

First fossil Mecysmaucheniidae (Arachnida, Chelicerata, Araneae), from Lower Cretaceous (uppermost Albian) amber of Charente-Maritime, France

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ABSTRACT

The first known fossil mecysmaucheniid spider, *Archaemecys arcantiensis* n. gen., n. sp., is described, from Lower Cretaceous (Upper Albian) amber of Charente-Maritime, France. This is the first fossil spider to be formally described from French Cretaceous amber and extends the geological record of Mecysmaucheniidae back into the Cretaceous, the family having previously been known only from the Recent. The fossil differs from other Mecysmaucheniidae in having four, rather than two spinnerets, so it can be considered plesiomorphic with respect to modern members of the family in this character. The amber of the Archingeay-Les Nouillers area is uniquely considered to have a largely preserved litter fauna and our specimen corroborates this hypothesis. Archaeidae, and now their sister group the Mecysmaucheniidae, have been found as fossils solely in the northern hemisphere, yet their Recent distributions are entirely southern hemisphere (Gondwanan). The find suggests a former pancontinental distribution of Mecysmaucheniidae.

KEY WORDS

Arachnida,
Araneae,
Mecysmaucheniidae,
amber,
Cretaceous,
France,
new genus,
new species.

RÉSUMÉ

Premier Mecysmaucheniidae fossile (Arachnida, Chelicerata, Araneae), de l'ambre crétacé inférieur (Albien terminal) de Charente-Maritime, France.

Le premier fossile connu d'une araignée mécysmaucheniidée, *Archaeomecys arcan-tiensis* n. gen., n. sp., est décrit de l'ambre crétacé inférieur (Albien terminal) de Charente-Maritime, France. Il s'agit de la première araignée fossile décrite de l'ambre crétacé de France, qui étend le registre géologique des Mecysmaucheniidae jusqu'au Crétacé, la famille étant jusque-là connue seulement dans l'Actuel. La présence de quatre filières au lieu de deux le distingue de tous les autres Mecysmaucheniidae et peut être considérée comme plésiomorphique. L'ambre d'Archingeay-Les Nouillers est supposé unique pour avoir largement préservé la faune de litière et notre spécimen corrobore cette hypothèse. Les Archaeidae, et maintenant leur groupe frère, les Mecysmaucheniidae, ont leurs fossiles représentés uniquement dans l'hémisphère nord, alors que leur distribution moderne est entièrement sud-hémisphérique (Gondwana). Cette découverte suggère une ancienne distribution pancontinentale des Mecysmaucheniidae.

MOTS CLÉS

Arachnida,
Araneae,
Mecysmaucheniidae,
ambre,
Crétacé,
France,
genre nouveau,
espèce nouvelle.

INTRODUCTION

Spiders (Araneae) are an extremely diverse order of arachnids, with 40 462 extant species in 3694 genera and 109 families (Platnick 2009). They are characterized by numerous synapomorphies, including the presence of spinnerets on the abdomen for producing silk, naked fangs and associated venom glands (in most species), two body regions, eight legs, and pedipalps modified in the male for sperm transfer.

The Mecysmaucheniidae, a relatively small family within the Araneae, is composed of seven genera and 25 known species (Platnick 2009). They are small, haplogyne, ecribellate spiders found in New Zealand and southern parts of South America (primarily Chile and Argentina) (Jocqué & Dippenaar-Schoeman 2006). The type genus *Mecysmauchenius* was first described by Simon (1884) as a member of the Archaeidae Koch & Berendt, 1854. Mecysmaucheniids are distinguished from other spiders by the presence of chelicerae originating from a foramen in the carapace and only two spinnerets (Forster & Platnick 1984). Mecysmaucheniids belong to the superfamily Palpimanoidea, which has had a long and controversial history. Forster & Platnick

