

The oldest available fossil arachnid name

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Abstract

Aranea fusca pilosa BLOCH, 1776 is the oldest available name for a fossil arachnid; i. e. the first fossil name published after CLERCK's 1757 monograph using Linnean binomials. This specimen described as being from copal – the original provenance of which is unclear – does not appear to be a spider based on the published illustration, which is reproduced here. Type or other reference material associated with this name could not be traced and it is formally treated here as a nomen dubium. Other very early fossil arachnid names are briefly reviewed. Most are problematic and have been treated, like *Phalangium succineum* PRESL, 1822 or *Attus fossilis* WALCKENAER, 1837 as nomina dubia or, like *Aranea globosum* PRESL, 1822 and *Aranea oblongum* (PRESL, 1822) as taxa of uncertain familial affinity. Some, like *Aranea (Chalinura) longipes* DALMAN, 1826, have been widely overlooked.

Key words: Araneae, copal, amber, systematics.

Zusammenfassung

Aranea fusca pilosa BLOCH, 1776 ist der älteste verfügbare Name, der nach der Monographie vom CLERCK (1757) mit Linneischen Binomina publiziert worden ist. Diese Art, beschrieben nach einem Fossil in Kopal, dessen Fundort unbekannt ist, scheint auf Grund der vorhandenen Abbildung (hier nachgedruckt) keine Spinne zu sein. Ein Typus oder andere Referenzmaterialien im Zusammenhang mit diesem Namen waren nicht zu finden, und es wird hiermit offiziell als nomen dubium behandelt. Andere frühere Namen von fossilen Spinnentieren werden kurz diskutiert. Viele sind problematisch und wurden wie *Phalangium succineum* PRESL, 1822 oder *Attus fossilis* WALCKENAER, 1837 als nomina dubia eingestuft, oder wie *Aranea globosum* PRESL, 1822 und *Aranea oblongum* (PRESL, 1822) als Taxa mit fraglicher Zuordnung behandelt. Andere, wie *Aranea (Chalinura) longipes* DALMAN, 1826, sind einfach übersehen worden.

1. Introduction

A handful of fossil arachnid names, erected for specimens in amber or copal, date from the late 18th and early 19th centuries (BLOCH 1776; PRESL 1822; DALMAN 1826; HOLL 1829; WALCKENAER 1837). Thus they predate the first major palaeontological study of the group, namely the classic monograph on Baltic amber arachnids, myriapods and flightless insects by KOCH & BERENDT (1854), which also includes further species raised by MENGE (1854) in his footnotes to their important publication. Potentially, these pre-1854 species represent the oldest available names for the relevant taxa concerned, but in many cases they suffer from inadequate descriptions and a lack of information about the repository of the type material. These problematic names have, in part, been only briefly touched upon in the literature (see e.g. SCUDDER 1891; ROEWER 1954; PETRUNKEVITCH 1955; BONNET 1955, 1959).

As well as these inclusions in fossilised resins, two other early publications (CORDA 1835, 1839) predate KOCH & BERENDT's work. Both concern scorpions from the geologically much older Carboniferous Coal Measures of the Czech Republic. CORDA's species are actually quite well known, having been redescribed in some detail from their types in Prague (e.g. PETRUNKEVITCH 1953; KJELLESVIG-WAERING 1986). A putative whip spider (Amblypygi) de-

scribed from the Eocene shales of Aix-en-Provence in France by KEFERSTEIN (1834) has been catalogued by HARVEY (2003), who treated it as a nomen dubium. Following comments in POCKOCK (1899) it may even be a spider, and a further true spider from the same locality and in the same KEFERSTEIN publication is regarded as a nomen nudum.

As part of a wider project to document and catalogue fossil spider names via an online platform (DUNLOP et al. 2008), the status of the pre-1854 names based on material in fossilised resins is briefly discussed for each author individually below. The focus of the present study is the oldest taxonomically available name for any fossil arachnid: *Aranea fusca pilosa* BLOCH, 1776. While there are even older published accounts of putative fossil spiders, BLOCH's is the first name introduced after CLERCK's (1757) adoption of the binomial system. Note that the names introduced by CLERCK (a student of LINNAEUS) have been ruled valid (ICZN Direction 104), even though they are older than the official 1758 date for the start of zoological nomenclature.

