A RAPID METHOD FOR HIGH PERFORMANCE LIQUID CHROMATOGRAPHIC DETERMINATION OF POLYAROMATIC HYDROCARBONS [CHRYSENE, DIBENZANTHRACENE AND BENZO(A)PYRENE] IN PROCESSED SARDINE FISH MEAT

Ö. Tokuşoğlu*, S. Cesur**, M.K. Ünal† & F. Yemiş*

*Celal Bayar University Department of Chemistry, 45040, Muradiye, Manisa, TURKEY.
** Ege University, Drug and Farmacokinetic Research and Application Center, 35100, Bornova, İzmir, TURKEY.
†Ege University, Department of Food Engineering, 35100, Bornova, İzmir, TURKEY.

Polyaromatic hydrocarbons (PAHs) that are crucial organic compounds contaminate environment and ground water basically by the food processing, food additives, environment pollution and endogenic or biosynthesis by plants and microorganisms.

In this research, polyaromatic hydrocarbons (PAHs) [Chrysene, Dibenzanthracene and Benzo(a)pyrene] of two species of Sardine fish meat (Sardina Pilchardus) were determined by reversed-phase HPLC with UV detection. An optimized isocratic HPLC procedure using Hypersil-ODS column (5-µm, 250 x 4.6 mm) with acetonitril including 0.1%(v/v) acetic acid as a mobile phase, UV detection at 254 nm and 1 ml/min of flow rate was used for separation of these PAH compounds. PAH standards had linear calibration curves through the origin \( R^2 = 0.9999 \). Analytical precision of the method analysis were obtained within the 95% confidence limits and mean recoveries were 100 %, 99.6%, 99.8 % for Chrysene, Dibenzanthracene and Benzo(a)pyrene, respectively.

The alterations in PAH contents at different process conditions of sardine meats as salt cured, commercially processed, deep-fat fried, hot smoked, broiled and grilled were obtained. Sardine fish samples contained primarily Chrysene (CRY) \( (p<0.01) \). Deep-fat fried sardine in microwave contained 1.78 µg/g CRY \( (p<0.01) \) whereas hot smoked sardine contained 3.17 µg/g CRY \( (p<0.01) \). CRY contents of broiled samples were 0.02 µg/g CRY \( (p<0.01) \) whereas commercially processed samples contained 0.58 µg/g CRY \( (p<0.01) \). Dibenzanthracene(DBA) was major polyaromatic hydrocarbon (PAH) in hot smoked sardine fish meat (16.23 µg/g) \( (p<0.01) \) whereas benzo(a)pyrene (BAP) was not detectable.

These study was rapid for routine analysis of quantitative identification of Polyaromatic hydrocarbons (PAHs) [Chrysene, Dibenzanthracene and Benzo(a)pyrene] in seafood industry.