(1984) enlarged the Palpimanoidea (originally it only included the Huttoniidae Simon, 1893, Palpimanidae Thorell, 1870 and Stenochilidae Thorell, 1873) to include the Archaeidae (and therefore the Mecysmaucheniidae), removing them from the araneoids. They also significantly enlarged the superfamily by including the Micropholcommatidae Hickman, 1944, Mimetidae Simon, 1881, Pararchaeidae Forster & Platnick, 1984 and Holarchaeidae Forster & Platnick, 1984 on the basis of two diagnostic characters: cheliceral peg teeth and a raised cheliceral gland. Although some accepted Forster & Platnick's revision (Coddington & Levi 1991; Coddington *et al.* 2004), others have contested the arrangement. According to Schütt (2000), Micropholcommatidae and Mimetidae should be placed within the Araneoidea, although the placement of the Archaeidae and Mecysmaucheniidae in Palpimanoidea was still dubious at best. Griswold *et al.* (2005) agreed with Schütt in that the Mimetidae should belong to the Araneoidea; however, they claimed that many of the palpimanoid familial placements are still debatable. Others have suggested that peg teeth are homoplastic (Schütt 2000; Coddington *et al.* 2004) and therefore should not serve as one of the defining characters of the Palpimanoidea.

The archaeids were first described from Baltic amber fossils by Koch & Berendt (1854) and were considered an extinct group for some 30 years until extant species were found in Madagascar. The *mecysmaucheniids* were described soon after from specimens in Chile and were placed as a genus under the *Archaeidae* (Simon 1884). *Mecysmaucheniids* were considered a subfamily of the *Archaeidae* by Simon (1895), and some people continued to hold this view (see Wunderlich 1986, 2004; Eskov 1987, 1992). Lehtinen (1967) suggested the subfamily be raised to family level, which would include *Mecysmaucheniidae* Simon, 1884, *Pararchaea* Forster, 1955 and *Zearchaea* Wilton, 1946. Although Lehtinen's placement of the *Pararchaea* and *Zearchaea* was contested by Forster & Platnick (1984), these authors retained the *Mecysmaucheniidae* as a distinct family (see Forster & Platnick 1984 for a detailed taxonomic history of the archaeids and related taxa).

There has been no formal description of a fossil *mecysmaucheniid* to date. Eskov (1987) tentatively assigned *Archaea conica* (see Koch & Berendt 1854; fig. 10) to the subfamily *Mecysmaucheniinae* because of its short chelicerae and only slightly elevated cephalic region of the carapace, even though the Baltic amber type specimen had been lost. Eskov (1992) later created a new genus, *Baltarchaea*, for *A. conica*; the species was listed under *Mecysmaucheniidae* in Penney (2003b: table 1). A description of a fossil *mecysmaucheniid* was said to be in preparation in Eskov & Golovatch (1986), but no such paper resulted, and the designation was likely changed to an archaeid (see Eskov 1987).

Lacroix (1910) was the first to describe Cretaceous amber from France, but it was not until the 1970s that extensive study of the fossiliferous material in French ambers was undertaken (Perrichot *et al.* 2007). The most fossiliferous French amber deposit from the Cretaceous is the Archingeay-Les Nouillers (herein referred to simply as Archingeay) locality (Perrichot *et al.* 2007). The amber from Archingeay is Late Albian in age and is unique in that a large percentage of the inclusions represent litter fauna (Néraudeau *et al.* 2002). It is thought that the resin was exuded from a member of the plant family *Araucariaceae*, and the abundant resin

flowed directly onto the ground (Néraudeau *et al.* 2002). The fossil assemblage of Archingeay is mainly composed of insects, but other arthropods are also present (Néraudeau *et al.* 2002; Perrichot *et al.* 2007). Nine percent of the total arthropod inclusions in Albian French amber are arachnids (Perrichot *et al.* 2007). Hitherto, no spider fossils have been described from the Cretaceous of France, although they were referred to by Schlüter (1978) and Néraudeau *et al.* (2002), and members of the family *Zodariidae* were mentioned as being present by Perrichot (2004) and Perrichot *et al.* (2007).

Cretaceous spiders are relatively rare but have been described from Siberia (Eskov & Zonshtein 1990; Eskov & Wunderlich 1994), New Jersey (Penney 2002, 2004a), the Isle of Wight (Selden 2002), Lebanon (Penney & Selden 2002; Penney 2003a; Wunderlich & Milki 2004), Canada (Penney 2004c; Penney & Selden 2006), Myanmar (Grimaldi *et al.* 2002; Penney 2003b, 2004b, 2005), Botswana (Rayner & Dippenaar-Schoeman 1995), Brazil (Mesquita 1996; Selden *et al.* 2002, 2006), Australia (Jell & Duncan 1986) and Spain (Selden 1989, 1990; Selden & Penney 2003; Penney 2006; Penney & Ortuño 2006). Here, we provide the first description of a fossil *mecysmaucheniid*, from Cretaceous (Late Albian) French amber. Living *mecysmaucheniids* are litter-dwellers, like most of the fauna from Archingeay amber, but are confined to South America and New Zealand. The find of a *mecysmaucheniid* in Cretaceous Laurasia suggests a more widespread distribution for this family in the Mesozoic than today.

