The Classification of Halictine Bees: Tribes and Old World Nonparasitic Genera with Strong Venation

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THE CLASSIFICATION OF HALICTINE BEES: TRIBES AND OLD WORLD NONPARASITIC GENERA WITH STRONG VENATION

By

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The Classification of Halictine Bees: Tribes and Old World Nonparasitic Genera with Strong Venation

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Abstract

This study segregates and describes the tribes of the subfamily Halictinae. The Nomiodidini is the most distinctive, but has not usually been recognized as a tribe. The Old World non-parasitic Halictini with strong wing venation are revised to the subgeneric level. The recognized species are listed for revised faunas; otherwise trivial names are listed without indications of synonymies. American representatives of the Old World groups are included. The name Patellapis is resurrected for a large African group, divided into three subgenera, Lomatalictus n. subg., Chaetalictus n. subg., and Patellapis s. str. A related, large, African genus, Zonalictus n. g., is recognized. The primarily Oriental group Paechyhalictus is raised to the generic level and Dictyohalictus n. subg. is described for its African representative. Thrienoalictus is raised to the generic level. Only three subgenera of Thrinchoalictus are recognized, Eothrinchoalictus, Thrinchoalictus s. tr., and Diagonozus. For Halictus the usual three subgenera Seladonia, Vestitoalictus and Halictus are recognized.

Introduction

This work on the classification of sweat bees (Hymenoptera, Apoidea, Halictidae) was begun in order to provide a firmer basis for understanding halictine social evolution. The present paper is a segment in a larger study. When all the halictine groups have been included, a comprehensive account of the probable lines of descent and of the origins of sociality will be prepared.

The parasitic halictine groups were treated earlier (Michener, 1978), so that the numerous special features of parasitic genera may be excluded from further consideration. The result is important shortening of the descriptive material for the nonparasitic genera.

The three halictine tribes are characterized below. The genera of one of them, the Augochlorini, were revised by Eickwort (1969). The Nomiodidini contains only a single genus and is treated below. The Halictini contains several nonparasitic genera. Two of them, possibly to be subdivided later, have the third and often the second transverse cubital veins and the second recurrent vein of the fore wing, at least in females, weakened relative to nearby veins. These genera, Homalictus and Lasioglossum (including Evylaeus), are excluded from the present paper and will be treated later. Also excluded from this paper are a number of strictly American genera with strong distal wing venation. These are Agapostemon, Caenohalictus, Habralictus, Paragapostemon, Pseudagapostemon, Rhinetula, and Ruizantheda. These genera are not closely related to those treated below and will be the topic of a later study by R. B. Roberts. The remaining Halictini, those with strong wing venation found in the Old World, are the principal topic of the present paper. One such genus, Halictus, occurs also in the New World and its variations and species in New World are included.

In the descriptive material, noteworthy characters and especially those unique to a group are italicized to facilitate rapid use. In the generic descriptions for the Halictini, the various areas or characters are numbered, to facilitate quick comparison of particular features among genera.

The lists of species given for the various genera and subgenera are not exhaustive. They contain names of species of which I have seen authentic material, plus names added from the literature when descriptive information is adequate. Many species described in Halictus s. l., often with no indication of group characters and sometimes compared to unrelated species that are now

1 Contribution number 1650 from the Department of Entomology, The University of Kansas, Lawrence, Kansas 66045, U.S.A.
in different genera, can be placed only by re-examination of type material.

For areas such as Africa for which no revisional studies exist, all names which I have been able to place as to genus or subgenus are included in the lists. For areas included in revisional studies or catalogues, synonymous names are excluded, often even when the published synonymy post-dates the revisional studies. Such catalogues or revisions are those of Sandhouse (1941) and Michener (1951) for North America, Wille and Michener (1971) for the Neotropical region, and Blüthgen (1920, 1921, 1923a, b, 1924) and Ebmer (1969, 1976b) for the Palearctic region. Revisional treatments of Pachyhalictus and Trinichostoma are indicated in the accounts of those genera.

Specific names marked by asterisks are placed on the basis of the literature only.

**KEY TO THE TRIBES OF HALICTINAE**

1. Anterior tentorial pits in clypeus, separate from epistomal suture although connected to suture by sulci; fimbria of metasomal tergum V of female not divided by longitudinal specialized area

   ...................... Nomioiini

   Anterior tentorial pit in epistomal suture; fimbria of tergum V of female in nonparasitic forms divided by longitudinal median area of specialized fine, dense pubescence and punctuation ...... 2

2. Longitudinal median specialized area of tergum V of female not divided by a cleft; metasomal tergum VII of male with a transverse ridge, usually carinate, forming a false apex beneath which the tergum is strongly reflexed to the morphological apical margin, surface above the transverse ridge usually with a recognizable hairless pygidial plate ..................... Halictini

   Longitudinal median specialized area of tergum V of female divided by a deep cleft in the tergal margin; tergum VII of male without pygidial plate and without transverse premarginal ridge of carina forming a false apex ............... Augochlorini

**TRIBE NOMIOIDINI**

This tribe consists of minute species with dull, metallic, greenish, bluish or brassy, or rarely black, head and thorax and yellow markings in both sexes, usually involving the clypeus, pronotal margin, often the scutellum and metanotum, parts of the antenna and legs, and bands across the metasomal terga.

Outer veins of forewings strong. Inner orbit rather strongly, angularly emarginate above middle. *Anterior tentorial pit at apex of sharp angle or sulcus deep into general clypeal area*, near upturned end of the large preapical transverse clypeal groove.

**Male:** Metasomal tergum VII without recognizable pygidial plate, but margin produced posteriorly; truncate or notched. Posterior margin thin, not reflexed anteroventrally as in Halictini. Sternum VIII with well developed spiculum as well as long apical process. Apex of sternal VI somewhat produced, but entire. Genitalia rather elongate, gonostylius longer than the rest of genital capsule, over twice as long as gonocoxite, without ventral reflexed flap, much exceeding penis valves; plane of dorsal bridge of penis valves vertical. Second tarsomere of hind leg narrowed toward base, freely articulated with basitarsus, as third is articulated to second.

**Female:** Labrum not thickened, apical process minute, with few hairs, not keeled. Metasomal tergum V with apical margin and fimbria entire, without median slit or area of specialized texture or vestiture.

**Genus Nomioides** Schenck

Figures 1, 7, 9

This is the only genus of the Nomioidiini. It consists of minute, usually yellow and greenish black bees. A few characters that vary among genera in other tribes and that are therefore of interest in the present context are as follows:

Lower ends of paraocular areas angularly projecting into clypeus. Inner hind tibial spur of female coarsely pectinate with a very few large teeth. Strigilis ending bluntly, with radiating series of apical spines. Costal margin of marginal cell about as long as stigma, shorter than distance from apex of cell to wing tip; apex of marginal cell subtruncate or rounded. Lateral margins of metasoma with sharp angle separating dorsal from ventral parts of terga, the latter and the sternum often with long scopal hairs (angle less sharp in *N. minutissima* than in most species).
Nomioides ranges from southern Europe to southernmost South Africa, west as far as the Canary Islands, eastward to Madagascar and across Asia (north to the Caspian) to Taiwan and the Philippines, and southeast to Indonesia and Australia. It is common and represented by many species in arid and semiarid areas, but scarce and local in humid forested regions; it has not been found in New Guinea or islands to the eastward, although present in various Sunda Islands. The genus was revised by Blühgen (1925) with a supplement in 1934.

Nomioides appears to be divisible into two subgenera, as follows:

Subgenus Nomioides Schenck, s. str.
This subgenus contains those species in which the pale, dorsal, integumental bands are on the posterior margins of the metasomal terga.

**Subgenus Ceylalictus Strand**


*Cellaria* Friese, 1913 (not Ellis and Solander, 1786), Deutsche Ent. Zeitschr., p. 575. Type species: *Nomioides arnoldi* Friese, 1913 (monobasic).


In this subgenus the pale, metasomal bands are on the median or basal parts of the terga. *Ceylalictus* is not the name generally applied to this group, because Blüthgen proposed *Eunomioides* for it. However, *Ceylalictus* has priority; moreover, *Eunomioides* was never described, nor was a bibliographic reference given. It was therefore not validly proposed. *Cellariella* easily falls into *Ceylalictus* as here understood, differing by a single venational character.

**Tribe Augochlorini**

This tribe is restricted to the Western Hemisphere and most of its species are strongly metallic green, blue, brassy, etc. A few, however, are weakly metallic (as is *Seladonia*) and a few almost completely lack metallic tints. Yellow or white markings are usually absent; if present they are limited to appendages, labrum, and lower half of clypeus of males.

Outer veins of forewings not weak. Inner orbit usually distinctly emarginate above middle of eye.

*Male*: Metasomal tergum VII without pygidial plate, without transverse premarginal carina and without zone below it reflexed to meet apex of sternum VI. Sternum VIII with speculum. Sternum VI usually with median apical notch. Genitalia rather broad, gonostylus usually shorter than gonocoxite, without basal ventral flap; plane of dorsal bridge of penis valves horizontal so that bridge is entirely visible in dorsal view. Second tarsomere narrowly articulated to first, as third is to second.

*Female*: Labrum thick, except in parasitic forms with apical process bearing a strong longitudinal keel. Metasomal tergum V with median longitudinal minutely pilose or roughened area deeply notching into the prepygidial fimbria of long hairs, tergal margin in middle of this area deeply cleft; or in parasitic forms (*Temnosoma*), tergum V unmodified with continuous apical hairy area.

The genera of this tribe have been treated in detail by Eickwort (1969) and are not further dealt with in this paper.

**Tribe Halictini**

This large tribe contains most Old World Halictinae as well as many of those of the New World. Species vary from minute to large, black to brilliantly metallic green or blue, usually without yellow markings in the female (the superficially *Nomioides*-like genus *Habralictus* is an exception) and with yellow if any restricted to the clypeus, antennae, and legs in males, less commonly (*Agapostemon* and related Neotropical genera) forming metasomal bands or present on pronotal lobes.
Outer veins of fore wings often weakened. Inner orbit usually not strongly emarginate.

Male: Metasomal tergum VII usually with recognizable although often poorly defined pygidial plate margined posteriorly by a transverse ridge or carina which forms the extremity or superficial apex of the tergum, above and behind the morphological posterior margin area (sometimes only narrow marginal zone) beyond apex of plate reflexed, normally meeting posterior margin of sternum VI, occasionally pygidial plate reduced or absent, but even in such cases posterior part of tergum VII reflexed as indicated above. Sternum VIII without specimen. Apex of sternum VI entire. Genitalia rather broad, gonostylus usually shorter than gonocoxite, often with basal ventral flap; plane of dorsal bridge of penis valves vertical. Second tarsomere of hind leg sometimes fused to first, sometimes articulated but with articulation broader than that of third to second, sometimes narrow at base like third.

Female: Labrum thick, except in parasitic forms with apical process bearing a strong longitudinal keel. Metasomal tergum V with median, longitudinal, minutely pilose area (absent in parasitic genera) deeply notching into the prepygidial fimbria of long hairs, but tergal margin not cleft.

Except for Halictus, the genera considered here all belong to a group of genera in which the metasomal sternum IV of the male is armed with coarse and sometimes gigantic setae or bristles and frequently shortened, mostly or wholly hidden by III. Only Thrinchostoma orchidarum and the subgenus Lomatialectus of Patellapis (perhaps only the one species of that subgenus whose male is known) are exceptions to this feature. This group of genera is primarily African although it also ranges across tropical Asia. The presence of a membranous retrorse basal lobe of the male gonostylus in all members of this group suggests a relationship to the Lasoglossum-Homalictus group, i.e., to the genera of Halictini with weakened distal wing venation. Such a lobe is absent in Halictus, although present in the Neotropical Agapostemon group.

**Key to World Non-Parasitic Genera with Strong Apical Wing Venation**

1. Female with margin of clypeal truncation, distal to preapical fimbria, extended downward at each side of labrum as a small, rather sharp, impunctate projection (except in some minute Asiatic species of the subgenus Vestito-halictus which lack such projections). Fourth sternum of male unmodified or at least without coarse, apical setae. Ventral basal process of male gonostylus absent or if present directed apically and resembling a second stylus .................... Halictus

2. Apical marginal areas of terga with simple, laterally directed hairs that usually form bands that are conspicuous only in certain lights. Profile of scutum in front gently convex, rising but little above level of pronotum. Pronotum with carina separating dorsal from declivous anterior surface. Recurrent veins both entering third submarginal cell or first recurrent entering extreme apex of second cell ........ Thrinchostoma

3. Malar area about as long (female) to twice as long (male) as diameter of
flagellum. Pygidial plate of male not defined. Gonostyli of male not bifurcate ........................................... *Thrincocolalictus*

... Malar area usually linear, rarely about half as long as diameter of flagellum. Pygidial plate of male defined at least posteriorly and posterolaterally by a carina. Gonostyli of male bifurcate, one branch sometimes slender and inconspicuous ............................. 4

4. Metasomal terga with basal bands of tomentum. Pygidial plate of male rather small. Rami of male gonostylius subequal in thickness. Hind tibia of female with outer surface largely covered with rather short, nearly erect hairs of uniform length .... *Pachyhalictus*

... Metasomal terga without basal bands of pale tomentum. Pygidial plate of male large. Outer ramus of male gonostylius much more slender than inner. Hind tibia of female with hairs on outer surface longer, slanting, as in most halictids ................................. 5

5. First and frequently other metasomal terga usually with colored (blue, green, yellow, white) apical integumental bands. Thoracic pubescence long, plumose, usually yellowish; body almost without areas of short, whitish pubescence or tomentum as in many halictine groups. Clypeus of male often with yellow ........................................ *Zonalictus*

... Tergal margins not colored. Thoracic pubescence usually shorter, less fully plumose, grayish or whitish; body often with areas of whitish pubescence or tomentum. Clypeus of male without yellow areas .......................... *Patellapis*

Genus *Patellapis* Friese

Figures 10-44

The hitherto little used name *Patellapis* is here applied in a much broader sense than previously. It becomes a substantial genus of African Halictini, encompassing species that exhibit much morphological diversity.

