

NOTES ON AUSTRALIAN THYNNINAE.

II. THE GENERA DIMORPHOTHYNNUS, RHAGIGASTER AND EIRONE.

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*(Communicated by Dr. A. J. Nicholson.)**(One hundred and twenty-six Text-figures.)*

[Read 26th November, 1958.]

Synopsis.

Reference is made to the instability of the usually accepted tribal categories (subfamilies of Turner, 1907, 1910, etc.). Selected species, including five new ones (*Rhagigaster burnsi*, *R. stradbrogensis*, *R. montanus*, *R. kiandrensis*, and *Eirone mulesi*) are described and figured.

INTRODUCTION.

Since paper no. 1 of this series was published (Given, 1953), the types of Turner, Smith and Westwood have been studied at the British Museum and Oxford University Museum. While in some instances this has produced greater perplexity, in others the situation has been clarified.

This series of papers cannot be considered as a revision of the group, but it may encourage some other worker to undertake such a comprehensive task. Study has been confined to a limited number of species, to define accurately those which can be determined with reasonable certainty.

Acknowledgement is made to the trustees and staff of the British Museum (Natural History) and to the staff of the Hope Department of Entomology, Oxford University, for permission to study material in their collections and to publish results of these studies. The writer is also indebted to the Director and the Senior Entomologist of the National Museum of Victoria, Melbourne, for the loan of material of an undescribed species for description. He is particularly indebted to Dr. P. B. Carne for his careful criticism of the draft of this paper.

REMARKS ON TRIBAL CATEGORIES.

It was hoped to begin this paper with a key to the tribes of the subfamily. However, attempts to construct such a key have failed. Although this could indicate that the present tribal classification is unnatural, attempts to erect a new and more satisfactory series of groupings have so far been unsuccessful. For females, separation into three tribes (on Australian material) can be made as follows:

Females — Key to Tribes.

- *1. Ocelli present, eyes more than half length of head capsule Diamini.
 Ocelli absent, eyes much less than half length of head capsule 2.
 2. Mesopleurae showing a distinct dorsal surface Rhagigasterini.
 Mesopleurae not showing a distinct dorsal surface Thynnini.

* Ocelli are also present in the South American species, *Anodontyra tricolor* Westwood.

For males, no such clear-cut distinction can be made, and even the characters listed by Turner for separation of the Diamini from the Thynnini (including the Rhagigasterini) are not always very clear. The following tabulation of differences is considered to be the best available:

Males — Key to Tribes.

- First transverse cubital nervure broken, with no indication of a spur vein dividing first cubital cell. Mandibles tridentate Diamini.
 First transverse cubital nervure entire, with a spur vein indicated or dividing first cubital cell. Mandibles not tridentate Thynnini.

(Including Rhagigasterini.)

It is hoped that after the completion of this series of papers the position will be clarified, but until then the writer must consider two tribes only to be tenable, namely

the Diamini and the Thynnini. This compromise is a reversion from the opinions of Turner in 1910 (p. 3) to that in 1907 (p. 210). However, even in his key of 1907, Turner was incorrect in stating that in the Diamini the males are smaller than the females. Such is usually, but not always, the case.

It must also be pointed out that Turner (1910) made a number of errors in his subfamily key (corresponding to tribal designations in the present paper).

Turner stated that in the Rhagigasterini the females always have at least four joints in the maxillary palpi. In the genus *Eirone*, several species have only three joints.

In keying out the males, Turner used a number of characters which are considered below in the light of the writer's observations.

Diamini (comprising the single species, *Diamma bicolor* Westwood).

"Both recurrent nervures received by second cubital cell close together."—This character is not sufficiently decisive. These nervures are actually not received very close together, and both are received by the second cubital cell in species other than *Diamma bicolor*. "Antennae short and stout."—Many rhagigasterine males have antennae equally short and stout. "First abdominal segment slightly strangulated at the apex."—This is not characteristic solely of *Diamma*. "Hypopygium not produced, rounded."—This also applies to several species of the genus *Eirone*. "Mandibles tridentate."—This character appears to be quite unique.

Rhagigasterini (as separated from Thynnini).

"Second and third cubital cells always each receiving a recurrent nervure."—This is not confined to the tribe. "Mandibles always bidentate."—This also applies to most Thynnini. "Hypopygium either not at all or very slightly produced and rounded at the apex, unarmed; or else ending in a long, acute, strongly recurved apical spine."—The first type of hypopygium (not at all or very slightly produced and rounded at apex) associates this grouping with *Diamma*. The second type (ending in a long, acute, strongly recurved apical spine) is also found to a less extent in such genera of the Thynnini as *Thynnoides*, *Epactiothynnus* and *Zaspilothynnus*. "Claspers with an apical tuft of long hairs turned inwards."—This character, like the last, appears to be merely more prominent in the Rhagigasterini than in the Thynnini, and cannot be considered as a key character.

Most characters which appear to separate natural tribal groups fail when all species are considered. For example, the presence of ocelli in the female of *Diamma bicolor* has always been regarded as unique, but in the South American species *Anodontyra tricolor* Westwood ocelli are also present, and in other species their positions are clearly represented by rudimentary structures. The reduction of female mouthparts cuts across the tribal grouping of Turner (1910). It is fairly frequent in the genus *Eirone*, rare in the South American Thynnini, but very common in the Australian Thynnini. The ventral modification of the head of males of the Australian Thynnini (Given, 1954) is completely absent in the South American fauna, and in *Thynnus* and *Megalothynnus* in Australia.

Wing venation appears to be rather unreliable in the group, many long series of males showing a surprising degree of variation in details.

Male characters in the clypeal and terminal abdominal areas have been tried, but none can be satisfactorily employed as tribal characters. In females, characters of the second and apical abdominal segments are similarly unsatisfactory. The answer to the problem may lie in the study of genitalia, although inspection of these structures from some fifteen selected genera does not show any great promise. There is doubtless an answer to this problem, but it is not yet obvious.

Genus DIMORPHOTHYNNUS Turner, 1910.

Gen. Ins., 105, p. 5.—*Enteles* Westwood, 1844, *Arcan. Ent.*, 2, p. 143.—*Rhagigaster* (part) Guérin, 1838, *Voy. Coquille*, Zool. 2, ii, p. 213.

Genotype: *Dimorphothynnus haemorrhoidalis* (Guérin).

Characters of the genus.—In the male there appears to be little of reliable nature to separate it from the genus *Rhagigaster*. The shape of the epipygium as used by

Turner (1910, p. 5) in his key would be better stated "broadly truncate posteriorly" for *Dimorphothynnus*. Other characters appear to be even less useful. In the female the transverse striation of the second abdominal segment appears to be general and at the present state of our knowledge must be considered as the only reliable generic character (Text-fig. A, 18-20) for separation from *Rhagigaster* and *Eirone*, but it does not separate the genus from the Thynnini.

DIMORPHOTHYNNUS HAEMORRHODALIS (Guérin), 1842, and allied species.

The type of this species, which is in the Genoa Museum, is damaged (Guiglia, 1948). Turner evidently did not see it, and his determination of the species was probably incorrect since he considered *apicalis* Smith to be a synonym (Turner, 1907). He later altered his opinions somewhat, but did not improve the situation. His changes of opinion in synonymy were as follows:

1907: *Enteles haemorrhoidalis* Guérin, 1842.

apicalis Smith, 1859; *bicolor* Westwood, 1844; *fimbriatus* Smith, 1859; *ottonis* Dalla Torre, 1897; *zingerlei* Dalla Torre, 1897; *lecheri* Dalla Torre, 1897.

1916: *Dimorphothynnus bicolor* Westwood, 1844.

? *haemorrhoidalis* Guérin, 1842; *zingerlei* Dalla Torre, 1897; ? *lecheri* Dalla Torre, 1897; *haemorrhoidalis* Turner, 1907.

Dimorphothynnus fimbriatus Smith, 1859.

apicalis Smith, 1859; *ottonis* Dalla Torre, 1897.

The 1916 synonymy involved the reduction of a genotype to synonymic status beneath a later-described species, when the type of at least one of the two had not been examined. Until the type of *haemorrhoidalis* Guérin is carefully compared with that of *apicalis* Smith, which are both males, and the types of *bicolor* Westwood and *fimbriatus* Smith (females) are compared and opposite sexes of the four types reliably associated and checked, the confusion will persist. It is of interest to note that with the type male of *apicalis* in the British Museum collection is a female which can probably be considered as an allotype. The position then is that *apicalis* can be compared with all other types of the complex.

