

ASIA PACIFIC ENVIRONMENTAL & OCCUPATIONAL DERMATOLOGY (APEOD) 1989 – 2018 RESEARCH DATABASE



*This database is compiled for and presented at the
15th APEODS 2019 in Malaysia in acknowledgment of the
APEOD group 30th anniversary.*

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DEDICATION

To all dedicated dermatologist in the Asia Pacific region and the team at ICDRG, who shared their experiences and knowledge with us, thank you very much.

For the aspiring dermatologists with special interest in Environmental and Occupational Dermatology, may you overcome the future challenges and achieve to greater heights.

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INTRODUCTION

This book highlights the various contact reactions and occupational dermatoses that had occurred in 10 Asia Pacific countries. The highlights is based on evidence from the research observation on environmental and occupational dermatology published in international and local journals, unpublished papers presented at national or international conferences, dissertation papers in contact and occupational dermatology kept in universities for the past 30 years.

Dermatologists from these countries have contributed researches conducted in their own respective countries or researches done in collaboration with other countries for compilation: Australia, Indonesia, Malaysia, Philippines, Singapore, Taiwan and Thailand. Research topics from India, Japan and New Zealand were retrieved from the internet and from the book by See Ket Ng, Chee Leok Goh: *The Principles and Practice of Contact and Occupational Dermatology in the Asia Pacific Region*. World Scientific 2001.

This research list is then sorted according to subject matter. We have included synopsis of certain interesting topics for readers on-the-go. The synopsis is based on data extracted from full text or abstracts of original research in posters or oral presentations in conferences and not confined to published articles.

Publications made in research journals that are not available online may have been missed, and some issues pertaining to contact dermatitis might not be addressed in full. Added to this, the number of publications far outnumber those tabled research articles on specific contact sensitizers/source of allergen.

This book should raise the reader's awareness of contact and occupational dermatoses that occurred in this region as well as highlight major concerns for the past 30 years, as compared to before 1989. Since we live in the same geosphere, with similar flora and fauna, there is a possibility of parallel conditions that can occur in another country, having the same effect in ours. We can learn from the neighbouring countries, how they identify, investigate, manage and solve these conditions.

For the benefit of all who dwell in the Asia Pacific region, we hope other Asian countries will contribute their research topics to this database as reference for future dermatologists, not only in Asia but also the world.

Rohana Ridzwan



SECTION 1

CONTACT & OCCUPATIONAL DERMATOSES IN ASIA PACIFIC REGION FOR THE PAST 30 YEARS

History

Research at a Glance

BEFORE 1989

1989 - 1998

1999 - 2008

2009 - 2018

HISTORY OF CONTACT & OCCUPATIONAL DERMATOSES IN ASIA PACIFIC REGION FOR THE PAST 30 YEARS

Agricultural Era

In the pre-industrial era (before 1989), work mostly involved exposure to the local flora and fauna sensitizers. In India, there have been several documentation on local plant allergens causing phytodermatitis, photocontact dermatitis and the airborne contact dermatitis (ABCD). Between 1989 and 1998, Parthenium, Xanthium, Helianthus and Chrysanthemum were allergens causing ABCD and they cross react to each other. Between 2009 and 2018, the Indian team created their own plant series that give a higher yield of patch test (PT) positivity to plant sensitizers. Parthenium was also reported in Japan. Since we share the same flora and fauna, we may want to use the Indian plant series to confirm contact allergy to plants in this region.

In Southeast Asia, we may add Rengas sensitizer to the Indian plant series since occupational dermatitis has been documented in Singapore, Malaysia and Philippines, among wood factory workers. Each Asian country may have their own plant causing phytodermatitis. *Gravellia* sp. is common in both Australia and New Zealand. In Australia, tea tree oil 10% is added to their baseline PT series to pick up contact sensitivity to tea tree oil skin care products. Contact dermatitis to several types of grass have been documented in 1980's till millennium in Singapore.

Besides plants causing occupational dermatoses, animals too have contributed to outbreak of dermatitis. Between 1989 and 2008, during Thai agricultural era, cercaria was identified as the cause of the *rice farmers' itch*. It was postulated that the flood brought snails infested with *Schistosoma spindale* cercaria to the fields. During the period from 2009 to 2018, the Indian rice farmers' feet dermatitis was attributed to contact to animal manure.

In the Pacific region, the Australian farmers were faced with the agriculture pest, the Rutherglen bug that also bites. In a non-agricultural setting, there was an outbreak in Singapore of dermatitis caused by tussock moths in the 1990s; an outbreak of rove beetle (*Paederus* insect) dermatitis was noted in 2009 in Malaysia, followed by similar *Paederus* outbreak amongst Thais military personnel in 2014.

Improper handling of pesticides in plantations had caused occupational dermatitis in Japan and Malaysia in the 1980s followed by Taiwan and New Zealand in the 1990s and Indonesia in 2013. Taiwan reported skin cancer among paraquat workers in 1995. In the past 10 years, non-melanoma skin cancer was linked to pesticide exposure in India whereas in the Philippines, skin cancer was linked to exposure to arsenic in the farmland. Similarly, Indonesian had reported arsenicosis associated with skin cancer.

Rubber plantation was introduced by British colonists in Malaysia. The British assisted in planting rubber trees extensively in 1937 on a commercial basis. Behl PN, dermatologist from India documented contact dermatitis to rubber footwear in 1963. Occupational glove dermatitis among construction workers in the prefabrication factory and motorbike rubber handles was only observed in Singapore in the mid 1980s.

In the early 1990s, with the AIDS scare, glove dermatitis is noted among health care workers (HCWs) in Singapore and Malaysia. Thailand and Taiwan reported it in the millennium (1999-2008). Currently there are glove dermatitis still observed in builders in India and HCW from Australia, Indonesia, Japan and Thailand. Marius Rademaker, a New Zealand dermatologist concluded in his study that Carba mix is a useful indicator of rubber sensitivity and can pick up patients with contact dermatitis to rubber compounds. During that time, in Malaysia we noted some patients have positive patch tests to 3 sensitizers from Trolab rubber series in the 1990s.

Currently the 3 of the top 5 rubber sensitizers are from Chemotechnique rubber series. One would have missed 9 out of 10 children if patch test is

done with only European standard series and if patch test were done with only shoe series, all 10 children would not have been identified.

Type 1 hypersensitivity reaction to latex in gloves was observed in Thailand among HCWs in the late 1990's. It was in the early millennium when Japan observed this reaction to barium rubber catheter. Hairdressers and HCWs were reported with Type 1 latex sensitization to gloves in Australia, Japan, Thailand and Malaysia. In the present decade, dental students from Thailand, Philippines hospital housekeepers and Australian HCWs had been sensitized to latex gloves.

For the past 30 years, the food responsible for immediate reaction were chestnut, worm in fish sushi, chitosan and garlic in Japan, corn and parmesan cheese (Australia), prawn/lobster (New Zealand, Singapore) and nuts (New Zealand). Food that caused contact dermatitis in the past 30 years are cinnamon (Singapore, Australia), mango peel (Taiwan), turmeric (Singapore, Malaysia, India, Philippines), garlic (India) and Spearmint (Australia). Contact dermatitis in food handlers is increasing gradually in the last 30 years. Most of them are at risk of Occupational Irritant Contact dermatitis (OICD) because of wet work. These are the few occupations at risk with the causative sensitizers: Meat sorter with Type I reaction to lamb liver, ox liver & mixture of lamb & beef blood; Baker developing CD to cinnamon and sodium metabisulfite; pastry chef with CD to lime in and white bean paste worker sensitized to parvalbumin & phaseolin.

Industrialization Era

Singapore and Taiwan underwent transformation to become industrialised countries much earlier compared to the rest of South East Asia and were faced with all the challenges in environmental and occupational dermatoses in 1980s. Chrome allergy was initially from contact to cement for builders and then it affected workers in the electronic industries, currently it involved the public who were sensitized to chrome in dental alloys and hand phones. Singapore, Thailand and Taiwan reported contact dermatitis to industrial chemicals

when exposed to dielectric fluids and soldering flux. Epoxy resin allergy is still of concern in people living in Australia and New Zealand.

Contact dermatitis also occurred in cottage industries in Asian countries. Cottage industries reflect the country's culture and craftsmanship. In India, it affected the workers in cashew nut, beedi, agarbatti, carpet weaving, copper ware and wood carving factories. In Indonesia, it was the batik, leather shoe industrial and shipyard workers. In Japan and Thailand, the lacquer and pottery ceramic workers were affected. The Rengas wood factory affected Singapore and Indonesian workers whilst plywood factory affected the Kiwis.

Culture

The well-documented effect of culture on contact dermatitis and contact dyspigmentation is the use of kumkum, bindi, alta and participating in Holi festival celebration. Some ladies have been noted to have contact dermatitis to the turmeric coating the string that holds the gold pendant. In Malaysia, initially ladies wearing scarf with the brooch under the chin had contact dermatitis to the nickel content in the brooch. This is easily preventable with the ready to wear scarf that is sewn under the chin.

Contact dermatitis to tattoo have been observed and documented in Australia and Thailand. The current trend in the use of non-permanent skin painting has also resulted in contact dermatitis as seen in India, Australia and Thailand.

Lifestyle Influence

As the country's economy improved, lifestyle change too because the affluent public now can afford to acquire products which used to be less prioritised. Contact dermatitis to cosmetics, sunscreen, skin, hair and dental care products, nail cosmetics, fragrances, clothing and footwear are apparently on the rise. Topical medication and antiseptics are readily made available to the public. Immediate type hypersensitivity reaction to the commonly used Chlorhexidine was noted in Singapore in the 1990's and now being recognised and detected in Australia and Malaysia in this current decade.

Occupation

Occupation at risk of contact dermatitis seen in the 1980s and throughout from 1989 to 2018 were the construction workers (builders) and farmers. India, Indonesia and Malaysia are still monitoring their contact dermatitis among pesticide handler in this decade (2009-2018). Hairdressers were of concern in Taiwan initially, now they are at high risk in Australia, Indonesia and Thailand. HCWs were monitored for glove allergy by at least 5 countries for the past 2 decades (1998-2018).

Australia is at the forefront in occupational dermatoses management. They have incorporated assessment tool occupational contact dermatitis disease severity index (OCDDSI) that correlates with patient's quality of life (QOL). Australasian dermatologists have embarked in educating the workers at risk, career counsellors as well as public education via public journal and forum regarding occupational dermatoses. They instituted wet work control measures in the country.

Children

Lastly, contact dermatitis is not confined to adults. Our children are at risk too. In Australia, India, Malaysia, New Zealand, Singapore and Thailand, children were noted to have positive patch test positive to fragrance, medicament, metal, preservatives, plant and rubber chemical sensitizers.

Thus there is a need to learn to recognise, investigate, monitor and control the concentration of sensitizers present in the environment for a safer place to live and work in our country.

Research At A Glance

Phytocontact dermatitis & Phytophoto CD

1980s	1989-1998	1999-2008	2009-2018
ABCD to plants India	ABCD to plants India	ABCD (Jap cedar) Japan	ABCD signs India
Grass (Wedelia trilobata) Singapore	Grass OD Singapore	Grass Singapore	Indian plant series India
Phyto dermatoses India	Phyto dermatoses Hibiscus Japan	Phyto dermatoses Asteraceae Thailand	Phyto dermatoses - Eucalyptus sp & Tanacetum parthenium Japan
Phytophoto dermatitis India	Jasmine Thailand	Kacip Fatimah Malaysia	Phyto photo dermatitis Thailand
Rengas wood Singapore	Rengas Philippines	Wooden rosary Thailand	Rengas Malaysia
Tobacco leaves Japan	Sawdusts, Elm tree leaf, Grevillea Australia	Asparagus officinalis, Hydrangea & Phytophoto dermatitis NZ	Grevillea sp. Australia, New Zealand
	Kiwi fruit vine, Lichen acids New Zealand	Tea Tree Oil Australia	

1980s	1989-1998	1999-2008	2009-2018
Agricultural Era OD in Farmers			
	Rice farmers' itch (cercarial) Thailand		Rice field worker Legs & feet dermatitis (animal manure) Forearm urticaria India
Pest bite & reaction to animal farm			
			Rutherglen bug bite Australia Mice allergen cause severe exacerbation AD in animal farm technician. (Occupational autoeczematisation of atopic dermatitis) Australia

1980s	1989-1998	1999-2008	2009-2018
Pesticides used in plantation causing dermatitis			
Captafol Japan Pesticides dermatitis Malaysia	Herbicides induce Erythroderma Malaysia Fruit farm pesticides (Captafol, Folpet & Captan) Taiwan Pesticides New Zealand		Orchid farm pesticides (Methamidophos) Indonesia Pesticide mix (herbicide & fungicide) Malaysia
Occupational Cancer			
	Skin cancer (Paraquat) Taiwan		Skin cancer NMSC (pesticides) India SCC in corn farmer Philippines Skin cancers (arsenicosis) Indonesia

1980s	1989-1998	1999-2008	2009-2018
Contact dermatitis to Rubber products			
Factory gloves & motorbike handle Singapore	Carba mix as indicator of rubber allergy New Zealand Condoms New Zealand Gloves Singapore Rubber products Malaysia Shoes India	Glove & shoes Thailand Neoprene knee brace Australia Rubber products Taiwan Shoes India	Atopic Periorbital dermatitis India Rubber PT series Malaysia Gloves dermatitis Dental Australia Builders India HCW Indonesia, Japan, Thailand Shoe dermatitis Indonesia