Male: 19. Clypeus and legs without yellow or white areas. 20. Body of labrum two (in P. brunsella) to over three times as wide as long, fringed with bristles, without apical process or with a short triangular process, or in P. schlutzei with strong, keeled apical process almost like that of a female. Mandible simple or in Lomatalictus bidentate. 21. Flagellum short to moderate in length, first segment broader than long, second and sometimes third and fourth broader than long and longer than broad, middle segments usually distinctly longer than broad, sometimes 1.5 times as long as broad. 22. Basitibial plate present or absent. 23. First two hind tarsal segments apparently articulated, but base of second broader than base of third. 24. Metafemora moderately robust, shaped about as in female, third segment widest or second and third equal. 25. Pygidial plate rather large, defined by strong carina both laterally and apically, smooth area longer than broad to slightly broader than long. 26. Sternal IV often short and largely or wholly hidden by III, usually with a series of bristles. Sternal V unmodified to broadly emarginate apically. 27. Sternal VII a transverse band with median apical projection; VIII with broadly rounded, truncate or emarginate apical projection, often with hairs. 28. Genitalia broad with somewhat narrow base (broad base in P. schlutzei). Gonostylus bifid distally (upper branch sometimes delicate and difficult to see, especially in P. schlutzei), more than half as long as gonopods, with retorse, ventral, basal, membranous lobe which is sometimes bifid (e.g., in P. schoenlandi). Penis valve rather slender to enlarged medially, inferior basal process slender and parallel sided in P. schlutzei or rounded to obliquely truncate.

Female: 29. Scape reaching at least to anterior margin of anterior ocellus, sometimes as in P. cincticandica reaching middle of posterior ocellus. Second flagellar segment broader than long (about as broad as long in P. montagnii), first and even third and labrum sometimes also broader than long. 30. Labrum with tapering apical process with keel; body of labrum more than twice as broad as long, 31. Hind tibia and its scopula of usual form. 32. Basitibial plate of moderate size, angular or rounded apically, margin elevated, surface dull or shining, with some hairs. 33. Inner hind tibial spur serrate to pectinate. Hind tibia with two apical spines, sometimes short and mere angles, or posterior one commonly absent, so that there is only one spine. 34. Sterna hairs simple to plumose, of moderate length.

Patellapis belongs to the group of genera with the apical wing venation strong and with the fourth metasomal sternum of males armed with bristles (except in the subgenus Lomatalictus) and nearly always shortened. It differs from Pachyhalictus by the lack of tomentous basal bands on the terga; the ordinary sculpturing and hind tibial shape and scopula of the female, these features being as in most halictines; the pointed marginal cell; the weakly carinate and nonlamellate dorsolateral protornal angles; and by the large, well defined pygidial plate of the male with the smooth area usually longer than broad. It differs from Zonalictus by the lack of apical, colored tergal bands, the hairy and sometimes fasciate apical tergal margins, the shorter and less fully plumose pubescence of the head and thorax (except for P. malachurina and allies which resemble Zonalictus in this respect), the shorter and more robust form, etc. It would not have been illogical, however, to include Zonalictus as a subgenus of Patellapis.

Key to the Subgenera of Patellapis

1. Claws of female simple or with inner tooth very small, of male with the teeth close together. Fourth sternum of male similar in size and vestiture to third .................................................. Lomatalictus

Claws toothed as usual in halictines.

Fourth sternum of male usually shortened, often largely hidden under third,
with a few to many coarse bristles in a transverse row .......................................................... 2

2. Terga with conspicuous apical hair bands; basitibial plate margined both in front and behind, apex in female usually rounded .................. Patellapis s. str.

.... Terga without or with weak apical hair bands; basitibial plate not or incompletely defined on anterior margin, apex angulate or pointed .... Chaetalictus

The subgeneric classification is not entirely satisfactory. When more species are known from both sexes, it should be re-examined. There is great diversity within the genus and even within the subgenera.

**Lomatalictus** new subgenus

Figures 10-20

Type species: *Halictus malachurinus* Cockerell, 1937.


The male of *pallidicinctula* is unknown to me; the above comments on males are based on *P. malachurina*.

**Lomatalictus** is known only from South Africa. There may be only two species; *P. pallidicinctula* is clearly different from *malachurina*, but the other two names may both be synonyms of the latter.

Included names, all described in *Halictus* and all new combinations, are as follows:

- *Patellapis (Lomatalictus) levisculpta* (Cockerell, 1939)
- *Patellapis (Lomatalictus) malachurina* (Cockerell, 1937)
- *Patellapis (Lomatalictus) pallidicinctula* (Cockerell, 1939)
- *Patellapis (Lomatalictus) suprafalva* (Cockerell, 1946)

The name *Lomatalictus* is based on *lomatos*, fringes, plus *Halictus*, with reference to the apical bands of hairs on the metasomal terga.

**Chaetalictus** new subgenus

Figures 20-26

Type species: *Halictus pearstonensis* Cameron, 1905.

Clypeus markedly convex in profile. Mandible of male simple. Claws normal for halictines. Basitibial plate of female rather slender, weak on anterior margin, narrowly rounded to angulate at apex, as in

---

Lomatia: of male absent to small, undefined anteriorly, with angulate apex. Inner hind tibial spur of female finely pectinate-serrate (in P. serrata, as figured for P. pallidiciinula) to pectinate. Metasomal terga with translucent margins narrow to broad, apical hair bands weak or absent. Sternum IV of male of normal size to shortened, broadly emarginate, and hidden under III; it bears six enormous bristles or (in P. rubrotibialis) a row of often erect or retrorse bristles, only the lateral ones of which are large, or (in P. pulchrinites) a row of rather weak bristles. Penis valve without enlarged dorsal crest.

This subgenus, known only from southern Africa, consists of species mostly smaller than those of Patellapis s. str.

Included names, all described in Halictus and all new combinations, are as follows:

*Patellapis (Chaetalictus) atricilla*  
(Cockerell, 1940)

*Patellapis (Chaetalictus) ausica*  
(Cockerell, 1945)

*Patellapis (Chaetalictus) calvini*  
(Cockerell, 1937)

*Patellapis (Chaetalictus) calviniensis*  
(Cockerell, 1934)

*Patellapis (Chaetalictus) capillipalpus*  
(Cockerell, 1946)

*Patellapis (Chaetalictus) chubbi*  
(Cockerell, 1937)

*Patellapis (Chaetalictus) cinctifera*  
(Cockerell, 1946)

*Patellapis (Chaetalictus) communis*  
(Smith, 1879)

*Patellapis (Chaetalictus) disposita*  
(Cameron, 1905)

*Patellapis (Chaetalictus) dispositina*  
(Cockerell, 1934)

*Patellapis (Chaetalictus) flavornfa*  
(Cockerell, 1937)

*Patellapis (Chaetalictus) leonis*  
(Cockerell, 1940)

*Patellapis (Chaetalictus) micropastina*  
(Cockerell, 1940)

*Patellapis (Chaetalictus) nelii*  
(Cockerell, 1937)

*Patellapis (Chaetalictus) pastina*  
(Cockerell, 1937)

*Patellapis (Chaetalictus) pastinella*  
(Cockerell, 1939)

*Patellapis (Chaetalictus) pastiniformis*  
(Cockerell, 1939)

*Patellapis (Chaetalictus) pearstonensis*  
(Cameron, 1905)

*Patellapis (Chaetalictus) pondoenisis*  
(Cockerell, 1937)

*Patellapis (Chaetalictus) probita*  
(Cockerell, 1933)

*Patellapis (Chaetalictus) pulchrinitens*  
(Cockerell, 1937)

*Patellapis (Chaetalictus) rubrotibialis*  
(Cockerell, 1946)

*Patellapis (Chaetalictus) rufiventris*  
(Friese, 1925) (not Halictus rufiventris Giraud, 1861)

Presumably a synonym of pearstonensis and hence not in need of a new name.

*Patellapis (Chaetalictus) sanguinibasis*  
(Cockerell, 1939)
Patellapis (Chaetalictus) schonlandi (Cameron, 1905)
Patellapis (Chaetalictus) semipastina (Cockerell, 1940)
Patellapis (Chaetalictus) serratiera (Cockerell, 1937)
Patellapis (Chaetalictus) spinulosa (Cockerell, 1941)
Patellapis (Chaetalictus) termuihirta (Cockerell, 1939)
Patellapis (Chaetalictus) terminalis (Smith, 1853)
Patellapis (Chaetalictus) vambensis (Cockerell, 1940)
Patellapis (Chaetalictus) villosicauda (Cockerell, 1937)
Patellapis (Chaetalictus) volutatoria (Cameron, 1905)

The name Chaetalictus is based on chaetes, bristle or hair, plus Halictus, with reference to the coarse bristles on the fourth sternum of the males.

Subgenus Patellapis Friese, s. str.

Figures 27-44


Agrees with description of Chaetalictus except as follows: Mandible of male simple or in minutior bilidentate. Basitibial plate of female rather broad, margin well defined throughout, not weak on anterior side, apex rounded or weakly angular; of male similarly broad and well defined in P. schultzei, narrower, pointed apically, but defined by carina at least part way up anterior margin in other species. Inner hind tibial spur of female weakly serrate to pectinate. Metasomal terga with broad translucent pallid margins and strong apical bands of plumose hair. Sternum IV of male unmodified in shape (in P. "minutior") to shortened, broadly concave apically, and largely hidden by III, in all species with a transverse row of coarse bristles, the lateral ones greatly enlarged in P. braunsella, but not in others. Penis valve with median dorsal carina greatly expanded to form apically directed helmet-like crest.

This subgenus, known only from Cape Province, South Africa, contains the following species:

Patellapis (Patellapis) braunsella new species
Patellapis (Patellapis) cincticauda (Cockerell, 1946) new comb.
Patellapis (Patellapis) minutior (Friese, 1909)
Patellapis (Patellapis) montagui (Cockerell, 1941) new comb.
Patellapis (Patellapis) schultzei (Friese, 1909)

The specimen of P. minutior used for this study was labeled "typus" by Friese and is in the American Museum of Natural History. Other specimens, similarly labeled, in the Berlin museum are a different species of the same subgenus, with simple mandibles and other features not agreeing with my comments on minutior. Presumably the Berlin specimens are the true minutior. I have therefore placed the name in quotes where reference is to the
Fig. 44. Top row: *Patellapis* (Patellapis) schultzei, face of male and *P. (P.) montagni*, face and wing of female. Middle row: *Patellapis* (P.) brunnsella, face of male, face and wing of female. Bottom row: *Zonalictus albofasciatus*, face of male, face and wing of female. Scale line = 1.0 mm.
specimen in the American Museum. It does not seem to me appropriate to name the species at present, since I have seen only a single specimen in poor condition.

*P. cincticauda* is placed in this subgenus hesitantly, since I have seen no males and have not examined specimens since recognizing the limits of this group. The genitalia of *P. schultzei* and *P. braunsella* are quite different as illustrated, but those of *P. "minutior"* are intermediate in gonobase width and some other features.

Great diversity within as well as between the subgenera of *Patellapis* sometimes confuses the subgeneric limits. The bristles of the fourth sternum of the male in *P. braunsella* are greatly enlarged laterally, suggesting *P. (Chaetalictus) rubrotibialis*. The size and shape of the same sternum (not shortened) in *P. "minutior"* suggest *Lomatalictus*, as do the bidentate mandibles of the male. The one female specimen of a minute and presumably undescribed species of *Chaetalictus* has claws with only a small inner tooth, like those of *P. (Lomatalictus) malachirina*. There are very striking differences among species of at least the genera *Patellapis* and *Chaetalictus*, and the subgenera here recognized may be inadequate to properly reflect this diversity, or the limits of the subgenera recognized may not be ideal. One of the major problems is that for too many species only one sex is known, so that the full suite of specific characters is not available. The classification presented above is, therefore, tentative and conservative in that few suites of specific characters is not available.

Zonalictus new genus

Figures 44-53


Type species: *Halictus albofasciatus Smith.*
translucent when not colored. Discs of terga II and III without oblique hairs.

