1381 | A 5-years aerobiological study (2013-2017) in Tbilisi, Georgia

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Background: Today, more than 300 million of the population is known to suffer from one or other allergic diseases affecting the socio-economic quality of life. Major causative agents implicated are pollen grains, fungal spores, dust mites, insect debris, animal epithelia, etc. Several aerobiological studies have been conducted in different parts of the world to ascertain air concentration and seasonality of pollen grains and fungi. The flowering time of higher plants are events that come periodically in each season, but the time of blooming may differ from year to year, in different geographic locations. Based on differences recorded in several years of observations in airborne pollen, pollen calendars are drawn as an aid to allergy diagnosis and management. The aim of this study was to create 5-years pollen calendar for the capital of Georgia.

Method: The airborne pollen monitoring was performed with a Burkard Seven Day Volumetric Spore-trap (Burkard Manufacturing Co Ltd, UK) during 5 years (2013-2017), following the recommendations of European Aerobiology Society. Pollens concentration was calculated and expressed as the number of pollen grains per cubic meter of air (p/m^3). Pollen index was defined as the total number of pollen grains during the pollination period. The main pollen season includes 95% of the seasonal total pollen count, starting on the day on which 2.5% of total pollen was recorded and ending on the day on which 97.5% of total pollen was registered.

Results: The pollen calendar includes 34 pollen types. Cupressaceae (43.6% of total annual amount), Platanus (10.3%), Morus (6.5%), Ulmus (5.9%), Artemiasia (4.3%) and Populus (3.9%) are the main pollen produced taxa. The annual Pollen Index is 36 895 grains, 82.6% of pollen is recorded during the February-May. The longest pollination period was observed for Asteraceae - season duration was 162 days and Poaceae—season duration was 132 days. The obtained results show that Corylus started the pollen season in Tbilisi at the middle of January. The latest flowering taxa was Cedrus, the exposure of pollen started the late of October.

Conclusion: This pollen calendar for Tbilisi is the first that has been created based on 5 years pollen count data. It represents a useful tool for clinical guidance intended for local allergy sufferers, either the local or foreign population and can be used to prevent and manage allergic respiratory diseases.

1382 | Detection of birch pollen allergen in household dust correlates with tree seasonality

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Background: Symptoms of pollen allergy are associated with the exposure of an affected individual to airborne pollen allergens, such as birch (*Betula verrucosa*) which is regarded as the most allergenic form of tree pollen in the majority of Europe. However, routes other than inhalation should also be considered and may be an important factor in sensitisation. Our primary objective was to determine whether Bet v 1 could be detected in settled house dust samples taken during the birch pollination season, and consequently, at what levels the allergen is present.

Method: All dust samples were obtained using DUSTREAM® collectors in homes across Western and Central European countries. From these samples, a final selection was made based on country of origin and the date collected to provide us with a cohort reflective of the flowering season which spans from late March to May. Bet v 1 allergen was measured quantitatively in household dust extracts using multiplex assay technology (MARIA) and a specific Bet v 1 ELISA 2.0 EP kit.

Results: Over 60% of house dust samples collected between April and May from Central European countries were found to contain Bet v 1 allergen at levels well above the Limit Of Detection of 0.0039 μg/g for ELISA 2.0 EP kit and 0.001 μg/g on MARIA. Samples were found to have much higher levels of Bet v 1 allergen from mid-to-late April, particularly those that were collected in Germany, Belgium and Hungary. Samples taken from outside of the pollination season were tested and found to be negative for Bet v 1.

Conclusion: In conclusion, we found that Bet v 1 allergen can be detected and quantified in house dust samples. These data suggest that household dust is a source of pollen allergen and could therefore be contributing to asthma and allergic rhinitis symptoms in individuals affected by pollen allergy. Household dust may also be considered as a source of Bet v 1 allergen which could contribute to allergic sensitization.

1383 | Cupressaceae pollen in the atmosphere of alentejo: Disruption of pollen grain during air transport

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Background: *Cupressaceae* family include several species that are widely used as ornamental plants pollinating in late winter—early

spring, depending on the temperature. Despite being considered moderately allergenic, it might be responsible for winter allergic outbreaks. As ornamental trees, they are found scattered throughout the territory but are more abundant in pockets of wild forest, outside Alentejo. Despite being more common in mountain, this pollen type is captured in considerable amounts in Alentejo, Portugal, where its aerobiological features and allergenic impacts are poorly characterized.

