Bulletin de veille du réseau d'écotoxicologie terrestre et aquatique N°52

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Edito

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Tribune libre

Peer Community in Ecotoxicology & Environmental Chemistry, un nouveau média ouvert, transparent et gratuit pour la valorisation et la diffusion de vos recherches

Que sont les Peer Community In… ?

Les Peer Community In… (PCI, https://peercommunityin.org/) sont des communautés scientifiques qui organisent des processus éditoriaux de science ouverte. Il s'agit de communautés spécialisées effectuant une évaluation scientifique par les pairs et à la demande des auteurs, de preprints déposés sur des serveurs de preprints ou des archives ouvertes institutionnelles. Dans chaque PCI, les recommandeurs, qui sont les équivalents des éditeurs scientifiques de revues, constituent une équipe de reviewers qui réalisent une évaluation détaillée de l'article. S'ensuit une décision éditoriale qui mène soit au rejet, soit à la demande de corrections, soit à la validation de l'article scientifique, éventuellement après plusieurs rounds d'évaluation. Dans ce dernier cas, le recommandeur écrit un texte de recommandation dans lequel il explique pourquoi il a validé l'article. L'ensemble de la communauté scientifique a ainsi accès gratuitement au contenu validé de l'article et aux évaluations/recommandations. Les PCIs ne publiant pas les articles recommandés, les auteurs peuvent éventuellement le soumettre pour publication dans une revue scientifique de leur choix et notamment dans les revues qui se sont déclarées PCI-friendly. Les éditeurs en chef de ces revues se sont engagés à prendre en compte, dans les cas appropriés, les évaluations et recommandations des PCIs pour compléter/accélérer leur processus éditorial, débouchant régulièrement sur une acceptation en l'état des preprints recommandés par PCI. Notons que les relations entre les PCIs et les revues scientifiques évoluent. A l'avenir un PCI-friendly ou un PCI-partner journal sera une revue de société savante, ou d'institut de recherche ou publiant en Open Access gratuit ou publié par un éditeur non lucratif. Les PCI-friendly journals s'engageront à fournir une réponse aux auteurs en 5 jours (pas intéressés acceptation sans reviews supplémentaires ou reviews supplémentaires nécessaires). Les PCI-partner journals s'engagent à accepter les articles recommandés sans reviews supplémentaires.

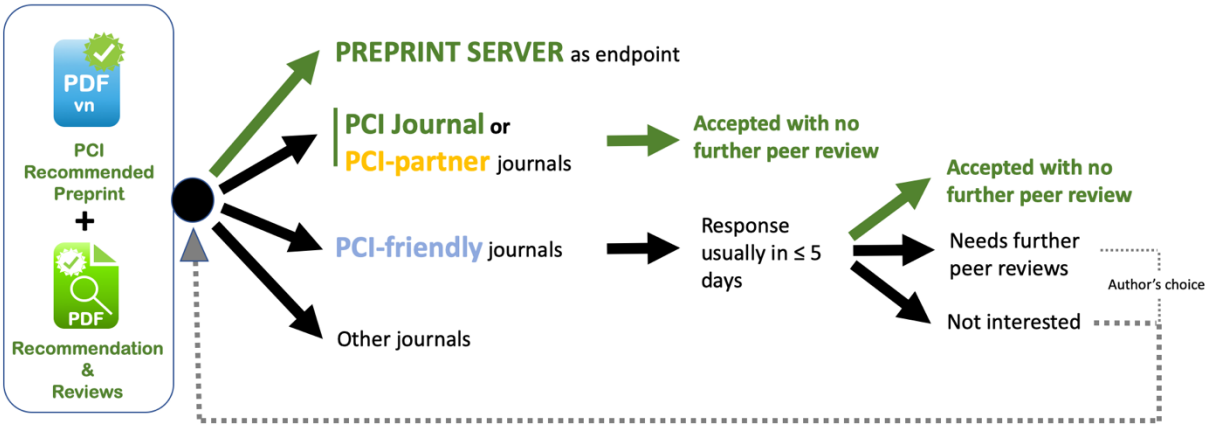
Une courte vidéo sur PCI: https://www.youtube.com/watch?v=4PZhpnc8wwo

L'objectif du PCI est d'évaluer et de recommander des preprints. Les preprints recommandés sont des articles valides, citables et finalisés. Le résultat normal est donc de les laisser sur des serveurs de preprint ou des archives ouvertes.

Cependant, les auteurs d'un article recommandé par PCI peuvent préférer :

- Le publier dans la revue PCI tel quel, immédiatement et sans frais.
- Le soumettre à une revue PCI-partner (acceptation de l'article "tel quel" ou sans autre examen par les pairs) ou à une revue PCI-friendly (réponse dans les 5 jours). Les revues PCI-partner et PCI-friendly sont ou bien des revues en libre accès Diamond, ou des revues de sociétés, ou des revues d'institutions de recherche ou des revues publiées par des éditeurs à but non lucratif.
- Le soumettre à d'autres revues, dont beaucoup peuvent utiliser l'évaluation faite par PCI si elles la jugent approprié.

https://doi.org/10.15454/64rs-v051



Peer Community in Ecotoxicology and Environmental Chemistry (PCI EcotoxEnvChem)

Peer Community in Ecotoxicology and Environmental Chemistry fait partie des 13 PCI existant à ce jour. Les articles rentrant dans le champ de PCI Ecotox Env Chem concernent des travaux originaux (observations, expérimentations, modélisations, approches théoriques…) qui permettent des avancées significatives de la connaissance dans les champs de l'écotoxicologie terrestre et aquatique, ainsi que de la chimie de l'environnement. PCI Ecotox Env Chem considère la dynamique et le transport des composés chimiques dans l'environnement, leur transfert vers les organismes au sein des réseaux trophiques, et leurs effets à différents niveaux d'organisation biologique et géographique. Ainsi, PCI Ecotox Env Chem intègre différentes disciplines et approches qui répondent aux problématiques d'écotoxicologie et de toxicologie de l'environnement : chimie analytique, physiologie, microbiologie, génétique, génomique, ingénierie environnementale, modélisation, science des données, évaluation des risques… PCI Ecotox Env Chem dispose à ce jour d'un panel international de 25 recommandeurs, et développe son partenariat avec les réseaux scientifiques et sociétés savantes, ainsi qu'avec des journaux partenaires.

Comment soumettre in preprint à PCI EcotoxEnvChem ?

Le processus de soumission et de recommandation s'articule autour de 4 étapes :

① Le preprint est soumis sur un serveur d'archives ouvertes (Zenodo, bioRxiv, HAL…). Les données, scripts et codes sont déposés dans des archives ouvertes.

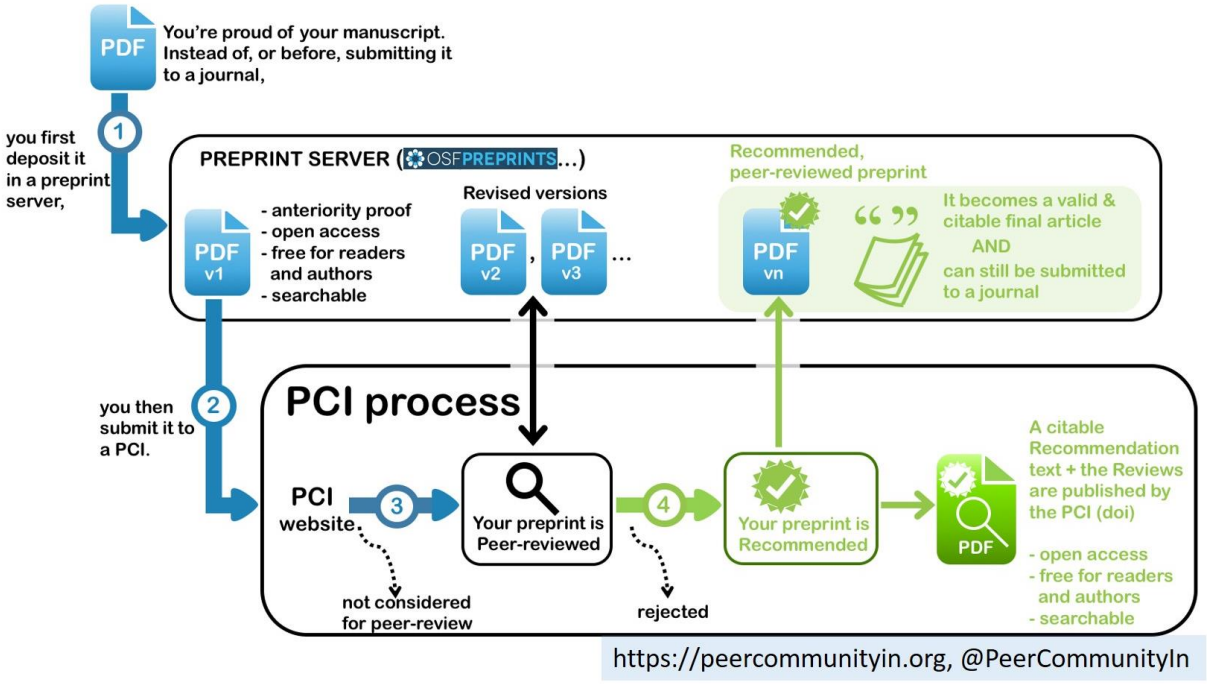
② Le preprint est soumis à PCI Ecotox Env Chem.

La soumission du preprint se fait via le site https://ecotoxenvchem.peercommunityin.org/. Vous devez vous enregistrer, puis soumettre votre pdf. Le preprint est soumis à une étape de vérification.

③ Le preprint est évalué par les pairs.

④ Le preprint est soit recommandé soit rejeté. Dans tous les cas vous obtenez les reviews et pouvez améliorer votre article. En cas de recommandation, PCI Ecotox Env Chem publie un texte de recommandation, accompagné par tout le processus d'évaluation (reviews, décisions, réponses des auteurs). En cas de rejet, PCI ne publie rien.

https://doi.org/10.15454/64rs-v051



N'hésitez pas à soumettre vos preprints sur https://ecotoxenvchem.peercommunityin.org/

Les PCI dans l'évaluation institutionnelle des chercheurs

Les articles recommandés par des PCIs sont de plus en plus considérés dans les dossiers d'évaluation des chercheurs, des unités et des projets. Par exemple, les sections 29, 30 and 52 du CoNRS, la section 67 du CNU, des CSS d'INRAE, etc. (voir le détail sur : https://peercommunityin.org/pci-network/) ont publié des motions dans ce sens. Cette reconnaissance doit être étendue plus généralement en France et à l'étranger. De nombreuses écoles doctorales considèrent également les articles recommandés par une PCI comme ayant la même valeur à priori que des articles publiés de bonne qualité dans des revues scientifiques. Elles permettent ainsi à leurs étudiants de soutenir leur thèse avec des articles recommandés par une PCI.

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Peer Community In
Ecotoxicology & Environmental Chemistry
Free and transparent preprint and postprint recommendations in ecotoxicology & environmental chemistry

https://doi.org/10.15454/64rs-v051

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Suivez nous sur : Twitter@PCI_EcotoxEnvCh

ERA / PUBLICATIONS SCIENTIFIQUES / COMMUNAUTES MICROBIENNES AQUATIQUES

Long-term multi-endpoint exposure of the microalga Raphidocelis subcapitata to lanthanum and cerium

Authors: Siciliano A, Guida M, Serafini S et al.

Source: SCIENCE OF THE TOTAL ENVIRONMENT 790: 148229, 2021, DOI 10.1016/j.scitotenv.2021.148229

Abstract: Significant release of rare earth elements (REEs) into the environment is mainly due to active or abandoned mining sites, but their presence is globally increasing due to their use in several industrial sectors. The effects on primary producers as Raphidocelis subcapitata are still limited. This research focused on La and Ce as the two most widespread REEs that can be currently found up to hundreds of µg/L in water and wastewater. Microalgae were exposed to La and Ce for 3 days (pH = 7.8) (short-term exposure) to derive the effective concentrations inhibiting the growth on 10% (EC10) of the exposed population. EC10 values (0.5 mg/L of La and 0.4 mg/L of Ce) were used for the 28 days long-term exposure (renewal test) to observe after 7, 14, 21, and 28 days on a multi-endpoint basis microalgae growth inhibition, biomarkers of stress (reactive oxygen species, superoxide dismutase, and catalase), and bioconcentration...

Glyphosate-based herbicide exposure affects diatom community development in natural biofilms

Authors: Corrales N, Meerhoff M, Antoniades D
Source: ENVIRONMENTAL POLLUTION 284: 117354, 2021, DOI 10.1016/j.envpol.2021.117354

Abstract: Glyphosate herbicide is ubiquitously used in agriculture and weed control. It has now been identified in aquatic ecosystems worldwide, where numerous studies have suggested that it may have both suppressive and stimulatory effects on diverse non-target organisms. We cultured natural biofilms from a hypereutrophic environment to test the effects on periphytic diatoms of exposure to a glyphosate-based herbicide formulation at concentrations from 0 to 10 mg L-1 of active ingredient...

Resistance, resilience, and functional redundancy of freshwater bacterioplankton communities facing a gradient of agricultural stressors in a mesocosm experiment

Authors: da Costa NB, Fugere V, Hebert MP et al.

Source: MOLECULAR ECOLOGY Early Access, 2021, DOI 10.1111/mec.16100

Abstract: Agricultural pollution with fertilizers and pesticides is a common disturbance to freshwater biodiversity. Bacterioplankton communities are at the base of aquatic food webs, but their responses to these potentially interacting stressors are rarely explored. To test the extent of resistance and resilience in bacterioplankton communities faced with agricultural stressors, we exposed freshwater mesocosms to single and combined gradients of

two commonly used pesticides: the herbicide glyphosate (0-15 mg/L) and the neonicotinoid insecticide imidacloprid (0-60 µg/L), in high or low nutrient backgrounds. Over the 43-day experiment, we tracked variation in bacterial density with flow cytometry, carbon substrate use with Biolog EcoPlates, and taxonomic diversity and composition with environmental 16S rRNA gene amplicon sequencing...

Transient effect of bisphenol A (BPA) and di-(2-ethylhexyl) phthalate (DEHP) on the cosmopolitan marine diatom *Chaetoceros decipiens*-lorenzianus

Authors: M'Rabet C, Yahia OKD, Chomerat N et al.

Source: ENVIRONMENTAL POLLUTION 285: 117362, 2021, DOI 10.1016/j.envpol.2021.117362

Abstract: Incubation under controlled laboratory conditions were performed to assess the toxic effects of two plastic derived chemicals, bisphenol A (BPA) and di-(2-ethylhexyl) phthalate (DEHP), on the growth, photosynthetic efficiency and photosynthetic activity of the cosmopolitan diatom *Chaetoceros decipiens-lorenzianus*. Non-axenic diatom cells were exposed to concentrations of BPA and DEHP (separately and in mixture), mimicking concentrations observed in contaminated marine ecosystems, for seven days...

Ecotoxicological effects of TiO2 nanoparticulates and bulk Ti on microalgae *Chaetoceros muelleri*

Authors: Baharlooeian M, Kerdgari M, Shimada Y
Source: ENVIRONMENTAL TECHNOLOGY & INNOVATION 23: 101720, 2021, DOI 10.1016/j.eti.2021.101720

Abstract: The substantial use of titanium compounds in different industries has raised concerns about the negative effects on aquatic environments. Therefore it is important to assess their fate in aquatic environments and their uptake by organisms. This study aimed to assess the toxicological effects of nanoparticle TiO2 and bulk Ti on *Chaetoceros muelleri*, the microalgae used as a bioindicator of water pollution, in different periods. The compositions of fatty acids, proteins, and carotenoids were selected as ecotoxicological markers in microalgae. The interaction of algal cells with nano-TiO2 and bulk Ti was evaluated using Fourier transform infrared spectroscopy...

Humic substances modulate fish bacterial communities in a marine recirculating aquaculture system

Authors: Louvado A, Cleary DFR, Pereira LF et al.

Source: AQUACULTURE 544: 737121, 2021, DOI 10.1016/j.aquaculture.2021.737121

Abstract: The stressful conditions of intensive aquaculture systems, combined with excessive antibiotic use, may have dysbiotic effects on aquaculture microbiomes and promote the spread of opportunistic pathogens. Here, we hypothesized that humic substances (HS), when added to the rearing water of a marine recirculating aquaculture system (RAS), will act as a chemical modulator of fish-associated bacterial communities and suppress potential pathogens. To test this, a 28-day RAS trial for juvenile European sea bass (Dicentrarchus labrax) was conducted with and without HS modulation. High-throughput sequencing of the 16S rRNA gene was used to evaluate role of HS in modulating fish bacterial assemblages (gut and skin mucus). In addition to this, biometric, digestive and oxidative stress parameters were measured to assess the impact of HS on fish performance...

Phycotoxicity of antibiotics and non-steroidal anti-inflammatory drugs to green algae *Chlorella* sp. and Desmodesmus spinosus: Assessment of combined toxicity by Box-Behnken experimental design

Authors: Gomaa M, Zien-Elabdeen A, Hifney AF, Adam MS

Source: ENVIRONMENTAL TECHNOLOGY & INNOVATION 23: 101586, 2021, DOI 10.1016/j.eti.2021.101586

Abstract: There is a growing concern regarding the adverse effects of pharmaceutical pollution on aquatic environments. The present study investigated the toxicity of different antibiotics and non-steroidal anti-inflammatory drugs (tetracycline, ciprofloxacin, amoxicillin, paracetamol, ketoprofen and diclofenac) on two green algae namely Chlorella sp. and Desmodesmus spinosus based on the 96h IC50 values of the two chlorophytes...

The Biolog EcoPlate (TM) Technique for Assessing the Effect of Metal Oxide Nanoparticles on Freshwater Microbial Communities

Authors Nemeth I, Molnar S, Vaszita E, Molnar M

Source Nanomaterials 11, 7, 2021, DOI 10.3390/nano11071777

Abstract The application of Biolog EcoPlate (TM) for community-level physiological profiling of soils is well documented; however, the functional diversity of aquatic bacterial communities has been hardly studied. The objective of this study was to investigate the applicability of the Biolog EcoPlate (TM) technique and evaluate comparatively the applied endpoints, for the characterisation of the effects of metal oxide nanoparticles (MONPs) on freshwater microbial communities...

The microalga *Phaeocystis antarctica* is tolerant to salinity and metal mixture toxicity interactions

Authors: Koppel DJ, Whitelaw N, Adams MS et al.