Male: 19. Clypeus often with apical transverse yellow area; labrum often partly yellow: legs without yellow. 20. Labrum usually over three times as wide as long, without or with a barely evident apical process, but in Z. concinulus only about twice as wide as long because of a strong, triangular apical process (not keeled), Mandible simple (bidentate in Z. concinulus). 21. Flagellum elongate, first segment a little broader than long, other segments much longer than broad. 22. Basitibial plate present and well defined to nearly absent with only the apex distinct. 23. First two hind tarsal segments articulated as in Pateellapis. Metasoma rather elongate, widest at segments 2 and 3. 25. Pygidial plate moderately large, defined by a strong carina both laterally and apically, smooth area usually longer than broad. 26. Sternum IV shortened, largely hidden by III, sometimes with a series of coarse bristles becoming progressively larger laterally (as in Pateellapis braunella), but usually with a series of erect or retrorse bristles of uniform size medially and one enormous, isolated, largely hidden, lateral bristle at each side. 27. Sternum VII a transverse band with median apical projection; VIII with produced apex emarginate. 28. Genitalia broad with somewhat narrow base. Gonostylus bident distally, more than half as long as gonobase, with retrorse, ventral, basal, membranous lobe which may be large and bifid or may be much reduced in size. Penis valve rather slender, dorsal keel not expanded as in Pateellapis s. str., inferior basal process broadly rounded or subtruncate at apex.

Female: 29. Scape reaching posterior ocellus. Second flagellar segment as long as broad or usually broader than long, others commonly longer than broad, but mostly broader than long in some species (e.g., Z. zacephalus). 30. Labrum with tapering or sometimes rounded apical process with keel, body of labrum more than twice as broad as long. 31. Hind tibia and its scopal of the usual form. 32. Basitibial plate of moderate size, angular or narrowly rounded apically, margin elevated throughout or anterior margin largely absent so that plate is defined only apically and posteriorly; surface of plate with some hairs. 33. Inner hind tibial spur usually coarsely serrate to pectinate with short teeth, but in Z. zacephalus finely ciliate-serrate. Hind tibia with one tibial spine. 34. Sternal hairs short to moderate in length, simple to plumose, not suggestive of a scopal.

Zonalictus is closely related to Pateellapis and could easily be incorporated into that genus as a subgenus. Because of its rather elongate form, the long, yellowish plumose hairs, and the integumental color bands on the apices of the metasomal terga (very rarely absent but often limited to tergum I or I and II), it has a different appearance from Pateellapis or other halictids. Because of this fact, and other characters which are not invariable, such as the yellow on the clypeus of the male, the usually longer male antennae, and the commonly dull integumental surfaces between punctures, I have hesitantly accorded Zonalictus generic status.

Zonalictus is found throughout subsaharan Africa and eastward to Madagascar, Socotra, and Yemen. The specific names known to be included are listed below. Names preceded by an asterisk are placed here on the basis of literature only.

Zonalictus aberdaricus (Cockerell, 1945)
*Zonalictus abessinicus (Friese, 1916)
Zonalictus albofasciatus (Smith, 1879)
Zonalictus albofilosus (Cockerell, 1937)
Zonalictus albolineolus (Meade-Waldo, 1916)
Zonalictus alopex (Cockerell, 1937)
Zonalictus andersoni (Cockerell, 1945)
*Zonalictus andreniformis (Friese, 1925)
*Zonalictus andrenoides (Friese, 1909)
Zonalictus barlongus (Cockerell, 1939)
*Zonalictus bilineatus (Friese, 1909)
Zonalictus broomi (Meade-Waldo, 1916), nomen nudum
Zonalictus burunganus (Cockerell, 1937)
*Zonalictus burungensis (Cockerell, 1937)
Zonalictus cerealis (Cockerell, 1945)
Zonalictus cinctulellus (Cockerell, 1946)
Zonalictus concinnulus (Cockerell, 1946)
*Zonalictus flavofasciatus (Friese, 1915)
Zonalictus flavovittatus (Kirby, 1900)
Zonalictus fuliginosus (Cockerell, 1937)
Zonalictus gowdeyi (Cockerell, 1937)
Zonalictus grandior (Blüthgen, 1929)
Zonalictus hargreavesi (Cockerell, 1946)
Zonalictus heterozonicus (Cockerell, 1937)
Zonalictus kabetensis (Cockerell, 1937)
*Zonalictus kamerunensis (Friese, 1914)
(This is the first of two forms to which Friese gave the same trivial name on the same page.)
Zonalictus kavirondicus (Cockerell, 1945)
Zonalictus kivunicola (Cockerell, 1937)
Zonalictus knysnae (Cockerell, 1945)
Zonalictus kristenseni (Friese, 1915)
Zonalictus macrozonius (Cockerell, 1937)
Zonalictus microzonius (Cockerell, 1937)
Zonalictus minor Blüthgen, 1929 (not Halictus minor Morawitz, 1876)
(Named as a variety of andreini-formis; no replacement name seems needed.)
Zonalictus mirandicornis (Cockerell, 1939)
Zonalictus moshiensis (Cockerell, 1937)
Zonalictus neavei (Cockerell, 1946)
Zonalictus nefasiticus (Cockerell, 1935)
Zonalictus nomioideus (Friese, 1909)
Zonalictus pallidicinctus (Cockerell, 1933)
Zonalictus paritius (Cockerell, 1933)
Zonalictus patriciformis (Cockerell, 1933)
Zonalictus pearsoni (Cockerell, 1933)
Zonalictus percinctus (Cockerell, 1937)
Zonalictus perlucens (Cockerell, 1933)
Zonalictus perpansus (Cockerell, 1933)
Zonalictus pronitius (Cockerell, 1934)
Zonalictus pulchricinctus (Cockerell, 1933)
Zonalictus pulchrhiirtus (Cockerell, 1933)
*Zonalictus rufobasalis (Alfken, 1930)
Zonalictus ruvensorenensis (Strand, 1911)
Zonalictus sidialis (Cockerell, 1937)
Zonalictus stanleyi (Cockerell, 1945)
*Zonalictus subpatricius Strand, 1911
Zonalictus subvittatus (Cockerell, 1937)
Zonalictus tenuimarginatus (Friese, 1925)
Zonalictus territus (Cockerell, 1937)
Zonalictus tinctorius (Cockerell, 1937)
Zonalictus tricolor (Meade-Waldo, 1916, nomen nudum, not Halictus tricolor Lepeletier, 1841
Zonalictus trifilosus (Cockerell, 1945)
Zonalictus unifasciatus (Cockerell, 1937)
Zonalictus viridifilosus (Cockerell, 1946)
Zonalictus vittatus (Smith, 1853)
*Zonalictus weisi (Friese, 1915)
Zonalictus zacephalus (Cockerell, 1937)
Zonalictus zaleucus (Cockerell, 1937)

The name Zonalictus is based on zone, a belt or girdle, plus Halictus, with reference to the conspicuous integumental metasomal color bands of many species.

Genus Pachyhalictus Cockerell
Figures 54-68

1. Nonmetallic black, rather small, robust, 5.5-7 mm long. 2. Frons, scutum and scutellum reticulate
(more finely on frons), not punctate, or occasionally partly smooth or, as in *P. binghami*, with fine wrinkles and shallow punctures. 3. Clypeus neither produced downward nor proterubent forward, about three times as wide as long or wider, angle at end of truncation not or feebly produced, surface closely punctured or reticulate and dull, uniformly gently convex. 4. Line between lower ends of eyes crossing clypeus below or above middle. 5. Malar space linear. 6. Paraocular area not extending down as lobe into clypeus, lateral clypeal margins only weakly curved and at an obtuse angle to one another. 7. Mouthparts short, the short glossa exceeded by labial palpi, post-palpal part of galea not much longer than broad.

8. Pronotum with horizontal dorsal surface medially one half (in *P. retigerus*) to one third as long as flagellar width, often densely tomentose, margined anteriorly in middle only by sharp declivity of pronotal surface, but laterally by carina or lamella. 9. Dorsolateral angle of pronotum obtuse, but formed by strong anteriorly or upward directed carina or lamella which extends across posterior pronotal lobe. 10. Anterior extremity of scutum sharply angular in profile, the largely impunctate vertical or overhanging anterior zone rising well above pronotum and sometimes separated from rest of scutal surface by a carina. 11. Preepisternal groove well developed. Metapleur strongly narrowed below, where narrowest less than one third as wide as at upper end. Metanotum tomentose. 12. Dorsal surface of propodeum slightly shorter than to longer than scutellum, usually coarsely areolate, sometimes irregularly coarsely striate, intervals or areolae dull or in *P. retigerus* shining. Triangular area not or scarcely defined. Lateral and posterior propodcal surfaces with short hairs in addition to long ones, these surfaces usually areolate. Posterior surface of propodeum usually margined all the way around by carinae, but *P. binghami* and *retigerus* without carina across summit or on upper parts of sides. 13. Apical wing veins strong. Recurrent veins entering second and third submarginal cells near apices, first sometimes almost intersitial; in *P. retigerus* both recurrents entering cells at apical third or fourth. (One specimen seen lacking first transverse cubital, another lacking second; species with only two submarginal cells may exist.) 14. Third submarginal cell short, third transverse cubital vein straight or arcuate, not sinuate or in *P. retigerus* feebly so. 15. Stigma of moderate size. Marginal cell with free part less than twice as long as part subtended by submarginal cells, apex appendiculate, minutely truncate to pointed, apex separated from wing margin by less than to more than two vein widths. 16. First metasomal tergum much broader than long. 17. Terga II, III, and sometimes IV with strong basal bands of pale tomentum, without apical fasciae. 18. Apical margins of terga broadly, weakly depressed with hairs and punctuation usually about as on more anterior parts of same terga; hairs not or scarcely directed laterally; only very narrow tergal margins impunctate, pallid, and hairless (broad marginal zones impunctate when discs of terga are also largely impunctate as for terga I and II of *P. retigerus*). Discs of terga II and III sometimes with oblique hairs.

**Male:** 19. Clypeus and legs without yellow or white areas. 20. Labrum nearly or over four times as wide as long, fringed with bristles, without apical process. Mandible simple. 21. Flagellum short, all but last two or three segments broader than long or middle segments about as broad as long, first segment much broader than long. 22. Basitibial plate absent (present in *P. retigerus*). 23. First two hind tarsal segments distinct or fused, but point of union indicated by strong constriction. 24. Metasoma robust, shaped about as in female. 25. Pygidial plate small, defined by carina which curves forward laterally, so that it margins the plate both laterally and apically. 26. Sternal IV broadly emarginate posteriorly, median part much shortened, hidden by III, thickened, with an apical series of erect bristles on each side of midline (*Blüthgen's species γ*) and often with an enormous lateral bristle (sometimes hooked as in *bihamatus*) (armature of sternum IV probably highly variable among species, bristles sometimes entirely hidden by sternum III). Sternum V gently emarginate apically (at least in species γ and *P. retigerus*). 27. Sterna VII and VIII much reduced, membraneous, VII a slender transverse strip in species γ, with small median apical projection in *P. retigerus*, VIII damaged, but apparently hairless and without significant apical projection. 28. Genitalia broad with somewhat narrow gonobase; gonostylus ornate, main part deeply bifid, as long as gonobase; retrore, membraneous,
basal lobe itself bilobed, one part extending distad, the other mesad. Penis valve slender, inferior basal process subtruncate (based on Blüthgen's species γ and on P. retigerus).

**Female:** 29. Scape reaching or nearly reaching anterior margin of anterior ocellus. Second, often first, and sometimes other flagellar segments broader than long. 30. Labrum with tapering apical process with keel, body of labrum much more than twice as wide as long. 31. Hind tibia rather robust, lower surface and therefore lower margin as seen from side gently concave, scarcely so in P. retigerus, outer surface largely covered with rather short, nearly erect hairs of uniform length, upper surface with short bristles; lower margin on outer surface with long, coarse, hairs, especially those of basal half of the tibia with more numerous, crowded, and coarser branches than in most halictids, all directed toward apex of tibia. 32. Basitibial plate of moderate size, triangular to rounded apically, margin elevated, surface dull, shining in P. retigerus, with some hairs. 33. Inner hind tibial spur pectinate with a few coarse to many fine teeth. Hind tibia without or with one short tibial spine. 34. Sterna and ventral parts of terga with plumose hairs which in some Indoaustralian species are large, richly plumose, and important scopal structures.

**Pachyhalictus** resembles *Homalictus* in the peculiar shape and vestiture of the hind tibia of the female and some species even have such a large ventral metasomal scopal as to suggest *Homalictus*. In many ways, however, *Pachyhalictus* differs from *Homalictus*, e.g., the robust body, basal bands of tomentum on the terga, and strong second recurrent and third transverse cubital veins. In this feature of venation and in the shortened, largely hidden fourth metasomal sternum of the male, *Pachyhalictus* resembles *Patellapis*, from which it differs in the structure of the tibia of the female, basal bands of tomentum, etc. The bifid gonostyls also suggest a relationship to *Patellapis*. The distinctive reticulate sculpturing of *Pachyhalictus* is found in a very few species of *Patellapis* and *Zonalictus*.

**Pachyhalictus** is found principally from the Asiatic tropics and nearby islands to New Guinea. One species (P. stirlingi), however, occurs in northern Australia. Another, *P. retigerus*, morphologically differentiated but clearly a member of the genus, occurs in southeastern Africa.

