

Evaluation of Polycyclic Aromatic Hydrocarbons (PAHs) in Smoked Catla (*Catla catla*) Harvested from Selected Reservoir with Different Combustion Materials and Storage Conditions

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Smoking is one of the oldest techniques of fish preservation and at present smoked fish has higher consumer demand due to their specific taste and aroma which is generated using partial combustion of woods. But, accumulation of carcinogenic Polycyclic Aromatic Hydrocarbons (PAHs) through the wood smoke is a major problem associated with smoked fish. Hence, the present study was carried out to evaluate the carcinogenic PAHs levels and their penetration with the storage time in smoked Catla (*Catla catla*). Freshly harvested Catla fishes (2.5 – 9.7 kg) were (n=3) brought from Handapanagala reservoir, Monaragala and equal size (6 × 5 × 2.5 cm³) fish cubes were smoked in electrical smoker (180 °F for 1.5 hrs.) using Cinnamon (*Cinnamomum verum*) and Mahogany (*Swietenia macrophylla*) wood smoke separately and stored at -20 °C. Acetonitrile extract of smoked and raw fish samples were treated with a mixture of anhydrous MgSO₄: NaCl followed by a mixture of MgSO₄: silica propylsulfonic acid cation exchanger to extract and purify PAHs at predetermined time intervals as day 1 and day 7(QuEChERS). Outer layer and center part of the smoked fish were analyzed for sixteen PAHs by Dionex Ultimate 3000 UHPLC system equipped with Hypersil Green PAH column (250 mm x 4.6 mm x 5 μm) and Diode Array detector (254 nm, 1 ml/min, Acetonitrile: water gradient elution) separately and compared with standards. Moisture content and crude fat content of raw fish samples were also analyzed. Indeno[1,2,3-*cd*]pyrene was detected in one of the raw fish sample, while Benzo[*a*]pyrene, Benzo[*ghi*]perylene, Indeno[1,2,3-*cd*]pyrene were detected in fish samples smoked with Cinnamon wood. Indeno[1,2,3-*cd*] pyrene was found to be the most abundant PAH and it varies between 198 – 212 μg kg⁻¹. No pattern of penetration of PAHs to center was observed. Detectable amounts of PAHs were not found in any of the samples smoked with Mahogany wood. Therefore, it can be concluded that modern smokers under controlled conditions produce lower levels of PAHs and Mahogany wood could be a suitable wood type to smoke *Catla catla*.

Keywords: Polycyclic aromatic hydrocarbons; Catla; QuEChERS method; Cinnamon; Mahogany