakala, Maui (4000—5000 ft.). Rare. 3 ♀.

(52) *Odynerus petrobis*, sp. nov.

Niger, subnitidus, alis infuscatis, caeruleo-iridescentibus. Fronte, mesopleuris, tegulis, nonnunquam scutello, postscutello, et propodeo, rubro-notatis. Segmentum abdominis primum late rubrum; secundum lateribus nonnunquam rubro-maculatis. Caput cum mesonoto grosse denseque punctatum. Segmentum abdominis secundum vix elevatum; subtus, depressione lata. ♂ ♀. Long. 5—8 mm.

Black, the wings with blue iridescence. The front of the head, the tegulae, mesopleurae, sometimes the scutellum, the postscutellum, the propodeum at the sides, the basal segment of the abdomen over a large part of its surface, and sometimes the sides of the second, have red markings. The prothorax and apical margin of the second abdominal segment are black. Clypeus truncate or very slightly emarginate at the apex; head coarsely and very closely punctured, especially in the ♂. Mesothorax with close and large puncturation, less regular posteriorly in the ♀; scutellum punctured, generally more finely in the ♀ than in the ♂. Propodeum with shallow, large punctures. Basal segment of the abdomen with coarse punctures, especially towards the base; second segment convex, hardly raised; beneath with the depression wide and rather deep, the segment at the sides being raised from the apices of the costae to a height equal to, or rather greater than, that of its basal portion.

HAB. Molokai coast, and in the mountains as high as 3000 ft.

(53) *Odynerus rubropustulatus*.

*Odynerus rubropustulatus*, Blackburn, P. Manch. Soc. Vol. xxv., Session 1885—1886, p. 159.

Niger, rubro-notatus, alis infuscatis caeruleo-iridescentibus, praecedenti simillimus, mesonoto minus dense punctato, thorace toto cum propodeo nigro bene distinguendus. ♂ ♀. Long. 6—8 mm.

Very closely allied to the preceding, the wings with a similar bright blue iridescence. The thorax is rather less shining between the punctures, which are

less strong; and the propodeum as well as the rest of the thorax is entirely black, without red markings. The depression beyond the costae of the second ventral segment is also of a somewhat different character, and less deep.

HAB. Mountains of Hawaii (4000 ft.), Kona and Kau districts.

(54) *Odynerus blackburni*.

*Odynerus blackburni*, Kirby, Ent. Month. Mag. xvii. p. 87. Blackburn, P. Manch. Soc. Vol. xxv. No. 8, Session 1885—1886, p. 156.

*Odynerus rubritinctus*, Smith ♂ nec ♀. J. Linn. Soc. Vol. xiv. p. 674.

Niger, alis fuscis, subaeneo-vel violaceo-micantibus, fronte, tegulis, mesopleuris, scutello plus minusve, postscutello, et propodeo rubro-notatis. Abdominis segmentum primum ex majore parte rubrum; secundum maculis lateralibus rubris. Coxis femoribusque saepe plus minusve rufis. ♂ ♀. Long. 6—9 mm.

Form and sculpture much as in the two preceding species, with which it agrees also in having the prothorax and apical margin of the second abdominal segment black. The scutellum is always spotted with red, sometimes almost entirely of that colour, and the second segment of the abdomen has large lateral red spots. The propodeum is largely red. The head, thorax, and basal segment of the abdomen are covered with large and close punctures; the second segment longitudinally convex, but not evidently raised from the base. The wings are dark with somewhat of a brassy glitter, and in some specimens with more or less violaceous iridescence, but not blue.

HAB. Kauai coast and lower slopes of the mountains. Abundant.

(55) *Odynerus soror*, sp. nov.

*O. blackburni* simillimus, sed pronoto anguste rufo-lineato, mesonoto magis nitido, postice magis profunde punctato, abdominis segmento secundo fortius convexo distinguendus. ♀. Long. 8 mm.

Very like *O. blackburni*, the wings of the same colour, without any bright blue iridescence. The prothorax in front has a narrow red line on each side, the whole thorax is more shining, the puncturation of the mesothorax is deeper and clearer posteriorly; the second segment of the abdomen is rather more strongly convex longitudinally, and beneath, its depression is rather deeper.

HAB. Mountains of Kauai in the forest (3000 ft.); 2 ♀ taken.

(56) *Odynerus frater*, D. T.

*Odynerus frater*, Dalla Torre, Cat. Hym. Fam. Vespidae.

*Odynerus pacificus*, Blackburn, P. Manch. Soc. Vol. xxv. (1885—1886), p. 159;  
(nec Kirsch).

Niger, opacus, alis obscure caeruleo-iridescentibus, abdominis segmento primo et secundo totis, vel fere totis, rufis. Clypeus emarginatus. Caput cum mesonoto peropacum, subobsolete punctatum. Abdominis segmentum secundum haud quaquam elevatum; subtus, depressione lata. Thorax cum propodeo totus niger, tegulis nonnunquam rufis. ♂ ♀. Long. 5.5—8 mm.

Black, the wings infusate and with slight blue iridescence. Two basal segments of the abdomen nearly entirely red. Clypeus distinctly emarginate, head and thorax with the surface very dull, and the punctures feebly impressed, more nearly obsolete in some examples than in others. Abdomen with the basal segment dull, closely, but very shallowly, punctured; second slightly shining, simply convex longitudinally; beneath, with the depression well-defined, meeting the apices of the costae widely at its base.

HAB. Hawaii, on the coast. Molokai and Maui coast, and lower slopes of the mountains. On the latter two islands this species has the tegulae red; those from Hawaii have these parts black.

(57) *Odynerus obscure-punctatus*.

*Odynerus obscure-punctatus*, Blackburn, l. c. p. 160.

Niger, alis infuscatis, laete caeruleo-iridescentibus, thorace cum propodeo nigro, abdominis segmentis 2 basalibus maculis rubris lateralibus ornatis. Caput supra antennis subobsolete punctatum. Mesonotum peropacum, plus minusve obscure et subobsolete punctatum, propodei puncturatione fere obsoleta. Abdominis segmentum primum aequaliter punctatum, segmenti 2 ventralis depressione lata, costarum apicibus late occurrente. Long. ♂ 6—8, ♀ 8—9 mm. (Plate I. fig. 13.)

Black, wings infusate, and with bright blue iridescence. Mandibles more or less red. Thorax and propodeum without red markings. Two basal segments of the abdomen with red lateral spots. Clypeus very slightly emarginate or truncate; head above the antennae with very feebly impressed puncturation. Thorax very dull, with very shallow more or less obsolete punctures. Propodeum with indications of large, shallow puncturation. Abdomen shining, basal segment evenly punctured;

second more finely so, somewhat strongly convex at the base in the ♂, less strongly in the ♀; beneath with a well-marked deep depression, meeting the apices of the costae widely at its base.

HAB. Kona district of Hawaii, on the coast, and in the mountains up to an elevation of 3000 ft. or more. Oahu? Beechey expedition. In the British Museum.

(58) *Odynerus dyserythrias*, sp. nov.

Niger, alis infuscatis, caeruleo-iridescentibus, abdominis segmento secundo subtus rubro, nonnunquam lateribus ejus rubro-maculatis; mandibulis rufis. Clypeus distincte dentato-emarginatus. Caput supra antennis confertissime, mesonotum dense fortiterque punctatum. Propodeum rugosum. Abdominis segmentum 2 ventrale depressione angustula, minus alta. ♂. Long. 8 mm.

Male black, the abdomen entirely black above, or with a red spot at the sides of the second segment, which beneath is nearly entirely red. Mandibles red, the clypeus distinctly dentately-emarginate; head above the antennae very densely punctured; mesothorax deeply and closely (more densely in some examples than in others), the interstices between these punctures somewhat shining and minutely punctured; scutellum very distinctly punctured, but more finely than the mesothorax; propodeum rugose. Abdomen with the basal segment closely and evenly punctured; second segment beneath raised at the sides above the apices of the costae to about the height of its basal portion, the depression feeble, with a more deeply impressed median line.

HAB. Kilauea, Hawaii (4000 ft.). Eight or nine ♂ taken, but no ♀.

(59) *Odynerus cyanoptyyx*, sp. nov.

Niger, alis infuscatis, caeruleo-iridescentibus, mandibulis cum apice clypei rufis, abdominis segmenti secundi lateribus rubro-maculatis. Mesonotum opacum, subtilius, sat distincte punctatum. Abdominis segmentum secundum juxta basim subelevatum; subtus, costis brevissimis, depressione levissima et angustissima. ♂ ♀. Long. 7—9 mm. (Plate I. fig. 28 and 28a.)

Black, the wings with bright blue iridescence, the thorax entirely black, as also the basal segment of the abdomen. Mandibles and apex of clypeus red. Second segment of the abdomen with a red spot at the sides in front, and more or less red on its ventral surface. In one example these markings are very obscure, but they can be seen in a favourable light. Apex of clypeus very slightly dentately-emarginate; the head above the antennae dull, and shallowly punctured. Mesonotum not coarsely,

but quite distinctly punctured, the surface dull. Abdomen with the surface shining, the basal segment depressed along its apical margin, with shallow puncturation; second segment evidently raised from its base, especially in the ♂; beneath with the costae very short, the depression narrow and very light, sometimes hardly evident.

HAB. Kona and Kau districts of Hawaii (4000 ft.).

(60) *Odynerus egens*, sp. nov.

Niger, alis infuscatis, caeruleo-iridescentibus, mandibulis et apice clypei rubris, abdomine toto nigro. Caput cum mesonoto peropacum, vix evidenter punctatum. Abdominis segmentum 2 ventrale costis fortibus et brevissimis, post has subplanum, depressione nulla. Long. ♂ 8 mm.

Black, the wings with blue iridescence, the apex of the clypeus and the mandibles red. Thorax and abdomen black. On the second ventral segment of the latter a faint reddish tint can be seen in a strong light. Head and thorax with the surface finely roughened, dull, the puncturation almost obsolete. With a very strong lens both systems of the thoracic punctures can be seen to be present, but very feebly impressed; the minute ones are rather less nearly obsolete, and form the chief part of the puncturation. The mesothorax in front has a smooth median line, extending back about one-third of its whole length. The second segment of the abdomen is very little raised from the base; beneath, the costae are short but strong, not so long as the basal part of the segment, which is shining; beyond the costae there is no evident depression, but the surface is nearly flat.

HAB. Kona, Hawaii (4000 ft.), Aug. 19, 1892, 1 ♂.

(61) *Odynerus nesiotis*, sp. nov.

Niger, alis infuscatis, caeruleo-iridescentibus, abdominis segmentorum 2 basaliū marginibus postice albo-marginatis. Mesonotum subnitidum grosse, fortiter, denseque punctatum. Abdominis segmentum 2 ventrale sulco nitido, costis fere obsoleteis, depressione lineari, minus distincta. ♂♀. Long. 7.5—9 mm.

Black, the wings with blue iridescence. Basal segment of the abdomen with a narrow, and the second with a wide, cream-coloured apical band. Head above the antennae, and the mesothorax, very densely, coarsely and rugosely punctured, the surface between the punctures shining. Propodeum with evident but shallow puncturation. Abdomen with the basal segment densely punctured; second segment beneath, with the sulcature for the most part smooth, with only traces of the costae at its base, the depression represented by a faintly impressed line.

HAB. Mountains of Kauai, near Makaweli (2000—3000 ft.).

(62) *Odynerus dubiosus*.

*Odynerus dubiosus*, Smith, Proc. Linn. Soc. xiv. p. 681. Blackburn and Cameron, l. c. p. 155.

Niger, alis fuscis, haud caeruleo-iridescentibus. Mesonotum vix nitidum, ♂ subgrosse, ♀ subtilius punctatum. Abdominis segmentum primum juxta basim grosse punctatum; secundum longitudinaliter convexum, vix elevatum; subtus, depressione distincta, sat lata. ♂♀. Long. 6—8 mm.

Black, the wings shining fuscous, without blue iridescence. Apex of clypeus depressed, hardly emarginate, head above the antennae with close and very shallow punctures. Mesothorax with the surface very slightly shining, somewhat coarsely punctured, but not deeply. Propodeum with very shallow punctures, giving it a more or less rugose appearance. Basal segment of the abdomen coarsely punctured at the base, the punctures becoming finer towards the apex; second segment hardly raised from the base, but longitudinally convex; beneath, with a very distinct depression, which is wide in front.

HAB. Honolulu, Waianae, &c., Oahu; on the plains. Very abundant round walls built of lava, in the holes of which it forms its cells.

(63) *Odynerus threnodes*, sp. nov.

Niger, opacus, alis fuscis, subaeneo-micantibus. Clypeus vix emarginatus. Mesonotum opacum, crebre, aequaliter, nec grosse, punctatum. Abdominis segmentum secundum minus elevatum; subtus, depressione lata, sat alta, costis oblique occurrente. ♀. Long. 6.5—8 mm.

Female black, with the wings shining fuscous and with a slight bronzy tint in certain aspects. Mandibles black, reddish at the tips; clypeus depressed at the apex, hardly emarginate; head above the antennae dull, with close but shallow punctures. Mesothorax dull, for the most part evenly and rather finely punctured; propodeum with the surface finely rugulose, the puncturation nearly obsolete. Basal segment of the abdomen in dorsal view about as long as wide, closely and shallowly punctured, the punctures coarser than those of the mesothorax; second segment scarcely raised from the base, hardly more than ordinarily convex; its sides beneath rather strongly raised from the apices of the costae, attaining a height evidently greater than that of the basal portion of the segment, the depression somewhat wide and deep, meeting the apices of the costae obliquely.

HAB. Waianae Mountains, Oahu (2000 ft. or more). 2 ♀.

This species is very closely allied to the preceding, but may be distinguished by the more shining mandibles, the duller surface of the mesothorax, which is more finely and rather more deeply punctured, and by the deeper depression of the second ventral segment of the abdomen.

(64) *Odynerus pterophaennes*, sp. nov.

Niger, nitidus, alis fuscis, micantibus, clypei apice truncato. Mesonotum nitidum sparsim irregulariter punctatum; propodeum laeve, haud dense punctatum. Abdominis segmentum secundum subfortiter elevatum, nitidum, puncturatione fere obsoleta; subtus, depressione minus lata. ♀. Long. 7.5 mm.

Female black, shining; wings fuscous, darker along the costal margin. Clypeus truncate at the apex, head above the antennae smooth and shining, with shallow punctures. Mesothorax shining, with fine sparse and irregular puncturation, propodeum smooth, but less shining than the rest of the thorax, with evident, but shallow, punctures. Abdomen shining, nearly vertical in front, coarsely punctured at the base, the punctures decreasing in size towards the apex; second segment rather abruptly raised from the base, with very fine indistinct punctures, even to the apical margin; beneath, with the depression narrow and not deep.

HAB. Oahu, a single ♀ taken in March, 1893, on the coast at Waialua, and a second in the Waianae Mountains (2000 ft.) in February, 1896.

(65) *Odynerus iopteryx*, sp. nov.

Niger, alis infuscatis, caeruleo-iridescentibus. Clypeus apice truncato; mesonotum subnitidum, sparsim subtiliter punctatum; propodeum opacum et rugosum. Abdominis segmentum primum juxta basim grosse, secundum vel ad apicem vix punctatum. ♀. Long. 7 mm.

Female black, the wings infuscate and with blue iridescence. Clypeus truncate at the apex; head above the antennae shining, with close and very shallow punctures. Mesothorax not very shining, finely and sparsely punctured, and with a distinct, but extremely fine, interstitial puncturation; scutellum with a few very feeble fine punctures; propodeum dull and rugose. Basal segment of the abdomen with very coarse shallow punctures at the base, less coarse towards the apex; second segment very strongly convex longitudinally from the base, its surface shining and without a definite puncturation, although in certain aspects traces of nearly obsolete punctures can be discerned; beneath, at the sides, it is raised from the apices of the costae to about the height of its basal portion, the depression shallow.

HAB. A single ♀ taken in the Waianae Mountains, Oahu, in April, 1892, at an elevation of over 2000 ft.

(66) *Odynerus waianaeanus*, sp. nov.

Niger, alis nitide fuscis, haud caeruleo-iridescentibus, abdominis segmento primo postice flavo-marginato. Clypeus leviter dentato-emarginatus. Mesonotum minus nitidum, subfortiter punctatum. Abdominis segmentum 2 ventrale depressione angustissima, haud alta. ♂. Long. 7 mm.

Male black, the wings fuscous, iridescent, but not blue; basal segment of the abdomen narrowly pale along its posterior margin. Clypeus slightly dentately-emarginate at the apex, head above the antennae closely punctured. Mesothorax slightly shining, somewhat coarsely and closely punctured. Propodeum with the surface somewhat smooth and bearing some large and very shallow punctures. Basal segment of the abdomen as long as wide in dorsal aspect, depressed along the apical margin, with shallow irregular punctures. Second evidently raised from the base; beneath with the depression very shallow and narrow.

HAB. Waianae, Oahu, on the coast. 1 ♂ taken.

(67) *Odynerus flosculus*, sp. nov.

Praecedenti simillimus, abdominis segmentis duobus basalibus postice albo-marginatis. ♂. Long. 7 mm.

Very like the preceding, of which it may possibly be a variety. It differs in having a rather wide yellowish-white apical band on the second segment of the abdomen, which is continued on the ventral surface. The mesothorax posteriorly is rather more rugosely punctate, and the depression of the second ventral segment is more definite, with a well-marked impressed median line.

HAB. Waianae, Oahu, on the coast; 1 ♂ taken.

(68) *Odynerus cooki*, sp. nov.

Niger, alis fuscis, nitentibus, iridescentibus, haud caeruleis; abdominis segmentis duobus basalibus postice flavo-marginatis. Mesonotum opacum, subtilius punctatum. Abdominis segmentum secundum longitudinaliter convexum; subtus, costis validis, depressione nulla. ♂. Long. 5—6 mm.

Male black, the wings shining, fuscous, iridescent, but not blue. Apical margin of each of the two basal abdominal segments narrowly yellowish-white. A minute median spot behind the insertion of the antennae, and one behind each eye of the same colour. Clypeus slightly dentately-emarginate. Head above the antennae with



obscure, ill-defined punctures. Mesothorax dull, somewhat finely and not closely punctured, the punctures shallow. Propodeum dull, with the posterior concavity rugose. Basal segment of the abdomen transverse in dorsal aspect, with shallow punctures; second simply convex longitudinally above; beneath with the costae strong, followed by a smooth space in the part usually occupied by a depression, which in this species is wanting, the segment being nearly flat beyond the costae and not elevated even at the sides.