**Key to the Subgenera of Pachyhalictus**

1. Inner hind tibial spur of female coarsely pectinate with three to six long teeth; basitibial plate of male absent or nearly so; first two hind tarsal segments of male fused .................

.............................. **Pachyhalictus** s. str.

... Inner hind tibial spur of female finely pectinate with more than 12 slender teeth; basitibial plate of male present; first two hind tarsal segments of male articulated ................. **Dictyohalictus**

**Subgenus Pachyhalictus** Cockerell, s. str.

**Figures 54-61**


Recurrent veins entering second and third submarginal cells near apices of the first interstitial. Third transverse cubital vein arcuate or nearly straight. Basitibial plate of male absent or indicated only apically. First two hind tarsal segments of male fused, but point of union indicated by strong constriction. Fourth sternum of male with an enormous lateral bridle hidden by the tergum, at least in species that have been dissected. Inner hind tibial spur of female pectinate with three to six long, coarse teeth.

**Pachyhalictus** s. str. is restricted to the Indoaustralian region, ranging from Ceylon and India eastward to the Philippines and Taiwan and through Indonesia, New Guinea, to northern Australia. The following is a list of species names, all new combinations in *Pachyhalictus*, based on Blüthgen (1926, 1928, 1931) plus my examinations of type material. Synonymies are those of Blüthgen, not re-evaluated here.

*Pachyhalictus* (Pachyhalictus) *assamicus* (Blüthgen, 1926)

*Pachyhalictus* (Pachyhalictus) *bedanus* (Blüthgen, 1926)

*Pachyhalictus* (Pachyhalictus) *bharamatus* (Blüthgen, 1926)

*Pachyhalictus* (Pachyhalictus) *binghami* (Kirby, 1900)
Of these species, *Pachyhalictus binghami* from Christmas Island in the Indian Ocean, is most distinctive, differing from ordinary *Pachyhalictus* in the less prominent reticulate pattern on the head and thorax (scutum has shallow punctures and fine wrinkles, thus intermediate between punctate and reticulate), and in the propodeal surface pattern (dorsal surface not areolate, with fine longitudinal wrinkles between which surface is dull; carinae marginal posterior surface reaching only three fourths of distance to upper margin of that surface).

**Dictyo halictus** new subgenus

Figures 62-68

Type species: *Halictus retigerus* Cockerell, 1940.

Recurrent veins entering second and third submarginal cells well before apices. Third transverse cubital vein slightly sinuate. Basitibial plate of male present. First two hind tarsal segments of male distinct, although articulation broader than that between second and third segments. Fourth sternum of male with a slender, posteriorly directed lobe at each side, hidden by the tergum, but without a lateral bristle. Inner hind tibia spur of female finely pectinate with more than a dozen rather short, slender teeth.

This subgenus is known only from southeastern Africa. It appears to contain only a single species, *Pachyhalictus (Dictyo halictus) retigerus* (Cockerell), new combination, but there are several synonyms as indicated in the Appendix.

The name *Dictyo halictus* is based on diktyon, a net, plus *Halictus*, with reference to the reticulate sculpturing of the head and thorax.
**Figs. 62-67. Packyhalictus (Dictyohalictus) retigerns.** 62, 63. Dorsal, ventral and lateral views of male genitalia. 64. Posterior dorsal view of male gonostylus. 65. Median part of seventh sternum of male. 66. Fourth sternum of male. 67. Inner hind tibial spur of female.

**Genus Thrincohalictus Blüthgen**

Figures 69-77


Type species: *Halictus prognathus* Pérez, 1912, by original designation and monotypy.

1. Nonmetallic black, moderately robust, length 9-10 mm. 2. Punctuation of the usual sort, rather fine and dense. 3. Clypeus strongly produced downward and protruberant forward, almost twice as broad as long (female) to little broader than long (male), with shining but roughened ground between irregular punctures, upper part flat in profile; angle at end of truncation weakly produced and rounded or absent in male. 4. Line between lower ends of eyes crossing above middle of clypeus (female) or entirely above clypeus (male). 5. *Malar area conspicuous*, about half as long as basal mandibular width (female) to longer than basal mandibular width (male). 6. Paraocular area extending down as strong lobe into clypeus. 7. Mouthparts long and slender, glossa linear and much exceeding palpi and galea, but galea elongate, postpalpal part about four times as long as basal width. 8. Pronotum with horizontal, dorsal surface less than one half as long medially as flagellar width, tomentose, margined anteriorly by angle where pronotal surface becomes declivous. 9. Dorsolateral angle of pronotum obtuse, a rounded ridge, but no carina extending downward from it. 10. Anterior extremity of scutum strongly convex in profile, the largely impunctate, vertical, anterior zone rising well above pronotum and curving uninterrupted onto dorsal surface. 11. Preepisternal groove well developed. Metanotum tomentose anteriorly. 12. Dorsal surface of propodeum about as long as metanotum, triangular area ill-defined and rather finely areolate or striate. Area behind triangle and lateral and posterior propodeal surfaces with few short hairs in addition to long ones.

Posterior and lateral surfaces of propodeum not areolate, separated by carinae only below. 13. Apical wing veins strong. Recurrent veins entering second and third submarginal cells at distal third or fourth. 14. Third submarginal cell somewhat elongate, third transverse cubital vein distinctly sinuate, being arcuate toward wing apex posteriorly and toward wing base anteriorly. 15. Stigma of moderate size. Marginal cell of the usual shape, free part much less than twice as long as part subtended by marginal cells, apex pointed, separated from wing margin by about a vein width or less. 16. First metasomal tergum broader than long. 17. Basal tergal tumen tument absent or nearly so. 18. Terga with apical bands of pale plumose hair as in *Halictus*. Tergal margins broadly depressed, with punctuation finer than on discs of terga, both hairs and punctures ending before margins proper, which are smooth and bare; hairs of marginal bands not or scarcely directed latitudinally; integument of marginal bands translucent brownish.

*Male:* 19. Apex of clypeus and areas on femora, tibiae, and tarsi yellowish white. 20. Labrum slightly ovoid, twice as wide as long, with small apical process; long bristles scattered over marginal part of process, not limited to marginal row; no keel. Mandible simple. 21. Flagellum elongate, segments over 1.5 times as long as wide except for first which is wider than long. 22. Basitibial plate absent. 23. First two hind tarsal segments articulated, base of second not or scarcely broader than base of third. 24. Metasoma rather robust, but nearly parallel sided, segments II and III widest. 25. Pygidial plate not defined by carina, its position occupied by a median projection or tubercle which has hairs like those of adjacent areas, but above which is an ill-defined bare area. 26. Sternum IV shorter than adjacent sterna and largely hidden, its posterior margin fringed with long, curved bristles directed posteriorly, lateral part without a special elongate lobe or bristle. Sternum V with apical margin broadly and strongly emarginate, extreme side with a pencile of extremely long, curved, apparently fused hairs hidden under sides of terga.

**Fig. 68. Face and wing of female of Packyhalictus (Dictyohalictus) retigerns.** Scale line = 1.0 mm.
27. Sternum VII a slender transverse bar with a median apical pointed process. Sternum VIII a transverse band, somewhat broadened and sclerotized medially. 28. Genitalia rather broad with narrowed base. Gonostylus rather simple, little over half length of gonocoxite, with large dense tuft of hairs near inner margin, with large, hairy "retrorse" ventral lobe which, however, is largely directed ventro distally, but with small arm directed mesobasally. Penis valve with inferior basal process broadly rounded apically.

Female: 29. Scape reaching to middle of anterior ocellus. First flagellar segment slightly longer than wide. 30. Labrum with keeled apical process narrow; body of labrum rounded apically, about 1.3 times as wide as long. 31. Hind tibia and scopula of the usual form. 32. Basitibial plate rather large, about one fourth as long as tibia, distinctly margined, surface largely hairy. 33. Inner hind tibial spur pectinate with four or five long coarse teeth. Hind tibia with two strong, apical spines. 34. Sterna with rather long hairs, many of them with a few branches.

*Thrincohaliucts* resembles *Halictus s. str.* in its general appearance, apical tergal bands, yellow markings on the clypeus and legs of males, short and rather simple gonostylus of the male, etc. It differs from *Halictus* in the elongate head, including the malar area, labrum, and proboscis, the short fourth sternum of the male armed with coarse bristles apically, and the large retrorse lobe of the male genitalia. In these features it resembles *Thrinchohostoma*, from which it differs, however, in so many features that there appears to be no close relationship. The fourth sternum of the male and the reduced angles at the ends of the clypeal truncation of the female suggest a relationship to the *Thrinchohostoma-Patellapis-Zonalictus-Pachyhalictus* group rather than to *Halictus* and *Lasigossum*. Among these genera, the similarity appears closest to *Patellapis*, some species of which have apical tergal hair bands and an elongate head and mouthparts (*P. braunsella*), but the simple gonostyl, shorter sternum VIII, almost complete lack of the pygidial plate of the male, yellow markings of the male, as well as the manner of head elongation (with long malar area) and other features distinguish *Thrincohaliucts* from *Patellapis*.

*Thrincohaliucts* contains only one known species, *T. prognathus* (Pérez, 1912), new combination, which ranges from the Armenian S.S.R. and Iran to the Aegean islands (Chios) and south to Israel. Its distinctiveness from relatives in Africa and tropical Asia and its distribution is suggestive of another monotypic genus, *Exoneuridia*, the only north temperate allodapine bee.
Genus *Thrinchostoma* Saussure

Figures 2, 78-87

1. Nonmetallic black or part of metasoma and legs, or even whole body, yellowish red; large and rather slender, 8.16 mm long. 2. Punctuation of the usual sort, rather fine and often dense. 3. Clypeus strongly produced downward and strongly protruding forward, 0.94 to 2.5 times as broad as long, with shining ground between punctures, upper part flat in profile. 4. Line between the lower ends of the eyes crossing clypeus above middle, much above the middle except in *T. afasciatum*, or even entirely above clypeus. 5. *Malar area conspicuous, as long as eye and nearly four times as long as basal mandibular width, densely tomentose, margined anteriorly by an angle or carina only below, rather sharply rounding onto dorsal surface. 13. Apical wing veins strong. **Recipient veins usually both entering third submarginal cell, but first recurrent sometimes interstitial or entering distal extremity of second submarginal cell. 14. Third submarginal cell of moderate length, third transverse cubital vein straight or in *Eothrinicostoma*, sinuate. 15. Stigma rather small and slender. Marginal cell rather slender, free part less than twice as long as part subtended by submarginal cells, apex minutely truncate and appendiculate. 16. First metasomal tergum about as long as broad. 17. Basal tergal bands of tomentum as well as apical fasciae of plumose hairs absent. 18. Apical margins of terga I-IV to III-IV of females and I-V to III-V of males usually broadly depressed, impunctate, with *golden to whitish simple hairs directed laterally, forming bands that are conspicuous in certain lights, except in *T. afasciatum*. 19. Commonly apex of clypeus, labrum, tarsi, sometimes tibiae and rest of clypeus, yellowish white. 20. Labrum with strong apical process margined with bristles, without keel. Mandible simple. 21. Flagellum elongate, segments longer than broad, first shorter than the others, apical segment often flattened and curved (not expanded), sometimes pointed. (A few species of *Thrinchostoma s. str. have male antennae only 12-segmented, but they are otherwise typical members of their species group, see Blüthgen, 1930.) 22. Basitibial plate not or scarcely recognizable. **Hind tibia with pallid inner apical enlargement which carries the tibial spurs far from basitarinsus and from one another. 23. First two hind tarsal segments fused, a weak constriction indicating point of union. 24. Metasoma rather elongate, parallel sided or widest at third or fourth segment. 25. Pygidial plate represented by a smooth, shining area, not delimited by a carina either posteriorly or laterally, this smooth area curving over onto reflexed ventral part of tergum VII. 26. Sternum IV broadly emarginate posteriorly, median part much shortened and hidden or nearly so by III (except in *T. orichar~), but lateral parts extending far posteriorly. Sternum V weakly to strongly emarginate apically, with basal transverse thickening or raised area, sometimes spicate or with large pegs or hooked bristles, this thickening often hidden under IV and absent in *T. orchardum*; sternum VI often with basal elevation frequently exposed by emargination in V. 27. Sternum VII a slender, transverse bar with median apical pointed process. Sternum VIII large with broad, truncate apical process provided with hairs. 28. Genitalia with general form of a typical halictid, the gonobase somewhat narrow, the gonocoxites broad. Gonostylus large and elaborate, half as long as the gonobase somewhat narrow, the gonocoxites broad. Gonostylus large and elaborate, half as long as the gonobase somewhat narrow, the gonocoxites broad. Gonostylus large and elaborate, half as long as the gonobase somewhat narrow, the gonocoxites broad. Gonostylus large and elaborate, half as long as the gonobase somewhat narrow, the gonocoxites broad.
with inferior basal process very slender, capitate or bifid. (Genitalia and hidden sternum examined only for *Thrinchostoma* s. str. and *Eothrinocostoma*.)