1980s	1989-1998	1999-2008	2009-2018
Latex immediate reaction			
	Double Use test for latex gloves allergy Thailand	Latex sensitization Hairdressers Australia HCW – Japan, Malaysia, Thailand Dental Thailand NRL sensitizers Hev b 1, 3, 5, 6.02 >1 µg Singapore Barium catheter Japan Gloves allergy awareness (HCW) Japan	Latex sensitization Dental students Thailand Housekeeper Philippines HCW (disposable gloves) Australia

1980s	1989-1998	1999-2008	2009-2018
Type 1 Reaction to Food			
	Food allergies (squid allergen Todp1) Japan CU to seafood Thailand	Anaphylaxis Chestnut, worm in sushi, Chitosan Japan Corn Parmesan cheese Australia Seafood & nuts New Zealand	Immediate reaction (garlic) Japan CU prawn/ lobster Singapore Seafood & nuts New Zealand
Contact dermatitis to Food			
Cinnamon Singapore Mango peels Taiwan Turmeric Singapore	Cinnamon Australia	Food Singapore Food/spices Systemic CD India	Benzoate (children) India Garlic India Spearmint oil Australia Turmeric India Philippines Malaysia

1980s	1989-1998	1999-2008	2009-2018
Food handler (OD)			
	Cinnamon (Baker) Australia Seafood (CU) Thailand Wet work (OICD) Australia	CME for food handlers Australia Type I reaction to Lamb organ & blood. (Meat sorter) Australia Sodium metabisulfite Australia	Lime (Pastry Chef) Australia Noodle worker (OICD) Thailand White bean paste worker Japan Prawn (CU) Singapore
Industrial Era			
Explosives CD Singapore			
Cement CD Singapore, Taiwan ABCD (Chromate) Singapore Prevention of cement CD Singapore	Electronic workers & Builders Singapore, Taiwan Prognosis chromate CD Australia	Electronic workers Singapore, Thailand Leather steering wheel Australia	ABCD India Builders & Mason India Cement Australia Dental alloy Japan Mobile phone Australia Housekeeper Philippines

1980s	1989-1998	1999-2008	2009-2018
Industrial chemicals			
Organic solvent in degreasing induced EM (Trichloro-ethylene), Polyvinyl Chloride, Soldering flux (colophony ABCD) Singapore	Dielectric fluids Singapore Ethyl ethoxy-methylene cyanoacetate Taiwan	Dielectric fluids Singapore Soldering flux Thailand	
Epoxy Resin dermatitis			
	OD & immediate hypersensitivity reaction Australia	Prognosis - Australia OD - construction workers, painters, engineer, windscreen repairers New Zealand	

1980s	1989-1998	1999-2008	2009-2018
OD among SMI/ cottage industries workers			
Cashew nut India	Furniture (Rengas) Thailand	Phenol-formaldehyde resin in plywood New Zealand	Cashew nut India
	Lacquer (uroshiol) Japan		Wood craftsman India
			Copper ware India
			Pottery & ceramic Thailand
Colour developer, Furniture, Herbal tea (Mesonia Chinensis) Singapore	Colour developer (Hydroxylamine Sulphate) Singapore	Beedi rollers, Kitchen India	Beedi rollers, Carpet, India
	Batik Indonesia		Cooling tower Australia
			Batik Indonesia
			Leather shoe Indonesia
			Shipyards Indonesia
			Agarbatti India

1980s	1989-1998	1999-2008	2009-2018
Lifestyle Cultural influence			
Pigmented CD (Sudan 1 Kumkum)	A Bindi adhesive (Colophony) Singapore Holi festival chemical injury due to colours India	Kumkum CD India Kumkum pigmented CD India	
Cosmetics induce pigment change			
Pigmented CD (cosmetics, fragrance) Japan	Alta Leucoderma (Azo dye) India	Kumkum Pigmented CD India	Leucoderma Rhododendrol Japan Pigmented CD (fragrance & cosmetics) Thailand

1980s	1989-1998	1999-2008	2009-2018
Cosmetics Top Allergens			
	Balsam of Peru India, Malaysia Bronopol, ethylene- diamine, lanolin Indonesia Fragrance mix, Isothiazolin, Quaternium, Wool alcohol Malaysia Lipstick, Liquid paraffin, Sidhoor India Parabens PPD India, Indonesia, Malaysia	Gallate mix, PPD , Thimerasol India Fragrance, Mercury (Ammoniated) Preservatives Thailand	Chloro- acetamide, Diazolidinyl urea, DMDM hydantoin, Imidazolidinyl urea. Australia Euxyl K400, Formaldehyde, Kathon CG, Quaternium-15 Australia, Malaysia Gallate India, Malaysia Fragrance Preservatives Metals PPD Malaysia Thimerasol India, Malaysia

1980s	1989-1998	1999-2008	2009-2018
Sunscreen & skin lightener CD			
Skin lightening cream (Ammoniated Mercury) Taiwan	Sunscreen (CD & PACD) Australia, New Zealand Singapore	Bleaching cream Sodium metabisulfite Taiwan Sunscreen Tri-ethanolamine Taiwan Whitening cream (Kojic acid) Thailand	Skin lightener 5,5'-dipropylbiphenyl-2,2'-diol Japan Whitening cream (Kojic acid) Thailand
Make-up dermatitis			
	Nickel in eye shadow dermatitis PPD & Nickel in face, scalp & neck dermatitis Singapore	Ricinoleic acid & lip preparation in cheilitis Singapore Propylene glycol ricinoleate in lipstick dermatitis Japan	Carmines in cosmetic blush dermatitis Japan Regular cosmetics Philippines

1980s	1989-1998	1999-2008	2009-2018
Skin care products induce anaphylaxis			
			Facial soap - hydrolysed wheat protein (Glupearl 19S) Soy based cosmetic Japan
Skin Care products induce dermatitis			
Deodorant Chlorphenesin Singapore		Cosmetic lotion & cleansing foam. 1,3-butylen Japan Facial cleanser Thailand Moisturising lotion Quaternium Sorbolene lotion Australia	Facial cleanser Thailand Massage oil (Turmeric) Philippines Baby wipes dermatitis in carers (MI) Skin cleanser (MI) Moisturiser (Isopropyl myristate) Australia

1980s	1989-1998	1999-2008	2009-2018
Hair care CD			
Zinc Pyrrithione & PPD Singapore	Wet work ICD (Hairdresser) Australia	Latex glove & ammonium persulphate CU (Hairdresser) Australia Canine anti- dandruff shampoo (Miconazole) New Zealand	Hairdressing series Additional sensitizers required Japan Ammonium persulfate,PPD, Toluene 2,5-diamine, Glyceryl monothioglycolate (Hairdresser) Australia PPD, Pure henna, black tea & Indigo (Hair dye allergy) Australia

1980s	1989-1998	1999-2008	2009-2018
Dental cosmetics contact reaction			
Mercury amalgam (Lichenoid & lichen planus) Australia, New Zealand		Mercury amalgam Japan (Cheilitis), Thailand Copper sulphate amalgam Thailand Dental alloy Au, Ag, Pd Japan Dental implant & screw Japan (Ti)	Mercury amalgam (Lichenoid & lichen planus) Australia, New Zealand
Nail cosmetics CD			
	Acrylic nails Australia		Acrylic nails (hydroxyethyl methacrylate) Nail polish (Tosylamide formaldehyde resin) Australia

1980s	1989-1998	1999-2008	2009-2018
Fragrance CD			
Fragrance Photo CD (Musk ambrette) Singapore	Lavender oil Japan New Zealand (Difflam®gel)	Geraniol Japan Fragrance CD, 6-methyl coumarin CD, Essential oils OD (Aromatherapi sts) Thailand Essential oil & Fragrance mix Taiwan Essential oil Oak moss, Usnic acid New Zealand	Cinnamyl alcohol, cinnamal CD Malaysia, Thailand Fragrance pigmented CD Thailand <u>Ylang Ylang oil</u> Malaysia Pustular CD (Oakmost absolute, FM2, citral) Australia
Clothing/ Material CD			

1980s	Before 1989	1989-1998	1999-2008
	Batik (OICD) Indonesia Nylon stocking dermatitis (Epsilon aminocaproic acid) Japan Pillow case pigmented CD (Naphthol AS) Japan	Sanitary pad Australia (MDBGN), New Zealand Sock dermatitis (Basic Red 46) Textile dye allergy (PPD) Australia Wetsuit dermatitis (PTBF resin) Japan	Black trousers (4,5-dichloro-2-n-octyl-4-isothiazolin-3) Mattress gel sheet (2-N-octyl-4-isothiazolin-3) Japan Textile allergy Formaldehyde Formaldehyde releaser, Basic Red 46, Disperse blue 106 & 126, PPD Australia
Footwear CD			
	Chromate, Colophony, PTBF resin, Rubber Australia	Adhesives, Dyes(black), Leather, Metal, Plastic, Polishing agents, Rubber India	Rubber Dye India Rubber, Preservatives Adhesives Leather Indonesia

SECTION 2

APEOD RESEARCH LIST (1989-2018)

Asia

*India *Indonesia *Japan *Malaysia
*Philippines *Singapore *Taiwan *Thailand

Pacific Region

*Australia *New Zealand

Research List (1980-1988)

Collaborative studies

Papers presented but not published in Journals

ASIAN (1989-2018) RESEARCH LIST

Indian Studies

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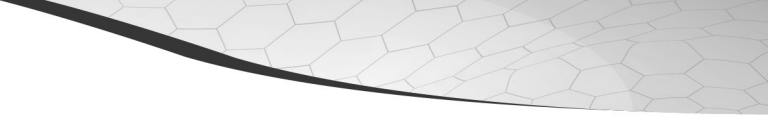
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| <p>2. <i>Prevalensi dan faktor yang berpengaruh terhadap terjadinya dermatitis kontak iritan kumulatif pada pekerja kebersihan lantai (cleaning service) Rumah Sakit Cipto Mangunkusumo Jakarta</i> by Susmeiati in 1998.</p> | <p>Indonesia</p> |
| <p>3. <i>Prevalensi kepositifan uji tempel dihubungkan dengan status atopi pada pekerja bagian pembuatan bahan di sebuah pabrik cinderamata</i> by Sandy in 2003.</p> | <p>Indonesia</p> |
| <p>4. <i>Proporsi kepositifan hasil uji tempel kromium heksavalen pada kelompok pekerja di lapangan dan dalam ruangan sebuah pabrik semen (dikorelasikan dengan kadar kromium dalam darah</i> by Sinta D in 2008.</p> | <p>Indonesia</p> |

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| 5. <i>Proporsi kepositifan uji tempel zat warna nafla dihubungkan dengan perilaku perajin batik terhadap penggunaan alat pelindung diri di lingkungan kerja</i> by Windy KB. 2010. | Indonesia |
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| 8. Occupational allergic contact dermatitis from tobacco: two case reports by Dewi VA, Verdy, Budiyanoto A, Soebono H and Indrastuti N. Presented in APEODS XII, Yogyakarta Indonesia 2013. | Indonesia |
| 9. Comparison of skin irritation level between world health organization (who) formulation-1, ethanol with n-propanol combination and chlorhexidine gluconate containing hand disinfectants among healthcare workers by Sansan MV and Tejo BA. Presented in APEODS XII, Yogyakarta Indonesia 2013. | Indonesia |
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| 13.Occupational Contact Dermatitis in Hairdressers: 3 Cases series by Ceki C, Dewi YD, Trisnowati N and Indrastuti N. Presented in APEODS XII, Yogyakarta Indonesia 2013. | Indonesia |
| 14.Occupational Allergic Contact Dermatitis in Indonesia Pottery Workers by Sri Awalia Febriana, Windhy Keumala Budianti, Retno Widowati Soebario, Niken Indrastuti, Erik Zimerson, Marlène Isaksson and Magnus Bruze. Presented in Asia Pacific Enviromental Occupational Dermatology (APEODS), Manila. 2015 | Indonesia |
| 15.Pittfall in the diagnosis of occupational skin diseases by Sri Awalia Febriana. Presented in PIT Perdoski , Balikpapan 2015. | Indonesia |
| 16.Occupational dermatoses in Indonesia by Sri Awalia Febriana. Invited speaker at Regional Conference Dermatology Singapore 2016. | Indonesia |
| 17.Identification of occupational and environmental hazard and occupational skin diseases in Indonesian Batik Home Industry by Sri Awalia Febriana, Erdina, Kusuma, Niken Indrastuti and Fajar Waskita. Presented in ESCD Manchester. | Indonesia |
| 18. <i>Proporsi hasil uji tusuk positif terhadap allergen hidup dihubungkan dengan masa kerja dan riwayat atopi responden di bagian penghancur uang sebuah bank di Jakarta</i> by Rina G. | Indonesia |

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| 27. Pattern of Ylang Ylang Oil Allergy In Selayang Hospital, Malaysia by Azlin Tee JT, Rohana R, Ng FY, Norhasmie R, Logesh S, Ong SB, Nur Ashiela MS and Siti Nasuha R. Poster presented at 40th Malaysian Annual Dermatology Congress, Weil Hotel, Ipoh, Perak, 14-17 September 2015. | Malaysia |
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| 29. Contact dermatitis in children and adolescents in public hospital by Azlin TJ Tee, Ong SB, Rohana R and Norhasmie R. 41st Malaysian Annual Dermatology Congress, Kuching Sarawak, 16-18 September 2016. | Malaysia |
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| 31. Short contact patch test profile in patients with history of urticaria and atopic dermatitis in Selayang Hospital from January to December 2016 by Nur Ashikin Ahmad, Ong Sai Beng, Rohana Ridzwan. Poster presented at the 14th APEODS in Taiwan 17-19 Nov 2017. | Malaysia |