HAB. Kealakeakua bay, Hawaii; ♂ only taken, close to the monument erected to Captain Cook.

(69) *Odynerus acelogaster*, sp. nov.

Niger, alis infuscatis, subcaeruleo-iridescentibus, clypeo, fronte, tegulis, postscutello, tibiisque flavo-notatis, abdominis segmentis duobus basalibus postice flavo-marginatis. Clypeus apice truncato. Mesonotum vix nitidum, distincte, sed postice minus aequaliter, punctatum. Abdominis segmentum 2 ventrale costis parte sua basali brevioribus, post has subplanum, depressione obsoleta. ♂. Long. 7.5 mm.

Male black, the clypeus, a median spot behind the antennae, one on the tegulae, the postscutellum, the tibiae more or less above, and the hind margin of the two basal abdominal segments, pale yellow. Wings infusate and with a blue iridescence. Apex of clypeus truncate. Mesothorax slightly shining, distinctly and rather finely punctured, more sparsely posteriorly than in front. Propodeum dull, somewhat finely rugose. Basal segment of the abdomen with shallow punctures; second somewhat raised from the base; beneath, with the costae short, shorter than the basal portion of the segment, which is tumid; beyond the costae the segment is nearly flat, and without any definite depression.

HAB. Waianae, near sea-level; 1 ♂ taken. The markings would probably vary in a series, but the species is very distinct structurally.

(70) *Odynerus vittativentris*, sp. nov.

Niger, alis infuscatis caeruleo-iridescentibus, abdominis segmentis duobus basalibus postice albo-marginatis. Mesonotum dense distincteque nec grosse punctatum. Propodeum sublaeve, vix evidenter punctatum. Abdominis segmentum 2 ventrale costis brevissimis, sat fortibus, parte sua basali tumida, post costas depressione nulla. ♂♀. Long. 8—10 mm. (Plate I. fig. 29 and 29a.)

Black, the wings infusate, and with blue iridescence, the two basal segments of the abdomen with yellowish-white apical bands, that on the second the wider. Clypeus slightly dentately-emarginate in the ♂, truncate or nearly so in the ♀.

Mesothorax dull in the ♂, generally somewhat shining in the ♀, distinctly and closely, but not coarsely, punctured. Propodeum somewhat smooth, with very obscure traces of puncturation. Basal segment of the abdomen finely and not very closely punctured; second hardly raised from the base; beneath, with the costae very short, although rather strong, much shorter than the tumid and strongly developed basal portion of the segment, beyond the costae somewhat flat, and with no evident depression.

HAB. Mountains of Kauai; not rare.

(71) *Odynerus cephalostictus*, sp. nov.

Niger, alis infuscatis, caeruleo-iridescentibus, fronte flavo-notata, abdominis segmento primo rufescente, secundi lateribus rufo-maculatis. Clypeus fortiter emarginatus. Mesonotum minus nitidum, inaequaliter subtiliterque punctatum. Propodeum opacum subobsolete rugoso-punctatum. Abdominis segmentum 2 ventrale depressione levissima, male definita. ♀. Long. 9—9.5 mm.

Female black, with a small median flavous spot behind the antennae, the basal segment of the abdomen mostly red, the second red at the sides near the base. Wings infuscate and with blue iridescence. Apex of clypeus deeply emarginate; head above the antennae not very densely punctured. Mesothorax somewhat shining, with fine shallow and irregular puncturation; between these punctures the surface is very densely and minutely punctured. Propodeum dull, with rugose and almost obsolete puncturation. Basal segment of the abdomen vertical in front, and shallowly punctured; second slightly raised from the base; beneath, with the depression very shallow and more or less vague, the segment even at the sides hardly raised from the apices of the costae.

HAB. Mountains of Molokai; rare, 3 ♀ taken between June and September, 1893, at an elevation of 3000 ft.

(72) *Odynerus axestes*, sp. nov.

Niger, fronte flavo-notata; mandibulis plus minusve rufis, abdominis segmento primo et secundo lateribus obscure rufescentibus, alis infuscatis, caeruleo-iridescentibus. Clypeus fortiter emarginatus. Mesonotum peropacum, inaequaliter leviter punctatum, propodei concavitate rugosa. Abdominis segmentum secundum longitudinaliter convexum, subtus depressione levissima. ♂. Long. 9 mm.

Black, with a median flavous spot behind the antennae, the mandibles more or less red, and the two basal segments of the abdomen obscurely reddish at the sides, the second for the most part red also beneath. Wings infuscate, with a blue

iridescence. Clypeus deeply emarginate, the head above the antennae dull, and with very shallow punctures. Mesothorax with the surface very dull, the puncturation irregular, very feebly impressed, and somewhat fine, the interstices with minute puncturation which is also very feebly impressed. Propodeum dull, the surface finely roughened, the concavity somewhat rugose. Abdomen with the second segment longitudinally convex, not otherwise raised from the base; beneath, with the depression evident, but very shallow.

HAB. Kona district, Hawaii, 4000 ft. Rare, 2 ♂ taken; June and September, 1892. Closely allied to the preceding but easily known by the very dull mesothorax, the less raised (or tuberculate) second dorsal segment of the abdomen, &c.

(73) *Odynerus insulicola*.

*Odynerus insulicola*, Blackburn, P. Manch. Soc. Vol. xxv. (1885-86), p. 163.

*Odynerus nautarum*, Dalla Torre, Cat. Hym. Fam. Vesp., nec de Saussure.

Niger; haud nitidus, alis infuscatis, plus minusve caeruleo-iridescentibus. ♂ clypeo, antennarum articulo basali, tegulis, postscutello, nonnunquam pronoto, tibiisque, flavo-notatis; abdominis segmentis 2 basalibus postice flavo-marginatis. Colore variabilis, sed clypeo semper plus minusve flavo-notato; ♀ nigra, abdominis segmento primo nonnunquam postice pallido-marginato. Clypeus fortius emarginatus. Frons capituli remote, mesonotum inaequaliter, subtiliter punctatum. Abdominis segmentum secundum haud elevatum; subtus, depressione distincta, minus alta. ♂♀. Long. 7—9 mm.

Male with the clypeus almost entirely, or only a small spot on it, yellow. The scape of the antennae, the tegulae, the apical margins of the first two abdominal segments, the tibiae, and sometimes the prothorax and postscutellum have yellow markings. Excepting that the clypeus has always (as it appears) at least a yellow spot, all these markings may be wanting, and some of them at least, generally are. Female black, with a minute spot behind the eyes, and sometimes the apical margin of the basal segment of the abdomen pale.

Clypeus distinctly, and usually somewhat angulately emarginate in both sexes; head above the antennae finely and remotely punctured. Mesothorax dull, finely and irregularly punctured, the puncturation finer in the ♀ than in the ♂. Propodeum subobsoletely and somewhat rugosely punctured. Basal segment of the abdomen with shallow, more or less even punctures; second not raised from the base, covered in fresh examples with fine sericeous pubescence; beneath with the depression rather wide, but shallow, meeting the apices of the costae obliquely.

HAB. Molokai, Lanai, and Maui, on the coast, and in open country up to an elevation of 3000 ft., but not in the forest. Dalla Torre in his catalogue refers this species to *O. nautarum*, Sauss., but that species has 'le métathorax seul ponctué.'

(74) *Odynerus nesotrepbes*, sp. nov.

Niger, alis infuscatis, subcaeruleo-iridescentibus, tegulis cum postscutello flavo-notatis, abdominis duobus segmentis basalibus postice flavo-marginatis. Clypeus distincte emarginatus. Mesonotum opacum, subtiliter et inaequaliter punctatum, interstitiis densissime et minutissime ruguloso-punctatis. Propodeum subobsolete punctatum, concavitate rugosa. Abdominis segmentum 2 ventrale depressione lata, minus alta. ♀. Long. 8 mm.

Female black, with the tegulae and postscutellum spotted with yellow, and the hind margin of the two basal abdominal segments of the same colour. Wings infuscate with very little blue iridescence. Clypeus distinctly emarginate, head above the antennae dull with somewhat remote and fine puncturation. Mesothorax dull, finely and irregularly punctured, more sparsely behind than on the anterior part. Propodeum with some large shallow punctures in front, the concavity rugose. Abdomen dull, covered with sericeous pubescence, the second segment not raised, ordinarily convex longitudinally; beneath with a well-marked, wide, but shallow depression, costae longer than the basal part of the segment, strong, but not very closely set.

HAB. Waialua, Oahu, a single example on the coast.

(75) *Odynerus lanaiensis*, sp. nov.

Niger, alis plus minusve infuscatis et caeruleo-iridescentibus. Clypeus vix emarginatus. Mesonotum dense fortiter punctatum. Propodeum opacum rugoso-punctatum. Abdominis segmentum secundum vix elevatum; subtus, depressione distincta nulla. ♂♀. Long. 6.5—10 mm.

Black, the wings infuscate, but not deeply, except along the costal margin of the anterior pair, their iridescence blue.

Apex of the clypeus hardly emarginate, head above the antennae densely punctured. Mesothorax strongly and closely punctured, the punctures rather larger in the ♂, and the surface of the thorax more dull. Propodeum rugose. Basal segment of the abdomen somewhat evenly punctured; second slightly raised from the base; beneath, somewhat flat beyond the costae, with no depression, or at the most with only a vague indication of one.

HAB. Lanai, on the coast at Manele.

(76) *Odynerus pterocheiloides*, sp. nov.

Niger, alis infuscatis, caeruleo-iridescentibus, fronte ♂ flavo-notata, mandibulis rufis. Caput cum mesonoto ♂ opacum, ♀ vix nitidum; mesonotum ♂ minus dense, ♀ sparsim subtiliter punctatum. Propodeum puncturatione fere obsoleta subrugosum. Abdominis segmentum secundum haud elevatum, subtus depressione fere obsoleta. ♀ palpi labiales pilis longis utrinque ciliati. Long. ♂ 5—7.5, ♀ 9 mm.

Black, the wings infuscate, and with blue iridescence, the ♂ with a median flavous spot behind the antennae.

Head and mesothorax dull in the ♂, and hardly shining in the ♀. Mesothorax finely, feebly, and sparsely punctured in the ♀, rather more largely and closely in the ♂, but very shallowly. Minute puncturation between these punctures distinct. Propodeum somewhat rugose, with nearly obsolete punctures. Abdomen with the second segment convex but not raised from the base; beneath, with the depression nearly obsolete. Labial palpi of the ♀ extremely long, and beautifully ciliated with long hairs. Mandibles more or less red or reddish.

HAB. Kona district of Hawaii (4000 ft.). Hawaii (loc.?), Blackburn. Mr Blackburn has sent over a ♀ of this species, as representing his *O. hawaiiensis*, but it does not at all agree with his description of that species.

(77) *Odynerus congruus*.

*Odynerus congruus*, Smith, J. Linn. Soc. xiv. p. 680. Blackburn and Cameron, P. Manch. Soc. xxv. p. 155.

Praecedenti forma et magnitudine similis, capite et mesonoto magis nitidis et laevioribus distinguendus. ♂♀. Long. 6—10 mm. (Plate I. fig. 30.)

Very closely allied to the preceding, but easily distinguished by the more shining surface of the front of the head and the mesothorax. In the ♀ the second ventral segment has no depression beyond the costae, and behind the antennae there is a median flavous spot as in the ♂.

HAB. Molokai, Lanai, and Maui, on the coast, and in the mountains, up to an elevation of 3000 ft., but not in the forest. This and the closely allied preceding species are, as far as the ♀ is concerned, very different to any other Hawaiian species. The type of the ♂ has four yellow spots on the clypeus, which is abnormal, the clypeus usually being entirely black. It is remarkable that the extraordinary appearance of the palpi has been passed over unnoticed. The locality 'Honolulu' is given in Lit. and Phil. Soc. Manch. Vol. xxv. (1885-86), p. 155, but this is no doubt an error, as in Ent. Mo. Mag. Vol. xvii. p. 87, the species is said to have been taken with *Prosopis blackburni*, an insect peculiar to Maui, and I have myself taken them together on that island.

(78) *Odynerus chelifera*, sp. nov.

Niger, alis infuscatis caeruleo-iridescentibus, mandibulis plus minusve rufescentibus vel piceis. Mesonotum opacum, distincte subtilius punctatum. Abdominis segmentum secundum haud elevatum; subtus, depressione fere obsoleta. Uterque sexus genis inter oculos mandibulasque distinctis (♀-ae longioribus) insignis. Mandibulae (♀) perlongae et angustae, dentibus fere obsoletis. ♂♀. Long. 5—7 mm. (Plate I. fig. 31.)

Black, the wings infuscate, and with blue iridescence. Mandibles more or less red or piceous on their apical portion. The cheeks between the base of the mandibles and eyes are distinct in both sexes, but longer in the ♀, in which sex the mandibles are extremely long and narrow, with the teeth obsolete or nearly so. The length of the part of the mandible, which projects beyond the apex of the clypeus, is about equal to the length of the clypeus itself. Interantennal carina very distinct and sharp, no flavous spot at its base. Mesothorax dull, distinctly but finely punctured; propodeum roughened by the subobsolete punctures. Abdomen with the second segment simple above, not raised from the base; beneath, with the depression extremely feeble and indefinite.

HAB. Kona, Hawaii (4000 ft.); Molokai and Lanai (coast to 3000 ft.). Rare. The examples from Hawaii do not altogether agree with the others, but the material is insufficient to separate them specifically.

(79) *Odynerus nigripennis*.

*Rhygchium nigripennis*, Holmgren, Eugenes Resa, Zool. vi. p. 441.

*Odynerus maurus*, Smith, J. Linn. Soc. xiv. p. 679.

*Odynerus nigripennis*, Blackburn and Cameron, P. Manch. Soc. Vol. xxv. (1885—86), p. 151.

Niger, robustus, alis infuscatis, caeruleo-iridescentibus, fronte flavo-notata. Clypeus leviter dentato-emarginatus. Mesonotum cum scutello densissime, subtilius, rugoso-punctatum. Postscutellum ad truncationem linea elevata (plerumque serrulata) munitum. Abdominis segmentum secundum haud elevatum; subtus, depressione lata, minus alta, costis subobsoletis. Long. ♂ 7—10.5 mm. ♀ 8—14 mm.

Black, the wings infuscate, and with a blue (but not bright) iridescence. A small median spot behind the antennae, and another behind each eye, often flavous. Apex of clypeus depressed, and lightly emarginate. Mesothorax finely, but very densely rugosely-punctate, the punctures generally rather larger in the ♂. Post-

scutellum with a very distinct raised line (usually serrulate or spinulose) at the truncation. Propodeum rough with large, feebly impressed, punctures. Abdomen with the second segment not raised from the base; beneath, with a wide depression, but shallow, meeting the apices of the costae obliquely, the costae themselves more or less obsolete or indistinct.

HAB. All over the islands from Oahu to Hawaii on the coast and as high as 4000 ft. in the mountains.

(80) *Odynerus radula*.

*Odynerus radula*, Fab. Ent. Syst. II. p. 269. Blackburn and Cameron, l.c. p. 150.

*Odynerus localis*, Smith, J. Linn. Soc. XIV. p. 678. (♂ nec ♀.)

Praecedenti cognatus, niger, robustus, alis infuscatis, caeruleo-iridescentibus, abdominis segmentis 2 basalibus postice flavo-marginatis. Mesonotum dense rugoso-punctatum; propodeum rugosum. Abdominis segmentum secundum haud elevatum; subtus, depressione latissima, oblique costis occurrente. Long. ♂ 6.5—11, ♀ 9—14 mm. (Plate I. fig. 14.)

Black, the wings infuscate and with blue iridescence, the apical margins of the two basal abdominal segments yellow. Of the same robust form as the preceding, and like that species with transverse basal segment of the abdomen, and a raised line at the truncation of the postscutellum. On the mesothorax two forms of puncturation can be made out in the ♂, consisting of larger and smaller punctures, the whole forming a dense and subrugose puncturation. In the ♀ the mesothoracic puncturation is almost identical with that of the preceding. The depression of the second ventral segment is wide and shallow, the costae are less obsolete than those of *O. nigripennis*.

HAB. Kauai, common on the coast and in the mountains, occupying the place which *O. nigripennis* holds on the other islands. It is evidently a directly modified form of that species.

(81) *Odynerus localis*, Smith.

*Odynerus localis*, Smith, J. Linn. Soc. XIV. p. 678. (♀ nec ♂.)

Niger, alis infuscatis, caeruleo-iridescentibus, abdominis segmentis 2 basalibus postice albo-marginatis. Mesonotum ♂ dense rugoso-punctatum, ♀ creberrime subtilius punctatum. Postscutellum linea elevata munitum. Abdominis segmentum primum subdepressum, parte anteriore dorsali parti subacute occurrente; secundum

haud elevatum; subtus depressione minus lata. ♂♀. Long. 8—17 mm. (Plate I. fig. 15.)

Allied to the preceding species, but with the abdominal bands wider. The scutellum is more rugosely punctured, and the basal segment of the abdomen is differently formed, being somewhat depressed from the base to the apex, and where the anterior and dorsal surfaces meet a comparatively sharp edge is formed, instead of this part being evenly rounded off. The depression of the second ventral segment is much less wide at its base, occupying only about the middle third of the segment, and the middle costa of the series is conspicuously long. The abdomen is altogether more shining, as also the surface of the mesothorax of the ♀.

HAB. Mountains of Kauai. Not rare.

The following five species of the genus *Odynerus* were brought back by the Beechey expedition many years ago. Probably all were collected at or near Honolulu, and most if not all of them are in that case now extinct. Neither the Rev. T. Blackburn nor myself have met with any of these species. The descriptions of the first two are copied from de Saussure's *Etud. Fam. Vesp.* (Pt. III.). The types were originally in the British Museum, but apparently no longer exist. A single insect in that collection was assigned to *O. nautarum*, de Sauss. but does not agree with the description. Under the name *O. sandwichensis*, de Sauss. (or rather *sandwithii*!), were placed several insects of three quite distinct species, none of which could possibly have been the subject of de Saussure's description.

"*Etud. d. Fam. Vesp.* (Pt. III.). *Mon. Masar. et Suppl.* p. 289. Div. *Antodynerus*."

(82) "*O. nautarum*, n. sp."

"*Niger signaturis flavis: abdominis fasciis duabus flavis.*"

"Long. 9 mm.; env. 18 mm."

