

# Heavy Metals Profiling of Medicinal Plants - Exigent Safety Strategy

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**Editorial**

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## Editorial

The use of plant and herbal products in treatment of ailments is as old as mankind. Herbal medicines being natural are still preferred to contemporary synthetic or allopathic medicines by a major section of the world. According to the World Health Organization (WHO), 80% of the world population still relies on traditional or herbal medicines for their basic health care needs [1]. The major merits of herbal medicine seem to be their perceived efficacy, low incidences of serious adverse effects and comparatively lower cost. Nowadays, medicinal plants are worldwide being extensively explored in pursuit of novel therapeutic entities.

Environment is continuously being polluted with hazardous chemicals and heavy metals due to dynamic development of industries and urbanization along with extensive use of pesticides and fertilizers. Some of the heavy metals namely arsenic, lead, cadmium and mercury are essential for neither plants nor animals and these are insidiously toxic. Plants are susceptible to environmental conditions and they can accumulate these heavy metals in their harvestable parts (leaf, root, bark seed etc) and intensity of this uptake process may change the overall elemental composition of the plant. These heavy metals get accumulated in the plants growing in the polluted areas, which subsequently enter the human food chain via plant parts and extracts or preparations thereof. The environmental impact of these metals as well as their adverse health effects has been a source of major concern worldwide. The possibility that the toxic heavy metals can

be translocated to humans and animals through the use of plants grown in polluted areas is a major apprehension for traditional and herbal medicine [2]. Nowadays, Indian medicinal plants have been regarded as a potential source of heavy metal toxicity to both human and animals [3]. The most common heavy metals implicated in human toxicity include arsenic, lead, cadmium and mercury although nickel and chromium may also cause toxicity. Except nickel, WHO prescribes limits of rest five toxic heavy metals in raw medicinal plants [1]. In India, likewise WHO, the Ayurvedic Pharmacopoeia of India recommends that medicinal plants, which form the raw materials for most Ayurvedic remedies, should be checked for the presence of the first four above said heavy metals especially and prescribes quantitative limits for them [4]. However, majority of Indian people, living in areas where these plants grow, harvest them locally for their own medicinal use without formally checking for heavy metal accumulation. Most of the Indian Ayurvedic and herbal manufacturing companies procure the raw herbs from commercial suppliers/vendors and use in formulations without checking them for heavy metals. Consumption of herbal products prepared from the medicinal plants, grown in polluted sites can cause serious consequences on human health. For getting desirable therapeutic benefits and to get rid of untoward effects, quality of these raw herbs must be ensured in terms of heavy metal contamination. Due to this reason, WHO advocates that herbs and herbal products should

not be used without qualitative and quantitative analysis of their heavy metals contents [1].

The medicinal plants-related trade in India has been estimated at Rs 5000 crores per annum with an annual growth rate of 7-15%, may experience serious consequences if heavy metal accumulation beyond permissible limits is detected [5]. Therefore, compulsory assessment of these hazardous heavy metals in raw herbal material and excipients (if used) must be carried out. Regular and systematic analysis of raw medicinal plants on quantitative basis is necessary to check the levels of the heavy metal pollutants prior to using them for consumption or manufacture of herbal or Ayurvedic medicinal formulations so that the possible contamination cannot reach up to the finished herbal products. Heavy metals profiling of raw herbs should be prioritized, so that the possible contamination could be detected and arrested at in process level. This is regarded as raw material quality assurance strategy for production of better, safe and efficacious Ayurvedic and herbal formulations.

## References

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