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2. Previous work

MARCUS ÉLIESER BLOCH (1723–1799) was a German doctor and naturalist, best known as an ichthyologist. Biographical details can be found in KARRER (1978) and an account of his extensive fish collection in PAEPKE (1999). Despite humble origins and problems he faced on account of his Jewish faith, BLOCH rose to prominence and was a founding member (in 1773) of the 'Gesellschaft Naturforschender Freunde' in Berlin; a leading natural history society which remains active today. Like many scientists at that time, BLOCH owned a cabinet of natural objects which is cited as containing fossils, minerals and cut stones (PAEPKE 1999). It is possible that this cabinet included the copal from which BLOCH described and figured various arthropods. BLOCH's collections of Recent fish and amphibians are in the Museum für Naturkunde, Berlin, but the fate of the geological specimens is equivocal (see below).

BLOCH (1776) published a wide-ranging essay on the natural history of copal, including a broad discussion of what copal is, chemical tests carried out on it and the inclusions it contained. Under these inclusions, he described and figured insects – including under this heading spiders – as well as plants and other bodies. The insects were largely assigned to common, extant genera and frequently to living species. Three 'spiders' were described. One (his pl. 3, fig. 2) was formally named *Aranea fusca pilosa* [not *fuscipilosa* as per BONNET (1959)] (Fig. 1a). This should not be confused with the Recent species (and potential junior homonym) *Aranea fusca* DE GEER, 1778, proposed two years later and currently regarded as a junior synonym of the fairly common European cave spider *Metellina merianae* (SCOPOLI, 1763) (Araneae: Tetragnathidae). However, there is an older (i.e. pre-LINNEAN and taxonomically invalid) name of the form '*Araneus fuscus alvo oblique virgata*', first introduced by LISTER (1661) and – according to BONNET's (1959) catalogue – probably referring to the extant wolf spider (Lycosidae) *Trochosa ruricola* (DE GEER, 1778). Whether this is the source of BLOCH's '*Aranea fusca*' part of his name is unclear. A second spider (Fig. 1b) from BLOCH's study (his pl. 3, fig. 5) was identified simply as '*Aranea*' and a third (Fig. 1c) yellow-brown spider (pl. 4, fig. 12) in a piece of copal together with an insect larva and a small fly was not further assigned. Note

that *Aranea* is an unjustified emendation of *Araneus* CLERCK, 1757 and that in the late 18th century this was a catch-all taxon applied to many different types of spider; not just orb-weavers.

BLOCH's name has gone largely unnoticed in the literature having been picked up only by SCUDDER (1891) in his compilation of fossil insect, arachnid and myriapod names and BONNET (1959) in his spider catalogue. SCUDDER listed it (without comment) as 'Theridides', i.e. implicitly a member of the cobweb or comb-footed spider family Theridiidae, despite the fact that BLOCH's text mentions the German name 'Winkelspinne' which is implicit of another family, Agelenidae. Consequently, BONNET cited it as *Theridium fuscipilosum* – whereby *Theridium* is an unjustified emendation of the common cobweb-spider genus *Theridion* WALCKENAER, 1805. Despite transferring the name, BONNET implied that it was nomen nudum; annotating it as 'nud.', yet conceding in a footnote that "I have not discovered the original Bloch citation" [our translation]. Bloch's name was not included in other compendiums like, for example, the spider catalogue of ROEWER (1942) or the Treatise on Invertebrate Paleontology (PETRUNKEVITCH 1955).

3. Material and methods

Taxonomic names (see DUNLOP et al. 2008 for a full list of fossil spiders) and subsequent citations were drawn from the primary literature, which was also searched for evidence of provenance or repositories. Biographical data about the authors was obtained from both the published literature and/or various internet resources as detailed below.

4. Systematic palaeontology

Nomen dubium (non Araneae?)
Aranea fusca pilosa BLOCH, 1776
 Fig. 1a (copy of original drawing)

1776 *Aranea fusca pilosa*. – BLOCH, p. 165, pl. 3, fig. 2.

1891 *Aranea fusca pilosa* BLOCH. – SCUDDER, p. 250 (as *Theridides*).

1959 *Theridium fuscipilosum* (BLOCH). – BONNET, p. 4475 (as nom. nud.).

Holotype: Unknown. BLOCH's collection of extant fish is now in the Museum für Naturkunde Berlin, but no copal from his collection could be traced in the palaeontological section of the museum (CHRISTIAN NEUMANN, pers. comm. 2008). BLOCH's collection of 'minerals and cut stones' is not known from the mineralogy section of the museum either (RALF-THOMAS SCHMITT, pers. comm. 2008) which gives the impression that his geological material probably did not end up in the Berlin museum.

