

Chemical and Health Assessment of Bakhour: Risks of Traditional Practices

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Abstract : Bakhour, or Arabian incense, is traditionally used to perfume houses, shops and clothing as part of cultural or religious practices in several Middle Eastern countries. Conventionally, Bakhour consists of a mixture of natural ingredients such as chips of agarwood (oud), musk and sandalwoods that are soaked in scented oil. Bakhour is usually burned by charcoal or by using gas or electric burners to produce the scented smoke. It is necessary to evaluate the impact of such practice on human health and environment especially that the burning of Bakhour is usually done on a regular basis and in closed areas without proper ventilation. Although significant amount of research has been reported in scientific literature on the chemical analysis of various types of incense smoke, unfortunately, only very few of them focused specifically on the health impacts of Bakhour. Raw Bakhour samples, their smoke emissions and the ash residue were analyzed to assess the existence of toxic ingredients and their possible influence on health and the environment. Three brands of Bakhour samples were analyzed for the presence of harmful heavy metals and organic compounds. Thermal Desorption Gas Chromatography-Mass Spectrometry (TD-GC-MS) was used to identify organic compounds while Inductively Coupled Plasma (ICP) and Scanning Electron Microscope-Energy Dispersive X-Ray Spectrometer (SEM-EDS) were used to analyze the presence of toxic and heavy metals.. Organic compounds from the smoke were collected on specific tenax and activated carbon adsorption tubes. More than 850 chemical compounds were identified. The presence of 19 carcinogens, 23 toxins, and 173 irritants were confirmed. Additionally, heavy metals were detected in amounts similar to those present in cigarettes. However, it was noticed that many of the detected compounds in the smoke lacked clinical studies on their health effects which shows the need for further clinical studies to be devoted to this area of study.

Keywords : bakhour, incense smoke, pollution, indoor environment, health risk, chemical analysis

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