

Pharmaceuticals as emerging pollutants: Case naproxen an overview

Andrea Liliana Moreno Ríos, Karol Gutierrez-Suarez, Zenen Carmona, Claudete Gindri Ramos, Luis Felipe Silva Oliveira

Abstract

Nonsteroidal anti-inflammatory drugs (NSAIDs), including naproxen (NP), diclofenac, ibuprofen, etc., are widely used for fever and pain relief. NP is one of the most widely consumed drugs in the world, because it is available over the counter in many countries. Many studies have proven that NP is not eliminated in conventional water treatment processes and its biodegradation in the environment is also difficult compared to other drugs. Along these lines, we are aware that both the original compound and its metabolites can be found in different destinations in the environment. To assess the environmental exposure and the risks associated with NP, it is important to understand better the environment where they finally reach, the behavior of its original compounds, its metabolites, and its transformation products. In this sense, the purpose of this review is to summarize the current state of knowledge about the introduction and behavior of NP in the environments they reach and highlight research needs and gaps. Likewise, we present the sources, environmental destinations, toxicology, environmental effects, and quantification methodologies.

Keywords

Naproxen, Sources, Toxicity, Environmental effects, Quantification methodology