Source: ENVIRONMENTAL SCIENCE-PROCESSES & IMPACTS, Early Access, 2021, DOI 10.1039/d1em00233cE

Abstract: Salinity in the Antarctic nearshore marine environment is seasonally dynamic and climate change is driving greater variability through altered sea ice seasons, ocean evaporation rates, and increased terrestrial ice melt. The greatest salinity changes are likely to occur in the nearshore environment where elevated metal exposures from historical waste or wastewater discharge occur. How salinity changes affect metal toxicity has not yet been investigated. This study investigated the toxicity of cadmium, copper, nickel, lead, and zinc, and their equitoxic mixtures across a salinity gradient to the Antarctic marine microalga *Phaeocystis antarctica*...

Combined impacts of photosystem II-inhibiting herbicides and light availability on seagrass and marine microalgae

Authors: King OC, Smith RA, Warne MS et al.

Source: MARINE ECOLOGY PROGRESS SERIES 668: 215-230, 2021, DOI 10.3354/meps13717

Abstract: The combined and interactive effects of multiple stressors threaten coastal ecosystems, yet most ecological risk assessments used to inform environmental management still treat stressors separately. For marine microalgae and seagrass-particularly those common to the Great Barrier Reef, Australia-key stressors include low light from increased turbidity and herbicide exposure that runs off agricultural land. Despite co-occurring in aquatic ecosystems, the effects of these stressors are often studied separately, meaning any combined or interactive effects are overlooked. Here, we aimed to develop a conceptual synthesis of the physiological responses of marine microalgae and seagrass when exposed to these key stressors...

Azithromycin induces dual effects on microalgae: Roles of photosynthetic damage and oxidative stress

Authors: Mao YF, Yu Y, Ma ZX et al.

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 222: 112496, 2021, DOI 10.1016/j.ecoenv.2021.112496

Abstract: Antibiotics are frequently detected in aquatic ecosystems, posing a potential threat to the freshwater environment. However, the response mechanism of freshwater microalgae to antibiotics remains inadequately understood. Here, the impacts of azithromycin (a broadly used antibiotic) on microalgae *Chlorella pyrenoidosa* were systematically studied...

Toxicity of wood leachate to algae *Desmodesmus subspicatus* and plant *Lemna minor*

Authors: Sackey LNA, Mocova KA, Petrova S, Koci V

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, Early Access, 2021, DOI 10.1007/s11356-021-15319-x

Abstract: Wood is one of the extensively used goods on the earth due to its large accessibility and usage in a wide range of human life. When woods are exposed to aquatic media, leachates are generated which may affect the quality of water and damage aquatic life into which they are discharged. This research seeks to evaluate the toxicity of linden (*Tilia cordata*), larch (*Larix decidua*) from the Czech Republic, cedrela (*Cedrela odorata*) and emire (*Terminalia ivorensis*) from Ghana wood leachates to two aquatic organisms (*Desmodesmus subspicatus* and *Lemna minor*). In algal and duckweed toxicity tests, these plants were exposed to different concentrations of wood leachate with nutrient medium creating concentration rates, 20, 30, 45, 67, and 100% v/v...

Biochemical Effects of Two Pesticides in Three Different Temperature Scenarios on the Diatom *Thalassiosira weissflogii*

Authors: Mesquita AF, Goncalves FJM, Rocha CP et al.

Source: PROCESSES 9: 1247, 2021, DOI 10.3390/pr9071247

Abstract: The exponential increase of the human population demands the overuse of fertilizers and pesticides in agriculture practices to suppress food production needs. [...] Besides the known effects of such products in organisms, climatic changes pose an additional issue, being a main concern among scientists and politicians worldwide, since these alterations may worsen ecosystems' and organisms' sensitivity to stress conditions, such as the exposure to pollutants. [...] However, few studies have evaluated the biochemical impacts of oxyfluorfen and copper sulfate exposure on diatoms. This study intends to (1) evaluate the effects on the growth rate of both

contaminants on *T. weissfloggi* at three temperatures, considering the actual scenario of climatic changes, and (2) assess biochemical changes on the diatom when exposed to the chemicals at different temperatures. To achieve these aims, the marine diatom was exposed to the two chemicals individually at different temperatures...

ALGAE AND CYANOBACTERIA IN THE RHIZOSPHERE OF LEAD ACCUMULATOR PLANTS

Authors Becerra, AG, Daga, C, Murialdo, R, and more...

Source Boletin de la Sociedad Argentina de Botanica 56I: 3-16, 2021

Abstract Background and aims: Algae and Cyanobacteria species that grow in contaminated sites can accumulate high concentrations of heavy metals. In this work it was proposed to a) characterize the community of algae and Cyanobacteria and b) evaluate the effect of lead (Pb) on the composition of algae present in the rhizosphere of plants capable to accumulate Pb in Cordoba province...

Wet-dry cycles protect surface-colonizing bacteria from major antibiotic classes

Authors: Beizman-Magen Y, Grinberg M, Orevi T, Kashtan N

Source: ISME JOURNAL, Early Access, 2021, DOI 10.1038/s41396-021-01051-4

Abstract: Diverse antibiotic compounds are abundant in microbial habitats undergoing recurrent wet-dry cycles, such as soil, root and leaf surfaces, and the built environment. These antibiotics play a central role in microbial warfare and competition, thus affecting population dynamics and the composition of natural microbial communities. Yet, the impact of wet-dry cycles on bacterial response to antibiotics has been scarcely explored. Using the bacterium E. coli as a model organism, we show through a combination of experiments and computational modeling, that wet-dry cycles protect bacteria from beta-lactams...

Chemical contamination alters the interactions between bacteria and phytoplankton

Authors: Pringault O, Bouvy M, Carre C et al.

Source: CHEMOSPHERE 278: 130457, 2021, DOI 10.1016/j.chemosphere.2021.130457

Abstract: Bacteria and phytoplankton are key players in aquatic ecosystem functioning. Their interactions mediate carbon transfer through the trophic web. Chemical contamination can alter the function and diversity of phytoplankton and bacterioplankton, with important consequences for ecosystem functioning. The aim of the present study was to assess the impact of chemical contamination on the interactions between both biological compartments. Two contrasting marine coastal ecosystems, offshore waters and lagoon waters, were exposed to chemical contamination (artificial or produced from resuspension of contaminated sediment) in microcosms in four seasons characterized by distinct phytoplankton communities...

River restoration changes distributions of antibiotics, antibiotic resistance genes, and microbial community

Authors: Zhang LL, Zhang C, Lian KT et al.

Source: SCIENCE OF THE TOTAL ENVIRONMENT 788: 147873, 2021, DOI 10.1016/j.scitotenv.2021.147873

Abstract: Although river restoration has been increasingly implemented to restore water quality in ecosystems, its effect on the removal of emerging pollutant antibiotics, and their resultant influence on microbial community structure and functions in river water is still unclear. This study investigated the changes of antibiotics, antibiotic resistant genes, microbial communities, and their spatial distributions in a megacity river before and after river restoration...

Molecular Mechanisms of Nanomaterial-Bacterial Interactions Revealed by Omics-The Role of Nanomaterial Effect Level

Authors: Mortimer M, Wang Y, Holden PA

Source: FRONTIERS IN BIOENGINEERING AND BIOTECHNOLOGY 9: 683520, 2021, DOI 10.3389/fbioe.2021.683520

Abstract: Nanotechnology is employed across a wide range of antibacterial applications in clinical settings, food, pharmaceutical and textile industries, water treatment and consumer goods. Depending on type and concentration, engineered nanomaterials (ENMs) can also benefit bacteria in myriad contexts including within the human body, in biotechnology, environmental bioremediation, wastewater treatment, and agriculture. However, to realize the full potential of nanotechnology across broad applications, it is necessary to understand conditions and mechanisms of detrimental or beneficial effects of ENMs to bacteria. [...] Here we review relevant literature regarding ENM impacts on bacterial cellular pathways obtained by transcriptomic, proteomic, and metabolomic analyses across three growth and viability effect levels: inhibitory, sub-inhibitory or stimulatory…

Herbicide Atrazine Alters the Microbiota of the Filamentous Green Alga *Cladophora* sp. Cultured from Thailand

Authors: Satjarak A, Piapukiew J, Chanthapatchot W et al.

Source: SAINS MALAYSIANA 50: 1255-1265, 2021, DOI 10.17576/jsm-2021-5005-06

Abstract: The attached green alga *Cladophora* known to harbor microbiota that play important roles in ecosystem, is one of the most common freshwater filamentous green algae in rivers globally, including those in the northern part of Thailand. These rivers mostly run through agricultural regions where herbicides are heavily used to improve crop quality and quantity. The effect of atrazine contamination on Cladophora microbiota in Thailand have not been investigated. To acquire this information, 16S rDNA amplicons were used to compare microbiota of *Cladophora* sp. cultures treated with a spectrum ofatrazine concentrations…

Algicidal activity of a novel indigenous bacterial strain of Paracoccus homiensis against the harmful algal bloom species, *Karenia mikimotoi*

Authors: Ding N, Du WJ, Feng YL et al.

Source: ARCHIVES OF MICROBIOLOGY Early Access, 2021, DOI 10.1007/s00203-021-02468-3

Abstract: Harmful algal blooms have deleterious effects on aquatic ecosystems and human health. The application of algicidal bacteria is a promising and environmentally friendly method of preventing and eradicating harmful algal blooms. In this study, a screen for algicidal agents against harmful algal blooms was used to identify an algicidal bacterial strain (strain O-4) isolated from a *Karenia mikimotoi* culture…

Growth Rate-dependent Cell Death of Diatoms due to Viral Infection and Their Subsequent Coexistence in a Semi-continuous Culture System

Authors: Tomaru Y, Yamaguchi H, Miki T

Source: MICROBES AND ENVIRONMENTS 36: ME20116, 2021, DOI 10.1264/jsme2.ME20116

Abstract: Viral infections are a major factor in diatom cell death. However, the effects of viruses on diatom dynamics remain unclear. Based on laboratory studies, it is hypothesized that virus-induced diatom mortality is dependent on the diatom growth rate. The present study aimed to elucidate the relationship between the diatom growth rate and virus-induced mortality using model systems of the marine planktonic diatom, *Chaetoceros tenuissimus* and its infectious viruses...

Study of the Tagus River and Entrepenas reservoir ecosystem around the Trillo nuclear power plant using chemometric analysis: Influence on water, sediments, algae and fish

Authors: Arguelles R, Toledo M, Martin MA
Source: CHEMOSPHERE 279: 130532, 2021, DOI:10.1016/j.chemosphere.2021.130532

Abstract: The fluvial and aquatic ecosystem of the Tagus River and Entrepenas reservoir located in the surrounding of the Trillo nuclear power plant (NPP) was evaluated from 1992 to 2008, considering the physicalchemical characteristics, metal content and radiological activity of the water, sediments, algae and fish...

The link between pharmaceuticals and cyanobacteria: a review regarding ecotoxicological, ecological, and sanitary aspects

Authors: Costa RD, Quadra GR, Souza HD et al.

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH Early Access, 2021, DOI 10.1007/s11356-021-14698-5

Abstract: Cyanobacteria are important for ecosystem functioning, but eutrophication may affect the surrounding biome by losing ecosystem services and/or through affecting the cyanotoxins production that threatens ecological and human health. Pollution is an environmental issue that affects aquatic ecosystems worldwide, and the knowledge of the role of synthetic chemicals such as pharmaceuticals is still scarce. [...] An overview of ecotoxicological tests performed in the literature exposing cyanobacteria to pharmaceuticals and the possible consequences regarding ecological and sanitary aspects was conducted...

Insights into the microbial degradation and biochemical mechanisms of carbamates

Authors: Mishra S, Pang SM, Zhang WP et al.

Source: CHEMOSPHERE 279: 130500, 2021, DOI 10.1016/j.chemosphere.2021.130500

Abstract: [...] This review discusses the deep understanding of carbamate degradation mechanisms with microbial strains, metabolic pathways, molecular mechanisms, and their genetic basis in degradation...

ERA / PUBLICATIONS SCIENTIFIQUES / MICROBIOLOGIE ET CONTAMINANTS

Bacterial community associated with canker disease from sweet cherry orchards of central valley of Chile presents high resistance to copper

Authors: Beltran MF, Osorio V, Lemus G and more...

Source: Chilean Journal of Agricultural Research 81(3): 378-389, 2021, DOI1 0.4067/S0718-58392021000300378

Abstract: The Chilean sweet cherry (*Prunus avium* L.) industry became the leading exporter worldwide. The bacterial canker is the most significant disease causing major economic losses. *Pseudomonas syringae* pv. syringae (Pss) is the only related pathovar recognized in Chile and it is mainly controlled with Cu-based antimicrobial compounds (CBAC). Soil contamination and the decreasing efficacy of CBACs by the emergence of Cu-resistant bacterial strains threaten the long-term sustainability of sweet cherry production. This study aimed at characterizing the bacterial community associated with canker infection injuries by assessing Cu resistance in sweet cherry orchards in the O'Higgins Region of Chile...

Cadmium Pollution Impact on the Bacterial Community Structure of Arable Soil and the Isolation of the Cadmium Resistant Bacteria

Authors Yu XX, Zhao JT, Liu XQ and more ...

Source Frontiers in Microbiology 2, 2021, DOI 10.3389/fmicb.2021.698834

Abstract Microorganisms play an important role in the remediation of cadmium pollution in the soil and their diversity can be affected by cadmium. In this study, the bacterial community in arable soil samples collected from two near geographical sites, with different degrees of cadmium pollution at three different seasons, were characterized using Illumina MiSeq sequencing...

Evaluation of brick kiln operation impact on soil microbial biomass and enzyme activity

Authors: Chowdhury N, Rasid MN

Source: SOIL SCIENCE ANNUAL 72,1, 2021, DOI 10.37501/soilsa/132232

Abstract: Heavy metal emission from brick kiln operation in developing countries is one of the major sources of environmental pollution. The present study evaluated the intensity of Cd and Pb pollution and the impact on soil microbial activity in agricultural soils in the vicinity of the brick kiln cluster of Hathazari, Chattogram, Bangladesh...

Soil heterogeneity within a vineyard impacts the beta but not the alpha microbial agro-diversity

Authors: Signorini M, Borruso L., Randall K. C., Dumbrell A. J. and more...

Source: Applied Soil ecology 166, 2021, DOI 10.1016/j.apsoil.2021.104088

Abstract: Here we investigate the effect of agricultural integrated management on soil microbial diversity within a vineyard with a history (20 years) of exposure to frequent applications of fertilizers and pesticides each season. Considering that these practices were mainly directed to the target plant (i.e. grapevine) and its surrounding area, we expected that these practices have influenced the soil alpha and beta bacterial and fungal diversity differently...

Microbial community profiles in soils adjacent to mining and smelting areas: Contrasting potentially toxic metals and co-occurrence patterns

Authors: Liu B, Yao J, Ma B and more...

Source: Chemosphere 282, 2021, DOI 10.1016/j.chemosphere.2021.130992

Abstract: Mining and smelting activities have introduced severe potentially toxic metals (PTMs) contamination into surrounding soil settings. Influences of PTMs on microbial diversity have been widely studied. However, variations of microbial communities, network structures and community functions in different levels of PTMs contaminated soils adjacent to mining and smelting aera are still poorly investigated. In this study, microbial communities of soils around different levels of PTMs contamination were comprehensively studied by 16S rRNA gene amplicons high-throughput sequencing...

Characteristics and Influencing Factors of Microbial Community in Heavy Metal Contaminated Soil under Silicon Fertilizer and Biochar Remediation

Authors: Zhang JC, He YW, Fang YC, and more...

Source: Adsorption Science & Technology 2021, DOI 10.1155/2021/9964562

Abstract: Silicon fertilizer and biochar have been widely used to remediate soil contaminated by heavy metals. The effects and mechanism of silicon fertilizer and biochar addition on the heavy metal availability, soil biological properties, and microbial community characteristics need further study in soils contaminated by heavy metals...

Combined Effect of Laboratory-Simulated Fire and Chromium Pollution on Microbial Communities in an Agricultural Soil

Authors: Rascio I, Curci M, Gattullo CE and more...

Source: Biology Basel 10, 7, 2021, DOI 10.3390/biology10070587

Abstract: Simple Summary Soil quality and fertility rely on soil microorganisms which contribute to nutrient cycling and plant nutrition. Accidental or intentional fires can almost completely kill soil microbiota and cause soil sterilization. Fires can also destroy soil organic matter (OM), thus causing the release of potentially toxic elements such as Cr that can further disturb soil recolonization by surviving bacteria. The identification of species able to cope with such altered environments is highly relevant to restore soil life in degraded soils and to remediate polluted sites...

Effects of antimony (III/V) on microbial activities and bacterial community structure in soil

Authors: Wang AH, He MC, Ouyang W and more...

Source: Science of The Total Environment 789, 2021, DOI 10.1016/j.scitotenv.2021.148073

Abstract: Antimony (Sb) primarily exists in trivalent (III) and pentavalent (V) speciation in the soil environment and poses a potential threat to ecological soil function as a toxic metalloid element. To evaluate the ecological effect of Sb in soil, the effects of different concentrations of Sb(III) and Sb(V) on microbial biomass carbon (MBC), soil basal respiration (SBR), potential nitrification rate (PNR), five enzyme activities and bacterial community structure were investigated using biochemical methods and high-throughput sequencing technology during the 1st and 8th weeks of exposure...

Microbial, Plant, and Invertebrate Test Methods in Regulatory Soil Ecotoxicology

Authors: Roembke J, Martin-Laurent F

Source: BIOAVAILABILITY OF ORGANIC CHEMICALS IN SOIL AND SEDIMENT; Handbook of Environmental Chemistry Series 100: 369-388, 2020, DOI 10.1007/698_2020_566

Abstract: Standard tests have been used in soil ecotoxicology for about 40 years, but there is still room for improvement, such as (1) increased use of such tests because of regulatory requirements, in particular for the risk assessment of chemicals (mainly pesticides) and, to a lesser extent, of contaminated soils; (2) increased efforts regarding the standardization of ecotoxicological methods, handled either by OECD (Organization for Economic Cooperation and Development) prospectively for individual chemicals or by ISO (International Organization for Standardization) retrospectively for contaminated soils; (3) increased inclusion of ecological aspects, i.e., by performing higher-tier tests under semi-field and field conditions...

Microbial Biosensors as Pesticide Detector: An Overview

Authors: Aynalem B, Muleta D

Source: Journal of Sensors 2021, DOI 10.1155/2021/5538857

Abstract Farmers are highly dependent upon agrochemicals to boost crop production through soil fertilization and and insect pests, pathogens, parasites, and weeds management. However, contentious application of agrochemicals on the farm has aggravated residual accumulation and has become problematic for environmental safety besides causing disease to humans and other animals...

