

APAWG-WAO Newsletter

January 2009

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APAWG:-Asia Pacific Aeroallergen Working Group

The World Allergy Organization (WAO) is an international organization of 77 regional and national allergy and clinical immunology societies. WAO's mission is to be a global resource and advocate in the field of allergy, advancing excellence in clinical care through education, research and training as a worldwide alliance of allergy and clinical immunology societies.

BACKGROUND AND HISTORY

Under the guidance of WAO, the Asia Pacific Aeroallergen Working Group (APAWG) was conceived in 2003 at the World Allergy Congress (WAC) in Vancouver. APAWG began activities at the Asia Pacific Congress in Tokyo, Japan in 2004, to promote aeroallergen and medical aerobiology research in the Asia Pacific region. The main objective of the group is to encourage and support the emerging societies in the Asia Pacific region to undertake research in aeroallergens, and to make clinical colleagues aware of the impact of indoor and outdoor allergens in the sensitization and development of allergic diseases such as asthma and allergic rhinitis. The group intends to assist various societies, particularly emerging societies, to carry out investigations into aeroallergens present within their regions.

The founding members of this first working group include Prof. Connie Katelaris (Australia), Prof. AB Singh (India), Dr. SM Hasnain (Saudi Arabia) and Dr. Ed Newbigin (Australia).

Since the commencement of this group, several workshops and symposia in the field of aeroallergens and aerobiological research have been organized during the World Allergy Congresses. The group has also published a manual titled "*Aeroallergen Monitoring Standard for the Asia Pacific Region*," intended for beginning allergists and researchers in the region.

This is a bi-annual publication of APAWG, under the umbrella of WAO. Issues will be released in January and July each year. Please send your contributions such as short articles, news items, etc. for publication in the newsletter addressed to the editor (Dr. SM Hasnain), editorial assistant (Samia Khan). Please forward the material at least two months before the deadline.

The first hands-on workshop on monitoring aeroallergens held in Tokyo, Japan in 2004 was greatly appreciated by attendees and benefited those in the region who were commencing monitoring. Subsequently, two different symposia on aeroallergens and medical aerobiology were held during WAC 2007 in Bangkok, Thailand.

The group currently comprises of a coordinator (Prof. AB Singh), executives (Dr. SM Hasnain, Dr. Abbas) and advisors (Prof. CH Katelaris, Dr. Ed Newbigan). The group welcomes new volunteers to join and assist the group further in its endeavors to advance the knowledge of aeroallergens in the Asia Pacific region.

NEWS

Aeroallergen Monitoring Standard for the Asia Pacific Region

The *Aeroallergen Monitoring Standard* handbook of the WAO APAWG, (Authors: Dr. SM Hasnain, Prof. CH Katelaris, Dr. Ed Newbigan, Prof. AB Singh) will be used as a standard in various parts of the world, as WAO works to assist aeroallergen monitoring activities. The handbook may be downloaded for free at:

http://www.worldallergy.org/esp/ptm_2007.pdf

Allergome e-newsletter

Allergome is a database for characterized allergens from different sources. Allergenic molecules and sources are included in the Allergome Database, and include animal and plant sources. For a specific description, visit the website: <http://www.allergome.org>.

WAO Pollen Trap in Pakistan

Under the WAO Emerging Societies Program (ESP), WAO provided one Burkard Volumetric Spore Trap to Dr. Shahid Abbas of Islamabad, Pakistan, to monitor air-borne pollen grains and fungal spores. With the assistance of Dr. Hasnain, Dr. Abbas was able to accumulate useful aerobiological data that formed the basis of a poster and presentation at WAC 2007 in Bangkok, Thailand.

Asthma and Allergy in Pakistan, Regional Variation and Impact of Allergens

A project titled "*Asthma and Allergy in Pakistan, Regional Variation and Impact of Allergens*," supported by the HEC (Higher Education Commission) in collaboration with Dr. SM Hasnain (KFSH&RC, Saudi Arabia), was conducted in Islamabad and Karachi. Four Burkard Volumetric Spore Traps purchased from Burkard manufacturing companies are currently in operation at different sites in Karachi and Islamabad. In addition, six personal viable and non-viable samplers are being used for indoor sampling. Some data were analyzed for presentation and publication under the direction of Prof. Mohammad Anwar Waqar. Manuscripts are also in press.