METHODS

The specimen was cut, polished and encased in clear resin before the authors received it. Drawings were done under both incident and transmitted light with a camera lucida attached to a Leica MZ16 stereomicroscope. Drawings were scanned and re-traced using Adobe Illustrator. Photographs were taken with a Canon Digital Rebel XTi attached to the microscope and manipulated in Adobe Pho-

toshop. Figure 1D was taken with a Leica DFC420 C camera attached to a Leica DM 2500 microscope; Leica Application Suite software was used to take a multifocus z-stack so as to achieve sharp focus throughout the image. Measurements were made using an ocular graticule.

Microtomography at the European Synchrotron Radiation Facility (ESRF) in Grenoble, France was attempted; however, the competing mediums within the amber piece (air, resin, arthropod cuticle, glue, and Canada balsam used for mounting) were problematical, and obtaining an image proved to be impossible. In order to prepare the specimen for microtomography, it was removed from the clear resin by gentle heating on a hot plate. Excess amber was cut away from the specimen so as to increase imaging ease; during this process, a small portion of the opisthosoma was unintentionally removed.

Fortuitously, removal of the specimen from the resin allowed for improved views of difficult to observe areas (i.e. we were able to observe cheliceral peg teeth). The specimen was mounted on a pin on a microscope stage so that the piece was rotatable at all angles. Further imaging was done with a Leica DFC420 C camera attached to a Leica M205 C microscope. Figure 3 is a stack of three images merged using Helicon Focus software (www.heliconsoft.com/heliconfocus.html).

ABBREVIATIONS

Leg formula (e.g., 1423) indicates the length of each leg relative to the other legs from longest to the shortest (in the example, leg 1 is longest, followed by leg 4). Abbreviations are as follows:

ALS	anterior lateral spinnerets;
AME	anterior median eyes;
BL	book lung;
cl	claw;
co	colulus;
cx	coxa;
EF	epigastric furrow;
fe	femur;
LC	left chelicera;
mt	metatarsus;
mx	maxilla;
op	opisthosoma;
PLS	posterior lateral spinnerets;
pp	pedipalp;

ps	prosoma;
pt	patella;
RC	right chelicera;
sr	spiracle;
st	sternum;
T	trichobothrium;
ti	tibia;
tr	trochanter;
ts	tarsus;
2-4	walking legs 2-4.

All measurements are in mm.

PRESERVATION AND MORPHOLOGICAL INTERPRETATION

The specimen is preserved in a piece of cloudy, light orange amber; approximately 4.5 × 3.5 mm. Prior to receipt by the authors, the piece of amber containing the specimen had been cleaved in half to the left of the abdomen and subsequently glued back together. Small air bubbles and pieces of organic material are present. The opisthosoma of the spider is translucent and the spinneret attachment points can be viewed internally. Many features of the specimen are difficult to study due to the cloudiness of the amber (many, tiny air inclusions). No other syninclusions co-occur with the specimen.

Penney (2003b) considered the wrinkled opisthosoma in his Cretaceous Burmese amber specimen of *Afrarchaea grimaldii* Penney, 2003 (Araneae, Archaeidae) to be the consequence of typical preservational processes that occur in amber. Repeated mention, however, of a wrinkled abdomen in archaeids, and the presence of wrinkles in our specimen, leads us to suggest this may be a specific preservational trait of mecysmaucheniids and closely related families. Koch & Berendt (1854: figs 9, 10) figured parallel abdominal folds in their drawings of Baltic amber archaeids, and Eskov (1992), Penney (2003b) and Wunderlich (2004) all mention wrinkles and folds in the abdomens of their archaeid amber specimens.

The organic material has shrunk in most of the specimen, as is the rule in amber preservation, leaving a ghostly but faithful outline of the original surface. The cuticle has shrunk from the distal end

of the leg segments, leaving only the outline of the original surface (Fig. 1E). In the tarsi, however, the cuticle is absent from the proximal end of the podomere, and a slight constriction occurs, indicating the area was unsclerotized in the living organism (a character that is present in both archaeids and mecysmaucheniids).