"Mâle. Formes allongées de l'*O. punctum*. Métathorax arrondi, lisse au milieu. Chaperon bituberculé au bout. Insecte noir, lisse; le métathorax seul ponctué. Chaperon, un point au haut des mandibules, devant du premier article des antennes, jaunes. Deux taches sur le prothorax, écaille, un tache sur l'aile, postécusson et une bande interrompue sur l'écusson, jaunes. Les deux premiers segments de l'abdomen ornés d'un large bordure jaune. Pattes noires; les tibias seuls, jaunes d'un côté; tarsi noirs. Ailes hyalines, la côte enfumée, et le bout un peu violet.

Var. Écailles, écusson, et antennes noires.

Habite: Les îles Sandwich. (Musée de Londres.)"



(83) "*O. sandwichensis*, n. sp."

"*Parvulus, niger, perdepressus; postscutello, metathorace, abdominis primo segmento, secundi margine et lateribus, rubris; alis caerulescentibus.*"

"Long. 7 mm.; env. 15 mm."

"Mâle. Petit, grêle, très déprimé. Métathorax dépassant de beaucoup le post-écusson, arrondi. Abdomen très plat; le premier segment en cloche, moins large que le deuxième. Insecte noir, ponctué, mais lisse et luisant. Entre les antennes un point rouge; un autre sous l'aile; deux autres sur chaque écaille; postécusson et métathorax d'un rouge sombre; le premier segment de l'abdomen, le bord du deuxième et ses côtés, de la même couleur, ainsi qu'un fin liseré le long des autres segments. Pattes noires. Ailes assez brunes, avec un reflet violet; deuxième cubitale subtriangulaire.

Distinct par sa forme très aplatie.

Habite. Les îles Sandwich. (Musée de Londres.)"

OBS. This species is evidently closely allied to *O. rubritinctus*, Sm.

The three following species are in the collection of the British Museum, and each is represented by only a single example. They appear to be distinct from any of the species collected by me.

(84) *Odynerus infaustus*, sp. nov.

Niger, mandibulis clypeique parte apicali rubris. Caput cum mesonoto obsolete punctatum. Abdominis segmentum secundum ventrale haud post costas depressum, parte basali permagna, costis multo longiore. ♀.

Black, mandibles and apical half of the clypeus red, the latter faintly emarginate at the apex. Head and whole thorax dull, the puncturation obsolete. Abdomen with the punctures of the basal segment very feebly impressed. Second ventral segment beneath with the basal portion very large, several times as long as the short costae, beyond which there is no depression. Wings dark, with violet iridescence.

HAB. Brought back by the Beechey expedition, probably from Oahu. The species appears to be very closely allied to *O. egens*, next to which it may be placed.

(85) *Odynerus oblitus*, sp. nov.

Niger, alis fuscis, abdominis segmentum basale postice testaceo-marginatum. Mesonotum opacum subtiliter sparsim punctatum, necnon etiam interstitiis subtilissime distincte punctulatis. Abdominis segmentum secundum ventrale post costas haud depressum, costis fortibus. ♂.

Black, the wings fuscous without blue iridescence, the apical margin of the basal segment of the abdomen testaceous, perhaps yellow in fresh examples. Clypeus faintly emarginate at the apex. Head dull, finely, feebly, and irregularly punctured. Mesothorax dull, very finely and sparsely punctured, and with a distinct and very minute puncturation between the larger punctures. Propodeum dull impunctate. Basal segment of the abdomen obsoletely punctured; second, beneath, with strong costae and beyond their apices flat, with no depression.

HAB. Brought back by the Beechey expedition, probably from Oahu. A single much mutilated ♂ example in the British Museum.

(86) *Odynerus relictus*, sp. nov.

Niger, capite cum thorace flavo-notato. Abdominis segmenta duo basalia postice flavo-marginata. Mesonotum opacum, sat evidentiter, subirregulariter, punctatum. Abdominis segmentum primum leviter punctatum; secundum ventrale post costas haud depressum, costis distinctis, parte sua basali sat brevi. ♂.

Male black, the mandibles with a small yellow spot at the base. The clypeus, a small spot on the scape of the antennae, one behind their insertion, two on the prothorax, others on the tegulae, and the postscutellum, yellow, as well as the apical margin of the two basal abdominal segments. No doubt these yellow markings would be variable in a series of examples. Head dull, subobsoletely punctured; thorax dull, evidently, but somewhat irregularly, punctate, and with the system of interstitial minute puncturation distinct; scutellum irregularly punctured, the propodeum dull, with the surface somewhat roughened by large subobsolete punctures. Abdomen with the basal segment feebly punctured; second convex, distinctly punctured on its yellow apical margin; beneath, its basal portion is short, the costae are distinct, and there is no depression beyond them. All the tibiae have a yellow line above. The wings are infuscate, and have a slight blue iridescence.

HAB. Probably from Oahu (Beechey expedition). A single ♂ example in the British Museum under the name of *O. nautarum*, de Sauss. The description of that species says "le métathorax seul ponctué," which will not at all agree with the insect above described. This species might be placed near *O. insulicola*, Blk.

Two species described by the Rev. T. Blackburn, *O. hawaiiensis* and *O. haleakalae*, I have not been able to identify with any certainty, not having seen the original specimens. Mr Blackburn very kindly sent me an example under the former name, but it was quite clearly not the subject of his description. This example belongs to the species I have called *O. pterocheiloides*, and is excessively closely allied to *O. congruus*, Smith. There is no trace of tuberculation on the second segment of the abdomen, and this alone is sufficient to distinguish it from *O. hawaiiensis* as described, but it is certain from the remarks made at the end of the description of *O. hawaiiensis*, that several species were included under that name. As regards *O. haleakalae* I cannot refer it for certain to any particular one of the species found on Maui. There is no doubt, however, that both these species will prove referable to two of the species which I have described under new names. Possibly *O. hawaiiensis*, Blk. is the same as my *O. erythrognathus*, and *O. haleakalae*, Blk. as *O. ecostatus*.

## ANTHOPHILA.

## OBTUSILINGUES.

*Nesoprosopis*, gen. nov.

Under this generic name I propose to separate certain bees which have hitherto been referred to the genus *Prosopis*, although at present it is necessary to rely on ♂ characters for the separation. In all the species examined (and these comprise most of the 52 species known to me) the 8th ventral segment is highly peculiar, and although exhibiting great variety in detail, yet always maintains the same general form. Its apex is always produced into an extremely long process, which on the ventral side rises erect or suberect from the body of the segment. In its simplest form the process is a delicate curved rod, expanded at the apex, or more usually bifurcated, the bifurcations being more or less recurved. On its apical portion at least it is clothed with long hairs. In many of the species the process is greatly expanded dorso-ventrally, so that in extreme cases it may be nearly as wide as long, and the apical bifurcations are also sometimes greatly expanded. All intermediate conditions between this and the simple form may be seen in the various species known from the islands.

The extreme apex of the process is always exposed in life, showing beyond the sixth segment, which is more or less compressed or carinate, and emarginate at

the apex, the ventral surface of a part of the process resting within the carina. The seventh segment is entirely concealed, and in strong contrast with the eighth shows little specific modification. It is produced at the apex into two processes, one on either side, which are more or less bent downwards. These processes are longer in some species than others, and are not hairy as is the apical process of the eighth segment.

The genital armature itself is also remarkably similar, even in the most widely separated species. The stipites are thin, somewhat concave inwardly, and simple, there being no trace of a lacinia. On the apical portion they are always clothed with long hairs. The sagittae do not extend as far as the apex of the stipites, being strongly curved downwards a little before that point is reached, or in one or two species (owing to the length of the stipites) considerably before.

The sculpture of the various species is remarkable for its feebleness. The puncturation is always fine and shallow, and excepting a group of species, which are relatively of very great size, there is in no case any definite abdominal puncturation. This extraordinary similarity of sculpture adds greatly to the difficulty of differentiating the species. The anterior area of the propodeum is but ill-defined, and its posterior face always bears a longish erect pubescence.

The habits of the bees of this genus exhibit considerable variety. On the coast and dry mountain slopes they form their burrows in the ground, but in thick forests and wet districts their cells are made in dead wood, generally of standing trees. The larval food contains comparatively little pollen, as these bees have no special polliniferous apparatus, and in cells that I have opened the larva was floating on the liquid food. Such pollen as is collected is swept towards the mouth by the curved hairs on the anterior tarsi, and regurgitated with the honey. Some species are quite peculiar to the coast region, others to the forests, and a few to the region above the forest line. A few are found in dense and gloomy woods, which bees would hardly be expected to inhabit, and may be seen flying round some bush, where a little sunlight is able to penetrate.

In the following descriptions I have used the term 'anterior area' for that part of the propodeum called by Smith 'the enclosed space of the metathorax,' the 'basal area' of many other hymenopterists. In the Hawaiian species it is not enclosed, and should, I think, rather be called the apical than basal area. In any case the term used avoids any possible confusion. All the known species, where possible, have been redescribed, the old descriptions being insufficient for their determination.

The species of *Nesoprosopis* form several more or less definite groups. One of these is easily distinguished by the evidently punctate abdomen of both sexes, and the large, robust form, at least of the females. *N. fuscipennis* is typical of this group, to which also must be referred *N. andrenoides*, a most remarkable species, resembling at first sight a medium-sized or rather small *Andrena*. It differs from

all the other large species in its nearly impunctate metallic abdomen, which bears fasciae of white pubescence. A second group is defined by its parasitic habits, and the clothing of the front tarsi of the ♀, the hairs of which have not the regular curved form of the industrial species. The females of all the parasitic species but one have the abdomen ferruginous at least at the base, but in two species the males are black or nearly so. Very closely allied to this group is another, the females of which are industrial, and provided with well-developed curved sweeping hairs on the front tarsi. The face is always long, and the pubescence of the front of the head is very short and inconspicuous. The remaining species form several ill-defined groups, none of which are parasitic, and in all the abdomen is impunctate or nearly so. The front of the head is clothed with more or less long hairs, at least in those which have the face elongate. Several species are distinguished by their small size, narrow form, and the more than usually long dorsal surface of the propodeum. *N. crabronoides* is the most striking species of this group. Others are remarkable for the great width of the face across the eyes, e.g. *N. laticeps* and its allies. Finally there are a number of species closely allied to *N. facilis*, which comprise the least remarkable species of the genus. The face is not extremely short and wide, nor is the form very narrow; the dorsal surface of the propodeum is short. These three last-mentioned groups, however, seem to be connected by intermediate forms.

The specific characters of the ♂ are chiefly to be found in the amount of dilatation of the scape of the antennae, the markings of the face (which, however, vary a good deal in some species), and the relative length and width of the head. The eighth ventral segment, which it is necessary to extract for examination, also furnishes very useful characters. If the scape of the antennae be viewed from the front, so that the front edge instead of the flattened surface be examined, it will be seen to be more or less concave beneath. The height and form of the arch so formed often furnishes useful specific distinctions. The females are much more difficult to separate, and in a few cases I see no specific distinction between two species, although the males are quite distinct. The shape of the head and its puncturation in front, the sculpture of the anterior area of the propodeum, the colour of the wings, and of the hairs on the apical segment of the abdomen, as well as the facial and prothoracic markings when present, furnish the most useful characters.

(1) *Nesoprosopis facilis*.

*Prosopis facilis*, Smith, J. Linn. Soc. xiv. p. 683.

*Prosopis facilis*, Blackburn and Cameron, P. Manch. Soc. Vol. xxv. (1885—86), p. 142. (Plate II. fig. 1, and fig. 8—8 h.)

Male black, with the clypeus, the plate above it, and an elongate spot on either side adjoining it, flavous; front tibiae and more or less of the front femora testaceous

inwardly, intermediate and posterior legs black or nearly so. The sides of the face are widely and deeply depressed along the inner margins of the eyes; the antennae black with the scape dilated, about twice as long as wide, and strongly arched beneath; head above the antennae with the surface rough, shallowly punctured, clothed with rather long pubescence; mesothorax dull, with fine and shallow puncturation, that of the scutellum rather more distinct; wings more or less infusate; propodeum longitudinally rugose to the brow, the rugosities more regular in some individuals than others; abdomen with the surface rugulose, with hardly definite or visible puncturation; beneath, with the sixth segment emarginate at the apex and carinated behind the emargination; process of the eighth sublinear, rising erect from the body of the segment and curved, bifurcate at its apex, very densely clothed with hairs on its apical half, the bifurcations with a long and regular fringe; genitalia with the stipites much produced at their apex, with long hairs on their outer margins, which do not extend to the extreme apex, being almost absent on the submembranous apical portion.

Female black, without any yellow markings on the face; head above the antennae pubescent as in the ♂, the antennae simple, and the face much wider between the eyes; mesothorax with very similar puncturation, but generally more clearly defined, as also is the anterior area of the propodeum, and more regularly longitudinally rugose; abdomen without definite puncturation, the terminal segments with dark pubescence above and beneath. Length, 6—9 mm.

HAB. Common generally on Oahu, Maui, Lanai, and Molokai, in dry or moderately dry localities, from the coast to an elevation of 4000 ft. in the mountains.

OBS. This is not a very variable species so far as the facial markings of the ♂ are concerned. The elongate spots adjoining the clypeus and that on the plate behind it are sometimes diminished in size or rarely absent. The latter part, although its sides are always longer than the apical margin, is variable, the length of the sides being considerably greater (in proportion to the length of the anterior margin), in some examples than in others. Those from Maui, Lanai and Molokai have this plate extremely long and narrow, but not more so than in some Oahuan specimens. The latter often have the wings clearer, and with a less distinct blue iridescence than those from the other islands, they are also on the average of smaller size, and the pubescence of the mesothorax is often paler in colour.

(2) *Nesoprosopis chlorosticta*, sp. nov.

Praecedenti colore ac puncturatione simillima, sed ♂ tibiis tarsisque posticis basi flavo-maculatis, capite latiore distinguendus. ♂ ♀. Long. 6—7.5 mm.

This species is very closely allied to the preceding, but the ♂ is easily distinguished by the yellow base of the posterior tibiae and tarsi, and apparently is not variable in this respect, as I have examined a fine series. It also has the face evidently wider across the eyes than *facilis*. The female is much more difficult to separate, but the face appears to be slightly wider, and the average size of the insect considerably less.

HAB. Mountains of Kauai (2000—4000 ft.). It is also found on the coast.

(3) *Nesoprosopis simplex*, sp. nov.

Praecedentibus simillima; ♂ tibiis posticis haud flavo-notatis; genitalium stipitibus minus productis, et usque ad apices longe ciliatis, distinctus. ♂ ♀. Long. 6—9 mm. (Plate II. fig. 9.)

In general appearance and puncturation very like the two preceding species; the ♂ may be known at once from *N. chlorosticta* by the entirely dark posterior tibiae, and from either by the genital armature, the stipites of which are less produced, and fringed right up to the apex with long hairs. The plate above the clypeus is very variable in its proportions, the length of its lateral margin being sometimes longer, sometimes equal to, or even shorter than its anterior margin. I see no character to separate the ♀ from that of *facilis*; the wings are strongly and entirely infuscate with evident blue iridescence, wherein they especially resemble examples of that insect, from Maui and Molokai, although their average size is less.

HAB. Island of Hawaii, generally distributed from 1500—4000 ft. elevation, and abundant.

(4) *Nesoprosopis hirsutula*, sp. nov.

Praecedentibus cognata, sed capite latissimo, latiore quam longiore; ♂ tibiis basi longe flavescentibus, tarsis haud maculatis; segmento ventrali 8° apice haud longe bifurcato, bene distinctus. ♂ ♀. Long. 6—9 mm. (Plate II. fig. 10—10 c.)

Male with the face very broad, transverse, the scape of the antennae slightly dilated, not quite so much as in *N. facilis*, &c., nor quite so strongly arched beneath: the clypeus, a small spot on either side of it, and the plate above it, pale yellowish-white. The latter two markings are variable, sometimes absent. The plate above the clypeus is very wide; cheek between the eye and mandible extremely short; clypeus clothed with rather long erect hairs, generally of an obscure colour; head above the antennae with long, dark pubescence, and roughly punctured. Thorax with rather long obscure pubescence; puncturation very like that of *facilis*, sometimes perhaps rather stronger; posterior tibiae white at the base, but the tarsi dark; eighth ventral segment of the abdomen with the process without long apical bifurcations.

Female very like the ♂, the face very wide with obscurely-coloured pubescence: cheek extremely short; the scutellum more or less shining; apical segments of the abdomen above and beneath with the hairs black or of an obscure colour.

HAB. Mountains of Kauai, 3000 ft., and on the high plateau.

(5) *Nesoprosopis difficilis*, sp. nov.

Nigra, mesonoto griseo-pubescente, subtiliter nec dense punctato, propodeo antice rugoso, alis plus minusve hyalinis, haud caeruleo-iridescentibus; ♂ articulo 1° antennarum dilatato, subtus fortiter arcuato, bis longiore quam latiore; capite prae antennis, necnon saepe tibiis tarsisque plus minusve flavescentibus; genitalium stipitibus apice rotundatis ac fimbriatis, haud productis; ♀ pedibus, segmentisque abdominis apicalibus pallide pubescentibus. ♂ ♀. Long. 5—8.5 mm. (Plate II. fig. 11—11c.)

♂ Black, with the clypeus, the plate above it, and a spot on each side adjoining it, yellow; anterior tibiae pale in front; antennae with the flagellum often more or less pale beneath; the posterior legs often have the tibiae and basal joint of the tarsi more or less yellow, sometimes also the intermediate legs are similarly coloured. All these markings are variable, the posterior and intermediate legs are often entirely dark. The general appearance is that of *N. facilis*, &c., the head being of similar form and in typical specimens similarly marked.

Antennae with the scape dilated as in *N. facilis*, about twice as long as wide, and strongly arched beneath; plate above the clypeus generally short, the length of each of its sides to the antennal fossa subequal to or less than the length of its anterior margin; cheeks between the eye and base of the mandibles short; head above the antennae dull, with roughened surface, closely and shallowly punctured, clothed with long grey hairs. Mesothorax and scutellum clothed with somewhat long, erect, grey pubescence, puncturation much as in *N. facilis*, &c., the punctures fine and very shallow, but not very close, the fine rugosity of the surface and the pubescence generally giving them an indistinct appearance; anterior area of the propodeum longitudinally rugose, wings subhyaline, or quite clear in fresh examples. Abdomen as in *N. facilis*; genital armature with the stipites rounded at the apex, not at all produced, evenly fringed with long hairs; eighth ventral segment apparently rather variable, its process towards the apex clothed with hairs, but with a less dense covering than that of *N. facilis*, its apex not bifurcated into long branches, but usually only slightly dilated at the extremity, rarely with the angles of the dilatation more or less produced.