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| 33. A two-year retrospective study of contact dermatitis to cosmetics in public hospital by Ong Sai Beng and Rohna Ridzwan. Poster presented at 42nd Malaysian Annual Dermatology Congress, VE Hotel, Kuala Lumpur, 24-27 August 2017. | Malaysia |
| 34. Positive patch test to copper sulphate and copper oxide, is there any relevance? By Teoh TY, Siti Nasuha R, MD. Salwa R, Rohna R and Wan Syameen Afira WAK. Poster presentation at 14th APEOD symposium, Taiwan 17-18 November 2017. | Malaysia |
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43.Patch testing children and adolescents: a seven year experience in Jose R. Reyes Memorial Medical Center by Co Cristina C and Villafuerte Lillian L. 2009	Philippines
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| 56.Dermatologic Quality Of Life of arsenic-affected patients from Lubao, Pampanga, Philippines admitted an A Tertiary Hospital by Tugon, Mary Renebe R.; Dumlao, Maria Antonette; Lavadia, Ma. Angela M. ;Arcega, Dee Jay B. 2016. | Philippines |
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| 61.Cutaneous delayed-type hypersensitivity to cosmetics in patients with rosacea: a prospective-controlled study reviewed by Verallo-Rowell. | Philippines |

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| <p>62.Incidence of patch test proven allergic contact dermatitis secondary to common preservatives among patient of Jose R. Reyes Memorial Medical Center Department of Dermatology by Santos, Villafuerte and Torres. 2018</p> | <p>Philippines</p> |
| <p>63.The prevalence of specific IgE-confirmed chicken hypersensitivity among atopic dermatitis patients with self-reported chicken meat allergy by Lin-Mendoza, Villafuerte and Tablizo. 2018</p> | <p>Philippines</p> |
| <p>64.Photopatch testing demonstrates visible light photoallergic contact dermatitis in patients with melasma; Report of 3 Cases by Verallo-Rowell VM, Ingente-Tablante MC, Ramas-Uypitching T, Bernal V, Oropeza NS, Sayoc-Ugalde MB and Almoró V.</p> | <p>Philippines</p> |

SECTION 3

CONTACT REACTIONS

Contact Dermatitis

Head
Periocular
Lips
Hands
Feet
Wound
Airborne distribution
Photo distribution
Widespread

Immediate Contact Reactions

Bite/sting
Chemical
Food
Latex

Other Types of Contact Reactions

Erythema multiforme
Lichenoid / lichen planus
Hyperpigmentation
Granuloma
Leucoderma

CD AT SPECIFIC SITES

Head

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Periocular

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Lips

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Hands

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Singapore

Taiwan

Thailand

Thailand

India

Taiwan

Singapore

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Feet

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Wound

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Airborne contact dermatitis

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Photocontact Dermatitis in Asia

Synopsis by

Dr. Tee Shwu Hoon

These are the countries that performed research in photocontact allergy during this 30years study in decreasing order: Philippines, Thailand, Singapore, Malaysia, Taiwan and Japan. The following are the photocontact allergens identified in various countries:

- Japan:** Methy and propyl paraben,
diisopropanolamine.
- Philippines:** Perfume; Plant ; Scandinavian PT Series, SSLI Sunscreen Series.
- Thailand:** Sulfanilamide, Jadit, chlorpromazine, promethazine, fenticlor
NSAIDS topicals
(tiaprofenic acid, ketoprofen, carprofen, benoxaprofen, piroxicam, tiaprofenic acid, ketoprofen, carprofen, suprofen, benzydamine)
6-methylcoumarin
Quisqualis indica
- Singapore:** Parsol MCX, oxybenzone, mexenone, 2-ethylhexyl-4-dimethylaminobenzoate, ketoprofen gel in sunscreens.
- Taiwan:** Bipyridine

Filipinos perform patch test using additional series from Chemotechnique Diagnostics (24 fragrance, 22 North American photopatch, 13 plants) and 8 cosmetic allergens from Skin Sciences Laboratory Inc. Investigations other than photopatch test were performed in Taiwan to confirm the photo contact reaction.

Topical NSAIDS and sunscreen ingredients are the common allergens identified in photocontact dermatitis or occupational dermatitis in Asian countries. Other than Asian countries, active agents in sunscreen were also implicated as the commonest cause of photocontact dermatitis in Australia. Excessive sun exposure in Asian populations staying in countries with tropical climate increases the risk of photocontact and occupational dermatitis.

Photocontact dermatitis research list in Asia Pacific Region

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Widespread dermatitis

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| 3. Bajaj A K, Saraswat A. Systemic contact dermatitis. <i>Indian J Dermatol Venereol Leprol.</i> 2006;72:99-102. | India |
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IMMEDIATE CONTACT REACTIONS

Bite / Sting

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| 1. Tomitaka A, Suzuki K, Akamatsu H, Matsunaga K. Anaphylaxis after hamster bites: a rare case? <i>Contact dermatitis</i> . 2002 Feb;46(2):113. | Japan |
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Chemical agent

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| 1. Lim J, Goh CL, Lee CT. Perioral and Mucosal Oedema due to Contact Allergy to Proflavin. <i>Contact Dermatitis</i> . 1991 Sept;25(3):195 -196. | Singapore |
| 2. Ophaswongse S, Maibach H. Alcohol dermatitis: allergic contact dermatitis and contact urticaria syndrome. A review. <i>Contact Dermatitis</i> 1994;30(1):1-6. | Thailand |
| 3. Yama. moto A, Morita A, Tsuji T, Suzuki K, Matsunaga K. Contact urticaria from geraniol. <i>Contact dermatitis</i> . 2002 Jan 46;1: 52. | Japan |
| 4. Rumi Suzuki, Kunitaro Fukuyama,Yasuhiro Miyazaki,Takeshi Namiki. Contact urticaria syndrome and protein contact dermatitis caused by glycerin enema. <i>JAAD Case Rep</i> . 2016 Mar; 2(2): 108-110. | Japan |
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Food

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| 8. Williams JDL Moyle M and Nixon R Occupational contact urticaria from parmesan cheese. <i>Contact Dermatitis.</i> 2007; 56:113-4. | Australia |
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ingredients in cosmetic products. *J Dermatol.* 2015 Sep;42(9):917-918.

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New Zealand

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Philippines

Latex Allergy in Asia

Synopsis by

Dr. Nazatul Shima Abdul Rahim

Countries that publish on immediate allergy to latex products during this 30-year study in descending orders are Thailand, Japan, Taiwan, Malaysia and Singapore.

Trend of latex allergy in various countries

Thailand: HCW (1998), Dental students (2011), Nurses & HCW (2014)

Japan: HCW (2004), Barium enema catheter (2004), Glove & fruit (2005), HCW(2006).

Taiwan: HCW (2002, 2007, 2008)

Malaysia: Patch test patients (1996), HCW (1999).

Singapore: HCW (2005)

Diagnostic tests performed

Japan	i. RAST (latex, banana, kiwi, grapefruit, avocado) ii. SPT (latex allergy, banana, grapefruit, avocado) iii. Scratch test (balloon, catheter) iv. Use test v. Proteomic strategies (allergonomics)
Thailand	i. Double use test / use test for latex allergy ii. SPT for latex allergy iii. Specific IgE to latex iv. Repeated insult technique with sterilised glove
Taiwan	i. SPT for latex allergy ii. Specific IgE to latex iii. Specific IgE to melon, banana, kiwi, tomato and chestnut iv. ELISA & immunoblotting (IgE antibody to latex)
Singapore	i. SPT for latex allergy ii. Specific IgE to latex iii. Enzyme immunoassay technique (to determine specific allergen levels of Hev b 1, Hev b 3, Hev b 5, Hev b 6.02)
Malaysia	i. SPT for latex allergy ii. <i>Use</i> test

In 1999, prevalence of latex hypersensitivity among Malaysian HCW was 3.1% (4/130) which is low when compared to USA which reported a prevalence of as high as 16.9%. In 2002, 8.6% (26) HCW in Taiwan had Type 1 latex allergy. In 2007, the prevalence of latex allergy among HCW was only 2.3% (3/130). In 2008, 6% of HCW in Taiwan had immediate reactions to latex products. Highest prevalence of allergy in those working in intensive care units and medical laboratories.

In Thailand, the latex sensitization rate in dental students in 2011 was 14.2% and is higher than the general population. The possible risk factors included personal history of allergic diseases, duration and frequency of exposure.

In Japan, there have been no latex allergy-related deaths. Following educational activities regarding latex allergy and replacement of the hospital's powdered gloves with low allergenic latex or non-latex, no new latex allergy patients have appeared among the HCWs in a Japanese university hospital since June 2001.

Thus, educational activities are paramount in the management of latex allergy among HCW.

Immediate reaction to latex products (Asia- Pacific Region)

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| 1. Rademaker M, Forsyth V. Allergic reactions to rubber condoms. <i>Sex Transm Infect.</i> 1989;65(3):194-195. | New Zealand |
| 2. Rademaker M, Forsyth A. Condoms and Rubber Allergy: A Preliminary Report of a New "Hypoallergenic" Condom. <i>Current Topics in Contact Dermatitis.</i> 1989;133-135. | New Zealand |
| 3. Tanglertsampan C, Patrakarn S, Vassansiri E. Contact urticaria from rubber gloves: an occupational skin disorder for health care workers. <i>J Med Assoc Thai.</i> 1998;81(1):71-4. | Thailand |
| 4. Rohna R, Suraiya H. Rubber allergy at the Dermatology clinic, HKL. <i>Med J Malaysia.</i> 1998;53:161-164. | Malaysia |

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| 5. Shahnaz M1, Azizah MR, Hasma H, Mok KL, Yip E, Ganesapillai T, Suraiya H, Nasuruddin BA. Prevalence of latex hypersensitivity among health care workers in Malaysia. <i>Med J Malaysia</i> . 1999 Mar;54(1):26-31. | Malaysia |
| 6. Lee A, Nixon R, Frowen K. Reduction of use of latex gloves in food handlers: an intervention study. <i>Contact Dermatitis</i> . 2001 Feb;44(2):75-9. | Australia |
| 7. Sajjachareonpong P, Lee A, Nixon R. Immediate-type latex hypersensitivity in a hairdresser. <i>Australas J Dermatol</i> . 2002; 43:150-151. | Australia |
| 8. Yi-Hsing Chen, Joung-Liang Lan. Latex allergy and latex-fruit syndrome among medical workers in Taiwan. <i>J Formos Med Assoc</i> 2002;101(9):622-626. | Taiwan |
| 9. Kano H, Yagami A, Suzuki K, Akita H, Akamatsu H, Matsunaga K, Ono Y. Survey of awareness and current state of latex allergy among all health care workers at a university hospital]. <i>Arerugi</i> . 2004 Jul 53;7: 659-668. | Japan |
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| 16.Lin CT, Hung DZ, Chen DY, Wu HJ, Lan JL, Chen YH. A hospital-based screening study of latex allergy and latex sensitization among medical workers in Taiwan. <i>J Microbiol Immunol Infect.</i> 2008 Dec;41(6):499-506. | Taiwan |
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| 19.Sheeran C, Cahill J, Nixon R. Glove-related hand urticaria caused by disposable gloves in healthcare workers. <i>Contact Dermatitis.</i> 2014 Aug;71(2):115-6. | Australia |
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| <p>21. Supapvanich C, Povey AC, Vocht FD. Latex sensitization and risk factors in female nurses in Thai governmental hospitals. <i>Int J Occup Med Environ Health</i>. 2014;27(1):93-103.</p> | <p>Thailand</p> |
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OTHER TYPES OF CONTACT REACTIONS

Erythema multiforme

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| <p>1. Goh CL. Urticarial papular and plaque eruptions. A noneczematous manifestation of allergic contact dermatitis. <i>Int J Dermatol</i>. 1989 April; 28(3):172-176.</p> | <p>Singapore</p> |
| <p>2. Harvey G, Oakley A, M Rademaker M. Erythema multiforme secondary to imiquimod. <i>Australas J Dermatol</i>. 2016;57:55.</p> | <p>New Zealand</p> |

Lichenoid / Lichen planus

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| <p>1. Pang BK1, Freeman S. Oral lichenoid lesions caused by allergy to mercury in amalgam fillings. <i>Contact Dermatitis</i>. 1995 Dec;33(6):423-7.</p> | <p>Australia</p> |
| <p>2. Gunatheesen S, Tam M, Tate B, Palmer A, Nixon R. Retrospective study of oral lichen planus and allergy to spearmint oil. <i>Australas J Dermatol</i>. 2012;55:224-228.</p> | <p>Australia</p> |
| <p>3. Thanyavuthi A, Boonchai W, Kasemsarn P. Amalgam contact allergy in oral lichenoid lesions. <i>Dermatitis</i> 2016;27(4):215-21.</p> | <p>Thailand</p> |

