

25TH ANNIVERSARY OF
MUSEUM OF AMBER INCLUSIONS
UNIVERSITY OF GDAŃSK



**Fossil Record
in Resins and Sediments**

BOOK OF ABSTRACTS

UNIVERSITY OF GDAŃSK
23-26 MAY, 2023



FossilRRS Conference



**Fossil Record in Resins
and Sediments**

**25th Anniversary
of Museum of Amber Inclusions
University of Gdańsk**

BOOK OF ABSTRACTS

**University of Gdańsk, Faculty of Biology
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WELCOME

The Museum of Amber Inclusions University of Gdańsk is pleased to invite you to celebrate its 25th anniversary and attend the conference *Fossil Record in Resins and Sediments*, which will be held in Gdańsk, Poland, from 23rd-26th May 2023.

Twenty-five years ago, the natural history collection of amber and inclusions, started from modest beginnings – scientific collection of the Diptera inclusions of Professor Ryszard Szadziewski. What revolutionised the collection was the donation of 50 kg of raw Baltic amber, which completely changed the view on amber, its inclusions and its amber taphocoenosis. The uniqueness of the scientific collection of the Museum of Amber Inclusions is in its positioning within the structures of the University. We are not a collection of specimens, musealia that cannot be touched, but a collection where amber is the basis of scientific discovery and research. Twenty-five years ago, we were at the point when interest in inclusions was developing, and the amber market was growing, and we were present at the Amberif Fair, among the amber workers and collectors, at the centre of the amber (and inclusions) fever. The scientific backbone of the Museum is its collection, research facilities and friends among scientists. The flesh is a collaboration with amber workers, collectors and enthusiasts of amber and inclusions. The blood is the circulation of information, data, ideas, and opinions.

New technologies allow us to look more and more closely into worlds hidden millions of years ago in the solidifying drops of resins. It is the 21st century and we are discovering new pages written in the books of amber, its inclusions and its deposits, but also in the stone books of palaeontology. We will not be able to answer more and more questions on our own – cooperation, exchange of information and experience of geologists, palaeontologists and biologists is needed.

The Conference, which is being held at the University of Gdańsk and supported by the Ministry of Education and Science, will offer an outstanding scientific programme thanks to the participants. It is an opportunity to share the current state of knowledge, new working hypotheses, to debate new findings and new tools, to discuss and find new interpretations of existing data and opinions.

It is with great pleasure that we invite all of you in the spring of 2023 to this Conference, we encourage scientific openness, warm discussions, collaboration, and a shared reading of palaeobiology in fossil resins and sediments. We trust that your stay in Gdańsk – the World Capital of Amber and Museum of Amber Inclusions will be a memorable opportunity for both professional and personal satisfaction.

HONORARY PATRONAGE



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ABSTRACTS



DINGLOMORPHA - KEY TAXON OR BLIND BRANCH IN STERNORRHYNCHA EVOLUTION?

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The Sternorrhyncha is a suborder of the Hemiptera, which comprise about 18,700 described recent species. In the modern fauna, these tiny phytophagous insects comprise groups of great ecological and economic importance, like aphids (Aphidomorpha), scale insects (Coccidomorpha), whiteflies (Aleyrodomorpha) and psyllids (Psylloidea). Their evolutionary history can be traced back to the early Permian, but the early stages of their evolution and diversification are poorly understood. The consensus is that the Sternorrhyncha are a monophyletic lineage, but their internal classification is still an object of debate. Two extinct groups – Pincombeomorpha and Naibiomorpha were variously placed in classifications and relationship hypotheses, and Dinglomorpha appeared as a sister group to Aleyrodomorpha. Most of the recent Sternorrhyncha groups radiated rapidly during the Cretaceous, and Dinglomorpha is only known from the mid-Cretaceous, Cenomanian amber of Kachin, Myanmar^{1,2}. Results of molecular investigations in Sternorrhyncha and Hemiptera were giving ambiguous results depending on sampling and due to long-branch attraction³.