Female in general appearance very like that sex of *N. facilis*. Head above the antennae dull, with roughened surface, closely and shallowly punctured, clothed with long pubescence. Mesothorax very finely punctured; propodeum with the anterior



area more or less regularly longitudinally rugose; wings hyaline or subhyaline without blue iridescence; abdomen without definite puncturation, calcaria testaceous; legs and the apical segments of the abdomen above and beneath with pale pubescence.

HAB. Molokai, Lanai, Maui and Hawaii; abundant in the mountains. This is a most perplexing species on account of its variability. In general appearance and sculpture it greatly resembles *N. facilis* and the allied forms. The yellow markings of the face in the ♂ are variable, being sometimes reduced in size, or altogether absent except that of the clypeus, which is always yellow over at least the greater part of its surface. Structurally the ♂ is quite distinct from the three species first described, by the simply rounded apex of the genital armature, which is not at all produced, and by the differences in the process of the 8th ventral segment. The female may be known by the clearer wings which are without blue iridescence and by the pale pubescence of the legs, and terminal segments of the abdomen. Sometimes the abdomen is of an immature reddish colour, as is also the case in other of the Hawaiian species which are normally black, the paler forms being apparently produced when the individuals arrive at maturity after an unusually short period has been occupied in the earlier stages.

(6) *Nesoprosopis laeta*, sp. nov.

Nigra, subnitida, praecedenti simillima, sed mesonoto et scutello subtilissime punctatis et laevioribus; metanoto minus rugoso; ♂ tuberculis pedibusque fere semper flavo-notatis; antennarum articulo primo fortiter arcuato; ♀ tuberculis saepe flavo-notatis, genis brevissimis. ♂♀. Long. 5—7 mm.

Closely allied to the preceding, the yellow markings variable. In the most brightly coloured males the following parts are yellow; the front tibiae in front and within, the intermediate tibiae inwardly, and the base and apex also outwardly; the posterior, except for a black spot towards the apex inwardly, and a more or less distinct fuscous stain outwardly; the basal joint of all the tarsi and sometimes also the apical ones, as well as the extreme apex of all the femora; the clypeus, the plate above it, an elongate spot on either side, and the tubercles of the prothorax are also yellow. In general the basal joint of all the tarsi, and the base of the posterior tibiae widely, are yellow. Of forty or fifty specimens of the ♂ one only has the legs entirely of an obscure colour, and this also has the tubercles black; while of about a score of the other sex, three or four have the tubercles black, and some of them have the posterior tibiae widely yellow at the base.

Male with the antennae formed much as in the preceding, the scape being strongly arched beneath, the lower surface of the flagellum pale; the plate above the clypeus as long to the antennal fossa, as the length of its apical margin, or rather longer; the

cheeks between the mandible and eye very short. Mesothorax slightly shining, evenly clothed with pale hairs, very finely and shallowly punctured; the scutellum more shining, and also very finely punctured; propodeum finely longitudinally rugose in front. Abdomen without definite puncturation, the apex with pale hairs; process of the 8th ventral segment bifurcate at the apex.

Female generally with a spot on the tubercles of the prothorax, and sometimes the base of the tibiae and tarsi pale; wings subhyaline, cheeks very short as in the ♂; mesothorax slightly shining, and clothed with very short pale erect pubescence; scutellum smooth and shining, finely and sparsely punctured; propodeum finely longitudinally rugose in front; apex of the abdomen above and beneath with pale hairs.

HAB. Oahu both mountain ranges (2000—3000 ft.) and also on the coast at Waianae. Kauai, Makaweli (3000 ft.) and Halemanu (4000 ft.).

Examples taken on the coast of Molokai and Maui, which are of larger size, appear referable to this species, as also others (from the mountains of the former island), having the abdomen red. It is not improbable that both this species, and the preceding, as characterized above, in reality include several distinct forms.

(7) *Nesoprosopis kona*.

*Prosopis kona*, Blackburn, P. Manch. Soc. xxv. (1885—86), p. 144.

Female, black, with a narrow line bordering the eyes, two spots on the prothorax, the tubercles, a spot at the base of the anterior and intermediate tibiae, and the basal half of the posterior, yellow. Face somewhat long, the clypeus lightly emarginate at the apex, the head above the antennae clothed with long pale hairs, and shallowly punctured. Mesothorax and scutellum dull, with exceedingly minute and remote punctures. Anterior area of the propodeum with the longitudinal rugosities extremely short. Wings clear. Apical segment of the abdomen with dark hairs. All the tarsi dark.

Male, black, the whole face below the antennae yellow, and this colour is extended backwards along the margin of the eyes above the insertion of the antennae, as in *N. blackburni*. A line on the prothorax, the tubercles, all the tibiae, and the basal joints of the tarsi, yellow. The tibiae are spotted with black. Basal joint of the antennae dilated, not so wide as long, the sides strongly rounded. Thorax, dull with very fine and remote puncturation, propodeum more shining, and with some oblique wrinkles. Length 5—7 mm.

HAB. Kona, Hawaii (4000—6000 ft.). I have only seen the ♀ of this species, and the description of the ♂ is condensed from that given by Blackburn (*l.c. supra*). Although the coloration of the face is like that of several species of the *N. blackburni* group, I believe this species is more closely related to *N. facilis* and its allies.

(8) *Nesoprosopis volcanica*, sp. nov.

*N. difficilis* simillima, ♂ antennarum articulo primo subtus levius arcuato, lamina supraclypeari angustiore, genis longioribus, segmenti 8<sup>i</sup> apice longe bifurcato; ♀ genis longioribus, scutello magis opaco distinguenda. ♂♀. Long. 6—8 mm. (Plate II. figs. 12—12b.)

This species has the form and general appearance of *N. difficilis*, and the facial markings of the ♂ are similar to those of that species, and similarly variable. The legs are nearly always entirely dark, without yellow markings.

Male, with the scape of the antennae rounded on its posterior margin, about twice as long as wide, as in most of the foregoing species, but very distinctly less strongly arched beneath; cheeks between the mandible and eye longer, and the plate above the clypeus narrower in proportion to its height, than in *N. difficilis*. Mesothorax and scutellum dull from the surface rugulosity, clothed with long grey hairs, as also is the front of the head behind the antennae; wings clear in fresh examples. Process of the 8th ventral segment with long delicate bifurcations at its apex.

Female, very like the ♂ apart from sexual differences, the head and thorax being similarly clothed, the cheeks unusually long, the scutellum quite dull, the wings hyaline or subhyaline.

HAB. Hawaii, near the active crater Kilauea, where it is abundant. I have also taken it in the Kona district at a similar elevation (4000 ft.), and at the bottom of the crater of Haleakala, Maui (7000 ft.).

(9) *Nesoprosopis nivalis*, sp. nov.

Nigra, opaca, genis longissimis, capite et mesonoto pubescentia longa vestitis; ♂ capite, ut praecedentis, flavo-decorato, utrinque juxta oculos fortiter depresso; antennarum articulo primo fortiter dilatato, lateribus rotundatis, longiore quam latiore; ♀ scutello opaco, aequaliter distincteque punctato. ♂♀. Long. 6—8 mm. (Plate II. figs. 13 and 13a.)

Male, with the face very long and narrow between the eyes, the cheeks between the mandibles and eyes extremely long; the clypeus, the plate above it and a spot on each side of it, yellow; these markings are variable, the spots varying in size, and those outside the clypeus may be entirely wanting; antennae with the scape much more strongly dilated than in the preceding species, having both its anterior and posterior margins rounded, but its length is evidently greater than its width. The face is very deeply depressed at the sides, then strongly raised round the

antennal fossae, forming a ridge which partly encircles them. Mesothorax dull, clothed with long grey hairs, the surface finely roughened, with very shallow, obscure and rather close puncturation; scutellum with close shallow punctures; the anterior area of the propodeum longitudinally rugose; the base of the posterior tibiae, and the basal joint of the posterior tarsi, pale. Abdomen with the 6th ventral segment emarginate at the apex, and carinated behind the emargination, its sides also emarginate; process of the 8th shortly bifurcated at the apex, or apparently sometimes truncate.

Female, very like the ♂ apart from sexual differences; entirely black, with the face very long between the eyes, and the cheeks extremely long; head and thorax clothed as in the ♂. Mesothorax dull, finely, closely and shallowly punctured; scutellum with very distinct, close, and even, but shallow puncturation; apex of the abdomen with pale hairs.

HAB. Haleakala, Maui, above the forest nearly to the summit of the mountain (10000 ft.). Frequents the flowers of *Cyathodes* etc. and is very abundant, but I took only a small series.

(10) *Nesoprosopis rugulosa*, sp. nov.

♀ nigra, griseopubescentis, haud nitida, mandibulis truncatis, haud distincte dentatis; genis brevissimis; mesonoto densissime ruguloso, subtiliter punctato; propodei area antica irregulariter rugosa; abdominis segmentis ventralibus distinctius ciliatis; alis subhyalinis. ♀. Long. 6 mm.

Female, black, antennae with the flagellum sometimes pale beneath; head with grey pubescence, mandibles somewhat obliquely truncate at the apex, and not toothed; cheeks extremely short, so that towards the clypeus the base of the mandible nearly touches the eye; the clypeus is closely and very shallowly punctured, the punctures ill-defined; the suture of its lateral margins with the sides of the face somewhat deeply impressed; head above the antennae closely and rather largely, though shallowly punctured. Mesothorax with grey pubescence, its surface dull, densely and excessively finely rugulose, the puncturation fine, shallow and indistinct; scutellum more largely punctured; propodeum irregularly rugose in front. Abdomen with the basal segment hardly shining; intermediate ventral segments pale at their apices, and rather distinctly ciliated along them with white decumbent hairs.

HAB. Kilauea, Hawaii (4000 ft.), 2 ♀. I do not know the ♂.

(11) *Nesoprosopis vicina*, sp. nov.

♀ nigra, genis brevibus, capite supra antenas levissime rugoso, haud dense punctato; mesonoto aequaliter subtiliter punctato; propodeo antice longitudinaliter

rugoso; abdominis segmento primo pernigro, nitido, subtilissime ruguloso; alis subhyalinis. ♀. Long. 6 mm.

This species is extremely like several of the preceding, but without doubt distinct. The mesothorax and scutellum are quite dull, smooth except for the very fine rugulosity of their surface, clothed with short pubescence, and finely and evenly punctured; the mesopleurae are not at all strigose or rough but are finely punctured. The basal segment of the abdomen is deep, black and shining; the apical segments clothed with dark pubescence.

HAB. Oloa, Hawaii (2000 ft.); a rare species. I took only two or three specimens, and have not seen the ♂.

(12) *Nesoprosopis koae*, sp. nov.

♀ nigra, praecedenti simillima, capite supra antennis minus opaco, et distinctius punctato; thorace minus opaco; alis infuscatis, ad apices subcaeruleo-iridescentibus, facile distinguenda. ♀. Long. circa 6 mm.

This is a very distinct species; the thoracic puncturation appears to be identical with that of the preceding, but the head above the antennae is less dull, and more distinctly punctured; the mesothorax less dull, and the scutellum somewhat shining.

The wings are entirely infuscate, with distinct bluish iridescence on their apical portion in certain lights. The longitudinal rugosity of the propodeum is unusually short. The basal segment of the abdomen deep black, and shining, as in the preceding, and the apical segments clothed with black hairs.

HAB. Mountains near Honolulu, Oahu (above 2000 ft.). A single specimen was taken in 1892. In March, 1897, three more females were taken from the blossoms of *Acacia koa*.

(13) *Nesoprosopis connectens*, sp. nov.

♂ niger, clypeo macula flava magna ornato, capite brevi, trans oculos lato, lamina supraclypeari latiore quam longiore; antennarum articulo primo haud fortiter dilatato; alis infuscatis; segmenti 8<sup>i</sup> ventralis parte producta minus fortiter dilatata, apice bifurcato et ciliato. ♂. Long. 6 mm.

Male, black, the clypeus with a large yellow spot, the front tibiae yellow inwardly. Face short and wide across the eyes, the apical margin of the plate above the clypeus much longer than its side to the antennal fossa. Antennae with the scape about twice as long as wide, and strongly arched beneath. Head above the antennae finely rugulose, dull, and very shallowly punctured. Mesothorax and scutellum finely

punctured, dull, the pubescence of the former short. Propodeum longitudinally rugose in front. Wings rather strongly infusate, and with a slight blue iridescence. The process of the 8th ventral segment of the abdomen is evidently but not at all strongly dilated, its apical bifurcation more strongly so, and ciliated with long hairs.

HAB. A single ♂ was taken in the Iao valley, Maui. A female captured with it is evidently of the same species, and is very closely allied to *N. koae*, but this example is much mutilated. A single ♀ taken on Lanai is also extremely close to, if not identical with, one of these species.

(14) *Nesoprosopis melanothrix*, sp. nov.

Nigra, capite, thorace et abdominis segmentis apicalibus densius nigro-pubescentibus; propodei rugis longitudinalibus antice brevissimis, vel absentibus; mesonoto et scutello subaequaliter punctatis; alis infuscatis caeruleo-iridescentibus; ♂ capite prae antennis toto nigro, aut maculis tribus flavis ornato; antennarum articulo 1° fortissime arcuato, scutello opaco; ♀ scutello nitido, clypei apice distincte angulatim emarginato. ♂♀. Long. 6—8 mm. (Plate II. figs. 14—14c.)

Male, entirely black, except the testaceous front of the fore tibiae, or with the clypeus, and a spot on each side bordering the eyes, yellow, or with the latter markings only present; the clypeus is more or less emarginate at the apex, clothed with dark, and rather long, erect hairs, somewhat largely but shallowly punctured, the plate above it is similarly punctured, generally much wider than long, but variable in this respect; head above the antennae, and the vertex, with very long dark hairs, densely and rugosely punctured, and dull; antennae with the scape dilated, its posterior margin rounded but not strongly, the dilated surface evidently not twice as long as wide; beneath exceedingly strongly arched, so that when the anterior margin is viewed from in front the apex appears to be strongly produced, both base and apex being much thickened owing to the deep concavity of the part between. Mesothorax with long erect black hairs, shallowly and rather closely punctured, its surface dull and rugulose between the punctures; scutellum similarly clothed and dull, the punctures rather larger than those of the mesothorax; propodeum with very short ill-defined longitudinal rugosity in front, sometimes obsolete: behind this the surface finely rugulose, its sides clothed with pubescence of an obscure colour; wings infusate, with blue iridescence; thorax beneath, and the legs with dark pubescence. Abdomen very finely rugulose, and hardly shining; beneath, shallowly punctured; 6th segment with the apex emarginate, and carinated behind the emargination; 8th with the process strongly dilated dorso-ventrally, the ventral edge densely hairy, its apex bifurcate, the bifurcations expanded, fringed with long hairs along their ventral margins.

Female, very like the ♂ in general sculpture, &c., clothed with similar dark pubescence; clypeus with its apical margin smooth and shining, and angulately emarginate; scutellum shining between the punctures which are distinct and even; propodeum often with a few very short wrinkles from its front margin, beyond these the surface smooth (except for the fine rugulosity of the surface), and slightly shining; wings quite dark, with very distinct blue iridescence; fifth and sixth ventral segments of the abdomen with long black hairs.

HAB. Haleakala, Maui (5000 ft.). In 1894 a small colony of this species was found burrowing in the hard dry trunk of a dead, but still standing, Ohia tree (*Metrosideros*). From this a short series of females was obtained, as they returned to their burrows. In October 1896 an enormous colony was found high up in a dead and decayed tree of *Straussia*, and most of the specimens examined (about 50 in number) were obtained as they flew wildly over the ferns in the immediate vicinity of the colony.

(15) *Nesoprosopis haleakalae*, sp. nov.

Nigra, capite trans oculos lato; mesonoto et scutello aequaliter punctatis; area propodei antica fortiter clathrate rugosa; alis fuscis; ♂ maculis tribus prae antennis flavis; antennarum articulo 1° dilatato, multo longiore quam latiore, margine antico subtus vix arcuato; segmenti ventralis 8<sup>i</sup> productione fortius dilatata; metatarsis posticis saepe plus minusve pallidis. ♂♀. Long. 6—7 mm.

Male, with a spot on the clypeus, and one on each side of the face without it, yellow; front of the front tibiae, and sometimes all the tarsi testaceous; base of the posterior metatarsi generally more or less pale, sometimes only obscurely so; the facial markings are more distinct in some examples than others, but I have seen none in which they are wanting.

Face wide across the eyes, and strongly convex from the ocelli to the apex of the clypeus; the latter distinctly but shallowly punctured, clothed with long hairs, the plate above it wide and punctured; the scape of the antennae dilated, but much longer than wide, its anterior margin when viewed from in front almost straight beneath, not concave or arched; if, however, the under surface be examined, it will be seen to be deeply concave as in other species, only the concavity in this species does not extend quite so far as the anterior margin; head above the antennae with long dark hairs, exceedingly densely punctured towards the middle, where the close sculpture forms a distinct deep black area; thorax and scutellum dull, with erect dark pubescence, and closely and evenly punctured; the whole of the anterior area of the propodeum is somewhat coarsely clathrately rugose; abdomen with the apical process of the 8th ventral segment dorso-ventrally expanded, its bifurcate apex also dilated, and beautifully fringed with long hairs.

Female, apart from sexual characters very like the male; in some examples there is a very narrow yellow line along the inner margin of the eyes, or the head may be entirely black; face very wide, and very strongly convex longitudinally, with long dark pubescence; propodeum coarsely clathrately rugose to the brow, as in the ♂; apical segments of the abdomen beneath with dark hairs; wings in both sexes fuscous, often with slight blue iridescence towards the tips.

HAB. Haleakala, Maui (4000—5000 ft.). Not a common species; found flying round ferns in the forest. It is very distinct by the structure of the scape of the ♂, and the clathrate area of the propodeum in both sexes.

(16) *Nesoprosopis unica*, sp. nov.

♂ capite latissimo, fortius transverso, longitudinaliter fortiter convexo, clypei apice, et magnis duabus maculis extra clypeum, flavo; pronoto interrupte flavo-lineato: metatarsis pallidis; alis subfuscis; antennarum articulo primo dilatato, longiore quam latiore, subtus fortiter arcuato; area propodei antica breviter subreticulatim-rugosa. ♂. Long. circa 6 mm.