Soil microbial communities in the face of changing farming practices: A case study in an agricultural landscape in France

Authors: Dunn L, Lang C, Marilleau N, Terrat S, and more...

Source : PLOS ONE 16, 6, 2021, DOI 10.1371/journal.pone.0252216

Abstract: According to biogeography studies, the abundance and richness of soil microorganisms vary across multiple spatial scales according to soil properties and farming practices. However, soil microorganisms also exhibit poorly understood temporal variations. This study aimed at better understanding how soil microbial communities respond to changes in farming practices at a landscape scale over time...

https://doi.org/10.15454/64rs-v051

Enhanced mutualistic symbiosis between soil phages and bacteria with elevated chromium-induced environmental stress

Authors: Huang D, Yu PF, Ye M, Schwarz C and more...

Source: Microbiome 9, 1, 2021, DOI 10.1186/s40168-021-01074-1

Abstract: Background: Microbe-virus interactions have broad implications on the composition, function, and evolution of microbiomes. Elucidating the effects of environmental stresses on these interactions is critical to identify the ecological function of viral communities and understand microbiome environmental adaptation. Heavy metal-contaminated soils represent a relevant ecosystem to study the interplay between microbes, viruses, and environmental stressors...

The growth of plants and indigenous bacterial community were significantly affected by cadmium contamination in soil-plant system

Authors: Du YY, Zhang DW, Zhou DG and more...

Source: AMB Express 11, 1, 2021, DOI 10.1186/s13568-021-01264-y

Abstract: Concentrations of heavy metals continue to increase in soil environments as a result of both anthropogenic activities and natural processes. Cadmium (Cd) is one of the most toxic heavy metals and poses health risks to both humans and the ecosystem. Herein, we explore the impacts of Cd on a soil-plant system composed of oilseed rapes (*Brassica napus* and *Brassica juncea*) and bacteria...

Effects of antimony contamination on bioaccumulation and gut bacterial community of earthworm *Eisenia fetida*

Authors: Huang BC, Long J, Li J, Ai YW

Source: Journal of Hazardous Materials 416, 2021, DOI 10.1016/j.jhazmat.2021.126110

Abstract: Antimony (Sb) contamination has brought great environmental problems to the surrounding soils. However, few studies focused on the response of bacterial communities in earthworm gut to Sb. *Eisenia fetida* was cultured in four soils with Sb contents (5,25,50,100 mg.kg(-1)) to investigate the distribution of Sb species in earthworm gut and the response mechanism of bacterial communities to Sb contamination...

Keystone taxa-mediated bacteriome response shapes the resilience of the paddy ecosystem to fungicide triadimefon contamination

Authors: Fan XY, Fu Y, Nie YX and more...

Source: Journal of Hazardous Materials 417, 2021, DOI 10.1016/j.jhazmat.2021.126061

Abstract: The increasing input of fungicides has emerged as a global concern for agroecosystem stability and sustainability. Agroecosystem resilience has been linked to microbiome response, however, is not well understood. Focusing on a widespread triazole-class fungicide triadimefon in the paddy ecosystem, we characterized that the soils and sediments were dominant triadimefon reservoirs with the peak level at 195 mu g kg-1 and 31.3 mu g kg-1, respectively, but essential for the resilience of paddy ecosystem to triadimefon...

https://doi.org/10.15454/64rs-v051

Changes in soil microbial community and activity caused by application of dimethachlor and linuron

Authors: Medo J, Makova J, Medova J, Lipkova N and more...

Source: Scientific Reports 11, 1, 2021, DOI 10.1038/s41598-021-91755-6

Abstract: Soil microorganisms and their activities are essential for maintaining soil health and fertility. Microorganisms can be negatively affected by application of herbicides. Although effects of herbicides on microorganisms are widely studied, there is a lack of information for chloroacetamide herbicide dimethachlor. Thus, dimethachlor and well known linuron were applied to silty-loam luvisol and their effects on microorganisms were evaluated during 112 days long laboratory assay...

Effects of Herbicides on the Microbial Community and Urease Activity in the Rhizosphere Soil of Maize at Maturity Stage

Authors: Chen, J, Yang, WP, Li, J, Anwar, S, and more

Source: JOURNAL OF SENSORS 2021, DOI 10.1155/2021/6649498

Abstract: Studying the effects of herbicides on microbial community and urease activity in the rhizosphere soil of maize is helpful to clarify the mechanisms herbicides used to affect soil microbial environment. In this research, four common preemergence maize specific herbicides, nicosulfuron+atrazine (A1), alachlor+acetochlor+atrazine (A2), propisochlor+atrazine (A3), and acetochlor+atrazine (A4), were selected to use in a pot trial. A preemergence herbicide nonspecific for maize, dinitraniline (A0), was used as the positive control, whereas water instead of herbicide was considered as the negative control (CK)...

Evaluating mercury concentrations in edible plant and fungi species in the Canadian Arctic environment

Authors Bergin, R, Koch, I, Rutter, A, Shirley, J, Zeeb, B

Source JOURNAL OF ENVIRONMENTAL QUALITY 50, 4: 877-888, 2021, DOI10.1002/jeq2.20253

Abstract Levels of environmental mercury (Hg) within the Canadian Arctic are a current area of concern. Although efforts have been made to reduce Hg released into the environment, levels remain elevated in flora and fauna. This study examined the concentrations of Hg in soil and naturally occurring edible plant and fungi species, identified by local Inuit residents, from eight locations in Iqaluit, Nunavut, and the surrounding area during the summers of 2018 and 2019...

Arsenic bioaccumulation in the soil fauna alters its gut microbiome and microbial arsenic biotransformation capacity

Authors: Wang HT, Liang ZZ, Ding Ji and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 417, 2021, DOI 10.1016/j.jhazmat.2021.126018

Abstract: The biotransformation of arsenic mediated by microorganisms plays an important role in the arsenic biogeochemical cycle. However, the fate and biotransformation of arsenic in different soil fauna gut microbiota are largely unknown. Herein the effects of arsenic contamination on five types of soil fauna were

compared by examining variations in arsenic bioaccumulation, gut microbiota, and arsenic biotransformation genes (ABGs)...

Effects of mancozeb on citrus rhizosphere bacterial community

Authors: Huang ZD, Wang P, Pu ZX and more...

Source: MICROBIAL PATHOGENESIS 154, 2021, DOI 10.1016/j.micpath.2021.104845

Abstract: Multiple and consecutive application of fungicide might damage the rhizosphere bacterial community of citrus. In order to evaluated effect of mancozeb on the chemical properties of citrus-cultivated soil and the richness and diversity of rhizosphere bacterial community...

Biological toxicity assessment of carbamate pesticides using bacterial and plant bioassays: An in-vitro approach

Authors: Shahid M, Manoharadas S, Chakdar H, and more...

Source: CHEMOSPHERE 278, 2021, DOI 10.1016/j.chemosphere.2021.130372

Abstract: In recent times, agricultural practices mainly rely on agrochemicals and pesticides to safe-guard edible crops against various pests and to ensure high yields. However, their indiscriminate use may cause severe environmental hazards that directly and negatively affect soil microorganisms and crop productivity. Considering these, present study was aimed to assess the toxicity of carbamate pesticides namely carbamoyl (CBL), methomyl (MML) and carbofuran (CBN) using bacterial and plant (Vigna mungo L.) bioassays. All pesticide doses (25-100 mu g mL(-1)) showed negative effect on bacteria as well as plant...

Dynamic Response of Soil Enzymes and Microbial Diversity to Continuous Application of Atrazine in Black Soil of a Cornfield without Rotation in Northeast China

Authors: Yang FS, Yang SY, Xu JL and more...

Source: DIVERSITY-BASEL 13, 6, 2021, DOI 10.3390/d13060259

Abstract: Atrazine has been extensively used in China's agricultural production for a long time and the potential risks to the environment have received widespread attention. The purpose of this study was to examine the effect of the continuous application of atrazine on soil herbicide residues, soil enzyme activity, and microbial community structure, as well as to provide a theoretical reference for the appropriate application of atrazine and the improvement of soil...

Effect of colloid-size copper-based pesticides and wood-preservatives against microbial activities of Gram-positive Bacillus species using five-day biochemical oxygen demand test

Authors: Tegenaw A, Sorial GA, Sahle-Demessie E

Source: JOURNAL OF ENVIRONMENTAL SCIENCES 105:71-80, 2021, DOI 10.1016/j.jes.2020.12.037

Abstract: Copper-based pesticides and wood preservatives could end up in the environment during production, use, and end-of-life via different pathways that could cause unintended ecological and adverse health effects. This paper

provides the effect of colloid-size Cu-based pesticides (CuPRO and Kocide), micronized Cu azole (MCA-1 and MCA-2) and alkaline Cu quaternary (ACQ) treated woods, Cu-2(+), Cu-2(+) spiked untreated wood (UTW), and CuCO3 solutions against Gram-positive Bacillus species using five-day biochemical oxygen demand (BOD5) standard test...

Effects of Flurochloridone Application on Rhizosphere Soil Fungal Community and Composition in Potato Growing Areas of the Qinghai-Tibet Plateau-Web of Science Core Collection

Authors: Li W, Shen S, Chen HY, Zhang Y and more...

Source: JOURNAL OF FUNGI, 6, 2021, DOI 10.3390/jof7060420

Abstract: The application of herbicides to arable land is still the most effective and accepted method to protect plants from weeds. Extensive use of chemicals in conventional agricultural practices has resulted in continuous and serious environmental pollution. Flurochloridone (FLC) is a monophenyl pyrrolidinone selective herbicide that is commonly used to inhibit weeds that occur during the growth of potatoes. In recent years, research on the toxicity of FLC has gradually increased. However, it is relatively rare to analyze the role of FLC by studying the composition of soil microorganisms…

Keystone taxa shared between earthworm gut and soil indigenous microbial communities collaboratively resist chlordane stress

Authors: Zhu GF, Du RJ, Du DL, Qian JZ and more…

Source: ENVIRONMENTAL POLLUTION 283, 2021, DOI 10.1016/j.envpol.2021.117095

Abstract: Chlordane is an organochlorine pesticide that is applied extensively. Residual concentrations that remain in soils after application are highly toxic to soil organisms, particularly affecting the earthworm gut and indigenous soil microorganisms. However, response mechanisms of the earthworm gut and indigenous soil microorganism communities to chlordane exposure are not well known. In this study, earthworms (Metaphire guillelmi) were exposed to chlordane-contaminated soils to investigate their response mechanisms over a gradient of chlordane toxicity...

Metatranscriptomic characterization of the bacterial community of a contaminated mangrove from the Caribbean

Authors: Isaza JP, Sandoval-Figueredo V, Rodelo MC and more...

Source: REGIONAL STUDIES IN MARINE SCIENCE 44, 2021, DOI 10.1016/j.rsma.2021.101724

Abstract: Mangroves are considered biodiversity hotspots threatened by various anthropogenic tensors such as pollution, which affect the taxonomic and functional diversity of microorganisms and therefore the stability of the ecosystem. Despite metagenomic work, knowledge of gene expression in contaminated mangroves is limited. Our general objective was to characterize the metatranscriptome at the taxonomic and functional level of bacteria associated with nutrient cycling and xenobiotic degradation of a mangrove contaminated by wastewater from the Colombian Caribbean...

Structure and variation of root-associated bacterial communities of *Cyperus rotundus* L. in the contaminated soils around Pb/Zn mine sites

Authors: Gao P, Song BR, Xu R and more...

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH 2021, DOI 10.1007/s11356-021-14595-x

Abstract: Soil contamination due to mining activities is a great concern in China. Although the effects of mining pollution resulting in changes of soil characteristics and the microbiome have been documented, studies on the responses of plant root-associated microbial assemblages remain scarce...

Variation, distribution, and diversity of canonical ammonia-oxidizing microorganisms and complete-nitrifying bacteria in highly contaminated ecological restoration regions in the Siding mine area

Authors: Li Y, Liang Y, Zhang HC and more...

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 217, 2021, DOI 10.1016/j.ecoenv.2021.112274

Abstract: Canonical ammonia-oxidizing archaea (AOA), ammonia-oxidizing bacteria (AOB) and complete-nitrifying bacteria (comammox) exist in a variety of ecosystems. However, little is known about AOA, AOB and comammox or their contributions to nitrification in the soils of heavily degraded and acidic mine regions...

Effects of increasing concentrations of fungicide Quadris(R) on bacterial functional profiling in loamy sand soil

Authors: Aleksova M, Kenarova A, Boteva S and more...

Source: ARCHIVES OF MICROBIOLOGY, 2021, DOI 10.1007/s00203-021-02423-2

Abstract A mesocosm experiment was conducted to assess the side effects of the fungicide Quadris(R) on soil bacterial functioning...

Can biochar regulate the fate of heavy metals (Cu and Zn) resistant bacteria community during the poultry manure composting?

Authors: Awasthi SK, Duan YM, Liu T and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 406, 2021, DOI 10.1016/j.jhazmat.2020.124593

Abstract: In this study, the influence of coconut shell biochar addition (CSB) on heavy metals (Cu and Zn) resistance bacterial fate and there correlation with physicochemical parameters were evaluated during poultry manure composting...

Salinization depresses soil enzyme activity in metal-polluted soils through increases in metal mobilization and decreases in microbial biomass

Authors: Azadi N, Raiesi F

Source: ECOTOXICOLOGY 2021, DOI 10.1007/s10646-021-02433-2

Abstract Salinity may increase metal mobilization with a potentially significant consequence for soil enzymatic activity and nutrient cycling. The goal of this study was to investigate changes in soil enzyme activity in response to salinization of a clay loam soil artificially polluted with cadmium (Cd) and lead (Pb) during a 120-day incubation experiment...

Hormetic responses in arbuscular mycorrhizal fungi

Authors: Jakobsen I, Murmann LM, Rosendahl S

Source: SOIL BIOLOGY & BIOCHEMISTRY 159, 2021, DOI 10.1016/j.soilbio.2021.108299

Abstract The concept of hormesis describes that the application of low concentrations of a toxic compound will stimulate growth and activity of an organism. Since it is unknown whether hormesis occurs in arbuscular mycorrhizal fungi (AMF) the present work was designed to reveal whether two fungicides would generate hormetic response curves for AMF performance...

ERA / PUBLICATIONS SCIENTIFIQUES / MICROBIOLOGIE ET CONTAMINANTS / Antibiotiques et antibiorésistances

Diversity of Multidrug-Resistant Bacteria in an Urbanized River: A Case Study of the Potential Risks from Combined Sewage Overflows

Authors: Balasa G, Levengood ES, Battistelli JM, Franklin RB

Source: Water 13, 15, 2021, DOI 10.3390/w13152122

Abstract: Wastewater contamination and urbanization contribute to the spread of antibiotic resistance in aquatic environments. This is a particular concern in areas receiving chronic pollution of untreated waste via combined sewer overflow (CSO) events. The goal of this study was to expand knowledge of CSO impacts, with a specific focus on multidrug resistance...

Removal trend of amoxicillin and tetracycline during groundwater recharging reusing: Redox sensitivity and microbial community response

Authors: Qin KN, Zhao QL, Yu H and more...

Source: Chemosphere 282, 2021, DOI 10.1016/j.chemosphere.2021.131011

Abstract The abundant existence of antibiotics within the effluent of wastewater treatment plant seriously threatened their safety recharging. To investigate the fate and biodegradation of those toxic antibiotics within the soil aquifer system, typical antibiotics of amoxicillin (AMX) and tetracycline (TC) were selected and their removal mechanisms were investigated...

Long-term application of manure alters culturable soil microbial populations and leads to occurrence of antibiotic resistant bacteria

Authors: Mahjoory Y, Aliasgharzad N, Moghaddam G, Bybordi A

Source: Soil & Sediment Contamination, 2021, DOI 10.1080/15320383.2021.1961122

Abstract: The use of manure for agricultural applications is believed to be an important factor in the proliferation of antibiotic-resistant bacteria and can affect natural soil microbial communities. The goal of this study was to determine if the application of manure on cultivated fields would result in the proliferation of antibiotic-resistant bacteria and change in soil microbial population...

Prevalence of Multi-Drug-Resistant bacterial strains in agricultural soils of Haryana, India

Authors: Avantika M, Rana J.S., Kiran N and more…

Source: Research Journal of Biotechnology 16, 8:61-71

Abstract: Due to continuous misuse or overuse of antibiotics for various purposes in farm animals, the present century has witnessed a rapid increase in the prevalence of multi-drug-resistant bacterial strains specifically in the soil ecosystems throughout the world. In view of this significant fact, the present study was designed to assess the prevalence and spread of antibiotic-resistant-bacteria in agricultural soils of Haryana State in India...

Common and management-specific responses of grassland soil bacterial communities to manure and chlortetracycline amendments

Authors: Chronakova A, Kyselkova M, Elhottova D

Source: European Journal of Soil Biology 105, 2021, DOI 10.1016/j.ejsobi.2021.103320

Abstract: Manure application to soil affects the composition of soil bacterial communities as well as levels of antibiotic resistance genes in a manner dependent on various environmental and agricultural factors. These effects have been widely studied in arable soils, while the situation in grasslands that also receive inputs of fresh animal manure is largely unknown...

Wet-dry cycles protect surface-colonizing bacteria from major antibiotic classes

Authors: Beizman-Magen Y, Grinberg M, Orevi T, Kashtan N

Source: ISME journal, 2021, DOI 10.1038/s41396-021-01051-4

Abstract: Diverse antibiotic compounds are abundant in microbial habitats undergoing recurrent wet-dry cycles, such as soil, root and leaf surfaces, and the built environment. These antibiotics play a central role in microbial warfare and competition, thus affecting population dynamics and the composition of natural microbial communities. Yet, the impact of wet-dry cycles on bacterial response to antibiotics has been scarcely explored...

https://doi.org/10.15454/64rs-v051

Antibiotic resistome mostly relates to bacterial taxonomy along a suburban transmission chain

Authors: Qin ZY, Gao Q, Dong Q and more...

Source: Frontiers of Envornmental Science & Engineering 16I, 3, 2021, DOI10.1007/s11783-021-1466-7

Abstract: Antibiotic resistance genes comprising antibiotic resistome are of great concern due to their increase in the environment. Recent evidence of shared resistomes between soils and animal husbandry has imposed potential risks to human health. However, the correlation between a given community's resistome and bacterial taxonomic composition is controversial. Here, a transmission chain of resistomes from swine manure to compost and compost-amended soil were analyzed in five suburban areas...