Type locality and horizon: 'Copal', exact provenance and age not stated. Careful reading of BLOCH's paper did not re-

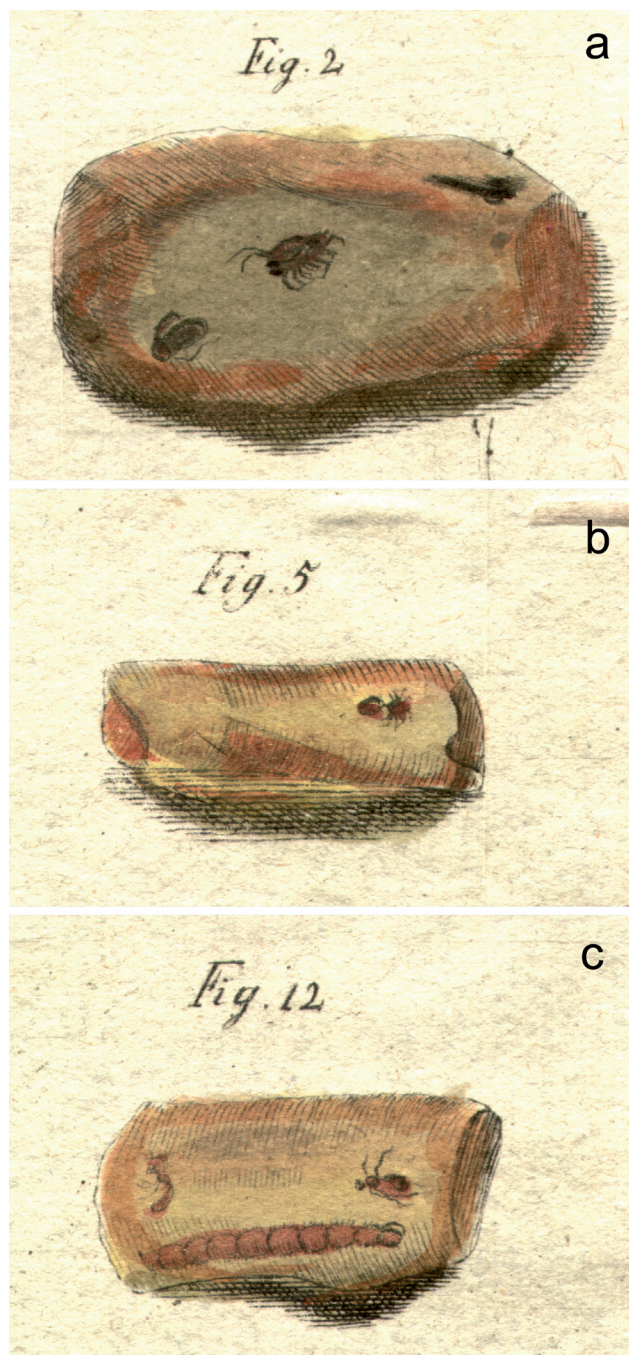


Fig. 1. Facsimile copies of BLOCH's (1776) original 'spider' illustrations. – **a.** *Araneus fuscus pilosus* BLOCH, 1776 (BLOCH 1776, pl. 3, fig. 2); probably not an arachnid judging from its habitus. **b.** An 'Araneus' (BLOCH 1776, pl. 3, fig. 5), which is demonstrably a spider and thus the historically oldest example to be described and figured after CLERCK's 1757 introduction of Linnean binomials, although unnamed at species level and of uncertain familial affinities. **c.** A 'spider' (BLOCH 1776, pl. 4, fig. 12), together with a larva ('Raupen') and a small fly, not assigned further. It is unclear whether the inclusion to the left or the right is meant to be the spider!

veal the source of his material, which may have been purchased from intermediate dealers. Places like Madagascar have yielded much copal, but it would be unwise to speculate on the origins of BLOCH's specimens without further data. We cannot completely rule out the possibility that this was amber (and thus much older) rather than Subrecent copal, as it is not clear whether the two forms of fossilised resin were scientifically treated as distinct in the late 18th century. The report of pale 'slime' associated with some inclusions (see below) is reminiscent of the white, cloudy 'Verlumpung' often associated with arthropods in Baltic amber (GÜNTER BECHLY, pers. comm. 2008).

Remarks. – The original description can be translated as follows: "Unlike the several smaller genera which we will get to know further in this text, this dirty yellow spider cannot easily be described, since its main character, a view of the position of the eyes, is not clear in the copal. Nevertheless, this particular specimen seems to be a kind of house spider [Winkelspinne in the original]. Its body is surrounded by white-greyish slime inside the piece. To the side in the copal there also lies the truncated body of a fly and looking at the other side of this piece one can distinctly see the new cockroach which is described as No. 16."