Hyperpigmentation

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| <p>1. Osawa J, Takekawa K, Onuma S, Kitamura K, Ikezawa Z. Pigmented contact dermatitis due to Naphthol AS in a pillow case. <i>Contact Dermatitis</i>.</p> | <p>Japan</p> |
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1997;37:37-38

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| 2. Sheno i ShruthakirthiD, Rao Raghavendra. Pigmented contact dermatitis. <i>Indian J Dermatol Venereol Leprol</i> . 2007 Sep-Oct;73(5): 285-287. | India |
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| 6. Verallo-Rowell VM, Pua JM, Bautista D. Visible Light Photopatch Testing of Common Photocontactants in Female Filipino Adults With and Without Melasma: A Cross-sectional Study. <i>J Drugs Dermatol</i> . 2008 Feb;7(2):149-56. | Philippines |
| 7. Verallo-Rowell VM. Melasma with Hyperpigmentation at classic photosensitivity sites: Photopatch Tests of twenty sequential patients from the Philippines. <i>Dermatitis</i> . 2010 Oct;21(6):350-351. | Philippines |

Granuloma

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| 1. Nagashima C, Tomitaka-Yagami A, Tsuruta K, Yatsushiro H, Akamatsu H, Matsunaga K, Kawamura T, Kobayashi H. Electron-beam treatment of allergic granuloma due to gold pierced earrings. <i>Contact dermatitis</i> . 2004 Aug 51;2: 90-91 | Japan |
| 2. Sasaki R, Suzuki K, Hayashi T, Inasaka H, Matsunaga K. Improvement of Cheilitis granulomatosa after Dental Treatment. <i>Case Rep Dermatol</i> . 2011 May-Aug; 3(2): 151-154. | Japan |

Leucoderma

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|--|-------|
| 1. Nishigori C, Aoyama Y, Ito A, Suzuki K, Suzuki T, Tanemura A, Ito M, Katayama I, Oiso N, Kagohashi Y, Sugiura S, Fukai K, Funasaka Y, Yamashita T, Matsunaga K. Guide for medical professionals (i.e., dermatologists) for the management of Rhododenol-induced leukoderma. <i>J Dermatol</i> . 2015 Feb;42(2):113-128. | Japan |
| 2. Yagami A, Suzuki K, Sano A, Takahashi M, Kobayashi T, Morita Y, Ando A, Iwata Y, Matsunaga K. Rhododendrol-induced leukoderma accompanied by allergic contact dermatitis caused by a non-rhododendrol skin-lightening agent, 5,5'-dipropylbiphenyl-2,2'-diol. <i>J Dermatol</i> . 2015 Jul;42(7): 739-740. | Japan |



SECTION 4

CONTACT DERMATITIS

in

**Children & Adolescent
Elderly
Atopic dermatitis
Psoriasis
Private practice
Rural population**

Prevalence of CD in Children / Adolescent

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|--|-------------|
| 1. Goon AT, Goh CL. Patch testing of Singapore children and adolescents our experience over 18 years. <i>Pediatr Dermatol.</i> 2006;23(2):117-20. | Singapore |
| 2. Patch testing children and adolescents: a seven year experience in Jose R. Reyes Memorial Medical Center by Co Cristina C and Villafuerte Lillian L in 2009. | Philippines |
| 3. Sarma N, Ghosh S. Clinico-allergological pattern of allergic contact dermatitis among 70 Indian children. <i>Indian J Dermatol Venereol Leprol.</i> 2010 Jan-Feb;76(1):38-44. | India |
| 4. Garg T, Yadav P, Meena S, Chander R. Allergic contact dermatitis in children: Culpable factors, diagnosis and management. <i>Astrocyte</i> 2014;1:33-40. | India |
| 5. Sharifah Rosniza SNC, Rohna R, Kasmawati T et al. Pattern of allergic contact dermatitis in school children in Selayang Hospital, Malaysia. <i>Malaysian J Dermatol.</i> 2013 Dec;31:13-18. | Malaysia |
| 6. Contact dermatitis in children and adolescents in public hospital by Azlin TJ T, Ong SB, Rohna R and Norhasmie R. Presented at 41st Malaysian Annual Dermatology Congress, Kuching Sarawak, 16-18 September 2016. | Malaysia |
| 7. Sharifah Rosniza, Min Moon Tang, Kin Fon Leong, Sabeera Begum, Asmah Johar. Patch Testing in Children and Adolescents: 7 Years' Experience in Hospital Kuala Lumpur. <i>Malaysian J Dermatol.</i> 2018 June;40:27-35. | Malaysia |

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| 8. Patch testing in Thai children presented with eczema by Puangpet P, Boonpuen N and Jamjanya S. Presented at International contact dermatitis congress in 2018, Rosario, Argentina. | Thailand |
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Case reports of CD in Children / Adolescent

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| 2. Cook N, Freeman S. Photosensitive dermatitis due to sunscreen allergy in a child. <i>Australas J Dermatol.</i> 2002 May;43 (2):133-5. | Australia |
| 3. Deekajorndech T, Kingwatanakul P, Wananukul S. Acute renal failure in a child with jellyfish contact dermatitis. <i>J Med Assoc Thai.</i> 2004;87 Suppl 2:S292-4 | Thailand |
| 4. Tempark T, Chatproedprai S, Wananukul S. Localized contact dermatitis from Ferula asafetida oleogum-resin essential oil, a traditional topical preparation for stomach ache and flatulence. <i>Indian J Dermatol Venereol Leprol.</i> 2016;82(4):467. | Thailand |
| 5. Chaithirayanon S. Comparative Study between Talcum and Zinc Oxide Cream for the Prevention of Irritant Contact Diaper Dermatitis in Infants. <i>J Med Assoc Thai.</i> 2016;99:S1-S6. | Thailand |

Contact Dermatitis in Elderly

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|---|-----------|
| 1. Goh CL, Ling R. A retrospective epidemiology study of contact eczema among the elderly attending a tertiary Dermatology referral centre in Singapore. <i>Singapore Med J.</i> 1998;29(10):442-446. | Singapore |
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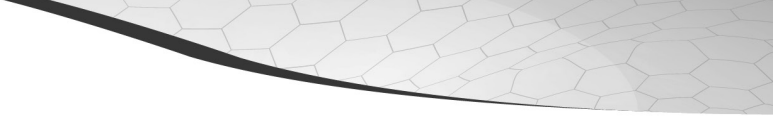
Contact Dermatitis in Atopic Dermatitis & Psoriasis

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| 1. Bannister MJ, Freeman S. Adult-onset atopic dermatitis. <i>Australas J Dermatology.</i> 2000;41: 225-228 2000. | Australia |
| 2. Goon A, Leow YH, Chan YH, Ng SK, Goh CL. Atopy patch testing with aeroallergens in patients with atopic dermatitis and controls in Singapore. <i>Clin Exp Dermatol.</i> 2005;30(6):627-31. | Singapore |
| 3. Roberts H, Frowen K, Sim M, Nixon R. Prevalence of atopy in a population of hairdressing students and practising hairdressers in Melbourne, Australia. <i>Australas J Dermatol.</i> 2006; 47:172-177. | Australia |
| 4. Cahill J, Williams J, Nixon R. Occupational autoeczematisation or atopic eczema precipitated by occupational contact dermatitis? <i>Contact Dermatitis.</i> 2007; 56:21-26. | Australia |
| 5. "Bhaba F, Nixon R. Occupational exposure to laboratory animals causing a severe exacerbation of atopic eczema. <i>Australas J Dermatol</i> 2012;53:154-5 | Australia |

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| 6. Patch test reaction among patient with atopic dermatitis at JRRMMC: A Quasi-experimental study by Gorkhali, Yaptinchay and Villafuerte in 2012. | Philippines |
| 7. Puangpet P, Lai-Cheong J, McFadden J P. Chemical atopy. <i>Contact Dermatitis</i> 2013;68: 208-13. | Thailand |
| 8. Vivek Malhotra, Inderjeet Kaur, Abir Saraswat, Bhushan Kumar. Frequency of patch-test positivity in patients with psoriasis: A prospective controlled study. <i>Acta Derm Venereol.</i> 2002; 82: 432-435. | India |

Private Practice & Rural Population

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| 1. Goon ATJ, Goh CL. Comparison of allergic contact dermatitis cases in the private and subsidised clinics in the National Skin Centre, Singapore. <i>Ann Acad Med Singapore.</i> 2001 Sep;30(5):485-488. | Singapore |
| 2. Henry BB Foong, EM Taylor, N Ibrahim. Allergic contact dermatitis in a private practice Dermatology clinic in Ipoh: A Seven-year retrospective study. <i>Malaysian J Dermatol.</i> 2007 Aug;19:47-49. | Malaysia |
| 3. Common contact allergens in a private clinic setting: A 5-year retrospective study by Angelina Onrubia and Sylvia Jacinto in 2007. | Philippines |
| 4. Mehta MJ, Diwan NG, Nair PA, Vora RV. Experience and feasibility of patch testing in allergic contact dermatitis in rural population. <i>Indian J Allergy Asthma Immunol.</i> 2015;29:40-5. | India |



SECTION 5

OCCUPATIONAL DERMATOSES (OD)

Occupational Dermatitis & Non-dermatitis OD

Agents

Chemicals
Plants
Food

Occupation

Farmers
HCW
Service providers
Industrial workers
Construction workers
Cleaners
Uniform staff

OCCUPATIONAL DERMATOSES IN ASIA

Synopsis by

Dr. Asmah Johar

Countries that perform various research in occupational contact allergy during this 30-year study in descending orders are Indonesia, India, Thailand, Singapore, Taiwan, Malaysia, Philippines and Japan. These data also include those who did case reports on 1-3 cases and poster or oral presentations in a conference but did not publish the article. They are original research and not a review of other research publications from other authors.

Occupational Type 1 allergy

Thailand: Seafood CU (1990)
Latex sensitization (1998, 2011)
Glove (1998, 2002, 2014)

Malaysia: Latex sensitization (1999)

Japan: Latex allergy (2004, 2006)
Food allergy (2015)

Singapore: Latex sensitization (2005)
Prawn & lobster allergy (2009)

Diagnostic test for Type 1 Occupational contact allergy

Thailand	i. Double use test / use test for latex allergy ii. SPT for latex allergy iii. Specific IgE to latex iv. Repeated insult technique with sterilised glove
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Malaysia	i. SPT for latex allergy ii. Use test – 20 min finger cot
Japan	i. Specific IgE to parvalbumin and Gly m5, SPT to raw fish, prawn, octopus, shellfish, anisakis ii. 2 Dimensional western blot to white kidney bean
Singapore	i. SPT for latex allergy ii. specific IgE to latex

Occupational dermatitis

In some countries because of their occupation in certain sectors involving farming or industries, the research publications/reports are specific to the potential allergens identified:

Japan	ACD to lacquer resin. Thai and Japanese lacquer trees are 2 distinct species but both are from Anacardiaceae family. ACD and ICD to okra (hibiscus) farming in 1990's.
India	Plant dermatitis, agriculture related to chrysanthemum growers, coconut plantation, padi field, cashew nut processing industries are still prevalent.
Indonesia	Batik workers and tannery workers have more reports on occupational disease.
Singapore	Most occupational dermatoses research were carried out before the year 2010.

Occupational allergens in Asia

Japan	Okra (<i>Hibiscus esculentus</i> L.), urushiol, latex, MI:2-methyl-4-isothiazolin-3-one, BIT:1,2-benzisothiazolin-3-one, MCI: 5-chloro-2-methyl-4-isothiazolin-3-one, parvalbumin & phaseolin, thiuram mix, dithiocarbamate mix, Eucalyptus species and Tanacetum parthenium.
India	Parthenium, Chrysanthemum, Dahlia & Tagetes, Xanthium & Parthenium, cement, potassium dichromate, epoxy resin, cobalt, nickel, thiuram mixture & black rubber mix, sesquiterpene lactone mix, parthenolide, achillea millefolium, fragrance mix, paraben, mercaptomix, PPD, fragrance mix, thiomersal, cetrimide, MBT, formaldehyde, chromium, cobalt, chromium(hexavalent), Balsam of Peru
Philippine	Nickel, chromium
Indonesia	Rengas, potassium dichromate, DPG, benzidine, sodium metabisulphate, nafla colour, orchid plant, methamidophos, ethanol with n-propanol & chlorhexidine gluconate.
Thailand	Seafood, <i>Schistosoma spindale</i> cercaria, Jasmine, gloves, latex protein, resin, essential oils, PPD, nickel sulphate, fragrance mix, p-toluenediamine sulphate, ammonium persulfate & p-aminophenol, potassium dichromate, fragrances, carba mix, cobalt chloride and thiuram mix.
Singapore	Nickel, epoxy resin & rubber, Hydroxylamine Sulphate, Cutting Oil, Dielectric Fluids containing hydrocarbons that are aromatic, paraffinic or naphthenic, cutting fluids(neat mineral oils), <i>Axonopus compressus</i> (carpet grass), <i>Ischaemum muticum</i> (seashore centipede grass), <i>Imperata cylindrica</i> (lalang), <i>Panicum maximum</i> (Guinea grass) and <i>Pennisetum purpureum</i> (elephant grass), chromate, rubber chemicals, latex, latex Hev b1,3,5,6.02, Trichloroethylene, acrylates, prawn and lobster.

