Domoic Acid  Toxicologic Pathology. Review

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Domoic acid was identified as the toxin responsible for an outbreak of human poisoning that occurred in Canada in 1987 following consumption of contaminated blue mussels (Mytilus edulis). The poisoning was characterized by a constellation of clinical symptoms and signs. Among the most prominent features described was memory impairment leading to the term of Amnesic Shellfish Poisoning (ASP). Domoic acid is produced by certain marine organisms, such as the red alga Chondria armata and the planktonic diatom Nitzschia pungens. Since 1987, monitoring programs have been successful in preventing other human incidents of ASP. However, there are documented cases of domoic acid intoxications in wild animals and outbreaks of coastal water contamination in many world regions. Hence domoic acid continues to pose a global risk to the health and safety of humans and wildlife. Several mechanisms have been implicated as mediators for the effects of domoic acid. Of particular importance is the role played by glutamate receptors as mediators of excitatory neurotransmission and the demonstration of a wide distribution of these receptors outside the central nervous system, prompting the attention to other tissues as potential target sites. The goal of this review is to provide a comprehensive up to date summary of the pathology induced by domoic acid and the mechanisms for cell and tissue injury.