

Assessment of Hazardous Antibiotics and Pesticides in Shrimp and Fish of Bangladesh

Fisheries sector plays an important role in the economy of our country in terms of nutrition, income generation, employment and foreign exchange earnings. Shrimp farming is one of the most important economic activities in the south and south-west parts of the country from the last three decades. But now-a-day's export of shrimp faces difficulties due to malpractices in shrimp processing and culture. Such as few banned antibiotics like Nitrofurans, Chloramphenicol, Malachite green, Leuco malachite green etc. are accumulating in shrimp which are zero tolerable by EU. In this study, Fifty six (56) samples of prawn and shrimp were analyzed for residual identification of Nitrofurans collected from Rampal, Bagerhat sadar, Mongla and Mollarhat Upazilla of Bagerhat. All of these samples were shell on. Among these analysed samples, seven (07) samples were considered as non-compliant due to presence of Nitrofuran metabolites at a concentration of 4 ppb, 1 ppb and 2 ppb respectively from Rampal, Fokirhat as well as Bagerhat sadar upazilla. A total three (03) active ingredients named Organophosphorus compound, Carbamate and Pyrethroidai of pesticides with 28 trade names *viz.* Mapzinon 10 G, Razdhan 10 G, Solar 55 EC, Dursban 20 EC, Rain 48 EC, Petrofos 20 EC, Gola 48 EC, Kirifos, Marine 20 EC, Curaterr 5G, Briker 5G, Green furan 5G, Carbofuran, Bifuran 5G, Furadan 5G, Agrifuran 5G, Cartap 50 SP, Cetap 50 SP, Actara 25WG, Fayfanon 57EC, Ashathion 57 EC, Jubas 2.5 EC, Karate 2.5 EC, Fighter 2.5 EC, Marshal 6G, Shobicron 425 G, Agromethrin 10 as well as EC were used by the respondents farmers among various Upazillas of Khulna and Bagerhat District during rice cropping. The rate of application was not so high which varied from 0.5-10 kg/L per hectare of land. Among the total respondent of 94% was applied pesticides for controlling pests and 5% respondent for biological control and pest management, whereas, 1% respondent did not use any technique for pest control. The farmers used three Organophosphates such as Diazinon, Thiamaxam and Malathion including 5 trade names *viz.* Mapzinon 10 G, Razdhan 10 G, Actara 25WG, Fayfanon 57EC as well as Ashathion 57 EC. They used three Organocarbamates such as Carbofuran, Cartap and Carbosulfan including 10 trade names *viz.* Curaterr 5G, Briker 5G, Green furan 5G, Carbofuran, Bifuran 5G, Furadan 5G, Agrifuran 5G, Cartap 50 SP, Cetap 50 SP as well as Marshal 6G and three Pyrethroids such as Chlorpyrifos, Cyhalothrin and Cypermethrin of 12 trade names *viz.* Solar 55 EC, Dursban 20 EC, Rain 48 EC, Petrofos 20 EC, Gola 48 EC, Kirifos, Jubas 2.5 EC, Karate 2.5 EC, Fighter 2.5 EC, Shobicron 425 G, Agromethrin 10 and EC as well. The pesticide groups of Organophosphorus and Carbamates used by 40% and 38% of the respondent farmers respectively. Total 15% farmers were used pyrethroid in their rice crop during the winter period. The various groups of pesticides were used in order of 36% of Carbofuran, 17% of Chloropyriphos, 12% of Malathion, 11% of Diazinon, 7% of Cyhalotrin, 7% of Cypermethrin, 3% of Carbosyphan and 1% of Thiomax respectively by the respondent farmers.

In case of dried fish products, the obtained results in the samples from different sampling sites viz. Khulna New market, Moilapota, Khalishpur of Khulna; Nagirartek, Khuruskhul, Borobazar of Cox'Bazar; Asadgonj, Reajuddin Bazar and Chittagong New Market of Chittagong are alarming for the consumers of Bangladesh. Most of the samples contained DDT. DDT residues in the samples of Bombay duck (dried product) ranged from 13.7 - 874.35 ppb. All samples of Chinese Pomfret (dried product) contained DDT residues ranged from 2.81 - 877.82 ppb. The mean concentration DDT residues of Ribbon fish (dried product) ranged from 3.73 - 253.68 ppb. The range of DDT residues in shrimp spp. recorded 4.27 - 585.97 ppb. In case of dry fish product, it was observed that the concentration of pesticide residues found gradually higher in samples collected from local traders than the producer.