Male, head very wide, across the eyes decidedly transverse; face with a spot near the apex of the clypeus, and two large triangular ones bordering the eyes, and also a widely interrupted line on the hind margin of the prothorax, yellow; clypeus with its posterior margin extremely wide, the sides very little divergent thence as far as the apex of the eyes, evenly punctured, and clothed with rather long pale hairs; plate above the clypeus very wide, its anterior margin about equal to the combined length of its sides; face very convex longitudinally; the scape of the antennae dilated, subtriangular, its posterior margin rounded, longer than wide, beneath somewhat strongly arched; head above the antennae with the surface finely roughened, and somewhat closely punctured. Mesothorax and scutellum with dark erect pubescence, finely, regularly and closely punctured, the scutellum rather the more largely, and its surface slightly less dull than that of the mesothorax; anterior area of the propodeum subreticulately rugose along its front margin, behind this smooth except for the surface rugulosity; wings fuscous; the front of the front tibiae, and all the metatarsi, pale.

HAB. A single male taken in the mountains near Honolulu at an elevation of about 2500 ft. (1897).

(17) *Nesoprosopis laticeps*, sp. nov.

Praecedenti affinis, capite transverso, fortiter convexo, alis fuscis; ♂ antennarum articulo primo dilatato, longiore quam latiore, subtus fortiter arcuato; capite prae antennis ad latera flavo-maculato, vel toto nigro; ♀ propodei area antica brevissime



antice rugosa; capite supra antenas in media parte subirregulariter punctato. ♂♀. Long. 6—8 mm. (Plate II. figs. 15—15 b.)

Male, face entirely black, or with two yellow spots, one on each side between the eye and clypeus; face transverse, the plate above the clypeus very broad, twice as wide as high; head above the antennae punctured, and clothed with obscure pubescence, as also the thorax; mesothorax dull, very finely punctured, scutellum somewhat more largely but not very closely; anterior area of the propodeum generally with some short rather strong longitudinal wrinkles at the extreme front. In some examples these are longer than in others and less regular, but they do not reach the posterior margin of the area, which has only the usual rugulose sculpture of the surface. Front legs pale in front, tarsi generally more or less testaceous; wings entirely fuscous with more or less blue iridescence; 8th ventral segment of the abdomen with the process dilated, as also its apical bifurcations.

Female, very like the male apart from sexual characters; head very wide and strongly convex, above the antennae very finely strigose and finely punctured, the punctures rather remote towards the middle; mesothorax and scutellum dull, clothed and punctured, as in the ♂; propodeum with the anterior area smooth, except for the rugulosity of its surface, and some extremely short wrinkles at the front margin, sometimes obsolete; wings as in the ♂, legs dark, apical segments with black hairs.

HAB. Dense wet forests high up on the mountains of Molokai, (above 4000 ft.). Not common, flying rapidly over ferns in places where the sunlight can penetrate the brush. On Lanai (2000—3000 ft.) the species is found of considerably smaller average size but (so far as I can see) inseparable from the Molokai examples by any constant character. The localities where it is found on Lanai are much less wet, and less heavily timbered, than those on Molokai, but appear to have been of much the same character before the forest had been so much thinned out and destroyed.

(18) *Nesoprosopis neglecta*, sp. nov.

Forma facieque praecedentis, capite supra antenas circa medium densissime rugoso-punctato, propodei area antica irregulariter fere tota rugosa, bene distincta. ♀. Long. 7 mm.

Of the same general form and appearance as the preceding but no doubt distinct. The head above the antennae is very densely subrugosely punctured, and the propodeum rather finely and irregularly rugose right up to the brow, whereas in *N. laticeps* the rugosity is extremely short, and the brow itself slightly shining.

HAB. Mountains of Molokai in the high boggy forest. Sept. 21st, 1893. 1 ♀ taken.

(19) *Nesoprosopis kauaiensis*, sp. nov.

Forma fere praecedentium, *N. unicae* cognatissima; alis subhyalinis; ♂ clypeo, et duabus extra clypeum maculis, pallide flavis; pronoto postice interrupte flavo-lineato; ♀ lineis duabus juxta oculos flavis, margine postico pronoti ad latera flavo-lineato. ♂ ♀. Long. 6—7 mm.

Male, with the scape of the antennae and the form of the head much as in the preceding species; clypeus almost entirely, a spot on each side of the face outside the clypeus, and the hind margin of the prothorax at the sides, very pale yellow; the posterior edge of the clypeus strongly rounded; head with long dark pubescence. Mesothorax dull, and closely punctured, densely clothed with black pubescence; scutellum closely and evenly punctured; propodeum with the anterior area longitudinally rugose in front, the rugosities short, not reaching the brow; posterior tibiae and tarsi normally dark, sometimes, when the abdomen is of a more or less reddish immature colour, they are more or less pale; 8th ventral segment of the abdomen much as in the allied species.

Female, in general sculpture and form like the ♂; two spots on the prothorax, and a line on each side of the face near the eyes, pale yellow; mesothorax and scutellum quite dull, evenly and closely punctured; propodeum with a few longitudinal wrinkles of moderate length, not reaching the brow; basal segment of the abdomen shining and very smooth; apical segments with dark hairs.

HAB. Mountains of Kauai (3000—4000 ft.); taken on several occasions, but scarce. The large pale markings of the face in the ♂, and the spotted collar and clear wings in both sexes, give this little species a very distinct appearance.

(20) *Nesoprosopis comes*, sp. nov.

Nigra, capite longitudinaliter minus fortiter convexo; mesonoto opaco, subtiliter minus dense punctato, pilis fuscis longioribus vestito; scutello haud nitido, minus dense subirregulariter punctato; propodei area antica subtiliter irregulariter rugosa; alis plus minusve infuscatis; ♂ clypei apice flavo-maculato; antennarum articulo primo dilatato, longiore quam latiore, subtus modice arcuato; segmenti 8<sup>i</sup> ventralis productione fortiter dilatata. ♂ ♀. Long. 6 mm.

Black, the ♂ with a spot of variable size (which would probably be sometimes absent) on the clypeus near its apex; front of the front tibiae pale, as is usual in this sex of most species. Male with the face short, but not of the great width of the several preceding species, nor nearly so convex longitudinally; plate above

the clypeus short, the length of its side to the antennal fossa less than that of its anterior margin; head above the antennae with long fuscous hairs, with very dense sculpture about the middle, forming an area of a more deeply black colour than that of the general surface; scape of the antennae dilated, but very evidently longer than wide, its posterior margin rounded, the anterior nearly straight; the front margin seen from in front moderately arched beneath, much less deeply concave than in *N. kauaiensis*, *laticeps*, &c., in which species the arch is highest near the apex, while in this species it is highest about the middle of the length of the scape. Mesothorax with long fuscous hairs, quite dull, very finely and not very closely punctured about the centre; scutellum very slightly less dull, and with rather larger puncturation, the punctures somewhat sparse and irregular, not close and even as in *N. kauaiensis*, &c.; propodeum quite finely irregularly rugose in front, the rugosity becoming less evident posteriorly, the actual brow somewhat less dull than the part in front. Apex of abdomen with dark hairs; 8th ventral segment strongly dilated dorso-ventrally, and the apical bifurcations also expanded; wings somewhat infusate.

Female, very like the ♂, but the face entirely black, clothed with similar dark pubescence; head much less convex longitudinally than that of *N. kauaiensis*, &c.; above the antennae the surface rather shining, distinctly punctured, the punctures slightly decreasing in size inwardly; along the middle line the sculpture is very dense, forming a quite opaque area. Mesothorax very finely and rather remotely punctured, quite dull from the fine rugulosity of the surface between the punctures; scutellum very slightly shining at the sides, less dull than that of the ♂, somewhat sparsely and irregularly punctured; propodeum as in that sex; basal segment of the abdomen rather dull, impunctate, the surface distinctly finely rugulose; apical segments with dark hairs.

HAB. Haleakala, Maui (4000—5000 ft.); rare, three males and one female taken in company with *N. haleakalae* and *N. melanothrix*.

(21) *Nesoprosopis coniceps*.

*N. coniceps*, Blackburn, P. Manch. Soc. Vol. xxv. (1885—86), p. 145.

A species taken on Hawaii, and very closely allied to the preceding, is I believe referable to the above. In sculpture &c. it seems hardly to differ from *N. comes*. The clypeus has the basal part, the lateral margins and the extreme apex black, all the rest flavous, as well as two large triangular spots between it and the inner margins of the eyes; the base of the posterior tibiae and of the basal joint of the hind tarsi (and sometimes of the intermediate tarsi), are sometimes yellow; the process of the eighth ventral segment appears to be slightly less dilated than that of *N.*

*comes*. The female is somewhat variable, and I see no definite character to separate it from the single individual of that sex of the preceding.

HAB. Kilauea, Hawaii (4000 ft.), 1895 and 1896. Not common. Mauna Kea (6000 ft.), Rev. T. Blackburn.

(22) *Nesoprosopis dumetorum*, sp. nov.

Parvula, nigra, opaca, mesonoto subtilissime nec dense punctato, pilis nigris brevissimis vestito, propodeo antice brevissime rugoso, postice nitidulo; ♂ fronte tribus maculis flavis ornata; maculis quam praecedentis minoribus; pronoto utrinque, cum tuberculis et tibiaram basi, nonnunquam flavo-notato, nonnunquam his omnibus nigris; articuli antennarum primi margine antico subtus vix arcuato; ♀ duabus juxta oculos lineis flavis; pronoto postice ad latera, tuberculis, tegulis plerumque, cum basi tibiaram flavo-notatis; capite longitudinaliter fortissime (maris minus fortiter), convexo. Long. 4.5—6 mm.

In the male a spot near the apex of the clypeus, and one on each side of the face bordering the eyes, are yellow. These spots are generally much smaller than in *N. coniceps* though sometimes nearly as large; prothorax on each side, the tubercles, and the base of the tibiae, sometimes spotted with yellow, but more often all these are black. The head is shaped very like that of the two preceding species, but the front margin of the scape of the antennae is nearly straight, hardly arched, beneath; face above the antennae dull, and very densely and finely punctured about the middle, with a large deep-black area in contrast with the rest of the surface and on which the sculpture is exceedingly dense. Mesothorax very finely punctured, clothed with very short dark pubescence; scutellum with slightly larger punctures, but fine and not very close; propodeum rugose at the extreme front, behind this part the surface only rugulose, the brow sometimes, at least in certain aspects, slightly shining. Abdomen with the basal segment dull, with distinct surface rugulosity; eighth ventral segment with the process dilated, much as in *N. coniceps*; wings sometimes somewhat infusate, but often hyaline.

Female, small, and very like the ♂ in most respects; face with only a narrow line along the eyes yellow; posterior margin of the prothorax at the sides, a spot on the tegulae (sometimes wanting), one on the tubercles, the whole front of the anterior tibiae, the extreme base of the intermediate, and the base of the posterior tibiae more widely, yellow; face strongly convex longitudinally, above the antennae hardly shining, but not so dull as in the ♂, and without the deep-black dull area of that sex, finely and closely punctured; mesothorax clothed, as in the ♂, with exceedingly fine puncturation, its surface quite dull; scutellum dull, very finely punctured, but quite evidently more strongly so than the mesothorax, the punctures not

very close; propodeum with very short rugosities at its anterior margin, behind these the surface finely rugulose, and about the brow in certain aspects quite brightly shining, as also beyond it; apical segments of the abdomen with blackish hairs.

HAB. Hawaii from 2000—4000 ft. Taken in the heart of dense damp forests in places where a little sunlight penetrates, and may also be found at the edges of such forests. I have examined many examples. It is quite a distinct species, though the ♂ is very variable in colour.

(23) *Nesoprosopis mutata*, sp. nov.

Praecedenti magnitudine forma et colore simillima, ♂ capite supra antennis minus distincte punctato, et plaga pernigra carente, scutello vix opaco, segmenti 8<sup>i</sup> ventralis parte producta haud dilatata, antennarum articuli basalis margine antico subtus distincte arcuato; ♀ scutello laeviore et nitido, tibiis posticis haud flavo-notatis bene distincta. Long. 5.5 mm.

This species represents on Kauai the *N. dumetorum* of Hawaii but is quite distinct. The head is similarly formed, but above the antennae the surface is rougher and the puncturation less distinct, and the ♂ lacks entirely the deep-black mark so conspicuous in the preceding; the scutellum of the ♂ is decidedly less dull, of the ♀ even shining; the eighth ventral segment has the process of a quite different form, not being dilated dorso-ventrally, nor evidently bifurcate at its apex.

The two males taken have the facial markings as in *N. dumetorum*, the tubercles, prothorax and legs black, as in some varieties of that species; the single ♀ has the tegulae unspotted as in some examples of *dumetorum*, and the base of both posterior and intermediate tibiae also dark.

HAB. Kauai (3000 ft.); 2 ♂, 1 ♀ in a dense forest, flying over ferns in a sunny spot.

(24) *Nesoprosopis specularis*, sp. nov.

♀ nigra, praecedentibus simillima; capite supra antennis minus subtiliter punctato; spatio verticis, inter ocellum anteriorem et oculum sito, laevissimo nitidoque, ne minime quidem ruguloso; clypei apice flavo-lineata, distinguenda. Long. 5.25 mm.

Female, like the preceding in size and general appearance, but the following characters will readily distinguish it. The head above the antennae is exceedingly closely and, for the size of the insect, rather strongly punctured: the surface between the punctures is smooth and shining; the spaces connecting the exterior ocelli with the impressed longitudinal lines bordering the eyes are extremely smooth and shining,

and the apical margin of the clypeus is yellow. The scutellum is perhaps hardly so dull as in *N. dumetorum*, but more so than that of *N. mutata*. Besides the line on the clypeus there is a long and rather broad yellow line along the inner margin of the eyes; the posterior margin of the prothorax at the sides, the tubercles, and the base of the posterior and intermediate tibiae are also marked with yellow; the clypeus is less convex longitudinally than that of *N. dumetorum*.

HAB. Hawaii; very rare, a single specimen only taken at Kilauea.

(25) *Nesoprosopis crabronoides*, sp. nov.

♀ nigra, angustula, capite supra antennis subnitido, dense distincteque punctato, vertice fortissime incrassato; mesonoto et scutello opacis, subtilissime punctatis. Caput prae antennis maculis duabus flavis lateralibus ornatum, pronoti margine postico ad latera, tuberculis, basi tibiis, flavo-notatis. Long. 4.5—5 mm. (Plate II. fig. 2 and 2 a.)

Female, narrow and elongate, the face with two yellow lateral spots, and sometimes an obscure one near the apex of the clypeus; an interrupted line on the prothorax posteriorly, the tubercles, and the base of the tibiae, also yellow; head with the vertex extraordinarily incrassate, the face exceedingly strongly convex longitudinally, distinctly punctured behind the antennae, the surface between the punctures shining, as also the smooth spaces adjoining the exterior ocelli. Mesothorax very dull and finely punctured, clothed with short pubescence, scutellum with fine sparse puncturation; propodeum shortly rugose at the extreme front of its anterior area, which otherwise is very finely rugulose and shining; abdomen narrow and sub-elongate.

HAB. Kilauea, Hawaii (4000 ft.); rare.

This minute and remarkable species cannot be confounded with any other of the Hawaiian bees known to me. Its resemblance, when on the wing, to a minute species of *Crabro* is very great. A few burrows were found in the hard trunk of a large dead tree, which was still standing. Though I visited this tree on many occasions I took but few specimens—all females—the males neither coming to the burrows, nor visiting the flowers in the immediate vicinity.

(26) *Nesoprosopis mauiensis*, sp. nov.

*N. mutatae* simillima; ♂ clypeo nigro; extra hunc flavis duabus maculis; pronoto, tuberculis, tibiisque posticis haud flavo-notatis; capite supra antennis subrugose punctato; antennarum articulo primo fortius dilatato, margine antico subtus distincte arcuato; ♀ capite juxta oculos et margine postico pronoti ad latera, flavo-lineatis; tuberculis, tibiisque posticis haud flavo-notatis; scutello opaco. Long. 5.75 mm.

Male, with only a line bordering the inner margins of the eyes yellow, the clypeus, prothorax, tubercles and hind tibiae black; antennae with the scape rather more dilated than the other small and narrow species, its anterior apical angle somewhat prominent, and bent downwards, the front margin distinctly arched beneath; head above the antennae clothed with long sparse pubescence, and having an area about the middle of a deeper black than the general surface, but less distinctly marked than that of *N. dumetorum*; in front of this are two smooth spaces corresponding in shape to the dilated scape. Mesothorax and scutellum dull, with very minute punctures; propodeum at its anterior margin with extremely short rugosity, behind which the anterior area is smooth except for the fine surface rugulosity, and slightly shining; 8th ventral segment of the abdomen with the process and its apical bifurcations dilated.

Female, with a narrow yellow line along the margins of the eyes, and one on each side of the hind margin of the prothorax yellow; head above the antennae with the surface shining (except narrowly in the middle), finely and closely punctured; mesothorax dull, and very finely punctured; scutellum also dull, finely and somewhat remotely punctured; anterior area of the propodeum with only the fine general surface rugulosity and shining in certain aspects; wings clear and iridescent.

This species may be known from its ally on Kauai by the more dilated scape of the antennae, the entirely black clypeus, and different sculpture above the antennae of the ♂; the ♀ by the dull scutellum, and the more shining and more distinctly punctured head above the antennae; from *N. dumetorum* the distinctly arched anterior margin of the scape of the antennae beneath will distinguish the ♂, the black legs and tubercles the ♀.

HAB. Haleakala, Maui (5000 ft.). A pair (♂ and ♀) were dug out of a burrow, which was made in a very hard tree trunk, in April 1894. Subsequent visits in 1895 and 1896 failed to produce further specimens.

(27) *Nesoprosopis angustula*, sp. nov.

Nigra, *N. dumetorum* cognatissima, antennis ejusdem formae; ♂ frontis plaga pernigra vix distincta; ♀ capite tibiisque posticis nigris, haud flavo-notatis, illo supra antennas subnitido, distinguenda. Long. 5—6 mm.