SYSTEMATICS

Order ARANEAE Clerck, 1757
Suborder OPISTHOTHELAE Pocock, 1892
Superfamily PALPIMANOIDEA
sensu Forster & Platnick, 1984

Family MECYSMAUCHENIIDAE Simon, 1895

REMARKS

Mecysmaucheniidae are diagnosed as having two spinnerets and chelicerae originating from a foramen in the carapace. Although our specimen has four spinnerets and we cannot be certain the chelicerae originate from a foramen in the carapace, we place the specimen in Mecysmaucheniidae on account of the following characters. The unsclerotized, constricted area on the base of the tarsal segments in our specimen appears to be a synapomorphy uniting the archaeids and mecysmaucheniids (Forster & Platnick 1984; H. Wood pers. comm.) and places our specimen firmly among these families. The lack of a constricted neck or greatly heightened cephalic area (characteristic of Archaeidae), and the presence of four spinnerets (vs six in archaeids), suggest our specimen should be included within Mecysmaucheniidae. Our reasoning is that, while mecysmaucheniids have only two spinnerets, this is a reduction from the plesiomorphic six (i.e. an apomorphy). Loss of spinnerets (or their reduction to patches of spigots) has occurred several times within the Palpimanoidea (Forster & Platnick 1984) and is a character of known polarity. It is likely that reduction is a trend within the Mecysmaucheniidae and the condition in *Archaemecys* n. gen. represents a stage in the reduction. Archaeids have two spiracle openings, unlike the single opening seen in the mecysmaucheniids and our specimen. Additionally,

Forster & Platnick (1984) mentioned that the spiracle is often sclerotized in mecysmaucheniids, a character observed in our fossil. *Archaemecys* n. gen., like other mecysmaucheniids, does not have tubercles on the carapace, and the chelicerae in the fossil are shorter and stouter than those usually found in archaeids. Archaeids have spatulate hairs on the tibia and metatarsus of leg 1 (Forster & Platnick 1984), but the Mecysmaucheniidae, including our specimen, do not. Additionally, our specimen does not have a femoral hump, as is present in archaeids (see Wunderlich 2004). A Pararchaeidae affinity can be ruled out because, as mentioned above, the pararchaeids do not possess the unsclerotized, constricted area at the bases of the tarsi. This aside, our specimen has plumose leg setae, not the serrate or smooth setae found in pararchaeids, and the legs are stout, unlike the slender legs characteristic of pararchaeids.

Genus *Archaemecys* n. gen.

TYPE SPECIES. — *Archaemecys arcantiensis* n. gen., n. sp., by present designation and monotypy.

MATERIAL EXAMINED. — Holotype and only known specimen, subadult male, MNHN ARC11R deposited in the Muséum national d'Histoire naturelle, Paris.

ETYMOLOGY. — The genus name is derived from the Greek *archae*, meaning primitive or ancient, and the modern genus *Mecysmauchenius*, which the fossil somewhat resembles.

STRATIGRAPHIC HORIZON. — Lower Cretaceous, uppermost Albian, subunit A1s12 (Néraudeau *et al.* 2002).

DIAGNOSIS. — *Archaemecys* n. gen. can be distinguished from all other genera of Mecysmaucheniidae by the presence of four spinnerets, a strongly sclerotized ring around the spinnerets, and a sclerotized tracheal spiracle.

REMARKS

The genus differs from other mecysmaucheniids by the presence of four spinnerets. All extant Mecysmaucheniidae have only two spinnerets, a derived condition. Additionally, *Archaemecys* n. gen. has a particularly robust sclerotized ring around the spinnerets, and its legs are much shorter and stouter than in extant mecysmaucheniids.