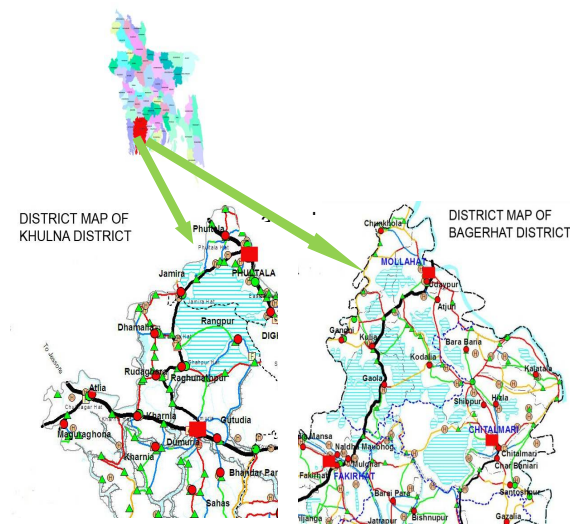


Fig 1. Locations of experimental site (a) Khulna and (b) Bagerhat

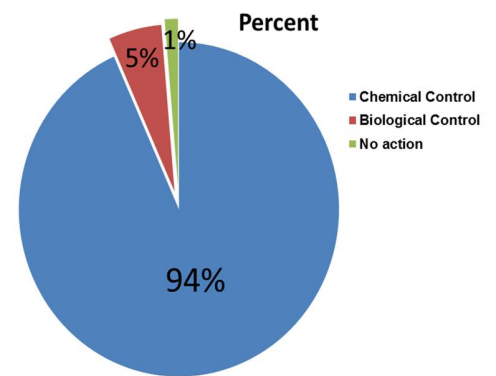


Fig 2. Percent of farmers used pesticides

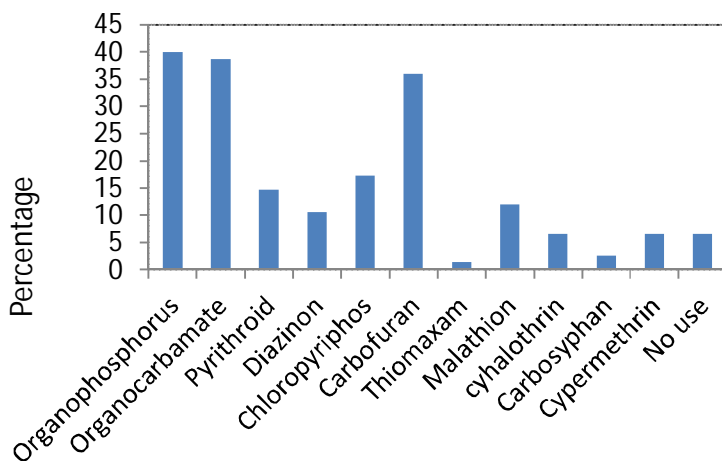


Fig 3. Group of pesticides used by farmers

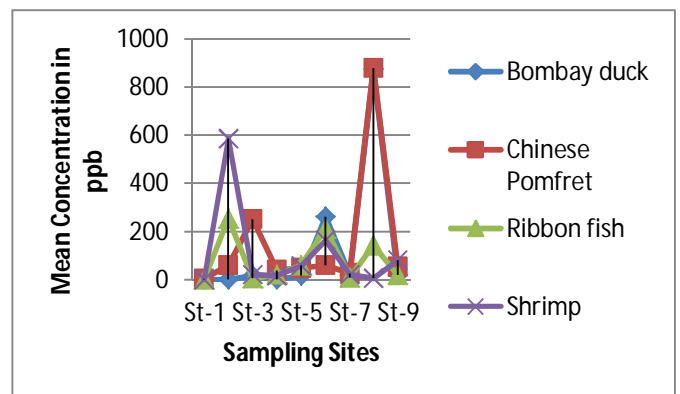


Fig 4. DDT residual concentration of different sampling sites among the various dried fish species