From personal examination of types the following appears to be the situation (see Text-fig. A):

1. *D. haemorrhoidalis* (Guérin), 1842. Type ♂ in Genoa Museum.
(Probably) *D. bicolor* (Westwood), 1844. Type ♀ in Oxford University Museum.
2. *D. fimbriatus* (Smith), 1859. Type ♀ in British Museum.
3. *D. apicalis* (Smith), 1859. Type ♂♀ in British Museum.

In the general collections in the British Museum a series of Western Australian specimens labelled by Turner as *D. fimbriatus* was examined. This series may be divided into groups as follows:

Males—

- (a) Mandibles expanded, prosternum concave. (Text-fig. A, 4, 2.)
- (b) Mandibles normal, procoxae concave. (Text-fig. A, 5, 3.)

Females—

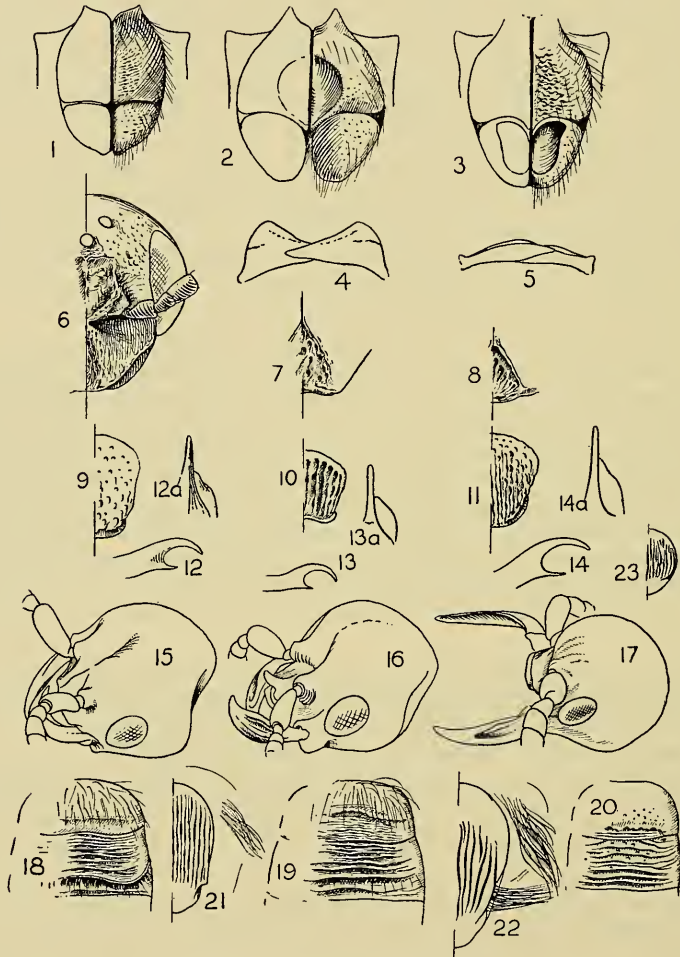
- (a) Clypeus normal. (Text-fig. A, 15.)
- (b) Clypeus carinate (*fimbriatus*). (Text-fig. A, 16.)

An analysis of mounted pairs (taken *in copula*) is as follows:

No. of pairs: 6.		
Male	Female	
Type	Type	
(a)	(a)	
(a)	(b)	On account of frequency of occurrence, probable correct pairing is
(a)	(b)	
(a)	(b)	
(b)	(a)	
(b)	(a)	
(b)	(a)	Male (a) with female (b)
		Male (b) with female (a)

An analysis of specimens not indicated as having been *in copula* but considered in accordance with locality is as follows:

Males	Females	Locality
3 (a)	3 (a)	Wanneroo
4 (b)	4 (b)	
1 (a)	10 (b)	Yallingup
1 (b)		



Text-fig. A. *Dimorphothynnus*.

1: *D. apicalis* (Smith) male, prosternum and procoxae. 2: *D. fimbriatus* (Smith) male, prosternum and procoxae. 3: *D. haemorrhoidalis* (Guérin)? male, prosternum and procoxae. 4: *D. fimbriatus* (Smith) male, mandibles. 5: *D. haemorrhoidalis* (Guérin)? male, mandibles. *6: *D. apicalis* (Smith) male, head. 7: *D. fimbriatus* (Smith) male, clypeus. 8: *D. haemorrhoidalis* (Guérin)? male, clypeus. *9: *D. apicalis* (Smith) male, epipygium. 10: *D. fimbriatus* (Smith) male, epipygium. 11: *D. haemorrhoidalis* (Guérin)? male, epipygium. *12, 12a: *D. apicalis* (Smith) male, hypopygium, lateral, ventral. 13, 13a: *D. fimbriatus* (Smith) male, hypopygium, lateral, ventral. 14, 14a: *D. haemorrhoidalis* (Guérin)? male, hypopygium, lateral, ventral. *15: *D. apicalis* (Smith) female, head. *16: *D. fimbriatus* (Smith) female, head. 17: *D. haemorrhoidalis* (Guérin)? female, head. *18: *D. apicalis* (Smith) female, abdominal tergites 1 and 2. *19: *D. fimbriatus* (Smith) female, abdominal tergites 1 and 2. 20: *D. haemorrhoidalis* (Guérin)? female, abdominal tergites 1 and 2. *21: *D. apicalis* (Smith) female, pygidium. *22: *D. fimbriatus* (Smith) female, pygidium. 23: *D. haemorrhoidalis* (Guérin)? female, pygidium.

* Figures drawn from type specimens.

The above analysis illustrates the danger of drawing conclusions from unpaired material, as a casual examination of the second group (unpaired material) would suggest that at Wanneroo pairing is in the reverse order to that of pairs taken *in copula*.

It is both unfortunate and extraordinary that Turner did not note the mandibular, coxal and prosternal male differences and the propodeal and clypeal differences in females of Western Australian material, as these are excellent characters for separation.

Text-figure A, figures 2, 4, 7, 10 and 13 therefore probably represent *D. fimbriatus* ♂, while figures 3, 5, 8, 11 and 14 may represent *D. haemorrhoidalis* ♂. (Of some interest is the fact that mandibular variation very similar to that illustrated in figures 4 and 5 occurs in males of *Rhagigaster mandibularis* Westwood (Text-fig. C, 12) and *R. unicolor* Guérin. Turner failed to note the character in either genus.)

While *apicalis* (Smith) is a South Australian species, it is probable that *haemorrhoidalis* (Guérin) and *fimbriatus* (Smith) are confined to Western Australia. The concave coxal and prosternal areas and expanded mandibles on the males, and the curious clypeal carina of *fimbriatus* females, appear to occur only on Western Australian species.

Other species of the genus are not considered in this paper as they have not entered into the work of the writer. However, a note must be included concerning the types of *D. dimidiatus* Smith. Both Oxford University and the British Museum have specimens marked as types, and both are identical as regards structure. The British Museum male is as much longer than Smith's record for the type as the Oxford Museum specimen is shorter.

Genus RHAGIGASTER Guérin, 1838.

Voy. Coquille, Zool. 2, ii: 213.—*Diamma* (Part) Guérin, 1838, *Voy. Coquille*, Zool. 2, ii: 235.—*Rhytidogaster* Turner, 1907, PROC. LINN. SOC. N.S.W., 32: 229.

Genotype: *Rhagigaster unicolor* Guérin.

Characters of the genus.

Male: General form elongate, the abdomen somewhat constricted between segments. Head not ventrally modified, mouth parts normal, mandibles bidentate. Antennae much shorter than head and thorax together. Hypopygium produced into a long recurved apical spine.

Female: Head relatively large, broader than thorax. Mandibles usually bidentate, sometimes simple. Mouth parts not usually greatly reduced. Thorax showing a distinct dorsal mesopleural surface. Pygidium never markedly elaborated, not truncate apically. Second dorsal and fifth ventral abdominal segments without characteristic sculpture. Mesosternal intercoxal processes present.

