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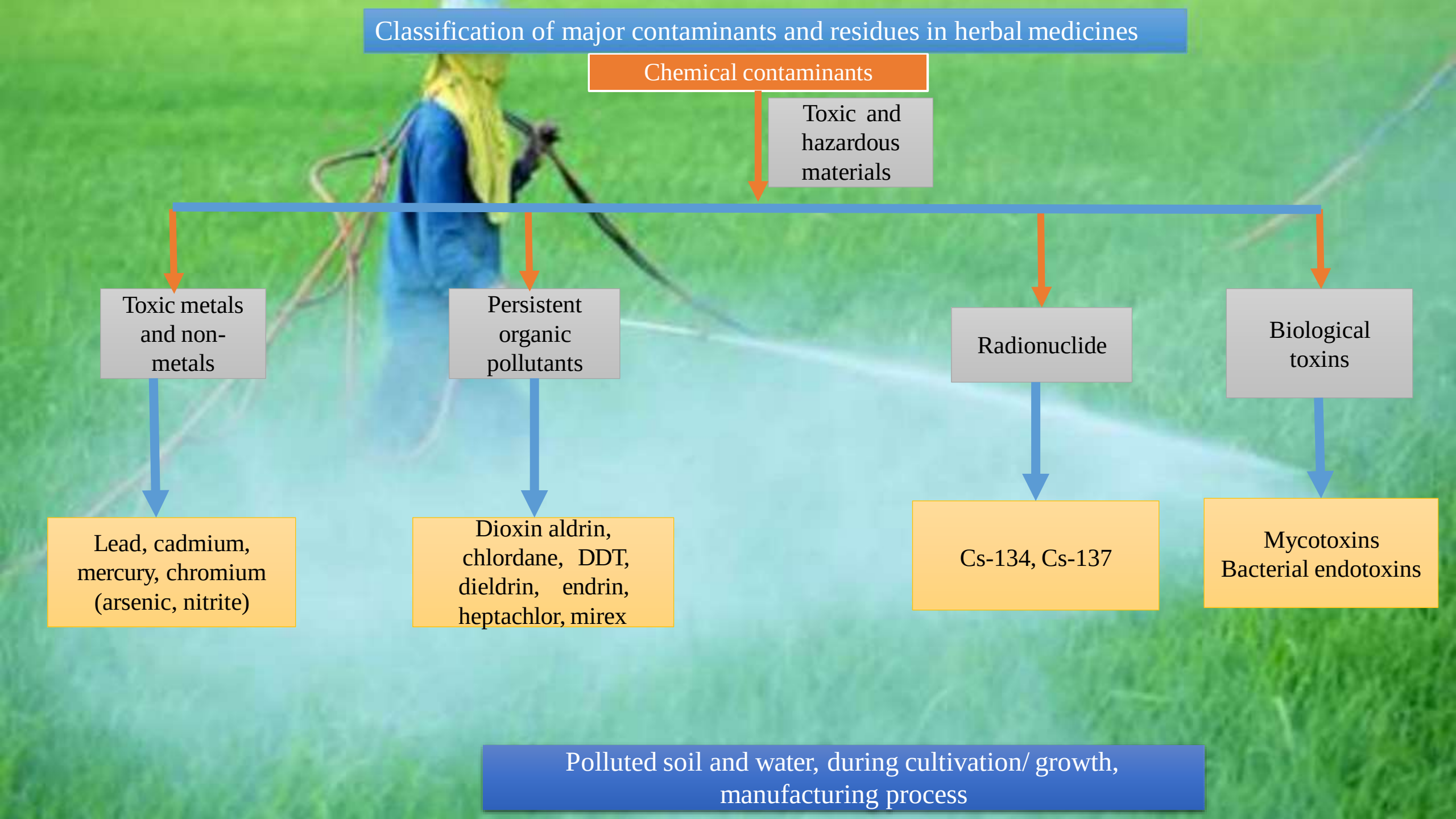
Limit test for heavy metal-lead