Aeroallergens and allergy in Saudi Arabia

The following projects on aeroallergens are being conducted in Saudi Arabia:

1. Clinical and efficacy trial of indigenous allergens for diagnostic and therapeutic program
2. Isolation, purification and immunochemical characterization of allergenic protein(s) from *Amaranthus viridis* pollen grains

3. An environmental, epidemiological, and clinical investigation of allergy and asthma in relation to outdoor and indoor aeroallergens in the western region of Saudi Arabia

Pollen study in Australia

Dr. Ed Newbiggin (Australia) has introduced Mr. Ian Fox as a new member to APAWG. Mr. Fox is the manager of Environmental Chemistry in the Health Protection Service of the ACT Government, and is setting up a new pollen count service for Canberra, Australia.

Aeroallergens study in India

Several studies are being carried out in India on various aeroallergens.

1. Allergy to periwinkle pollen (Catharanthus roseus G. Don.)

Catharanthus roseus G. Don (CR) or periwinkle plants are widely grown / cultivated as garden plants in the tropics and subtropics. In spite of its predominantly entomophilous nature, CR pollen had been reported to be airborne and allergenic. A study in Calcutta, India has concluded that CR pollen can trigger IgE mediated respiratory allergy in the people living in close proximity. (Ghosh D et al. *Ann Agric Environ Med.* **2007** 14(1):39-43.)

2. Prevalence of allergenic pollen grains in the aerosol of the city of Calcutta, India: a two year study

In a two year study in Calcutta, India, attempts were made to assess the frequencies of airborne pollen in the Calcutta metropolis and to identify the taxa which cause significant amounts of sensitization to respiratory allergic disorders, such as asthma and allergic rhinitis. An aeropalynological survey of the atmosphere of Calcutta was carried out from 2004 to 2006. This is the first study to design a pollen calendar for Calcutta city; it will provide useful data for enabling allergologists to achieve accurate diagnosis for patients with pollen hypersensitivity. (Jyotshna Mandal et al. *Aerobiologia.* **2008** 24(3) 151-164.)

Indian Journal of Aerobiology

The Indian Journal of Aerobiology, edited by Prof. AB Singh, can be an excellent platform for circulating updates on the work being done by researchers involved in monitoring allergens. Please contact Prof. Singh for further information.

EVENTS

1. Aerobiology Symposium in Bangkok, Thailand, 2007

The WAO's Emerging Societies Program (ESP), in collaboration with the West Pacific Allergy Organization (WPAO), offered an extensive one-day aeroallergen workshop and post-graduate course during WAC 2007 in Bangkok, Thailand on 6 December 2007.

Faculty included Michael A. Kaliner, WAO; Chein-Soo Hong, President, WPAO; A.B.Singh, India; Shahid Abbas, Pakistan; Jae-Won Oh, South Korea; Syed Hasnain, Saudi Arabia; Connie Katelaris, Australia; Takeshi Fukuda, Japan; Sang Il Lee, South Korea; Bob Lanier, United States; Hun-Jong Dhong, South Korea; Jessie de Bruyne, Malaysia; Hee-Bom Moon, South Korea; Jung Won Park, South Korea.



The above photos show a view of WAC 2007 in Thailand.



Members of APAWG-Prof. Connie Katelaris, Dr. SM Hasnain and Dr. AB Singh with the participants of Aerobiology Symposium during WAC 2007 meeting in Bangkok, Thailand.



An artifact of HDM, created by Prof. Vanna Mahakittikun (Mahidol University, Bangkok, Thailand) to show participants the movements of HDM in the bedding at the House Dust Mite workshop.

2. World Asthma Day in Riyadh, Saudi Arabia, May 2008

The World Asthma Day was celebrated by King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia. The event was organized in a public park where hundreds of school children along with their families gathered to attend various awareness programs on causes and prevention of allergic diseases. The event included lectures regarding allergens and various other activities providing the general public with useful and interesting information on allergens.