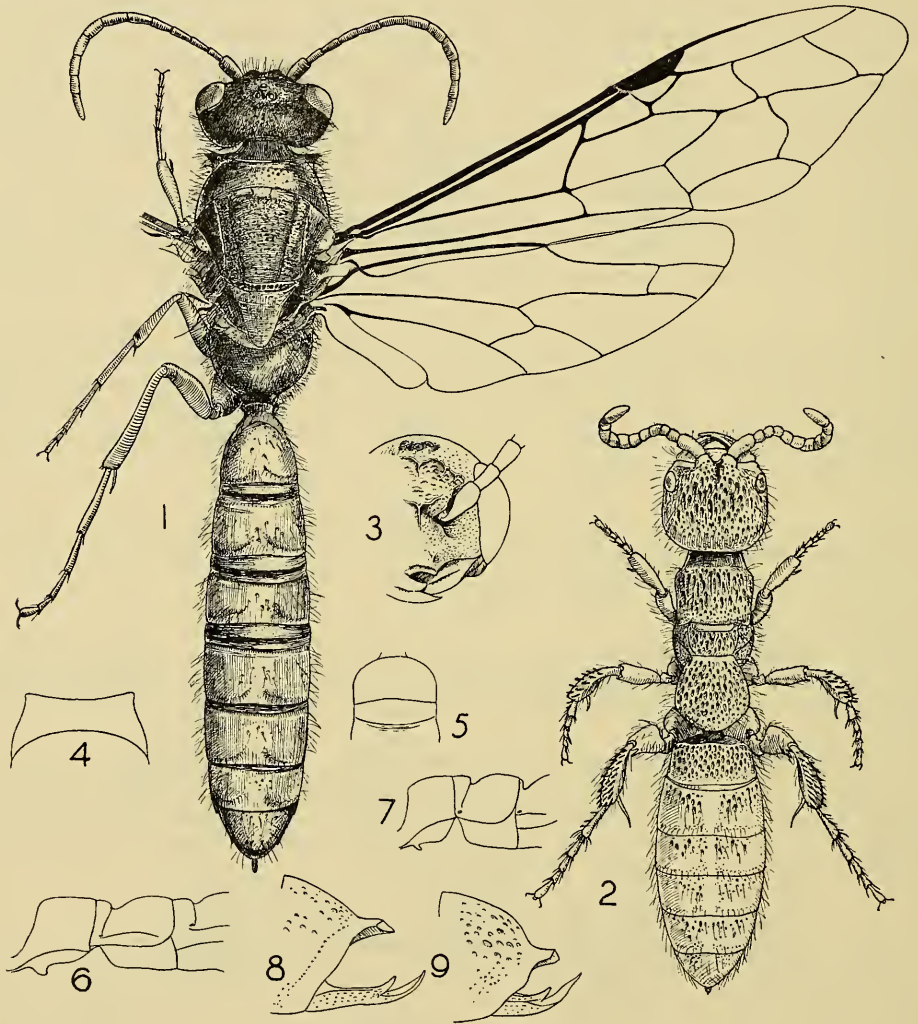
RHAGIGASTER BURNSI, n. sp. (Text-fig. B.)

Male: Colour black, the legs reddish. Head distinguished by the presence of an irregularly arcuate, transverse, rugose carina above the frons (Text-fig. B, 3). Pronotum more strongly produced at the anterior angles than in any other species of the genus (Text-fig. B, 1; cf. Fig. 4). First abdominal segment ventrally tuberculate, approaching the subtuberculate state dorsally (Text-fig. B, 1 and 6; cf. Text-fig. B, 5 and 7). Terminal abdominal segment as illustrated in Text-fig. B, 1 and 8; cf. Fig. 9). Length (excluding antennae) 19–22.5 mm.

Female: Colour black, the legs and antennae deep reddish, head with a brownish-red transverse area between eyes behind antennae. Sculpture highly distinctive (Text-fig. B, 2). Longitudinal post-orbital grooves absent from head. Length (excluding antennae) 14–17.5 mm.

Relationships.—Most closely allied to *R. corrugatus* Turner, but differs in the male in the presence of an arcuate suprafrontal carina (Text-fig. B, 3), smoother clypeus, strongly produced anterior pronotal angles (Text-fig. B, 1 and 4), more acute dorsal prominence on first abdominal segment (Text-fig. B, 1 and 5), ventral abdominal tubercle less slender, intersegmental incision between abdominal segments one and two shallower and more obtuse (Text-fig. B, 6 and 7) and differences in form and punctuation

of terminal abdominal segment (Text-fig. B, 8, 9). The reddish colour of the legs is also distinctive. Both *burnsi* and *corrugatus* may be separated from all other species of the genus by the broadly rounded apex to the epipygium. In this they approach the genus *Dimorphothygnus* in which this structure is broadly truncate apically.



Text-fig. B. *Rhagigaster*.

1-3: *R. burnsi*, n. sp. *1, male; *2, female; *3, male head, anterior. 4, 5: *R. corrugatus* Turner. 4, male, pronotum; 5, male, abdominal segment 1, dorsal. *6: *R. burnsi*, n. sp., male, abdominal segments 1 and 2, lateral. 7: *R. corrugatus* Turner, male, abdominal segments 1 and 2, lateral. *8: *R. burnsi*, n. sp., male, abdominal apex, lateral. 9: *R. corrugatus* Turner, male, abdominal apex, lateral.

* Figures drawn from type specimens.

The female of *R. burnsi* can be confused with no species other than *R. corrugatus*, from which it differs in having even coarser head and thoracic puncturing (Text-fig. B, 2), with more sparse puncturing on the abdomen, and in the colour of the head. Whereas in *burnsi* the only light head coloration is a band between the eyes, in *corrugatus* the entire dorsal area behind the antennae, the antennae themselves, and the mandibles are light coloured.

Locality, etc.—All material of this species examined was collected by Messrs. Burns and Pescott at Tubrabucca, New South Wales, January 10-23, 1948.

Types.—Holotype ♂, allotype ♀, 19 paratype ♂ and 7 paratype ♀ in the collection of the National Museum of Victoria, Melbourne. Four paratype ♂, 3 paratype ♀ in the collection of Mr. A. N. Burns, Melbourne (after whom the species is named). A paratype pair in the collection of the Division of Entomology, C.S.I.R.O., Canberra, A.C.T.

Acknowledgement.—For permission to examine and describe the above material acknowledgement is made to Mr. A. N. Burns, Curator of Insects, and Mr. R. T. M. Pescott, Director, The National Museum of Victoria.

RHAGIGASTER STRADBROKENSIS, n. sp. (Text-fig. C.)

Male: Colour black, wings fusco-violaceous. Head (Text-fig. C, 1) with transverse frontal carina above a sparsely rugose-punctate area. Pronotum (Text-fig. C, 2) not strongly produced at anterior angles. First abdominal segment (Text-fig. C, 5) obtusely tuberculate ventrally. Abdominal terminalia (Text-fig. C, 3, 4) as illustrated (note widely spaced prominent lateral spines on hypopygium). Length (excluding antennae) 19 mm.

Female: Colour black with lateral testaceous areas between antennae and eyes. Tips of mandibles reddish. Head (Text-fig. C, 13) shining, finely sparsely punctate except on frontal area. Mandibles (Text-fig. C, 14) simple. Thorax (Text-fig. C, 13) shining, slender, sparsely punctate. Abdomen smooth and shining, sparsely punctate. First segment ventrally toothed (Text-fig. C, 16). Pygidium (Text-fig. C, 15) relatively simple, shining. Length (excluding antennae) 11 mm.

Relationships.—Probably most closely allied to *R. unicolor* Guérin.

Locality, etc.—The only pair examined was collected by H. Hacker at Stradbroke Island, 17th September, 1915.

Types.—Holotype ♂, allotype ♀ in the collection of the Cawthron Institute, Nelson, New Zealand.

RHAGIGASTER UNICOLOR LYELLI Turner, 1910. (Text-fig. C.)

Proc. zool. Soc. Lond., p. 260.

Male: Colour black, wings clear. Head (Text-fig. C, 6) with frontal area below transverse carina closely, coarsely punctate. Pronotum (Text-fig. C, 7) with posterior margin strongly curved, anterior angles not strongly produced. First abdominal segment variably tuberculate ventrally. In Text-fig. C, 10, this condition is represented in its maximum development for the species. Abdominal terminalia as in Text-fig. C, 8 and 9 (note depth of aciculus in profile (Fig. C, 9) and presence of lateral spines). Length (excluding antennae) 14-19 mm.