Enrichment of potential degrading bacteria accelerates removal of tetracyclines and their epimers from cow manure biochar amended soil

Authors: Yue Y, Liu YJ, Wang JC, Vukanti R, Ge Y

Source: CHEMOSPHERE 278, 2021, DOI 10.1016/j.chemosphere.2021.130358

Abstract: The excessive usage of tetracyclines in animal husbandry and aquaculture invariably leads to deterioration of the microbial quality of nearby soils. We previously reported the accelerated removal of tetracyclines and their intermediates from the cow manure biochar amended soil (CMB). However, little is known about the underlying changes in the microbial community that mediate the accelerated removal of tetracyclines from the CMB...

Variations in bacterial community structure and antimicrobial resistance gene abundance in cattle manure and poultry litter

Authors: Gurmessa B, Ashworth AJ, Yang YC and more...

Source: ENVIRONMENTAL RESEARCH 197, 2021, DOI 10.1016/j.envres.2021.111011

Abstract: Cattle manure and poultry litter are widely used as fertilizers as they are excellent sources of nutrients ; however, potential adverse environmental effects exist during land applications, due to the release of zoonotic bacteria and antimicrobial resistance (AMR) genes. This study was conducted to understand linkages between physiochemical composition, bacterial diversity, and AMR gene presence of cattle manure and poultry litter...

Dynamics of Diversity and Abundance of Sulfonamide Resistant Bacteria in a Silt Loam Soil Fertilized by Compost

Authors: Han H, Bai MH, Chen YT and more...

Source: ANTIBIOTICS-BASEL, 10, 6, 2021, DOI 10.3390/antibiotics10060699

Abstract: Although composting is effective in deactivating antibiotic substances in manure, the influence of compost fertilization on the occurrence and dissemination of antibiotic resistance in arable soils remains to be controversial. Herein, the abundance and diversity of two sulfonamide resistance genes (sul1 and sul2) in soil fertilized by compost spiked with two concentrations of sulfadiazine (1 and 10 mg kg-1) were studied intensively by qPCR and high throughput sequencing based on a two-month microcosm experiment...

Animal manures application increases the abundances of antibiotic resistance genes in soil-lettuce system associated with shared bacterial distributions

Authors: Huang JL, Mi JD, Yan QF and more...

Source: SCIENCE OF THE TOTAL ENVIRONMENT 787, 2021, DOI: 10.1016/j.scitotenv.2021.147667

Abstract: An increasing amount of animal manures is being used in agriculture, and the effect of animal manures application on the abundance of antibiotics resistance genes (ARGs) in soil-plant system has attracted widespread attention. However, the impacts of animal manures application on the various types of bacterial distribution that occur in soil-lettuce system are unclear...

Response of soil bacterial communities, antibiotic residuals, and crop yields to organic fertilizer substitution in North China under wheat-maize rotation

Authors: Xu F, Liu YL, Du WC and more...

Source: SCIENCE OF THE TOTAL ENVIRONMENT 785, 2021, DOI 10.1016/j.scitotenv.2021.147248

Abstract: Manure application can benefit soil quality and sustainable food productivity, but overapplication can spread high levels of antibiotics and antibiotic resistance genes. A two-year field experiment was conducted to evaluate the comprehensive impacts of organic fertilizer substitution in North China under a wheat-maize rotation...

Assessing visitor use impact on antibiotic resistant bacteria and antibiotic resistance genes in soil and water environments of Rocky Mountain National Park

Authors: Scott LC, Wilson MJ, Esser SM and more...

Source: SCIENCE OF THE TOTAL ENVIRONMENT 785, 2021, DOI 10.1016/j.scitotenv.2021.147122

Abstract: Antibiotic resistant bacteria (ARB) and antibiotic resistance genes (ARGs) have been detected in soil and water in close proximity to anthropogenic sources, but the extent to which human impact plays into ARB and ARGs entering the environment is not well described. This study aimed to determine the impact of visitor use on ARB and ARGs in a national park environment...

Microbial and chemical pollutants on the manure-crops pathway in the perspective of "One Health" holistic approach

Authors: Buta M, Korzeniewska E, Harnisz M and more...

Source: SCIENCE OF THE TOTAL ENVIRONMENT 785, 2021, DOI 10.1016/j.scitotenv.2021.147411

Abstract: This study determined the impact of poultry and bovine manure fertilization on the content of antibiotics, heavy metals (HMs), and the quantitative and qualitative composition of integrase and antibiotic resistance genes in soil, groundwater, and crops cultivated on manure-amended plots...

https://doi.org/10.15454/64rs-v051

ERA / PUBLICATIONS SCIENTIFIQUES / MICROBIOLOGIE ET CONTAMINANTS / Biocontrôle

Arsenic bioaccumulation in the soil fauna alters its gut microbiome and microbial arsenic biotransformation capacity

Authors: Xiao JW, Guo XJ, Qiao XL and more...

Source: FRONTIERS IN MICROBIOLOGY 12, 2021, DOI 10.3389/fmicb.2021.682437

Abstract: *Bacillus subtilis* Z-14 can inhibit phytopathogenic fungi, and is used as a biocontrol agent for wheat take-all disease. The present study used the soil-borne fungus Gaeumannomyces graminis var. tritici (Ggt), which causes wheat take-all disease, and the soil microbial community as indicators, and investigated the antifungal effects of fengycin and iturin A purified from strain Z-14...

ERA / PUBLICATIONS SCIENTIFIQUES / MICROBIOLOGIE ET CONTAMINANTS / Bioremédiation

Identification of a plant endophytic growth-promoting bacteria capable of inhibiting cadmium uptake in rice

Authors: Tian W, Li L, Xiao X and more...

Source: Journal of Applied Microbiology 2021, DOI 10.1111/jam.15201

Abstract: The study aims to identify a novel plant growth-promoting bacteria (PGPB), which contributes to promoting growth and reducing cadmium (Cd) concentration in rice under Cd-contaminated conditions...

Interactive Effects of Potassium and Mycorrhizal Fungi on Glomalin and Biochemical Responses of Sunflower Grown in a Pb and Zn Contaminated Soil

Authors: Jahantigh M, Ahmadabadi Z, Motesharezadeh B and more...

Source: Soil & Sediment Contamination 2021, DOI 10.1080/15320383.2021.1963670

Abstract: It is well documented that sole application of potassium (K) or mycorrhizal fungi can alleviate heavy metal stress in plants. As an indicator of the efficient defense in the mycorrhizal fungi-plant system, glomalin synthesis in the rhizosphere can be determined. In this study, interactive effects of mycorrhizal fungi (MY) and K on glomalin content, heavy metal uptake and mycorrhizal properties of sunflower plants were examined with three soil K levels (0, 100, and 200 mg K kg (-1) using K2SO4)...

Revitalization of bacterial endophytes and rhizobacteria for nutrients bioavailability in degraded soils to promote crop production

Authors: Mburu SW, Koskey G, Njeru EM, Maingi JM

Source: AIMS AGRICULTURE AND FOOD 6(1): 496-524, 2021, DOI 10.3934/agrfood.2021029

Abstract: ... The use of rhizosphere and endophytic bacteria can significantly reduce the amount of agrochemicals that contribute to environmental pollution. In the context of the changing climatic conditions, some beneficial rhizospheric and endophytic bacterial communities enhance adaptation and resilience, thereby promoting sustainable farming systems…

Enhanced removal of fifteen pesticide mixture by a single bacterial strain using response surface methodology and its application in raw milk

Authors: Wageed M, El-Sherbiny GM, Sharaf MH, and more...

Source: Journal of Envronmental Health Science and Engineering 2021, DOI 10.1007/s40201-021-00683-0

Abstract: Purpose Environmental contamination with various pesticides accompanied by uncontrolled use contributes to severe ecological and health problems. Although extensive research was conducted on pesticides degradation, very few reports have demonstrated the degradation of mixed pesticides. Consequently, this study aimed to evaluate the removal efficacy of highly potent bacterial isolate for pesticide mixture under optimal culture conditions, followed by their application in milk...

Bioremoval of cadmium by co-cultivated bacterial strains, Bacillus paramycoides and Bacillus subtilis, in a pilot-scale phyto- and rhizoremediation approach

Authors: Viji A.S., Antony B.T., Wagh M.S., Osborne W.J.

Source: International Journal of Environmental Science and Technology 2021, DOI 10.1007/s13762-021-03540-7

Abstract: Cadmium is a highly toxic environmental pollutant that is known to show lethal effects on the macro- and microorganisms. The current study is aimed at the isolation and screening of cadmium-resistant bacteria from contaminated soil samples collected from the rhizosphere region wet land paddy fields near Katpadi, Vellore...

Potential use of fungal-bacterial co-cultures for the removal of organic pollutants

Authors: Espinosa-Ortiz EJ, Rene ER, Gerlach R

Source: Critical Reviews in Biotechnology 2021, DOI 10.1080/07388551.2021.1940831

Abstract: ... This article reviews: (i) the mechanisms of pollutant degradation that can occur in fungal-bacterial systems (e.g.: co-degradation, production of secondary metabolites, enhancement of degradative enzyme production, and transport of bacteria by fungal mycelia); (ii) case studies using fungal-bacterial co-cultures for the removal of various organic pollutants (synthetic dyes, polycyclic aromatic hydrocarbons, pesticides, and other trace or

volatile organic compounds) in different environmental matrices (e.g. water, gas/vapors, soil); (iii) the key aspects of engineering artificial fungal-bacterial co-cultures, and (iv) the current challenges and future perspectives of using fungal-bacterial co-cultures for environmental remediation…

Bacteria Isolated from Wastewater Irrigated Agricultural Soils Adapt to Heavy Metal Toxicity While Maintaining Their Plant Growth Promoting Traits

Authors: Ajmal AW, Saroosh S, Mulk S and more...

Source: Sustainability 13, 14, 2021, DOI 10.3390/su13147792

Abstract: The present study explored the plant growth promotion and bioremediation potential of bacteria inhabiting wastewater irrigated agricultural soils...

Potential of arsenate-reducing bacterial inoculants to enhance field-scale remediation of arsenic contaminated soils by *Pteris vittata* L.

Authors: Zhu GH, Liu WJ, Wen Y and more...

Source: Ecological Engineering 169, 2021, DOI10.1016/j.ecoleng.2021.106312

Abstract: The effects of arsenate-reducing bacterial inoculants (C13, F2, F2-As and compound microbial inoculant) on the remediation of arsenic (As) contaminated soil by *Pteris vittata* L. were studied in field experiments...

Soil bacterial community dynamics following bioaugmentation with *Paenarthrobacter* sp. W11 in atrazine-contaminated soil

Authors: Chen SM, Li YY, an, ZW and more...

Source: Chemosphere 82, 2021, DOI 10.1016/j.chemosphere.2021.130976

Abstract: Atrazine is one of the most widely used herbicides, however it and its metabolites cause widespread contamination in soil and ground water. Bioaugmentation is an effective method for remediation of environmental organic pollutants. High-throughput sequencing provides an important tool for understanding the changes of microbial community and function in response to pollutants degradation based on bioaugmentation...

Differential responses of 23 maize cultivar seedlings to an arbuscular mycorrhizal fungus when grown in a metal-polluted soil

Authors: Yin ZP, Zhang Y, Hu N and more...

Source: Science of The Total Environment 789, 2021, DOI 10.1016/j.scitotenv.2021.148015

Abstract: Modern breeding efforts have been accelerating crop improvement and yielding numerous cultivars with distinct genetic traits; however, interactions between different cultivars and their root-associated arbuscular mycorrhizal fungi (AMF) are not clear. Herein, we selected the 22 most common commercial maize (*Zea mays*) varieties in China and an inbred line (B73) to study the differential responses of these 23 cultivars to mycorrhizal inoculation when grown in an arable soil polluted by multiple metals (Pb, Zn, and Cd)...

Microbial response to designer biochar and compost treatments for mining impacted soils

Authors: Ducey TF, Novak JM, Sigua GC and more...

Source: BIOCHAR 3(3): 299-314, 2021, DOI 10.1007/s42773-021-00093-3

Abstract: The Oronogo-Duenweg mining belt is a designated United States Environmental Protection Agency Superfund site due to lead-contaminated soil and groundwater by former mining and smelting operations...

Stress amelioration response of glycine betaine and Arbuscular mycorrhizal fungi in sorghum under Cr toxicity

Author: Kumar P

Source: PLOS ONE 16, 7, 2021, DOI 10.1371/journal.pone.0253878

Abstract: Chromium toxicity is a major problem in agricultural soils that negatively affects a plant's metabolic activities. It reduces biochemical and antioxidant defence system's activities. In search of the solution to this problem a two-year pot experiment (completely randomized design with three replications), in three genetically different varieties of sorghum (SSG 59-3, HJ 513 and HJ 541) under Cr toxicity (2 and 4 ppm) was conducted to determine the effect of glycine betaine (50 and 100mM) and Arbuscular mycorrhizal fungi (AMF) on the antioxidant system...

Rhizosphere Microbial Communities and Heavy Metals

Authors: Caracciolo AB, Terenzi V

Source: Microorganisms 9, 7, 2021, DOI 10.3390/microorganisms9071462

Abstract: The rhizosphere is a microhabitat where there is an intense chemical dialogue between plants and microorganisms. The two coexist and develop synergistic actions, which can promote plants' functions and productivity, but also their capacity to respond to stress conditions, including heavy metal (HM) contamination...

Biodegradation performance and diversity of enriched bacterial consortia capable of degrading high-molecular-weight polycyclic aromatic hydrocarbons

Authors: Wang DQ, Qin L, Liu EY and more...

Source: Environemental Technology, 2021, DOI 10.1080/09593330.2021.1946163

Abstract Polycyclic aromatic hydrocarbons (PAHs) are key organic pollutants in the environment that pose threats to the ecosystem and human health. The degradation of high molecular weight (HMW) PAHs by enriched bacterial consortia has been previously studied, while the involved metabolisms and microbial communities are still unclear and warrant further investigations...

https://doi.org/10.15454/64rs-v051

Polyamine-producing bacterium *Bacillus megaterium* N3 reduced Cd accumulation in wheat and increased the expression of DNA repair - and plant hormone - related proteins in wheat roots

Authors: Qin SM, Wu XJ, Han H and more...

Source: Environemental and Experimental Botany 189, 2021, DO I10.1016/j.envexpbot.2021.104563

Abstract: Metal-immobilizing bacteria play an important role in reducing the metal uptake of plants. However, little research has characterized the effects of polyamine-producing bacteria on the inhibition of Cd uptake in wheat. Herein, the effects of *Bacillus megaterium* N3 on wheat Cd uptake and the differentially expressed proteins in wheat roots were studied using hydroponic experiments...

Synergistic interaction of fungal endophytes, Paecilomyces formosus LHL10 and *Penicillium funiculosum* LHL06, in alleviating multi-metal toxicity stress in *Glycine max* L.

Authors: Bilal S, Shahzad R, Lee IJ

Source: Environmental Science and Pollution Research 2021, DOI 10.1007/s11356-021-15202-9

Abstract: Heavy metal accumulation in crop grains due to hazardous metal contamination is considered a great concern. However, phytobeneficial fungi are reported to have important abilities for the biosafety of crops grown in contaminated soil. Therefore, the current study was undertaken to explore the mutualistic association of plant growth-promoting endophytic fungi in reducing heavy metal concentration in the seeds of soybean plants subsequently grown in contaminated soil, without comprising seed quality and biochemical profile...

Natural Fungal Endophytes From *Noccaea caerulescens* Mediate Neutral to Positive Effects on Plant Biomass, Mineral Nutrition and Zn Phytoextraction

Authors: Yung L, Sirguey C, Azou-Barre A, Blaudez D

Source: Frontiers in Microbiology 12, 2021, DOI 10.3389/fmicb.2021.689367

Abstract: Phytoextraction using hyperaccumulating plants is a method for the remediation of soils contaminated with trace elements (TEs). As a strategy for improvement, the concept of fungal-assisted phytoextraction has emerged in the last decade. However, the role played by fungal endophytes of hyperaccumulating plants in phytoextraction is poorly studied...

ISOLATION OF 2 PHOXIM DEGRADING BACTERIA AND CONSTRUCTION OF A LIVE MICROBIAL AGENT FOR BIOREMEDIATION OF PHOXIM CONTAMINATED SOIL

Authors: Meng ZL, Zhu Q, Ni XF and more...

Source: Fresenius environmental bulletin 30(6B): 7604-7611, 2021

Abstract: 2 kinds of bacteria, named XLL-M04 and XLL-M12, were isolated from the soil, which could

degrade phoxim effectively. XLL-M04 and XLL-M12 were identified as *Bacillus cohnii* and *Bacillus firmus*. The degradation efficiency of 10mg/L of phoxim by XLL-M04 could reach about 99.0% in 7d, and the strain XLL-M12 could reach 98.0% under the same conditions. Both strain XLL-M04 and strain XLL-M12 could also effectively degrade chlorpyrifos, malathion, parathion and fenitrothion…

Biodegradation of pesticides by adapted fungi. Potential use on biopurification systems ?

Authors: Pinto A.P., Teixeira D.M., Caldeira A.T., Rodrigues S.C.

Source: Book Chapter Edited by Prasad MNV (Prasad, MNV) AGROCHEMICALS DETECTION, TREATMENT AND REMEDIATION: PESTICIDES AND CHEMICAL FERTILIZERS: 1-23, 2020, DOI 10.1016/B978-0-08-103017-2.00001-5

A Comparative Taxonomic Profile of Microbial Polyethylene and Hydrocarbon-Degrading Communities in Diverse Environments

Authors: Zokaei FH, Gharavi S, Asgarani E and more...

Source: Iranian Journal of Biotechnology 19(2): 1-9, 2021, DOI 10.30498/IJB.2021.2955

Abstract: Polyethylene (PE) is one of the most abundant plastic wastes which accumulates in marine and terrestrial environments. As microbial degradation has been a promising approach for the bioremediation of polluted environments, identification of the microbial community profile where these pollutants accumulate, has recently been in focus. We have investigated the taxonomic and functional characteristics of polyethylene-degrading microorganisms in a plastic waste recycling site in Tehran, Iran...

Assessment of heavy metal bioremediation potential of bacterial isolates from landfill soils

Authors: Oziegbe O., Oluduro A.O., Oziegbe E.J., Ahuekwe E.F., Olorunsola S.J.

Source: Saudi Journal of Biological Sciences 28(7): 3948-3956, 2021, DOI 10.1016/j.sjbs.2021.03.072

Abstract: Indiscriminate disposal of wastes on landfills has led to increase in heavy metal contamination in landfill soils. However, the ability of the indigenous microorganisms to remediate the polluted environment can be of great influence in reclamation of such soils. The objectives of this study were to assess the bioremediation potential of the screened indigenous bacteria and evaluate the effects of carbon source and pH in the enhancement of the bioremediation process...

