

The Baltic amber species of *Prionomyrmex* (Hymenoptera, Formicidae)

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With 5 figures and 1 table

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Abstract

This paper reports about the rediscovery of *Prionomyrmex longiceps* MAYR, an enigmatic Baltic amber ant species of considerable phylogenetic interest whose original specimens were presumably lost. Examination of this material permits confirmation of the presence of a ventral stridulatory organ in the fossils, an important synapomorphy with the unique Recent *Prionomyrmex* previously admitted only hypothetically. The finding confirms that at least two distinct *Prionomyrmex* species were present in the Baltic amber fauna. Comparison between these two species, moreover, shows a certain amount of inter- and intraspecific variation in the relative proportions of the petiolar nodes, i. e. in the most salient character separating the two fossils from the sole extant Australian representative of the subfamily Prionomyrmeciinae.

Zusammenfassung

Dieser Artikel berichtet über die Wiederentdeckung von *Prionomyrmex longiceps* MAYR, einer rätselhaften fossilen Ameisenart aus Baltischem Bernstein von großem phylogenetischem Interesse, deren ursprüngliche Stücke als verloren galten. Das Vorhandensein eines ventralen Stridulations-

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organs (früher nur hypothetisch angenommen) wurde für das erste Mal festgestellt. Der Fund bestätigt die Existenz von mindestens zwei verschiedenen *Prionomyrmex*-Arten in Baltischem Bernstein. Ferner zeigt der Vergleich dieser beiden Arten einen gewissen Grad inter- und intraspezifischer Variation bei der relativen Gestalt des Petiolus, dem auffälligsten Unterscheidungsmerkmal der beiden fossilen Arten vom einzigen rezenten australischen Vertreter der Unterfamilie Prionomyrmeciinae.

I. Introduction

The monotypic Baltic amber ant genus *Prionomyrmex*, described by MAYR (1868) and redescribed by WHEELER (1915), was never collected again until recently (BARONI URBANI, 2000). In the latter paper, BARONI URBANI (l. c.) confirmed the previously hypothesized relationship between the fossil *Prionomyrmex* and the Recent Australian genus *Nothomyrmecia* and pushed it so far as to show their belonging to the same genus. The original *Prionomyrmex* specimens described by MAYR (1868) and by WHEELER (1915), however, appear to have been lost. There is no mention of them in a catalogue of the Königsberg collection now preserved in Göttingen, a catalogue compiled in electronic form by Dr. Hans JAHNKE, Göttinger Zentrum für Geowissenschaften, Göttingen, Germany. BARONI URBANI (2000) described the specimens that he studied as a new species, *P. janzeni*. The characters differing the new species from *P. longiceps* MAYR were inferred from fragments of sentences in the descriptions by MAYR (1868) and by WHEELER (1915). In the present paper I report about the rediscovery of two specimens unequivocally referable to *P. longiceps*, one of it belonging to the collection of the Museum für Naturkunde der Humboldt-Universität in Berlin, the other to the the Geological-Paläontological Institute and Museum, University of Hamburg.

II. Material

Specimen A. A Baltic amber sample from the Museum of Natural History of the Humboldt University in Berlin (figs. 1, 3). The specimen pertains to the collection SIMON, a historical amber collection. The amber is cut in parallelepiped shape around the ant body and the whole amber sample is embedded in balsam and mounted on a microscopic slide. The specimen bears an anonymous identification label with written „Gen. Prionomyrmex longiceps“.

Dr. Stefan SCHÖDL, curator of the MAYR collection in the Natural History Museum of Vienna, sees no similarities between the handwriting of the amber label and several original identification labels by MAYR. In addition, contrarily to what stated by MAYR (1868), about the unique specimen from which he described the new genus and species, the preservation conditions of this specimen are good.

