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to aquatic animals by endocrine disrupting chemicals detected in the aquatic environment in Japan. For the consistent assessment of the effects on reproduction associated with estrogenic, anti-estrogenic, androgenic, and/or anti-androgenic activities of chemicals throughout Tier 1 screening to Tier 2 testing, a unified test species, Japanese medaka (Oryzias latipes), has been used. For Tier 1 screening, the in vivo Fish Short-Term Reproduction Assay (OECD test guideline No. 229) was conducted for 17 chemicals that were nominated based on the results of environmental monitoring, existing knowledge obtained from a literature survey, and positive results in reporter gene assays using the estrogen receptor of Japanese medaka. In the 17 assays using Japanese medaka, adverse effects on reproduction (i.e., reduction in fecundity and/or fertility) were suggested for 10 chemicals, and a significant increase of hepatic vitellogenin in males, indicating estrogenic (estrogen receptor agonistic) potency, was found for eight chemicals at the concentrations in which no overt toxicity was observed. Based on these results, and the frequency and the concentrations detected in the Japanese environment, estrone, 4-nonylphenol (branched isomers), 4-tert-octylphenol, triphenyl phosphate, and bisphenol A were considered as high priority candidate substances for the Tier 2 testing.

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Effectiveness of UV/SO_{2} advanced reduction process for degradation and mineralization of trichlorfon pesticide in water: identification of intermediates and toxicity assessment

2021-11-04

This study aimed to investigate the degradability, mineralization, proposed decomposition pathway, intermediate products, and toxicity of effluent from trichlorfon (TCF) degradation in water by UV/sulfite-advanced reduction process (UV/S-ARP). This study was experimentally performed in a photochemical reactor as a batch operation. The source of light was a UV lamp. Sulfite ion was used as the reducing agent. After the treatment, the residual concentration of TCF was measured by liquid chromatography equipped with tandem mass spectrometry (LC-MS/MS). UV/S-ARP had the highest performance at an initial pH of 7, a sulfite ion concentration
Preventing Parkinson's Disease: An Environmental Agenda

Fueled by aging populations and continued environmental contamination, the global burden of Parkinson's disease (PD) is increasing. The disease, or more appropriately diseases, have multiple environmental and genetic influences but no approved disease modifying therapy. Additionally, efforts to prevent this debilitating disease have been limited. Numerous environmental contaminants (e.g., pesticides, metals, industrial chemicals) are implicated in PD, disease prevention is possible. To reduce the burden of PD, we have compiled preclinical and clinical research priorities that highlight both disease prediction and primary prevention. Though not exhaustive, the "PD prevention agenda" builds upon many years of research by our colleagues and proposes next steps through the lens of modifiable risk factors. The agenda identifies ten specific areas of research and considers the funding and policy changes that will be necessary to help prevent the world's fastest growing brain disease.

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Accumulation of chemical elements and occurrence of microplastics in small pelagic fish from a neritic environment

The assessment of contaminant exposure in marine organisms often focuses on the most toxic chemical elements from upper trophic level species. Information on mid-trophic level species and particularly on potentially less harmful elements is lacking. Additionally, microplastics have been considered emergent contaminants in aquatic environments which have not been extensively studied in species from mid-trophic levels in food chains. This study aims to contribute to an overall assessment of environmental impacts of such chemicals in a community of small pelagic fish in the North Atlantic. The concentrations of 16 chemical elements, rarely simultaneously quantified (including minerals, trace elements and heavy metals), and the presence of microplastics were analysed in sardines (Sardina pilchardus) and mackerels (Scomber spp. and Trachurus trachurus) sampled along the Portuguese coast. Biochemical stress assessments and stable isotope analyses were also performed. The chemical element concentrations in S. pilchardus, T. trachurus, and Scomber spp. were relatively low and lower than the levels reported for the same species in the North Atlantic and adjacent areas. No clear relationships were found between chemical elements and oxidative damage in fish. However, the concentration of several chemical elements showed differences among species, being related with the species' habitat use, trophic niches, and specific feeding strategies. The presence of plastic pieces in the stomachs of 29% of the sampled fishes is particularly concerning, as these small pelagic fish from mid-trophic levels compose a significant part of the diet of humans and other top predators. This study highlights the importance of multidisciplinary approaches focusing on the individual, including position data, stable isotopes, and oxidative stress biomarkers as complementary tools in contamination assessment of the marine mid-trophic levels in food chains.