Female: Black or piceous, meso- and metathorax and propodeum red, lateral areas between antennae and eyes ferruginous. Head (Text-fig. C, 17) shining, sparsely punctate except at bases of antennal prominences. Mandibles as in Text-fig. C, 18. Thorax smooth and shining, as Text-fig. C, 17. Terminal area of abdomen smooth, sparsely punctate, not highly distinctive. Length (excluding antennae) 10-13 mm.

Locality, etc.—Material examined (23 males, 21 females) was collected at Kiandra, Jindabyne, Kosciusko, Cooma, Goulburn in N.S.W., and Dartmoor, Melton, Porpunkah, Daylesford in Victoria. All were collected by the writer except a pair from Porpunkah collected by F. E. Wilson and a pair from Goulburn collected by E. F. Riek.

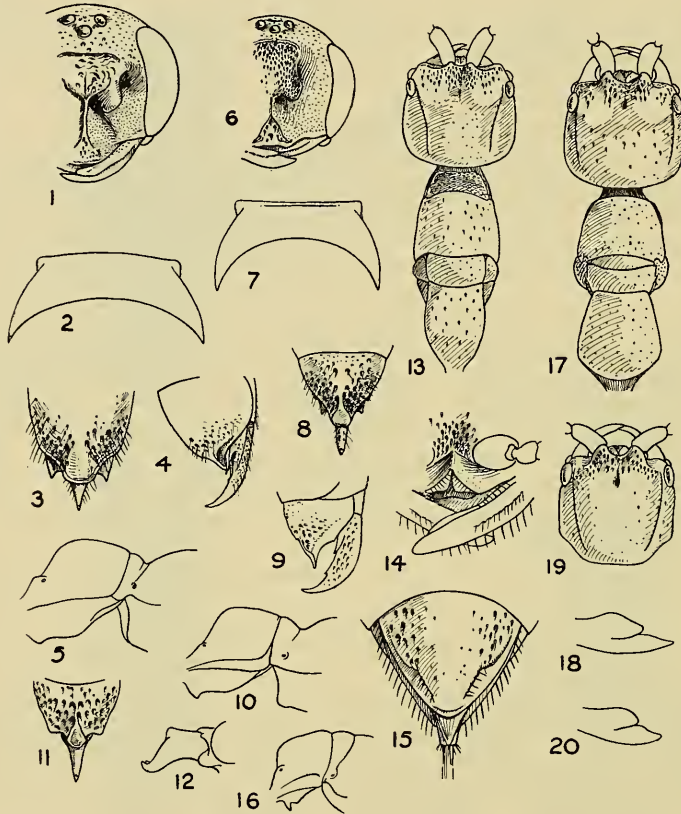
Types.—The male originally described by Turner is in the British Museum. The female has not previously been described, and the specimen from which the illustrations in this paper were made is in the collection of the Division of Entomology, C.S.I.R.O., Canberra.

Relationships.—Turner (1910*a*, 1910*b*) divided *R. unicolor* into three subspecies and in 1910*b* he lists distinctions which appear to be sufficiently sound. In 1910*a* he mentions proportions of the second and third cubital cells. This character, however, is somewhat unreliable on account of its variability.

Turner was very much in error in confusing *R. unicolor* with *R. mandibularis* Westw., the material which he in 1907 ascribed to this latter species being obviously misidentified.

Although the subspecies of *R. unicolor* are related to *stradbrokensis* and *mandibularis* the differences are considerable, as illustrated in Text-figure C.

Note.—Females of this species stridulate when not in copula.



Text-fig. C. *Rhagigaster*.

*1-5: *R. stradbrokensis*, n. sp. *1, male, head; *2, male, pronotum; *3, male, epipygium and hypopygium, dorsal; *4, male, epipygium and hypopygium, lateral; *5, male, abdominal segment 1. 6-10: *R. unicolor lyelli* Turner. 6, male, head; 7, male, pronotum; 8, male, epipygium and hypopygium, dorsal; 9, male, epipygium and hypopygium, lateral; 10, male, abdominal segment 1. 11, 12: *R. mandibularis* Westwood. 11, male epipygium, dorsal; 12, male, left mandible, lateral. 13-16: *R. stradbrokensis*, n. sp. *13, female, head and thorax; *14, female, mandibles and clypeus; *15, female, pygidium; *16, female, abdominal segment 1. 17, 18: *R. unicolor lyelli* Turner. 17, female, head and thorax; 18, female, right mandible. 19, 20: *R. mandibularis* Westwood. 19, female, head; 20, female, right mandible.

* Figures drawn from type specimens.

RHAGIGASTER MANDIBULARIS Westwood, 1844. (Text-fig. C.)

Arcan. Ent., 2: 105.

Male: Colour black, wings clear. Head similar to that of *R. unicolor lyelli* (Text-fig. C, 6) but with a distinctive process on the dorsal edge of the mandibles (Text-fig. C, 12). Thorax and abdomen similar to that of *R. unicolor lyelli* except for terminalia. Epipygium (Text-fig. C, 11) laterally produced, hypopygium without lateral spines. Length (excluding antennae) 15–19 mm.

Female: Colour black or piceous, meso- and metathorax and propodeum and legs red. No lighter markings between antennal bases and eyes. Head (Text-fig. C, 19)

rectangular with posterior angles somewhat excavated. Mandibles as in Text-fig. C, 20. Thorax and abdomen as in *R. unicolor tyelli*. Length (excluding antennae) 9–13 mm.

Relationships.—Most closely allied to *R. unicolor*, but readily separated in the male by hypopygial and mandibular characters, and in the female by the differences in the rear angles of the head, colour of legs, absence of colour patches between antennal bases and eyes and shape of the mandibles.

Wing venation of males (variation).—In Text-figure G, 7–13, aberrations in wing venation are illustrated. It is of interest to note that out of 23 males examined six showed aberrations; Text-fig. G, 14 and 15 illustrate the range of variation shown in 23 males in the relative coincidence of junction of the second transverse cubital and second recurrent nervures.

Locality, etc.—The type pair was collected at Port Phillip. Material in the writer's collection was collected at the following localities: Cavendish, Victoria Valley, Croydon, Melton, Nigretta, Dunkeld and Hamilton, in Victoria.

Types.—The type pair is in the Oxford University Museum.

RHAGIGASTER ACULEATUS Saussure, 1868. (Text-fig. D.)

Reise Novara, Zool. 2, Hym.: 113 (♂).—Turner, 1910, *Proc. zool. Soc. Lond.*, 1910: 264 (♀).

Male: Colour black on head, thorax, legs and first abdominal segment. Remainder of abdomen ferruginous, except for a dorsal infuscate mark on segments 2 to 5 inclusive. Head closely punctate, not highly distinctive. No well-defined triangular area on clypeal apex. Antennae shorter than thorax. Thorax closely punctate, pronotum somewhat obtusely produced at anterior angles. Abdomen rather coarsely punctate, second segment as in Text-fig. D, 3. Epipygium (Text-fig. D, 4) coarsely punctured. Length (excluding antennae) 9–11 mm.

Female: Colour uniform light yellowish-brown, sometimes with the head slightly darker infuscate. Head (Text-fig. D, 1) rather elongate, rectangular, puncturing moderately dense anterodorsally except for a median longitudinal space. Thorax (Text-fig. D, 1) rather sparsely and finely punctate, propodeum much broader posteriorly than anteriorly. Abdomen finely punctate, smooth, anterior angles of segment 1 acute (Text-fig. D, 1). Pygidium as in Text-fig. D, 2. Length (excluding antennae) 5–8.5 mm.

Locality, etc.—The four pairs examined were collected by the writer at Cavendish, Victoria. The species also occurs in New South Wales.

Type.—The type male has not been seen, and identification was based on the original description and on material determined by Turner, in the British Museum.

Relationships.—This species, and those which follow, are in the group which Turner placed (1907, p. 211) in the genus *Rhytidogaster*. Most of the smaller members of this group are closely allied, but *aculeatus* may be separated from them on colour in the male, and on the acute angles of the first abdominal segment in the female.

RHAGIGASTER COMPARATUS Smith, 1859. (Text-fig. D.)