Figs. 1-5: *Prionomyrmex longiceps* MAYR, worker, in Baltic amber (Eocene); Yantarnyi, Kaliningrad Region, Samland Peninsula, Russia; 1: Spec. A, general habitus and preservation conditions; Museum of Natural History HUMBOLDT Museum, Berlin, coll. Simon no.MB12232; 2: Spec. B, general habitus and preservation conditions, coll. Geological-Palaeontological Institut and Museum University of Hamburg no.xxxx (ex coll. Jonas DAMZEN Vilnius, (Lithuania)); 3: Spec. A, distal part of the scape and first funicular joints showing the erect and suberect hairs; 4: Spec. B, oblique ventral view of the anterior border of the fourth abdominal segment. The transversal ridges provide evidence for the presence of a ventral *stridulitrum*, a rare structure previously reported only for two recent ant species; 5: Spec. B, part of the cephalic capsule, left scape and first funicular joints showing the erect and suberect hairs. In all figures: distance between two scale bars 0.1 mm.



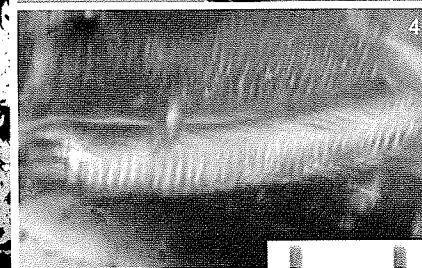
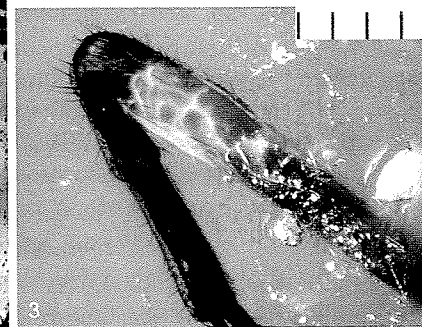
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This is not, hence, MAYR's holotype and, with all probabilities, even not one of the specimens identified later by WHEELER (1915).

Specimen B. Flat, roundly polished Baltic amber sample (4.3'2.0'0.9 cm) containing a nearly intact *Prionomyrmex* worker (figs. 2, 4, 5), smaller than the one of specimen A. Only part of the left mesotarsus is missing. Several minute fragments of burned vegetable material and a small dipteran are also included. The position of the specimen and the impurities of the amber render its photography difficult. This is nonetheless a superb example in which most relevant structures can be examined. The specimen originally belonged to Mr. Jonas DANZEN, Vilnius (Lithuania) and will be deposited in the collection of the Geological-Palaeontological Institute and Museum, University of Hamburg.

II. Identification and Description

Specimen B allows further insights on the relationships between the Baltic fossils and the recent Australian *Prionomyrmex macrops*. BARONI URBANI (2000), on the basis of parsimony arguments, supposed that the fossil *Prionomyrmex* should possess a ventral stridulatory organ between A III and A IV, as it is described for the Recent Australian species. Careful examination of specimen B allows the detection of minute, ventral, parallel transversal ridges on the anterior border of the fourth abdominal sternum. These must be interpreted as a component of the *pars stridens* (fig. 4). This transverse structure, in the fossil, prolongs minimally also over the lateral border of the fourth tergum.

Though the holotype of *P. longiceps* MAYR appears to have been lost, both specimens in question can be attributed to this species with a high degree of confidence.

Since BARONI URBANI (2000) gives a recent, exhaustive description of a closely related new species, *P. janzeni*, the following comparison between the two species should be sufficient for their characterization.

<i>P. longiceps</i>	<i>P. janzeni</i>
Scapes with erect and suberect hairs	Scapes without hairs
Propodeal teeth larger	Propodeal teeth smaller
Petiole thicker	Petiole slender
Head length 2.64-2.20 mm	Head length 2.48 mm
Head width 2.08-1.68 mm	Head width 1.72 mm
Cephalic Index 78.8-76.4	Cephalic Index 69.3
Scape length 2.48-2.16 mm	Scape length 2.30 mm
Petiolar length 1.32-1.08 mm	Petiolar length 0.76 mm
Petiolar Index 74.2-74.1	Petiolar Index 67.8
Postpetiolar length 1.48-1.40 mm	Postpetiolar length 1.36 mm
Postpetiolar width 1.84-1.56 mm	Postpetiolar width 1.48 mm
Maximum Gaster width 2.28-1.80 mm	Maximum Gaster width 1.88 mm
Petiole & Postpetiole Index 53.3 (sp. A only)	Petiole & Postpetiole Index 51.3
Postpetiole & Gaster Index 80.7-86.6	Postpetiole & Gaster Index 78.7
Total length 14.4-12.8 mm	Total length 13.6 mm

Tab.1: Comparison between *P. longiceps* and *P. janzeni*; character states for *P. longiceps* are listed for specimen A 1st and B 2nd.