Influences of modified biochar on metal bioavailability, metal uptake by wheat seedlings (*Triticum aestivum* L.) and the soil bacterial community

Authors: Wang YY, Ren Q, Li T, Zhan WH and more...

Source: Ecotoxicology and Envoronmental Safety 220, 2021, DOI 10.1016/j.ecoenv.2021.112370

Abstract: A 6 weeks pot culture experiment was carried out to investigate the stabilization effects of a modified biochar (BCM) on metals in

https://doi.org/10.15454/64rs-v051

contaminated soil and the uptake of these metals by wheat seedlings...

Biochar decreased enantioselective uptake of chiral pesticide metalaxyl by lettuce and shifted bacterial community in agricultural soil

Authors: You XW, Suo FY, Yin SJ and more...

Source: Journal of Hazardous Materials 417, 2021, DOI 10.1016/j.jhazmat.2021.126047

Abstract: A 35-day microcosmic experiment was conducted with lettuce (*Lactuca sativa* L.) and two metalaxyl (MET) enantiomers (R-MET and S-MET) to understand the roles of biochar in the enantioselective fate of chiral pesticides in soil-plant ecosystems...

A critical assessment on the short-term response of microbial relative composition in a mine tailings soil amended with biochar and manure compost

Authors: Risueno Y, Petri C, Conesa HM

Source: Journal of Hazardous Materials 417, 2021, DOI10.1016/j.jhazmat.2021.126080

Abstract: Phytomanagement of tailings requires the use of soil conditioners to favour plant establishment, but their benefits on soil microbial composition need to be assessed. The goal of this work was to evaluate the effect of two organic amendments, manure compost and biochar, on soil bacterial and fungal composition at metallic mine tailings...

The positive effects of inoculation using arbuscular mycorrhizal fungi and/ or dark septate endophytes on the purification efficiency of CuO-nanoparticles-polluted wastewater in constructed wetland

Authors: Ban YH, Xiao Z, Wu C and more...

Source: Journal of Hazardous Materials 416, 2021, DOI 10.1016/j.jhazmat.2021.126095

Abstract: The extent to which, and mechanisms by which, arbuscular mycorrhizal fungi (AMF) and dark septate endophytes (DSE) purify wetlands polluted by metallic nanoparticles (metallic NPs) are not well understood. In this study, micro-vertical flow constructed wetlands (MVFCWs) with the Phragmites australis (reeds)-AMF/DSE symbiont were used to treat CuO nanoparticles (CuO-NPs)-polluted wastewater...

Microbial community structure and co-occurrence are essential for methanogenesis and its contribution to phenanthrene degradation in paddy soil

Authors: Wang YQ, Wang MX, Chen YY and more...

Source: Journal of Hazardous Materials, 417, 2021, DOI 10.1016/j.jhazmat.2021.126086

Abstract: Although polycyclic aromatic hydrocarbons (PAHs) degradation under methanogenesis is an ideal approach to remediating PAH-polluted soil, the contribution of methanogenesis to soil PAH elimination and the relationships between microbial ecological

characteristics and PAH degradation during this process remain unclear…

Degradation of polyethylene plastic in soil and effects on microbial community composition

Authors: Quintela C, Varrone C

Source: SOIL MICROENVIRONMENT FOR BIOREMEDIATION AND POLYMER PRODUCTION: 75-94, 2020 Book Chapter

Abstract: ...The present chapter introduces the most recent findings in the field of bioremediation of pesticides, critically discussing the main bottlenecks and how to overcome them...

Investigation of arsenic-resistant, arsenite-oxidizing bacteria for plant growth promoting traits isolated from arsenic contaminated soils

Authors: Laha A, Bhattacharyya S, Sengupta S and more...

Source: ARCHIVES OF MICROBIOLOGY 2021, DOI 10.1007/s00203-021-02460-x

Abstract: The problem of arsenic (As) pollution being severe warrants opting for low-cost microbial remediation strategies. The present study of identifying suitable bacterial strains led to the isolation of eleven As-tolerant strains from the As-contaminated rhizosphere soils of West Bengal, India...

Siderophore Production of the Hg-Resistant Endophytic Bacteria Isolated from Local Grass in the Hg-Contaminated Soil

Authors: Ustiatik R, Nuraini Y, Suharjono S, Handayanto E

Source: JOURNAL OF ECOLOGICAL ENGINEERING 22(5): 129-138, 2021, DOI 10.12911/22998993/135861

Abstract: Mercury (Hg)-contaminated soil remediation has become an urgent necessity due to its harmful effect on the environment and living organisms. The use of plant-endophyte partnership for phytoremediation demonstrates an excellent opportunity for cleaning heavy metal contaminated soil. This study aimed to screen and characterize the phenotype of the Hg-resistant endophytic bacteria from local grasses (*Cynodon dactylon and Eleusine indica*) in the Hg-contaminated soil of West Nusa Tenggara, Indonesia with siderophore-producing traits...

Heavy metal tolerance of bacterial isolates associated with overburden strata of an opencast coal mine of Assam (India)

Authors: Singh KN, Narzary D

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH 2021, DOI 10.1007/s11356-021-15153-1

Abstract: Coal overburden strata (OBS) vary in thickness, geochemical composition, and physical properties from stratum to stratum. Here, we enumerated the cultivable bacterial diversity and their distribution in different OBS taken from the opencast mining of Tikok colliery, Assam...

https://doi.org/10.15454/64rs-v051

Soil remediation approach and bacterial community structure in a long-term contaminated soil by a mining spill (Aznalcollar, Spain)

Authors: Paniagua-Lopez M., Vela-Cano M., Correa-Galeote D. and more...

Source: SCIENCE OF THE TOTAL ENVIRONMENT 777, 2021, DOI 10.1016/j.scitotenv.2021.145128

Abstract: The Aznalcollar accident, which occurred in 1998, spilled 36 x 10(5) m (3) of pyritic sludge and 9 x 10(5) m(3) of acidic water around an area of 43 km(2) in the south of Spain. This spill is considered one of the most important metal-mining associated accidents worldwide. In this study, two soil remediation techniques were evaluated: the addition of marble sludge (liming treatment, LS) and the mixing of recovered soils (RC) with contaminated soils (CT) (biopile treatment, BS)...

Reduction and bacterial adsorption of dissolved mercuric ion by indigenous bacteria at the Oak Ridge Reservation site

Authors: Li RW, Qi L, Ibeanusi V, and more...

Source: CHEMOSPHERE 280, 2021, DOI 10.1016/j.chemosphere.2021.130629

Abstract: Mercury exists in various forms in the environment and the indigenous bacteria mediated processes have the potential to be used for mercury remediation. In this study, two mixed cultures of indigenous bacteria at the Oak Ridge Reservation site (i.e., ORR soil culture and ORR sediment culture) were selected to study the microbial mediated mercuric reduction under an aerobic condition as well as mercury adsorption onto bacterial surfaces...

Inhibition effects of long-term calcium-magnesia phosphate fertilizer application on Cd uptake in rice: Regulation of the iron-nitrogen coupling cycle driven by the soil microbial community

Authors: Wang CR, Huang YC, Zhang CB and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 416, 2021, DOI 10.1016/j.jhazmat.2021.125916

Abstract Cadmium (Cd) pollution in paddy soil seriously endangers food safety production. To investigate the effects and microbiological mechanisms of calcium-magnesium-phosphate (CMP) fertilizer application on Cd reduction in rice, field experiments were conducted in Cd-contaminated paddy soil...

A crucial review on polycyclic aromatic Hydrocarbons - Environmental occurrence and strategies for microbial degradation

Authors: Premnath N, Mohanrasu K, Rao RGR, and more...

Source: CHEMOSPHERE 280, 2021, DOI 10.1016/j.chemosphere.2021.130608

Abstract: Over the last century, contamination of polycyclic aromatic hydrocarbons (PAHs) has risen tremendously due to the intensified industrial activities like petrochemical, pharmaceutical, insecticides and fertilizers applications. PAHs are a group of organic pollutants with adverse effects on both humans and the environment. These PAHs are widely distributed in various ecosystems including air, soil, marine water and sediments. Degradation of PAHs generally occurs through

processes like photolysis, adsorption, volatilization, chemical degradation and microbial degradation. Microbial degradation of PAHs is done by the utilization of diverse microorganisms like algae, bacteria, fungi which are readily compatible with biodegrading/bio transforming PAHs into H2O, CO2 under aerobic, or CH4 under anaerobic environment...

Attainment and characterization of a microbial consortium that efficiently degrades biphenyl and related substances

Authors: Xu T, Liu T, Jiang DW and more...

Source: BIOCHEMICAL ENGINEERING JOURNAL 173, 2021, DOI 10.1016/j.bej.2021.108073

Abstract: Persistent organic pollutants (POPs) mainly including polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and organochlorine pesticides (OPs), have long-term harmful effects on human health and the environment. In this study, a natural consortium BP-W was attained from oil-contaminated soil using biphenyl as the sole carbon source, which is a relatively simple PAH and can form PCBs under certain catalytic conditions. PCR-DGGE techniques were used to analyze the structure of the consortium BP-W...

Chlorpyrifos degradation using binary fungal strains isolated from industrial waste soil

Authors: Kumar A, Sharma A, Chaudhary P, Gangola S

Source: BIOLOGIA 2021, DOI 10.1007/s11756-021-00816-8

Abstract: Chlorpyrifos is a broad-spectrum organophosphate pesticide and used frequently on different cropping systems to control phytopathogens. Being a hazardous substance, chlorpyrifos may affect human health as some unutilized pesticide percolates through soil and contaminates ground water. Present study was planned to establish an effective remediation method of chlorpyrifos using two fungal isolates (C1 and C3), recovered from the waste (soil) of a refrigeration industry...

Degradation studies of pendimethalin by indigenous soil bacterium *Pseudomonas* strain PD1 using spectrophotometric scanning and FTIR

Authors: Trivedi N, Dubey A

Source: ARCHIVES OF MICROBIOLOGY 2021, DOI 10.1007/s00203-021-02439-8

Abstract: In this study pendimethalin degrading indigenous soil bacterium was isolated from rice field (supplemented with pendimethalin) and identified as, Pseudomonas strain PD1 on the basis of 16S rRNA phylogenetic analysis. Biodegradation of pendimethalin by this strain was evaluated by spectrophotometric scanning and FTIR analysis of degraded compounds in minimal salt media...

Organic amendment improves rhizosphere environment and shapes soil bacterial community in black and red soil under lead stress

Authors: Liu XS, Zhang X, Li R and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 416, 2021, DOI 10.1016/j.jhazmat.2021.125805

https://doi.org/10.15454/64rs-v051

Abstract Heavy metal pollution is a worldwide problem affecting the quality of agricultural production and human health. In this study, spent mushroom substrate (SMS) and its compost (CSMS) were used to remedy black soil and red soil with simulated Pb contamination, aiming to discover their role in the improving rhizosphere environment and structuring rhizosphere bacterial community under lead stress...

Effect of 4-chloro-2-methylphenoxy acetic acid on tomato gene expression and rhizosphere bacterial communities under inoculation with phosphate-solubilizing bacteria

Authors: Zhang J, Guo TT, Xiao QQ, Wang PC, Tian H

Source: JOURNAL OF HAZARDOUS MATERIALS 416, 2021, DOI 10.1016/j.jhazmat.2021.125767

Abstract: The herbicide 4-chloro-2-methylphenoxy acetic acid (MCPA) is widely used to control the spread of broad-leaved weeds in agricultural soils, though it remains unclear how tomato plants cope with the phytotoxic effects of MCPA at the molecular level. In this study, RNA-seq and Illumina MiSeq were used to sequence bacterial communities in tomato rhizosphere soils treated with MCPA and the phosphate-solubilizing bacterial strain N3....

Clary Sage Cultivation and Mycorrhizal Inoculation Influence the Rhizosphere Fungal Community of an Aged Trace-Element Polluted Soil

Authors: Raveau R, Sahraoui ALH, Hijri M, Fontaine J

Source: MICROORGANISMS 9, 6, 2021, DOI 10.3390/microorganisms9061333

Abstract: Soil fungal communities play a central role in natural systems and agroecosystems. As such, they have attracted significant research interest. However, the fungal microbiota of aromatic plants, such as clary sage (*Salvia sclarea* L.), remain unexplored. This is especially the case in trace element (TE)-polluted conditions and within the framework of phytomanagement approaches...

Bacteria responsible for antimonite oxidation in antimony-contaminated soil revealed by DNA-SIP coupled to metagenomics

Authors: Zhang MM, Kolton M, Li Z and more...

Source: FEMS MICROBIOLOGY ECOLOGY 97, 5, 2021, DOI 10.1093/femsec/fiab057

Abstract: Antimony (Sb), the analog of arsenic (As), is a toxic metalloid that poses risks to the environment and human health. Antimonite (Sb(III)) oxidation can decrease Sb toxicity, which contributes to the bioremediation of Sb contamination. Bacteria can oxidize Sb(III), but the current knowledge regarding Sb(III)-oxidizing bacteria (SbOB) is limited to pure culture studies, thus underestimating the diversity of SbOB....

Recruiting endophytic bacteria of wetland plants to phytoremediate organic pollutants

Authors: Singh T, Awasthi G, Tiwari Y

https://doi.org/10.15454/64rs-v051

Source: INTERNATIONAL JOURNAL OF ENVIRONMENTAL SCIENCE AND TECHNOLOGY 2021, DOI 10.1007/s13762-021-03476-y

Abstract: The release of organic compounds in the aquatic environment, resulting from different human activities, is a serious hazard due to the toxic, hydrophobic and persistent nature of these compounds. Removing organic contaminants from aquatic systems is vital and is one of the major topics of research in the arena of environmental science…

Phosphate-solubilizing bacterium *Burkholderia* sp. strain N3 facilitates the regulation of gene expression and improves tomato seedling growth under cadmium stress

Authors: Zhang J, Xiao QQ, Wang PC

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 217, 2021, DOI 10.1016/j.ecoenv.2021.112268

Abstract: Cadmium (Cd) is among the most toxic heavy metals in soils. The ways by which tomato plants inoculated with a phosphate-solubilizing bacterium (PSB) respond to Cd and regulate gene expression remain unclear...

Enhanced HCB removal using bacteria from mangrove as post-treatment after electrochemical oxidation using a laser-prepared Ti/RuO2-IrO2-TiO2 anode

Authors: Mota WJD, Santos GDS, Doria AR and more...

Source: CHEMOSPHERE 279, 2021, DOI 10.1016/j.chemosphere.2021.130875

Abstract The environmental persistence of hexachlorobenzene (HCB) is a challenge that promotes studies for efficient treatment alternatives to minimize its environmental impact. Here, we evaluated the HCB removal by electrochemical, biological, and combined approaches...

Enhanced Cd phytostabilization and rhizosphere bacterial diversity of Robinia pseudoacacia L. by endophyte *Enterobacter* sp. YG-14 combined with sludge biochar

Authors: Zhang X, Yu JL, Huang ZL and more...

Source: SCIENCE OF THE TOTAL ENVIRONMENT 787, 2021, DOI 10.1016/j.scitotenv.2021.147660

Abstract: *Robinia pseudoacacia* L., a pioneerwoody legume grown in mining areas, has been recognized as a remarkable accumulator of various heavy metals. Compared with other hazardous heavy metals (HMs), it is of low capacity in accumulating Cd, which, as a result, may hinder the phytoremediation efficiency. To enhance *R. pseudoacacia*'s uptake efficiency of Cd, the individual effects of various rhizobia and arbuscular mycorrhizal fungi have been reported, however, the combined influence of endophytes and biochar receives little attention...

Malathion biodegradation by a psychrotolerant bacteria *Ochrobactrum* sp. M1D and metabolic pathway analysis

Authors: Verma S., Singh D., Chatterjee S.

Source: LETTERS IN APPLIED MICROBIOLOGY 2021, DOI 10.1111/lam.13517

https://doi.org/10.15454/64rs-v051

Abstract: An organophosphorus pesticide malathion biodegradation was investigated by using the bacteria *Ochrobactrum* sp. M1D isolated from a soil sample of peach orchards in Palampur, District Kangra, Himachal Pradesh (India)...

Degradation kinetics of DDT in tropical soils: A proposed multi-phase zero order kinetic model that takes into account evaporation, hydrolysis, photolysis, microbial degradation and adsorption by soil particulates

Authors: Zaranyika MF, Matimati E, Mushonga P

Source: SCIENTIFIC AFRICAN 9, 2020, DOI 10.1016/j.sciaf.2020.e00467

Abstract: The Food and Agriculture Organization (FAO) and International Atomic Energy Agency (IAEA) commissioned a 5-year international programme during 1989 to 1993 to study the behaviour of DDT in 10 tropical countries: India, Indonesia, Pakistani, China, Philippines, Egypt, Tanzania, Kenya, Panama and Brazil. The traditional approach of plotting the residual pesticide concentration as a function of time was employed to treat the data in order to arrive at the half-life of the pesticide in the specific environment. However, most of the curves obtained were not first order, as the dissipation was observed to be biphasic...

Reclamation competence of *Crotalaria juncea* with the amalgamation and influence of indigenous bacteria on a waste dump of bauxite mine

Authors: Narayanan M, Thangabalu R, Natarajan D and more...

Source: CHEMOSPHERE 279, 2021, DOI 10.1016/j.chemosphere.2021.130632

Abstract: The accumulated bauxite mine soil had an acidic pH of 5.52 +/- 0.12 and more heavy metals such as Cr, Cd, Zn, and Pb, which can cause severe soil and water pollution to the nearby farmlands and water reservoirs. Hence, the work was designed to find the possibility of reclamation of bauxite mine soil through Crotalaria juncea with the amalgamation of native metal degrading bacterial isolates...

Effects of plant growth regulator and chelating agent on the phytoextraction of heavy metals by *Pfaffia glomerata* and on the soil microbial community

Authors: Huan, R, Cui XY, Luo XZ and more...

Source: ENVIRONMENTAL POLLUTION 283, 2021, DOI 10.1016/j.envpol.2021.117159

Abstract: *Pfaffia glomerata* is a candidate for the remediation of heavy metal-contaminated soil, but phytor-emediation efficiency requires enhancement. In this study, we evaluated how application of DA-6, EDTA, or CA affected the growth and heavy metal accumulation of *P. glomerata* and soil microorganisms...

The microbial community from the early-plant colonizer (*Baccharis linearis*) is required for plant establishment on copper mine tailings

Authors: Gazitua MC, Morgante V, Poupin MJ and more...

