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Short Communication

Organochlorine Pesticides in Three Fish Samples

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I. Introduction

Use of organochlorine pesticides (OCP) is forbidden in Bangladesh, but evidences of the presence of OCP were found in the environmental samples (fish, dry fish, and poultry feed)[1-2] and through the food chain in human blood samples as well[3-4]. The cause may be illegal trafficking of banned OCP from neighboring countries where OCP are allowed to use in health sector and pilferage from large stockpiles of OCP in the three godowns of Bangladesh[5]. Fish is one the most suitable bio-concentrators to identify OCP[6]. In continuation of our work on OCP, we are now reporting residual level of DDT (1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane) and its metabolites in three large sizes fish samples, *Labeo rohita* (rui), *Katla katla* (katla) and *Pangasius pangasius* (pangus).

II. Methods and Materials

Three fish samples, rui (n=10), katla (n=10) and pangus (n=10) were purchased from Dhaka New Market, Polashi Bazar, Azimpur Bazar, Kaptan Bazar, Mirpur Bazar, Gabtoli Bazar and from the local markets of Chuadanga, Savar, Munshigonj and Gazipur districts (the average sizes of the fish samples were ~ 2.5 kg). The collected fish samples were washed in water, wrapped with aluminium foil and kept in a chilled box, transferred immediately to the laboratory and stored below -15^{o}C until analysis was carried out.

All the chemicals, reagents and solvents were analytical and HPLC grade (purity 99.99%). Anhyd. Na_2SO_4 was heated at 200^{0}C (4 h) and cooled before use. Certified standard of OCPs were purchased from Dr. Ehrenstrofer GmbH, Augsberg-Germany. All glass apparatus were cleaned and dried at 250^{0}C, cooled and wrapped with Al-foil before use. Gas chromatograph (Shimadzu-17A) with an electron capture detector (ECD) was used for the analysis of OCP[1-5]. Injector and detector temperatures were set at 230º and 240ºC, respectively. Separations were performed on quartz capillary columns (SUPELCO SPB-50 & SPB-5; both of 30 m x 0.32 mm *i.d.*) at 130 (1 min) to 230ºC (10 min) and 5 ^{o}C per min (split ratio 1:76) where helium and nitrogen were used as carrier (2 mLmin^{-1}) and make-up gases, respectively.

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Extraction and clean-up

Edible parts of the fish samples were extracted by solid disperssion method, cleaned up by conc. H_2SO_4 treatment and the cleaned extracts were analyzed by GC-ECD[7].

III. Results and Discussion

Limit of detection (LOD) (S/N; 3:1) and Limit of quantification (LOQ) (S/N ratio, 9:1) for DDT, DDE and DDD were found to be 0.39, 0.39, 0.50 and 1.36, 1.36 and 1.5 ppb, respectively whereas recoveries for the three compounds were found 74, 81 and 93%, respectively. The standard calibration curves were linear with correlation coefficient (r^2) 0.987, 0.985 and 0.997 for DDE, DDD and DDT, respectively.

Residue levels of *p,p´*-DDT, *p,p´*-DDD and *p,p´*-DDE in rui, katla and pungus fish samples were found to be in the range 3-192, 3-24, 4-67; 3-511, 0-59, 2-109 and 5-78, 0-16, 1-28, (∑DDTs; 10-279, 6-669 and 8-113) ngg^{-1} fresh fish samples, respectively which are below Maximum Residue Limits (MRL)[8]. The percentage ratio of ∑DDTs/DDT were found to be 0.59, 0.68 and 0.57 for rui, katla and pangus, respectively which indicated their recent and ongoing uses. Although the residue levels are below MRL, but the long term consumptions will accumulate in fatty tisues in human subjects, and will cause chronic toxic effects.

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