



KAMARAJ IAS ACADEMY
Only IAS Academy by Grandson of "Perunthalaivar" Kamarajar"

Ricin Toxin, at Centre of alleged Terror Plot;

Published On: 14-11-2025

Ricin is a highly toxic, naturally occurring protein that inhibits protein synthesis in cells, leading to cell death and multi-organ failure. It is derived from the waste material left after processing castor beans and is considered a potential bioterrorism agent because it is easy to produce and extremely potent

Key Features of Ricin Toxin

Origin: Extracted from the seeds of the castor oil plant (*Ricinus communis*). The castor oil itself is not toxic, but the "mash" by product contains high concentrations of ricin.

Mechanism of Action: Ricin is an A-B toxin. Its B chain binds to receptors on the cell surface, allowing the A chain to enter the cell's cytosol. Once inside, the A chain acts as an enzyme that deactivates ribosomes, which are essential for protein synthesis. A single molecule in the cytosol can kill a cell.

Physical Form: It can be a white powder, a mist, a pellet, or dissolved in water or weak acid. It is relatively stable under normal environmental conditions but can be inactivated by heat above 80°C (176°F).

Toxicity/Lethality: Ricin is highly toxic, especially if inhaled or injected. As little as 5 to 10 micrograms per kilogram of body weight can be a lethal dose if inhaled or injected. Ingested ricin has a lower toxicity, but even a few chewed castor beans can be fatal.

Routes of Exposure: It is most potent when inhaled or injected. Ingestion is another route of exposure, but absorption through intact skin is minimal.

Symptoms: Symptoms vary by exposure route and dose, but generally appear within a few hours to a few days and include fever, nausea, cough, chest tightness, severe diarrhea, vomiting, and organ damage (lungs, liver, spleen, kidneys).

Treatment: There is no specific antidote for ricin poisoning. Treatment is supportive care, focusing on managing symptoms and keeping vital organs functioning.

Bioterrorism Potential: Due to its high toxicity, ease of production from a widely available source, and the lack of an antidote, ricin is classified as a Category B bioterrorism agent by the U.S. Centers for Disease Control and Prevention (CDC) and a Schedule 1 chemical under the Chemical Weapons Convention

Chemical Weapons Convention (CWC)

What it bans: The development, production, stockpiling, and use of chemical weapons

Key features:

oIt was negotiated after the BWC and is enforced by a dedicated international body

oIt entered into force on April 29, 1997

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Enforcement:

oThe Organisation for the Prohibition of Chemical Weapons (OPCW) is the dedicated organization that verifies compliance

oThe OPCW conducts inspections and monitors the chemical industry to prevent new weapons from emerging

oThe convention includes a "challenge inspection" procedure, where a State Party can request an inspection of another State Party suspected of non-compliance

Common elements

Both conventions are designed to prevent the proliferation of chemical and biological weapons and protect against their use

Both require states to take domestic legal and administrative measures to implement the treaty's provisions

Both build on the Geneva Protocol of 1925, which prohibits the use of these weapons in wartime, while the BWC and CWC prohibit their entire life cycle