Source: SCIENTIFIC REPORTS 11, 1, 2021, DOI 10.1038/s41598-021-89769-1

Abstract: Plants must deal with harsh environmental conditions when colonizing abandoned copper mine tailings. We hypothesized that the presence of a native microbial community can improve the colonization of the pioneer plant, Baccharis linearis, in soils from copper mining tailings…

Organics removal and microbial interaction attributes of zeolite and ceramsite assisted bioretention system in copper-contaminated stormwater treatment

Authors: Mehmood T, Lu J, Liu C and more...

Source: JOURNAL OF ENVIRONMENTAL MANAGEMENT 292, 2021, DOI 10.1016/j.jenvman.2021.112654

Abstract: Bioretention has been increasingly used recently to treat heavy metals contaminated stormwater. However, less is known about how metal accumulation influences microbial performance and organics removal mechanisms in different layers of the bioretention system...

Pioneer plant species and fungal root endophytes in metal-polluted tailings deposited near human populations and agricultural areas in Northern Mexico

Authors: Flores-Torres G, Solis-Hernandez AP, Vela-Correa G and more...

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH 2021, DOI 10.1007/s11356-021-14716-6

Abstract: As a consequence of industrial mining activity, high volumes of tailings are scattered around Mexico. Frequently, tailings contain heavy metals (HM) which entail threats against all organisms. The aim of this research was to identify plants and root fungal endophytes in polymetallic polluted tailings with the potential to be used in strategies of bioremediation...

Effects of ferrous iron supplementation on reductive dechlorination of tetrachloroethene and on methanogenic microbial community

Authors: Yoshikawa M, Zhang M, Kawabe Y, Katayama T

Source: FEMS MICROBIOLOGY ECOLOGY 97, 5, 2021, DOI 10.1093/femsec/fiab069

Abstract: Chloroethenes are common soil and groundwater pollutants. Their dechlorination is impacted by environmental factors, such as the presence of metal ions. We here investigated the effect of ferrous iron on bacterial reductive dechlorination of chloroethenes and on methanogen community....

https://doi.org/10.15454/64rs-v051

Physiological response of Arizona cypress to Cd-contaminated soil inoculated with arbuscular mycorrhizal fungi and plant growth promoting rhizobacteria

Authors: Aalipour H, Nikbakht A, Etemadi N

Source: RHIZOSPHERE 18, 2021, DOI 10.1016/j.rhisph.2021.100354

Abstract: Increasing some industrial activities has been constantly contaminated the soil with different toxic metals leading to serious environmental concerns. However, some beneficial soil microorganisms would be useful tools for reducing toxic effects of heavy metals without producing toxic residuals. Therefore, present study was conducted to evaluate potential role of Pseudomonas fluorescens and arbuscular mycorrhizal fungi (AMF) in reducing cadmium toxicity in the Arizona cypress seedlings both individually and in combination...

Effects of chromium stress on the rhizosphere microbial community composition of *Cyperus alternifolius*

Authors: Wang BC, Zhu SX, Li WJ and more...

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 218, 2021, DOI 10.1016/j.ecoenv.2021.112253

Abstract: Wetland plants are often used as the main body of soil, and the rhizosphere is a hot spot migration and transformation. Response mechanism to rhizosphere microorganisms on chromium (Cr) stressing could help improve the phytoremediation system. *Cyperus alternifolius* (CA) is selected as the research object by Cr-stress treatments...

ISOLATION OF TWO AMETRYN-DEGRADING BACTERIA AND THE CONSTRUCTION OF A MICROBIAL AGENT FOR THE BIODEGRADATION OF AMETRYN

Authors: Zhao Y, Zhao CX, Shi L and more...

Source: FRESENIUS ENVIRONMENTAL BULLETIN 30, 4: 3166-3174, 2021

Abstract: Two kinds of bacteria named YMJ-5 and YMJ-8 were isolated from the soil which could degrade ametryn effectively...

Combined effect of putrescine and mycorrhizal fungi in phytoremediation of Lallemantia iberica in Pb-contaminated soils

Authors: Ansari A, Andalibi B, Zarei M, Shekari F

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 2021, DOI 10.1007/s11356-021-14821-6

Abstract: As soil contamination with heavy metals is increasing and polyamines have roles in the growth of mycorrhiza and plants, it is important to study phytoremediation, growth, tolerance, and mycorrhization in Lallemantia iberica as a multi-purpose plant, by the application of putrescine along with mycorrhiza in Pb-contaminated soils...

Soil microbial response to silicate fertilization reduces bioavailable arsenic in contaminated paddies

Authors: Das S, Hwang HY, Song HJ, Cho SR and more...

Source: SOIL BIOLOGY & BIOCHEMISTRY 159, 2021, DOI 10.1016/j.soilbio.2021.108307

Abstract: Rice grown in arsenic (As)-contaminated soils will have an elevated As concentration in the edible parts and lower yield due to the stressful growing environment. Silicon fertilizer is a soil amendment that can prevent As bioaccumulation and increase rice yield. This may be due to chemical interactions between silicon and As, but we hypothesized that silicon fertilization would improve soil microbial functions that control the bioavailable As concentration and improve the growing environment for rice in As-contaminated agroecosystems...

Microbiological Reduction of Molybdenum to Molybdenum Blue as a Sustainable Remediation Tool for Molybdenum: A Comprehensive Review

Authors: Yakasai HM, Rahman MF, Manogaran M, and more...

Source: INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH 18, 11, 2021, DOI 10.3390/ijerph18115731

Abstract: Molybdenum (Mo) microbial bioreduction is a phenomenon that is beginning to be recognized globally as a tool for the remediation of molybdenum toxicity. Molybdenum toxicity continues to be demonstrated in many animal models of spermatogenesis and oogenesis, particularly those of ruminants. The phenomenon has been reported for more than 100 years without a clear understanding of the reduction mechanism, indicating a clear gap in the scientific knowledge. This knowledge is not just fundamentally important-it is specifically important in applications for bioremediation measures and the sustainable recovery of metal from industrial or mine effluent...

Insights into the microbial degradation and biochemical mechanisms of carbamates

Authors: Mishra S, Pang SM, Zhang WP and more...

Source: CHEMOSPHERE 279, 2021, DOI 10.1016/j.chemosphere.2021.130500

Abstract: Carbamate compounds are commonly applied in agricultural sectors as alternative options to the recalcitrant organochlorine pesticides due to their easier breakdown and less persistent nature. However, the large-scale use of carbamates also leads to toxic environmental residues, causing severe toxicity in various living systems. The toxic effects of carbamates are due to their inhibitor activity against the acetylchlolinesterase enzyme. This enzyme is crucial for neurotransmission signaling in living beings. Hence, from the environmental point of view, the elimination of carbamates is a worldwide concern and priority. Microbial technology can be deliberated as a potential tool that can work efficiently and as an ecofriendly option for the dissipation of carbamate insecticides from contaminated environments by improving biodegradation processes via metabolic activities of microorganisms...

https://doi.org/10.15454/64rs-v051

ERA / PUBLICATIONS SCIENTIFIQUES / PESTICIDES/CLIMAT et VdT/ENCHY

Keystone taxa shared between earthworm gut and soil indigenous microbial communities collaboratively resist chlordane stress

Authors: Zhu G, Du R, Du D, Qian J, Ye M

Source: Environmental Pollution 283, 2021, 117095, DOI 10.1016/j.envpol.2021.117095

Abstract: Chlordane is an organochlorine pesticide that is applied extensively. Residual concentrations that remainin soils after application are highly toxic to soil organisms, particularly affecting the earthworm gut andindigenous soil microorganisms. However, response mechanisms of the earthworm gut and indigenoussoil microorganism communities to chlordane exposure are not well known. In this study, earthworms (Metaphire guillelmi) were exposed to chlordane-contaminated soils to investigate their responsemechanisms over a gradient of chlordane toxicity...

Avoidance behavior of *Eisenia fetida* and *Metaphire posthuma* towards two different pesticides, acephate and atrazine

Authors: Datta S, Singh J, Singh J, Singh S, Singh S

Source: Chemosphere 278: 130476, 2021, DOI 10.1016/j.chemosphere.2021.130476

Abstract: The avoidance behavior is regarded as the method that providesfirst hand information about thebehavior of an organism in the presence of contaminants in the soil. Very little data is found in literatureregarding the effect of pesticides on tropical earthworms. Two pesticides, acephate and atrazine whichare widely used in Indian tropical area were investigated for their avoidance behavior on standard species, *E. fetida* (ISO 2007) and on a tropical species, *M. posthuma*...

Measurement of multixenobiotic resistance activity in enchytraeids as a tool in soil ecotoxicology

Authors: Kovacevic M, Hackenberger DK, Loncaric Z, Hackenberger BK

Source: CHEMOSPHERE 279: 130549, 2021, DOI 10.1016/j.chemosphere.2021.130549

Abstract: The multixenobiotic resistance (MXR) mechanism is the first defense line against xenobiotics. Enchytraeids, a model organism in soil ecotoxicology, are often exposed to various xenobiotics, some of which may influence MXR activity. Since MXR activity has not been studied in these organisms, the aim of this paper was to establish a methodology for the implementation of the dye assay in enchytraeids...

ERA / PUBLICATIONS SCIENTIFIQUES / PLASTIQUES

Biofilm influenced metal accumulation onto plastic debris in different freshwaters

Authors: Liu ZL, Adyel TM, Miao LZ et al.

Source: ENVIRONMENTAL POLLUTION 285: 117646, 2021, DOI 10.1016/j.envpol.2021.117646

Abstract: Microbial biofilms can rapidly colonize plastic debris in aquatic environments and subsequently, accumulate chemical pollutants from the surrounding water. Here, we studied the microbial colonization of different plastics, including polyethylene terephthalate, polypropylene, polyvinyl chloride, and polyethylene exposed in three freshwater systems (the Qinhuai River, the Niushoushan River, and Donghu Lake) for 44 days. We also assessed the biofilm mass and associated metals attached to plastics...

Diatom and cyanobacteria communities on artificial polymer substrates in the Crimean coastal waters of the Black Sea

Authors: Ryabushko L, Miroshnichenko E, Blaginina A et al.

Source: MARINE POLLUTION BULLETIN 169: 112521, 2021, DOI 10.1016/j.marpolbul.2021.112521

Abstract: This research on the species diversity of fouling diatoms and cyanobacteria on different polymer materials and carried out from August to November 2020 in Karantinnaya Bay of the Black Sea...

Comparative Analysis of the Taxonomic Composition of Bacterial Fouling Developing on Various Materials Exposed to Aqueous Environments

Authors: Tourova TP, Sokolova DS, Nazina TN, Laptev AB

Source: MICROBIOLOGY 90: 416-427, 2021, DOI 10.1134/S0026261721040159

Abstract: The work was aimed at detection of potential degraders of polyethylene terephthalate (PET), polystyrene (PS), and steel 20 based on comparison of the taxonomic composition of the biofilm communities formed on these materials immersed in aqueous environments of diverse origin (marine, natural freshwater, and industrial) in different climatic regions...

Ecotoxicological Determination of Microplastic Toxicity on Algae Chlorella sp.: Response Surface Modeling Approach

Authors: Miloloza M, Bule K, Ukic S et al.

Source: WATER AIR AND SOIL POLLUTION 232:327, 2021, DOI 10.1007/s11270-021-05267-0

Abstract: An extensive use of plastic material, which is a characteristic of modern society, is increasing the amount of plastic waste in the environment. Accordingly, plastic pollution has become a global environmental problem. The problem is particularly related to microsized and nanosized plastic particles which have become environmental contaminants of emerging concern. This research was focused on ecotoxicological aspects of 5 the most common

plastic substances: polyethylene (PE), polypropylene (PP), polystyrene (PS), polyvinyl chloride (PVC), and polyethylene terephthalate (PET); all substances were in form of microplastics. The used test organism was freshwater microalgae Chlorella sp. and inhibition of the algal growth after 3-day exposure was measured. The experimental domain included microplastics in range 10-1000 mg/L and sizes 100-700 µm. Response surface modeling was applied in order to analyze the influence of these two parameters and statistical analysis of the obtained models was performed...

Contribution of microplastic particles to the spread of resistances and pathogenic bacteria in treated wastewaters

Authors: Galafassi S, Sabatino R, Sathicq MB et al.

Source: WATER RESEARCH 201: 117368, 2021, DOI 10.1016/j.watres.2021.117368

Abstract: Microplastic Particles (MPs) are ubiquitous pollutants widely found in aquatic ecosystems. Although MPs are mostly retained in wastewater treatment plants (WWTPs), a high number of MPs reaches the open waters potentially contributing to the spread of pathogenic bacteria and antibiotic resistance genes in the environment. Nowadays, a limited number of studies have focused on the role of MPs as carriers of potentially pathogenic and antibiotic resistant bacteria in WWTPs. Thus, an investigation on the community composition (by 16S rRNA gene amplicon sequencing) and the abundance of antibiotic and metal resistance genes (by qPCR) of the biofilm on MPs (the plastisphere) and of planktonic bacteria in treated (pre- and post-disinfection) wastewaters was performed...

Impact of the Virgin and Aged Polystyrene and Polypropylene Microfibers on the Soil Enzyme Activity and the Microbial Community Structure

Authors: Choi HJ, Ju WJ, An J

Source: Water Air and Soil Pollution 232I, 8, 2021, DOI 10.1007/s11270-021-05252-7

Abstract: In this study, we focused on investigating the plastic microfibers and how their aging due to UV irradiation could be further aggravating their negative effects on the environment. Hence, we examined the microfibers of polypropylene (PP) and polystyrene (PS) as model microplastics to observe the induced surface changes caused by aging through UV irradiation when the plastic is discarded in the environment. We also observed the enzymatic activity and microbial community changes in the soil when microplastics are added...

Spatiotemporal distribution of microplastics in surface water, biofilms, and sediments in the world's largest drinking water diversion project

Authors: Huang S, Peng CR, Wang ZC et al.

Source: SCIENCE OF THE TOTAL ENVIRONMENT 789: 148001, 2021, DOI 10.1016/j.scitotenv.2021.148001

Abstract: Investigations of microplastics have increased exponentially over the past decade, yet no information is currently available on the status of microplastics in strictly regulated, artificial bodies of water. The Middle Route of the South-to-North Water Diversion Project (SNWDP) in

https://doi.org/10.15454/64rs-v051

China, a highly regulated canal, supplies water to 19 cities and more than 53.10 million residents since 2014, as part of the world's largest inter-basin drinking water diversion project. In this study, the spatiotemporal distribution, characteristics, and polymer types of microplastics were surveyed for the first time in the Middle Route of the SNWDP...

Microplastics can act as vector of the biocide triclosan exerting damage to freshwater microalgae

Authors: Verdu I, Gonzalez-Pleiter M, Leganes F et al.

Source: CHEMOSPHERE 266: 129193, 2021, DOI 10.1016/j.chemosphere.2020.129193

Abstract: Despite the large number of recent studies on microplastics (MPs) and their ability to act as carriers of pollutants, the knowledge about the biological effects of MPs loaded with chemicals is scarce. The aim of this study was to evaluate the potential of MPs as vectors for the antimicrobial triclosan (TCS). For it, we tested low-density polyethylene, polyamide, polyethylene terephthalate, polyoxy-methylene, polypropylene, polystyrene and the biodegradable polylactic acid. Thus, chemical analysis of sorption and desorption of TCS by these MPs was evaluated. The effect of TCS-loaded MPs to *Anabaena* sp. PCC7120, a cyanobacterium model of primary producers in freshwater ecosystems, was investigated...

Insight into the immune and microbial response of the white-leg shrimp *Litopenaeus vannamei* to microplastics

Authors: Wang ZL, Fan LF, Wang J et al.

Source: MARINE ENVIRONMENTAL RESEARCH 169: 105377, 2021, DOI 10.1016/j.marenvres.2021.105377

Abstract: Microplastics (MPs) are a new type of environmental pollutant. To investigate the response of shrimp and their microflora to MPs, Litopenaeus vannamei (L. vannamei) was exposed to different concentrations of MPs (0, 50, 500, and 5000 μg/L) for 48 h. The survival rate, intake of MPs, immune-related gene expression and microbial response under MP exposure were detected...

Microplastics accumulate fungal pathogens in terrestrial ecosystems

Authors: Gkoutselis G, Rohrbach S, Harjes J and more...

Source: Scientific Reports 11, 1, 2021, DOI 10.1038/s41598-021-92405-7

Abstract: Microplastic (MP) is a pervasive pollutant in nature that is colonised by diverse groups of microbes, including potentially pathogenic species. Fungi have been largely neglected in this context, despite their affinity for plastics and their impact as pathogens. To unravel the role of MP as a carrier of fungal pathogens in terrestrial ecosystems and the immediate human environment, epiplastic mycobiomes from municipal plastic waste from Kenya were deciphered using ITS metabarcoding as well as a comprehensive meta-analysis, and visualised via scanning electron as well as confocal laser scanning microscopy...

https://doi.org/10.15454/64rs-v051

Transcriptome analysis of the toxic mechanism of nanoplastics on growth, photosynthesis and oxidative stress of microalga *Chlorella pyrenoidosa* during chronic exposure

Authors: Yang WF, Gao P, Ma GY et al.

Source: ENVIRONMENTAL POLLUTION 284:117413, 2021, DOI 10.1016/j.envpol.2021.117413

Abstract: The toxicity of nanoplastics to aquatic organisms has been widely studied in terms of biochemical indicators. However, there is little discussion about the underlying toxic mechanism of nanoplastics on microalgae. Therefore, the chronic effect of polystyrene nanoplastics (80 nm) on Chlorella pyrenoidosa was investigated, in terms of responses at the biochemical and molecular/omic level...

A Comparative Taxonomic Profile of Microbial Polyethylene and Hydrocarbon-Degrading Communities in Diverse Environments

Authors: Zokaei FH, Gharavi S, Asgarani E et al.

Source: IRANIAN JOURNAL OF BIOTECHNOLOGY 19: 1-9, 2021, DOI 10.30498/IJB.2021.2955

Abstract: Polyethylene is one of the most abundant plastic wastes which accumulates in marine and terrestrial environments. As microbial degradation has been a promising approach for the bioremediation of polluted environments, identification of the microbial community profile where these pollutants accumulate, has recently been in focus. We have investigated the taxonomic and functional characteristics of polyethylene-degrading microorganisms in a plastic waste recycling site in Tehran, Iran. We have analyzed and compared a 16S rRNA dataset from this study with 15 datasets from 4 diverse plastic and oil polluted habitats to identify and evaluate bacterial communities involved in bioremediation...