Taiwan	Ethyl ethoxymethylene cyanoacetate, Captofol, Folpet, Captan, Potassium dichromate, cobalt, fragrance mix, Epoxy resin, Thiuram mix, p-phenylenediamine, acrylonitrile, PPD, Nickel sulfate, Balsam of Peru, medicaments, colophony, rubber chemicals, 1,2-ethanedithiol, m-xylene diamine, 1,6-hexanediol diglycidyl ether, Epoxy resin of Bisphenol F-type & Trimethylpropane, , Epoxy resin of Bisphenol A-type & Triglycidyl ether, Kathon CG and essential oils.
Malaysia	Thiuram mix, Mercapto mix, PPD mix, black rubber, MBT, latex, pewter dust (silver), Phenol-formaldehyde, Epoxy resin, fragrance, Chromium, Cobalt, balsam of Peru & paraben mix.

Most of the allergens are found in other countries causing occupational contact dermatitis. However there are a few agricultural activities or industries which have none or limited publications similar to other countries.

Allergens	Countries	Allergens	Countries
Hibiscus	Japan, Denmark, India, Australia	Pottery	UK, Denmark
Urushiol	Japan	Jasmine	India, Thailand
Parthenium hysterophorus	India	Soldering flux	Thailand, Japan, Singapore, USA
Cashew nut	India, Brazil	Isothiazoline in wall paint	Japan
Rice field animal manure	India	Essential oil aromatherapists	Thailand, UK
Cercarial dermatitis	Indonesia, Thailand	Hydroxylamine sulphite	Singapore
Batik	Indonesia	Shoe	Indonesia
Orchid	Indonesia, Denmark	Tobacco	Indonesia

Patch test using local or additional series in Asia

Japan	Japanese standard series, additional concentration of suspected chemicals, plant parts for Okra and urushiol in sap of Japanese raw lacquer.
India	Chrysanthemum extracts or standardised plant extracts, Indian standard series, Chemotechnique plant series, strip patch test to potassium dichromate, Indian cosmetic series, foot series, fragrance series, textile series.
Indonesia	Shoe series, nafla colour, parts of orchid plants including roots, coconut hides and Photopatch test to specific allergens.
Thailand	Jasmine flower, Siriraj standard series (European standard series and International standard series and additional allergens/series according to individual occupation using Chemotechnique allergens).
Singapore	Axonopus compressus (carpet grass), Ischaemum muticum (seashore centipede grass), Imperata cylindrica (lalang), Panicum maximum (Guinea grass) and Pennisetum purpureum (elephant grass).
Taiwan	Agricultural chemical allergens (Captan, Folpet, Captan), additional suspected allergens series according to individual occupation, m-xylene diamine, 1,6-hexanediol diglycidyl ether, epoxy resin of Bisphenol F-type & Trimethylpropane, epoxy resin of Bisphenol A-type and Triglycidyl ether.
Malaysia	Rubber series, photoallergen series, pewter dust and rubber gloves

In Asia, there are more reports in industry related activities rather than agriculture though certain countries have well-developed agriculture practices.

Molecular related techniques such as microarray IgE is too expensive for research purposes therefore hinder research progress. There are paucity of researches on knowledge of Occupational diseases, more recent epidemiology of Occupational diseases in a country and Quality of life research. ACD or ICD is dependant on the type of occupation and whether manual labour is involved. When manual labours are involved, there are more ICD.

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SECTION 6

ALLERGENS

Top Patch Test Allergen

1989-1998

1999-2008

2009-2018

Allergen series

Metal

Rubber chemicals

Preservatives

Fragrance

Source of Allergen

Cosmetics

Medicaments

Plants

Food

Animals

Materials

I. Tracking Top Contact Allergen in Asia

Synopsis by

Dr. Moonyza Akmal Ahmad Kamil

Countries that perform regular research in monitoring the top patch test allergens during this 30-year study in descending orders are Philippines, Singapore, Thailand, Malaysia and India. Unfortunately, we were unable to list up the top positive patch test allergens in Philippines due to inability to have access to their papers.

Standard Series used in Patch Test

Philippines, Malaysia and Thailand use either **European standard or International series**. The Indian local Standard Series differs from the European *Standard Series* by inclusion of propylene glycol, nitrofurazone, gentamicin, chlorocresol, PEG-400 and ethylenediamine chloride, while Sesquiterpene lactone mix and primin *allergens* were excluded.

In a study on preservatives in Singapore, a modified European standard series was used, which included the following 4 preservatives: paraben mix, methylchloroisothiazolinone/ methylisothiazolinone (MCI/MI; 5-chloro-2-methyl-4-isothiazolin-3-one/2-methyl-2H-isothiazol-3-one), Quaternium 15 and methyldibromoglutaronitrile (1,2-dibromo - 2,4-dicyanobutane).

Where clinically indicated, patients were also tested to an additional 7 preservatives: 2-phenoxyethanol, Bronopol, diazolidinylurea, methyldibromoglutaronitrile + phenoxyethanol, imidazolidinylurea, formaldehyde, and 1,3-dimethylol-5,5-dimethyl hydantoin (DMDM hydantoin).

There were also studies using additional series, but were not constituted as a form of local series.

Allergens / Patch Test Series Utilised

Cosmetic series

Dental series

Fragrance substances in cosmetic product in accordance with EU

Cosmetics Directive

Metal series

Photoallergen (Chemotechnique Diagnostics, Vellinge, Sweden)

Plant series

Preservatives (AllergEAZE)

Psoriasis series

Rubber series

Own products

Detergents

Kum-kum

Kerosene

Native medication

Turmeric

Vegetables (garlic, onion, Aloe Vera and lemon)

List of Allergens

Singapore NSC Standard series

(< 2003)

Black rubber mix 0.6%,	Ethanol Tixocortol
Cobalt chloride 1%	-21-pivalate 1%,
Colophony 20%,	Ethylenediamine
Epoxy resin 1%	dihydrochloride 1%,
Fragrance mix 8%,	Flavine 0.5%,
Neomycin 20%,	Fluocinolone
Nickel sulfate 5%,	acetonide 0.25%,
Parabens 15%,	Formalin 2%,
Paraphenylene diamine 1%,	Gold sodium
Potassium dichromate 0.5%,	Thiosulfate 0.5%,
Mercaptobenzothiazole	Hydrocortisone-17-
(MBT) 2%,	butyrate 1%
Thiuram mix 1%,	Mercapto mix 1%,
Wool alcohol 30%,	Mercapto mix 2%
Amerchol 50%,	Olive oil,
Amerchol 100%,	PCMX (4-chloro-3-xyleneol) 0.5%
Betamethasone valerate 2%,	Quinoline mix 6%,
Budesonide 0.1%,	Sesquiterpene lactone Mix 0.1%,
Cetyl stearyl alcohol 20%	Thimerosal (Merthiolate) 0.1%,
	Turpentine 0.3%

Indian Standard Series

Balsum of Peru 10%,
Benzocaine 5%,
Black rubber mix 0.6%
Chlorocresol 1%,
Cobalt sulphate 5%,
Colophony 10%,
Epoxy resins 1%
Formaldehyde 2%, ,
Fragrance mix 8%,
Neomycin sulphate 20%

Nickel sulphate 5%,
Nitrofurazon 1%
Paraben mix 9%,
Paraphenylene diamine 1%,
Parthenium 15%,
Potassium dichromate 0.1%,
Mercaptobenzothiazol 1%
Thiurum mix 1%,
Vaseline 100%
Wool alcohol 30%,

Additional:

Gentamycin sulphate 20%
Clioquinol 5%
Black rubber mix 0.6%
polyethylene glycol 400 (PEG400)
As per Indian standard battery (CODFI) INS-1000

Siriraj Standard Series

European Std Series &
Internatioanl Std Series

PLUS

Carbamix ,
Ethylenedine dihydrochloride,
Gold sodium thiosulfate dehydrate,
Tetramethyl thiuram monosulfide,

MINUS

Lyrall & Primin

Monitoring Top Positive Patch Test Allergens (1989 to 2018)

The common allergens are mostly the same in most of the listed Asian countries around the same period of time, but with some differences in prevalence & percentages of the allergens involved.

It is also noted that age of patients, the underlying skin condition, cultural habits and lifestyle, as well as occupation landscape play important roles in contact allergy.

Additional series may be used when clinically indicated.

1989-1998 Top Positive Patch Test Allergens

India	Singapore	Malaysia
Fragrance mix Ni Cr Thiurum mix PPD Cinnamic aldehyde Balsam of Peru Epoxy resin Paraben mix Carba rubber mix Bronopol 2-MBT Wool alcohol Mercapto mix	Ni Fragrance mix Neomycin Lanolin Colophony Flavine Rubber chemicals Clioquinol Chromates Contact urticarial: Proteinaceous foodstuff Rubber latex products Photoallergic CD Musk ambrette Sunscreen: Parsol MCX, PABA	Metal: Ni, Cr, Co Cosmetics: Fragrance Mix, Balsam of Peru, PPD free base, Wool alcohol, Isothiazolol, Quaternium, Paraben, Rubber: Thiuram mix, Mercapto mix, PPD Black rubber mix, MBT OD: Epoxy resin, RC, Metals, Photoallergens Psoralen, Musk ambrette, Hexachlorophene, Food Garlic, Mango Plant Lalang, Lemon grass, Cow grass, Kacip Fatimah

1999-2008 Top Positive Patch Test Allergens

India	Singapore	Malaysia (Private clinic)
Nickel	Chromate	Nickel
Chromate	Nickel	Fragrance
Cobalt	Cobalt	Balsam of Peru
Parabens	Fragrance mix	Cobalt
Fragrance mix	Myroxylon pareirae	Chromate
Kathon CG,	PPD	Parabens
Benzotriazol,	Colophony	Wool alcohol
Hydroquinone,	Neomycin	Neomycin
Gallatte mix	Gold thiosulfate	Flavine
(kum kum dermatitis)	Thimerosal	Chlocresol
	Lanolin	Thiuram mix
Dithranol,		Mercapto mix
Fragrance mix,		
Neomycin &		
Nitrofurazone in		
psoriatic pts		

 Allergen in additional series or patient's own product

2009-2018 Top Positive Patch Test Allergens

India	Singapore	Thailand
Parabens,	Nickel	Nickel
Chromate	Fragrance	Cobalt
Fragrance mix	Kathon CG	Fragrance mix
Nickel,	Sunscreen:	PPD
Cobalt,	Oxybenzone	Gold
Mercury	Mexenone	Carba mix
Aluminium	2-ethylhexyl-4-	Thiuram
Fragrances	dimethylaminobenzoate	Ethylenediamine
Neomycin	Ketoprofen gel	Fragrance
Preservatives		Evernia
Thiuram mix		furfuracea
Black rubber mix		Cinnamyl alcohol
Aluminium OH		Kathon CG
Balsam of Peru		
Formaldehyde		
Chlorocresol		
PPD		
Epoxy resin		
Parthenium		
Mercury salts		
Sesquiterpene		
Thimerosal		
Gallate Mix		
Kathon CG		
Benzotriazol		
hydroquinone		

2009-2018 Top Allergens

Malaysia Selayang (2011-2013)	Malaysia Selayang (2015)	Malaysia HKL (2018)
Nickel	Nickel,	Nickel sulphate
Cobalt Paraben mix	Chromate,	Potassium
Balsam of Peru	Cobalt	dichromate
Chromate		Kathon CG
Rubber additives:		
DPG	DPG	Fragrance mix
CPPD		Cobalt chloride
	Kathon CG	
	Paraben mix	
	Fragrance mix I	
	Formaldehyde	
N-Cyclohexylthiophthalimide	Povidone iodine 10%	Palladium chloride,
	Copper sulphate	Stannous chloride,
Fragrance mix 1	Textile Dye Mix	Miconazole,
Ylang ylang oil	MI	Gold sodium
	PPD	thiosulfate,
	Neomycin	Thimerosal.
	MBGDN/PE	
	Euxyl 400(2%)	
	Colophony	
	Balsam of Peru	
	Wool alcohol	
	Iodopropynl	
	Butylcarbamate	
	Gold sodium	
	thiosulphate 2%	

2009-2018 Positive Patch Test Allergens in Children and Adolescents

Malaysian Selayang (2013)	Malaysian HKL (2018)
Paraben mix	Nickel
Rubber chemical	Fragrance mix
Nickel	Chromate
Fragrances	Cobalt
Topical medicaments	Kathon CG
Dental series	Thimerosal

 Allergen in additional series or patient's own product

The above allergens are also noted in other countries at the same decade. However, the prevalence of contact allergy may differ from 1 country to the other. For example, in nickel allergy, a higher percentage was seen in Singapore compared to those in Europe/America/Japan, although nickel is still the commonest contact allergen throughout the world in the same decade.

Another example would be sunscreen, which is the most common photoallergen in Singapore, similar to European Multicentre Photopatch Test Study. For example, a study in Malaysia in 2013, found that the commonest allergen was paraben mix, which differs from the US and European countries. But this was similar to nearby Asia country like in India.

Research List on Top Patch Test Allergens in Asia Pacific Region

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II Top Patch Test Series

a)Contact Reaction to Metals in Asia

Synopsis by

Dr. Ch'ng Chin Chwen

Countries that performed research once/several times in metal allergy during this 30-year study in descending orders are Thailand, Singapore, Japan, India, Taiwan, Malaysia, Philippines and Indonesia. In the 80s and 90s – chromium allergy in cement worker, less after due to change in cement manufacturing process in Singapore and Thailand. However still reported in India up to lately. Between 1998 to 2003, gold allergy became prominent.