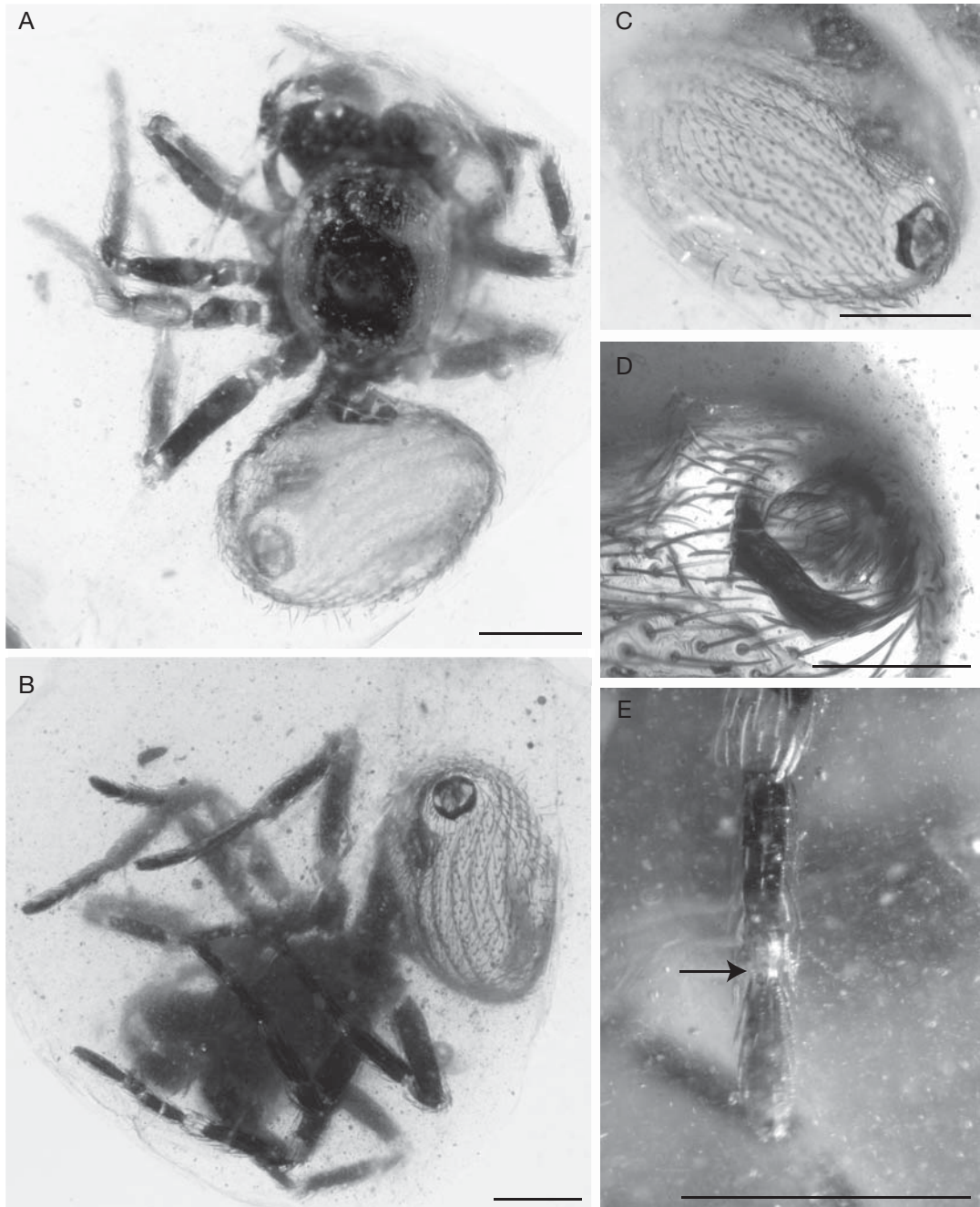


FIG. 1. — *Archaemecys arcantiensis* n. gen., n. sp. (MNHN ARC11R): **A**, dorsal view; **B**, ventral view; **C**, opisthosoma, notice the pronounced wrinkling of the cuticle and the sclerotized rings around the tracheal spiracle and the spinnerets; **D**, lateral view of the spinnerets, anterior to the left; the anterior two spinnerets (left) are relatively large, with two segments, while the posterior two spinnerets (right) are smaller; **E**, close-up of metatarsus and tarsus third leg segment showing the unsclerotized portion at the base of the tarsus (arrowed). Scale bars: A, B, D, E, 0.5 mm; C, 0.2 mm.