Degradation of polyethylene plastic in soil and effects on microbial community composition

Authors: Huang DF, Xu YB, Lei FD and more...

Source: Journal of hazardous materials 416A, 2021, DOI 10.1016/j.jhazmat.2021.126173

Abstract: Plastics pollution in global soil systems is becoming a severely global issue and potential threat to terrestrial ecosystem serves and human health. Herein, in order to determine the degradability and ecological effects of polyethylene (PE) films, we measured the weight loss and characterization of PE films and analyzed variation in microbial community...

Freshwater alga *Raphidocelis subcapitata* undergoes metabolomic changes in response to electrostatic adhesion by micrometer-sized nylon 6 particles

Authors: Sakurai K, Yamashita H

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH Early Access, DOI 10.1007/s11356-021-15300-8

Abstract: Nylon powders are a type of microplastic (MP) used in personal care products such as cosmetics and sunscreens. To determine the effects of nylon polymers on freshwater microalgae, we investigated the effects of two

types of micrometer-sized nylon polymers, i.e., powdered nylon 6 (Ny6-P) and nylon 12 (Ny12), and four other micrometer-sized MPs, i.e., low-density polyethylene, polyethylene terephthalate, polystyrene, and ultra-high-molecular-weight polyethylene, on the microalga *Raphidocelis subcapitata*...

Understanding the Fundamental Basis for Biofilm Formation on Plastic Surfaces: Role of Conditioning Films

Authors: Bhagwat G, O'Connor W, Grainge I, Palanisami T

Source: FRONTIERS IN MICROBIOLOGY 12: 687118, 2021, DOI 10.3389/fmicb.2021.687118

Abstract: Conditioning films (CFs) are surface coatings formed by the adsorption of biomolecules from the surrounding environment that can modify the material-specific surface properties and precedes the attachment of microorganisms. Hence, CFs are a biologically relevant identity that could govern the behavior and fate of microplastics in the aquatic environment. In the present study, polyethylene terephthalate and polylactic acid plastic cards were immersed in natural seawater to allow the formation of CFs. The changes in the surface roughness after 24 h were investigated by atomic force microscopy, and the surface changes were visualized by scanning electron microscopy…

Plastic film mulch changes the microbial community in maize root-associated compartments

Authors: Li YZ, Li T, Wang ZT, Wang SN, Qin XL, Liao YC

Source: PLANT AND SOIL Early Access, 2021, DOI 10.1007/s11104-021-05060-2

Abstract: Aims - Plastic film mulch (PFM) was an important agricultural measure to promote crop production. It is important to reveal the patterns of root-associated microbiomes under PFM to enhance the basic knowledge in the agroecosystem. Methods - The microbial composition, assembly, and co-occurrence in four compartments (bulk soil, root zone, rhizosphere, and rhizoplane) under maize field adopting PFM and flat planting were analyzed at the V12 stage. The root phenotypic traits were measured to explore their interaction mechanisms with microbes. Results - The compartment was the dominant factor shaping the bacterial communities, while fungal communities were recruited by treatment…

Microbial Communities on Plastic Polymers in the Mediterranean Sea

Authors: Vaksmaa A, Knittel K, Asbun AA et al.

Source: FRONTIERS IN MICROBIOLOGY 12: 673553, 2021, DOI 10.3389/fmicb.2021.673553

Abstract: Plastic particles in the ocean are typically covered with microbial biofilms, but it remains unclear whether distinct microbial communities colonize different polymer types. In this study, we analyzed microbial communities forming biofilms on floating microplastics (mainly polyethylene, polypropylene, and polystyrene) in a bay of the island of Elba in the Mediterranean Sea...

https://doi.org/10.15454/64rs-v051

A multi-OMIC characterisation of biodegradation and microbial community succession within the PET plastisphere

Authors: Wright RJ, Bosch R, Langille MGI et al.

Source: MICROBIOME 9: 141, 2021, DOI 10.1186/s40168-021-01054-5

Abstract: Plastics now pollute marine environments across the globe. On entering these environments, plastics are rapidly colonised by a diverse community of microorganisms termed the plastisphere. Members of the plastisphere have a myriad of diverse functions typically found in any biofilm but, additionally, a number of marine plastisphere studies have claimed the presence of plastic-biodegrading organisms, although with little mechanistic verification. Here, we obtained a microbial community from marine plastic debris and analysed the community succession across 6 weeks of incubation with different polyethylene terephthalate (PET) products as the sole carbon source, and further characterised the mechanisms involved in PET degradation by two bacterial isolates from the plastisphere...

Toxic effects of polystyrene nanoplastics on microalgae *Chlorella vulgaris*: Changes in biomass, photosynthetic pigments and morphology

Authors: Khoshnamvand M, Hanachi P, Ashtiani S, Walker TR

Source: CHEMOSPHERE 280: 130725, 2021, DOI 10.1016/j.chemosphere.2021.130725

Abstract: Presence of nanoplastics within aqueous media has raised concerns about their adverse impacts on aquatic organisms. This study evaluated toxic effects of amino-functionalized polystyrene nanoplastics (PS-NH2) with diameters of 90, 200 and 300 nm on green microalgae *Chlorella vulgaris*...

Understanding nanoplastic toxicity and their interaction with engineered cationic nanopolymers in microalgae by physiological and proteomic approaches

Authors: Tamayo-Belda M, Vargas-Guerrero JJ, Martin-Betancor K et al.

Source: ENVIRONMENTAL SCIENCE-NANO Early Access, 2021, DOI 10.1039/d1en00284h

Abstract: The amount of plastics produced per year is in constant growth alongside their use in different sectors like the textile industry, agriculture or, more recently, in nanotechnology. Under certain environmental conditions, plastics break down into smaller pieces. Those plastics in the nanosize range are the most difficult to identify, quantify and remove and therefore probably prevail in aquatic ecosystems. Likewise, nanomaterial production has been increasing exponentially and therefore their potential release to the environment poses a threat. There is a lack of knowledge regarding the combined effects of co-occurring nanopolymers on biota. In this work, we have studied the individual toxicity of polystyrene nanoplastics (PS-NPs) as well as their combined effect with generation 7 PAMAM dendrimers (G7) on the filamentous cyanobacterium *Anabaena* sp. PCC7120, a relevant aquatic primary producer...

https://doi.org/10.15454/64rs-v051

A marine bacterial community capable of degrading poly(ethylene terephthalate) and polyethylene

Authors: Gao RR, Sun CM

Source: JOURNAL OF HAZARDOUS MATERIAL 416: 125928, 2021, DOI 10.1016/j.jhazmat.2021.125928

Abstract: Plastic wastes are becoming the most common form of marine debris and present a growing global pollution problem. Here, we used a screening approach on hundreds of plastic waste-associated samples and discovered a marine bacterial community capable of efficiently colonizing and degrading both poly (ethylene terephthalate) (PET) and polyethylene (PE)...

Arsenic bioaccumulation in the soil fauna alters its gut microbiome and microbial arsenic biotransformation capacity

Authors: Zhao, TT, Lozano, YM, Rillig, MC

Source: FRONTIERS IN ENVIRONMENTAL SCIENCE 9, 2021, DOI 10.3389/fenvs.2021.675803

Abstract: Microplastic pollution is a topic of increasing concern, especially since this issue was first addressed in soils. Results have so far been variable in terms of effects, suggesting that there is substantial context-dependency in microplastic effects in soil. To better define conditions that may affect microplastic-related impacts, we here examined effects as a function of microplastic shape and polymer type, and we tested if effects on soil properties and soil microbial activities change with incubation time...

Biodegradation of polystyrene by bacteria from the soil in common environments

Authors: Kim HW, Jo JH, Kim YB and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 416, 2021, DOI 10.1016/j.jhazmat.2021.126239

Abstract: Polystyrene (PS), a major plastic waste, is difficult to biodegrade due to its unique chemical structure that comprises phenyl moieties attached to long linear alkanes. In this study, we investigated the biodegradation of PS by mesophilic bacterial cultures obtained from various soils in common environments...

Attached and planktonic bacterial communities on bio-based plastic granules and micro-debris in seawater and freshwater

Authors: Nguyen NHA, El-Temsah YS, Cambier S et al.

Source: SCIENCE OF THE TOTAL ENVIRONMENT 785: 147413, 2021, DOI 10.1016/j.scitotenv.2021.147413

Abstract: Bio-based plastics, produced from renewable biomass sources, may contribute to lowering greenhouse gases and the demand for fossil resources. However, their environmental fate is not well understood. Here, we compared the impacts of industrially produced granules (G) and micro-debris (MD) from three pristine bio-based plastics: high-density polyethylene (HDPE), polylactic acid (PLA) and poly(3-hydroxybutyrate-co-3-hydroxyvalerate) (PHBV) on natural bacterial communities in seawater and freshwater using metagenomics...

https://doi.org/10.15454/64rs-v051

Comparison of the effects of continuous and accumulative exposure to nanoplastics on microalga *Chlorella pyrenoidosa* during chronic toxicity

Authors: Yang WF, Gao P, Nie Y et al.

Source: SCIENCE OF THE TOTAL ENVIRONMENT 788: 147934, 2021, DOI 10.1016/j.scitotenv.2021.147934

Abstract: Most previous studies have focused on the continuous exposure of aquatic organisms to nanoplastics. However, persistent pollutants in natural aquatic surroundings are a threat, and their concentrations are continuously creasing. The discussion and research into the effects of accumulative exposure to these materials are limited. Therefore, this study aimed to compare the effects of continuous and accumulative exposure to polystyrene (PS) nanoplastics (80 nm) on *Chlorella pyrenoidosa* during chronic toxicity...

Effect of microplastics on growth and biochemical composition of microalga *Acutodesmus obliquus*

Authors: Ansari FA, Ratha SK, Renuka N et al.

Source: ALGAL RESEARCH-BIOMASS BIOFUELS AND BIOPRODUCTS 56: 102296, 2021, DOI 10.1016/j.algal.2021.102296

Abstract: Microplastics have been widely detected in different aquatic ecosystems. The toxicity of microplastics has been extensively evaluated on aquatic animals; however, there is limited information on their influence on microalgal growth and metabolism. This study investigates the effect of different concentrations (0, 5, 10, 15, 25, 100, 125, 200, and 250 mg L-1), of microplastics namely high-density polyethylene, polypropylene, and polyvinyl chloride exposure on growth, photosynthesis, and biochemical composition of Acutodesmus obliquus...

DROIT ET POLITIQUE DE L'ENVIRONNEMENT

REACH : la liste des substances extrêmement préoccupantes évolue

INERIS 5/08/21

L'agence européenne des produits chimiques (ECHA) a mis à jour la liste candidate des substances extrêmement préoccupantes (SVHC). Huit nouvelles ont été ajoutées. Cette liste engendre des obligations légales pour les importateurs, producteurs et fournisseurs d'articles contenant l'une de ces substances, avec une concentration supérieure à 0,1 %. [...]

Accès au document

Pesticides dans l'air - Lancement d'un suivi annuel et national

Ineris 20/07/21

Après la Campagne Nationale Exploratoire de mesure des résidus de Pesticides dans l'air ambiant (CNEP), réalisée en 2019, Atmo France avec les Associations agréées de surveillance de la qualité de l'air (AASQA) et l'Ineris, en tant que membre du Laboratoire central de surveillance de la qualité de l'air (LCSQA), lancent ce mardi 20 juillet 2021, un suivi à vocation pérenne des pesticides dans l'air à l'échelle nationale (métropole et outre-mer).

https://doi.org/10.15454/64rs-v051

Les premières données seront accessibles à l'été 2022, sur les bases des données de qualité de l'air, Geod'Air1, et de mesures de pesticides, PhytAtmo.

Accès au document

Plan Écophyto II+ : quinze nouveaux lauréats de l'appel à projets national

Actu-environnement 18/08/21

Quinze nouveaux projets de réduction de l'utilisation et de l'impact des produits phytosanitaires ont été retenus dans le cadre de l'appel à projets national 2020-2021 du plan Écophyto II+. L'Office français de la biodiversité (OFB) ainsi que les ministères de l'Agriculture et de la Transition écologique ont présenté les lauréats le 29 juillet 2021...

Accès au document

Néonicotinoïdes : le Conseil d'État reconnaît les effets néfastes sur la santé des abeilles

Actu-environnement 13/07/21

Par une décision du 12 juillet 2021, le Conseil d'État a rejeté la requête de l'Union des industries et de la protection des plantes (UIPP) et de trois autres organisations professionnelles qui demandaient l'annulation du décret du 30 juillet 2018. Ce texte avait interdit cinq insecticides néonicotinoïdes (acétamipride, clotianidine, imidaclopride, thiaclopride et thiamétoxam) en France. Il avait été pris en application de la loi de reconquête de la biodiversité du 8 août 2016 qui avait posé le principe de l'interdiction, tout en prévoyant des possibilités de dérogations jusqu'au 1er juillet 2020. [...]

Accès au document

LMR de 24-épibrassinolide, d'extrait de bulbe d'Allium cepa L., de cyflumétofène, de fludioxonil, de fluroxypyr, de 5-nitroguaiacolate de sodium, d'o-nitrophénolate de sodium et de p-nitrophénolate de sodium

RÈGLEMENT (UE) 2021/1098 DE LA COMMISSION du 2 juillet 2021 modifiant les annexes II, III et IV du règlement (CE) n° 396/2005 du Parlement européen et du Conseil en ce qui concerne les limites maximales applicables aux résidus de 24-épibrassinolide, d'extrait de bulbe d'Allium cepa L., de cyflumétofène, de fludioxonil, de fluroxypyr, de 5-nitroguaiacolate de sodium, d'o-nitrophénolate de sodium et de p-nitrophénolate de sodium présents dans ou sur certains produits.

Numéro officiel : UE/2021/1098
Date de signature : 02/07/2021
Liens juridiques : Modification Règlement CE/396/2005 23/02/2005

Accès au document

LMR d'amétoctradine, de bixafen, de fenazaquine, de spinetoram, de téfluthrine et de thiencarbazone-méthyle

RÈGLEMENT (UE) 2021/1110 DE LA COMMISSION du 6 juillet 2021 modifiant les annexes II et III du règlement (CE) n° 396/2005 du Parlement européen et du Conseil en ce qui concerne les limites maximales applicables aux résidus d'amétoctradine, de bixafen, de fenazaquine, de spinetoram, de téfluthrine et de thiencarbazone-méthyle présents dans ou sur certains produits

Numéro officiel : UE/2021/1110

Date de signature : 06/07/2021

https://doi.org/10.15454/64rs-v051

Liens juridiques : Modification le 27/01/2022 Règlement CE/396/2005 23/02/2005

Accès au document

EPA Takes Steps to Protect Endangered Fish from Pesticide Exposure

EPA July 9, 2021

EPA is taking steps to protect more than two dozen endangered and threatened fish species on the west coast. EPA is taking this action in response to two final biological opinions on metolachlor, bromoxynil, prometryn and 1,3-D issued by the National Marine Fisheries Service (NMFS). EPA worked with NMFS and pesticide registrants to develop a range of risk reduction measures, which include no-spray buffers, retention ponds, and participation in recognized stewardship programs. Pesticide users will have several options to comply with the listed species protection goals.

Accès au document

REGLEMENTATION / DROIT

Mise à disposition sur le marché par dérogation et utilisation du produit biocide « MINNCARE Cold Sterilant » pour une période de 180 jours

Arrêté du 19 août 2021 autorisant par dérogation la mise à disposition sur le marché et l'utilisation du produit biocide « MINNCARE Cold Sterilant » pour une période de 180 jours

Numéro officiel : TREP2125216A

Date de signature : 19/08/2021

Accès au document

Mise à disposition des informations permettant d'identifier les perturbateurs endocriniens dans un produit

Décret n° 2021-1110 du 23 août 2021 relatif à la mise à disposition des informations permettant d'identifier les perturbateurs endocriniens dans un produit mis sur le marché. L'objectif [...] est « d'assurer aux citoyens une information transparente sur la présence de substance présentant des propriétés de perturbateur endocrinien dans les produits. [...]

Entrée en vigueur le 1er janvier 2022.

Accès au document

Dérogation temporaire accordée pour la quantité de cuivre applicable pour lutter contre le mildiou de la vigne

Arrêté du 7 août 2021 relatif à une dérogation temporaire accordée pour la quantité de cuivre applicable pour lutter contre le mildiou de la vigne

Numéro officiel : AGRG2124450A
Date de signature : 07/08/2021

Accès au document

https://doi.org/10.15454/64rs-v051

Modification des conditions d'utilisation du nouvel aliment « oléorésine riche en astaxanthine extraite de l'algue *Haematococcus pluvialis* »

RÈGLEMENT D'EXÉCUTION (UE) 2021/1377 DE LA COMMISSION du 19 août 2021 autorisant une modification des conditions d'utilisation du nouvel aliment « oléorésine riche en astaxanthine extraite de l'algue *Haematococcus pluvialis* » en vertu du règlement (UE) 2015/2283 du Parlement européen et du Conseil et modifiant le règlement d'exécution (UE) 2017/2470 de la Commission

Numéro officiel : UE/2021/1377
Date de signature : 19/08/2021
Liens juridiques : Modification Règlement d'exécution UE/2017/2470 20/12/2017

Accès au document

Non-renouvellement de l'approbation de la substance active « famoxadone »

RÈGLEMENT D'EXÉCUTION (UE) 2021/1379 DE LA COMMISSION du 19 août 2021 concernant le non-renouvellement de l'approbation de la substance active « famoxadone » conformément au règlement (CE) n° 1107/2009 du Parlement européen et du Conseil concernant la mise sur le marché des produits phytopharmaceutiques, et modifiant le règlement d'exécution (UE) n° 540/2011 de la Commission

Numéro officiel : UE/2021/1379
Date de signature : 19/08/2021
Liens juridiques : Modification Règlement d'exécution UE/540/2011 25/05/2011

Accès au document

Programmes nationaux pluriannuels de contrôle des résidus de pesticides à établir par les États membres

RÈGLEMENT D'EXÉCUTION (UE) 2021/1355 DE LA COMMISSION du 12 août 2021 concernant les programmes nationaux pluriannuels de contrôle des résidus de pesticides à établir par les États membres

Numéro officiel : UE/2021/1355
Date de signature : 12/08/2021

Accès au document

Propoxycarbazone supprimé de la liste des substances actives devant être considérées comme substances dont on envisage la substitution

RÈGLEMENT D'EXÉCUTION (UE) 2021/1177 DE LA COMMISSION du 16 juillet 2021 modifiant le règlement d'exécution (UE) 2015/408 en ce qui concerne la suppression du propoxycarbazone de la liste des substances actives devant être considérées comme substances dont on envisage la substitution

Numéro officiel : UE/2021/1177
Date de signature : 16/07/2021
Liens juridiques : Modification Règlement d'exécution UE/2015/408 11/03/2015

Accès au document

https://doi.org/10.15454/64rs-v051

Approbation renouvelée de la substance active « clopyralid »

RÈGLEMENT D'EXÉCUTION (UE) 2021/1191 DE LA COMMISSION du 19 juillet 2021 renouvelant **l'approbation** de la **substance** active « clopyralid » conformément au règlement (CE) n°**1107/2009** du Parlement européen et du Conseil concernant la mise sur le marché des produits **phytopharmaceutiques**, et modifiant l'annexe du règlement d'exécution (UE) n°540/2011 de la Commission

Numéro officiel : UE/2021/1191
Date de signature : 19/07/2021
Liens juridiques : Modification Règlement d'exécution UE/540/2011 25/05/2011

Accès au document

AVIS / EXPERTISES / NORMES

Expositions professionnelles aux pesticides et cancer de la prostate : l'Anses rend son premier rapport d'expertise pour la reconnaissance des maladies professionnelles

L'Anses a mené une expertise scientifique sur le cancer de la prostate associé aux expositions professionnelles aux pesticides avec un focus sur le chlordécone au regard de la situation particulière aux Antilles. Premier rapport de l'Agence dans le cadre de sa nouvelle mission d'expertise pour la reconnaissance des maladies professionnelles, il met en lumière la grande variété des situations professionnelles exposant aux pesticides en France que ce soit dans les secteurs agricoles et non agricoles. L'expertise conclut à une relation causale probable entre le risque de survenue du cancer de la prostate et l'exposition aux pesticides dont le chlordécone. L'ensemble des éléments scientifiques développés dans cette expertise apporte des éléments en faveur de la création d'un tableau de maladie professionnelle dans les régimes agricole et général.