Cat. Hym. B.M. 7: 69.

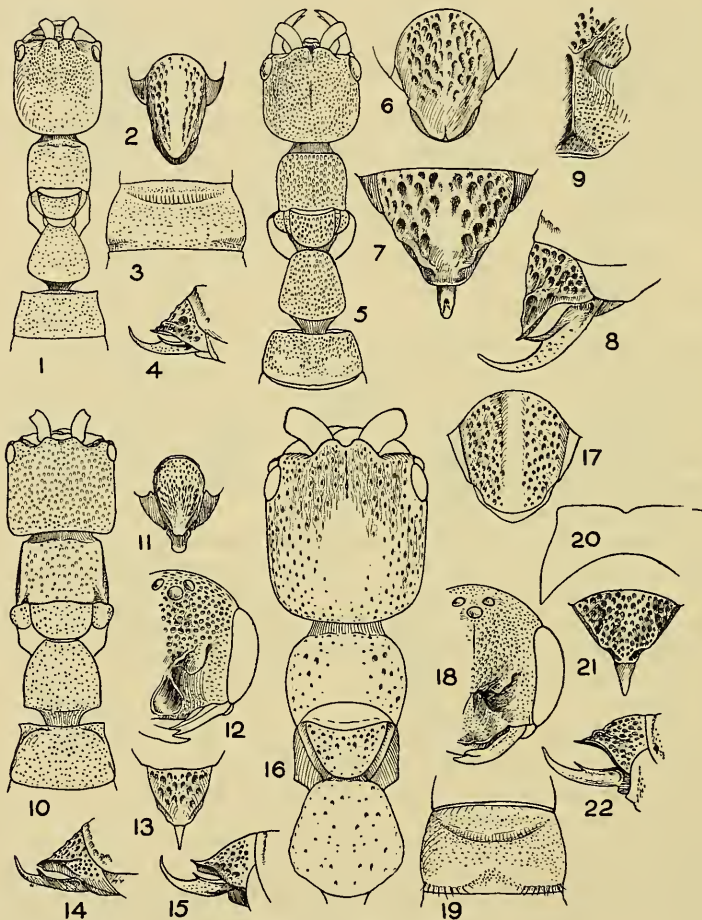
Male: Colour black, abdominal segment 6 and terminalia reddish, tibiae and tarsi brown. Head (Text-fig. D, 9) closely, rather coarsely and rugosely punctate. A small triangular clypeal area present. Thorax closely and coarsely punctate, apical angles not markedly produced. Abdomen more shallowly punctate than thorax. Epipygium and hypopygium as illustrated (Text-fig. D, 7, 8). Length (excluding antennae) 9.5–10 mm.

Female: Colour black, abdominal segment 5 and terminalia red, legs ferruginous. Head (Text-fig. D, 5) approximately square, uniformly punctate, with minute intermediate punctures and striations, particularly anteriorly. Posterior angles broadly rounded. Thorax uniformly coarsely punctate, the punctures elongate. Abdomen with angles of first segment not acute; coarsely, longitudinally, rugosely punctate. Pygidium as in Text-fig. D, 6. Length (excluding antennae) 6.5–7.5 mm.

Locality, etc.—The 16 pairs examined were collected by the writer at Wannon, Cavendish and Woori Yallock, Victoria. Turner states the locality as being Victoria and South Australia.

Types.—The type pair appear to be lost, but should be in the British Museum.

Remarks.—This species is commonly found feeding at *Hakea* blossom. It is most plentiful during September and October.



Text-fig. D. *Rhagigaster*.

1-4: *R. aculeatus* Saussure. 1, female; 2, female, pygidium; 3, male, abdominal segment 2; 4, male, epipygium and hypopygium. 5-9: *R. comparatus* Smith. 5, female; 6, female, pygidium; 7, male, epipygium and hypopygium, dorsal; 8, male, epipygium and hypopygium, lateral; 9, male, frontal detail of head. 10-14: *R. iracundus* (Turner). 10, female; 11, female, pygidium; 12, male, head; 13, male, epipygium and hypopygium, dorsal; 14, male, epipygium and hypopygium, lateral. 15: *R. tumidus* (Turner), male, epipygium and hypopygium. 16-22: *R. montanus*, n. sp. *16, female; *17, female, pygidium; *18, male, head; *19, male, abdominal segment 2; *20, male, pronotum; *21, male, epipygium and hypopygium, dorsal; *22, male, epipygium and hypopygium, lateral.

* Figures drawn from type specimens.

RHAGIGASTER IRACUNDUS (Turner), 1907. (Text-fig. D.)

PROC. LINN. SOC. N.S.W., 32: 237 (*Rhytidogaster*).—1910. *Gen. Ins.*, 105: 7 (*Rhagigaster*).

Male: Colour black, abdominal segment 6 and terminalia dark red. Wings clear. Head (Text-fig. D, 12) very coarsely punctate, with a smooth, depressed, cordate

clypeal area with strongly elevated margins. Thorax closely, rugosely punctured. Anterior pronotal angles moderately produced. Abdomen moderately coarsely punctate. Epipygium and hypopygium as illustrated in Text-fig. D, 13 and 14. In some specimens the aciculus is more uniformly curved than as shown. Length (excluding antennae) 12–14 mm.

Female: Colour ferruginous to piceous. Head almost square (Text-fig. D, 10), uniformly punctate. Thorax (Text-fig. D, 10) uniformly punctate. Pronotum almost square, depressed internal to posterior angles. Propodeum angled posteriorly. First abdominal segment strongly angled anteriorly (Text-fig. D, 10). Abdomen uniformly punctate. Pygidium as in Text-fig. D, 11. Length (exclusive of antennae) 8–9 mm.

Locality, etc.—The type is from Melbourne. The four pairs examined by the writer are from Hartley, South Australia (H. F. Lower), Canberra, A.C.T. (P. B. Carne), and Nelson, Victoria.

Types.—The type male is in the British Museum. The female has not previously been described and the specimen on which the above description is primarily based is in the collection of the Division of Entomology, C.S.I.R.O., Canberra.

Remarks.—The Nelson pair is atypical. The male has abdominal segment 5 red, and the female is not as angular as the genotype on the head or thorax. The male from Canberra is similar to the Nelson specimen, and these may represent a different but very closely allied species.

RHAGIGASTER TUMIDUS (Turner), 1907. (Text-fig. D.)

PROC. LINN. SOC. N.S.W., 32: 236 (*Rhytidogaster*).—1910. *Gen. Ins.*, 105: 8 (*Rhagigaster*).

This species superficially resembles *R. iracundus* but is readily distinguished as follows.

Male: Head without cordate smooth clypeal area. Epipygium and hypopygium as in Text-fig. D, 15 (compare Fig. D, 14).

Female: Colour dominantly black, head longer than broad, less densely punctured, not so angular.

Locality, etc.—The specimen (♂) in the writer's collection is from Kiandra, N.S.W. Turner records the species from Melbourne, Victoria; Swan River, W.A.; and Tempe, N.S.W.

Types.—In the British Museum.

RHAGIGASTER MONTANUS, n. sp. (Text-fig. D.)

This species is allied to *R. tumidus*.

Male: Colour black, wings clear. Head (Text-fig. D, 18) closely punctured, without smooth clypeal area. Thorax closely punctured, moderately produced at anterior angles (Text-fig. D, 20). Abdomen coarsely and rather densely punctured (second segment, Text-fig. D, 19). Hypopygium and epipygium as in Text-fig. D, 21 and 22. Length (excluding antennae) 11–12 mm.

Female: Colour black on head and abdomen. Thorax, legs, antennae and pygidium red. Head (Text-fig. D, 16) oblong, moderately deeply punctate, aciculate between punctures. Thorax (Text-fig. D, 16) sparsely irregularly punctate. Abdomen with regular, elongate punctures, truncate anteriorly but without acute anterior angles. Pygidium as in Text-fig. D, 17. Length (excluding antennae) 5.5–6.5 mm.