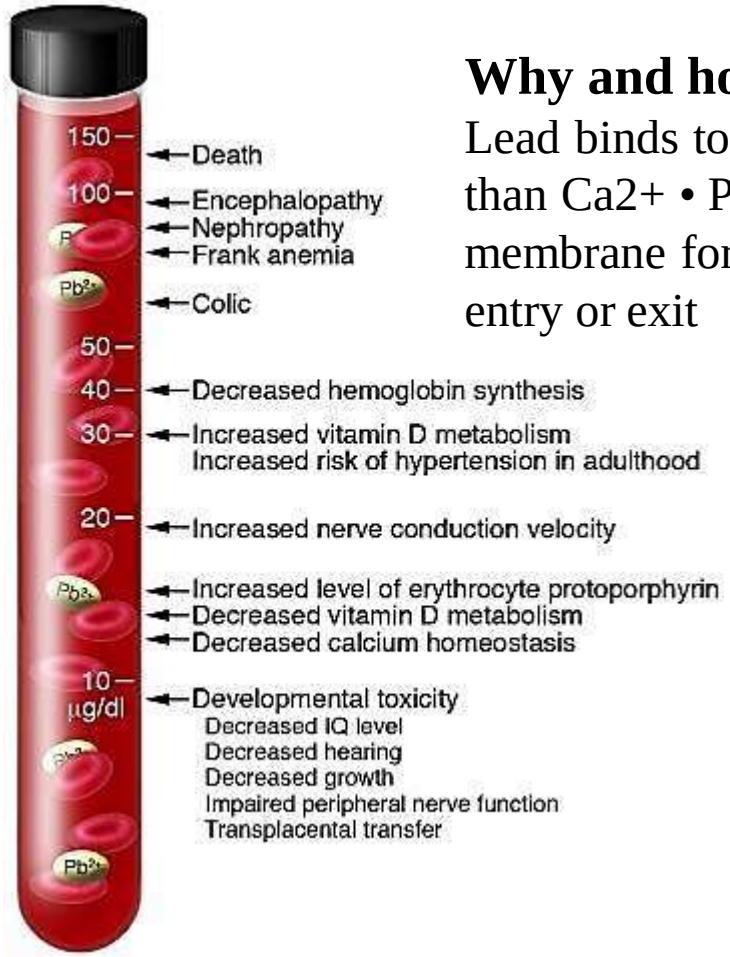

Classification of major contaminants and residues in herbal medicines
Chemical contaminants
Toxic and hazardous materials
Toxic metals and non-metals
Persistent organic pollutants
Radionuclide
Biological toxins
Lead, cadmium, mercury, chromium (arsenic, nitrite)
Dioxin aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex
Cs-134, Cs-137
Mycotoxins
Bacterial endotoxins
Polluted soil and water, during cultivation/ growth, manufacturing process

WHO recommendations-
10 mg/kg

Examples of national limits for lead metal in herbal medicines and products

For herbal medicines

Canada	raw herbal materials	10 ppm
	finished herbal products	0.02 mg/day
China	herbal materials	10 ppm
Malaysia	finished herbal products	10 mg/kg
Republic of Korea	herbal materials	
Singapore	finished herbal products	20 ppm
Thailand	herbal material, finished herbal products	10 ppm



Why and how this is hazaradous

Lead binds to calcium-activated proteins 105 times than Ca2+ • Pb2+ and Ca2+ compete at the plasma membrane for transport systems, which affect their entry or exit

Limit test for toxic metals lead in extracts

Test solution:-

Ignite 0.3 g of extracts to ash

3 ml of dilute HCl

filter

Wash the residue with two 5 ml portions of water

Neutralize

ammonia

Add 2 ml of dilute acetic acid and water to make 50 ml

Cntrol solution:-

3 ml of dilute hydrochloric acid add 3 ml of standard lead solution 1 ppm, and water to make 50 ml, remaining as test.

Procedure

Add 1 drop of sodium sulfide to both the test solution and to the control solution.

Mix thoroughly

Allow to stand for 5 minutes.

Then compare the colours of the two solutions by viewing the tubes downwards or transversely against a white background

The test solution has no more colour than the control solution.

(1) Preparation of Test Solution and Control Solution. Unless otherwise specified, proceed as directed below. Test Solution Weigh the specified quantity of a sample, transfer into a platinum or quartz crucible, moisten with a small amount of sulfuric acid, and ignite slowly at a temperature as low as possible until the sample is almost incinerated. Cool, add 1 ml of sulfuric acid, heat slowly, and ignite at 450℃ to 550℃ to incinerate. Dissolve the residue in a small amount of diluted nitric acid (1 → 150), add diluted nitric acid (1 → 150) to make 10 ml. Control Solution Measure 1.0 ml of Lead Standard Solution, add diluted nitric acid (1 → 150) to make 10 ml.

(2) Test Unless otherwise specified, proceed as directed below. Measure the atomic absorbance in the flame type method for the test solution and the control solution under the conditions given below. The absorbance of the test solution does not exceed that of the control solution. Operating Condition Light source: Lead hollow cathode lamp Analytical line wavelength: 283.3 nm Supporting gas: Air Inflammable gas: Acetylene

Method 2 (1) Preparation of Test Solution : Unless otherwise specified, proceed as directed below. Weigh the specified quantity of a sample, transfer into a polytetrafluoroethylene decomposition-vessel, add 0.5 ml of nitric acid to dissolve, seal up the vessel, and heat at 150℃ for 5 hours. After cooling, add water to make exactly 5 ml, and use this solution as the test solution.

(2) Test Unless otherwise specified, perform the test as directed below. Prepare at least 3 solutions containing the same volume of the test solution and perform tests as directed in the standard addition method under the Atomic Absorption Spectrophotometry (electrothermal type) under the operating conditions below. The standard solution is prepared by measuring exactly a suitable volume of Standard Lead Solution and adding water. To the sample solution, the same volume of palladium nitrate TS is added and mixed well. Perform a blank determination with a solution prepared by adding water to exactly 10 ml of nitric acid to make exactly

B. GENERAL TESTS 100 ml, and make any necessary correction.

Operating Conditions Light source: Lead hollow cathode lamp.

Analytical line wavelength: 283.3 nm.

Temperature for drying: 110℃. Temperature for incineration: 600℃. Temperature for atomizing: 2100℃.