

Further description of *Ananthidium* Urban, with keys to the Argentine Anthidiini (Hymenoptera: Megachilidae)

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Abstract: Additional descriptive information is given for the genus *Ananthidium* Urban with a key to species. Also, new geographical and floral records are given. A key to the genera of the Anthidiini of Argentina is provided. *Bothranthidium* Moure is considered a subgenus of *Anthodiocles*. A brief discussion of generic characters of the South American genera are given. *Carlatica* Moure & Urban is placed as a synonym of *Epanthidium* Moure. Also, *Saranthidium* Moore & Hurd is considered as a subgenus of *Hypanthidiodes* Moore.

Introduction

During a revisionary study of the genus *Epanthidium* Moure (Stange, 1983) it was noted that *E. inerme* (Friese) was not congeneric. Further studies have revealed structural characters which separate it and a second species from *Epanthidium* and other known anthidiine genera. Urban (1991) also recognized the uniqueness of *Epanthidium inerme* and proposed a new genus, *Ananthidium*, to include it and one additional new species. The structure of the male tergum VII (Fig. 2) appears to be an autapomorphy of *Argentidium*. The highly modified endophallus (Figs. 3,4) is a synapomorphy occurring in various anthidiine genera including *Epanthidium*. The term juxtantennal carina is used in place of interantennal carina at the suggestion of Michener. One species, *A. inerme* (Friese), appears to be restricted to the subandean creosote bush desert of Argentina whereas *A. dilmae* has been described from Minas Gerais Province of Brasil and also occurs in the low mountains of Misiones Province.

Ananthidium Urban, 1991

Type species: *Anthidium inerme* Friese, 1908, by original designation.

Diagnosis: This genus is distinguished by the combination of lack of juxtantennal carina and

preoccipital carina, pretarsus with arolium, presence of postspiracular carina on propodeum, bilobed male tergum VII, and simple female sternum VI. An autapomorphy of the genus is the female clypeus which is thin and overhanging the base of labrum which is hidden when mandibles are closed. The modified apex of the male endophallus (Figs. 3,4) also appears to be a unique modification of the genus.

Description: (Female characters are taken from *A. inerme*.) Head without juxtantennal carina and preoccipital carina; subantennal suture weak in male, scarcely recognizable in female, straight; apex of female clypeus thin, projecting over labral base, not distinctly nodose; female clypeus with irregular punctuation extending to extreme apex; female mandible (Fig. 6) less than twice as long as broad, surface dulled by microsculpturing, apex slightly wider than base, with four teeth, apical well developed, subapical much smaller, subbasal and basal weakly developed; male mandible (Fig. 5) mostly yellow, not much dulled by micropunctuation, about 1.5 x longer than wide, apical width about equal to basal width, with three well developed teeth; maxillary palpus two segmented; pronotal lobe with translucent lamella nearly as high as midocellus diameter, extending mesally to lateral edge of scutum; mesepisternum with carina separating anterior from lateral face present only dor-

sally; tegula about as long as wide, widest near middle; scutoscutellar suture with two narrow, deep foveae, as in *Epanthidium*; scutellum rounded posteriorly, nearly as wide laterally as medially, not carinate, only slightly overhanging metanotum; postspiracular sulcus bordered by carinae and divided by carinae into several divisions; row of pits across base of propodeum present laterally, sometimes weakly indicated; without lateral carina from postspiracular carina to base; basitarsus of foreleg and midleg without setal comb; pretarsal arolium present; mid and hind tibial spurs with apices rather strongly bent; female tergum VI with weak preapical transverse depression, irregular longitudinal median carina; sternum VI of female with margin thin, evenly curved, without subapical processes; tergum VI of male simple, apical margin very strongly depressed; tergum VII of male with each lateral lobe about two times as wide as long, emargination between them a U-shaped notch; male sterna II to VI with dense apical row of white setae; sternum I with longitudinal keel and posteriorly truncate, rest of sterna without salient modifications or specialized setae; male with penis valves straight, united at dorsal base, extending beyond gonostylus which is entire (Figs. 3,4); endophallus well developed, with eversible bulbous dark brown apex which is finely setose.