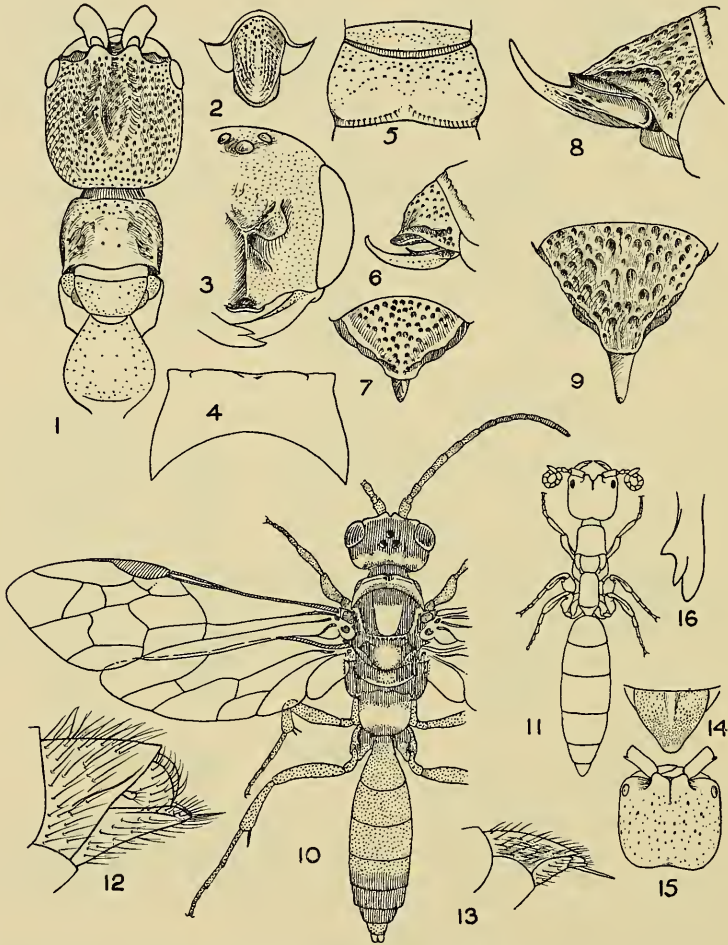
Locality, etc.—The holotype and paratype pairs were collected by the writer at Kiandra, N.S.W., at 4,500 ft., 9th February, 1952.

Types.—Holotype and allotype (pair taken *in copula*) in the collection of the Division of Entomology, C.S.I.R.O., Canberra, and a paratype pair in the collection of the Entomology Division, D.S.I.R., Nelson, New Zealand.

Relationships.—Allied to the *tumidus*, *aculeatus*, *iracundus* group. The male is separated from *iracundus* on account of its lack of smooth clypeal area, and from *tumidus*, etc., by colour and terminal characters. The female is highly characteristic on account of colour and punctuation, as well as the form of the pygidium.

RHAGIGASTER KIANDRENSIS, n. sp. (Text-fig. E.)

Male: Colour black, wings slightly infusate. Head (Text-fig. E, 3) rugosely punctate, the frontal and supra-antennal carinae well developed, the apex of the former subtuberculate. Pronotum (Text-fig. E, 4) broad and strongly but not acutely produced at anterior angles. Abdomen shallowly and irregularly punctate (Text-fig. E, 5, abdominal segment 2). Epipygium and hypopygium as in Text-fig. E, 6 and 7. Length (exclusive of antennae) 12–16 mm.

Text-fig. E. *Rhagigaster* and *Eirone*.

*1-7: *R. kiandrensis*, n. sp. *1, female; *2, female, pygidium; *3, male, head; *4, male, pronotum; *5, male, abdominal segment 2; *6, male, epipygium and hypopygium, lateral; *7, male, epipygium and hypopygium, dorsal. 8, 9: *R. pugionatus* Saussure. 8, male, epipygium and hypopygium, lateral; 9, male, epipygium and hypopygium, dorsal. 10-16: *Eirone rufopicta* (Smith). 10, male; 11, female; 12, male, abdominal terminalia; 13, female, abdominal terminalia; 14, female, pygidium; 15, female, head; 16, female, left mandible.

* Figures drawn from type specimens.

Female: Colour black, metathorax and legs dark ferruginous. Head (Text-fig. E, 1) almost square, posterior angles rounded, coarsely longitudinally rugosely punctate. Minute punctures and lines between main punctures. Thorax (Text-fig. E, 1) unevenly punctured, punctures coarse on pronotum, which is laterally somewhat depressed. Abdomen more sparsely and finely punctate, anteriorly truncate, but anterior angles not produced. Pygidium as in Text-fig. E, 2. Length (excluding antennae) 8–11 mm.

Locality, etc.—The 16 type pairs were collected by the writer at 4,500 ft. at Kiandra, N.S.W., in February, 1952, feeding at *Leptospermum* blossom.

Types.—The holotype and allotype (taken *in copula*) and four paratype pairs are in the collection of the Division of Entomology, C.S.I.R.O., Canberra, and 11 paratype pairs are in the collection of the Entomology Division, D.S.I.R., Nelson, New Zealand.

Relationships.—This species is allied to the *tumidus*, *iracundus* group, but is larger and in some ways intermediate between them and *corrugatus* and *burnsi*.

RHAGIGASTER PUGIONATUS Saussure, 1868.

Reise Novara, Zool. 2, Hym.: 113.

The determination of the two males studied is based on Turner's interpretation of Saussure's description, having been named by comparison with Turner's material at the British Museum.

Male: Colour black, mesopleurae red, wings slightly violaceous infusate. Head closely rugosely punctate, no clypeal area or tubercle. Thorax as in other members of the *tumidus*, *iracundus* group. Abdomen moderately closely punctate. Hypopygium and epipygium as in Text-fig. E, 8 and 9. Length (excluding antennae) 11.5 mm.

Locality, etc.—The two males examined were collected by E. F. Riek at Orford and Cole's Bay, Tasmania, on 9th and 13th January, 1948. Turner also records this species from New South Wales (Sydney).

Genus EIRONE Westwood, 1844.

Arcan. Ent., 2: 44.—*Aelurus* Turner, 1907 (not Klug) (part), PROC. LINN. SOC. N.S.W., 32: 247.—*Aelurus* (*Lepteirone*) Turner, 1907, PROC. LINN. SOC. N.S.W., 32: 299.—*Aelurus* (*Eirone*) Turner, 1907, PROC. LINN. SOC. N.S.W., 32: 258.

Genotype: *Eirone dispar* Westwood.

Characters of the Genus.—The male may be separated from other members of the rhagigasterine genera by the unspecialized hypopygium, which is apically broadly rounded and rarely projects beyond the epipygium. However, this does not separate it from all other genera of the Thynnini, as certain species of *Zeleboria*, *Neozeleboria* and *Phymatothynnus* are very similar in this respect. From these genera, *Eirone* males may be readily distinguished by the unspecialized anteroventral surface of the head.

In the female the contiguous nature of the mesocoxae appears to be a distinguishing character not only from other rhagigasterine genera, but also from the genus *Ariphron*, to some species of which *Eirone* females are in other respects similar. The lack of any conspicuous adornment, such as carinae or rugae on the second abdominal segment, is a character shared with some species of *Ariphron* and with all species of *Rhagigaster*.

Note.—The above remarks refer only to Australian genera.

EIRONE RUFOPICTA (Smith), 1879. (Text-fig. E.)

Descr. N. Sp. Hym., p. 159 (*Thynnus*).—Turner, 1907, PROC. LINN. SOC. N.S.W., 32: 251, *Aelurus* (*Lepteirone*).—1910, *Gen. Ins.*, 105: 9 (*Eirone*).

Male: Colour as indicated in Text-fig. E, 10. The line-shaded areas black, stippled areas ferruginous and unshaded areas yellow. The relative extent of the colour areas varies somewhat between individuals. Vestiture is golden. Head with the longitudinal median ridge below the antennal bases apically truncate-tuberculate. Depressed areas between eyes and lateral ocelli. Punctuation fine and close. Thorax (Text-fig. E, 10) very finely and rather sparsely punctate on pronotum, elsewhere closely punctate. Median segment very finely transversely rugose-striate. Abdomen smooth, very finely and sparsely punctate. Terminalia as in Text-fig. E, 12, not highly characteristic. Length (excluding antennae) 9–12.5 mm.