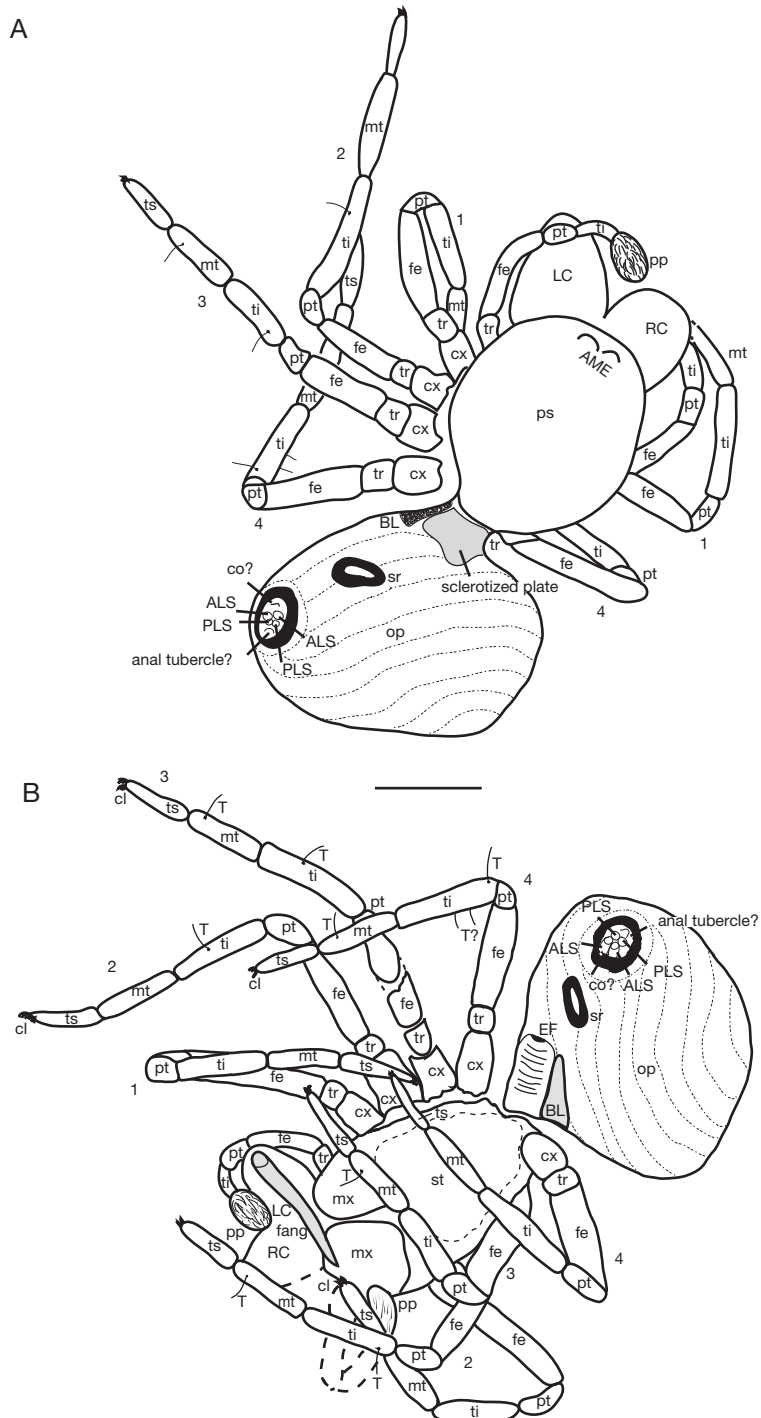


FIG. 2. — Interpretive drawings of *Archaemecys arcantiensis* n. gen., n. sp.: **A**, dorsal view; **B**, ventral view. See text for explanation of abbreviations. Scale bar: 0.5 mm.

Archaemecys arcantiensis n. sp.
(Figs 1-3)

Arachnida Salticidae – Néraudeau *et al.* 2002: fig. 6.8.

TYPE LOCALITY. — Archingeay-Les Nouillers, Charente-Maritime, south-west France.

ETYMOLOGY. — The specific epithet is based on *Arcantiatum*, former Latin name of the locality Archingeay from which the fossil originates.

DIAGNOSIS. — As for the genus.

