

**The Identity of *Megachile rotundata* (Fabricius)
and *M. argentata* (Fabricius)
(Hymenoptera: Apoidea).**

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For more than 150 years the identity of *Megachile rotundata* and *M. argentata* have quite apparently been based chiefly, if not entirely, on interpretations of the original descriptions supplied by Fabricius (1787, 1793). It also appears that even though Fabricius provided remarkably informative type locality statements, the import of these were either overlooked or not considered seriously. Only Mitchell (1962:122-124) has questioned the identity of one of these species (*M. rotundata*). Unfortunately, as the type studies reported herein reveal, these names have become associated with species of *Megachile* other than those described by Fabricius. This is particularly unfortunate since a large literature, both economic and systematic, is tied to these names. Equally disturbing is the realization that neither of the Fabrician names are, as has been supposed (Mitchell, 1937; Krombein, 1948; Daly, 1952; Hurd, 1954; and Stephen and Torchio, 1961), the correct names for two of the accidentally introduced species of *Eutricharaea* in the United States. This state of affairs is especially troublesome because the so-called *Megachile rotundata*, which has shown much promise as a pollinator of alfalfa in the United States and Canada (Bohart, 1962; Stephen, 1962; Hobbs, 1965; and Bacon, *et al.*, 1965), is not *Megachile rotundata* (Fabricius) and is, as a consequence of this investigation, left without a name. Moreover the geographic origins are presently unknown for both of these introduced species.

The purpose of this study is to set forth in some detail the results stemming from my examination of the extant type specimens of *M. rotundata* (Fabricius) and *M. argentata* (Fabricius).

As is discussed in the accounts which follow, the first is a synonym of *Megachile* (*Megachile*) *centuncularis* (Linnaeus) in the sense of modern authors, while the second is a North African species of *Megachile* belonging to the subgenus *Eutricharaea*.

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***Megachile rotundata* (Fabricius).**

Apis rotundata Fabricius, 1787, Mant. Insect., 1:303 ("Habitat Hafniae D. Pflug."); Fabricius, 1793, Ent. Syst., 2:332-333 ("Habitat Hafniae Dr. Pflug."); Zimsen, 1964, The type material of I. C. Fabricius, p. 419 ("Copenhagen 1 specimen").

Anthidium rotundatum Fabricius, 1804, Syst. Piezatorum, p. 367 ("Habitat Hafniae Dr. Pflug.").

Although specimens labeled as this species are contained in both the Copenhagen and Kiel Collections, I have designated the single male specimen in the Copenhagen Collection as the lectoholotype. Unlike the four specimens in the Kiel Collection, which represent the genera *Megachile* and *Osmia*, the Copenhagen specimen agrees in every detail with the original description. In addition to the lowermost lectotype label affixed to the pin supporting the specimen (LECTOTYPE, *Apis rotundata* Fabricius, ♂ P. D. Hurd '64), there are two labels, the uppermost a red label with a machine-printed inscription "Type" and below it a white label which carries in ink script: "A rotundata [final "a" overwritten with "um"] D. Pflug". In the lower right corner of this latter label there is a pencilled "x" presumably put there by Ella Zimsen during her search for eligible type specimens. This specimen is the basis of the Zimsen (1964:419) statement "Copenhagen 1 specimen".

The four specimens in the Kiel Collection are males and are pinned in a transverse row behind two large labels which are secured to the bottom of the box by note pins. The first label in

ink script reads "Osmia angustata Zett" and behind it, just before the row of specimens, is a typewritten label by Ella Zimsen: "Anthidium rotundatum F. Syst. Piez. 1804, p. 367.8". From left to right the row of specimens, all males, represent the following:

(1) A specimen of the genus *Osmia*, in good condition, bears a single white label which reads: "Fabr. Saml. unter Anthid. rotundatum".

(2) A representative of the genus *Osmia* which has been rather severely eaten by museum pests such that only a shell of the head, the thorax and appendages are left. The metasoma is missing. A single white label is affixed to the pin and reads in ink script: "rotundata".

(3) An unlabeled specimen of the genus *Megachile*, subgenus *Eutricharaea*. It is in good condition, but the very pallid vestiture and reddened integument suggests that it may have been exposed to light for a protracted period of time.

(4) A specimen of the genus *Megachile*, subgenus *Eutricharaea*, which in spite of damage to the eyes and antennae by museum pests, is otherwise in good condition. The eyes have been largely eaten away and only the scape, pedicel and first flagellar segments of the antennae remain.