BLOCH's original figures (reproduced here in Fig. 1) are hand-coloured plates showing entire pieces of copal containing the relevant inclusions. While aesthetically pleasing, the images are not sharp and details of the animals themselves are largely lacking. The original figure of *A. fuscus pilosus* (Fig. 1a) indicates an animal without an obvious constriction between the prosoma and opisthosoma and seemingly with at least twelve pediform limbs; two of which at one end seem to be raised up rather like antennae (Fig. 1a). Theridiid spiders are relatively common in Madagascan copal (JÖRG WUNDERLICH, pers. comm., 2008) and the raised limbs could conceivably be interpreted as spider pedipalps. BONNET accepted this fossil as a spider, but it seems he did not actually see the original description (see above). Thus on balance, we feel it unlikely that this really is a spider – or any other type of arachnid – but a positive identification as anything else is difficult. There are some parallels in habitus with a woodlouse (Crustacea: Isopoda), but without a reference specimen with which to confirm this, it is probably better to treat the name as a nomen dubium of uncertain affinities. Since there is a figure and an, albeit brief, description it need not be treated as a nomen nudum as per BONNET.

Araneae CLERCK, 1757

Fig. 1b (copy of original drawing)

1776 *Aranea*. – BLOCH, p. 167, pl. 3, fig. 5.

Locality and horizon: See above.

Remarks. – BLOCH's second figured specimen (Fig. 1b), the '*Aranea*' sp., is unequivocally a spider with a clear

distinction into a prosoma and opisthosoma of about equal size. The legs seem curtailed, or perhaps folded under the body. If the drawing can be accepted as accurate this specimen would most resemble a cursorial hunter such as a wolf spider (Lycosidae) or perhaps a jumping spider (Salticidae), but without characters like the eye pattern it is impossible to assign it to a family with any confidence.

? Hymenoptera LINNAEUS, 1758
Fig. 1c (copy of original drawing)

1776 gelbbraune Spinne. – BLOCH, p. 172, pl. 4, fig. 12.

Locality and horizon: See above.

Remarks. – The third specimen (Fig. 1c), the ‘yellow-brown spider’, is again hard to reconcile with a spider based on the published illustration. It could be an ant (Hymenoptera).

5. Other early amber and copal records

5.1. PRESL

The brothers JAN SVATOPLUK PRESL (1791–1845) and KAREL BOŘIWOJ PRESL (1794–1852) are important figures in the history of Czech natural history and in particular botany and mineralogy; so much so that the journal of the Czech botanical society is still named ‘Preslia’ in their honour. Their co-edited 1822 book ‘*Deliciae pragensis, historiam naturalem spectantes*’ was a compendium of natural history works published in Prague where they were based. Four of these works concerned living plants, but one entitled ‘*Additamenta ad faunam protogaeam, sistens descriptiones aliquot animalium in succino inclusorum*’ by J.S. PRESL describe a series of insects (Hymenoptera and Diptera) and four arachnids from ‘Prussian’ (i. e. Baltic) amber. The arachnids were two spiders (*Aranea globosa* PRESL, 1822 and *Aranea oblonga* PRESL, 1822), a harvestman (*Phalangium succineum* PRESL, 1822) and a mite (*Acarus resinosus* PRESL, 1822). The repository of their types is unclear, but they could not be traced in the Prague National Museum (VOJTĚCH TUREK, pers. comm. 2005). No figures were provided in the original descriptions.

The spiders have been most recently listed as ‘*Theridion*’ *globosum* (PRESL, 1822) and ‘*Theridion*’ *oblongum* (PRESL, 1822). As with BLOCH’s species above, SCUDDER (1891) did not formally transfer the species to *Theridion* (contra MARUSIK & PENNEY 2004), but did assign them to the family Theridiidae (as Theridides). The generic transfers must be credited to BONNET (1959), who did so (under the invalid emendation *Theridium*) without comment, and misleadingly implied that these amber specimens origi-

nated from the Czech Republic. In any case, the original descriptions are very general and, as noted by MARUSIK & PENNEY (2004), their familial position remains uncertain. In the case of the harvestman, PRESL’s original reference to a prosoma and opisthosoma as separate elements – with the opisthosoma explicitly described as long and oval – may indicate that PRESL had another spider rather than a harvestman (DUNLOP 2006), in which these body tagmata should be fused together. In the absence of an illustration or type material with which to test its affinities, the name was regarded by DUNLOP (2006) as a nomen dubium. The status of PRESL’s mite has not been formally resolved. A distinct red colour is mentioned which would characterise various groups like Erythraeidae or Tetranychidae (red spider mites), but the description is again very general.

