

Studies of poly aromatic hydrocarbons on wood smoke and smoked fish

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Abstract

Smoked food is popular all over the world due to its taste, flavour and keeping qualities. However, there are sufficient evidence to prove that wood smoke contains mutagenic and carcinogenic poly aromatic hydrocarbons (PAHs). Even though smoking of fish and other food has been practiced in Sri Lanka for a long period, no sufficient studies have been carried out to determine the PAH emission of the existing smoking methods. This study was therefore focused on to find whether the existing smoking methods in Sri Lanka and wood species used for smoking are safe in the sense of PAHs present.

In this study, PAH emissions of five woods species (Mango, Jackfruit, Coconut Shells, Cinnamon and Madan- Zyzigium) and smoked fish products using three different wood species (Cinnamon, Jack and Lunumidella) were analyzed using a HPLC. The smoking carried out using a locally built smoker to simulate the smoking of fish in rural areas in Sri Lanka. Smoke samples collected using a personal sampling pump, glass fiber filter papers and sorbent tubes. Wood smoke and smoked fish analyzed for 16 PAHs (US EPA priority pollutants).

Smoke generated by all five woods contained light PAHs in large quantities. The heavy or the most toxic PAHs also detected on all wood species but Madan (Zyzigium cumini) and Jack wood (A.Heterophyllus) contained higher quantities heavy PAHs compared to other three wood species. B(a)p detected in Jack (1.35 µg/liter), Madan (11.77 µg/liter) and Coconut Shells(0.48 µg/liter). PAH contents detected on smoked fish were very higher compared to the wood smoke. Smoked fish from wood species jack, Cinnamon and Lunumidella contained B(a)p 38.77 µg, 2033.87 µg, 968.38 µg respectively per 100g of smoked fish. Results of this study revealed that the local fish smoking methodologies (direct exposure to flue gas) generate higher amounts of toxic PAHs and hence local smoking methods are extremely unsafe in the sense of PAH toxicity.

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