The lectoholotype of *Apis rotundata* is in remarkably good condition. The head was boldly glued to the thorax in such a manner as it was impossible to see the mouth-parts or even the bases of the fore legs. Fortunately the glue is readily soluble in water and a sufficient portion of the obscuring mass was dissolved away so as to expose the mandibles and fore coxae. Once visible it became immediately evident that the specimen represents the well known *Megachile (Megachile) centuncularis* (Linnaeus) in the sense of current usage.

According to the type statement provided by Fabricius (1787: 303), the original description of *Apis rotundata* is founded upon material from "Hafniae" which, as Dr. Børge Petersen points out, is the equivalent of Copenhagen. In the entomological collections of the Zoological Museum of Copenhagen I was able to locate a male of *M. centuncularis* that matches the lectoholotype of *Apis rotundata* in almost every detail. This specimen, which had been collected in Copenhagen, was loaned to me by Dr. Petersen for subsequent comparative type studies centering on *M. centuncularis*, the type species of *Megachile* (see Opinion 219, Ops. Decls. int. Comm. Zool. Nomencl. 4:95-101, 1954).

Upon my arrival in London Dr. I. H. H. Yarrow kindly made arrangements with Mr. W. H. T. Tams for Dr. Yarrow and I to visit Burlington House, Linnean Society of London, in order to examine the putative type of *Apis centuncularis* Linnaeus. Not unexpectedly our examination of that specimen reveals the same findings previously reported by Richards (1935:175). The specimen is a female of *Megachile ligniseca* (Kirby) and consequently does not agree with the current concept of *M. centuncularis*. However, as Richards (*ibid.*) concludes "... there is no reason why *Megachile centuncularis* of modern authors should not continue under this name". This is obviously not only a desirable objective but is also essential if we are to achieve a concordance in the nomenclature and taxonomy for the type species of the genus *Megachile*. To secure this basis, the selection and designation of a neotype appears necessary. If this is done then it would seem appropriate to obtain specimens of *Megachile centuncularis* (current concept) from the gardens of Linnaeus' home.

In any event, the lectoholotype of *Apis rotundata* Fabricius is synonymous with *Megachile (Megachile) centuncularis* (current concept) and is not, as has generally been supposed, a representative of *Megachile*, subgenus *Eutricharaea*. The correct name for "*Megachile (Eutricharaea) rotundata* (Fabricius)" remains to be established. It is indeed a regrettable state of affairs since this species, which has masqueraded under the name of "*Megachile rotundata* (Fabricius)", is economically important to agriculture and has been both accidentally and purposely introduced into the New World.

***Megachile argentata* (Fabricius).**

Apis argentata Fabricius, 1793, Ent. Syst., 2:336 ("Habitat in Barbaria Mus. Dom. Desfontaines."); Zimsen, 1964, The type material of I. C. Fabricius, p. 421 ("Kiel 4 specimens").

Anthophora argentata, Fabricius, 1804, Syst. Piezatorum, p. 377 ("Habitat in Barbaria, Gallia Dom. Desfontaines").

This species was described by Fabricius (1793:336) on the evidence of his type statement from material collected in "Barbaria" by René Louriche Desfontaines. According to Zimsen (1964: 17), Desfontaines traveled in Tunisia and Algeria around 1790 where he collected, in addition to plants, insect specimens which served as the basis for some 100 of the species described by Fabricius. Zimsen (*ibid.*) mentions that Walter Horn states that the

Desfontaines collection was deposited in the museum in Paris, but the staff there were unable to supply her with any information as to its whereabouts. However, the personal collection of Fabricius (Kiel Collection) contains 4 specimens of *Apis argentata* Fabricius (Zimsen, 1964:421). These specimens, three of which are pinned in a transverse row with the fourth specimen pinned behind the second, are preceded by two large labels that are secured to the bottom of the box by note pins. The first label in ink script reads "Megachile argentata F" and behind it, just before the specimens, is a typewritten label: "Anthophora argentata F. Syst. Piez. 1804, p.p. [sic!] 377.2". From left to right the first row of specimens represent the following:

(1) An unlabeled male of the genus *Megachile*, subgenus *Eutricharaea* in poor condition. The head and all the legs, except right hind one, are missing.