Very close to *N. dumetorum*, the ♂ with the scape of the antennae similarly formed. Male with a yellow spot at the apex of the clypeus, and a well-marked triangular one along the inner margin of each eye; tubercles, posterior and intermediate tibiae and tarsi, black; head above the antennae very densely punctured about the middle, where there is no very distinct deep-black area, differing greatly from the surrounding sculpture. In *N. dumetorum* on close examination that area is found to

be formed of a patch of extremely short and close-set black pubescence. Female with the face entirely black, the prothorax with small lateral yellow spots, and the tubercles are also marked with yellow; intermediate and posterior tibiae and tarsi black; head above the antennae especially towards the vertex distinctly shining between the closely-set punctures.

HAB. Lanai (2500 ft.); January 1894, very rare; 2 ♂, 1 ♀ only taken.

(28) *Nesoprosopis dimidiata*, sp. nov.

♂ capite prae antennis fere toto flavo, tibiis tarsisque flavis, illis nigro-maculatis, horum articulis apicalibus plus minusve infuscatis, tuberculis pronoti flavo-notatis; capite supra antenas dense ruguloso, minus distincte sparsim punctato; antennarum articulo primo multo longiore quam latiore, subtus modice arcuato; ♀ nigra, angustula, tibiis intermediis et posticis ad basim breviter pallidis; mesonoto cum scutello opaco, subtilissime punctato. Long. 5 mm.

Male, with the whole of the face below the antennae, except the upper part of the plate above the clypeus, yellow; antennae with the scape dilated, but considerably longer than wide, its anterior margin moderately arched beneath; head above the antennae dull, with the surface very finely roughened, and very shallowly, somewhat remotely punctured. Mesothorax dull and finely punctured; scutellum dull with shallow and not very close puncturation; propodeum with the anterior area rugose at the extreme front, otherwise only finely rugulose and dull, hardly shining even at the brow; tubercles of the prothorax with a yellow spot, all the tibiae and tarsi bright flavous, the front tibiae with a black spot behind, the intermediate and posterior with a black ring; apical joints of the tarsi more or less obscured in colour; pubescence of head, thorax and legs pale: the process of the eighth ventral segment dilated.

Female, entirely black, except the front of the anterior tibiae, which are yellow, the flagellum of the antennae, which is testaceous beneath, and the extreme base of the middle and posterior tibiae, which have a yellow spot. Face not at all strongly convex longitudinally, above the antennae rather shining, and finely punctured; mesothorax and scutellum quite dull, with exceedingly feebly impressed punctures; scutellum with very sparse, almost obsolete puncturation; propodeum with hardly any distinct rugosity at its anterior margin, the whole anterior area being very densely rugulose and dull, the brow shining in certain aspects, dull in others; basal segment of the abdomen hardly shining, the apical segments with pale hairs.

HAB. A single ♂ taken in Kona, Hawaii, at an elevation of 4000 ft. (Aug. 1892). The ♀ I have here described came, I believe, from the same locality, but unfortunately the locality label was lost.



(29) *Nesoprosopis blackburni*.

*Prosopis blackburni*, Smith, J. Linn. Soc. xiv. p. 682. Blackburn and Cameron, P. Manch. Soc. xxv. (1885-86), p. 143.

(Plate II. fig. 16—16 *d.*)

Male, with the whole face below the antennae bright yellow, which colouring is continued upwards behind them rather broadly along the margins of the eyes; labrum, the mandibles more or less, the tubercles and all the tibiae and tarsi are yellow, the tibiae generally with a testaceous stain or a black spot behind; the scape of the antennae has the front half of its upper surface yellow, and the flagellum fulvous or even yellow beneath. Face subrotundate, the cheeks between the eyes and mandibles very short; scape of the antennae hardly dilated, twice or more than twice as long as wide, the anterior margin widely but not deeply arched beneath; the plate above the clypeus is rather short but not wide; head above the antennae hardly shining, shallowly punctured, very densely in the middle immediately behind the antennae, with only a very short inconspicuous pale pubescence. Mesothorax rather smooth, the surface rugulosity being exceedingly fine, very finely and evenly punctured, and clothed with short pubescence; scutellum slightly shining; propodeum with its anterior area more or less longitudinally rugose; eighth ventral segment with the process dilated, and bifurcate at the apex, the bifurcations fringed with long hairs.

Female, with only the front of the anterior tibiae, and the under side of the flagellum of the antennae pale. Head very little convex longitudinally, above the antennae with only very short scanty pale pubescence, distinctly punctured, the surface between the punctures somewhat shining, at least in certain aspects; cheeks very short; mesothorax with very short pubescence, rather smooth but not shining, very finely and evenly punctured; scutellum shining, very finely but not very closely punctured; propodeum with the anterior area more or less longitudinally rugose in front and subopaque; legs and apex of the abdomen with pale hairs; wings clear. Length 5—6.75 mm.

HAB. Maui, but only on the coast and lowlands; common on the sandhills at Wailuku and near the coast at Lahaina.

The ♂ is very distinct from any other species, the ♀ is very like some of the following. This is the species described by Smith in his paper in J. Linn. Soc. (xiv. pp. 674—685), the types being in the British Museum. Mr Blackburn clearly had several quite distinct species before him, when he subsequently made some remarks on what he supposed to be *N. blackburni*. (P. Manch. Soc. *loc. cit.*)

(30) *Nesoprosopis longiceps*, sp. nov.

Praecedenti affinis, capite elongato, supra antennis densissime punctato, mesonoto opaco dense aequaliter punctato, propodei area antica rugosa, abdomine haud nitido, alis haud infuscatis; ♂ colore fere praecedentis sed mandibulis, pronoti tuberculis, antennarum articulo basali, tibiis posticis et intermediis (basi extrema excepta) nigris; tarsis omnibus plerumque flavis vel pallidis, rarius piceis. Long. 5·75—8·5 mm. (Plate II. fig. 3.)

Male, with facial markings like those of *N. blackburni*, but with the mandibles, the scape of the antennae, and generally the labrum, black; face extremely narrow between the eyes and longer than its greatest width across them; plate above the clypeus very narrow and elongate; head above the antennae very densely punctured, especially over the middle portion, the surface dull with short inconspicuous pale pubescence; the cheeks between the mandibles and eyes short; scape of the antennae twice or more than twice as long as wide, its anterior margin widely and shallowly arched beneath, the flagellum beneath fulvous. Mesothorax and scutellum hardly shining (often quite dull), closely and evenly punctured, clothed with grey pubescence; propodeum with the anterior area irregularly rugose to the brow—more strongly so in some examples than in others; wings in fresh specimens very clear, with dark neuration. Abdomen dull, without definite puncturation; eighth ventral segment with its process somewhat dilated, bifurcate at the apex, the bifurcations somewhat narrow and fringed with long hairs. The legs are variable in colour, but all the tarsi are generally yellow or at least pale; the posterior and intermediate tibiae are black with a yellow spot at the base and sometimes at the extreme apex; tarsi rarely entirely piceous.

Female, without yellow facial markings; the anterior tibiae pale in front; antennae with the flagellum fulvous beneath; face very long and narrow for this sex, the apex of the clypeus slightly emarginate; head above the antennae finely and very densely punctured (at least except at the extreme sides), dull, with short inconspicuous pale pubescence, the whole front hardly at all convex longitudinally. Mesothorax and scutellum closely and evenly punctured, not shining; anterior area of the propodeum rugose, more strongly so in some examples than in others, sometimes irregularly, sometimes more or less longitudinally. Abdomen dull, impunctate, the apical segments with pale hairs; legs black with silvery pubescence; wings in fresh examples almost or quite clear.

HAB. Coast and lowlands of Molokai, Lanai, and Maui.

OBS. Sometimes examples are taken which have the abdomen more or less of an immature-looking red colour—the so-called 'highly-coloured' varieties of Smith and others. Such individuals are liable to differ also in sculpture and other respects from typical specimens, not only in this, but also in other species.

(31) *Nesoprosopis obscurata*, sp. nov.

Praecedenti simillima, sed ♂ colore flavo tantum anguste supra antennis producto, lamina supraclypeari tota, vel ex parte, nigra, minus elongata, tibiis posticis et intermediis nigris; ♀ capite supra antennis minus dense punctato, inter puncta laeviori, scutello subnitido et laeviori, alis infuscatis, distinguenda. Long. 6—8.5 mm.

Very closely allied to *N. longiceps*, but the ♂ with the head rather less elongate, the plate above the clypeus decidedly wider, and entirely or partly black, the yellow markings of the face only very narrowly produced behind the antennae; the posterior and intermediate tibiae are not pale at the base, the posterior tarsi black or piceo-testaceous; wings more or less distinctly infuscate.

Female, with the head rather less densely punctured above the antennae, than in the preceding, the surface between the punctures smoother and less dull, the scutellum somewhat shining, the wings quite infuscate, and the face somewhat wider.

HAB. Coast or lower slopes of the mountains of Molokai and Lanai; coast of Hawaii (Kealakeakua Bay). Rare.

OBS. I have taken the specimens from Hawaii as types. It is uncertain whether they will prove specifically identical with those from the other islands, but the material taken is insufficient to settle this point.

(32) *Nesoprosopis flavipes*.

*Prosopis flavipes*, Smith, Cat. Hym. Ins. pt. 1. p. 23; Blackburn and Cameron, P. Manch. Soc. xxv. (1885-86), p. 149.

"Male. Length  $2\frac{1}{4}$  lines. Black; the face yellow, the colouring is continued upwards on each side nearly to the vertex of the eye; the scape cylindrical, black, the rest of the antennae orange, yellow beneath. Thorax, the metathorax has no distinctly enclosed space, and is subrugose; the wings hyaline, the nervures dark fuscous, all the tibiae and tarsi bright yellow, the former have a ferruginous stain behind. Abdomen smooth and shining, the margins of the segments narrowly rufotestaceous."

"HAB. Sandwich Islands."

The above description is taken from Smith's work (*l. c. supra*). The species is represented by a single example brought home by the Beechey expedition. Probably it represents on Oahu the *N. finitima* of Kauai, and *N. longiceps* of Molokai, &c. Although very closely allied I believe it to be distinct from either of these species.



(33) *Nesoprosopis finitima*, sp. nov.

*N. longicipiti* cognata, eodem colore et magnitudine sed mesonoto et scutello subtilius punctatis; ♀ capite etiam minus elongato, et pro longitudine latiore distinguenda. Long. 7 mm.

♂ with the face shaped and coloured as in *N. longiceps*, but with the puncturation of the mesothorax and scutellum distinctly finer; the ♀ is more distinct, the difference between the puncturation of its mesothorax and scutellum and that of *longiceps* being more evident, and its head is evidently shorter and wider.

HAB. Kauai, on the coast at Makaweli in 1894; a single pair only taken. It must be a very scarce species in this and other localities where I searched for it, as I was never able to take another specimen.

(34) *Nesoprosopis anthracina*.

*Prosopis anthracina*, Smith, Cat. Hym. Ins. i. p. 23.

*Prosopis rugiventris*, Blackburn and Cameron, P. Manch. Soc. xxv. (1885-86), p. 146.

(Plate II. fig. 17—17 d.)

Male, with the clypeus, the plate above it and a spot on each side of it yellow, the greater part of the face in front of the antennae being of this colour; front of the anterior tibiae more or less flavous; legs black, with the tarsi sometimes piceous or testaceous. Head elongate, longer than its width across the eyes, above the antennae dull, rugulose, and shallowly punctured, without any excessively finely and densely punctured area, clothed with short inconspicuous pubescence; scape of the antennae dilated, strongly rounded on its posterior margin, little or not at all on the anterior, evidently but not greatly longer than its greatest width, the front margin viewed from in front deeply arcuate beneath. Thorax and scutellum dull, evenly and closely punctured; propodeum with its anterior area rugose, sometimes rather regularly longitudinally, sometimes quite irregularly, the rugosities much stronger in some individuals than others; seen from in front the rugosities extend to the brow, which is not at all smooth or shining. Abdomen dull, the intermediate ventral segments often raised transversely across the middle; when strongly raised, then generally the surface is smoother and more shining, but extremely variable in this respect; process of the eighth ventral segment not much dilated dorso-ventrally, the apex bifurcate and fringed with long hairs.

Female, black, with only the flagellum of the antennae beneath, and the front of the anterior tibiae pale. It closely resembles the ♂ in form and sculpture; the clypeus

is slightly emarginate at its apex; the head above the antennae quite dull and rugulose, shallowly punctured as in the ♂. Scutellum dull, rugulose between the punctures, which are close and even. Abdomen dull, the apical segments with dark hairs. Wings in both sexes clear, or clouded across the middle. Length 5.5—7.5 mm.

HAB. Coast and lowlands of Molokai, Lanai, and Maui; abundant. Oahu (Honolulu and Waianae); Kealakeakua Bay, Hawaii.

OBS. Most of the examples (♂) from the intermediate islands have the ventral segments transversely ridged more or less strongly, but in some the ridges are obsolete, and then the surface is generally duller and more or less evidently punctured; Oahuan specimens are generally of the latter form, but sometimes the ridges are quite strongly developed. The ♂ is quite distinct from any other except the slightly modified form next described, although its general appearance is extremely similar to that of *N. facilis* and others. The ♀ is very like that of *N. longiceps* and *blackburni*, to which it is really closely allied, but the much less densely punctured head behind the antennae will easily separate it from the former; the longer face, and the duller and more closely punctured scutellum, from the latter.

(35) *Nesoprosopis flavifrons*.

*Prosopis flavifrons*, Kirby, Ent. Mo. Mag. xvii. p. 85. Blackburn and Cameron, P. Manch. Soc. xxv. (1885-86), p. 144.

(Plate II. fig. 18—18 b.)

Male, like the preceding in general form and colour; scape of the antennae often with the anterior margin more or less pale, and evidently more strongly dilated than that of *N. anthracina*, subcordiform in shape, the anterior margin distinctly rounded as well as the posterior; the face is also rather wider, and the eighth ventral segment has the process rather strongly dilated. I see no character whereby the females of the two forms can be separated. Length 5.5—7.5 mm.

HAB. Coast of Kauai, not rare; many males were taken in January, 1897, but only two or three females. I have seen cells of this species formed in dead twigs.

(36) *Nesoprosopis assimulans*, sp. nov.

*N. obscuratae* cognata, et colore simillima; ♂ antennarum articulo primo magis dilatato, margine posteriore fortius rotundato; ♀ mesonoto subtilius punctato bene distincta. Long. 6.75—9.5 mm.

(Plate II. fig. 19—19 b.)

Male, with the greater part (often nearly the whole) of the clypeus, and a large subtriangular mark on either side of it which reaches as high, or a little higher than the

line of insertion of the antennae, yellow ; the lateral triangles are always divided from the yellow of the clypeus by more or less narrow black lines ; the plate above the clypeus is entirely black. In form the species is very like *N. obscurata*, but the following characters will easily distinguish it. Male with the scape of the antennae evidently more strongly dilated, its posterior margin more strongly rounded ; puncturation of the mesothorax and scutellum rather finer, these parts being very dull, with very close and shallow punctures. The ♀ may be known at once by the exceedingly minute shallow puncturation of the mesothorax, that of the scutellum being only slightly more distinct, and the surface of both quite dull. Wings more or less distinctly clouded, especially across the middle portion.

HAB. Mountains of Lanai (2000 ft.) and on the coast at Awalua. Wailuku, Maui on the sandhills, and at Lahaina. Not common.

*Nesoprosopis assimulans* var. *oahuensis*, var. nov.

♂ maculis flavis minoribus, ♀ alis fortiter infuscatis distinguenda.

Agrees with the former in structure, but the ♂ has the yellow markings of the face often much reduced in size, and the wings generally darker ; ♀ with the wings entirely infuscate, and in certain lights with a distinct steely iridescence.

HAB. Waialua and Waianae (Oahu), on the coast, or a few hundred feet above sea-level.

(37) *Nesoprosopis inquilina*, sp. nov.

Nigra, opaca, griseo-pubescentis, alis hyalinis ; ♂ clypeo fere toto, maculisque duabus triangularibus extra clypeum, late supra antennis productis, flavis ; lamina supra-clypeari tota, vel ex majore parte, nigra ; antennarum articulo primo fortius dilatato, apice antice producto ; ♀ capite nigro, trans oculos lato, mesonoto opaco, levissime punctato ; tarsis anterioribus pilis brevioribus, vix curvatis, vestitis. Long. 7 mm.

Male, with the clypeus almost entirely, and the sides of the face between it and the eyes, yellow ; the latter markings produced rather widely above the antennae along the margin of the eyes ; plate above the clypeus entirely or almost entirely black ; anterior tibiae and tarsi pale in front ; tibiae of the intermediate and posterior legs sometimes with a yellow spot at the extreme base, and slightly pale at the apex, their tarsi black or piceous.

Face much shorter and wider than that of *N. longiceps*, the scape of the antennae somewhat strongly dilated, and of peculiar form, as its anterior apical angle is somewhat produced ; head above the antennae closely, subrugosely and very shallowly

punctured. Mesothorax dull, with grey pubescence, and very shallow ill-defined puncturation; the scutellum with very similar sculpture; propodeum with the anterior area entirely dull, rugose to the brow. Abdomen dull, with rugulose surface; the first, second, and third segments with a short fringe of pale decumbent hairs, at least at the sides, but these bands are very easily abraded; process of the eighth ventral segment dilated, and densely clothed with long hairs on the ventral side, and the apical bifurcation fringed. Wings clear in fresh specimens.

Female, black, with the anterior tibiae testaceous in front. The face is wide across the eyes, in certain positions appearing even transverse; the apex of the clypeus slightly emarginate; head above the antennae quite dull, and shallowly punctured. Mesothorax dull, with fine, indefinite punctures, these being very shallow, and the general surface rugulose; scutellum also dull and similarly punctured; propodeum as in the ♂. Abdomen dull, the apical margins of the segments widely pale, apical segments with pale hairs; front legs with the intermediate joints of the tarsi with somewhat short hairs, quite different from the long, curved, and regularly disposed ones of all the preceding species.

HAB. Kilauea, Hawaii (4000 ft.). Very rare. I took a ♂ and ♀ in company in December, 1896, and a single ♂ on each of two previous visits to the same locality. The ♀ is somewhat abraded and shows no trace of lateral pubescent streaks, but I suspect they would be present in a fresh example.

OBS. This and the four following species are parasitic on certain of the species already described. The females are easily known from those of the industrial forms by the degeneration of the sweeping hairs on the front tarsi. The males however seem to show no important points of distinction.

(38) *Nesoprosopis hilaris*, Sm.

*Prosopis hilaris*, Smith, J. Linn. Soc. xiv. p. 683. Blackburn and Cameron, P. Manch. Soc. xxv. (1885-86), p. 147.