Morphological analysis of the Sternorrhyncha including the fossil groups¹ revised former opinions, placing the fossil groups in the context of their modern relatives. Two postulated lineages – Aphidiformes comprises [extinct Pincombeomorpha + [Coccidomorpha + [extinct Naibiomorpha + Aphidomorpha]]], and Psylliformes comprises [Protopsyllidoidea + [extinct Dinglomorpha + Aleyrodomorpha] + [extinct Liadopsyllidae + Psylloidea]]. These results clearly indicate that morphology should not be neglected in phylogenetic studies, and showed limitations of exclusively molecular approaches. Thus a new morphological and molecular and total evidence analyses are necessary to resolve existing contradictions. Dinglomorpha presents a mixture of characters shared with Aleyrodomorpha combined with unique features and sternorrhynchan symplesiomorphies. Thus it seems to be a key taxon to understand evolutionary traits in this lineage. The only dinglomorph family, Dinglidae is represented by two monospecific genera: *Dingla* Szwedo & Drohojowska, 2020 and *Alloeopterus* Poinar et Brown, 2020, known from Cenomanian amber of Kachin. A few more inclusions from the same fossil resin, available for study, suggest that more taxa could be described, widening the range of morphological disparity of this group of sternorrhynchans. Dinglidae could be a relictual group, survived in particular conditions in the mid-Cretaceous archipelago of West Burma terrane. The West Burma terrane separated from Australia during the Jurassic and collided with Eurasia at ca. 80 Ma, so that Burmese amber may represent a mid-Cretaceous island flora and fauna with Gondwanan faunal elements⁴. This makes fossil Dinglidae even more interesting and important for diversity, disparity and phylogenetic studies. The oldest Aleyrodidae are known since the Jurassic of northern China, and these were

quite dispersed during the Cretaceous⁵. The questions if Dinglidae have Gondwanan origin, their biogeographic status, the taxonomic and phylogenetic character remain open.