A member of the Allergy Laboratory at KFSH&RC demonstrates the sampling of various allergens.

FORTHCOMING REGIONAL EVENTS

1. MEAAAIC, Dubai, March 2009

The Middle East-Asia Allergy Asthma Immunology Congress (MEAAAIC)

New horizons in allergy, asthma and immunology

Dubai, UAE, March 26-29 2009

Website: www.meaaaic.com

Email: MEAAAIC2009@mci-group.com.

2. International House Dust Mite Course: From Culture to Products, 13-16 January 2009

The Siriraj Dust Mite Centre (SDMC), **Thailand**, will be conducting the above mentioned course to:

- (i) Provide training in theoretical and practical aspects of house dust mites
- (ii) Equip trainees with specialized skills for potential research with HDMs
- (iii) Communicate research on the effectiveness of procedures for controlling dust mites

FORTHCOMING INTERNATIONAL EVENTS

1. EAACI, Poland, June 2009

XXVIII Congress of the European Academy of Allergy and Clinical Immunology (EAACI)

Warsaw, **Poland**, 6-10 June 2009

Website: <http://www.eaaci2009.com>

E-mail: eaaci2009@congrex.com

2. AIA, Italy, May, 2009

XII National Congress 2009

Florence, **Italy**, 7-9 May, 2009

Email: aia_congresso2009@atenacongressi.it

3. International Workshop "Current Problems in Allergen Vaccine Development and Manufacturing" Allergenvaccines2009

Sirenis La Salina Hotel, Varadero, **Cuba**, 18-23 October 2009

Website: <http://www.sci.sld.cu/alergia2009/allergen.htm>

4. WAC 2009, Argentina, December, 2009

XXI World Allergy Congress (WAC) 2009

Buenos Aires, **Argentina**, 6-10 December 2009

Website: <http://www.worldallergy2009.com>

5. International Congress of Aerobiology, Argentina, August, 2010

IX International Congress of Aerobiology: "Expanding Aerobiology" Museo Argentino de Ciencias Naturales "Bernardino Rivadavia"

Buenos Aires–Argentina, 23–27, August 2010

Website: <http://www.aerobiologia.com.ar/index.php>

RECENT PUBLICATIONS

The following are some recent publications (during the last 3 years) from the Asia Pacific region on various aerobiological and aeroallergen topics.

Allergy to Fungal spores

Aerobiological, biochemical and immunological studies on some of the dominant *Aspergillus* species of South Assam (India)

Dhruba Sharma et al. *Aerobiologia*. **2007** 23(3):201-210.

Characteristics, determinants, and spatial variations of ambient fungal levels in the subtropical Taipei metropolis

Yi-Hua Wu et al. *Atmospheric Environment*. **2007** 41(12):2500-2509.

Status of airborne spores and pollen in a coir factory in Kerala, India

T. S. Nayar et al. *Aerobiologia*. **2007** 23(2):131-143.

Culturable airborne fungi in outdoor environments in Beijing, China
Zhiguo Fang et al. *Science of the Total Environment*. 2005 350(1-3):47-58.

Domestic exposure to fungi and total serum IgE levels in asthmatic children
Su HJ et al. *Mediators Inflamm*. 2005 (3):167-170.

Prevalence of airborne basidiospores in three coastal cities of Saudi Arabia
Hasnain SM et al. *Aerobiologia*. 2005 21:139-145.

Allergy to Pollen Grains

A Correlation between Symptom Severity and Unbalanced Reactive IgA Production in Japanese Cedar Pollinosis Patients
Nobukazu Komatsu et al. *Asian Pac J Allergy Immunol*. 2008 26:97-104.

Development of electron spin resonance radical immunoassay for measurement of airborne orchard grass (*Dactylis glomerata*) pollen antigens
Yuichi Takahashi et al. *Aerobiologia*. 2008 24(1):53-59.