Male, with the whole face below the antennae bright yellow, and this colouring is produced above the line of insertion of the antennae broadly along the border of the eyes; mandibles ferruginous with a yellow line; scape of the antennae yellow on the anterior half of its dilated surface, fulvous on the posterior; abdomen with the basal segments ferruginous. Antennae with the scape dilated, evidently longer than wide, but not nearly twice as long; head above the antennae dull, somewhat rugosely punctured. Mesothorax with grey pubescence, dull, and evenly punctured; scutellum

with similar sculpture; propodeum rugose to the brow; apical segments of the abdomen with narrow fasciae of white pubescence along their apical margins; all the tibiae and tarsi fulvous.

Female, like the ♂ in sculpture, cheeks, clypeus and the face at the sides, as well as the antennae, more or less red; the clypeus distinctly emarginate at its apex; the face wide across the eyes; intermediate tibiae almost entirely pale, their apex only narrowly fuscous, the posterior widely pale at the base, their apical half generally more or less fuscous; the intermediate and posterior trochanters both red or pale; wings in both sexes clear. Length, 5—8 mm.

HAB. The sandy Isthmus between East and West Maui; also found on the coast of Lanai at Manele. In both cases the closely allied species *N. volatilis* Sm. is found with it, but apparently that species alone frequents the neighbouring island of Molokai, as the present species was not found there. *N. volatilis* extends its range far up the mountains—as high as eight or nine thousand feet—but *N. hilaris* is confined to sandy localities near the coast. Individuals vary greatly in size; on Maui the small examples breed in the cells of *N. blackburni* and probably of *N. anthracina*, the large ones in the cells of *N. assimulans*. The delicate fringe of white pubescence on the apical margins of the apical segments is very easily destroyed, but the present species could easily be distinguished from *N. volatilis* by this character, as they flew together over the sand.

(39) *Nesoprosopis hostilis*, sp. nov.

Praecedenti forma et colore simillima; segmentis abdominis apicalibus pubescentia haud fasciatis; ♂ articulo primo antennarum antice pallido, postice nigro; tibiis posterioribus et intermediis basi anguste pallidis; ♀ capite flavis duabus maculis juxta oculos ornato, tibiis posterioribus basi anguste flavis distinguenda. Long. 5—6 mm. (Plate II. fig. 4, also fig. 20—20 b.)

Very closely allied to the preceding species, from which it seems hardly to differ in sculpture, although it is a rather more shining insect than any of the other parasitic species.

Male, with the face coloured as in *N. hilaris*, the yellow markings being produced behind the antennae rather broadly along the borders of the eyes; mandibles without a yellow line; scape of the antennae with the upper surface pale only on its anterior part, the posterior being black or nearly so; intermediate and posterior tibiae dark, pale at the base outwardly for only a short distance.

Female, with a yellow (generally triangular) spot on each side of the face, surrounded by reddish colour, with which they gradually become blended; the legs coloured much as in the ♂. The range of colour in the ♀ is quite different from that of the allied



species, the prothorax, the mesothorax at the sides and the propodeum wholly or in part being generally red or reddish.

HAB. Mountains of Kauai (3000—4000 ft.) in various localities. Parasitic on *N. laeta*, and probably other species.

(40) *Nesoprosopis volatilis*.

*Prosopis volatilis*, Smith, J. Linn. Soc. xiv. p. 683. Blackburn and Cameron, P. Manch. Soc. xxv. (1885-86), p. 148.

Closely allied to *N. hostilis* but duller. In the ♂ the yellow colour is less widely produced along the eyes behind the antennae; the scape of the antennae is coloured like that of *N. hostilis*, but the pale colour is often much diminished, and sometimes absent in Oahuan specimens, which are in general duller, and have the yellow markings more clouded, or reduced in size, than examples from Molokai and Lanai. The ♀ has the face below the antennae red without yellow markings; the intermediate and posterior trochanters are of an obscure colour, or quite black. The wings in both sexes are less clear than those of *N. hilaris*, and the margins of the abdominal segments are without a fringe of pubescence. Length 5—8.5 mm.

HAB. Oahu, Lanai, Molokai and Maui, both on the coast and in the mountains—as high up as 8000 ft. on Haleakala. I have taken remarkably large specimens at Waianae, Oahu, in company with *N. assimulans* var. *oahuensis*—a large species—on which no doubt they were parasitic. It also attacks *N. facilis*, *N. difficilis*, and other species.

(41) *Nesoprosopis sphaecodoides*, sp. nov.

Praecedentibus affinis, ♂ abdomine toto nigro, vel nonnunquam segmento basali plus minusve obscure rufo vel piceo, antennarum articulo primo nigro; ♀ capite prae antennis toto nigro distinguenda. Long. 5—7 mm.

Male, with the abdomen entirely black, or with the basal segment sometimes more or less obscurely reddish; clypeus with a yellow spot extending from its base to about three-fourths of its whole length, and outside it there is a triangular spot on each side of the face; these spots are separated by more or less black between them, and they are variable themselves, being much reduced in size in some examples; scape of the antennae entirely black. Superficially the ♂ bears a close resemblance to some of the non-parasitic species, but the inconspicuous pubescence of the front of the head above the antennae, the closely punctured scutellum, and the

propodeum, which is rugose right up to the brow, will generally distinguish it. The ♀ is black with the basal and more or less of the second segment of the abdomen ferruginous; the face is entirely black, the clypeus at the most showing a slight tinge of obscure red; posterior and intermediate tibiae black or of an obscure colour.

HAB. Hawaii, both sides of the island, at an elevation of 4000 ft. Parasitic on *N. difficilis* and probably other species.

OBS. The five parasitic species above described are extremely closely allied to one another, but I believe them to be sufficiently distinct. They all agree in having the vertex of the head somewhat incrassate, the scutellum closely and evenly punctured, the propodeum rugose to the brow, and the head between the antennae and the vertex with only an inconspicuous pubescence, the latter character being characteristic of the *blackburni* group of non-parasitic species, to which I believe these are closely allied. The males (except *N. inquilina*) all have the scape similarly formed; the females have the apex of the clypeus distinctly emarginate, and the sweeping hairs of the anterior tarsi in an evidently degraded condition.

(42) *Nesoprosopis fuscipennis*.

*Prosopis fuscipennis*, Smith, J. Linn. Soc. xiv. p. 682. Blackburn and Cameron, P. Manch. Soc. xxv. (1885-86), p. 140.

A very large species, the ♂ with the face black, deeply depressed along the eyes, the depressions dull; clypeus with shallow punctures, and a few hairs along the apical margin. Scape of the antennae strongly dilated, closely and finely punctured, both front and hind margins rounded, the latter much the more strongly, the former with a white line, seen from in front the front margin is very strongly arcuate beneath; head above the antennae with shallow punctures. Prothorax with a whitish band posteriorly; mesothorax dull and punctured, the punctures slightly wider apart and larger posteriorly; scutellum with larger and less shallow punctures, depressed from the sides to the middle line; propodeum with the anterior area more or less strongly irregularly rugose. Legs with the apical joints of the tarsi usually clear testaceous, sometimes however entirely obscure; posterior tibiae with a white line beneath at the base, the posterior metatarsi also generally with a short basal streak, but this is sometimes absent. Basal segment of the abdomen with scattered punctures, second and following with very distinct though shallow puncturation; beneath shining, rather largely and shallowly punctured.

Female, very like the ♂, apart from sexual differences. The prothorax is similarly banded, and the posterior legs are marked in the same way; the tarsi are often without

the white streak, their apical joints are generally pale, but sometimes dark. Apical segments of the abdomen generally with bright brown hairs, but sometimes these are of an obscure colour. Length, 8—11 mm.

*Nesoprosopis fuscipennis*, var. *obscuripes*, var. nov.

Tarsi all dark, and the wings, especially beneath, with a violet iridescence; pubescence of the apical segments of the abdomen of the ♀ usually darker than in typical examples.

HAB. Mountains of Oahu, both ranges. Mountains of West Maui, var. *obscuripes*.

OBS. This and most of the following species are remarkable for their great size, and the very evident puncturation of the abdomen. The examples taken on Maui appear to be always of the var. *obscuripes*; some of the Oahuan specimens are hardly separable from these, while others with shining fuscous wings without iridescence, and pale tarsi, have a distinct appearance.

(43) *Nesoprosopis caeruleipennis*, sp. nov.

Praecedenti simillima, pronoto postice albo-marginato, tarsis infuscatis, alis laete caeruleo-iridescentibus. Long. 8—11 mm.

Hardly differs in structure, so far as I can see, from the preceding, but the dark wings with light blue iridescence on both surfaces, give it a very distinct appearance. The pale markings are like those of *N. fuscipennis*, those on the legs are variable. The apical segments are clothed above and beneath with more or less obscurely-coloured pubescence, and the tarsi are dark.

HAB. Mountains of Molokai and Lanai, from two to four thousand feet. Many examples taken, and a variety of both ♂ and ♀ on Molokai with the abdomen more or less reddish.

(44) *Nesoprosopis pubescens*, sp. nov.

Praecedentibus simillima, abdomine magis pubescente, pronoto postice nigro, rarius albo-marginato, segmento secundo ventrali a basi magis elevato, saepe subtuberculato; alis fuscis; ♀ abdominis segmentis apicalibus pallide pubescentibus. Long. 8—11 mm. (Plate II. fig. 21—21 c.)

Prothorax generally black, sometimes with a much broken white band on the posterior margin or faint indications of such, very rarely the ♂ has an entire band. The legs are variable in colour, in some examples almost the whole of the posterior metatarsi are white. The wings in the ♀ are shining fuscous, generally also in the ♂, but in one of these they show a distinct blue iridescence. The prothorax in the ♀ appears

never to have an entire pale band, its abdomen is decidedly more pubescent and rather more punctured than in the allied species, and the second ventral segment is more strongly raised from the base, having in some specimens a tuberculate form.

HAB. Mountains of Hawaii from 2000—4000 ft. in various localities (Kona, Puna, and Kau). Not rare.

(45) *Nesoprosopis setosifrons*, sp. nov.

Nigra, alis fuscis caeruleo-iridescentibus; clypeo breviter nigro-setoso; scutello vix depresso, aequaliter punctato; ♂ pronoto nigro, nonnunquam postice albo-lineato, antennarum articulo primo nigro atque dilatato, evidenter longiore quam latiore; capite prae antennis utrinque, nonnunquam etiam clypeo, albo-maculato; tibiis posticis albo-lineatis; ♀ segmentis abdominis apicalibus pilis nigricantibus vestitis. Long. 7.5—10.5 mm. (Plate II. fig. 22—22 c.)

Male, with a large white spot on each side of the face below the antennae, and sometimes one near the apex of the clypeus; the hind margin of the prothorax rarely with a white band; posterior and intermediate tibiae with a pale line from the base, of variable length, sometimes reaching to their apex; basal joint of the tarsi with a spot at their base; sometimes however the legs are entirely dark, except the front of the anterior tibiae. Scape of the antennae black, without a white line on its front margin, dilated, its hind margin strongly rounded, its front one very slightly so, considerably longer than wide; clypeus with short erect black hairs (easily seen in lateral view); the face not deeply grooved at the sides along the eyes, above the antennae clothed with black hairs. Mesothorax and scutellum with dark pubescence, and shallowly punctured, the latter not depressed from the sides to the middle line; anterior area of the propodeum rugose, more strongly so in some examples than in others. Abdomen subelongate, evidently, but very shallowly, punctured; apical segments with dark pubescence; eighth ventral segment with the process dilated for about half its length, the dilatation of triangular shape, fringed on the ventral edge with long hairs, as also the terminal bifurcation.

Female, like the ♂ in general sculpture, but more robust. Face rather strongly convex longitudinally; clypeus with black bristly hairs. Prothorax always with a white margin; all the tibiae above white, or with a white line, beneath dark, except at the base; basal joint of the posterior tarsi with a white line. Abdomen shining with shallow and by no means close puncturation; second and third segments at the sides without indications of pale pubescence; apical segments with black hairs. Wings in both sexes entirely dusky, with steely-blue iridescence.

HAB. Mountains of Hawaii (4000 ft.). Kona district and at Kilauea. The ♂ is easily known from any of the preceding large species by the form of the scape

of the antennae, which is less strongly arched beneath, and the less strongly dilated process of the eighth ventral segment, while the black-haired clypeus, the steely iridescence of the wings, and the less pubescent and less punctured abdomen, will distinguish either sex. Generally taken from flowers of *Metrosiderus*, *Rubus*, and sandal trees, and from burrows in the trunks of the latter. The single ♂ taken in Kona is the only one with the white-bordered prothorax, and it also has a large white spot on the clypeus. The ♀♀ taken there do not differ from the Kilauea specimens. The latter sex appears to be much more constant in colour than the former.

(46) *Nesoprosopis perspicua*, sp. nov.

Praecedenti affinis, pronoto latissime albo-fasciato, tibiis posticis (macula nigra apicali excepta) albidis; alis peropacis, nigricantibus; clypeo minus pubescente; ♂ capite toto nigro, antennarum articulo basali antice albo-marginato, bene distinguenda. Long. 8—9.5 mm. (Plate II. fig. 5.)

Closely allied to the preceding, but easily distinguished by the very wide creamy-white collar, and the posterior tibiae almost entirely of the same colour, being black only at the apex within. The wings are very dark, with steely iridescence. The posterior metatarsi are black, sometimes with a small white spot at the base. The ♂ has the face entirely black, but the anterior margin of the scape of the antennae is white. The eighth ventral segment is dilated much as in the preceding species. In both sexes the thorax is clothed with short inconspicuous pale pubescence, while in *N. setosifrons* it is longer and black.

HAB. Mountains of Kauai about 3000 ft. (January, 1897). A nice series were taken all from the flowers of a single tree (a species of *Straussia*), but only one of these was a ♂.

(47) *Nesoprosopis satelles*

*Prosopis satelles*, Blackburn, P. Manch. Soc. xxv. (1885-86), p. 141.

(Plate II. fig. 23—23 d.)

Male, with the face entirely black, or with the clypeus tinged with red, or brightly red, as also sometimes the plate above it; scape of the antennae entirely black or with the anterior margin red. The face is wide across the eyes, and its sides along their borders deeply depressed, the depressions extending behind the line of insertion of the antennae. Scape of the antennae greatly dilated, not longer than wide, distinctly and very closely and finely punctured, both front and hind margins

strongly rounded, beneath deeply arcuate. Mesothorax and scutellum with dark pubescence, distinctly and evenly punctured; propodeum with the anterior area more or less rugose in front, behind these rugosities its surface merely rugulose, sometimes the whole area rugulose. Abdomen subelongate, with a fine and shallow, but quite distinct puncturation, even on the basal segment; eighth ventral segment with its process exceedingly strongly dilated, the dilated part with a pale membranous appearance, its ventral crest densely clothed with generally sooty-black hairs, the extremity bifurcate and greatly dilated, fringed with long pubescence. Posterior tarsi sometimes testaceous, sometimes dark.

Female very like the ♂, but more robust, the clypeus and sometimes the plate above it and the scape of the antennae (more or less) red. Face strongly convex longitudinally, above the antennae generally finely strigose and punctured, clothed with dark pubescence. Prothorax black, as in the ♂, and the mesothorax and scutellum similarly punctured; propodeum with the rugosity of its anterior area extremely short, sometimes almost absent, the surface finely rugulose. Abdomen with the basal segments shining, the first distinctly, though finely and shallowly punctured, somewhat closely towards the apex; second segment very finely punctured on the basal half; the following segments with rather larger, but very shallow puncturation; apical segments with black hairs. Wings entirely dark in both sexes, and with blue iridescence. Length, 8—10 mm.

HAB. Mountains of Molokai and Lanai, and on Haleakala, Maui (5000 ft.). The males from Molokai generally have the face entirely black, or with the clypeus only obscurely reddish towards the apex. On Lanai they apparently always have the clypeus and anterior margin of the scape of the antennae pale. Two examples from Molokai resemble those from Lanai. Specimens from the latter island are of smaller average size than those from the former. On Maui I have only taken the ♀.

(48) *Nesoprosopis insignis*, sp. nov.

Praecedenti finitima, ♂ articulo primo antennarum fortiter transverso marginibus ambobus fortissime rotundatis; ♀ clypeo nigro distinguenda. Long. 8—9.5 mm. (Plate II. fig. 24.)

Like the preceding in general form and sculpture, but the ♂ with the scape still more strongly dilated, it being strongly transverse, both front and hind margin exceedingly strongly rounded. The facial markings are evidently variable, one of the two examples taken having the face entirely black, the other with a broad longitudinal yellow band, expanded at the apex, down the middle of the clypeus. In one the sides of the face are very deeply grooved, in the other much less so. Thorax and abdomen much as in *N. satelles*.

Female, face entirely black. Scutellum very dull, and very shallowly punctured; anterior area of the propodeum more rugose than that of *satelles*. Apical segments of the abdomen with a very faint aeneous tint in some lights, and clothed with dark pubescence. Wings dark, with blue iridescence.

HAB. Kilauea, Hawaii (4000 ft.). Two pair were taken, but neither in very good condition. When fresh, the ♀ probably has fairly distinct apical pubescent bands on the basal segments.

(49) *Nesoprosopis andrenoides*, sp. nov.

♀ praecedentis forma; propodei area antica clathrate-rugosa; abdomine laevissimo, subtilissime sparsim punctato, aeneo-micante, segmentis tribus basalibus postice pulchre albido-fasciatis (fascia prima interrupta), bene distincta. Long. 9·5—10 mm. (Plate II. fig. 6.)

Female, black, very like the preceding in shape. Mesothorax and scutellum quite dull, and distinctly punctured; anterior area of the propodeum entirely clathrately-rugose. Abdomen with the surface very smooth, sparsely and very finely punctured, black with a distinct aeneous or bluish tint; the first, second and third segments with beautiful fasciae of pale decumbent hairs on their apical margins, the first widely interrupted, apical segments with black hairs, beneath finely but distinctly punctured. Legs black (except that the anterior tibiae in front are sometimes more or less pale), with black pubescence. Wings dark, with blue iridescence.

HAB. Mountains of Kauai (2000—3000 ft.). Four females of this beautiful species were taken from the flowers of *Metrosiderus*.

(50) *Nesoprosopis paradoxica*, sp. nov.