As one can not of *P. janzeni*, *P. longiceps*, a character appears slightly thick *longiceps* appears to

Another trait of and figure of *P. longiceps* while joints one and predicted by the drawings of specimens reported following three, which explained by the author who starts his description...

The present finding is genetically and biogeographically confirmed and the diversity of the fauna from which it

Moreover, comparing the evolutionary patterns of Myrmecinae and *P. longiceps* postpetiole broadly as *P. macrops*, which is related to A IV. *P. longiceps* by having a much broader

Additionally, the presence of a ventral structure before, was only initially a synapomorphy shared

Dr. Wolfgang W. the Hamburg University and kindly forwarded Stefan SCHÖDL, of the between the handwriting described in this paper

As one can notice from the comparison above, and as it was assumed in the description of *P. janzeni*, *P. longiceps* differs from *janzeni* essentially by its presence of pilosity on the scapes, a character easily visible in both specimens reported here (figs. 3, 4). The pilosity appears slightly thicker and longer also on the legs and on other body parts. In addition, *longiceps* appears to be slightly stouter than *janzeni*.

Another trait of these ants may be worth mentioning here: MAYR's (1868) description and figure of *P. longiceps* depict a specimen with very elongate second funicular joint, while joints one and three appear much shorter and subequal. This morphology is contradicted by the drawing and description by WHEELER (1915), and by examination of the specimens reported in the present paper: the first funicular joint is much shorter than the following three, which are ca. twice as long as the first. The discrepancy can be easily explained by the bad preservation conditions of the sole specimen studied by MAYR (l. c.) who starts his description of the antennal morphology with the statement: „Wenn ich recht sehe...“.

IV. Discussion

The present finding permits a redescription of the previously enigmatic and phylogenetically and biogeographically significant Baltic amber ant *Prionomyrmex longiceps*. With this finding the presence of two distinct *Prionomyrmex* species in Baltic amber is confirmed and the diversity of the Baltic fauna appears greater than the one of the Recent fauna from which only one *Prionomyrmex* species is known.

Moreover, comparison of these two, closely related species, allows some insights into the evolutionary path of the shape of the postpetiole within the two sister ant subfamilies Myrmeciinae and Prionomyrmeciinae. Both Baltic amber species have a differentiated postpetiole broadly articulated to abdominal segment IV. In this they differ from the Recent *P. macrops*, which shows the postpetiole without posterior constriction and entirely articulated to AIV. *P. longiceps*, however, approaches more the condition of the Recent species by having a much broader postpetiole, both in absolute and proportionally with its size.

Additionally, the specimens described in the present paper allow confirmation of the presence of a ventral *stridulitrum* in the Baltic amber species. Presence of this rare trait, before, was only inferred from phylogenetic reconstructions. This is an additional, odd synapomorphy shared by the fossil *P. longiceps* and the Recent Australian *P. macrops*.

Acknowledgements

Dr. Wolfgang WEITSCHAT of the Geological-Palaeontological Institute and Museum of the Hamburg University „discovered“ the specimens in question, recognized their interest and kindly forwarded them to me practically already identified. I am also grateful to Dr. Stefan SCHÖDL, of the Natural History Museum of Vienna for his fast and detailed comparison between the handwriting of Gustav MAYR and the one of the label of the first specimen described in this paper.

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Chaulio

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Abstract.....
Zusammenfassung
I. Einleitung
II. *Chauliodes* im
III. Systematische
IV. Diskussion....
Dank
Literatur

Fishflies (Me
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Corydalidae) ist mit
zwei rezenten Arten
Chauliodes prisca
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*) Anschrift des V
Universität zu J