Female: Colour ferruginous, usually darker infusate on abdomen and anterior discal area of head. Antennae and legs usually testaceous. Head (Text-fig. E, 15) almost square, broadly rounded at posterior angles with posterior margin medially incurved. Punctuation rather variable and irregular, integument very finely aciculate anteriorly behind antennal bases. Mandibles (Text-fig. E, 16) strongly tridentate. Eyes

very small. Thorax (Text-fig. E, 11) slender, particularly the propodeum. Punctuation rather coarse but not close, dorsal surfaces finely longitudinally aciculate. Abdomen more uniformly punctate than thorax, finely longitudinally aciculate. Pygidium (Text-fig. E, 13, 14) relatively simple and finely punctate. Length (excluding antennae) 5.5-8.5 mm.

Locality, etc.—Turner gives Adelaide and Melbourne as localities. The 32 pairs collected by the writer were all taken at Wannon, Victoria, in September and October from 1949 to 1951. This species, like most of the genus, appears to be a honey-dew feeder, rarely if ever visiting blossom.

Types.—The type male is in the British Museum. The above is the first description of the female and is principally based on a specimen in the collection of the Division of Entomology, C.S.I.R.O., Canberra.

EIRONE MAJOR Turner, 1919. (Text-fig. F.)

Rec. S. Aust. Mus., 1: 171.

Male: The following supplements Turner's description. Colour black, with clypeus, antennal prominences dorsally, anterior pronotal margin, mandibles basally and legs yellow. Antennae ferruginous, darker apically. Tegulae and wing veins ferruginous. Mandibles apically dark ferruginous. Head almost impunctate between ocelli and antennae; much produced posteriorly (Text-fig. F, 6). Epipygium as in Text-fig. F, 5. Length (excluding antennae) 12 mm.

Female: Colour of head and abdomen piceous; mandibles, antennae, thorax and legs ferruginous. Head (Text-fig. F, 4) slightly broadest posteriorly, somewhat sparsely and irregularly punctate, sparsely and finely aciculate towards antennal prominences. Thorax (Text-fig. F, 4) with rather large elongate punctures on pronotum and mesopleurae, fine sparse punctures elsewhere except on posterior face of propodeum, which is densely, finely punctate. Abdomen (Text-fig. F, 4) with scattered elongate punctures, finer punctures toward anterior margins of each tergite. (Note: These fine punctures may be covered by telescoping of segments in some specimens.) Pygidium as in Text-fig. F, 2. Length (excluding antennae) 9.5 mm.

Locality, etc.—Turner gives the locality for the type (collected by Lea) as Forest Reefs, between Bathurst and Orange, N.S.W. The pair and single male collected by the writer were both taken at Croydon, Victoria, in February, 1950, while sweeping *Eucalyptus* foliage at about 25 ft. above ground level using a net with an 18 ft. handle. The trees were infested with *Eriococcus coriaceous* Maskell, and it seems possible that the specimens were feeding on honey-dew.

Types.—A cotype male is in the South Australian Museum, Adelaide, and another in the British Museum. The female has not previously been described and the specimen on which the above description is based is in the collection of the Division of Entomology, C.S.I.R.O., Canberra.

Variety of EIRONE MAJOR Turner.

Two males and a pair taken *in copula* at Kiandra, N.S.W., on 9th, 19th and 23rd February, 1952, respectively, differ from the typical form as follows (see Text-fig. F).

Male: Larger size (14.5 mm. compared with 12 mm.), black antennae and antennal prominences and difference in head shape (Text-fig. F, 7 and 6).

Female: Larger size (11 mm. compared with 9.5 mm.), black propodeum, differences in punctuation pattern (Text-fig. F, 4 and 1) and different pygidial characters (Text-fig. F, 3 and 2).

The pair on which the above remarks are based is in the collection of the Division of Entomology, C.S.I.R.O., Canberra. Two males are in the Entomology Division, D.S.I.R., Nelson, New Zealand.

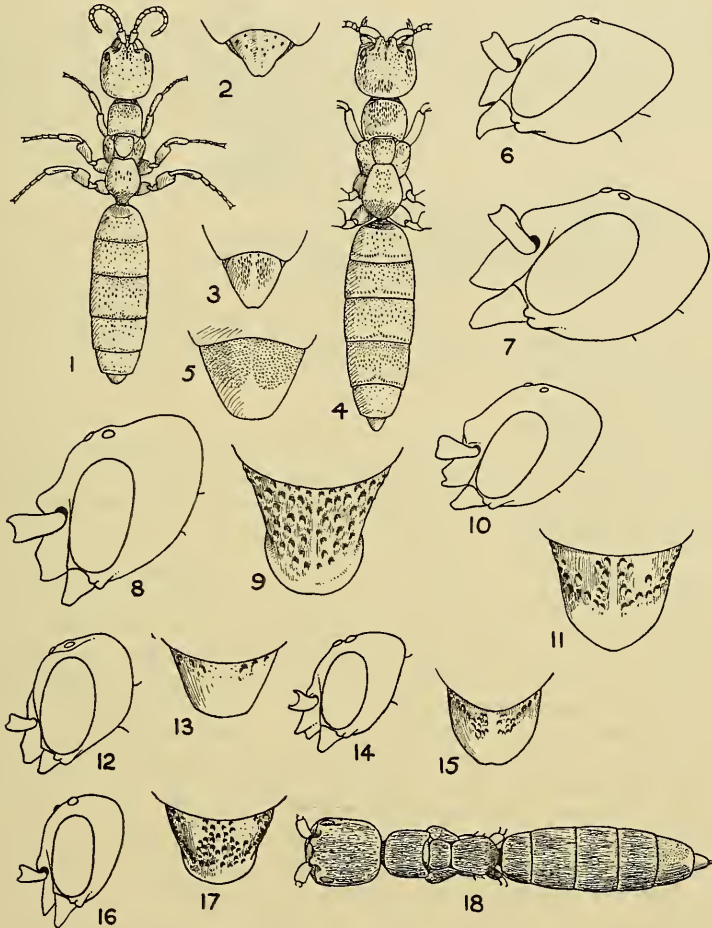
EIRONE ARENARIA (Turner), 1907. (Text-fig. F.)

PROC. LINN. SOC. N.S.W., 32: 253, *Aelurus (Lepteirone)*.—1910, *Gen. Ins.*, 105: 9 (*Eirone*).

Male: Turner gives a good general description of this species, but the following remarks will assist identification. Turner states that the apex of the clypeus is

produced into minute spines. These processes would be better described as tubercles. Text-fig. F, 8, of the head profile, illustrates the large antennal prominences. Text-fig. F, 9, illustrates the epipygial structure, in which the reflex margin should be noted.

The female is unknown.



Text-fig. F. *Eirone*.

1-2: *E. major* Turner. 1, female; 2, female, pygidium. 3-4: *E. major* Turner, var. 3, female, pygidium; 4, female. 5-6: *E. major* Turner. 5, male, epipygium; 6, male, head, profile. 7: *E. major* Turner, var., male, head, profile. 8, 9: *E. arenaria* (Turner). 8, male, head, profile; 9, male, epipygium. 10, 11: *E. schzorhina* Turner. 10, male, head, profile; 11, male, epipygium. 12, 13: *E. ferrugineicornis* Turner. 12, male, head, profile; 13, male, epipygium. 14, 15: *E. lucida* (Smith). 14, male, head, profile; 15, male, epipygium. 16-18: *E. dispar* Westwood. 16, male, head, profile; 17, male, epipygium; 18, female.

Locality, etc.—The type was collected by French in Victoria, and the two males examined were collected by the writer at Kiandra, N.S.W., 4500 ft., on 3rd and 23rd February, 1952. They were taken feeding on jassid exudations on *Eucalyptus* foliage. One male is deposited in the collection of the Division of Entomology, C.S.I.R.O., Canberra, the other in the collection of the Entomology Division, D.S.I.R., Nelson, New Zealand.

Type.—In the British Museum.

EIRONE SCHIZORHINA Turner, 1910. (Text-fig. F.)

Proc. zool. Soc. Lond., 1910, p. 264.

The following notes will serve to supplement Turner's description. *Male*: Clypeal tubercles and marginal depression (Text-fig. F, 10) are distinctive, as also is the epipygium (Text-fig. F, 11). The antennal prominences are joined as a transverse ridge.

The female is unknown.