(2) A female of the genus *Megachile*, subgenus *Eutricharaea* with some museum pest damage, as noted below, to the antennae and legs. It is impaled on a pin some 22 mm in length. The scape and pedicel of both antennae are present, but all of the flagellar segments are missing except the basal one of the right antenna and the basal two of the left antenna. All legs except the right fore leg are reduced to coxal stumps or shells but some fragments of the left front femur and its tibia remain. The wings are intact and are partly spread in a drooping attitude. Two labels are affixed to the pin, the uppermost a red label with a machine-printed inscription "Type" and below it a white label which carries in ink script: "argentata". As discussed below this specimen is selected to serve as the lectoholotype and thus a third label (LECTOTYPE, *Apis argentata* Fabricius, ♀ P. D. Hurd '64) is affixed as the lowermost label on the pin.

(3) An unlabeled female of the genus *Megachile*, subgenus *Eutricharaea* in poor condition. The head is missing and the legs have been partly eaten by museum pests.

The fourth specimen in this group is, as noted above, pinned behind the second specimen of the transverse row of three specimens and is:

(4) A male of the genus *Melitta* with the head eaten away most noticeably on the left side. There are two labels consisting of white paper, the upper in ink script which reads: "Fab Samml

unter *Anthophora argentata*" and the lower label in ink hand-printing: "Cilissa melanura Nyl."

The second specimen (2) is selected and designated to serve as the lectoholotype. It is selected not only because of its better state of preservation but more importantly the species it represents has been subsequently collected from the type locality. Of the specimens known to me from "Barbaria", the one that agrees in virtually every detail with the lectoholotype is a female in the collection of the British Museum (Natural History) and is labeled from Algeria (Frederick Smith Collection, presented by Mrs. Farren White, 99-303). As discussed earlier, since Desfontaines collected the material upon which Fabricius based the original description of *Megachile argentata*, and since the collections of Desfontaines in North Africa were made in Algeria and Tunisia, the type locality "Barbaria" is by these facts restricted to either Algeria or Tunisia. On the evidence of subsequently collected material of this species in North Africa it appears almost a certainty that the type locality is in Algeria. Even so I hesitate to so restrict the type locality until such time that more adequate samples become available from this area of North Africa.

In any event it is certain that the so-called *Megachile argentata* of northern and central Europe is not the same species described by Fabricius. Of course this is unfortunate in itself, but is further irksome because Thomson (1872:228) has based the subgenus *Eutricharaea* clearly and unambiguously upon the so-called *Megachile argentata* of Scandinavia. He has thus based *Eutricharaea* on a misidentified type species. This is, perhaps, a trivial matter since the so-called *Megachile argentata* properly belongs to the subgenus *Eutricharaea*. Obviously a critical revision is indicated for the *M. argentata* complex of northern and central Europe. *Megachile (Eutricharaea) leachella* Curtis (1828:219) is an available name and appears to be the senior name for the northern and central European *M. argentata* of authors. *Apis albiventris* Panzer (1798) is not, as his illustration reveals, a species of the genus *Megachile* or for that matter a member of the family Megachilidae.

The following descriptive comments are based on the lectoholotype female of *Apis argentata* Fabricius and are offered to facilitate its identification. The measurements, which follow, were taken in accordance with the methods outlined by Hurd and Moure (1963:41-43).

Length of body 10 mm. Forewing including tegula, ± 7.0 mm. Maximum width of abdomen, as seen from above, 3.4 mm.

Eye, 71:60:55:51; clypeus, 27 x — : — : 42; inter-ocellar, 19:15:12:11, ϕ 7; malar area, 0×14 ; interalveolar, 19:15:25:29, ϕ 6; antennae, 29:5:6:6: — : —, ϕ —.

Vestiture chiefly white or silvery, that on sixth metasomal tergum consisting of two large lateral patches of appressed whitish hairs which are narrowly separated medially and are bordered anteriorly and posteriorly by pallid, almost whitish brown pubescence. Apices of metasomal sterna II-V each with a narrow intensely white band of decumbent and posteriorly projecting pubescence which strongly contrasts with the long, yellowish-white, over projecting scopal hairs; scopal hairs on first metasomal sternum white, disposed laterally; tegulua reddish-brown, scarcely darker than wing nervures; apex of first metasomal sternum, although partly eaten away, evidently broadly and semi-circularly emarginate; ocelli small, individually scarcely as large as an antennal socket.

Although the male specimen (1, above) is a *Eutricharaea* and perhaps may have been collected by Desfontaines with the lectoholotype female, I hesitate to designate it at this time as the allolectotype. Preferably this might be best reconsidered when and if the type locality is more precisely fixed.

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