**Female**: 29. Scape reaching beyond anterior ocellus; first flagellar segment longer than wide. 30. Labrum with moderate to broad tapering apical process with keel; body of labrum less than twice as wide as long. 31. Outer surface of hind tibia with hairs largely simple, usually some branched hairs along upper margin and large curved branched hairs along basal half of lower margin. (Hairs most branched in *Eothrinocostoma*, intermediate in *Thrinchostoma* s. str., nearly all simple in *Draconozus*). 32. Basitibial plate small, triangular, elevated above surrounding area, but without marginal ridge, surface smooth, with scattered pits, or with large grooves. 33. Inner

Fig. 86. Top row: *Thrinchostoma* (*Eothrinocostoma*) *producta*, face of male, face and wing of female. Middle row: *Thrinchostoma* (*Thrinchostoma*) *spotted*, face of male, face and wing of female. Bottom row: *T. (T.)* *afasciatum*, face and wing of holotype female. Scale line = 1.0 mm.
hind tibial spur rather finely serrate or with broad median tooth beyond which it is coarsely toothed. Hind tibia with one long, slender, tibial spine. 34. Sterna without distinctive scopae.

The Asiatic species of *Thrinchostoma* were reviewed by Blüthgen (1926), the African species, by the same author (1930). Various species have been described since those dates, however.

**KEY TO THE SUBGENERA OF *Thrinchostoma***

1. Forewing without an area of dense hairs along second transverse cubital vein, this vein simple and straight; first transverse cubital arising far from base of vein r and margin of stigma; sternum IV of male with a series of enormous simple setae arising from margin both medially under sternum III and laterally, under the lateral extremity of tergum IV, where the setae are largest ........................................... *Eothrinocostoma*

   Forewing with an area of dense hairs near median part of second transverse cubital vein, in males these hairs forming conspicuous dark spot; second transverse cubital vein usually angulate or thickened medially, sometimes incomplete (not reaching marginal cell); first transverse cubital arising very near margin of stigma; sternum IV of male without coarse, specialized setae .......... 2

2. Head extraordinarily produced below eyes, malar area nearly as long as or longer than eye, several times as long as basal width of mandible ....... *Diagonozus*

   Head only moderately produced below eyes, malar area much shorter than eye, three times as long as basal width of mandible or less .................................................. .......... ............................... *Thrinchostoma s. str.*

Subgenus *Eothrinocostoma* Blüthgen

Figures 78-81, 85, 86


Clypeus moderately produced below lower ends of eyes; malar area about as long as wide. Fore wing without area of dense hairs on second transverse cubital vein. First transverse cubital arising well away from margin of stigma so that vein r is nearly as long as anterior margin of second submarginal cell; third submarginal cell strongly narrowed anteriorly (i.e., toward costal margin of wing), anterior margin less than half as long as posterior margin; second transverse cubital vein nearly straight, not angulate or thickened, complete. Inner hind tibial spur of female with inner margin rather finely and uniformly serrate, each tooth occupying about as much space as three of the very fine teeth on other margin. Fourth metasomal sternum of male with apical row of enormous bristles, bent near apices, smaller medially where they arise under the margin of sternum III, larger laterally where the bases are under the lateral margins of tergum IV, and smaller again near apices of lateral processes, also under lateral margins of tergum IV. Sternum V with a pair of similar large discal bristles. Sternum VI with preapical thickening which is densely hairy posteriorly, the hairy area narrowly divided by longitudinal hairless band.

This subgenus is more like ordinary halictids than the other subgenera in its wing venation and lack of a hair spot on the wings. Moreover, its male antennae and other features do not exhibit the special features found in many species of *Thrinchostoma* proper. *Eothrinocostoma* is presumably more primitive than and probably ancestral to *Thrinchostoma s. str.*

*Eothrinocostoma* ranges widely over tropical Africa, southward to Natal. The following is a list of species:

- **malelanum** Cockerell, 1937
- **manyemae** Cockerell, 1932
- **patricium** (Strand, 1910)
- **sylvaticum** Blüthgen, 1930
- **torridum** (Smith, 1879)
- **wellmani** Cockerell, 1908

Subgenus *Thrinchostoma* Saussure s. str.

Figures 2, 82-84, 86


Type species: *Thrinchostoma renitentia* Saussure, 1890 (monobasic).

*Trichostoma* Dalla Torre, 1896, Catalogus Hymenopterorum, 10:381 (unnecessary emendation of *Thrinchostoma*); Friese, 1909, Die Bienen Afri-

*Trincho3toma* dalla Torre, 1896, Catalogus Hymenopterorum, 10:611 (unnecessary emendation of *Trincho3toma*).

*Trincho3toma* Sladen, 1915, Canad. Ent., 44:214 (unnecessary emendation of *Trincho3toma*).


Type species: *Thri31c1ostoma serricorne* Blüthgen, 1933 (monobasic).

Clypeus but little (*T. afasciat1um*) to moderately produced below lower ends of eyes; malar area one third to three times as long as wide. Fore wing with area of dense hairs near middle of second transverse cubital vein, these hairs forming conspicuous dark spot (minute in *T. serricorne*) in males. First transverse cubital vein arising very near to stigma so that vein r is short (about twice as long as vein width in *T. serricorne*) or virtually absent; third submarginal cell only moderately narrowed anteriorly (i.e., toward costal margin of wing), anterior margin over half as long as posterior margin; second transverse cubital usually at least slightly angulate medially in area of dense hairs, sometimes absent anterior to that point, usually also thickened medially. Inner margin of inner hind tibial spur markedly widened near middle by broad obusce tooth, beyond which margin is coarsely toothed (Fig. 84 for *afasciatum*) to almost smooth and edentate. Sternum IV of male often with long setae on posterior lateral prolongations, but without row of very coarse setae, but such setae often present on basal thickening of sternum V. Sternum VI usually unmodified.

*T. orchid1arum* should be restudied and its genitalia examined for possible distinctive features (type in British Museum). In this species, which is more hairy than others, the sterna II to IV are similar in form; IV is broadly exposed, but somewhat shorter than the preceding ones. Sterna II to IV each bears a preapical fringe of long hairs, broken medially. Sternum V has no basal thickening, and has a dense continuous preapical fringe. Thus, the sternae are less modified than usual in the genus.

This subgenus is widespread in tropical Africa southward to Natal, in Madagascar and in tropical Asia from south India and Assam eastward to Vietnam, Kalimantan and Java.

The following is a list of included species:

- *ac1culatum* Blüthgen, 1928
- *afasciatum* new species
- *affine* Blüthgen, 1928
- *albitarse* Blüthgen, 1933
- *amanicum* (Strand, 1910)
- *assamense* Sladen, 1915
- *atrum* Benoist, 1962
- *bequaerti* Blüthgen, 1930 and form
  - *ochropus* Blüthgen, 1930
- *bibundicum* (Strand, 1910) and form
- *tessmannii* Strand, 1912
- *bryanti* Meade-Waldo, 1914
- *castaneum* Benoist, 1945
- *conjungens* Blüthgen, 1933
- *emini* Blüthgen, 1930
- *flaviscapus* Blüthgen, 1926
- *fulvipes* Blüthgen, 1933
- *fulvim* Benoist, 1945
- *insulare* Benoist, 1962
- *joffrei* Benoist, 1962
- *kandti* Blüthgen, 1930
- *lemuriae* Cockerell, 1910
- *ludienae* Cockerell, 1939
- *macrogynatum* Friese, 1914 and form
  - *brunneum* Blüthgen, 1926
- *michaelis* Cockerell, 1932
- *millari* Cockerell, 1916
- *mwangai* Blüthgen, 1930
- *nachtigali* Blüthgen, 1930
- *obscurn* Blüthgen, 1933
- *orchidarium* Cockerell, 1908
- *othonnae* Cockerell, 1908
- *perineti* Benoist, 1962
- *petersi* Blüthgen, 1930
- *productum* (Smith, 1853)
- *renitantely* Saussure, 1891
- *rugulosum* Benoist, 1962
- *sakalavum* Blüthgen, 1930
- *serricorne* Blüthgen, 1933
- *sjostedti* (Friese, 1908) and form
  - *rufescens* (Friese, 1908)
- *sladeni* Cockerell, 1913
telekii Blüthgen, 1930  
tokinense Blüthgen, 1926  
ugandae Blüthgen, 1930  
umtaliense Cockerell, 1936  
undulatum Cockerell, 1936  
vachali Blüthgen, 1930  
wissmanni Blüthgen, 1930

Subgenus Diagonozus Enderlein  
Figure 87


Lower part of head enormously produced so that head is about as long as thorax; clypeus entirely below lower ends of eyes; malar area about four times as long as basal width of mandible, nearly as long as eye to longer than eye. Fore wing as described for Thrinchostoma s. str., but third submarginal cell with anterior margin about half as long as posterior margin, second transverse cubital vein unusually strongly angulate and thickened. Inner hind tibial spur as described for Thrinchostoma s. str.

Diagonozus is also extremely long, although relative to the very long head it is little or any longer than that of Thrinchostoma s. str. Diagonozus appears to be a derivative of Thrinchostoma s. str., recognizable primarily by the elongate head and proboscis.

Diagonozus is known from tropical west Africa. Included species are as follows:

- bicometes (Enderlein, 1903)  
- ghesquieri Cockerell, 1932  
- guineense Blüthgen, 1930  
- lettotu-vorbecki Blüthgen, 1930

Genus Halictus Latreille  
Figures 3-5, 88-101

1. Nonmetallic black or with body dull greenish or bluish, metasoma sometimes partly or wholly red; body length 3.5 to 17 mm. 2. Punctuation of the usual sort, often fine and dense, but surfaces sometimes shining with widely separated punctures. 3. Clypeus of females and some males not much produced or protuberant, but in some males strongly produced downward and protuberant forward, nearly four times as wide as long (e.g., female of H. squamosus) to less than twice as wide as long (males of various species), angle at end of truncation strongly produced in female, usually acute as seen from front, absent in male; surface usually with shining inter-spaces among punctures, usually distinctly more convex near apex than near base. 4. Line between lower ends of eyes usually crossing clypeus near or above middle, but variable, in H. squamosus lower margin of clypeus. 5. Malar area linear or in some males nearly half as long as wide, widest near anterior margin. 6. Paraocular area not extending down as lobe into clypeus or at most forming an obtuse or right angular lobe. 7. Distal parts of proboscis short, glossa not much longer than labial palpi or postpalpal part of galea. 8. Pronotum with sub-horizontal dorsal surface medially about one third as wide as flagellar diameter, often minutely tomentose, margined anteriorly only by declivity of pronotal surface and sometimes sloping anteriorly so that it merges with the declivous surface. 9. Dorsolateral angle of pronotum usually obtuse, sometimes right angular, not lamellate or strongly carinate, a ridge extending toward posterior lobe of pronotum, but usually not extending across lobe, another ridge (rounded in most Vestitohalictus) extending down from dorsolateral angle. 10. Anterior extremity of scutum strongly convex in profile, the largely impunctate vertical anterior zone rising well above pronotum, usually rounding onto dorsal surface, but rarely with a sharp angle between anterior and dorsal surfaces.

Males have not been seen by me although described by Blüthgen (1930).

Another distinctive character of the subgenus is the more elongate pronotum, the dorsal surface of the elevated portion on the midline being considerably longer than the diameter of an ocellus. In other subgenera this length is little if any longer than an ocellar diameter. The proboscis of...
anterior zone strongly bilobed in *H. squamosus* because of deeply impressed longitudinal median line of front part of scutum. 11. Pre-episternal groove often short and shallow below scrobal groove. Metanotum tomentose or not. 12. Dorsal surface of propodeum longer than metanotum, shorter than to as long as scutellum, striate to granular. Triangular area sometimes defined by end of striate or granular zone, variable in extent. Lateral and posterior surfaces of propodeum without conspicuous short hairs in addition to long ones, not areolate. Posterior surface of propodeum margined by carinae, if at all, only below, or rarely these carinae reaching upper end of posterior surface (as in *H. sexinctellus*). 13. Apical wing veins strong. Recurrent veins entering second and third submarginal cells or rarely first recurrent nearly interstitial with second transverse cubital. 14. Third submarginal cell somewhat elongate, third transverse cubital strongly arcuate posteriorly, straight or nearly so anteriorly, the whole vein often sinuate. 15. Marginal cell rather slender to robust, free part equal to or longer than part subtended by submarginal cells, apex narrowly truncate to pointed on wing margin. 16. First metasomal tergum broader than long or in some males longer than broad. 17. Terga with or without basal areas or bands of tomentum. 18. Terga with apical bands of pale plumose hair (sometimes only laterally), or rarely entire surface uniformly covered with such hair. Apical margins of terga broadly depressed, with punctuation somewhat finer than on more anterior parts of terga, but punctuation continuous nearly to posterior borders, at least on more anterior terga, hairs not or not strongly directed laterally, posterior margins of terga dark to transparent. Disc of tergum II sometimes with oblique hairs.