Protease activity of allergenic pollen of cedar, cypress, juniper, birch and ragweed
Gunawan H et al. *Allergol Int*. 2008 57(1):83-91.

Prevalence of allergenic pollen grains in the aerosol of the city of Calcutta, India: a two year study
Jyotshna Mandal et al. *Aerobiologia*. 2008 24(3) 151-164.

Soluble and nonsoluble protein assay for antigenic extracts from pollen and seeds of mustard (*Brassica* spp.)
Shahi Shipra et al. *Allergy and Asthma Proceedings*. 2008 29(1):78-87(10).

Allergenic pollen plants and their influential factors in urban areas
Xin Jianan et al. *Acta Ecologica Sinica*. 2007 27(9):3820–3827.

Allergy to periwinkle pollen (*Catharanthus roseus* G. Don.)
Ghosh D et al. *Ann Agric Environ Med*. 2007 14(1):39-43.

Characterization of Genes for A Pollen Allergen, Cry J 2, Of *Cryptomeria Japonica*
Futamura et al. *International Archives of Allergy and Immunology*. 2007 143(1):59–68.

Predominant Airborne Pollen in a District of Beirut, Lebanon for the Period Extending From March 2004 to August 2004
Elias A. Rahal et al. *Lebanese Science Journal*. 2007 8(1):29-37.

Prevalence of Allergenic *Amaranthus viridis* Pollen in seven Different Regions of Saudi Arabia
Hasnain SM & Al-Frayh AR. *Annals of Saudi Medicine*. 2007 27(4):259-263.

Onset of Nasal Symptoms Induced by the Pollen of *Cryptomeria fortunei* in a Japanese Patient with Cedar Pollinosis: A Clinical Pilot Study

L Cheng et al. *Journal of Allergy and Clinical Immunology*. 2006 117(2):S1:S298.

Profile of Pollen Allergies in Patients with Asthma, Allergic Rhinitis and Urticaria in Hyderabad

B Anuradha et al. *Indian J Chest Dis Allied Sci*. 2006 48:221-222.

Clinico-immunologic evaluation of allergy to Himalayan tree pollen in atopic subjects in India--a new record.

Bist A et al. *Asian Pac J Allergy Immunol*. 2005 23(2-3):69-78.

Evaluation of Cross-Reactivity between *Holoptelea integrifolia* and *Parietaria judaica*

S Sharma et al. *Int Arch Allergy Immunol*. 2005 136:103-112.

Identification of human T cell epitopes in Japanese cypress pollen allergen, Cha o 1, elucidates the intrinsic mechanism of cross-allergenicity between Cha o 1 and Cry j 1, the major allergen of Japanese cedar pollen, at the T cell level

Sone T et al. *Clinical & Experimental Allergy*. 2005 35(5):664-671(8).

One-Year Pollen and Spores Calendars of Saudi Arabia: Al-Khobar, Abha and Hofuf.

Hasnain SM et al. *Aerobiologia* 2005 21:241-247.

Allergy to House Dust Mite

Anaphylaxis Following the Ingestion of Flour Contaminated by House Dust Mites - A Report of Two Cases from Singapore

Tay Sok Yan et al. *Asian Pac J Allergy Immunol*. 2008 26:165-170.

House Dust Mite Allergens in Domestic Homes in Cheonan, Korea

Hae-Seon Nam et al. *Korean J Parasitol*. 2008 46(3):187-189.

Bioinformatic Studies on the Group 2 Allergens of *Dermatophagoides Farinae* from China

Yubao Cui et al. *Asian Pac J Allergy Immunol*. 2007 25:199-206.

Allergy to Animal/domestic pets

A Murine Model of Allergy Caused by American Cockroach (CR), *Periplaneta Americana*

Nitat Sookrung et al. *Asian Pac J Allergy Immunol*. 2008 26:143-149.

Native Troponin-T of the American cock-roach (CR), *Periplaneta americana*, Binds to IgE in Sera of CR Allergic Thais

Onruedee Khantisitthiporn et al. *Asian Pac J Allergy Immunol.* **2007** 25:189-197.