Discussion: *Ananthidium* appears to be closely related to *Epanthidium* sharing with that genus the same type of mandibles, pronotal lobe, scutoscutellar suture, and weak or absent juxtantennal carina. It differs from *Epanthidium* in having the female sternum VI smoothly curved, without carinae or teeth (1 to 4 premarginal teeth in *Epanthidium*), male sternum II without curved, transverse elevation, female clypeus thin, overhanging the base of labrum (only slightly overhanging the base in *Epanthidium*), and the tegula is about as wide as long, widest spot near the middle. The basitarsi of *Epanthidium* have well developed setal combs which are absent in *Ananthidium*. In addition, the modified endophallus of the male genitalia (Figs. 3,4) may be an autapomorphy of *Ananthidium*. Roig-Alsina (1993) has discussed the phylogenetic value of the endophallus which is especially bizarre and diverse in the Anthidiini. Although enlarged, modified and highly diverse endophalli are found in the related *Epanthidium*, the modified apex of the endophallus of *Ananthidium* appears distinct. Most *Epanthidium* have tergum VII trilobed whereas

Ananthidium has tergum VII bilobed. Three species of *Epanthidium* also have tergum VII bilobed; however, the mesal emargination is very deep in these species (*E. boharti*, *E. trichurum* and *E. paraguayensis*). Moure and Urban (1990) have proposed the genus *Carloticola* for these species. However, in other generic characters these species agree with *Epanthidium*, and *Carloticola* is a synonym of *Epanthidium*. The lack of a median carina on tergum VI of the female of *Carloticola* is not diagnostic since *Epanthidium erythrocephalum* (Schrottky) also lacks the median carina. *Ananthidium* has a weak, irregular carina on tergum VI. Known nests of both species of *Ananthidium* are of the same type: a single resinous cell attached to a twig. Although Stange (1983) described the nest of *Epanthidium nigrescens* (Friese) as being made of clay without resin, this is now in doubt since a cell of *Epanthidium nectarinoides* (Schrottky) was seen which is identical to that of *Ananthidium*.

Key to species of *Ananthidium* Urban

1. Metasoma with terga I-III dark, IV to VI yellowish orange with thickened setae; tegula dark brown, densely punctate except laterally at middle; upper row of pits of propodeum moderately strong except at middle; Minas Gerais, Brazil and Misiones, Argentina
..... *dilmae* Urban
- Metasoma with terga I-II mostly reddish, terga III to VI black with sublateral yellow spots, setae not thickened; tegula reddish, sparsely punctate; upper row of pits of propodeum weakly indicated; Subandean desert of Argentina
..... *inermis* (Friese)

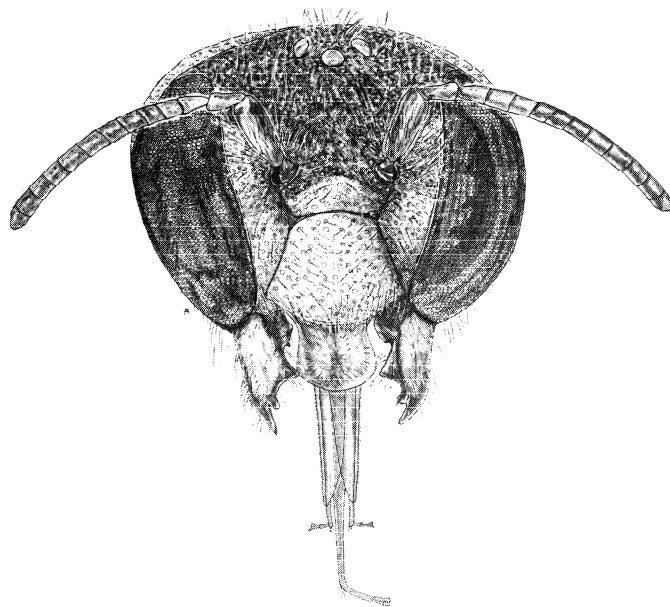
Ananthidium dilmae Urban

(Figs. 2,3)

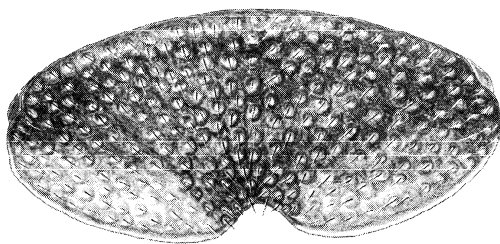
Ananthidium dilmae Urban, 1991:77

Holotype male, Belo Horizonte, Minas Gerais, Brasil, VIII-1961, Oliveira (Curitiba).

