891 A Novel Modeling System for Estimating Pollen Emissions: Application to North East US

C. I. Efstathiou[1], S. S. Isukapalli[1], L. J. Bielory[2], P. G. Georgopoulos[1]; [1]UMDNJ-RW Johnson Medical School, Piscataway, NJ, [2]UMDNJ-New Jersey Medical School, Newark, NJ.

RATIONALE: Allergic airway diseases represent a complex health problem which can be exacerbated by the synergism of pollen and air pollutants. Understanding exposures to pollen requires accurate estimates of the spatial distribution of pollen emissions. Currently there are no established methods for estimating pollen emissions across the United States.

METHODS: A prototype algorithm for estimating emissions of pollen particles from major allergenic tree and plant families in the United States was developed, extending the approach for modeling biogenic gas emissions in the Biogenic Emission Inventory System (BEIS). A spatio-temporal vegetation map was constructed from different remote sensing sources and local surveys, and was coupled with a meteorological model to develop pollen emissions rates. The pollen emissions model was applied to study the pollen emissions for April, 2002 for North East US at 12 km resolution for comparison with ground level tree pollen data collected in Newark, NJ.

RESULTS: Allergenic species-specific emission rates exceeding 100 grains/m^2 -s were predicted within 12 km of Newark, NJ (with over 3000 grains/m^2 -s in some areas within 36 km of Newark, NJ). The peak pollen emission predictions within 12 km of Newark, were within a day of peak pollen counts measured, thus corroborating independent model verification.

CONCLUSIONS: Conclusion: The approach presented here allows independent prediction of pollen emissions, and provides an important component in assessing exposures of populations to pollen. This system overcomes limitations posed by the lack of temporally resolved dynamic vegetation mapping in traditional pollen emission estimation methods.

892 Prevalence of Sensitization to Soybean Hull in Patients with Asthma and/or Allergic Rhinitis in Argentina

L. R. F. Ardusso[1], J. Molinas[2], C. D. Crisci[1], E. J. Jares[3], S. Molinas[4]; [1]Rosario School of Medicine, Rosario, Argentina, [2]Universidad Centro Educativos Latinoamericanos (UCEL), Rosario, Argentina, [3]Hospital Posadas, Buenos Aires, Argentina, [4]Biochemical School of Rosario, Rosario, Argentina.

RATIONALE: The inhalation of soybean dust may induce respiratory symptoms in allergic patients.

METHODS: To establish the prevalence of skin sensitization to soybean hull (SH) allergens in patients from Argentina with asthma (BA) and/or allergic rhinitis (AR), 574 consecutives patients were included, 330 female (57.5%), ranging in age from 5 to 76 years old, from Capital Federal and surroundings (n = 239) and from Rosario city and the agro-exporter zone (port or rural cities up to 57 kilometres from Rosario) (n = 335). All of them had at least one positive skin test to an aeroallergen. Patients were classified taking into account the level of exposure to SH as follows: urban (UE), direct (DE) and indirect (IE). Skin prick test (SPT) with SH extracts and usual aeroallergens were performed. A wheal diameter greater than 3 mm was regarded as positive.

RESULTS: Among the patients included, 313 presented AR (54.5%), 55 BA (9.6%) and 206 both pathologies (35.9%). In Rosario and nearby cities, 34.3% (115/335) of the patients had a SPT(+) to SH and 3.3% (8/239) patients in Capital Federal. When sensitization to SH was studied taking into account the level of exposure, the percentage of SPT(+) to SH was 58.9%, 31.8%, 18.7% and 3.3% corresponding to patients with DE, IE, UE from Rosario and UE from Capital Federal respectively ($p < 0.000001$).

CONCLUSIONS: We find a high prevalence of sensitization to SH in patients suffering from asthma and/or rhinitis that live in the epicentre of soybean cultivation and exportation. This sensitivity showed a directly proportional relationship to the exposure level.

893 Method for Determining Airborne Allergen Concentrations Generated During Household Dusting and Its Application

R. L. Wimalasena, J. C. O'Brien, L. R. Deaton, S. M. Fernando, T. G. Huggins, K. R. Wehmeyer; The Procter & Gamble Company, Cincinnati, OH.

RATIONALE: As hand dusting of hard surfaces can disturb indoor allergens present on those surfaces, we developed a method to determine the airborne concentration of indoor allergens generated during dusting and demonstrate its application using a dry cloth alone and dry cloth plus Swiffer® Dust and Shine furniture spray.

METHODS: Air monitoring filters collected during dusting of a hard surface laden with allergen containing dust were extracted and analyzed using Fluorescent Multiplex Array for indoor allergens (MARIA™) for the presence of Der p1, Der f1, Fel d1 and Can f1. Results obtained from dusting with a dry cloth were compared with those obtained from dusting using a dry cloth plus Swiffer® Dust and Shine furniture spray.

RESULTS: Method validation results for the determination of allergen levels in air filter extracts demonstrated excellent recovery, precision, accuracy, specificity, selectivity and re-assay reproducibility. Further, the use of Swiffer® Dust & Shine furniture spray reduced significantly the amount of indoor allergens from dust mites, cats, and dogs made airborne during hand dusting vs. dusting with a dry cloth alone (n = 10 experiments per treatment) ($p = < 0.05$).

CONCLUSIONS: A method has been developed to measure the amount of airborne allergens generated during household dusting. Dusting with Swiffer® Dust & Shine reduces significantly the amount of aeroallergen generated during hard surface dusting vs. dusting with a dry cloth alone.

894 Airborne Fungal Fragments: Are We Overlooking an Important Source of Aeroallergens?

E. Levetin[1], C. Owens[1], H. Weaver[2], W. Davis[2]; [1]University of Tulsa, Tulsa, OK, [2]Ochsner Clinic Foundation, New Orleans, LA.

RATIONALE: Previous studies have shown the allergenic importance of fungal fragments; however, there is little information available on the day-to-day occurrence of these bioaerosols. This study examined the presence of fungal fragments in the atmosphere for two bioclimatically different locations, Tulsa, Oklahoma (TUL) and New Orleans, Louisiana (NO).

METHODS: The atmosphere in TUL and NO was monitored using Burkard spore traps from Aug 2007 through July 2008. Sampling and analysis were conducted using standard methods and results expressed as spores/m^3 or fragments/m^3. Meteorological data were obtained from NWS offices in TUL and NO.

RESULTS: Fungal fragments were present in the atmosphere on 99% of the days in both cities. Concentrations in TUL were higher with a mean concentration of 257 and peak of 2326 fragments/m^3. In NO the mean was 81 and peak 965 fragments/m^3. Highest concentrations occurred in the fall and lowest in late winter and early spring. The ratio of spores to fragments was 29:1 in TUL and 77:1 in NO. Fragments showed a significant correlation ($p < 0.05$) with total spores and many individual spore types. Highest correlations for fragments were with smut spores ($p < 0.0001$) and *Alternaria* ($p < 0.0001$). In TUL, fragments showed significant positive correlations with maximum, minimum, and average temperature, and significant negative correlations with rainfall and average wind speed. In NO significant positive correlation occurred with maximum temperature and negative with average wind speed.

CONCLUSIONS: Although only a fraction of total spore levels, fungal fragments are abundant bioaerosols and may be a significant risk factor for mold sensitive patients.