Pet ownership and associated respiratory diseases

Ibrahim A Janahi et al. *Aerobiologia.* **2006** 22(4):305-311.

Miscellaneous

Anaphylactic shock caused by silkworm pupa consumption in China.

Ji KM et al. *Allergy.* **2008** 63(10):1407-1408.

Hydrophobic Allergens from the Bottom Fraction Membrane of Hevea brasiliensis

Kesajee Mengumpun et al. *Asian Pac J Allergy Immunol.* **2008** 26:129-136.

Adult-Onset Atopic Dermatitis: A Cross-Sectional Study of Natural History and Clinical Manifestation

Kanokvalai Kulthanan et al. *Asian Pac J Allergy Immunol.* **2007** 25:207-214.

Prevalence of Asthma, Rhinitis, and Eczema in the University Population of Phitsanulok, Thailand

Suwannee Uthaisangsook. *Asian Pac J Allergy Immunol.* **2007** 25:127-13.

Prevalence and Severity of Symptoms of Asthma, Allergic Rhinitis, and Eczema in 10- to 15-Year-Old Schoolchildren in Central Taiwan

Li-Chi Chiang et al. *Asian Pac J Allergy Immunol.* **2007** 25:1-5.

Sensitization to Allergens among Patients with Allergic Rhinitis in Warm Dry Climates

Abbas H AlSaeed. *Bahrain Medical Bulletin.* **2007** 29: No.1

Validation of the Diagnostic Criteria for Atopic Dermatitis in the Adult Thai Population

Rungsima Wanitphakdeedecha et al. *Asian Pac J Allergy Immunol.* **2007** 25:133-138.

Buckwheat anaphylaxis: an unusual allergen in Taiwan

Wang TC et al. *Asian Pac J Allergy Immunol.* **2006** 24(2-3):167-170.

Nocturnal Symptoms and Sleep Disturbances in Clinically Stable Asthmatic Children

Inder Mohan Chugh et al. *Asian Pac J Allergy Immunol.* **2006** 24:135-142.

Prevalence of Asthma and Comorbid Allergy Symptoms in Singaporean Preschoolers

Teng Nging Tan et al. *Asian Pac J Allergy Immunol.* **2006** 24:175-182.

Prevalence of bronchial asthma and allergic rhinitis among urban and rural adult population of Delhi

S N Gaur et al. *Indian J Allergy Asthma Immunol* **2006** 20(2):90–97.

Evaluation of risk factors for asthma in Taipei City.

Chiang CH et al. *J Chin Med Assoc.* **2005** 68(5):199-201.

Prevalence of asthma, allergic rhinoconjunctivitis and allergic sensitization in Mongolia

Viinanen A et al. *Allergy.* **2005** 60(11):1370-1377.

REVIEW FEATURE

INDOOR ALLERGENS

By

Syed M Hasnain, PhD, FACAAI, FAAAAI

Exposure to indoor allergens by susceptible individuals may lead to sensitization (development of specific IgE antibodies) and/or elicitation of allergic symptoms in already sensitized subjects. Allergic symptoms caused by allergens of indoor origin include bronchial asthma, allergic rhinitis, atopic dermatitis, Rhino-conjunctivitis, as well as allergic broncho-pulmonary aspergillosis“*Aeroallergen Monitoring Standard for the Asia Pacific Region,*”, and hypersensitivity pneumonitis (extrinsic allergic alveolitis).

Indoor allergens comprise a very potent group of allergens, and are considered to be responsible for most cases of perennial symptoms of allergic rhinitis and bronchial asthma. Indoor allergens mainly originate from indoor sources, but outdoor (including backyard/garden) sources such as plants and grasses can also contribute to the allergen concentration of indoor environment. As such, indoor allergens and bio-pollutants come from a number of sources both within the house and from outside. Indoor allergens, which are known to be most prevalent in many parts of the world, belong to both animal and plant kingdom.

