

Workshop VI - GA Antalya, 7.Sept. 2011

☛ **Joint WS of Permanent Committees**

Breeding and Cultivation of Medicinal Plants and Manufacturing and Quality Control of HMPs

PC Chairs: Chlodwig Franz / Clemens Erdelmeier

Topic:
**„Plant Protection Products and other non-biological
Contaminants in Herbal Materials“**

Table 1. Classification of major contaminants and residues in herbal medicines I

Contaminants					
General classification	Group	Subgroup	Specific examples	Possible sources	Stage of production at which detectable ^a
Chemical contaminants	Toxic and hazardous materials	Toxic metals and non-metals	Lead, cadmium, mercury, chromium (arsenic, nitrite)	Polluted soil and water, during cultivation/growth, manufacturing process	1,2,3,4
		Persistent organic pollutants	Dioxin aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex	Polluted air, soil and water, during cultivation/growth	1,2,3,4
		Radionuclide	Cs-134, Cs-137	Air, soil, water during cultivation/growth	1,2,3,4
		Biological toxins	Mycotoxins	Post-harvest processing, transportation and storage	2,3,4
			Bacterial endotoxins	Post-harvest processing, transportation and storage	1,2,3,4
Biological contaminants	Micro-organisms	Bacteria	<i>Staphylococcus aureus</i> , <i>Pseudomonas aeruginosa</i> , <i>Salmonella</i> species, <i>Shigella</i> species, <i>Escherichia coli</i>	Soil, post-harvest processing, transportation and storage	1,2,3,4
		Fungi	Yeast, moulds	Post-harvest processing, transportation and storage	1,2,3,4
	Animals	Parasites	Protozoa – amoebae, Helminths – nematoda	Soil, excreta; organic farming/cultivation, manufacturing process	1,3,4
		Insects	Cockroach and its parts	Post-harvest processing, transportation and storage	1,2,4
		Others	Mouse excreta, earthworms, acarus	Post-harvest processing, transportation and storage	1,2,4
Solvents		Organic solvents	Acetone, methanol, ethanol, butanol	Soil and water, during cultivation/growth, manufacturing process	1,2,3,4

^a Stage of production at which detectable: 1, medicinal plants; 2, herbal materials; 3, herbal preparations; 4, finished herbal products.

Source:
WHO Guidelines for
Assessing Quality of herbal
medicines with reference to
contaminants and residues,
World Health Organization
2007



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Table 1. Classification of major contaminants and residues in herbal medicines II

Residues					
General classification	Group	Subgroup	Specific examples	Possible sources	Stage of production at which detectable ^a
Agrochemical residues	Pesticides	Insecticides	Carbamate, chlorinated hydrocarbons, organophosphorus	Air, soil, water, during cultivation/growth, post-harvest processing	1,2,3,4
		Herbicides	2,4-D, 2,4,5-T	Air, soil, water, during cultivation/growth, post-harvest processing	1,2,3,4
		Fungicides	Dithiocarbamate	Air, soil, water, during cultivation/growth	1,2,3,4
	Fumigants	Chemical agents	Ethylene oxide, phosphine, methyl bromide, sulfur dioxide	Post-harvest processing	2,3,4
	Disease control agents	Antiviral agents	Thiamethoxam	During cultivation	1,2,3,4
Residual solvents		Organic solvents	Acetone, methanol, ethanol, butanol	Manufacturing process	3,4

^a Stage of production at which detectable: 1, medicinal plants; 2, herbal materials; 3, herbal preparations; 4, finished herbal products.

Source:

WHO Guidelines for Assessing Quality of herbal medicines with reference to contaminants and residues, World Health Organization 2007

Workshop VI - Program

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Legal Requirements for the Control of Contaminants
in Herbal Medicinal Products

Dr. Meihua Yang

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China*

The Application of Pesticides in the Production of
Medicinal Plants in China

Dr. Bernhard Klier

PhytoLab GmbH & Co.KG, Vestenbergsgreuth, Germany

Pesticide Testing according to the European Pharmacopoeia (Ph.Eur.)
-legal Requirements and Practical Approach

Dr. Andreas Hofmann

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Environmental Contaminants – Heavy Metals Origin
– Analytical Methods – Points to Consider