5.2. SCHWEIGGER and HOLL

AUGUST FRIEDRICH SCHWEIGGER (1783–1821) was a German zoologist and from 1809 professor of Medicine and Botany in Königsberg [= Kaliningrad, Russia]. Little biographical information about him could be traced, but it is known that he was instrumental in setting up the Königsberg botanical gardens, and that he was murdered during an excursion to Sicily! His monograph on corals (SCHWEIGGER 1819) also contained an addendum on amber. A fossil spider and a scorpion were described in some detail, including reasonable figures, but were not formally named. These two specimens were named ten years later by F. HOLL in a general palaeontological textbook.

Entomocephalus formicoides HOLL, 1829 was noted by PENNEY (2003) as an ant-mimicing salticid, and he discussed the possibility of the genus name being a senior synonym of the subsequently described, extant genus *Myrmarachne* MACLEAY, 1839. WUNDERLICH (2004: 34, fig. 1) also supported affinities with *Myrmarachne* and suggested that the original *E. formicoides* specimen – which has not been traced – may even be in copal, rather than Baltic amber which should have been common in the Königsberg area. A formal application to the ICZN to conserve *Myrmarachne* has recently been submitted.

‘*Scorpio*’ *schweiggeri* HOLL, 1829 is the historically oldest available name for a fossil scorpion. HADŽI (1931), SCHAWALLER (1979) and LOURENCO & WEITSCHAT (1996) all noted the insufficiency of the original description, but concluded, based on the original drawing, that the specimen must be a buthid. FET et al. (2000) thus listed it under Buthidae in their catalogue. Note that KJELLESVIG-WAERING (1986) erroneously described it as being preserved from ash falls, rather than in resin. Since HOLL’s referral back to SCHWEIGGER’s, albeit imperfect, drawing probably constitutes an indication under ICZN rules, ‘*Scorpio*’ *schweiggeri* may best be treated as nomen dubium rather than a

nomen nudum as per SCHAWALLER (1979). If SCHWEIGER's spider proves to be from copal (see above) this might conceivably apply to the scorpion too.

5.3. DALMAN

The Swedish naturalist JOHAN WILHELM DALMAN (1787–1828) worked as both a palaeontologist (especially trilobites) and entomologist and was, from 1818, librarian and keeper of the zoological collections at the Swedish Royal Academy of Science; now the Naturhistoriska Riksmuseet. DALMAN (1826) described both a spider, *Aranea (Chalinura) longipes* DALMAN, 1826, and a pseudoscorpion, *Chelifera eucarpus* DALMAN, 1826, from copal. The pseudoscorpion was figured, but not the spider. DALMAN's names have gone largely unnoticed and were not picked up in the otherwise comprehensive list of SCUDDER (1891), or in the case of the spider by BONNET (1955). The description of the spider is of an animal with an oval abdomen bearing four spinnerets and rather long, slender legs. It is too general to assign it to any particular family, although it is not inconsistent with theridiids which are, as noted above, quite common in copal. At least the pseudoscorpion type specimen still exists in Stockholm and is currently being restudied (MARK JUDSON, pers. comm., 2008). Restudy of the spider fossil would be welcome too. *Chalinura* DALMAN, 1826 is incidentally a senior homonym of a modern deep sea fish genus *Chalinura* GOODE & BEAN, 1883 (p. 198).

5.4. WALCKENAER

Baron CHARLES ATHANAISE WALCKENAER (1771–1852) was a founding member of the French Entomological Society and described many species of (Recent) arachnids. A fossil jumping spider (Salticidae) was formally described by him as *Attus fossilis* WALCKENAER, 1837 (WALCKENAER 1837: 426), although the name was introduced earlier (as a nomen nudum) by WALCKENAER (1805: 25). The original description of this male fossil spider mentions a pale median line in the anterior part of the opisthosoma and three or four small transverse chevrons in the posterior part. No figures were provided. Unfortunately, there is no clear indication in the original description where this material originated from; i.e. if it was truly amber or copal. The type should have been in WALCKENAER's collection ("De ma collection") and thus could be in Paris like his Recent spider material, in which case restudy would be welcome. *Attus fossilis* was listed by SCUDDER (1891: 253) and BONNET (1955: 799), and was effectively treated as a nomen dubium by ROEWER (1954: 1422) who listed it with the comment "nicht zu deuten!" (which translates as 'impos-

sible to interpret'). *Attus* WALCKENAER, 1805 is now a synonym of the common jumping spider genus *Salticus* LATREILLE, 1804, but given the apparently dubious status of WALCKENAER's fossil species name a formal transfer seems presently unnecessary.

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