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Monitoring of emerging contaminants of concern in the aquatic environment: a review of studies showing the application of effect-based measures
2021-11-02
Water scarcity is increasingly a global cause of concern mainly due to widespread changes in climate conditions and increased consumptive water use driven by the exponential increase in population growth. In addition, increased pollution of fresh water sources due to rising production and consumption of pharmaceuticals and organic chemicals will further exacerbate this concern. Although surface water contamination by individual chemicals is often at very low concentration, pharmaceuticals for instance are designed to be efficacious at low concentrations, creating genuine concern for their presence in freshwater sources. Furthermore, the additive impact of multiple compounds may result in toxic or other biological effects that otherwise will not be induced by individual chemicals. Globally, different legislative frameworks have led to pre-emptive efforts which aim to ensure good water ecological status. Reports detailing the use and types of effect-based measures covering different chemical pollutants and the impact of these pollutants on aquatic fauna with special focus on pollutants that are contaminants of emerging concern (CEC) in urban wastewater. A critical discussion on studies that have used effect-based measures to assess biological impact endpoints measurements employed is presented. The application of effect-based monitoring of pharmaceutical/organic compound in the aquatic ecosystem and the impact of these pollutants on aquatic lives and ultimately human lives have recently emerged from monitoring networks such as the NORMAN network. In this review, we critically evaluate some studies within the last decade that have implemented effect-based monitoring of pharmaceuticals and organic chemicals in aquatic fauna, evaluating the occurrence of different chemical pollutants and the impact of these pollutants on aquatic fauna with special focus on pollutants that are contaminants of emerging concern (CEC) in urban wastewater. A critical discussion on studies that have used effect-based measures to assess biological impact endpoints measurements employed is presented. The application of effect-based monitoring of chemicals other than assessment of water quality status is also discussed.
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Water scarcity is increasingly a global cause of concern mainly due to widespread changes in climate conditions and increased consumptive water use driven by the exponential increase in population growth.

Allergic contact dermatitis to rubber accelerators in protective gloves: Problems, challenges, and solutions for occupational skin protection
2021-10-22
Protective gloves are an elementary component of personal protective equipment in many occupations and are intended to protect the hands from various hazards (e.g., wetness, chemicals, mechanical forces, or thermal stress). This is particularly important when other occupational safety measures (e.g., technical-organizational measures) cannot be implemented or are insufficient. However, it is not uncommon for protective gloves themselves to become a problem, as some of their ingredients (e.g., rubber accelerators) can cause allergic reactions. Accelerators in rubber gloves include thiurams, dithiocarbamates, thiazoles, guanidines, and thioureas. If no alternative means of protection are available, this may even result in abandoning the profession. This article is about rubber accelerators, which are often contained in protective gloves made of different rubber materials (e.g., natural rubber (latex) and nitrile rubber) and may cause delayed-type allergies, as well as related challenges, problems, and solutions for occupational skin protection.
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Full Source: Allergologie select 2021 Oct 22;5:335-344. doi: 10.5414/ALX02265E.
A regulatory relic: After 60 years of research on cancer risk, the Delaney Clause continues to keep us in the past 2021-10-29

The Delaney Clause of the Federal Food, Drug, and Cosmetic Act became law in 1958 because of concerns that potentially harmful chemicals were finding their way into foods and causing cancer. It states, "[n]o additive shall be deemed to be safe if it is found to induce cancer when ingested by man or animal, or if it is found, after tests which are appropriate for the evaluation of the safety of food additives, to induce cancer in man or animal!" The United States Food and Drug Administration (US FDA) and United States Environmental Protection Agency (US EPA, prior to implementation of the Food Quality Protection Act) were charged with implementing this clause. Over 60 years, advances in cancer research have elucidated how chemicals induce cancer. Significant advancements in analytical methodologies have allowed for accurate and progressively lower detection limits, resulting in detection of trace amounts. Based on current scientific knowledge, there is a need to revisit the Delaney Clause's utility. The lack of scientific merit to the Delaney Clause was very apparent when recently the US FDA had to revoke the food additive approvals of 6 synthetic flavoring substances because high dose testing in animals demonstrated a carcinogenic response. However, US FDA determined that these 6 synthetic flavoring substances do not pose a risk to public health under the conditions of intended use. The 7th substance, styrene, was de-listed because it is no longer used by industry. The scientific community is committed to improving public health by promoting relevant science in risk assessment and regulatory decision making, and this was discussed in scientific sessions at the American Association for the Advancement of Science (AAAS) 2020 Annual Meeting and the Society of Toxicology (SOT) 2019 Annual Meeting. Expert presentations included advances in cancer research since the 1950s; the role of the Delaney Clause in the current regulatory paradigm with a focus on synthetic food additives; and the impact of the clause on scientific advances and regulatory decision making.
making. The sessions concluded with panel discussions on making the clause more relevant based on 21st-century science.
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