Diagnosis: Easily distinguished by the color pattern, basal metasomal terga dark, posterior terga yellowish orange. This color pattern occurs in other anthidiine bees in Argentina such as *Epanthidium nectarinoides* (Schrottky), and *Anthodioctes megachiloides* Holmberg as well as in other insects such as the genus *Brachygastra* (Vespidae). The male genitalia are distinctive (Fig. 3).



1



2

Figures 1 - 2: Head of *A. inerme*, male; 2. Male tergum VII of *A. dilmae* (dorsal view).

Description: Length about 6.5 mm. Body dark brown to black with yellow as follows: spot between and slightly below antennae; small spot behind eye laterally; apical margin of clypeus extending dorsally at middle; genae; mandible except apex; sternum VI laterally. Wing veins orange color. Metasomal terga IV to VII yellowish orange color; Pubescence white, moderately long, especially dense on vertex, mesoscutum, scutellum, metanotum, in front of propodeal spiracle and apically on metasomal sterna; setae on metasomal terga very thick. Punctuation relatively coarse and nearly contiguous on most of body, less dense on metasomal sterna; tegula coarsely punctate except impunctate laterally at middle. Head slightly wider than high; clypeus with apex thickened, nearly straight, with-

out teeth; mandible with 3 strong teeth, cutting area of mandible between subapical tooth and basal tooth about $\frac{1}{2}$ length of apical margin; pronotal lobe about twice as long as greatest width, lamella translucent, raised to about a mid-ocellus diameter; distance between lateral ocellus and eye more than between lateral ocelli; midocellus closer to lateral ocellus than distance between lateral ocelli; tegula about as wide as long, outer margin mostly evenly curved but with a slight undulation near middle; scutellum rounded posteriorly, nearly as wide laterally as medially, not carinate, only slightly overhanging metanotum; carina present on upper half of omalus; row of pits across base of propodeum moderately well developed, weak at middle; metasomal tergum VI with apical lamella similar to preceding terga; tergum VII with medial emargination U-shape (Fig. 2); terminalia and genitalia as in Figure 3.

New Record: Argentina, Bompland, Misiones, 21-III-1910 (FSCA).

Discussion: This species was described from Minas Gerais Province of Brazil and is now recorded from Argentina. One cell attached to a twig is preserved with the specimen. This cell is resinous with tiny embedded plant fibers. The differences between *A. dilmae* and *A. inerme* are many including a basic color difference, punctuation (tegula and propodeum), pubescence (male metasomal tergal setae flattened in *A. dilmae*, simple in *A. inerme*), and male genitalia.

Ananthidium inerme (Friese)

(Figures 1, 4, 5, 6)

Anthidium inerme Friese 1908:72. Syntypes: male, female, Mendoza, 27 Nov. (Vienna), 9 January (Vienna), "31-12 1906" (USNM).

Epanthidium inerme (Friese), Michener 1948:19.
Ananthidium inerme (Friese), Urban 1991:75.

Material examined (all Argentina): *Catamarca*: 20 km. E. Belén, 30-X-1972, L. Stange, flowers of *Zuccagnia punctata* (FSCA); *Andagalá*: 8-XI-1972, G. Bohart, Flowers of *Verbesina oclantha* (FSCA); *Chubut*: Puerto Pirámides, 14-I-1977, L. Stange (FSCA); *Neuquén*: Pampa Salado, 25-XI-1964, M. Gentili (FSCA); *Salta*: Yacochuya, near Cafayate, 15-XII-1973, L. Stange, flowers of *Cercidium praecox* and *Adesmia muricata*, (FSCA; IML); *Tucumán*:

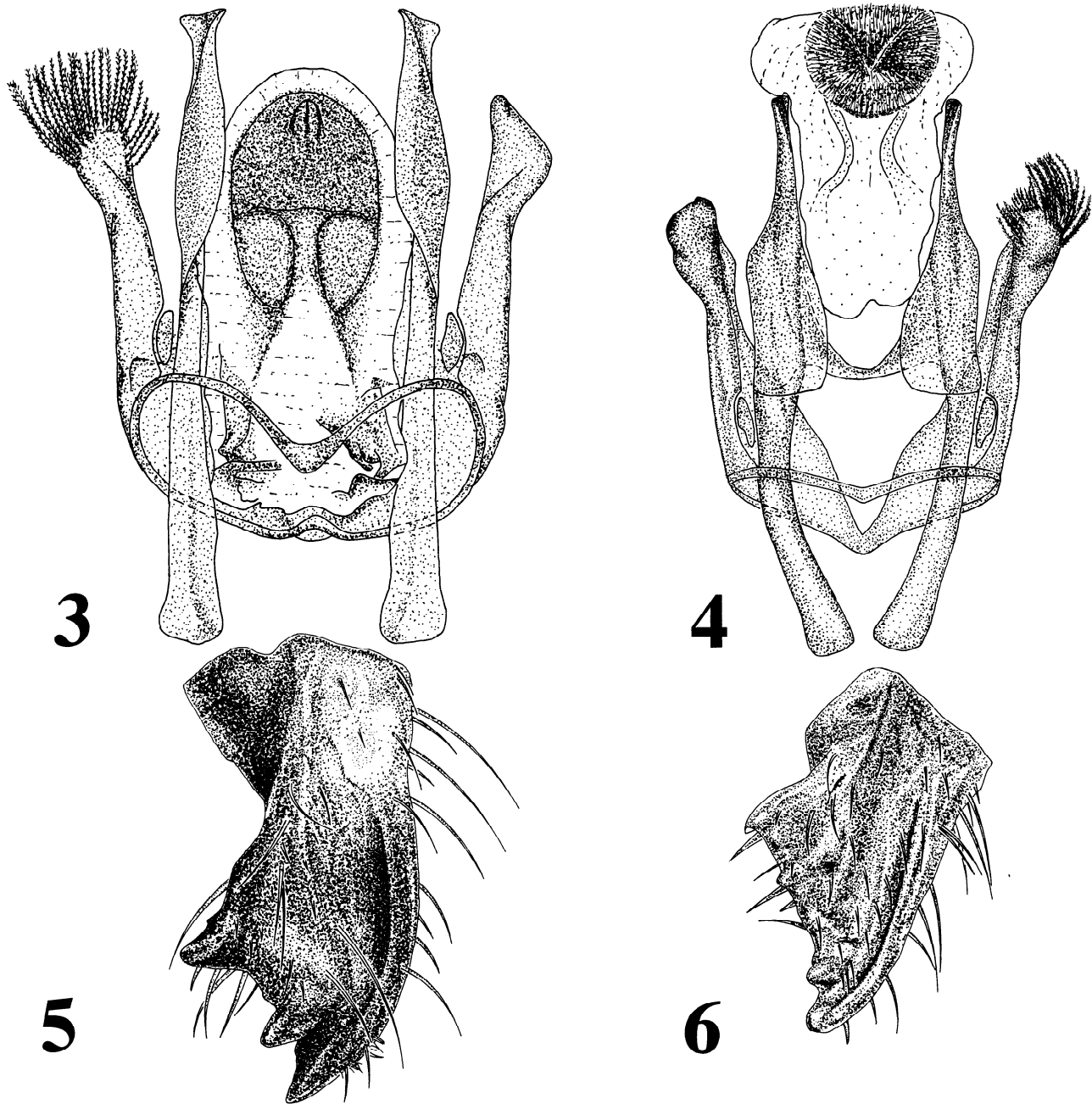
Amaicha del Valle, 20-XI-1966, L. Stange (FSCA);
Mendoza: Mendoza, (FSCA; IML; Vienna; USNM).

Discussion: The coloration of *A. inerme* is distinctive with the metasomal terga reddish basally, black posteriorly with yellow spots. This same color pattern is found in *Epanthidium sanguineum* (Friese). The male genitalia (Fig. 4) are quite different from those of *A. dilmae*. The distribution of *A. inerme* appears to correspond with the biogeographic province "monte" (Stange et al., 1976) which is a subandean creosote bush desert ranging from Salta Province in the North to Chubut Province in the South.

