

Toxin-Producing Algae of Nigerian Coast, Gulf of Guinea

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Abstract : Toxin-producing algae are algal species that produce potent toxins, which accumulate in food chains and cause various gastrointestinal and neurological illnesses in humans and other animals. They result in shellfish toxicity, ecosystem alteration, cause fish kills and mortality of other animals and humans, in addition to compromised product quality as well as decreased consumer confidence. Animals, including man, are directly exposed to toxins by absorbing toxins from the water via swimming, drinking water with toxins, or ingestion of algal species via feeding on contaminated seafood. These toxins, algal toxins, undergo bioaccumulation, biotransformation, biotransference, and biomagnification through the natural food chains and food webs, thereby endangering animals and humans. The Nigerian coast is situated on the Atlantic Ocean, the Gulf of Guinea, one of Africa's five large marine ecosystems (LME), and studies on toxic algae in this ecosystem are generally lacking. Algal samples were collected from eight coastal states and ten locations spanning the Bight of Bonny and the Bight of Benin. A total of 70 species of toxin-producing algae were found in the coastal waters of Nigeria. There was a great variety of toxin-producing algae in the coastal waters of Nigeria. They were Domoic acid-producing forms (DSP), Saxitoxin-producing, Gonyautoxin-producing, and Yessotoxin-producing (all PSP). Others were Okadaic acid-producing, Dinophysistoxin-producing, and Palytoxin-producing, which are representatives of DSP; CFP was represented by Ciguatoxin-producing forms and NSP by Brevetoxin-producing species. Emerging or new toxins are comprising of Gymnodimines, Spirolides, Palytoxins, and Prorocentroidess-producing algae. The CyanoToxin Poisoning (CTP) was represented by Anatoxin-, Microcystin-, Cylindrospermopsis-Lyngbyatoxin-, Nordularin-Applyssiatoxin and Debromoapplatotoxin-producing species. The highest group was the Saxitoxin-producing species, followed by Microcystin-producing species, then Anatoxin-producing species. Gonyautoxin (PSP), Palytoxin (DSP), Emerging toxins, and Cylindrospermopsis -producing species had a very substantial representation. Only Ciguatoxin-producing species, Lyngbyatoxin-Nordularin, Applyssiatoxin, and Debromoapplatotoxin-producing species were represented by one taxon each. The presence of such overwhelming diversity of toxin-producing algae on the Nigerian coast is a source of concern for fisheries, aquaculture, human health, and ecosystem services. Therefore routine monitoring of toxic and harmful algae is greatly recommended.

Keywords : algal syndromes, Atlantic Ocean, harmful algae, Nigeria

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