

**APABILITIES OF A SMALL ROBOTIC COMPLEX
FOR CBR SAMPLE COLLECTION IN CASE
OF BIOLOGICAL WEAPON THREATS AND BIOTERRORIST ATTACKS**

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The U.S. Centers for Disease Control and Prevention (CDC) defines four main categories of targets that may be developed and used for biological weapons. These targets include humans/society, agriculture (both livestock and crop sectors), agricultural product processing, technologies (biotechnological and food industries), and the environment.

Biological weapons can be delivered via air, water, or living transmission vectors (mosquitoes, ticks, fleas, flies, rodents). In case of a threat involving biological agents, it is necessary to ensure rapid and high-quality sampling of atmospheric air, water from various sources at different depths, soil, vegetation, suspicious powdery and liquid substances, animal bodies or small organisms, and surface swabs in affected areas.

Sample collection is carried out using a small robotic complex for CBR (chemical, biological, radiological) contamination sampling, which is equipped with a set of special sensors designed to detect, identify, and collect samples for further laboratory analysis of chemical warfare agents, hazardous chemicals, biological agents (biological material), and radioactive substances. It also includes a manipulator for remote biological sample collection and a weather station to determine environmental conditions at the sampling point.

A significant number of robotic complexes of foreign origin are represented by manufacturers such as: ECA (France), Allen Vanguard (Canada), QinetiQ, Cobham (UK), iRobot (USA), and PIAP (Poland).

Thanks to their compact size and remote-control capabilities, small robotic complexes can access hard-to-reach and high-risk areas that are inaccessible to humans. This enables the collection of analytical samples without endangering personnel lives and health. Sampling is conducted in a conventionally marked "red zone". Sterile swabs with a buffer medium are used for surface swabs. Air is aspirated at five points, water is sampled at different depths, soil is collected from the surface, and plant samples are taken from multiple points. Samples are cooled to +4°C and transported following the cold chain. Packaging, disinfection, and transportation are conducted according to WHO and IATA international requirements.