DESCRIPTION

Body length 3.10. Carapace 1.31 long, 0.94 wide, ≥ 0.66 high; pars cephalica highly elevated so that carapace, when viewed from side, appears sub-rectangular in outline; without tubercles. Only AME visible on anterior face of carapace. Chelicerae with ≥ 11 peg teeth on promargin (Fig. 3); peg teeth ≈ 0.17 long, chelicerae 0.71 long; fang ≥ 0.35 long; chelicerae appear to originate from a foramen, although this is not certain; sclerotized lip/projection above where chelicerae originate (Fig. 3). Sternum 0.34 wide, 0.57 long, lateral margins project slightly between coxae. Maxillae converge slightly, almost circular in shape. Petiole encircled by sclerotized plate (Fig. 2A); rugose epigastric plate, flanked by book lung covers (Fig. 2B). Opisthosoma 1.42 long, approximately 1.10 wide, height uncertain; likely sub-globular in life; dorsal surface not preserved so presence of scutum not known. Opisthosomal cuticle wrinkled in subparallel lines, bearing short, plumose setae, each originating from a prominent follicle. Four spinnerets and anal tubercle surrounded by well-developed chitinous ring (Fig. 2B); ALS well defined in two segments (Fig. 1D), posterior spinnerets smaller; patch of cuticle with short setae in front of ALS, possibly a colulus. Spiracle situated well anterior to spinnerets; well fortified with cuticle ring (Fig. 1A-C).

Leg formula 1423; leg 1 cx 0.23, tr 0.16, fe 0.57, pt 0.25, ti 0.39, mt 0.39, ts 0.39, total 2.38; leg 2 cx 0.18, tr 0.19, fe 0.52, pt 0.20, ti 0.38, mt 0.33, ts 0.33, total 2.13; leg 3 cx 0.17, tr 0.18, fe 0.45, pt 0.21, ti 0.39, mt 0.33, ts 0.28, total 2.01; leg 4 cx 0.25, tr 0.16, fe 0.54, pt 0.20, ti 0.44, mt 0.41, ts 0.33, total 2.33. Plumose setae on all leg segments; no

spines; each metatarsus with single trichobothrium, most likely on dorsal surface (trichobothrium located seven-tenths of way along metatarsus from proximal end in legs 2-4); tibiae 2-4 with at least one (up to three) trichobothria (Fig. 2). Legs relatively short and stout. Tarsi with unsclerotized constriction at the base of the tarsus (Fig. 1E). Three tarsal claws on unsclerotized onychium; paired claws with four, possibly five teeth, unpaired claw simple. Pedipalp rounded and bulbous, 0.37 long, 0.16 wide.

REMARKS

While we are only able to view four spinnerets, we cannot completely rule out the possibility of six, as there may be a very small median pair (this is unlikely since we are able to view inside the opisthosoma to the point of spinneret attachment). Regardless, even if the specimen possesses six spinnerets, this would not change its placement within the Mecysmaucheniidae. Although the archaeids and pararchaeids have six spinnerets, these families do not share the other characters found in our specimen (see family remarks). Additionally, losing spinnerets is a fairly common phenomenon within the Araneae. Extant mecysmaucheniids have lost four spinnerets in the reduction to the two the family currently possesses; given this, it seems quite possible that a primitive mecysmaucheniid would have four, or even six, spinnerets.

DISCUSSION

This is the first description of a fossil mecysmaucheniid and it extends the range of the family back to the Cretaceous Late Albian. Archaeids have been described from Late Cretaceous amber (Penney 2003b) and are known from the Jurassic (Eskov 1987; Selden *et al.* 2008); it follows that mecysmaucheniids are also present in the Mesozoic, since they are the sister to the archaeids.

A cladistic analysis was attempted on the Palpimanoidea *sensu* Forster & Platnick (1984) in an effort to determine where *Archaemecys* n. gen. grouped in relation to the other palpimanoid families. The result was a polytomy which failed to provide us with useful information. The polytomy likely resulted



FIG. 3. — *Archaemecys arcantiensis* n. gen., n. sp., anterior view of the chelicerae and pedipalps. Notice the peg teeth on the chelicerae and the heightened profile of the carapace. Scale bar: 0.1 mm.