Grandis et robusta, nigra, griseo-pubescentis, propodeo antice rugoso, abdomine rufo (♀ rufo-nigro), distincte punctato; alis fuscis, supra aeneo-micantibus, subtus caeruleo-iridescentibus; ♂ antennarum articulo primo fortiter dilatato, sed haud latiore quam longiore, margine antico saepe plus minusve pallido, subtus fortiter arcuato; clypeo depresso; abdomine supra nigro-pubescente. Long. 9·5—11·5 mm. (Plate II. fig. 7, also fig. 25 and 25 a.)

Male, with the face entirely black, scape of the antennae sometimes with a pale line in front. The face is not deeply depressed at the sides, but the depression extends over the greater part of the clypeus; the scape of the antennae dilated, not much less wide than long, clothed with long pale hairs, its front and hind margins both rounded, beneath deeply arched. Thorax and scutellum with grey pubescence,

and distinctly punctured, the latter depressed from the sides to the middle line; propodeum rugose in front. Abdomen red, with the basal segments shining, distinctly punctured, and clothed rather densely, especially on the third and following segments, with short black hairs; eighth ventral segment with the apical portion of its process hardly dilated, the terminal bifurcation fringed with dense long hairs.

Female, like the ♂, but more robust; face not very strongly convex longitudinally; scutellum dull, closely and evenly punctured; anterior area of the propodeum irregularly rugose. Abdomen shining, distinctly punctured, the basal segment red, more or less obscured, the rest reddish-black; second ventral segment simple, somewhat strongly and evenly punctured, the following segments more closely, the apical ones clothed with black hairs.

Wings in both sexes fuscous with blue iridescence beneath, and a bronzy glitter above.

HAB. Kona, Hawaii (4000 ft.). Not common. Taken while entering burrows in dead trunks of *Sophora*. It is an industrial species, though the ferruginous abdomen reminds one of most of the parasitic forms. This colour and the great size distinguish it at a glance from all but the following species.

(51) *Nesoprosopis erythrodemas*, sp. nov.

♀ praecedenti simillima, nigra, abdomine toto rufo; capite longitudinaliter magis convexo; propodeo, a fronte viso, acutius postice rotundato, sparsim longitudinaliter rugoso; abdominis segmento secundo ventrali minus nitido, subtilius punctato, et a basi fortiter elevato, distinguenda. Long. 10 mm.

Female, very like the preceding, but somewhat less robust; the face strongly convex longitudinally; the propodeum seen from in front sharply rounded behind, bearing a few longitudinal wrinkles. Abdomen entirely red, with the second segment more sparsely punctured above, beneath very strongly raised from the base to near the apex, and less shining and more finely punctured than that of *paradoxica*.

HAB. Kilauea, Hawaii (4000 ft.). Very rare, a single ♀ only taken, but had I supposed it to be distinct from the preceding at the time of capture, others probably might have been found.

(52) *Nesoprosopis anomala*, sp. nov.

♀ minor, capite, oculis exceptis, rubro; pronoto postice albido-marginato; mesonoto densissime punctato, pubescentia pallida vestito; propodei area antica glabra, subnitida, clathrate-rugosa, lateribus et parte posteriore dense pubescentibus; abdomine ad basim rubro, postice rufo-nigro, distincte punctato; tibiis rufis, supra albo-lineatis. Long. 7.5 mm.



Female robust, but not very large; head entirely red except the eyes, closely and rugosely punctured above the antennae, the pubescence pale. Thorax black, prothorax with a whitish posterior margin; tegulae testaceous with a yellow spot; mesothorax excessively densely and shallowly punctured, the disc glabrous, but all the margins clothed with pale fulvous pubescence, as also the whole of the scutellum, postscutellum, and propodeum, except the anterior area of the latter, which is quite hairless, and rather strongly clathrately-rugose and shining. Abdomen shining, the base red, the rest blackish, but more or less tinged with red; second and following segments distinctly punctured, apical segments with black hairs. All the legs red, the tibiae with a yellow line above: wings fuscous with very little iridescence.

HAB. Mountains near Honolulu. A single ♀ taken on the blossoms of *Acacia koa*. Allied to *N. setosifrons* and *perspicua*, this remarkable species in general appearance is quite unlike any other.

## ACUTILINGUES.

## APIDAE.

(1) *Xylocopa aeneipennis*.

*Xylocopa aeneipennis*, de Geer, Mémoires, III. p. 573, tab. 28, fig. 8. Smith, J. Linn. Soc. XIV. p. 684.

HAB. Abundant on the lowlands, but not found far up the mountains.

(1) *Megachile diligens*.

*Megachile diligens*, Smith, l. c. supra.

HAB. Oahu, Molokai, Kona district of Hawaii; not in the mountains. Rare. Blackburn says 'not uncommon,' and I suspect the species is rarer now than it was twenty years ago. It may be an endemic species, while the two following are certainly introduced, and are now abundant on most of the islands. Had they occurred in the islands formerly, Mr Blackburn would certainly have met with them, as they are common around the houses in Honolulu. I have not identified either from elsewhere, and do not know whence they were imported.

(2) *Megachile schauinslandi*.

*Megachile schauinslandi*, Alfken, Ent. Nachr. xxiv. (1898), p. 340.

Niger, thorace abdominisque segmento primo pubescentia fulva breviter denseque vestitis, segmentis caeteris utrinque macula pubescente albida ornatis, alis infuscatis, caeruleo-iridescentibus, scopa ♀ pallida. Long. 9—11.5 mm.

Black, the thorax and basal segment of the abdomen densely clothed with short fulvous pubescence.

Male: clypeus fringed with long pale hairs in front, otherwise shining, coarsely and closely punctured, and sparsely clothed with erect black hairs. Head above the clypeus with pale hairs, becoming fulvous about the insertion of the antennae. Thorax with short dense fulvous hairs, becoming longer at the sides of the propodeum. Anterior tarsi simple, the basal joint three or four times as long as wide. Wings and nervures fulvescent at the base, deeply infuscate over more than the apical half, and with a blue iridescence. Abdomen somewhat shining, coarsely punctured, the puncturation becoming less distinct on the apical segments, basal segment densely clothed with fulvous hairs, the following with inconspicuous black ones, and each with a small spot of white pubescence on either side along the apical margin, the second and third deeply impressed at the base, sixth with its apical crest slightly emarginate, and deeply foveolated before the crest. Ventral segments very densely punctured, clothed with appressed white pubescence, and each of the four visible ones with an entire apical fascia of longer and denser appressed hairs.

Female like the ♂ in general appearance but larger, the clypeus without the pale fringe and its puncturation excessively dense. Mandibles dull, rugose and punctured, flattened in front. Ventral scopa of silvery hairs, those on the apical segment black.

HAB. Several and probably all of the islands in and around settlements, often making its *nidus* in holes in woodwork, keyholes, &c. Very abundant in Honolulu.

OBS. I have had this species described for some years under the name of *M. domesticum* in MSS. awaiting publication, and have given it away under this name.

(3) *Megachile palmarum*, sp. nov.

Niger, cinereo-pubescent, abdomine ♂ 4, ♀ 5, fasciis pubescentiae pallidae ornato, alis subhyalinis, segmento sexto ♂ profunde emarginato, scopa ventrali ♀ pallida. Long. 9—10 mm.

Male: face densely clothed with pale fulvous pubescence to above the insertion of the antennae, the vertex almost bare and very densely punctured. Thorax finely and very densely punctured, sparsely clothed with pale pubescence. Wings subhyaline. Front tarsi simple. Abdomen densely punctured, the first four segments with a narrow entire apical band of pale pubescence, sixth with the apical crest deeply emarginate, and having a spot of appressed pubescence before the crest; beneath with four segments exposed, the second and third with an entire apical band of pale pubescence, the apical margin of the fourth sinuate; 5th submembranous, with a semilunar impressed area, which is notched in the middle of its apical margin, and appears to be densely covered with minute asperities (under the microscope these apparent asperities are seen to consist in reality of peculiar short thick hairs with knobbed apices); 6th band-like and fragile, with a transverse line of remarkable hairs, which are flattened and curved, with their apices bent and acuminate; 8th very delicate, tongue-like, obtuse at the apex; genital armature with the *stipites* and *sagittae* of equal length, the latter connected by membrane to their apex, the former flattened, widening towards the apex, and there pointed, bent outwards, and set with a few extremely short hairs. Calcaria pale.

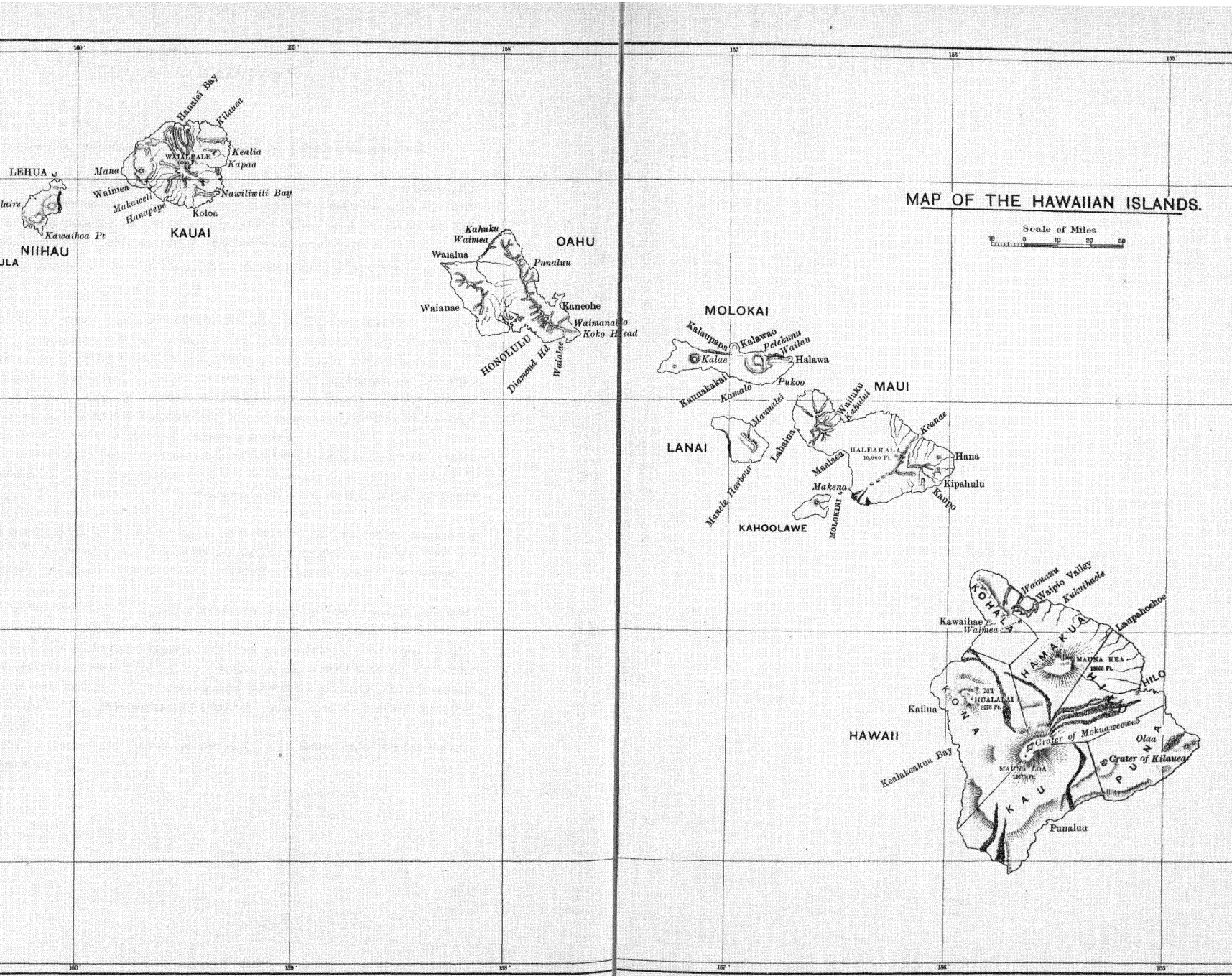
Female very like the ♂ in general appearance. The pubescence is cinereous with little or no fulvous tinge, that on the clypeus is sparse, so that the puncturation is exposed. The first five abdominal segments have a band of pale pubescence, beneath the scopa is formed of silvery hairs, those on the apical segment black.

HAB. Several and probably all the islands, especially about towns or settlements. Nests frequently in the leaves of coconut and other palms when they have been rolled up by the larva of a Pyralid.

(1) *Apis mellifica*.

*Apis mellifica*, Linn. Syst. Nat. ed. x. i. p. 576.

HAB. The hive bee is common throughout the islands, and is now found wild in many of the mountain forests, forming its nests in hollow trees.

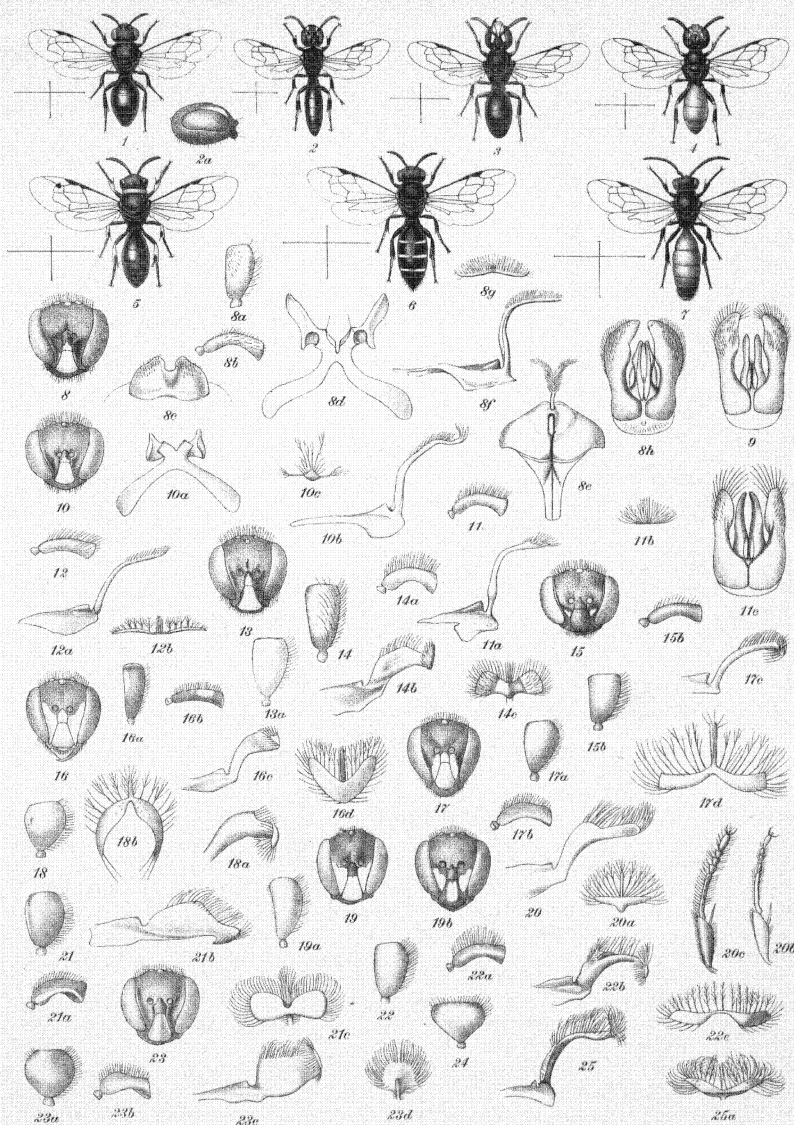


Edwin Wilson C.

## DESCRIPTION OF PLATE I. (VOL. I.)

### HYMENOPTERA ACULEATA.

- Fig. 1. *Nesomimesa kauaiensis* ♀; 1 *a*, front view of head; 1 *b*, lateral view of head; 1 *c*, apical joint of tarsus.
- Fig. 2. *N. nitida* ♀, head, front view; 2 *a*, lateral view of head.
- Fig. 3. *Deinomimesa ferox* ♀; 3 *a*, clypeus, viewed from above; 3 *b*, basal segment of abdomen in lateral view.
- Fig. 4. *D. cognata* ♀, basal segment of abdomen, dorsal view; 4 *a*, lateral view of the same; 4 *b*, clypeus, viewed from above.
- Fig. 5. *D. hawaiiensis* ♂, basal segment of abdomen, dorsal view.
- Fig. 6. *Crabro monticola* ♀; 6 *a*, antenna of ♂.
- Fig. 7. *C. tumidoventris* ♀, abdomen showing strongly convex second ventral segment.
- Fig. 8. *C. affinis* ♂, antenna.
- Fig. 9. *C. curtipes* ♂, posterior tibia and tarsi.
- Fig. 10. *Nesocrabro compactus* ♀.
- Fig. 11. *N. rubrocaudatus* ♀; 11 *a*, front view of head.
- Fig. 12. *Odynerus erro* ♀.
- Fig. 13. *O. obscure-punctatus* ♀.
- Fig. 14. *O. radula* ♀.
- Fig. 15. *O. localis* ♀.
- Fig. 16. *O. cyphotes* ♂, abdomen, lateral view.
- Fig. 17. *O. orbis*, second ventral segment; 17 *a*, lateral view of the same.
- Fig. 18. *O. kirbyi*, second ventral segment; 18 *a*, lateral view of the same; 18 *b*, posterior tibia of ♂, exterior surface.
- Fig. 19. *O. dilatatipes* ♂, posterior tibia.
- Fig. 20. *O. sociabilis* ♂, clypeus.
- Fig. 21. *O. nubicola*, second ventral segment; 21 *a*, lateral view of the same.
- Fig. 22. *O. ecostatus*, second ventral segment; 22 *a*, lateral view of the same.
- Fig. 23. *O. camelinus*, second ventral segment; 23 *a*, lateral view of the same.
- Fig. 24. *O. rudolphi*, second ventral segment; 24 *a*, lateral view of the same.
- Fig. 25. *O. purpurifer*, second ventral segment; 25 *a*, lateral view of the same.
- Fig. 26. *O. deinogaster*, second ventral segment; 26 *a*, lateral view of the same.
- Fig. 27. *O. pseudochromus*, second ventral segment; 27 *a*, lateral view of the same.
- Fig. 28. *O. cyanopteryx*, second ventral segment; 28 *a*, lateral view of the same.
- Fig. 29. *O. vittativentris*, second ventral segment; 29 *a*, lateral view of the same.
- Fig. 30. *O. congruus* ♀, lateral view of head showing labial palpus.
- Fig. 31. *O. chelifer* ♀, front view of head.



*Edwin Wilson, lith. Cambridge.*

Perkins, Hymenoptera Aculeata.

