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# THE PUFFERFISH TOXIN- TURNING A THREAT INTO AN OPPORTUNITY

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## Abstract

In the Mediterranean region, the fisheries sector has been suffering from the impacts of migration of aquatic organisms through the Suez Canal. Among the most devastating species to both fisheries and habitats is the aggressive predatory puffer fish *Lagocephalus sceleratus*. The fish bio-concentrates Tetrodotoxin (TTX), a very potent poison making it unmarketable and poses a great risk to human health if consumed. In addition, *L. sceleratus* has been recorded to destroy fishing nets and lines leading to economic losses for fishers. The objective of this review is to describe the status of *L. sceleratus* and its commercial applications, if any, around the world with emphasis on the Mediterranean Sea. Given the lethal TTX toxicity of *L. sceleratus*, and the strict regulations passed around the world preventing its fishing and consumption, coupled with the little knowledge available about its biology and its bio-concentration of TTX, the fish should not be marketed to consumers. Nevertheless, the use of TTX has been investigated for different usages including in the medical field as an analgesic to treat some cancer and other pains. It has been proposed that TTX do not pose a genotoxic risk to patients, an advantage in comparison to other anesthetics like morphine. Unlike morphine, TTX is non-addictive and has no known side-effects. The alteration of neuronal functions makes this toxin a promising tool as a therapeutic drug treatment especially of certain pains. If *L. sceleratus* is used as one of the sources of TTX for the medical industry, then such a promising tool can be converted into an opportunity for the fishermen on several levels: increasing fishing pressure on *L. sceleratus* will reduce its numbers (reduce impact on the natural environment); will form an income to fishermen by further promoting the use of natural toxins from marine origin in the medical field; and will directly reduce the damages to fishing gear. The recommended option lies in creating a program in association with pharmaceutical companies, the medical sector, and multidisciplinary laboratories in Mediterranean countries to isolate TTX from puffer fishes including *L. sceleratus* to be used in the medical industry. Instituting such a program at regional level would create many employment opportunities, but more importantly, it will create a fishery that will yield economic benefits to fishers and control *L. sceleratus* wild populations through increased fishing pressure. Businesses embracing the Corporate Social Responsibility (CSR) concept (like pharmaceutical companies amongst others) can be approached to initially fund such an initiative and therefore contribute to sustainable development by delivering economic, social and environmental benefits to stakeholders.

**Keywords:** Pufferfish, toxin, opportunity.