The metal allergens causing contact dermatitis identified in each country is as follows:

Thailand: Chromium (1996), (2006, 2014)
Nickel (2014)
Nickel & Cobalt (2015)
Copper & amalgam (2016)

Singapore: Chromium(1996),
Chromium & Gold (1998)
Nickel, Chromium, cobalt, gold (2005)

Japan: Gold (2004),
Amalgam (2011)
Nickel, Cobalt, Chrome, Zinc (2012),
Gold-Silver-Palladium alloy (2013)
Titanium (2016)

India: Chromium & Cobalt (2006)
Chrmium, Cobalt & Nickel (2009)

Chromium & Cobalt (2018)

Taiwan: Chromium, Nickel (2006)
Nickel, Thiomerazol, Chromium, (2008)

Malaysia: Nickel, Cobalt, Chromium (1998)
Nickel, Cobalt, Chromium,
Gold sodium thiosulphate (2014)
Copper (2017)

Indonesia: Chromium (2008)

In addition to the Standard series, Japan, Singapore Taiwan and Malaysia also performed patch test to metal series in patients suspected of having metal allergy. Thailand performed open application test in nickel ACD to confirm the skin reaction.

Research List on Metal Allergy in Asia Pacific Region

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Chromate Allergy

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Copper Allergy

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Malaysia

b) Rubber Chemical Allergy in Asia

Synopsis by

Dr. Nazatul Shima Abdul Rahim

In Japan, the rates of type IV allergy caused by latex and rubber additives are 16.7% and 14.6% respectively. In the United States, Canada, Australia and Europe, 5% to 10% of the populations have allergies against rubber additives.

North American Contact Dermatitis Group found statistically significant differences in rubber allergy between men and women. In general, dermatitis of the hands and feet were commoner in men than women although face and neck dermatitis were more frequent in women. Contrasting findings were noted in a study in Kuala Lumpur Malaysia. The number of women with rubber allergy is more than twice that of males. Hand dermatitis from rubber glove allergy was commoner in female nurses, domestic workers and cleaners.

The pattern of contact dermatitis seen at the Kuala Lumpur Hospital has changed. The top 3 allergens noted in 1989 were cetavlon (22.9%), nickel (14.5%) and colophony (8.5%). In 1996, rubber chemicals (19%) became the second top common after nickel (36%). The main factor contributing to this change in pattern is the usage of gloves as a universal precaution during the AIDS scare in 1990's.

Rubber Chemical Allergens detected in Asian countries

India	Black rubber mix, Mercaptobenzothiazole, Thiuram mix
Indonesia	2-Mercaptobenzothiazole, rubber materials
Japan	Natural rubber products, Thiuram, Dithiocarbamate, Mercapto mix
Malaysia	Thiuram mix, Mercapto mix, PPD black rubber mix, 4,4 Dihydroxybiphenyl, N-Cyclohexylthiophthalimide, 1,2 phenylguanidine, monobenzole, 3-hexamethylaminotetramine, Dibenzothiazyle disulphide, Ethylenethiourea, Phenyl naphthalene, Mercaptobenzothiazole, latex product. N-Cyclohexyl-N-phenyl-4-phenylenediamine (CPPD) and Diphenylguanidine
Philippine	Rubber prosthesis, Thiuram mix, rubber chemicals,
Singapore	Rubber chemicals
Taiwan	Thiuram mix, Mercapto mix, Carba mix, black-rubber mix

The top five allergens noted in the 10 year Spanish study in 1993 were Thiuram mix, Carba mix, black rubber mix, Mercapto mix and Naphthyl mix. In 1990's, Malaysia's the top five incriminating rubber allergens in this series were Thiuram mix (ES), Mercapto mix (ES), PPD black rubber mix (ES), 4,4 Dihydroxybiphenyl (RS) and N-Cyclohexylthiophthalimide (RS) and N,N-Diphenylguanidine.

After 2010, N,N-Diphenylguanidine, N-Cyclohexyl-N-phenyl-4-phenylenediamine (CPPD) and N-Cyclohexylthiophthalimide have replace the rubber chemicals in European series (Thiuram mix, Mercapto mix, Mercaptobenzothiazole and N-Isopropyl-N Phenyl Paraphenylenediamine (PPD black rubber mix) as top 30 common allergens in Malaysia. Inclusion of rubber series in patch testing had increased the pick up rate of rubber allergy. Some of the patients were more sensitive to the less common rubber allergens.

Patch test performed with additional/local series plus own products to confirm rubber allergy

India	Indian Standard Battery of Patch Test Allergens, Indian Standard Series and indigenous antigens
Indonesia	Shoe series, 12 additional allergens, Own shoe material
Japan	Japanese standard series, additional concentration of suspected chemicals – nitrile gloves, thiuram mix, and dithiocarbamate mix
Malaysia	Rubber chemical series, Rubber gloves
Philippines	European Standard Patch Test Series
Singapore	Modified ICDRG Standard Series, Photopatch test
Taiwan	Additional suspected allergens series according to individual occupation
Thailand	Rubber Chemicals series

Contact dermatitis due to additives may also be a result of increased used of additives. Across the world, the number of products using additives may actually exceed those using latex, and additives such as Thiuram, Mercapto and Carba mix are part of various products used in the workplace and encountered in people's daily lives-including medicines, foods, and pesticides.

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c) Contact Sensitivity to Preservatives in Asia

Synopsis by

Dr. Voo Sook Yee Michelle & Dr. Rohna Ridzwan

Countries that performed research on preservative allergy during this 30-year study are Thailand, Malaysia, Singapore, Taiwan, Japan, Philippines, Indonesia and India. Benzalkonium chloride and formaldehyde had caused immediate hypersensitivity reaction in 3 countries as shown

Korea: Benzalkonium chloride causing anaphylaxis from a nebulizer solution (SH Kim, et al 2004).

Japan: Formaldehyde causing type 1 reaction in root canal sealant after dental treatment (Kijima A, et al 2007).

Taiwan: Anaphylaxis to Benzalkonium chloride-coated central venous catheter (Shih CK, et 2010).

Common allergens identified in each country

Thailand: Thimerosal (1998, 2007), Formaldehyde (2003), Kathon CG (2015, 2018).

Singapore: Benzalkonium chloride (1989), Thimerosal (1992), Paraben (2014), Kathon CG (2014), Quaternium-15 (2014), MDBGN (2014), Diazolidinylurea (2014).

Japan: Formaldehyde (2003), Isothiazolin (2010, 2013, 2014), Kathon CG (2013).

India: Paraben (1992-1994, 2006, 2010, 2017), Kathon CG (2006, 2017), Thimerosal (2006, 2017), Gallate mix (2006, 2017), Formaldehyde (2007).

Taiwan: Formaldehyde (2003), Kathon CG (2017).

Malaysia: Paraben (1997, 2010, 2013, 2017), isothiazolin (1997), Kathon CG (2013, 2015), Formaldehyde (2013, 2015), MBDGN (2015), Iodopropynyl butylcarbamate (2015), Thimerosal (2015).

Indonesia: Parabens (1995, 2014), Bronopol (1995).

Philippines: Parabens (2005), Formaldehyde (2012),
Thimerosal (2012).

Korea: Benzalkonium chloride, Thimerosal,
Methylchloroisothiazolinone / Methylisothiazolinone
(2012).

In addition to the Standard series, Singapore, Malaysia, Thailand, Korea and China also performed patch test to additional series in their patients suspected of having preservative allergy.

Singapore: Preservatives from modified European Baseline Series and other preservatives from Chemotechnique Diagnostics (Chong S, et al 2014).

Malaysia: Preservatives from European Baseline series, Cosmetic Series (SYM Voo 2013). Preservatives from AllergEAZE (2015).

Thailand*: Preservatives from Baseline series from Chemotechnique Diagnostics and additional allergens from other series (Boonchai W et al, 2011).

Korea*: Preservatives from Cosmetic Series, benzalkonium chloride, chlorphenesin (Lee SS 2012).

China*: Modified European Standard Series (Wang WH, et al 2005)

*Patients with cosmetic dermatitis

In Korea and Japan, investigations other than patch test were performed to confirm the skin reaction.

Korea: Irritancy patch testing performed on volunteer subjects. (Lee SS, et al 2012).

Japan: Liquid chromatography (Kawakami T, et al 2014).

There is lack of studies done in trend of preservative allergy in the countries across Asia. The sensitization frequency of the preservative allergens varies, depending on the timing of the study, the cohort of patients patch tested, exposure, cultural background and local regulation.

Nevertheless Thailand and Malaysia have high frequency of sensitization to Methylchloroisothiazolinone/ Methylisothiazolinone. However this is not found in Singapore, while Taiwan reported an increase in contact allergy to this preservative after 2005.

Thailand: 13.6% among adult patients with contact dermatitis 2012- (Dararattanaroj W, et al 2017).

Malaysia: 12.9% among adult patients in Hospital Kuala Lumpur 2011-2015 (Kang NH, et al 2017).

6.5% among adults and paediatric patients in Hospital Selayang 2011-2013 (Ng FY, et al 2018).

Korea: 5.5% among patients with cosmetic dermatitis bet 2010 -2011 (Lee SS, et al 2012).

Taiwan: 2.1% among all patients with allergic contact dermatitis between 1987- 2006 compared to 5.9% between 2006-2015 (Liao SL, et al 2017).

Singapore: 1.75% among all patients with allergic contact dermatitis 2006-2011(Cheng S, et al 2014).

Preservatives Contact Sensitivity in Asia Pacific Region

Prevalence

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III Source of Allergen

a)Cosmetics Contact Reaction in Asia

Synopsis by

Dr. Saadiah Sulaiman & Dr. Rohna Ridzwan

Participating countries that performed research in cosmetic allergy during this 30-year study are Thailand, Japan, Singapore, Taiwan, Philippines, India, Malaysia and Indonesia. The source of allergens are from make-ups, skin lightening cream, sunscreen, tattoo / skin painting and the skin, hair and dental care products.

The cosmetic reaction varies from contact dermatitis, photocontact dermatitis, dyspigmentation, cosmetic intolerance and hypersensitivity reaction. It is important to note that the true prevalence of allergic reactions to cosmetics remains unknown, as reactions are often not reported because those affected simply discontinue use of the agent instead of seeking medical care.

Fragrances and preservatives remains the most prevalent ingredient in causing contact dermatitis. In Thailand, there were 1247 cases (239 males and 1008 females; mean age 38.5 years). Fragrance chemicals and preservatives were the most commonly recognized cosmetic allergens. Ammoniated mercury was the only allergen that showed a significantly increased frequency over the 10-year period ($p = 0.0008$).

Of the 549 tested products, 6.0% ($n = 33$) contained mercury above 1000 ppm. In all, 45% of mercury-containing samples contained mercury in excess of 10,000 ppm. Of lightening products purchased in the United States, 3.3% were found to contain mercury in excess of 1000 ppm despite being a banned component for such purpose.

Common allergens identified in each country

Thailand	Red & blue pigment, Kojic acid, fragrance chemicals, preservatives, ammoniated mercury, PPD, cosmetic preservatives & hairdressing sensitizers, Sodium Lauryl Sulfate (irritant), Evernia furfuracea, black henna tattoo.
Japan	Propylene glycol ricinoleate, 1,3-Butylene glycol and Glycerol, Mercury & amalgam, Carmine, 5,5'-Dipropylbiphenyl-2,2'-diol, Rhododendrol, Rhododendrol & 5,5'-dipropylbiphenyl-2,2'-diol, Soy, PPD. P-Methylaminophenol and o-Aminophenol, Cysteamine HCl .
Taiwan	Triethanolamine, PPD. Sodium metabisulfite, MI/MCI, essential oil, benzocaine, PABA, (Formaldehyde, sunscreen-no specific info)
Singapore	Cosmetics, Spectraban 15 Lotion & Zovirax Cream, Nickel, Colophony & Abietic / Dehydroabietic acids, ParsolMCX & oxybenzone, PPD, Ricinoleic acid & lip preparation.
Philippine	Fragrance mix, Formaldehyde, Nickel sulfate, Benzoyl peroxide, & Thimerosal and hair dyes.
Malaysia	Preservatives, Fragrance, Metals, PPD, Nickel, Potassium Dichromate, Thimerosal & Cobalt chloride.
Indonesia	PPD, Ethylenediamine, Parabens, Lanolin, Bronopol, Paraben mix, Quaternium & Fragrance mix.
India	Nickel sulphate, Parabens, Kathon CG, Benzotriazol, tertiary-butyl Hydroquinone, Quaternium-15, Balsam of Peru, Potassium Dichromate, Cobalt chloride, Gallate mix, Cetrimide, Thimerosal, PPD, Fragrance mix, Methyl paraben, Colophony & Balsam of Peru.

