

# AEROBIOLOGY IN LITHUANIA

## Historical aspects

Botany professor Kazimieras Grybauskas work can be considered as the beginning of the anemophilous plants airborne pollen spread research in Lithuania. In the beginning of XIX century, he founded the medical plants collection where while studying other plants features also studied the different characteristics of pollen. In 1942 K. Grybauskas defended his dissertation "The phenology of pollen rain spectra". From 2003 the aerobiological monitoring is administrated by Siauliai University scientists' initiative. The activity is not supported by any special funds from the government.

The aims of Lithuania's aerobiologists are pollen and spores monitoring; phenology of plants, forecast of airborne pollen concentration, taking advantage of pollen data in various aspects. Since 2007 we give information about pollen spread to allergist and their patient's through national television, radio and newspapers. In the projects using geologists' data of airborne pollen is being used for the study of the reconstruction of vegetation's. With the initiative of our colleague from University of Latvia we started investigating the pollen rain. Botanists are interested in pollen data in their research of conservation of biodiversity. Interest of pollen monitoring' data is noticed from climatologists, who analyse climates change. In 2010 Laura Veriankaitė defended PhD thesis „Pollen concentration in the air: circulating and phenological aspects“.

The clinical experience of allergists' showed that in Lithuania allergy provokes *Alnus*, *Betula*, *Corylus Poaceae*, *Urticaceae* and *Ambrosia* pollen. There are over 5% of local people population with seasonal allergic rhinitis induced of airborne pollen. It was established that 38% of suffered of allergic rhinitis are in ill of bronchial asthma.

## Lithuanian climate and flora

Lithuania has a mid-way climate between maritime and continental. The weather is changeable, with mild, wet summers and cold winters. Winter temperatures are usually below freezing. Rainfall is spread throughout the year, but more rain tends to fall on the coast. Summer is the wettest season and cloudy skies are common.

In phytogeographical view Lithuanian territory is in critical location: it is stretched on joint of boreal coniferous and broad-leaved wood zones. Type of zonal vegetation – hybrid coniferous and broad-leaved woods, however at the time they cover only small areas. Succession of their associations is degrading, due to intense economical activities. Natural ecosystems are very afflicted, and most of artificial ones are poorly maintained, therefore they are dominated by ruderal plants associations.

In 2006 we started recording phenological phenomena in two ways: in wild forest territory and in Siauliai University Botanical garden, we incorporate especial plants. Two years ago we received sprouts from Humboldt-University of Berlin (Institute of Plant Sciences) and planted them in our garden. Clones which are from the same mother plant grow in Norway, (Bergen, Kvithama, Tromso) as well.

## Current situation

Lithuania's aerobiological network (Fig. 1) consists of three aerobiological stations. Observations started at Šiauliai University in 2003. The second station was set-up in Klaipėda in 2004, and the third one in Vilnius, the capital of Lithuania, in 2005. All these stations are currently in operation and provide the information to the European Aeroallergen Network, EAN (<http://www.polleninfo.org>). The coordinates of the easternmost station in Vilnius are 25°16'05E, 54°40'40N, and the measurement height is 18 m above the ground level. The aerobiological station in Klaipėda (21°07'32E and 55°45'20N) is situated at the coast of Baltic Sea, and its measurement height is approximately 20 m above the ground level. The measurement height of the northernmost station in Šiauliai (23°18'32E, 55°55'36N) is 18 m above the ground level. These monitoring stations are sufficiently closely located to allow for an analysis of the regional characteristics of the pollen seasons. The stations are able to reproduce the spatial distributions patterns of pollen over most of Lithuania. On the other hand, long-range transport episodes commonly affect more than one of these sites.

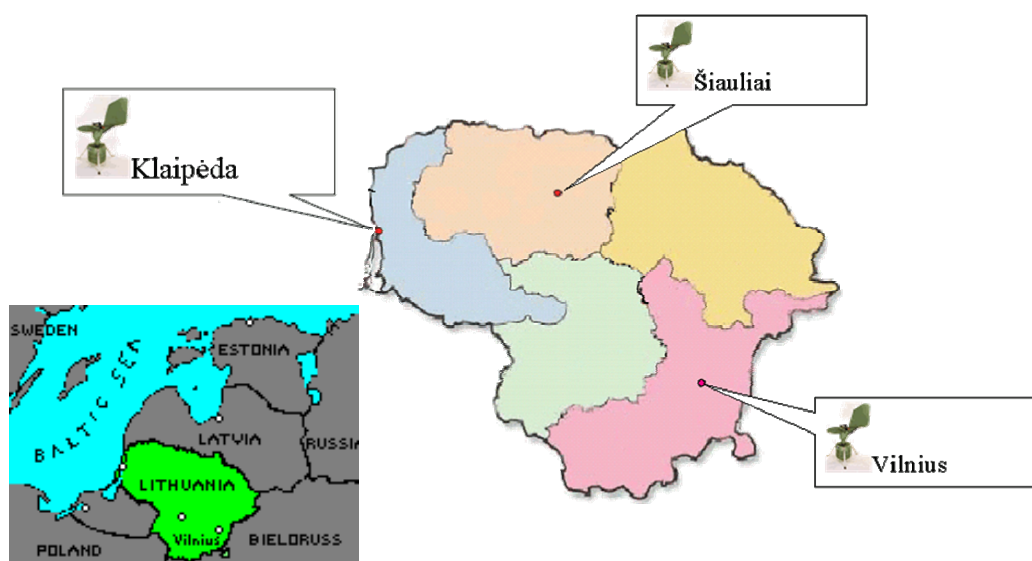


Fig. 1 Location of aerobiological stations in Lithuania

Aerobiological stations are equipped with the Hirst-type continuous volumetric pollen sampler (Burkard Ltd.), the 7-day recording version. The sampling surfaces, preparations of the slides, pollen counting and concentration calculations followed the standard methodology of Mandrioli et al. (1998) by scanning the samples area in 12 traverse strip under the microscope and referring to the results to 1 m<sup>3</sup> of sampled air averaged over 24 hours (pollen grains/ m<sup>3</sup>). The observations can identify pollens of 37 different pollen types of anemophilous plants. For data keeping we are using EANpool software. We send data to EAN data base and preparing every week forecast for EPI.

Address of our internet page is [www.pollen.lt](http://www.pollen.lt). At this stage we publish just pollen information, but in the nearest future we intend to add similar spores map. Browsers can find there map about pollen abundance in each monitoring station, specific information about aerobiological monitoring, can read about pollen allergenic characteristics and can find other information which supplements knowledge in Lithuanian earlier published in internet.

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