**Male:** 19. Clypeus, labrum, and legs usually with yellow areas, tegula sometimes with yellow. 20. Labrum over three times as wide as long, rarely less than twice as wide as long, fringed with bristles, without apical process. Mandible simple. 21. Flagellum elongate, middle segments well over 1.5 and often over 2.0 times as long as wide. 22. Basitibial plate absent or sometimes vaguely recognizable as a flattened area of the usual shape, but in no case defined by a carina. 23. First two, hind, tarsal segments apparently articulated, but base of second broader than base of third. 24. Metasoma rather slender, usually parallel sided, segments I to IV almost equally broad although II and III slightly wider than others. 25. Pygidial plate defined only at apex by a carina, the carina not curving forward and defining the plate laterally, smooth area in front of apical carina sometimes small, broader than long, but often extending far toward base of tergum forming a longitudinal shiny band, sometimes elevated to form a shining ridge, in *H. maculatus* narrowed to a longitudinal carina. 26. Sterna IV and V truncate (i.e., unmodified) to broadly emarginate, without coarse bristles. 27. Sterna VII and VIII each with median apical projection, sometimes as in *H. maculatus* blunt and short, that of VIII almost absent in

H. *parallelus* and even emarginate in *H. jarinosus*, the projections usually hairless, but either or both may bear hairs. 28. Genitalia rather broad with somewhat narrow base. Gonostylus rather simple with hairy apical or subapical dorsal lobe or elaborate with one or two clumps of bristles on inner surface, some species (subgenus *Seladonia* and *H. quadricinctus*) with a "second styli" arising ventrolateral to major one, this being the homologue of the retrore lobe of many halictids but directed apically rather than basally; therefore gonostylus without retrore ventral basal lobe. Penis valve moderately slender, inferior basal process rather slender, rounded apically, inconspicuous.

**Female:** 29. Scape usually reaching posterior ocelli or even beyond, rarely only attaining anterior ocellus or in a few species (*H. desertorum, placidulus*) not reaching anterior ocellus. Second flagellar segment broader than long to at least as long as broad, first and middle flagellar segments broader than long to much longer than broad. 30. Labrum with tapering apical process with keel; body of labrum usually more than twice as broad as long, rarely less than twice as broad as long, bugibbous, the two gibbosities sometimes merged. 31. Hind tibia and its scopae of the usual form. 32. Basitibial plate of moderate size, angular to rounded apically, margin elevated or absent on anterior side in *Pentahalictus*, surface dull,
Table 1. Major Differences between Halictus and Lasioglossum s.l.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Halictus</th>
<th>Lasioglossum</th>
</tr>
</thead>
<tbody>
<tr>
<td>distal wing veins</td>
<td>strong</td>
<td>weak</td>
</tr>
<tr>
<td>apical tergal hair bands</td>
<td>of densely plumose hairs</td>
<td>absent or rarely of weakly plumose hairs</td>
</tr>
<tr>
<td>inferior basal process of penis valve</td>
<td>inconspicuous, slender rounded at apex</td>
<td>broad, truncate or obliquely truncate</td>
</tr>
<tr>
<td>inferior basal retrorse lobe of male gonostylius</td>
<td>absent or if present, directed apically, not retrorse</td>
<td>commonly present, membranous, minutely hairy</td>
</tr>
</tbody>
</table>

... Basitibial plate of female of the usual shape and defined by a ridge or carina anteriorly as well as posteriorly; hairless triangular area of propodeum larger, nearly always reaching posterior declivity medially ...................... 2

2. Integument nonmetallic, black; gonostylus of male single (double in H. quadricinctus and allies) ........ Halictus

... Integument, at least of head and thorax, metallic greenish or bluish; gonostylus of male double; i.e., two apparently separate gonostyli on apex of gonocoxite, the outer inferior one equivalent to the retrorse lobe of some halictids, but directed apically and in H. hesperus and lutescens much reduced ...................... Seladonia

Subgenus Seladonia Robertson
Figures 6, 92


Type species: Apis seladonia Fabricius, 1794, by original designation.


Type species: Pachyceble lanei Moure, 1940, by original designation and monotypy.

Length 4.5 to 10 mm. Integument of body dull greenish, sometimes bluish or brassy, that of metasoma sometimes nonmetallic black or brownish. Pubescence not especially dense or widespread although occasionally as in H. microeucnitalis tending to spread between basal and apical tergal bands and thus suggestive of Vestitohalictus. Ridge extending down from lateral angle of pronotum sharply angulate or carinate. Apex of marginal cell pointed. Basitibial plate of female defined by a ridge both anteriorly and posteriorly: inner hind tibial spur of female pectinate...
with long or short teeth. Triangular area of propodeum ample in size, reaching posterior declivity medially, not margined by densely punctate area. Male gonostylus double (outer, inferior "stylus" reduced, but present in H. lilacinosus and H. hesperus of the American tropics); major gonostylus usually with a clump of coarse setae on inner surface.

This is the most widespread subgenus of Halictus, being found in the Holarctic region, south in the Western Hemisphere to Brazil, in Africa to the Cape of Good Hope, and into India and Southeast Asia. It is morphologically compact and unified.

The following is a list of species names placed in Seladonia:

abuensis Cameron, 1908  
adophi-frederici Strand, 1911  
aeneobrunneus Pérez, 1895  
aerarius Smith, 1873  
atrorirdis Cameron, 1906  
austrovagens Cockerell, 1932  
banalianus Strand, 1911  
benguellensis Cockerell, 1908  
ceaelestis Ebmer, 1976  
candescent Cockerell, 1945  
capensis Friese, 1909  
centrosus Vachal, 1910  
cephalicus Morawitz, 1873, and form neuter Blüthgen, 1923  
chloropinus Cockerell, 1946  
confusus Smith, 1853 and forms arapahonum Cockerell, 1906, alpinus Alfen, 1907, and perkinsi Blüthgen, 1925  
datrace Cockerell, 1929  
diductus Cockerell, 1932  
dissensus Cockerell, 1945  
*disidens Pérez, 1903  
duplocinctulus Cockerell, 1940  
eruditus Cockerell, 1924  
expertus Cockerell, 1916  
*exquisitus Warncke, 1975  
ferripennis Cockerell, 1929  
*gashunicus Blüthgen, 1935  
*gavarnicus Pérez, 1903  
gemmatus Dours, 1872  
harmonius Sandhouse, 1941  

hesperus Smith, 1862  
hotoni Vachal, 1903  
jucundiformis Cockerell, 1940  
jucundus Smith, 1853  
kestleri Bramson, 1879 and form nebulosus Warncke, 1975  
komensis Cockerell, 1939  
lanei (Moure, 1940)  
laoisina Cockerell, 1929  
laticinctulus Cockerell, 1946  
leucaheneus Ebmer, 1972 and form arenosus Ebmer, 1976  
lucidipennis Smith, 1853  
lutescens Friese, 1921  
medanicus Cockerell, 1945  
medaniellus Cockerell, 1945  
*meridionalis Morawitz, 1873  
mogrenensis Cockerell, 1945  
mondaensis Blüthgen, 1923  
mongolicus Morawitz, 1880  
*morinellus Warncke, 1975  
mugodaricus Blüthgen, 1933  
nikkoensis Cockerell, 1911  
niloticus Smith, 1879  
*niveoicinctulus Cockerell, 1940  
*occipitalis Ebmer, 1972  
pervires Cockerell, 1940  
petraeus Blüthgen, 1933  
*pjalmensis Strand, 1909  
*pontificus Cockerell, 1940  
propinquus Smith, 1853  
prunescens Cockerell, 1937  
*secundus Dalla Torre, 1896  
seladonius (Fabricius, 1794)  
seminiger Cockerell, 1937  
semitecetus Morawitz, 1873  
silvaticus Blüthgen, 1926  
smaragdulus Vachal, 1895  
speculiferus Cockerell, 1929  
subauratoides Blüthgen, 1926  
subauratus (Rossi, 1792) and its forms corsa Blüthgen, 1933, and syrius Blüthgen, 1933  
*subincertus Cockerell, 1940  
*subpetraeus Blüthgen, 1933  
sudanicus Cockerell, 1945
tataricus Blüthgen, 1933
		tibetanus Blüthgen, 1926

tokarensis Cockerell, 1945

tokariellus Cockerell, 1945

*transbaikalensis Blüthgen, 1933

trichirus Cockerell, 1940

tripartitus Cockerell, 1895

tumilorum (Linnaeus, 1758)

*umbrosus Cockerell, 1929

tansen Cockerell, 1935

tarentzoni Morawitz, 1895

taripes Morawitz, 1876

ternalis Smith, 1879

*verticalis Blüthgen, 1931

vicinus Vachal, 1895

virgatellus Cockerell, 1901

viridibasis Cockerell, 1946

*wollmanni Blüthgen, 1933

Subgenus Vestitoliscus Blüthgen

Figure 100


Type species: Halictus vestitus Lepeletier, 1841, by original designation. (According to Ebmer, 1976b, this was a misidentification; Blüthgen actually had H. pulvereus Morawitz. From the practical viewpoint this is of no importance, since pulvereus and vestitus are similar species of the same subgenus. The type should stand as H. vestitus.)

Length 3.5 to 8 mm. Integument of body dull greenish to entirely non-metallic and black, often with metasoma partly or wholly red. Pubescence dense, white or yellowish, commonly covering entirely metasomal surface, although denser on posterior margins than elsewhere. Ridge extending down from lateral angle of pronotum rounded. Apex of marginal cell pointed on wing margin or apex separated by a vein width or more from margin. Basitibial plate of female undefined anteriorly, or if defined, plate narrow and pointed below rather than broad as in other subgenera; inner hind tibial spur of female pectinate with long or short teeth. Triangular area of propodeum small, short, not reaching posterior declivity, usually margined posteriorly and laterally by densely punctate hairy area. Male gonostylus double as in Seladonia or the outer "stylus" absent.

This subgenus is found in the drier parts of the Palearctic region, from the Canary Islands and the Mediterranean basin to western China. It includes minute as well as moderate sized species, some al-most wholly white because of dense pubescence, many of them with the metasomal integument partly or wholly red.

There is much diversity in the subgenus as here delimited. The type species and its close relatives (including forms with non-metallic as well as with greenish integument) have a median apical tuft or longitudinal band of dense hair on the fourth sternum of the male, but this is absent in other species. The labrum of the female in some species is quite ordinary, but in others the body of the labrum is much longer than usual (e.g., H. desertorum, in which it is two thirds as long as wide). The labral process is broad and very long, about twice as long as the body of the labrum in the female of H. nasica. In males, also, the labrum is sometimes longer than in other Halictus, only somewhat over twice as wide as long as in H. desertorum. Variation in the male gonostylus and in the basitibial plate of the female is indicated in the subgeneric description above. The most conspicuously strange feature of any female Halictus is the clypeus of the minute H. nasica which bears a long, downward projecting median process (Fig. 100).

A. W. Ebmer (in litt., 1977) questions the placement of H. semiticus and H. pla-
in the following list, and says that their male genitalia are similar to those of Seladonia. It may be that the problem arises in part from misassociation of sexes of *H. placidulus*, for Ebmer indicates that the female holotype has a small propodeal triangle as in *Vestitohalictus* while the male has characters suggesting a relationship with *H. (Seladonia) varentzolti*. It well may be that some species intergrade with Seladonia. In general, however, the two subgenera seem quite distinct.

The following is a list of species that fall in the subgenus *Vestitohalictus*.

*aenescens* (Radoszkowski, 1893)
*balearicus* Pérez, 1903
*bubiceps* Blüthgen, 1929
*concinnus* Brullé, 1840
*cupidus* Vachal, 1902
*cyprinus* Blüthgen, 1937
*desertorum* Morawitz, 1876
*fuscicollis* Morawitz, 1876 and form *transscipica* Blüthgen, 1923
*indefinitus* Blüthgen, 1923
*inpolios* Ebmer, 1975
*kuschkensis* Ebmer, 1975
*microcardia* Pérez, 1895
*morawitzi* Vachal, 1902 and form *thescus* Ebmer, 1975
*mordacellus* Blüthgen, 1929
*mordax* Blüthgen, 1923
*mucidus* Blüthgen, 1923
*mucoreus* (Eversmann, 1852)
*nasica* Morawitz, 1876
*ochropus* Blüthgen, 1923
*persephone* Ebmer, 1976
*pici* Pérez, 1895
*placidulus* Blüthgen, 1923
*pollinosus* Sichel, 1860 and its forms *limissicus* Blüthgen, 1937 and *thevestensis* Pérez, 1903
*pulvereus* Morawitz, 1873, and its form *tecutus* Radoszkowski, 1876
*pseudomucoreus* Ebmer, 1975
*pseudovestitus* Blüthgen, 1925
*radoszkowi* Vachal, 1902

Subgenus *Halicicus* Latreille s. str.
Figures 3-5, 88-91, 93-99, 101


Type species: *Apis quadricincta* Fabricius, 1776, by designation of Richards, 1935 (see below).


Type species: *Halicicus ligatus* Say, 1837, monobasic and by original designation.


Type species: *Hyalaeus tomentosus* Eversmann, 1852, monobasic and by original designation.

The type species for the name *Halicicus* has been a subject of much discussion. The following designations and interpretations exist:

4. *Andrena rufipes* auctorum, nec Fabricius = *Apis sexcincta* Fabricius, 1775. This is the interpretation of Latreille’s designation by Warncke (1975).
5. *Andrena rufipes* Fabricius, 1793. This is the interpretation of Latreille’s designation by Ebmer (1974, 1976a).

The only species included by Latreille in 1804 were *rufipes, quadriuscinata, and flavipes*. Designation number 2 is there-
fore invalid for it clearly involves a species not originally included.