***Patch test to additional series/ patients' own products
besides Standard series***

Thailand	Red & blue pigment, Kojic acid, Fragrance chemicals, Preservatives, Ammoniated mercury, occupational chemical & cosmetics, Mercury, preservatives, Sodium Lauryl Sulfate, Evernia furfuracea, black henna tattoo & PPD (24hr patch test).
Japan	Propylene glycol ricinoleate, 1,3-Butylene glycol and Glycerol, 1,3-Butylene glycol and Glycerol, Rhododendrol & 5,5'-Dipropylbiphenyl-2,2'-diol, p-Methylaminophenol & o-Aminophenol.
Taiwan	Triethanolamine, Sunscreen, Sodium metabisulfite & Mercury (Photopatchtest).
Singapore	Spectraban 15 Lotion and Zovirax Cream, Ricinoleic acid & lip preparation, Parsol MCX & oxybenzone & Abietic/dehydroabietic acids.
India	Gallate mix , Cetrimide , Thiomersal & Cosmetic allergen.
Malaysia	Cosmetic, Fragrance, Rubber, Metal, Hairdressing or Dental series from Chemotechnique Diagnostics when indicated. Preservatives series from AllergEAZE.
Indonesia	Bronopol

The frequency of positive patch test reactions observed following 24-hr exposure to complete permanent hair dyes is comparable to that observed following 48-hr exposure to 1% PPD/petrolatum in those individuals whose degree of sensitization is such that they typically present ++ or +++ reactions diagnostically.

In vitro test to determine irritation using artificial skin are available routinely in countries such as Japan and Malaysia. Although reference to such tests are not made in the publications, this does not mean that the tests are not available to be done to confirm such reaction. This in vitro

irritation test utilised the reconstructed human epidermis from normal human keratinocytes model as the medium to demonstrate irritation effects of skin care products and commonly utilised by cosmetic industries during product development.

For sensitisation test, Buehler tests and guinea pig maximisation test which are routinely used to test for biocompatibilities of rubber gloves in MS ISO IEC accredited laboratories in Malaysia, is also available to determine the potential of cosmetic ingredient in causing sensitisation.

Local Lymph Node Assay (LLNA), as an alternative, to utilise less number of guinea pigs and in vitro skin sensitisation tests are not readily available in this region.

Other Diagnostic Tests Performed

Thailand	Human 4-h Patch Testing. Patch testing and Histopathology. Spectrometric analysis of mercury content in 549 skin-lightening products.
Japan	Contact leucoderma- Rhododendrol, Type 1 allergy anaphylaxis-soy, specific IgE antibodies against Glupearl 19S
Taiwan	Spectrometric analysis of mercury content in 549 skin lightening products. Ammoniated mercury in spectacle frames and skin-lightening creams.
Singapore	Screening for p-phenylenediamine (PPD) in hair-care products by Thin-layer Chromatography
Malaysia	Modified Draize 95 test, human repeat insult patch test, human skin irritation test (ISO 10993-10-2010(E)), cumulative irritation test, ocular irritation test. Transepidermal water loss- evaporimeter. Comedogenicity test.

Trend in Cosmetic Allergy

Cosmetic allergy is culturally related and also determined by the prevalence of usage of ingredients in products. Socioeconomic factors also play a key role. In view of the cultural practices, ethnic variation of responses and environment peculiar to each geographical region, in order to cater for its needs, each country may need to have its own patch series modified from the available standard series.

Incorporation of fragrances in baby products, lotions, cleansers and baby oils by industries is of major concern because of lifelong sensitisation that starts at an early age. New trends in the popularity of usage of essential oils as aromatherapy has caused increasing sensitisation. Also noted, the people who were diagnosed as having ACD to essential oils also frequently had positive reactions to fragrance mix (77.8%). Among the patients with contact allergy to MI/MCI, those with associated source of essential oil ($n = 6$), 83.3% ($n = 5$). Contact allergy to Kathon CG could be attributed to its use as preservative in essential oil.

Outbreak of wheat allergy as noted among Japanese, reported in 2009, following incorporation of wheat in facial soap, which is supposed to be natural, as an ingredient that has moisturising effect. Such allergy is an acute hypersensitivity reaction rather than contact allergy. However, now, in 2019, except for a few reported cases of clinical allergy in France, this does not seem to be a major problem in other region despite the use of wheat in cosmetic products in other countries. The risk of allergy can be reduced by using lower molecular weight protein, less than 30kDa. (The SCCS adopted this opinion at its 6th plenary meeting of 18 June 2014).

Mercury allergy was studied in Japan, 2007, 2011, which was attributed to dental amalgam. Studies in Taiwan and Thailand, 2014, showed mercury was detected in cosmetic as lightening agent. This pose a danger to individuals who are already sensitised to mercury from dental amalgam.

There is an increasing incident of PPD allergy due to its incorporation into haircare products such as shampoos. Once sensitized to PPD, individuals may suffer from ACD not only related to future use of PPD-containing hair dyes but also to compounds sharing structural similarity to PPD caused by cross-reactivity, such as henna.

Liao et al, Taiwan 2017 noted the incidence of contact allergy to Kathon CG (MI/MCI) increased from 2.1% (3/145) to 5.4% (11/202) after 2005 ($P = 0.1665$).

Other observations

In terms of diagnostic, there seems to be a problem in diagnosing a positive sensitisation reactions. Example is sodium lauryl sulphate which is a standard irritant, but being incriminated as a cause of allergic contact dermatitis. The newer less irritating surfactant, cocamidopropyl betaine (CAPB), has been shown 42 out of 429 patients (9.8%) had a positive reaction to CAPB(China).

For non standard allergen, efforts should be made to ascertain the highest non irritating concentration before subjecting to patch testing in order to eliminate irritation effects.

The emergence of many new cosmetic products with new ingredients in the market has caused increasing cosmetic intolerance. However, this problem is underdiagnosed because most cases are not reported.

Cutaneous reaction to cosmetic may not necessarily be caused by an allergy, but rather cutaneous irritation following repeated use. Hence, patch test results using non standard allergens need to be interpreted with caution. Initiatives taken by cosmetic manufacturer to conduct cumulative irritation test during product development may help minimise this problem.

Use of food ingredients with high molecular weight protein such wheat, soy, oat in cosmetic may have long term effects through sensitisation,

that may cause lifelong allergy to common staple food, thus is a serious morbidity especially in children, is wise not to be included in cosmetic ingredients.

(Of 302 children seen at a pediatric dermatology unit in Bordeaux, France, nearly one third had a positive skin reaction to oats, report Dr. Franck Boralevi, at the Hospital Pelligrin-Enfants and colleagues.)

There are minimal studies on the dermatitis caused by botanical extracts in cosmetics in this region. Topical cosmetics containing botanical ingredients are often falsely believed by consumers to be safer than their synthetic or chemical counterparts. This is of concern considering the inclusion of new botanical extracts in cosmetic products. . Extracts derived from *Compositae* plants, propolis, and limonene, along with a number of essential oils and waxes, are popular in cosmetics and serve as botanical sources are increasingly implicated in causing adverse skin reactions.

Screening allergens for suspected botanical dermatitis may include Tea tree oil, Lichen acid mix, Geranium oil, Spearmint oil, Dandelion, Neroli oil, and Lavender, Sandalwood oil, Cananga oil, Rose oil, Ylang-Ylang oil and *Compositae*.

Interestingly Magnolia bark extract, Honokiol and Magnolol, which are important components of Chinese (Kampo) have been used for hundreds of years as Oriental medicine in Asia Pacific has recently been proven to have anti-inflammatory, antioxidant, antiangiogenic, antitumour anxiolytic, neuroprotective and cardioprotective effects.

It modulates NF-kB, and has potential for treating inflammatory dermatologic disorders. Ironically, with its incorporation in cosmetics over the past few years, in 2015, the first case of contact allergy has been reported in Europe instead of this region. Perhaps, oral consumption has induced tolerance.

Contamination of cosmetics, in particular by bacteria, as a cause of cosmetic induced dermatitis, though not directly implicated poses a real problem. In warm climatic conditions of the Asia Pacific region, cosmetics, kept at room temperature, have chances of contamination despite good preservatives. In a study on microbial contamination published in Malaysia on six cosmetic products consisting of creams and lotions purchased from the local market in Faisalabad, reveals *all cosmetic samples contaminated with varying degree of E. coli, P. aeruginosa, staph. aureus and Aspergillus niger in six samples of cream and lotion purchased from the local market in Faisalabad.*

In another study in Denmark, on patients with eczema, a total of 32 different products were collected from the 20 different patients, 6 jars and 26 tubes. Microorganisms were found in 20 of the 32 products (63%). In 11 (55%) of the 20 products microorganisms were isolated from the cream itself, 30% of the contaminated products contained *S. aureus*.

Non-bacterial contamination may not necessarily be inadvertent, but rather purportedly introduced to exert certain function.

From time to time, cosmetics have been withdrawn from the market as a result of adulteration with scheduled poison. Among those identified are hydroquinone and mercury for whitening effects, tretinoin for antiageing, diphenhydramine for anti itch. (Malaysia 2014,2018)

Most recently, antibiotics, metronidazole, chloramphenicol, sulfamethoxazole and trimethoprim, and antifungals, ketoconazole and griseofulvin have been identified in cosmetics in 12 cosmetic products (May 2019).

This alarming phenomenon only represents the tip of the iceberg of all the cosmetic adulteration committed by the few cosmetic manufacturers. Thus there is need for more comprehensive and intensive post market surveillance on cosmetics by the authority.

Cosmetic Dermatoses in Asia Pacific Region

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b) Topical Medicament Contact Allergy in Asia

Synopsis by
Dr. Latha R Selvarajah

Countries that perform research once/several times in contact allergy to plant during this 30-year study in descending orders are Singapore, India, Taiwan, Japan, Thailand, Malaysia, Philippines and Indonesia.

The incidence of type 1 allergy to topical medicaments is low. These **urticariogenic agents** were identified in Japan, Malaysia, Singapore and Thailand.

Japan: Glycerin enema (CUS)

Malaysia: Chlorhexidine (anaphylaxis)

Singapore: Chlorhexidine (contact urticaria)
Proflavine (angioedema)

Thailand: Alcohol (CUS)

Contact dermatitis medicamentosa

Singapore: Antimicrobials (1989, 1991)
Topical steroids (1989, 1998)
Traditional medication (1995, 2007)
Anti-acne (2009)

India: Antimicrobials (1990 - 1993, 2018)

Taiwan: NSAIDS (2003, 2015),

Chemotherapy agent (2003)
Traditional medication (2003, 2015).
Acyclovir (2007)
Topical steroids (2015)
Antimicrobials (2015)

Japan: Eye drop (2003, 2011 & 2013)

Thailand: Antimicrobials antihistamine
Topical NSAIDS (1993)
Budesonide nasal spray (2002)
Thimerasol (2007)
Traditional medication (2016)

Malaysia: Acriflavin (2011)
Traditional medication (2013)

Philippines: **Traditional medication**
Katialis (2002)
Chemotherapy agent (2014)
Topical antipsoriasis (2018)

Indonesia: Sulphonamides (1995)

Flavine has been constantly reported as an allergen for contact dermatitis in Singapore, India and Malaysia. Traditional Chinese medications as an allergen for contact dermatitis seem to be getting more frequently reported probably as its usage is becoming more popular in Asian countries. Frequency of contact dermatitis to topical corticosteroids is low.

Other allergens commonly indicated in contact dermatitis among the countries are nickel, topical antimicrobials (especially neomycin) and fragrance. This is probably because these compounds are frequently used in Asian countries.

European standard series is still popular among the Asian countries. These countries performed additional tests to confirm the diagnosis.

Japan: Closed scratch patch test
(eye drop).
Prick test & scratch patch test
(glycerine enema).

Thailand: Photopatch test for

- Sulfanilamide,
- Jadit
- Chlorpromazine
- Promethazine
- NSAIDS.

Singapore: Biopsy
(non-eczematous rash)

Medicament Allergy Studies in Asia Pacific

Medicament Hypersensitivity Reaction

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Thailand

Australia

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Australia

Australia

c) Plant & Plant Product Contact Allergy

Synopsis by

Dr. Rajalingam Ramalingam

Countries that perform research once/several times in contact allergy to plant during this 30-year study in descending orders are India, Japan, Thailand, Singapore, Malaysia, Philippines and Indonesia. In Japan, **hydrolysed wheat protein in facial soap** had caused wheat-dependent exercise-induced anaphylaxis. The Japanese had also observed anaphylaxis with **Soy-based cosmetics**. ***Hevea brasiliensis* latex** causing immediate hypersensitivity reaction (Refer to section 3) had been observed in Australia, New Zealand, Singapore, Malaysia, Thailand and Japan.

Contact Dermatitis to Phytoallergens

- India:** *Parthenium hysterophorus*, *Xanthium strumarium*, *Chrysanthemum morifolium*, *Dahlia pinnata*, *Tagetes indica* and *Helianthus annuus*.
- Japan:** *Cryptotaemia japonica*, Okra, Japanese lacquer tree/urushiol, Japanese cedar pollen, Eucalyptus species and *Tanacetum parthenium*
- Thailand:** Jasmine, Wooden rosary, *Compositae/Asteraceae*, *Quisqualis indica*, *Evernia furfuracea*
- Singapore:** Grass, Sesquiterpene lactone
- Malaysia:** Kacip Fatimah, Rengas and Turmeric
- Philippines:** Turmeric and phytoallergen
- Indonesia:** Rengas

Patch test allergens

- Singapore:** European standard series,
Rubber series
- India:** European standard series,
Indian standard series
- Malaysia:** European standard series,
Plant & textile series
- Thailand:** Modified European standard series
Additional Thai series,
Scandinavian standard series,
Sunscreen series
- Japan:** Japanese standard series

Investigations Beyond Patch test

- India:** Infra-red spectrophotometry

Singapore: Skin-prick test for latex, CAP-FEIA for latex

Japan: Specific serum IgE, histopathology

There is no apparent trend in phytoallergen. This is due to the wide variety of phytoallergen explored in the various countries. This in turn can be attributed to the heterogeneous nature of local cottage industries or agriculture-based practices, which vary greatly from one country to another. Nevertheless, in India, it is noted that the common plant allergens are largely the same in the 1990s and early 2010s, while in Japan, a bigger variety of plant allergens were reported.