The two house dust mites (HDMs), *Dermatophagoides pteronyssinus* (*Der p*) and *D. farinae*, (*Der f*), are very potent and well known allergens. Other HDMs present in house dust and known to be allergenic are *Euroglyphus maynei* (*Eur m*), *Blomia tropicalis* (*Blo t*) and *Lepidoglyphus destructor* (*Lep d*). HDMs are humidity dependent and only thrive in high humidity (c.70%). Animal (mammal) allergens mainly include cat or *Felis domesticus* (*Fel d*), dog or



Two species of highly allergenic House Dust Mites

Canis familiaris (can f), *Mouse or Mus musculus* (Mus m) and rat or *Rattus norvegicus* (Rat n).

The two well known cockroaches, *Blattella germanica* (*Bla g*) and *Periplaneta Americana* (*Per a*), have been found to be highly allergenic. *Blatta orientalis* (*Bla o*) has emerged to be allergenic in some countries; particularly in Singapore, Mexico and Saudi Arabia. *Periplaneta australisiae* and *Supella supelledium* are also known to be present in homes; however, detailed reports on allergenicity are not available.

Major allergenic components are known to be proteins and glycoproteins of molecular weight 10-50 KD, which are mostly contained in fecal particles (HDMs and cockroach), saliva (cat, rat) urine (rat and mouse) and spores (fungi). Household items such as carpet, mattress, pillow, furniture stuffing, bedding, fur, clothing, leather items, etc. are known to contain most of these allergens, while the airborne concentration of the allergen particles can reach their peak with indoor human activities such as dusting, bed making and vacuuming.

Indoor allergens also include allergens of plant origin. This includes various fungi originating from different indoor sources, such as stored fruits and vegetables (e.g. onion, garlic, ginger). Stored and discarded items such as jam, jelly, cheese, and bread can also be potent sources for fungal growth. Fungi found indoors are usually from the Mould Group, commonly termed “molds and mildews”. Airborne pollen grains from nearby outdoor sources can enter indoor environment. For example, Basidiospores from mushroom fungi growing in the backyard of wet and humid region and ascospores such as *Leptosphaeria* spp (perfect state of some *phoma* spp) can enter indoor environment with the air currents through open doors and windows. Allergenicity to basidiospores has been established, and allergenic extracts of basidiospores are now commercially available (Lehrer, 1990).

In Saudi Arabia, efforts are being made to establish the prevalence and possible contribution of allergens of indoor origin in the etiology of allergic diseases, particularly bronchial asthma. Studies in various regions of Saudi Arabia have confirmed the presence of indoor allergens with considerable quantitative diversity. The geographic centers included in the study are Riyadh (Central region), Al-Khobar and Hofuf (Eastern region), Gassim and Jeddah (Western region), and Abha (Southern region). Indoor allergens identified from the above regions were *Der p Der f*, *Fel d* and *Per a*, as well as various fungi. Significant diversity was recorded in the composition of *Der p*, being prevalent in Southern region and *Der f*, prevalent in Western region. Riyadh (Central region) with low humidity did not show any considerable amount of any HDMs in dust samples. Contrary to that, *Per a* was more prevalent in Riyadh.

The clinical threshold or risk levels of some indoor allergens, particularly of *Dermatophagoides*, have been proposed to be 2 µg/g dust (c.100 mites) of *Der p* or *Der f* Group 1 as sensitization level and 10 µg/g dust (c. 500 mites) for causing severe attack of bronchial asthma (**Platts-Mills, 2000**). Not only were these levels detected in Saudi homes, but the risk levels were also exceeded in parts of the Kingdom.

[Allergen nomenclature in parentheses have been adopted by the World Health Organization (WHO) and International Union of Immunology Societies (IUIS) for characterized antigen of respective organism]

References

- Platts-Mills T A E, Blumenthal K, Perzanowski M, Woodfolk J A. “Determinants of Clinical Allergic Disease: The Relevance of Indoor Allergens to the Increase in Asthma” *Am. J. Respir. Crit. Care Med.* (2000) 162(3) S128-S133.
- Lehrer S B, Horner W E. “Allergic reactions to basidiospores: identification of allergens” *Aerobiologia.* (1990) 6(2) 181-186.