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Chapter 1

Introductory Chapter: Persistent Organic Pollutants (POPs)

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Additional information is available at the end of the chapter

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1. About POPs

According to the World Health Organization (WHO), persistent organic pollutants (POPs) are chemicals of global concern due to their potential for long-range transport, persistence in the environment, ability to biomagnify and bioaccumulate in ecosystems, as well as their significant negative effects on human health and the environment. The WHO further indicates humans are exposed to these chemicals in a variety of ways: mainly through the food we eat but also through the air we breathe, in the outdoors, in the indoors and at the workplace. The WHO further explains that many products used in our daily lives may contain POPs, which have been added to improve product characteristics, such as flame retardants or surfactants. This property renders POPs to be found virtually everywhere on our planet in measurable concentrations [1].

2. How POPS are manifested chemically in life

According to the WHO report, the most commonly encountered POPs are organochlorine pesticides, such as DDT, industrial chemicals, most notably polychlorinated biphenyls (PCB), as well as unintentional by-products of many industrial processes, especially polychlorinated dibenzo-p-dioxins (PCDD) and dibenzofurans (PCDF), commonly known as 'dioxins' [1].

3. Characteristics of POPs

The WHO report further indicates that POPs biomagnify throughout the food chain and bioaccumulate in organisms. The highest concentrations of POPs are thus found in organisms

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at the top of the food chain. Consequently, background levels of POPs can be found in the human body [1].

4. The human risks to POP exposure

Human exposure—for some compounds and scenarios, even to low levels of POPs—can lead, among others, to increased cancer risk, reproductive disorders, alteration of the immune system, neurobehavioral impairment, endocrine disruption, genotoxicity and increased birth defects [1].

POPs as could be seen from above summary are indeed environmental threats that need to be addressed with all seriousness. Their mode of transmission is by atmospheric, and they can find their ways in all aspects of the environment (air, water and soil), and what is making it more dangerous is their persistent nature and most of them being non-biodegradable [2].

Health risk is the most important thing to note and pay particular attention to avoid contraction of example carcinogenic diseases that are life-threatening. It is no wonder that some of the chemicals such as DDT have been banned from usage in modern times. In places where they are found such as in lake sediments and other areas are difficult to remediate and difficult to repair when any damage has been done [3].

There is therefore the urgent need to give the maximum attention and try not to contaminate fresh waters and further spread it in the environment. People should be forewarned about its imminent dangers and try to avoid the dissipation of these dangerous chemicals into the environment.

There is the need to further research into possible areas suspected to be already contaminated such as farmlands where pesticides have been applied and their possible spread around. Taking note also of the fact, some of these dangerous pesticides could reach far more areas than could be imagined, and the strict adherence to the banning of some of them should be observed [4].

Scientists should be encouraged to publish their findings from research and data compiled. The research should target specific environments and the problems well addressed to ascertain what POPs have done to those environments.

The following areas of attention need to be concentrated:

- Dissemination of POP chemicals into the food chain
- Effects of POPs on rural drinking water
- Atmospheric transfer of POPs into the environments
- Harmful effects of POPs
- Managing common sources of POPS

- Anthropological effects of POPs
- The environmental effects of POPs from application of pesticides

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