

AMBERIF 2018

International Fair of Amber,
Jewellery and Gemstones

INTERNATIONAL SYMPOSIUM AMBER. SCIENCE AND ART



Abstracts

GDAŃSK, POLAND

22-23 MARCH 2018

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Abstracts

Editors: Ewa Wagner-Wysiecka · Jacek Szwedo · Elżbieta Sontag
Anna Sobecka · Janusz Czebreszuk · Mateusz Cwaliński

This International Symposium was organised
to celebrate the 25th Anniversary
of the AMBERIF International Fair of Amber,
Jewellery and Gemstones
and the 20th Anniversary of the Museum of Amber
Inclusions at the University of Gdańsk

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Foreword

For 25 years, AMBERIF has been gathering people of common passion: Baltic amber (=succinite). Since its first edition, AMBERIF has been accompanied by scientific seminars, which were initiated by Prof. Barbara Kosmowska-Ceranowicz and Wiesław Gierłowski. In its silver jubilee year 2018, the seminar is an International Symposium, organized under the supervision of AMBERIF Project Director Ewa Rachoń.

Science and art have been coming together from times immemorial. They are like a good marriage, supporting and complementing each other, providing creativity and inspiration, opening new perspectives and opportunities every day. Baltic amber, but also other fossil resins of the world, is a perfect example of a link between science and art. It is because succinite in a magical way simply attracts—not only those who just love the secret beauty of amber, but also scientists and artists.

During the two days of the Symposium (22-23 March 2018), we would like to present, in light of the latest scientific reports, the dynamic development and progress of the research areas related to amber in the field of natural sciences, exact sciences and humanities. Four thematic sessions, which will be chaired by members of the Scientific Committee of the Symposium, with the honorary Chair of the Symposium, Professor Barbara Kosmowska-Ceranowicz (Museum of the Earth in Warsaw, Polish Academy of Sciences), include lectures and poster sessions. Our invitation as keynote lecturers was accepted by: Prof. Faya Causey (Getty Research Institute, USA), Prof. Sarjit Kaur (Laboratory of Amber Research, Faculty of Chemistry, M. Vassar College, USA), Prof. Joseph B. Lambert (Faculty of Chemistry, University of Trinity, USA), Prof. Vincent Perrichot (Faculty of Earth Sciences, University of Rennes 1, France).

Session “*Life traces in amber*” chaired by Prof. Jacek Szewo and Dr Elżbieta Sontag (Faculty of Biology, Laboratory of Evolutionary Entomology and Museum of Amber Inclusions, University of Gdańsk) is dedicated to the traces of ancient organisms and their activities, preserved in fossil resins. Its main topic is the inclusion of insects and other arthropods, plants, fungi and other organisms. This session is also a celebration of the 20th Anniversary of the Museum of Amber Inclusions at the University of Gdańsk.

Local and supra-regional traditions in the manufacture of amber objects among European societies of the Bronze and Iron Age is the leading topic of the session “*Stylistics and processing technology of amber products in 3rd-1st millennium BC: local and interregional perspective*” conducted by Prof. Janusz Czebreszuk and Mateusz Cwaliński (Institute of Archaeology, Adam Mickiewicz University in Poznań). The twelve oral communications presented in this session will be summarized in a special final discussion.

The latest achievements in research on amber properties with the use of modern research techniques and applications of these achievements form the main topic of the session “*Highlights of amber properties investigations and current aspects of amber mining.*” This part of the Symposium is also dedicated to very important current problems—also environmental ones—related to the geology and extraction of amber. This session is under the supervision of Dr Ewa Wagner-Wysiecka and Dr Natalia Łukasik (Faculty of Chemistry, Gdańsk University of Technology).

The amazing and captivating world of myths, toposes and their representations in amber artefacts is the subject of the session on “*Myths, collections and conservation of amber,*” led by Dr Anna Sobiecka (Faculty of History, University of Gdańsk).

Instead of a summary—

“Man is unique not because he does science, and he is unique not because he does art, but because science and art equally are expressions of his marvellous plasticity of mind” (Jacob Bronowski)

Ewa Wagner-Wysiecka

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Sternorrhyncha (Insecta: Hemiptera) from Burmese amber

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Sternorrhyncha bugs (Hemiptera: Sternorrhyncha) are tiny opophagous (sucking phytophagous) insects, recently distributed worldwide. This group covers several lineages still present as aphids (Aphidomorpha), scale insects (Coccidomorpha), whiteflies (Aleyrodomorpha) and psyllids (Psylliformes), as well as extinct Naibiomorpha and Pincombeomorpha (Szwedo 2018). The geological history of the group could be traced back to Permian, but their records are not so numerous as for euhemipteran lineages (Fulgoromorpha, Cicadomorpha, Coleorrhyncha and Heteroptera). Fossilised resins are perfect preservative for these minute creatures, and since the early Cretaceous, the fossil record of aphids, scale insects and aleyrodids is quite rich, while surprisingly, not so rich for protopsyllidiids and psyllids (Psylliformes). Similar image is to be observed among sternorrhynchan inclusions in mid-Cretaceous Burmese amber (Ross 2018).