Key to genera of Argentina Anthidiini

1. Propodeum without postspiracular carina; mesepisternum usually without carina separating anterior from lateral face 2
Propodeum with postspiracular carina; mesepisternum with carina separating anterior face from lateral face at least dorsally ... 4
2. Pretarsal arolium absent; mandible of female with five or more close-set conical teeth; forewing with vein cu-v distal to median vein; tergum VI of male with lateral spine
..... *Anthidium* Fabricius
Pretarsal arolium present; mandible of female with no more than four teeth, usually widely spaced; forewing with vein cu-v interstitial with respect to median vein; tergum VI of male without lateral spine 3
3. Clypeus short, not overhanging base of labrum; head of female with large, deep antennal groves posterior to antennae; propodeum with irregular, inconspicuous, shiny, non-carinate sulcus posterior to spiracle *Notanthidium* Isensee
Clypeus overhanging base of labrum; head without antennal groves in male; propodeum without postspiracular sulcus
..... *Allanthidium* Moure
4. Head with strong juxtantennal carina which extends both up and down from middle of inner margin of antennal socket, not touching antennal fossa; often with preoccipital carina dorsally 5
Head without juxtantennal carina which extends both below and above middle of inner margin of antennal socket, sometimes (some *Epanthidium*) with carina originating at middle of mesal margin of antennal socket and extending upward; without preoccipital carina 8
5. Head with preoccipital carina, at least ventrally *Anthodioctes* Brèthes
Head without preoccipital carina 6
6. Female without scopa; male tergum VII weakly exerted, mostly rounded apically; male tergum VI without subapical process or lamella
..... *Hoplostelis* Dominique
Female with scopa; male tergum strongly exerted and usually strongly emarginate (except *Hypanthiodes flavofasciatum* which has a strong apical lamella on tergum VI) 7
7. Propodeum with complete lateral carina from postspiracular carina to base; pretarsal arolium absent in both sexes; male sternum VI with apical comb of reddish bristles; male hind coxae without spines or teeth
..... *Saranthidium* Moure & Hurd
Propodeum without complete lateral carina (except for *H. arenarium* not yet recorded from Argentina); pretarsal arolium present in male, usually very small or absent in females; male sternum VI without comb; male hindcoxa usually with spines or tooth, sometimes from between bases of coxae
..... *Hypanthiodes* Moure
8. Pretarsus without arolium; male tergum VII truncate *Hypanthidium* Cockerell
Pretarsus with arolium; male tergum VII bilobed or trilobed 9
9. Tegula about as long as wide, widest point at middle; female clypeal apex broadly rounded, rather thin, overhanging base of labrum which is hidden when mandibles are closed; female sternum VI without premarginal carina or teeth, margin being thin; male sternum II without curved, transverse elevation
..... *Ananthidium* Urban
Tegula longer than wide, widest point in front of middle; female clypeal apex truncate, nodulose, only slightly overhanging base of labrum which is therefore exposed when the mandibles are closed; female sternum VI variously modified, with median tooth, or sublateral ridges or processes, or with posterior margin thickened and serrate; male sternum II with curved, transverse elevation, usually ending sublateral in spine *Epanthidium* Moure

Discussion: The preceding key may not hold up for material outside of Argentina since there are still many problems in defining genera in the New World Anthidiini. Genera such as *Anthidium*, *Notanthidium*, and *Allanthidium* appear to be relatively isolated morphologically from other New



Figures 3 - 6. Male genitalia of *A. dilmae* (dorsal view); 4. Male genitalia of *A. inerme* (dorsal view); 5. Mandible of *A. inerme*, male; 6. Mandible of *A. inerme*, female.

World genera and easily recognized. The other genera have a synapomorphy which distinguishes them as a group. This is the presence of a sulcus bordered by carinae posterior to the propodeal spiracle.

In the key *Anthodioctes*, *Saranthidium*, and *Hypanthidoides* are separated from the other genera by the presence of juxtantennal carina. Although this appears to hold up in defining the

Argentine fauna, there is some variation in the carina in the diverse genus *Hypanthidoides*. There are a few species of *Hypanthidoides* (undescribed) which have the juxtantennal carina extremely faint. *Saranthidium* is here considered as a subgenus of *Hypanthidoides* since there are no really significant differences compared to all of the groups of *Hypanthidoides* together. The complete lateral ca-

rina of *Saranthidium* is found also in a few species of *Hypanthidiodes* (such as *H. arenarium*). The pretarsal arolium varies greatly in *Hypanthidiodes* from moderately developed to absent in the females and sometimes nearly absent in the males. The comb of bristles on male sternum VI of *Saranthidium* appears to be distinctive but found only in the male. Many unique setal characters (especially of the hind coxa) are found among male *Hypanthidiodes*.

Actually there are no strong characters separating the genus *Anthodioctes* from *Hypanthidiodes*. Griswold & Michener (1988) have placed the genus *Nananthidium* Moure as a subgenus of *Anthodioctes*. I consider the genus *Bothranthidium* Moure as a subgenus of *Anthodioctes* as well. A comparative study of the male genitalia of these groups may help in determining generic limits.

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