

Program and Abstracts



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Pollen as indicator of vegetation changes in the Taurene integrated monitoring site at the Vidzeme Upland, Latvia

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Taurene is situated at the Vidzeme Upland, in hilly-ranged landscape with roundshaped hill with convex slopes. Spruce forest vegetation is more diverse than pine forest vegetation in the Taurene site. Extensive area is covered by the association Oxalidoso-Piceetum.

Dry pine forests are the most common and economically the most valuable forests in Latvia. At the same time pine stands of oligotrophic and oligo-mesotrophic sites have experienced substantial changes during the last 50 years. The total area of pine forests was 53.3 % out of total area of forests in 1940 in Latvia, but it had decreased to 35.3 % in 2006 (area of oligotrophic forest site types Cladinoso-Callunosa, Vacciniosa, and Myrtillosa which are the most suitable for pine changed from 14.7 to 11.7 % during this period). The main reason for transformation of pine stands is anthropogenic influence, and amelioration of wet forests in particular. Presumably, also

environmental dynamics has influenced the floristic composition of pine forests: increase of air temperatures (climate warming) and increase of atmospheric deposition (with maximum in the 60-80ies of the last century). In Latvia, vegetation ruderalisation, graminification and fruticification are the processes that indicate the transformation of pine forest stands under the influence of man and namely the slow gradual eutrophication of forests, which appears also in the fossil pollen spectra, obtained from 4 m deep organic sediment core reflecting vegetation development through the 9039±70 years BP after 14C dating. Although, these features are less expressed in the pollen spectra from modified Tauber traps monitored for last 10 years. The results from main tree pollen traps show prevalence of the *Pinus sylvestris*, *Picea abies* and *Betula pendula*. Among pollen spectra *Pinus* and *Betula* pollen prevail. Significant increase of birch pollen is characteristic for last years.

Cluster analysis of dispersed leaf cuticles from the transitional Permian-Triassic Nedubrovo locality, Moscow Syncline, Russia

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The Nedubrovo smectitic claystone - siltstone alternation assigned to the latest Permian on palynological and magnetostratigraphic evidence contain abundant dispersed leaf cuticles that were first recorded by Krassilov (1999) and are here systematically studied. According to the existing practice, only the most well preserved dispersed cuticles are studied in order to detect corresponding leaf morphotaxa. An alternative approach is to obtain a representative sample of dispersed leaf cuticles and work out for them a formal or informal micromorphological classification based on epidermal and cuticular characters. Thus, dispersed cuticles of various preservation and taxonomic values can be divided into three categories: (1) cuticles well preserved, identified by means of epidermal characteristics with the known leaf morphotaxa; (2) cuticles lacking a full set of cuticular-epidermal features, but showing taxonomically important features, such as the pavement cell outlines and a few stomata, sufficient for comparison with the leaf morphogenera or the higher taxa of macromorphological classification, and (3) cuticles fairly preserved with the major cuticular-epidermal features intact, but scarcely matching any known leaf morphotaxa.

Our study of dispersed cuticles proceeded in four stages: (1) preliminary sorting dispersed cuticles by the major diagnostic characters into distinctive epidermal types; (2) performing cluster analysis that can handle a large number of features; (3) assessment and assignment of taxonomic rank to the recognized cuticular clusters; 4) naming and description of micromorphological taxa.

We paid a particular attention to analysis of epidermal characters in the leading group of peltasperms. Three genera of peltasperms were analyzed using our collected material and published sources. This analysis showed a high taxonomic value in determination of dispersed peltasperm cuticles of such characters as the presence/absence of costal/intercostal differentiation, the topography of stomata and the pavement cell outlines. Among the features characterizing stomatal structures, the most significant are the degree of guard cells exposure and cutinization of subsidiary cells, as well as outlines of the guard cells.

At the current stage of the dispersed cuticle analysis, 12 epidermal types are recognized in the Nedubrovo locality, four of them are new micromorphotaxa.