Up to the end of 20th century, Burmese amber, mineralogically named as burmite by Gdańsk pharmacist Otto Helm (Helm 1892, 1893), was regarded as one of the rare and weakly known fossil resins. Resurgence in the study of this amber and its inclusions over the past two decades resulted in hundreds of papers. The main deposit in which the Burmese amber is exploited is area near Noije Bum Hill, in Hukawng Valley, Kachin State of northern part of Burma (Kania et al. 2015; Thu and Zaw 2017). These deposits were investigated and dated in detail by Cruickshank and Ko (2003) and Shi et al. (2012), which currently date the deposit of 98.8 ± 0.63 Ma. However, slightly older, late Aptian age of amber was recently postulated (Zheng et al. 2018), due to fact, that the amber shows evidence of redeposition (Grimaldi and Ross 2017; Smith and Ross 2018).

Scale insects are the best known so far group of insects from Burmese amber. To date 14 species (4 of *incertae sedis* position) were described from 7 families. The first descriptions of scale insects from families Burmacoccidae and Albicoccidae were presented by Koteja (2004). Families and representatives of other families – Ortheziidae, Coccidae, Kozariidae, Pseudococcidae and Weitschatiidae were presented by Vea and Grimaldi (2012, 2015) and Wang et al. (2015), the latter paper with the first report on brood care preserved in Burmese amber. Numerous inclusions representing Ortheziidae are under elaboration, and the first male from the family Monophlebidae.

The second group quite well recognised among inclusions in burmite is Aphidomorpha. The first aphids from Burmese amber were presented by Poinar and Brown (2005). Two families Parvaverrucosidae and Burmitaphididae were established, both of them now extinct (Szwedo 2018). Later another family – Isolitaphididae was described by Poinar (2017), but it recently proposed to be synonymised under Juraphididae (Liu et al. 2018). Number of papers with description of new genera and species in families already known were also presented recently (Wegierek et al. 2017, Poinar 2018, Liu et al. 2018). To the date 7 species of 5 extinct families of aphids are reported.

The other sternorrhynchan groups entombed as inclusions in burmite, are known extremely weakly. Two species of whiteflies were described, first by Cockerell (1919) and the other one by Shcherbakov (2000). Taxonomically, whiteflies are very difficult group to study, often being not correctly recognised as inclusions, which hampering the studies of these insects from Burmese amber. The group was well represented and

diversified during the Cretaceous (Drohojowska and Szewo 2015) and number of new species is going to be described from Burmese amber in nearest future.

Psylliformes from Burmese amber are represented exclusively by single Protopsyllidiidae species. This group was revealed as sister to all Sternorrhyncha by Grimaldi (2003). Liadopsyllidae were reported from Lebanese and New Jersey amber (Ouvrard et al. 2010), however, not found yet among Burmese amber inclusions. Recent investigations (Drohojowska 2015) put them as a sister group in relation to Aleyrodomorpha and Psylloidea. This group need more attention and detailed survey, more specimens, well preserved and correctly described, can put a light on the relationships of these insects. The great challenge is to find true Psylloidea in Burmese amber, as they enter the fossil record in the Palaeogene, and nothing is known on early stages of their evolution and morphological disparity, which probably started at the times of Burmese amber formation.

One more group, of particular Sternorrhyncha is now under detailed investigation, but their taxonomic and phylogenetic position needs further investigations and will be presented soon.

To sum up, Sternorrhyncha inclusions of mid-Cretaceous Burmese amber show wide taxonomic diversity and broad range of morphological disparity, owing to place them at their own groups of familial ranks. These insects, despite of tiny size, are of great interest and of great importance to reconstruct the biota of Burmese amber and evolutionary scenarios for formation and extinction of lineages, formation of modern faunas.

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Dragonflies in amber from the age of the dinosaurs

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Odonatans (dragonflies and damselflies; dragonflies in the broad sense) are rare as amber inclusions, but quite diverse in mid-Cretaceous Burmese amber (circa 100 million years old) with 27 species in 22 genera (Figure 1) representing 13 families: this is the most abundant dragonfly assemblage so far discovered as amber inclusions.

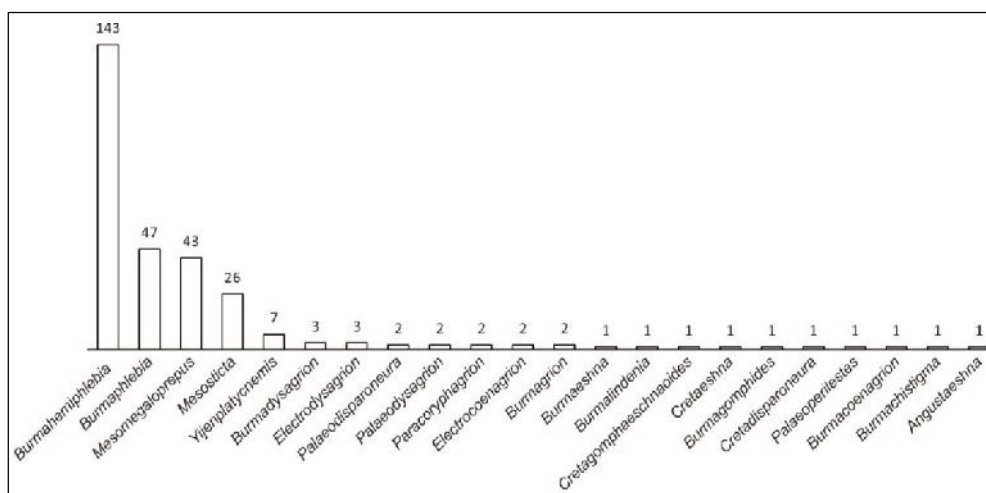


Fig. 1. Histogram chart showing number of odonatan specimens vs. genus in Burmese amber.

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