Locality, etc.—The type locality is New South Wales. Material examined was collected at Blundell's, A.C.T. (E. F. Riek, 10th February, 1948), and Kiandra, N.S.W. (the writer, 23rd February, 1952). The former specimen is in the collection of the Division of Entomology, C.S.I.R.O., Canberra, the latter in the collection of the Entomology Division, D.S.I.R., Nelson, New Zealand.

EIRONE FERRUGINEICORNIS Turner, 1910. (Text-fig. F.)

Proc. zool. Soc. Lond., 1910, p. 265.

Turner's description is good, but the illustrations (Text-fig. F, 12 and 13) and the following notes will make determination more simple.

Male: The pronotum, not the entire prothorax, is ferruginous. Antennae inserted in rather deeply depressed areas, antennal prominences being scarcely present (as illustrated by profile, Text-fig. F, 12). The abdomen is unusually short for the genus, in the specimen examined being shorter than the thorax. Epipygium (partly retracted) as in Text-fig. F, 13.

The female is unknown.

Locality, etc.—The type, which is in the British Museum, was collected at Hermannsburg, Central Australia. The specimen examined was collected by E. F. Riek on 27th October, 1949, 20 miles south-east of Bourke, N.S.W., and is in the collection of the Division of Entomology, C.S.I.R.O., Canberra, A.C.T.

EIRONE LUCIDA (Smith), 1859. (Text-fig. F.)

Cat. Hym. B.M., 7: 36. *Thynnus (Agriomyia)*.—Turner, 1907, *Proc. Linn. Soc. N.S.W.*, 32: 266. *Aelurus (Eirone)*.—1910, *Gen. Ins.*, 105: 9 (*Eirone*).

Male: Black, legs testaceous or light ferruginous except for coxae and trochanters, which are black, mandibles testaceous with ferruginous apices, small yellow spot on each antennal prominence, tegulae light yellow. Head (Text-fig. F, 14) shallowly, rather finely punctate, with a smooth impunctate longitudinal band between anterior ocellus and antennal prominences, clypeal margin strongly depressed beneath the strongly forked and tuberculate clypeofrontal longitudinal carina. Thorax with the pronotum only slightly narrowed anteriorly. Pronotum very finely and sparsely punctate, mesonotum closely and deeply punctate and transversely rugulose. Abdomen short and rather broad (equal in length to thorax), very finely and sparsely punctate, minutely transversely rugulose. Epipygium as in Text-fig. F, 15. Length (excluding antennae) 8 mm.

Locality, etc.—The type locality is Tasmania. The specimen examined was collected by Key, Carne and Kerr at Oatlands, Tasmania, on 15th January, 1948, and is in the collection of the Division of Entomology, C.S.I.R.O., Canberra.

EIRONE DISPAR Westwood, 1844. (Text-fig. F.)

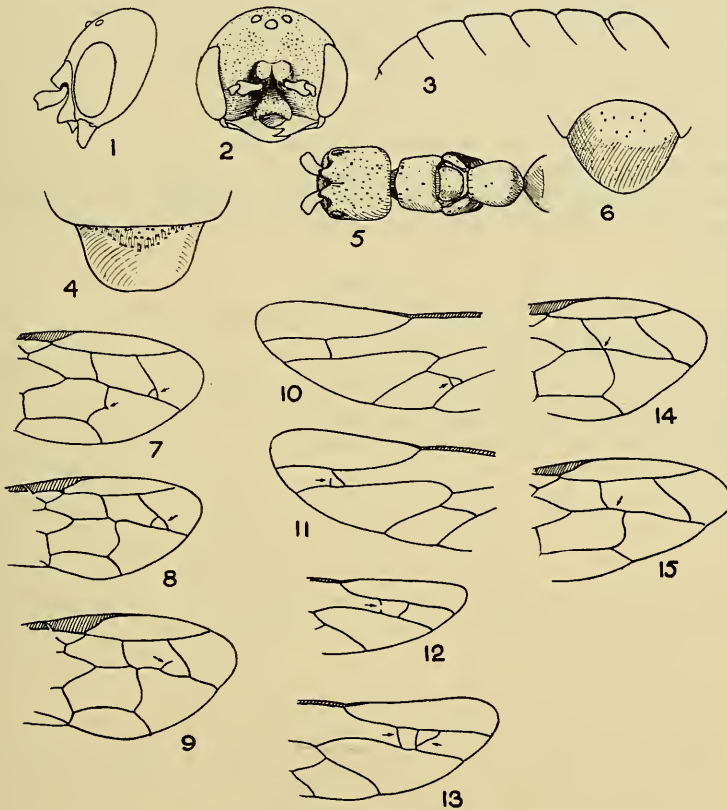
Arcan. Ent., 2: 144.

Male: Colour black, mandible apices deep reddish. Head (Text-fig. F, 16) completely punctate, clypeus without tubercles or carina. Face strongly depressed below antennal prominences, which are not markedly outstanding. Thorax rather finely punctate, not rugulose between punctures. Abdomen longer than thorax, dorsally flattened, finely shallowly punctate, finely shagreened on posterior discal areas of segments. Epipygium as in Text-fig. F, 17. Length (excluding antennae) 10 mm.

Female: Colour ferruginous, head and abdomen somewhat darker suffused, legs testaceous. Head (Text-fig. F, 18) irregularly punctate and finely aciculate. Mandibles bidentate. Thorax (Text-fig. F, 18) more finely and sparsely punctate than head, finely aciculate except for the posterior face of the propodeum, which is very finely and

densely punctate. Abdomen sparsely punctate and longitudinally aciculate except for segment 5, which is finely and rather closely punctate. Pygidium extremely thin and transparent. Length (excluding antennae) 4 mm.

Locality, etc.—The type locality is Adelaide, and the pair examined were taken by the writer at Cooma, N.S.W., on 3rd February, 1952. This pair is in the collection of the Division of Entomology, C.S.I.R.O., Canberra, and the type pair in the Oxford Museum.



Text-fig. G. *Eirone* and *Rhagigaster*.

1-6: *Eirone mulesi*, n. sp. *1, male, head, profile; *2, male, head, frontal; *3, male, abdominal outline, dorsal; *4, male, epipygium; *5, female, head and thorax; *6, female, pygidium. 7-15: *Rhagigaster mandibularis* Westwood. 7-9, forewing aberrations; 10-13, hindwing aberrations; 14-15, range in position of insertion of second recurrent nervure on third cubital cell of forewing.

* Figures drawn from type specimens.

EIRONE MULESI, n. sp. (Text-fig. G.)

Male: Colour black, shining. Head (Text-fig. G, 1 and 2) sparsely, finely punctate. Antennal prominences very acute and prominent. A well-developed bituberculate, almost crescentic clypeal prominence dominant below the antennae. Thorax sparsely punctate, pronotum medially depressed towards posterior margin. Abdomen with the first segment strongly constricted dorsally (Text-fig. G, 3), widest towards posterior. Sparsely, irregularly punctate. Epipygium as in Text-fig. G, 4. Length (excluding antennae) 7.5 mm.

Female: Colour of head, antennae and abdomen black, thorax ferruginous, legs somewhat darker. Head (Text-fig. G, 5) almost square, posterior angles rounded. Punctuation irregular. Mandibles bidentate. Thorax (Text-fig. G, 5) almost impunctate.

Abdomen very finely punctate towards anterior of segments 2 to 5, elsewhere irregularly and very sparsely punctate. Pygidium (Text-fig. G, 6) very broad, evenly rounded and smooth.

Types.—The type pair was taken *in copula* at Traralgon, Victoria, on 23rd December, 1951, by Mr. M. W. Mules, and is in the collection of the Division of Entomology, C.S.I.R.O., Canberra, A.C.T.

Note: Apart from the species mentioned above, the writer has material representing at least 18 further species in the genus *Eirone* which it has not been possible to determine with any degree of certainty, yet which cannot be described as new because of the taxonomic difficulties of the genus. Three forms tentatively labelled as varieties of *E. ichneumoniformis* (Smith), one labelled as a variety of *E. lucidula* (Turner), and one labelled "near *montivaga* Turner" have been the only species in this indeterminate residue which have received even tentative labels. It would seem probable that the genus will prove to be unsuspectedly large once collectors pay more attention to coccid and similar exudations. One species has been taken only on young *Banksia* leaves, where no sucking insects were present and no blossom was available.

The genus is an extremely difficult one from the systematic standpoint and requires careful revision.

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