The aim of this work is to characterize the aerobiology of *Cupressaceae* pollen, to evaluate the effect the meteorological conditions and the source of this allergenic pollen type in the atmosphere of Evora, Alentejo.

Method: Pollen were collected using a Hirst type 7-day pollen trap and pollen was identified following standard methodology. Temperature (°C), relative humidity (RH; %), precipitation (mm) and wind speed and direction were obtained from ICT/CGE platform. Back trajectories (12-hour) of air masses arriving at Évora were calculated using the HYSPLIT model (Hybrid Single-Particle Lagrangian Integrated Trajectory). All trajectories have been computed at 12:00 and 15:00 UTC at different height levels.

Results: Elevated daily concentrations of *Cupressaceae* pollen were detected, reaching maximum value of ~1600 grain/m^3; One remarkable feature was that a significant amount of the pollen grains, ranging between 18% and 50% on different days, were disrupted, showing a distended intine and released cellular content. Higher levels of disrupted pollen coincided with RH >70%. Temperature, wind speed or direction did not correlate with elevated pollen grain disruption. Hourly counts, performed for days with the highest pollen loads, have shown that pollen peaked around 13 hours, suggesting local origin. Back trajectory analysis suggested that pollen was mostly from local origin, but did not exclude the contribution of long-range transport.

Conclusion: To our knowledge, this is the first report of a considerable fraction of disrupted *Cupressaceae* pollen grains reaching the sampler, releasing cell contents, which may significantly increase ambient free allergen and contribute to enhance allergenic activity of this pollen type. A better understanding of this phenomenon may contribute to improve allergy risk management.

1384 | Towards personalized pollen exposure measurements using hand held pollen samplers

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Background: Allergic rhinitis caused by pollen is one of the most common allergic diseases. The presence of pollen in the air is currently centrally monitored at roof top levels, and not in the direct living environment of sensitized subjects. In the current project we aimed to develop a handheld pollen sampler, called pollensniffer, that can collect pollen in the living environment of the allergic subjects. As a first step this device was validated against the standard Burkard pollen sampler and used to monitor local pollen concentrations at street level in the city of Leiden.

Method: Rooftop level pollen were monitored routinely by a Hirst type pollen sampler (Burkard, UK). The pollensniffer (6 × 14 cm) consists of a conical inlet and a ventilator powered by a commercial powerbank. The pollen were collected on a cellulose strip. For the validation of the pollensniffer, the device was mounted on top of the Burkard sampler. All pollen collected on the strip from the Burkard and the pollensniffer were counted microscopically. Street level pollen were monitored once every week (April-June) at three locations in the city of Leiden, during the morning, midday and evening. Statistical analyses were performed using the software package STATA 14.0 (StataCorp, TX).

Results: The correlation between the different pollen types collected by the pollensniffer and the Burkard sampler was high (correlation coefficient [CC] >0.8). During the validation experiments the pollensniffer appeared to collect on average 7 times more pollen than the Burkard sampler. Street level (pollensniffer) and roof top level pollen counts (Burkard sampler) showed a very good correlation (CC > 0.85). Local street level measurements in the city of Leiden showed that plane trees in one park produced pollen a week before the plane trees in another park. Grass pollen were observed at street level 4 weeks before the pollen were observed at roof top level.

Conclusion: Pollen numbers collected by the pollensniffer and the Burkard correlate well, but the pollensniffer collected on average 7 times more pollen than the Burkard sampler. Street level measurements showed differences in pollen loads between locations. Furthermore, street level grass pollen were detected 4 weeks before they were observed at rooftop level. These findings suggest that the pollensniffer is well suited for the measurement of pollen (and maybe other allergens) in the living environment of sensitized subjects.

1385 | Does the allergy risk due to pollen exposure information is useful for the allergy sufferers?

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Background: In France the information for the allergy sufferers is not made with pollen counts, which have not a real signification, but with the allergy risk due to pollen exposure.

Method: Since more than 20 years, RNSA (Réseau National de Surveillance Aérobiologique), the French aerobiology network, has