Near PTB floristic turnover and precursors of Mesozoic dominant forms

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On the Russian platform, the Late Permian Vyatkian flora is followed by two sequential floristic horizons, the Vyaznikovian and Nedubrovian, representing the level of the major biotic turnover in both marine and non-marine realms. These end-Permian assemblages are characterized by a relatively low taxonomic diversity, but disparity of floristic composition is rather high, most higher taxa being represented by a solitary species. The first appearing genera amount to 21% in the Vyaznikovian assemblage and 10% in the Nedubrovian assemblage, indicating a high turnover rates. Among the new elements, Permophyllocladus Karasev and Krassilov includes leafy shoots with distinct scale leaves, planate transitional forms with more or less connate scale leaves, and the lobed to nearly entire bilateral phylloclades. Phylloclade formation like this went parallel in the Vyaznikovian and Zechsteinian forms and resulted in the typical Triassic *Lepidopteris* leaves, the phylloclade origin of which is betrayed by the rachis scales alone. Another Vyaznikovian genus, *Dichoplanophyllum* has unequally forking leaves with long linear lobes, strikingly similar to the Mesozoic Czekanowskiales in the epidermal features.

Vjaznicopteris with recurved basal segments could have been transformed into *Ginkgo*-type leaf by reduction of the midrib, a process that is on the way already in the Vyazniki species. *Willsiostrobus* is an essentially Triassic Voltziacean pollen cone. *Protobeania* from Nedubrovo is a planate bilobed megasporophyll bearing large cycadean ovules, a possible precursor of the Beaniales (Nilssoniales), an extinct group of Mesozoic cycadophytes. *Navipelta*, a peltasperm with laterally compressed ovulate peltoids shows a transition from radial to bilateral symmetry occurring in many Mesozoic gymnosperm lineages. We conclude that the end-Permian ecosystem turnover was accompanied by the high-rate morphological innovations of macroevolution scale, including organ fusion, planation and the change of symmetry. A number of widespread Mesozoic morphotypes might have originated in this way. At the same time, such an ecosystem event as leaf mining, a major habit of leaf parasitism from the Triassic to the present, first appeared at the Vyaznikovian level, with yet not fully accounted for, but a priori important consequences for the host plant evolution.

The relationship between pollen deposition with vegetation and meteorological parameters in Igneada Longoze Forest (Turkey)

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The pollen monitoring stations in Turkey are established as a part of a doctorate thesis, which aims to find out the relationship between the meteorological parameters and pollen influx in Belgrade Forest in Istanbul and Igneada Longoze Forest in Kırklareli-Turkey. This research includes the monitoring of pollen deposition across vegetation transitions from closed forest to open situations between September 2008 and September 2009 in the Longoze Forest around Mert Lake. The pollen traps were collected once in a month and the pollen preparations were prepared in the laboratory. At least 200 pollen per preparation were counted and the results were shown at the pollen diagrams. The aim of this paper is to show the pollen influx (cm²/month) of the main taxa of Igneada Longoze Forest and the relationships with temperature and precipitation.

Igneada Longoze Forest has a natural richness such as *Fraxinus angustifolia*, *Fraxinus ornus*, *Alnus glutinosa*, *Carpinus betulus*,

Carpinus orientalis, *Quercus robur*, *Quercus frainetto*, *Quercus petraea*, *Quercus cerris*, *Ulmus laevis*, *Ulmus minor*, *Acer campestre*, *Acer trautvetteri* and *Juglans regia*. The results of pollen monitoring were obtained for 3 different sample areas, close to each other in the Longoze Forest around Mert Lake. The arboreal pollen influx in the forested area were collected from *Carpinus*, *Fraxinus* and *Hedera helix*. At the edge of the forested area they were *Fraxinus* and *Hedera helix*, and in the unforest area *Fraxinus* and *Alnus*. Also, an increase of the pollen influx of some herbal species was observed in the unforest area. In and around the studied area, because of the main tree species is *Fraxinus*, the highest amount of pollen fell down on the soil was belong to this species. Also, pollen influx of these taxa (cm²/month) was affected by monthly temperature and precipitation.