STUDIES ON PESTICIDE ACCUMULATION IN SELECTED FISH SPECIES IN KOLE WETLANDS OF CENTRAL KERALA

UGC Reference No. F. 2253-MRP/15-16/ KLCA025/UGC-SWRO dated 25 APR 2016

Dr.Sushama.S, Associate Professor, Department of Zoology

The Kole lands form one of the rice granaries of Kerala are part of the unique Vembanad-Kole wetland ecosystem comprising of 151250 ha included as a Ramsar site in 2002. This wetland come under the 'Central Asian-Indian Flyway' (Anonymous, 1996) and serves as 'stepping stone' for the trans-continental migrant birds. It is found that the wetland system supports 20000 residential as well as migratory water birds. About 91 species of resident/local migratory and 50 species of migratory birds are found in the Kole area. Kole supports eight Red data book species birds according to the IUCN category .Among the various goods and services provided by the Kole wetlands, rice cultivation, fishing, mining, water transport and tourism, are important on-site activities which are marketed. Apart from the goods and services which have direct market value, the Kole lands provides a number of ecological services in the form of flood control, recharge of groundwater, nutrient retention, habitat and nesting place for migratory birds, support of plant and animal diversity which does not have a direct market value.

Organochlorine pesticides have been used widely in agriculture, as well as, in mosquito, and termite control programs. India is the only country still manufacturing and consuming DDT. Studies have shown that DDT is still in its highest concentration in biota of some areas. It is a hydrophobic molecule which upsets ionic channels like Na^+/K^+ pumps in nervous cell membrane leading to automatic stimulation of neurons and involuntary contraction of muscles.

The persistent nature of organochlorine residues in the environment may pose the problem of chronic toxicity to animals and humans via air, water and food intake. Many of these OC pesticides and their metabolites have been implicated in a wide range of adverse human and environmental effects including reproduction and birth defects, immune system dysfunction, endocrine disruptions and cancer .The determination of OC residues in fish, may give indication of the extent of aquatic contamination and accumulation characteristics of these compounds in the tropical aquatic biota that will help in understanding the behaviour and fate of these persistent chemicals. For the conservation of wetlands an understanding of the pesticide contamination status of fishes is indispensable. Fishes were collected from kole lands and tested for pesticide residues. Sample were analysed 31 pesticide residues such as for Dichlorvos, Trifluralin, Phorate, BHC-alpha, BHC-beta, BHC –delta, Parathion-methyl, Chlorpyrifos-methyl,Heptachlor,Transfluthrin,Alachlor,Aldrin,Malathion,Chlorpyrofos, Fenethion, Parathion, Chlorfenvinphos, Chlordane-trans(gamma),Chlordane-cis(alpha),DDE-o,p',DDD- o,p, DDD- p,p', DDT-o,p',DDT-p,p' Endosulfan sulphate ,EndosulfanI, EndosulfanII, Dieldrin Endrin and Ethion .DDT and Chlorpyrifos were above detectable limit and all other pesticides were below detection level. Three isomers of DDT (DDT, DDE and DDD) and metabolite (*p,p'* DDE) were detected in the samples. These pesticides effect human health through food chain hence their regular monitoring at all trophic levels is strongly desirable. Hence unless the stakeholders of kole adopt more sustainable procedures, this pristine system will not survive the pressures of the so called development.