The problems center around designation number 1, of which numbers 4 and 5 are interpretations. This designation is invalidated by Opinion number 136 of the International Commission on Zoological Nomenclature (1939), which takes the position that when Latreille in his tabulation of 1810 listed two or more trivial names, there was no type designation.

Even if one ignores Opinion 136, the conclusion is the same. The abbreviation "ejusd." in Designation 1 is for ejusdem or ejusdemmodi, meaning "in the same way." One might assume that this means "the same species," and that Latreille was therefore synonymizing rufipes, an originally included name, with sexcinctus, which was not included by name, but has priority, at the same time that he stated the type species. The International Code of Zoological Nomenclature [Article 69, (a) (iv)] states that if an author designates a type species using a name that was not originally included, but at the same time synonymizes that name with one of the originally included species, the designation of the latter as type species is valid. Thus Latreille's act would be considered as designation of Apis sexcinctus as the type species. It is irrelevant that the so-called type specimen of Andrena rufipes is a wasp which does not agree with the original description at all well (Ebmer, 1976a). There is no need to draw the distinction that Warncke (1975) makes between rufipes acutorum (the bee) and rufipes Fabricius (the wasp), for the wasp with the label "rufipes" must be a result of a probably post-Fabrician error. Under the circumstances, it is also irrelevant that rufipes and sexcinctus are not now considered synonymous (Ebmer, 1974, 1976a).

In reality, Latreille (1810) did not use "ejusd." to indicate synonymy. He listed together species that were not at all alike, but that agreed in what he considered as generic characters. For example, for the genus Megachile he lists miraria Fab. ejusd. lanata, argentata, and centuncularis. These are extremely different looking species; he could not have been suggesting specific synonymy. The same is true for Centris where he lists haemorrhoidalis ejusd. versicolor, two differently colored and clearly nonsynonymous species. Thus for Halictus, he was evidently saying "the type is sexcinctus, and rufipes also belongs here." Since sexcinctus was not an originally included species, Latreille's "designation" is invalid.

Ebmer (1976a) has argued that since Latreille, in indicating the type species, listed two species, only one of which was originally included, that one (rufipes) is thereby designated as the type. This view does not appear to be justified by Article 69 of the International Code of Zoological Nomenclature. Moreover, as already indicated, in view of Opinion 136, all such considerations are irrelevant in any event.

Presumably, it was for the reasons outlined above that Richards made the only valid type designation, number 3 above, the species being Apis quadricincta Fabricius.

Warncke (1970, see also 1975) designated the same Apis quadricincta Fabricius as the type species of Hylaeus, a name proposed by Fabricius in 1793. This designation would have the effect of making Hylaeus available as a senior synonym of Halictus. Warncke's designation is invalid since Latreille in 1810 designated a different species, Apis annulata Linnaeus, as the type species of Hylaeus. This is a species belonging to the genus known in most parts of the world today as Hylaeus. Latreille's designation may have been unfortunate at the time, for annulata was the only species of its genus included by Fabricius under the name Hylaeus, compared to six species of Halictinae, and the name
**Hylaeus** was widely although not uniformly used at one time for the group now known as Halictini. Nonetheless, *Apis annulata* was one of the species originally included in *Hylaeus* and the designation is valid. There is no legitimacy to Warncke’s argument that *Hylaeus* of Latreille is a different genus with a different type species from *Hylaeus* of Fabricius.

Length 6 to 17 mm. Integument of body non-metallic, black or brownish, the metasoma rarely partly red. Pubescence not especially dense or widespread, metasomal terga usually without basal bands of hair but with apical bands only, in the *H. senilis* group hair dense, widespread, often white. Ridge extending down from lateral angle of propomum sharply angulate or carinate. Apex of marginal cell minutely truncate to pointed on wing margin. Basitibial plate of female defined by a ridge anteriorly and posteriorly; inner hind tibial spur of female coarse serrate to short pectinate, or the teeth long in *H. latisinatus*. Triangular area of propodeum ample in size, reaching posterior declivity medially, not margined by densely punctate area. Male gonostylus usually not double, with or without one or two tufts of coarse setae on inner surface, gonostylus double (i.e., with the equivalent of the retrorse lobe projecting distally) only in *H. quadrincinctus* and its immediate allies such as *H. brunneusens*.

The subgenus *Halictus* is abundant in the Palearctic region. It does not occur, however, in subsaharan Africa or in southeast Asia and only one species (*H. latisignatus*) reaches southern India. Only four species occur in North America. One of them, *H. rubicundus*, is Holarctic and one, *H. ligatus*, extends southward into the Neotropical region as far as Colombia and Trinidad.

The subgenus *Halictus* contains several diverse elements, probably as different from one another as they are from *Seladonia*. The latter subgenus, however, is easily recognized in both sexes by its greenish coloration while the groups included in *Halictus* proper are all non-metallic and the females are difficult to segregate into groups. Since for many species, only females are known or males have not been available for dissection, I have not been able to place numerous names as to group. If the subgenus were divided now, many species would therefore not be assignable to subgenus. For this reason, subdivision has not been formally proposed. The groups, however, are distinguishable by the characters of males listed below, and are numbered 1 to 4. These numbers in front of names in the list of species indicate the groups to which certain species belong. (Since writing the above, A. W. Ebmer of Linz, Austria, the principal specialist on Palearctic halictines, has been kind enough to examine my groupings. In general, he agrees with them and has placed nearly all the species not only in these groups, but in subdivisions thereof. I leave to him the full account of groups or subgenera and placement of the species.)

**Group 1**

Mandible broadened basally. First flagellar segment much broader than long; flagellum somewhat moniliform. Hypostomal area concave. Malar space present. Sternum IV with apical margin concave, malar space variable. Sternum IV deep concave. Basitibial plate of female defined by a ridge anteriorly and posteriorly; inner hind tibial spur of female coarse serrate to short pectinate, or the teeth long in *H. latisinatus*. Triangular area of propodeum ample in size, reaching posterior declivity medially, not margined by densely punctate area. Male gonostylus usually not double, with or without one or two tufts of coarse setae on inner surface, gonostylus double (i.e., with the equivalent of the retrorse lobe projecting distally) only in *H. quadrincinctus* and its immediate allies such as *H. brunneusens*.

The name *Monilapis* is available for Group 1 and could be used in a subgeneric sense except for the problem of placing species known only from females, as mentioned above. The name “tetazonius group” has usually been used. It is a compact, Palearctic group characterized by a series of derived features. The clump of coarse setae usually arising from the inner surface of the gonostylus is probably homologous to the coarse setae on the basal extension of the preapical hairy lobe in Group 3. It is not homologous to the clump of specialized, flattened setae found in Group 3 and *Seladonia*.

**Group 2**

Mandible not broadened basally. First flagellar segment slightly broader than long to longer than broad; flagellum not moniliform. Hypostomal area not concave. Malar space variable. Sternum IV sim-
The name Odontalictus is available for this group, which is restricted to the Palearctic region except for *H. ligatus* which is American. The genal tooth of the female of *H. ligatus*, which led Robertson to provide the name *Odontalictus*, is not a subgroup or group character. It is also found in some unrelated Palearctic species such as *H. modernus* and *submodernus* and even in *H. (Seladonia) wollmani*. *H. ligatus* is in the *scabiosae* subgroup of my Group 2.

**Group 3**

Agrees with Group 2 except as follows: sternum IV, if concave, longest at lateral margins as in Group 1. Gonostylus complex, with preapical, hairy lobe which often projects both basally and apically, and with clump of coarse, flattened setae on inner surface basal to the lobe; sometimes (e.g., in *H. rubicundus*) with small outer inferior "stylus," this fully developed so that the stylus appears double in *H. quadricinctus* and its allies.

The double gonostylus of *H. quadricinctus* and its allies is suggestive of that of *Seladonia*, as is the clump of specialized setae arising from the inner surface of the gonostylus, but the large, nonmetallic species of Group 3 and the small, greenish species of *Seladonia* do not superficially appear closely related.

The name *Halictus s. str.* is available for this group, which is restricted to the Palearctic region except for three species found in North America.

**Group 4**

Mandible not broadened basally. First flagellar segment longer than broad, flagellum not moniliform. Hypostomal area not concave. Malar area linear. Sternum IV with apical margin concave, sternum widest laterally: V deeply marginate, VI with large median hairy area. Gonostylus not double, with broad, scarcely hairy, thin lobe extending downward and slender apical process projecting in same direction, with clump of long coarse setae on inner surface, but this displaced basal relative to other species so that it arises basal to apex of gonocoxite.

This group contains only the Indian species *H. latisignatus*, which is distinguishable in the female by the small median elevation on the apical margin of the clypeus. The distinctive features have been well illustrated by Sakagami and Wain (1966).

The following is a list of species of the subgenus *Halictus*:

- *acrocephalus* Blüthgen, 1923
- *adjikenticus* Blüthgen, 1923
- *aegyptiacus* Friese, 1916
- *aegyptica* Strand, 1909
- *albohispidus* Blüthgen, 1923
- *albozonatus* Dours, 1872
- *alkenellus* Strand, 1909
- *altaicus* Pérez, 1903
- *asperatus* Bingham, 1898
- *asperulus* Pérez, 1895
- *atripes* Morawitz, 1894
- *aureipes* Dours, 1872
- *bagirensis* Blüthgen, 1936
- *berlandi* Blüthgen, 1936
- *bifidus* Warncke, 1975
- *brunnescens* (Eversmann, 1852)
- *bucharicus* Blüthgen, 1936
- *carinthaicus* Blüthgen, 1936
- *cedens* Blüthgen, 1931
- *cochlearitarsis* (Dours, 1872)
- *consobrinus* Pérez, 1895
- *constantinensis* Strand, 1910
- *constrictus* Smith, 1853

![Fig. 101. Halictus (Halictus) jarnosus, face of male, face and wing of female. Scale line = 1.0 mm.](image-url)
(1) *crenicornis* Blüthgen, 1923
(1) *cyrenaicus* Blüthgen, 1930,
(1) *determinandus* Dalla Torre, 1896
(4) *dsculifensis* Blüthgen, 1936
(1) *dunganicus* Blüthgen, 1936
(2) *eurygnathopsis* Blüthgen, 1923
(1) *eurygnathius* Blüthgen, 1930
(3) *farinosus* Smith, 1853
(2) *fatselisis* Blüthgen, 1936
*fi mbriaulis* Smith, 1853
*formosus* Dours, 1872
(2) *frontalis* Smith, 1853
*fulvipes* Morawitz, 1876
(2) *fulvipes* (Klug, 1817)
*funattpennis* Blüthgen, 1924
(2) *funerarius* Morawitz, 1876
(1) *furcatus* Blüthgen, 1925
*georgicus* Blüthgen, 1936
*gerdinus* Warncke, 1975
(2) *graceus* Blüthgen, 1936
(1) *grunwaldi* Ebmer, 1975
*gunzleieter* Ebmer, 1975
*hedlini* Blüthgen, 1935
*holomelaenius* Blüthgen, 1936
(2) *humkalensis* Blüthgen, 1936
(2) *hybridopis* Blüthgen, 1923
*intumescent Pérez, 1895
*jaramielicus* Blüthgen, 1923
*kudasai* Ebmer, 1975
(1) langobardicus Blüthgen, 1944
(4) latisignatus Cameron, 1908
*libanensis* Pérez, 1911
(2) ligatus* Say, 1837
(2) *luganicus* Blüthgen, 1936
*luhati* Warneke, 1975
*lussinicus* Blüthgen, 1935
(2) *maculatus* Smith, 1848 and form
*priesneri* Ebmer, 1975
*marchali* Vachal, 1891
*maroecanus* Blüthgen, 1933
*mediterranellus* Strand, 1909
*minor* Morawitz, 1876
*modernius* Morawitz, 1876
(2) nadigi Blüthgen, 1933
*nicosiae* Blüthgen, 1923
*morphoedipterus* Dours, 1872
*palustris* Morawitz, 1876
(3) *parallelus* Say, 1837
(1) *patellatus* Morawitz, 1873
*pentheri* Blüthgen, 1924
(1) *ponticus* Blüthgen, 1936
*pseudomaclatus* Blüthgen, 1925
*pseudotetrazonius* Strand, 1921
(1) pyrenaicus Pérez, 1903
(2) *quadricinctoides* Blüthgen, 1936
(3) *quadricinctus* (Fabricius, 1776)
*(1) *quadrifasciatus* Blüthgen, 1923
(3) *rubicundus* (Christ, 1791) and forms
*mongolensis* Blüthgen, 1936,
*laticinctus* Blüthgen, 1923, and
*lerouxii* Lepeletier, 1841
(3) *rufipes* (Fabricius, 1793)
sajoi Blüthgen, 1923
(1) *samerensis* Blüthgen, 1936
(2) *scabiosae* (Rossi, 1790) and form
*powellii* Cockerell, 1931
(1) *scaricus* Blüthgen, 1936
*sefidicus* Blüthgen, 1936
*senilis* (Eversmann, 1852)
*sepositus* Cockerell, 1921
(2) *sexcinctus* (Fabricius, 1775)
(1) *siculus* Blüthgen, 1925
(1) *simplex* Blüthgen, 1923 (= *ibex*
Warncke, 1973)
squamosus Lebedev, 1910
*stachii* Blüthgen, 1923
(2) *subalfenellus* Blüthgen, 1936
*submodernus* Blüthgen, 1936
(2) *subsenilis* Blüthgen, 1955
*takuricus* Blüthgen, 1936
(1) *tetrazonianellus* Strand, 1909
(1) *tetrazonius* Klug, 1817
*tibialis* Walker, 1871
*tonentosus* (Eversmann, 1852)
*tridivisus* Blüthgen, 1923
*tsingtongenis* Strand, 1910
*turanicola* Dalla Torre, 1896
(2) *turkomannicus* Pérez, 1903
*t Wagneri* Blüthgen, 1937
(1) *ujernicus* Blüthgen, 1936
*yarkandensis* Strand, 1909
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I am especially pleased to acknowledge the help of P. Andreas W. Ebmer of Linz, Austria, with regard to the lists of species of Halictus. Not wishing to detract from his future publications, I have not incorporated all the information which he provided relative to groupings, synonymies, and the like, but I have incorporated many additions and corrections received from him.

