



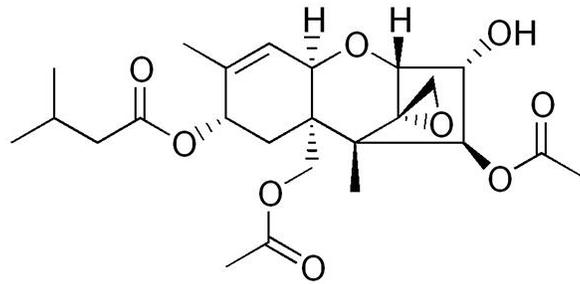
T-2 TOXIN AS A BIOLOGICAL WEAPON

T-2 toxin is a trichothecene mycotoxin. It is a naturally occurring by product of *Fusarium spp.* fungus which is toxic to humans and animals.



Ingestion of moldy whole grains may cause alimentary toxic aleukia and a host of other symptoms which can affect the skin, the airway, and the stomach. T-2 toxin can be absorbed through the human skin (Boonen et al., 2012).

Alimentary toxic aleukia (ATA), a disease which is caused by trichothecene like T-2 toxin, killed many thousands of USSR citizens in the Orenburg District in the 1940s. It was reported that the mortality rate was about 10% of the population in that area. It was later proposed, in the 1970s, that the consumption of contaminated food was the cause of the mass poisoning. Because of World War II, harvesting of grains was delayed and food was scarce in Russia. This resulted in the consumption of grain that was contaminated with *Fusarium* molds, which produce T-2 toxin (Pitt, 1989).



Although it is still controversial, it is suspected that T-2 toxin has been used as a chemical warfare agent from the 1970s till the 1990s. Based on the descriptions of eyewitnesses and victims, T-2 toxin was mostly delivered by low-flying aircraft that released a yellow oily liquid. Hence, this phenomenon is also named "yellow rain".

In 1982, the US Secretary of State Alexander Haig and his successor George P. Shultz accused the Soviet Union of using T-2 toxin as a chemical weapon in Laos (1975-81), Kampuchea (1979-81), and Afghanistan (1979-81), where it allegedly caused thousands of casualties (Shultz, 1982). T-2 toxin is also thought to be a cause of the Gulf War Syndrome. US troops suffered from mycotoxicosis-like symptoms after an Iraqi missile detonated in a US military camp in Saudi Arabia during Operation Desert Storm in the Persian Gulf War, in 1991. It has been shown that Iraq had researched trichothecene mycotoxins, among other substances, and thus was capable of its possession and its usage in chemical warfare. Nevertheless, much of the key information from these incidents remains classified, leaving these matters still unresolved (Zilinskas and Raymond, 1997).





Good to know:

Grain and feed consumers can easily and fast quantitatively detect T-2 and HT-2 toxins. Combined tests (T+HT-2) are available from various producers and a lateral flow technique is the most common assay. Test results can be read quantitatively with the use of a special reader provided by the supplier of a rapid test. Samples are usually extracted with 70% methanol or in some cases with water.





References:

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