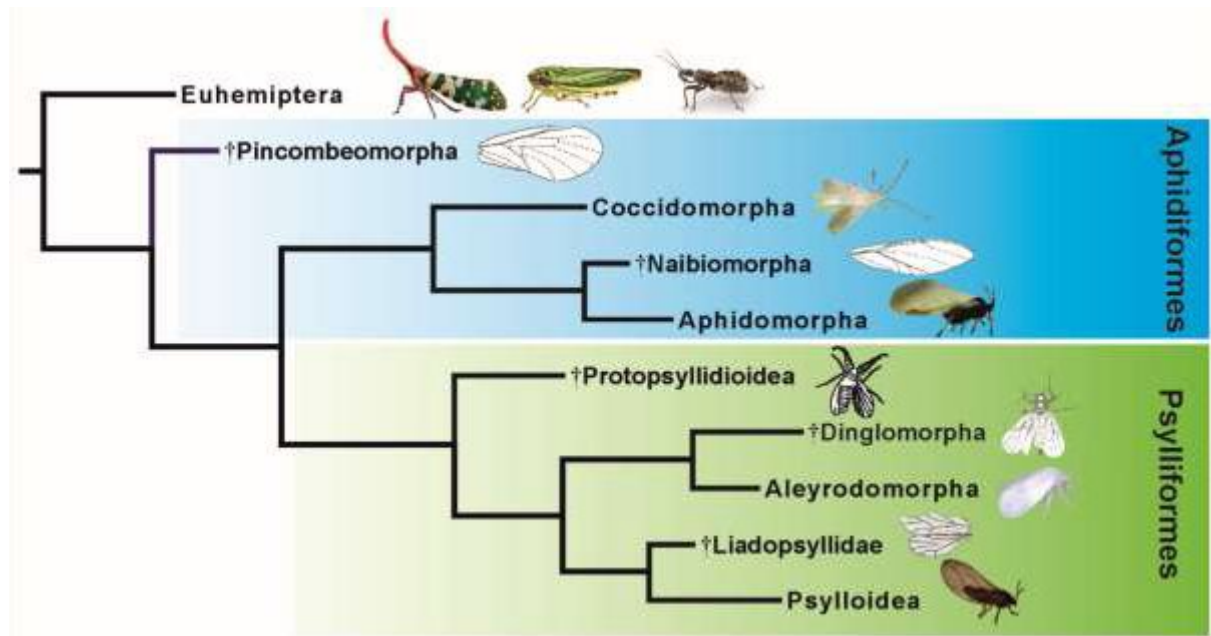
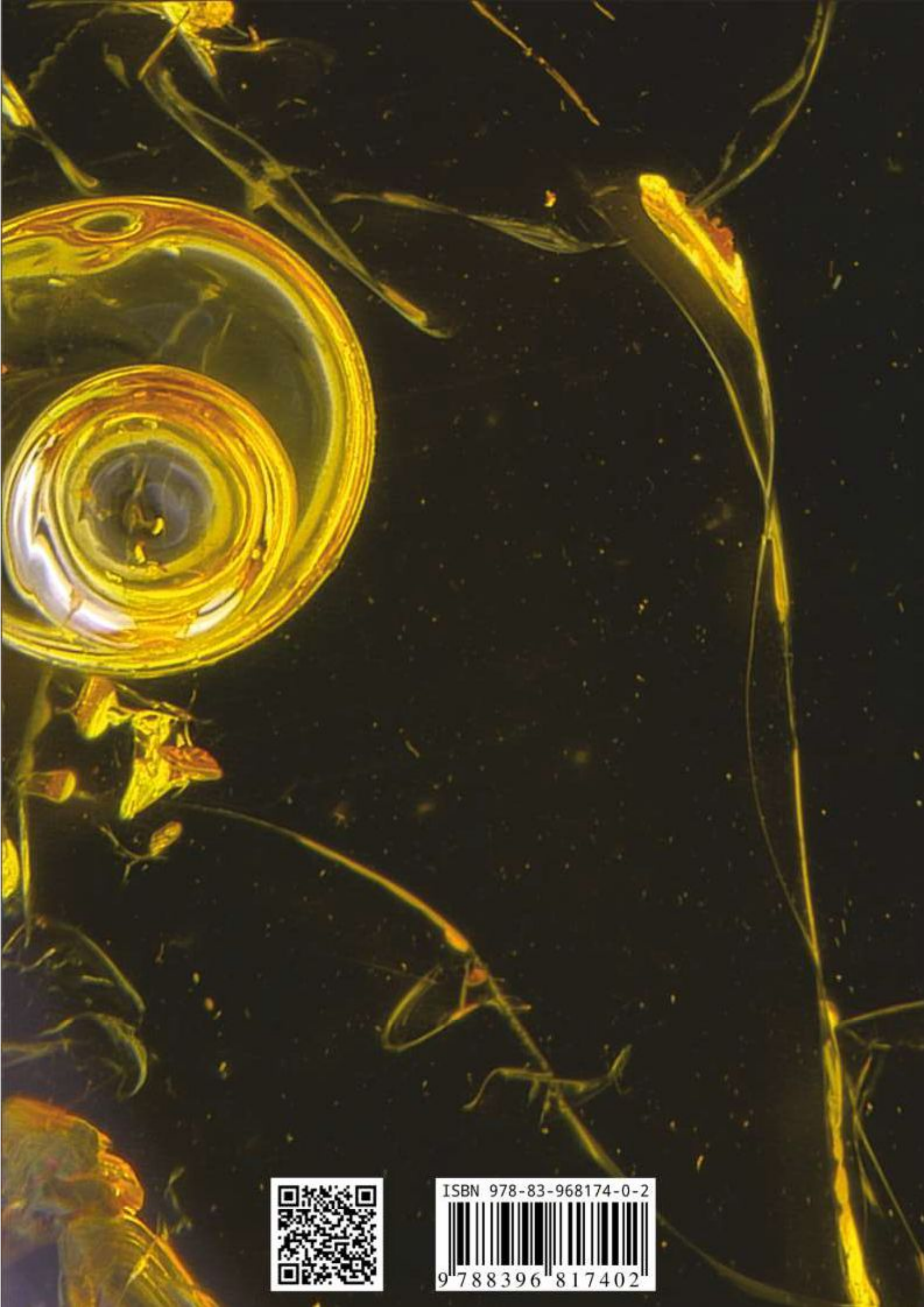


Fig.1. Relationships of major lineages within the Sternorrhyncha (Hemiptera).

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