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Appendix

The following are new species described so that their characters can be incorporated into the descriptions in the body of this paper, plus certain other taxonomic notes that relate to these bees.

Patellapis (Patellapis) braunsella
new species
Figures 27, 29-33, 44

In its elongate head and associated features such as the long glossa and the lobe of the paraocular area cutting into the clypeus, this species differs from all other Patellapis. P. (Lomatatifus) pastina has a moderately elongate head and a somewhat long glossa, but these features are less extreme than in P. braunsella and must be independently evolved. P. braunsella, as shown by the subgeneric characters, is more closely related to P. schulzi and P. minuttior. It is the size of the latter, but differs in many ways including the head shape and associated characters listed above and the more elongate and crenulate antennal flagellum.

Female: Length 8 mm; forewing length 6.5 mm. Black with dark brown on middle of mandible, under side of flagellum, and small segments of tarsi; apices of metasomal terga and sterna II to IV broadly pallid translucent. Wings clear, veins and stigma rather light brown.

Pubescence dull white, moderately abundant and long, plumose but not as heavily so as in P. mala­chnerina, especially long (much longer than eye width) on genal area; longest hairs on basal half of scape nearly half as long as scape; first metasomal tergum with apical white hair band restricted to sides; base of tergum II, especially laterally, with scattered plumose white hairs (the closest approach to basal bands of tomentum found in the genus); terga II-IV with broad, well defined, dense apical hair bands. Hair of fifth tergum orange red, fading to white laterally. Tibial and tarsal hairs yellowish white, yellowish on sides of tarsi; clypeal fringe and hairs of mandible similarly yellow; penicillus orange yellow.

Head slightly longer than broad (188:162); upper and lower interorbital distances as 104:100. Clypeus slightly over twice as wide as long (98:42); line between lower ends of eyes crossing clypeus near upper margin; paraocular area extending down into clypeus as an approximately right angular lobe. Malar space linear. Inner orbits convergent below, except for upper parts, which are convergent above. Antennal sockets separated by less than diameter of a socket. Antennocellar:interantennal:antennocellular:interocellar: ocellar distances as 32:12.5:23:24. Labrum with convex body about twice as wide as long and apical pointed process shorter than body. Frontal carina ending well below level of lower margins of antennal sockets. Upper part of genal area wider than eye, area widest at upper third of eye and narrowing to almost nothing in lateral view at lower end of eye. Glossa as long as head. Scape reaching to level of upper margin of lateral ocellus; first flagellar segment about as broad as long, second broader than long, others longer than broad. Dorsolateral pronotal angles obtuse; a ridge, but no carina, extending across pronotal lobe. Dorsal surface of propodeum shorter than scutellum, separated from posterior surface by a moderately sharp angle, no distinct carina defining posterior surface laterally although several minute ridges mark the lateral limit of that surface below. Basitibial plate
rather narrowly rounded apically. Inner margin of inner hind tibial spur minutely serrate-pectinate or ciliate.

Clypeus and lower part of paraclypeal area shining with irregular, large, well separated punctures. Supra-
clupeal area minutely roughened, dull, with smaller
punctures separated by over a puncture width. Frons and vertex finely and densely strigose-punctate. Genal
area more coarsely and shallowly strigose. Hypo-
 stomal area nearly smooth, shining, flat. Scutum
dull, minutely and closely punctured; scutellum and
metanotum with much coarser punctures on a mi-
nutely roughened but shining ground. Sides of tho-
rax and propodeum minutely reticulate or punctate
with scattered large, shallow punctures. Dorsal part
of propodeum minutely roughened and dull, the tri-
angular area with a coarser pattern of fine, radiating
striae laterally, medially on basal half or more of tri-
angle such striae anastomosing to form irregular small
areolae. Metasomal terga somewhat shining, but
surfaces minutely roughened, especially on more pos-
terior terga, almost without such roughening on
dorsolateral swellings in front of depressed margins
of terga I and II; punctation rather fine, coarsest on
above mentioned swellings, progressively finer and
sparser on marginal areas, where densest punctures
separated by about a puncture width. Sterna shining,
but minutely roughened, hairs arising from papillae.

Male: Length 8 mm; wing length 6.5 mm. Col-
oration as in female but mandibular apices, under
side of flagellum, and pygidal plate and adjacent
areas red brown; all exposed terga and sternae except
seventh tergum with broadly pallid, translucent apices.

Pubescence as described for female, but all tergal
hair bands weak middorsally and even laterally not as
dense as in female; terga V and VI without hair
bands; base of II without tomentum. No red hair
at apex of metasoma. Sterna 1-IV with apical fringes
of hair, sternum V with area of dense hair at each
side subapically. Hair of legs, clypeal margin, and
mandible nearly as white as that of body. Under
sides of all trochanters and femora with particularly
long white hairs; under side of hind femur except
apex densely covered with such hairs, some nearly
half as long as femur, mostly directed basad.

Head longer than broad (180:159) upper and
lower interorbital distances as 102:82. Clypeus width:
length:78:44. Line between lower ends of eyes cross-
ing clypeus above middle. Paraclypeal lobe, malar
space, convergence of orbits, and separation of an-
tennal sockets as in female. Antennocollar; interantenn-
nal:antennocollar:interocellar:ocellocular distances as
27:12:48:40:26. Labrum with strongly convex, shin-
ing body twice as wide as long and small oblong
angle representing apical process. Frontal carina, genal area,
glossa as in female. Scape reaching middle of anterior
ocellus; first flagellar segment much broader than
long, others longer than broad (second over 1.5 times
as long as broad), median ones crenulate. Pronotum
and propodeum as in female. Basitibial plate defined
by strong carina, but plate much more slender than
in female and therefore with angulate apex. Sternum
IV hidden by third, with row of about 22 bristles
arising from premarginal thickening, lateral ones
enormous and lying flat, others progressively smaller
toward median ones, middle 12 bristles or thereabouts
bent at about level of apical sternal margin and
thereafter erect. Sternum V with apical margin
broadly emarginate between sublateral lobes.

Punctuation similar to that of female, but on clypeus
and lower part of paraclypeal area denser; hypostomal
area minutely roughened, not smooth and impunctate.
Propodeum with minutely areolate or reticulate
part of triangle extending almost to posterior margin.
Tergal punctuation somewhat finer than in female,
punctures of first two terga separated by about a
puncture width, ground shiny and smooth; more
posterior terga progressively more roughened and less
punctate.

Holotype male, Willowmore, Cape Province (Capland on the label), South
Africa, February 1, 1905 (Dr. Brauns).
Allotype female, same locality and collector,
May 15, 1905. Two female paratypes,
May 4 and 15, 1905 and two male para-
types, August 25, 1906 and October, 1910.

The holotype and allotype are in the
Transvaal Museum, Pretoria, South Af-
rica; a pair of paratypes is in the Snow
Entomological Museum, University of
Kansas, and the other pair in the British
Museum (Natural History).

This species is named for the collector,
the late Dr. H. Brauns, formerly of Wil-
lowmore, Cape Province.

_Pachyhalictus_ (Dictyohalictus) retigerus
(Cockerell)

Figures 62-68


Hist., (11)8:205 (new synonym).

_Halictus latifronsus_ Cockerell, 1946, Entomologist,
79:43 (new synonym).

_Halictus crassineuris_ Cockerell, 1946, Entomologist,
79:183 (new synonym).

Examination of types in the British
Museum indicated that the specific names
listed above are synonymous. The types of
the last three were all taken at the same
locality in Natal, South Africa, by the same
collector. The name _crassineuris_ is based
on males, the others on females. The lo-
cality for the first name listed is in Rhino-
desia.
The following locality record extends the range to another country: one female, Vipya Plateau, 12 miles northeast of Mzimba, Malawi, 5200 feet altitude, 15 April 1967 (C. D. Michener).

*Thrincostoma (Thrincostoma) afasciatum* new species

Figures 84, 86

This species is described here because it has certain characters not otherwise found in the genus which must therefore be accounted for in the generic description. The short malar space, only one third as long as broad or perhaps less, distinguishes this species from all others except *T. sladeni* Cockerell (see Blüthgen, 1926) from Asam. The most remarkable feature, however, is the lack of the bands of pale (usually silvery), laterally directed hairs on the posterior marginal areas of the metasomal terga. Such bands characterize all other species of the genus. The incompletely described *T. bryanti* Meade-Waldo, 1914, also from Borneo, could be the male of *T. afasciatum*. It has black head and thorax, probably lacks radiating striae in the proepodal triangle, and thus seems likely to be different although the description says nothing of the apical tergal bands.

**Female**: Length 9.5 mm. Head brownish black; labrum, malar area, clypeus, and lower part of paracircular area testaceous, this color grading into the dark color of rest of head, supracylpeal area and hypostomal area being largely reddish brown. Mandible testaceous except for dark brown apex. Antenna brownish black except base of scape and under sides of segments 7-12 testaceous. Thorax and legs testaceous except for mesoscutum which is dusky brownish, grading to testaceous posteriorly. Wings yellowish, veins and stigma dusky brown, at extreme wing bases testaceous, also veins forming marginal cell beyond stigma and beyond third transverse cubital vein testaceous. First metasomal tergum and narrow basal bands on terga 2-4 testaceous; broad apical bands on terga 1-4 transparent so that basal testaceous bands on terga 2-4 show through; rest of metasomal dorsum brownish black; metasomal venter brown, testaceous basally.

Hair of head dull yellowish white, some of long hairs dusky in certain lights; subpressed plumose hairs almost hiding surface of lower part of paracircular area laterally; short subpressed hairs also abundant, but not obscuring surface on rest of paracircular area, frons, vertex and genal areas; long, simple, mostly subsecret hairs present on most of head, unusually long, yellowish, and strongly directed forward on supracylpeal area, clypeus, mandible, hypostomal area, and lower genal area. Thoracic hair colored like that of head, short whitish hairs abundant on pleura, sides and posterior face of propodeum, and on metasternum; longer erect hairs mostly simple and dusky in certain lights dorsally, paler and often coarsely plumose laterally. Hairs of legs pale testaceous, golden on under sides of tibiae and tarsi. Metasomal hair dull yellowish white, long erect dorsal hairs dusky in certain lights: transparent marginal bands of terga 1-4 with only scattered, short, laterally directed hairs.

Head broader than thorax, clypeus 2.5 times as broad as long, not much produced downward nor protuberant anteriorly; inner orbits not strongly converging below (Fig. 86); line tangent to lower ends of eyes only a little above middle of clypeus; antennal sockets separated by more than diameter of a socket; antennococular distance about twice diameter of antennal socket: malar area about three times as wide as shortest length; mandible long, less strongly curved than in the forms with a more produced clypeus; first flagellar segment slightly longer than broad, middle segments markedly so. Intercellular distance much less than ocellocular distance. Genal area about as broad as eye seen from side. Glossa distinctly longer than length of head, apical fourth without long hairs. Inner hind tibial spur as in Figure 84. Scutellum gibbous: dorsum of propodeum longer than scutellum. Forewing with basal vein and m-cu interstitial; submarginal cells as in Figure 81; hairs denser around the medially thickened second transverse cubital vein than elsewhere.

Cl ypeus and supracylpeal area shining, with coarse punctures, some of them longitudinally elongate, irregularly placed, but mostly about a puncture width apart; rest of head and thorax with minute punctures, widely separated on scutum, the center of which is shining and impunctate, scutellar gibbosities also shining and impunctate; sides of thorax mostly minutely roughened and dull; propodeal triangle large, nearly reaching declivity, with strong, regular, radiating ridges. Metasomal terga grading from the first which is shining with only scattered minute punctures to the fifth which has a dull surface and scattered small punctures: posterior transparent margins of terga 1-IV impunctate, shining on tergum I, progressively duller on succeeding terga.

Holotype female: Pontianak, Borneo (Kalimantan, Indonesia) (F. Muir) in the collection of the Bishop Museum, Honolulu.

The specific name is based on a, without, plus *fasciatus*, banded, with reference to the lack of apical tergal bands of later-
ally directed silvery or golden hairs, characteristic of other species of the genus.

**Halictus (Seladonia) lutescens** Friese, 1921


Type of *rufus* in National Museum of Natural History, Washington, D.C.

**Literature Cited**