Plant Allergy Studies in Asia Pacific Region

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d) Contact Allergy to Food in Asia

Synopsis by Dr. Rajalingam Ramalingam

Countries that had performed several studies in contact allergy to food during this 30-year study in descending frequency are, Japan, India and Thailand, Singapore, Malaysia and Philippines. These are the allergens identified in contact dermatitis to food.

Japan: Pacific flying squid,
white kidney beans
& fish

India: Garlic

Garlic that had caused a Type IV allergy in India in 2018 is also capable of inducing a Type I reaction as reported in Japan in 2015. The following are other **urticariogenic foods** that had been reported in different countries.

Japan: Chestnut (anaphylaxis),

	Chitosan (anaphylaxis), Anasakis worm in sushi fish, Garlic and soy
Philippines:	Chicken meat
Singapore:	Prawn and lobster
Thailand:	Seafood
Australia:	Cheese and corn

India is using their local standard series for patch test. Whereas Japan and Singapore had performed investigations other than patch test to confirm the causative food allergens.

Japan:	Skin prick test, Scratch test, Specific IgE immunoblotting, chromatography, Mouse polyclonal & monoclonal antibodies, Mass spectrometric analysis, Electrophoresis
Singapore:	Skin prick test

Food Allergy Studies in Asia Pacific

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e) Contact Reaction to Animals

Hypersensitivity reaction

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SECTION 7

INVESTIGATIONS

Clinical Tests

- Patch Test Beyond Standard Series
 - Patch Test Reading

Laboratory Tests

- Screening tests
- Other confirmatory tests

Research List in Clinical Tests

Patch Test Beyond Standard Series

- | | |
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Screening tests

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Taiwan,
Thailand
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|--|----------|
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SECTION 8

OCCUPATIONAL DERMATOSES MANAGEMENT

- Disease Severity Index
 - Quality Of Life
 - OD Awareness
 - Education

PROGNOSIS

Occupational Dermatoses Management Studies

Disease Severity Index

- | | |
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Quality Of Life

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OD Awareness

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Skin Care

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MSDS

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Studies in Prognosis of Patients with Occupational Dermatoses

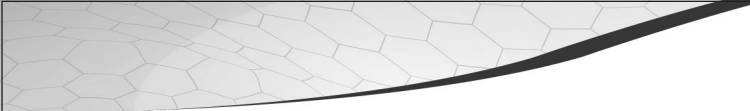
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ABBREVIATIONS

ABCD	Airborne Contact Dermatitis
Acad	Academy
ACD	Allergic contact dermatitis
Ag	Silver
APEOD	Asia Pacific Environmental & Occupational Dermatology
APEODS	Asia Pacific environmental & occupational Dermatology symposium
Arborist	Tree surgeon
Assoc	Association
Au	Gold
Australas	Australasian
Br	British
Captafol	Fungicide – N-(1,1,2,2-tetrachloroethylthio) -4-cyclohexene-1,2-dicarboximide
Captan	Fungicide
CD	Contact Dermatitis
CoCl ₂	Cobalt chloride
CU	Contact urticaria
CPPD	N-Cyclohexyl-N-phenyl-4-phenylenediamine
CUS	Contact urticaria syndrome
Dithiocarbamate	Pesticides ethylenebis
DMDM Hydantoin	1,3-Dimethylol-5,5-Dimethyl Hydantoin (Formaldehyde releaser)
DOI	Digital object identifier
ECG	Electrocardiogram
ELISA	Enzyme-linked immunoassay
Environ	Environmental
Euxyl K400	Methyldibromoglutaronitrile & phenoxyethanol
FEIA	Fluorescence Enzyme immunoassay
FMI	Fragrance Mix 1
FMII	Fragrance Mix II

Folpet	Fungicide
HCl	Hydrochloride
HCW	Health care workers
Hev	Natural rubber latex protein
Hg	Mercury
HWP	Hydrolysed wheat protein
ICD	Irritant contact dermatitis
IgE	Immunoglobulin E
Jan	January
JRRMMC	Jose R. Reyes Memorial Medical Center
K ₂ Cr ₂ O ₇	Potassium dichromate
Kathon CG (MCI/MI)	Combination of Methylchloroisothiazolinone & Methylisothiazolinone
Kojic acid	Chelation agent produced by several species of fungi, especially <i>Aspergillus oryzae</i> ,
Maneb	Pesticides manganese
MCI	Methylchloroisothiazolinone
MDBGN	Methyldibromoglutaronitrile
MDVI	Media Dermato Venerologica Indonesiana
Methamidophos	Pesticides
MI	Methylisothiazolinone
MSDS	Medical Safety Data Sheet
NiSO ₄	Nickel sulfate
NMSC	Non melanoma skin cancer
NRL	Natural rubber latex
OCD	Occupational contact dermatitis
OCDDSI	OCD disease severity index
OD	Occupational dermatoses
OICD	Occupational Irritant Contact Dermatitis
PACD	Photoallergic contact dermatitis
Pd	Palladium
<i>Pediatr</i>	Paediatric
PPD	Paraphenylenediamine
PTBF resin	p-tertiary-Butylphenol-Formaldehyde resin,
PVC	Polyvinyl chloride



QOL	Quality of life
RAST	Radioallergosorbent test
RC	Rubber chemical
SCC	Squamous cell carcinoma
SCCS	Scientific committee on Consumer Safety
SCD	Systemic contact dermatitis
SMI	Small medium industries
SPT	Skin prick test

ABBREVIATIONS

(Journal Titles)

Acta Derm Venereol
Acta Derm Venereol (Stockh)
Acta Stomatol Croat
Allergol Int
Am J Clin Dermatol.

Am J Contact Dermat.
Ann Acad Med Singapore

Ann Trop Med Public Health

Antimicrob Agents Chemother

Arerugī
Asia Pac Fam Med
Asian Pac J Allergy Immunol

Astrocyte
Aust Fam Physician
Australas J Dermatol
Australian Doctor
Biomedika

Br J Dermatol
Case Rep Dermatol
Clin Exp Dermatol.
Clinics in Dermatol
Contact Dermatitis
Curr Probl Dermatol
Current Dermatology Reports
Cutan Ocul Toxicol
Dermatitis

Acta Dermato-Venereologica
Acta dermato-venereologica
Acta stomatologica Croatica
Allergology International
American Journal of Clinical
Dermatology
American Journal of Contact Dermatitis
Annals, Academy of
Medicine, Singapore (AAMS)
Annals of Tropical Medicine and Public
Health
Antimicrobial Agents and
Chemotherapy
Allergy
Asia Pacific Family Medicine
Asian Pacific Journal of Allergy and
Immunology
Multidisciplinary Medical journal
Australian Family Physician
Australasian Journal of Dermatology
Australian Doctor
Online Journal of Faculty of Medicine of
University Muhammadiyah Surakarta
British Journal of Dermatology,
Case reports in Dermatology
Clinical Experimental Dermatology
Clinics in Dermatology
Contact Dermatitis
Current Problems in Dermatology
Current Dermatology Reports Journal
Cutaneous and Ocular Toxicology
Journal of American Contact Dermatitis

Dermatol Res Prac
Dermatol Sin
Dermatol Ther
Dermatology (Basel)

Drugs Real World Outcomes
Egypt J Dermatol Venerol.

Environ Dermatol
Exogenous Dermatol
Expert Rev Dermatol
Genitourin Med
HKL J Med

Ind J Aerospace Med
Indian Dermatol Online J.
Indian J Allergy Asthma
Immunol.
Indian J Comm Health
Indian J Dermatol
Indian J Dermatol Venereol
Leprol
Indian J Occup Environ Med

Indian J Paediatr Dermatol

Int Arch Allergy Immunol

Int Arch Occup Environ Health

Int Archives Occ Health

Int J Biomed Res

Society

Dermatology Research and Practice
Dermatologica Sinica
Dermatology and therapy.
Dermatology : International journal for
clinical and investigative dermatology.
Drugs - Real World Outcomes
Egyptian Journal of Dermatology and
Venerology

Environmental Dermatology
Exogenous Dermatology
Expert review of dermatology
Genitourinary Medicine
Hospital Kuala Lumpur Journal of
Medicine

Indian Journal of Aerospace Medicine
Indian Dermatology Online Journal
Indian Journal of Allergy, Asthma &
Immunology

Indian Journal of Community Health
Indian Journal of Dermatology
Indian Journal of Dermatology
Vereology & Leprology
Indian Journal of Occupational &
Environmental Medicine

Indian Journal of Paediatric
Dermatology

International archives of allergy and
immunology

International Archives
of Occupational and Environmental
Health

International Archives of Occupational
Health

International Journal of Biomedical

Int J Community Med Public Health

Int J Dermatol

Int J Occup Environ Health

Int J Res Dermatol

Intech Open

Interl Med J

Internet J Dermatol

IP Indian Journal of Clinical and Experimental Dermatology.

J Allergy

J Allergy Clin Immunol.

J Clin Exp Dermatol Res

J Clinical & Diagnostic Res

J Cosmet Dermatol

J Dermatol

J Dermatol Sci

J Dermatol Treat

J Drugs Dermatol

J Environ Anal Chem

J Eur Acad Dermatol Venereol.

J Formos Med Assoc

J Gen Proced Dermatol Venereol Indones

Research

International Journal Of Community Medicine And Public Health

International Journal of Dermatology

International Journal of Occupational and Environmental Health

International Journal Of Research In Dermatology

Publisher of open access books

Internal Medicine Journal

Internet Journal of Dermatology

IP Indian Journal of Clinical and Experimental Dermatology

Journal of Allergy

Journal of Clinical Immunology

Journal of Clinical & Experimental Dermatology Research

Journal of Clinical & Diagnostic Research

Journal of Cosmetic Dermatology

Journal of Dermatology

Journal of Dermatological Science

The Journal of dermatological treatment

Journal of Drugs in Dermatology

Journal of Environmental Analytical Chemistry

Journal of the

European Academy of Dermatology and Venereology

Journal of the Formosan Medical Association

Journal of general-procedural dermatology & venereology Indonesia

J Med Assoc Thai.	Journal of the Medical Association of Thailand = Chotmaihet thangphaet.
J Medula Unila	Medical Professional Journal of Universitas Lampung
J Occup Health Saf, Aust, NZ	Journal of occupational health and safety, Australia and New Zealand
J Occup Med	Journal of occupational medicine
J Occupational Safety & Health.	Journal of Occupational Safety and Health
J Pakistan Assoc Dermatol	Journal of Pakistan Association of Dermatologists
J Phil Dermatol Soc	Journal of the Philippine Dermatological Society (JPDS)
J Phil Med Assoc.	Journal of the Philippine Islands Medical Association
J Philippine Soc Cutaneous Med	Journal of Philippine Society of Cutaneous Medicine
J Preventive Med Assoc Thailand	Journal of Preventive Medicine Association of Thailand
J Prosthodontic Res.	Journal of Prosthodontic Research.
J Toxicol Sci	Journal of Toxicological Sciences
J Travel Med	Journal of Travel Medicine
JAAD	Journal of the American Academy of Dermatology
JAAD Case Rep	Journal of the American Academy of Dermatology Case Reports
Japanese J Latex Allergy	Japanese Journal of Latex Allergy
Jpn J Allergol	Japanese Journal of Allergology
Jurnal Kesehatan Masyarakat	Journal of Public Health
MADRAC Newsletter	Malaysian Adver Drug Reaction Advisory Committee Newsletter
Malaysian J Dermatol (MJD)	Malaysian Journal of Dermatology
Malaysian J Public Health Med	Malaysian Journal of Public Health Medicine
MDVI	Media Dermato-Venerologica

Med & Health
Med J Aust
Med J Malaysia (MJM)
Microbiol Immunol Infect

MJA
Modern Medicine
N Z Med J
Natl Med J India
Nippon Rinsho Jpn J Clin Med

Occ Env Med

Occup Med
Occup Med Health Aff

Pediatr Dermatol
Phil J Dermatol Dermatol Surg

Photodermatol Photoimmunol
Photomed
Regulatory toxicology and
pharmacology
Science Total Environ
Singapore Med J
Siriraj Med J
Skin Res Technol
South Asian J Cancer
Thai J Dermatol.
Thammasat Med J

Indonesiana
Medicine & Health
The Medical Journal of Australia
Medical Journal of Malaysia
Journal of Microbiology, Immunology
and Infection
The Medical Journal of Australia
Modern Medicine
The New Zealand Medical Journal
National Medical Journal of India
Nippon rinsho. Japanese Journal of
Clinical Medicine
Occupational and Environmental
Medicine (OEM)
Occupational Medicine
Occupational Medicine and Health
Affairs
Pediatric Dermatology
Philippine Journal of Dermatology and
Dermatologic Surgery
Photodermatology, photoimmunology &
photomedicine
Regulatory toxicology and
pharmacology
The Science of the Total Environment
Singapore Medical Journal
Siriraj Medical Journal.
Skin Research & Technology
South Asian Journal of Cancer
Thai Journal of Dermatology
Thammasat Medical Journal