from a lack of informative characters used in the analysis and because we were dealing with family-level data that is possibly unnatural. For example, the tendency to lose spinnerets is prevalent within the Palpimanoidea: Palpimanidae, Stenochilidae, Huttoniidae and Mecysmaucheniidae all have a reduced number (Forster & Platnick 1984), but the Archaeidae (sister to the Mecysmaucheniidae and phylogenetically removed from many of the previously cited taxa) still retain the primitive six. It is important to note that the mecysmaucheniids are diagnosed by the combined characters of having only two spinnerets (a character present in other palpimanoid families) and chelicerae originating from a foramen in the carapace. The mosaic of characters found in palpimanoid taxa is reflected in

the use of combined characters to diagnose families. In order to accurately perform an analysis on this superfamily, one should include many possible outgroups, such as those within the Araneoidea, and re-evaluate the characters used to diagnose each family. Additionally, cladistic analyses should be performed at the species level. The analysis suggests more work needs to be done on the systematics of the Palpimanoidea.

Mecysmaucheniids are commonly found in the litter layer of forests (Forster & Platnick 1984; Jocqué & Dippenaar-Schoeman 2006). Since the Archingeay amber fauna is considered a unique representative of a litter fauna (Néraudeau *et al.* 2002; Perrichot *et al.* 2007), our spider specimen corroborates this observation and supports the

hypothesis that resin flowed directly onto the forest floor, thereby engulfing our spider and the many other organisms found in this amber.

Recent mecysmaucheniids occur only in New Zealand and South America (specifically Argentina and Chile) (Jocqué & Dippenaar-Schoeman 2006; Platnick 2009), while archaeids are found only in Australia, South Africa and Madagascar. The presence of fossil archaeids and mecysmaucheniids in Eurasia poses interesting biogeographical questions. Although the present distribution of mecysmaucheniids and archaeids may be an artifact of sampling bias, this seems unlikely, and it is especially curious that mecysmaucheniids occur in precisely those parts of Gondwana from which archaeids are absent. The particular distributions of these two families may represent a case of competitive exclusion or, more likely, since they are sister taxa, may result from a familial divergence in the distant geological past. There are two broad, opposing hypotheses to explain the Gondwanan distribution of extant taxa: mobilistic or vicariance biogeography, whereby Gondwana fragmented and continental drift explains current taxa distributions, and the theory of a relict population or ousted relicts, which proposes a pancontinental distribution of taxa followed by extinction in the northern hemisphere (see Platnick & Nelson 1978; Nelson & Platnick 1981; Eskov & Golovatch 1986; Briggs 1987, 1995; Eskov 1987, 1992; Penney 2003b; and Wunderlich 2004 for a review of the above scenarios). Mobilistic and/or vicariance biogeography is not supported by the fossil evidence for archaeid and mecysmaucheniid spider families (see Penney 2003b and Eskov 1987 for further discussion on archaeids). Mecysmaucheniids are known from the Cretaceous of France (this paper), whereas archaeids are known from the Jurassic of Kazakhstan (Eskov 1987) and China (Selden *et al.* 2008), French Eocene amber (Penney 2007), and they are commonly found in Cenozoic Baltic amber. This non-Gondwanan distribution of the fossils suggests either an overall migration from the northern to the southern hemisphere from Mesozoic to Recent times (this is unlikely) or, more likely, because few fossil spider localities are yet known from Gondwanaland (Wunderlich 2004), a cosmopolitan distribution harking back

to Pangaea that has experienced extinction in the northern hemisphere. Thus, it appears as if the extant distribution of mecysmaucheniids consists of relicts of a once more widespread distribution, as is mimicked in their archaeid sisters.

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NOTE ADDED TO PROOFS

A work published recently by Wunderlich (2008) referred to *Archaemecys arcantiensis* n. gen., n. sp. (this paper) as *Palaeomecysmauchenius* (this was a manuscript name – we provided Wunderlich with a preliminary draft of the present paper in 2007) and placed our specimen in his new subfamily Lacunaucheniinae. We refute this placement on the following grounds: *Archaemecys* n. gen. possesses a ring around the spinnerets (*contra* members of Lacunaucheniinae) and does not, to our knowledge, have three pairs of spinnerets (a trait of Lacunaucheniinae). Furthermore, Wunderlich (2008) indicated we support the theory of ousted relicts (the hypothesis that northern lineages were ousted to the southern hemisphere by more competitive taxa). This is false: we simply stated that Archaeidae and Mecysmaucheniidae likely had a more widespread distribution in the Mesozoic, so their extant range would therefore be a relict of a previous pancontinental distribution.

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