Accès au document

PUBLICATIONS DU RESEAU ECOTOX

Vegetation shapes aboveground invertebrate communities more than soil properties and pollution: a preliminary investigation on a metal-contaminated site

Authors: Ozaki S, Fritsch C, Mora F, Cornier T et al.

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH Early Acess, 2021, DOI 10.1007/s11356-021-15811-4

Abstract: Pollution with trace metals (TM) has been shown to affect diversity and/or composition of plant and animal communities. While ecotoxicological studies have estimated the impact of TM contamination on plant and animal communities separately, ecological studies have widely demonstrated that vegetation is an important factor shaping invertebrate communities. It is supposed that changes in invertebrate communities under TM contamination would be explained by both direct impact of TM on invertebrate organisms and indirect effects due to changes in plant communities. However, no study has clearly investigated which would more importantly shape invertebrate communities under TM contamination. Here, we hypothesized that invertebrate communities under TM

contamination would be affected more importantly by plant communities which constitute their habitat and/or food than by direct impact of TM…

Antibacterial and anatomical defenses in an oil contaminated, vulnerable seaduck

Authors: Moller AP, Laursen K, Izaguirre J, Marzal A

Source: ECOLOGY AND EVOLUTION Early Access, 2021, DOI 10.1002/ece3.7996

Abstract: Oil spills have killed thousands of birds during the last 100 years, but nonlethal effects of oil spills on birds remain poorly studied. We measured phenotype characters in 819 eiders Somateria mollissima (279 whole birds and 540 wings) of which 13.6% were oiled. We tested the hypotheses that (a) the morphology of eiders does not change due to oil contamination; (b) the anatomy of organs reflects the physiological reaction to contamination, for example, increase in metabolic demand, increase in food intake, and counteracting toxic effects of oil; (c) large locomotion apparatus that facilitates locomotion increases the risk of getting oiled; and (d) individual eiders with a higher production of secretions from the uropygial grand were more likely to have oil on their plumage. We tested whether 19 characters differed between oiled and nonoiled individuals, showing a consistent pattern...

Effects of the anxiolytic benzodiazepine oxazepam on freshwater gastropod reproduction: a prospective study

Authors: Lebreton M, Malgouyres JM, Carayon JL, Bonnafe E et al.

Source: ECOTOXICOLOGY Early Access, 2021, DOI 10.1007/s10646-021-02453-y

Abstract: Psychoactive drugs have emerged as contaminants over the last few decades. These drugs are frequently prescribed and poorly eliminated by wastewater treatment plants, and many are present at non-negligible concentrations in surface waters. Several studies have investigated the non-target organism toxicity of one such drug, oxazepam, a benzodiazepine anxiolytic frequently detected in rivers. However, very little is known about the impact of this drug on reproduction. We investigated the effects of environmentally relevant concentrations of oxazepam on *Radix balthica*, a freshwater gastropod widespread in Europe…

The contributions of enchytraeids and earthworms to the soil mineralization process in soils with fungicide

Authors: Pelosi C, Thiel P, Bart S, Amosse J et al…

Source: ECOTOXICOLOGY Early Access, 2021, DOI 10.1007/s10646-021-02452-z

Abstract: Pesticides may harm soil organisms such as earthworms and enchytraeids, but knowledge is lacking on their relative sensitivity to these chemicals and the consequences on soil functions. The aim of this study was to assess the impact of exposure to a commercial fungicide formulation (Swing (R) Gold, containing dimoxystrobin and epoxiconazole) on the function of earthworms (*Aporrectodea caliginosa*) and enchytraeids (*Enchytraeus buchholzi*) in soil organic matter (SOM) mineralization. The soil organisms were incubated alone and together in a 26-day laboratory experiment...

Cytotoxicity and genotoxicity of lanthanides for *Vicia faba* L. are mediated by their chemical speciation in different exposure media

Authors: Romero-Freire A, Gonzalez V, Groenenberg JE, Qiu et al…

Source: SCIENCE OF THE TOTAL ENVIRONMENT 790: 148223, 2021, DOI 10.1016/j.scitotenv.2021.148223

Abstract: A comprehensive study of the toxicity of lanthanides (LN) in relation to the media composition will enhance the prediction of their potential adverse effects for living organisms. Here we examined the effect of different media on the *V. faba* root elongation and on the cytotoxic (mitotic index) and the genotoxic (micronucleated cell number) effects from toxicity tests with Ce, Gd and Lu (100, 800 and 6400 µg L-1). Three different exposure media were selected: the standard Hoagland media (SH); an alternative SH, without phosphates (SH-P); and distilled water (DW)…

Use of Chenevotte, a Valuable Co-Product of Industrial Hemp Fiber, as Adsorbent for Pollutant Removal. Part I: Chemical, Microscopic, Spectroscopic and Thermogravimetric Characterization of Raw and Modified Samples

Authors: Mongiovi C, Lacalamita D, Morin-Crini N, Gabrion X et al…

Source: MOLECULES 26(15): 4574, 2021, DOI 10.3390/molecules26154574

Abstract: FINEAU (2021-2024) is a trans-disciplinary research project involving French, Serbian, Italian, Portuguese and Romanian colleagues, a French agricultural cooperative and two surface-treatment industries, intending to propose chenevotte, a co-product of the hemp industry, as an adsorbent for the removal of pollutants from polycontaminated wastewater. The first objective of FINEAU was to prepare and characterize chenevotte-based materials. In this study, the impact of water washing and treatments (KOH, Na2CO3 and H3PO4) on the composition and structure of chenevotte (also called hemp shives) was evaluated using chemical analysis, X-ray diffraction (XRD) analysis, scanning electron microscopy (SEM), energy-dispersive X-ray (EDX) spectroscopy, X-ray computed nanotomography (nano-CT), attenuated total reflectance-Fourier transform infrared (ATR-FTIR) spectroscopy, solid state NMR spectroscopy and thermogravimetric analysis…

Maximize EU pollinator protection: Minimize risk

Authors: Simon-Delso N, Aebi A, Arnold G, Bonmatin JM et al…

Source: SCIENCE 373(6552): 290-290, 2021, DO I10.1126/science.abj8116

Letter: Bees and other pollinators play vital roles in biodiversity and food security, and they are a source of income and inspiration. Yet, bees' biodiversity and abundance are decreasing every day. Their decline, driven by pesticides (1–3), poses serious threats to the environment, ecosystems, and human health. The European pesticide authorization framework states that a pesticide can only be put on the market if it has no harmful effects on human health or animal health and no unacceptable effects on the environment (4). EU ministries met in June to decide what constitutes an “acceptable” effect of a pesticide on bees (5)…

Mercury accumulation in the sediment of the Western Mediterranean abyssal plain: A reliable archive of the late Holocene

Authors: Cossa D, Mucci A, Guedron S, Coquery M et al…

Source: GEOCHIMICA ET COSMOCHIMICA ACTA 309: 1-15, 2021, DOI 10.1016/j.gca.2021.06.014

Abstract: Temporal reconstruction of Hg deposition from sediment archives is relatively straightforward in organic-rich or high sedimentation rate environments, such as lakes and ocean margins. To retrieve long-term records at regional or global scales, deep-sea sediments are more appropriate, but such records are scarce and their reliability has been questioned because of possible post-depositional Hg diagenetic remobilization. Here, we investigated the accumulation of Hg in the Balearic Abyssal Plain (2850 m deep) of the Western Mediterranean through a comprehensive characterization of the chemical and isotopic composition (organic carbon, nitrogen, sulfur, major and redox-sensitive elements) of sediment trap material and sediment cores…

Introducing ground cover management in pesticide emission modeling

Authors: Gentil-Sergent C, Basset-Mens C, Renaud-Gentie C, Mottes C et al.

Source: INTEGRATED ENVIRONMENTAL ASSESSMENT AND MANAGEMENT Early Access, 2021, DOI 10.1002/ieam.4482

Abstract: Ground cover management (GCM) is an important agricultural practice used to reduce weed growth, erosion and runoff, and improve soil fertility. In the present study, an approach to account for GCM is proposed in the modeling of pesticide emissions to evaluate the environmental sustainability of agricultural practices. As a starting point, we include a cover crop compartment in the mass balance of calculating initial (within minutes after application) and secondary (including additional processes) pesticide emission fractions. The following parameters were considered: (i) cover crop occupation between the rows of main field crops, (ii) cover crop canopy density, and (iii) cover crop family. Two modalities of cover crop occupation and cover crop canopy density were tested for two crop growth stages, using scenarios without cover crops as control. From that, emission fractions and related ecotoxicity impacts were estimated for pesticides applied to tomato production in Martinique (French West Indies) and to grapevine cultivation in the Loire Valley (France)…

In situ and ex situ bioassays with *Cantareus aspersus* for environmental risk assessment of metal(loid) and PAH-contaminated soils

Authors: Louzon M, Pauget B, Gimbert F, Morin-Crini N et al.

Source: INTEGRATED ENVIRONMENTAL ASSESSMENT AND MANAGEMENT Early Access, 2021, DOI 10.1002/ieam.4480

Abstract: Environmental risk assessment of contaminated soils requires bioindicators that allow the assessment of bioavailability and toxicity of chemicals. Although many bioassays can determine the ecotoxicity of soil samples in the laboratory, few are available and standardized for on-site application. Bioassays based on specific threshold values that assess the in situ and ex situ bioavailability and risk of metal(loid)s and polycyclic aromatic hydrocarbons (PAHs) in soils to the land snail Cantareus aspersus have never been simultaneously applied to the same soils. The aims of this study were to compare the results provided by in situ and ex situ bioassays and to determine

their respective importance for environmental risk assessment. The feasibility and reproducibility of the in situ bioassay were assessed using an international ring test…

Functional and Taxonomic Diversity of Collembola as Complementary Tools to Assess Land Use Effects on Soils Biodiversity

Authors: Joimel S, Schwartz C, Bonfanti J, Hedde M et al…

Source: FRONTIERS IN ECOLOGY AND EVOLUTION 9: 630919, 2021, DOI 10.3389/fevo.2021.630919

Abstract: Collembola have been proposed for several decades as a good model organisms to survey soil biodiversity; but most of the studies focused on taxonomic endpoints. The main objectives of this study are to compare the effects of the different land uses, including urban and industrial land uses, while using both collembolan functional and taxonomic biodiversity approaches. We collected data on 3,056 samples of Collembola communities across 758 sites in various land uses throughout France. The types of land use considered included all types of human activity from forestry to urban, industrial, traffic, mining and military areas, agricultural grassland, arable land, vineyards and urban vegetable gardens. In order to study functional and taxonomic biodiversity, we used community-weighted means, functional indices, species richness and density…

Biosorbents from Plant Fibers of Hemp and Flax for Metal Removal: Comparison of Their Biosorption Properties

Authors: Mongiovi C, Morin-Crini N, Lacalamita D, Bradu C et al.

Source: MOLECULES 26(14): 4199, 2021, DOI 10.3390/molecules26144199

Abstract: Lignocellulosic fibers extracted from plants are considered an interesting raw material for environmentally friendly products with multiple applications. This work investigated the feasibility of using hemp- and flax-based materials in the form of felts as biosorbents for the removal of metals present in aqueous solutions. Biosorption of Al, Cd, Co, Cu, Mn, Ni and Zn from a single solution by the two lignocellulosic-based felts was examined using a batch mode. The parameters studied were initial metal concentration, adsorbent dosage, contact time, and pH…

A Multidisciplinary Approach for the Assessment of Origin, Fate and Ecotoxicity of Metal(loid)s from Legacy Coal Mine Tailings

Authors: Gauthier-Manuel H, Radola D, Choulet F, Buatier M et al.

Source: TOXICS 9(7): 164, 2021, DOI 10.3390/toxics9070164

Abstract: Over the course of history, the development of human societies implied the exploitation of mineral resources which generated huge amounts of mining wastes leading to substantial environmental contamination by various metal(loid)s. This is especially the case of coal mine tailings which, subjected to weathering reactions, produce acid mine drainage (AMD), a recurring ecological issue related to current and past mining activities. In this study, we aimed to determine the origin, the fate and the ecotoxicity of metal(loid)s leached from a historical coal tailing heap to the Beuveroux river (Franche-Comte, France) using a combination of mineralogical, chemical and biological approaches…

The Foraging Gene, a New Environmental Adaptation Player Involved in Xenobiotic Detoxification

Authors: Amichot M, Tares S

Source: INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH 18(14): 7508, 2021, DOI 10.3390/ijerph18147508

Abstract: Foraging is vital for animals, especially for food. In Drosophila melanogaster, this behavior is controlled by the foraging gene (for) which encodes a cyclic guanosine monophosphate (cGMP)-dependent protein kinase (PKG). In wild populations of Drosophila, rover individuals that exhibit long foraging trails and sitter individuals that exhibit short ones coexist and are characterized by high and low levels of PKG activity, respectively. We, therefore, postulated that rover flies are more exposed to environmental stresses, including xenobiotics contamination, than sitter flies. We then tested whether these flies differed in their ability to cope with xenobiotics by exposing them to insecticides from different chemical families. We performed toxicological tests and measured the activity and expression levels of different classes of detoxification enzymes...

Taking full advantage ofmodelling to better assess environmental risk due to xenobiotics-the all-in-one facility MOSAIC

Authors: Charles S, Ratier A, Baudrot V, Multari G et al...

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH Early Access, 2021, DOI 10.1007/s11356-021-15042-7

Abstract: In the European Union, more than 100,000 man-made chemical substances are awaiting an environmental risk assessment (ERA). Simultaneously, ERA of these chemicals has now entered a new era requiring determination of risks for physiologically diverse species exposed to several chemicals, often in mixtures. Additionally, recent recommendations from regulatory bodies underline a crucial need for the use of mechanistic effect models, allowing assessments that are not only ecologically relevant, but also more integrative, consistent and efficient. At the individual level, toxicokinetic-toxicodynamic (TKTD) models are particularly encouraged for the regulatory assessment of pesticide-related risks on aquatic organisms. In this paper, we first briefly present a classical dose-response model to showcase the on-line MOSAIC tool, which offers all necessary services in a turnkey web platform, whatever the type of data analyzed...

Quantification of the organophosphate flame retardant triphenylphosphate and its main metabolite in whole blood by liquid-liquid micro-extraction and liquid chromatography-tandem mass spectrometry

Authors: Giroud B, Bulete A, Spinner L, Deverchere J et al.

Source: MICROCHEMICAL JOURNAL 168: 106374, 2021, DOI 10.1016/j.microc.2021.106374

Abstract: This work proposes a rapid, simple and accurate analytical method for quantification of the organophosphate flame retardant triphenylphosphate (TPhP) and the biomarker diphenylphosphate (DPhP) in whole blood by a simple and effective sample preparation followed by liquid chromatography-tandem mass spectrometry (LC-MS/ MS) quantification. A liquid-liquid microextraction (mu LLE) from 250 µL of mouse whole blood was developed and

validated to quantify TPhP and DPhP. Nature of extraction solvent, grinding for cell lysis and purification step were investigated…

Lack of impact of radiation on blood physiology biomarkers of Chernobyl tree frogs

Authors: Burraco P, Bonzom JM, Car C, Beaugelin-Seiller K et al.

Source: FRONTIERS IN ZOOLOGY 18(1): 33, 2021, DOI 10.1186/s12983-021-00416-x

Abstract: Background: Human actions have altered natural ecosystems worldwide. Among the many pollutants released to the environment, ionizing radiation can cause severe damage at different molecular and functional levels. The accident in the Chernobyl Nuclear Power Plant (1986) caused the largest release of ionizing radiation to the environment in human history. Here, we examined the impact of the current exposure to ionizing radiation on blood physiology biomarkers of adult males of the Eastern tree frog (Hyla orientalis) inhabiting within and outside the Chernobyl Exclusion Zone. We measured the levels of eight blood parameters (sodium, potassium, chloride, ionized calcium, total carbon dioxide, glucose, urea nitrogen, and anion gap), physiological markers of homeostasis, as well as of liver and kidney function…

Identification of non-validated endocrine disrupting chemical characterization methods by screening of the literature using artificial intelligence and by database exploration

Authors: Zgheib E, Kim MJ, Jornod F, Bernal K, Tomkiewicz C et al.

Source: ENVIRONMENT INTERNATIONAL 154: 106574, 2021, DOI 10.1016/j.envint.2021.106574

Abstract: Background: Exposure to endocrine disrupting chemicals (EDCs) represents a critical public health threat. Several adverse health outcomes (e.g., cancers, metabolic and neurocognitive/neurodevelopmental disorders, infertility, immune diseases and allergies) are associated with exposure to EDCs. However, the regulatory tests that are currently employed in the EU to identify EDCs do not assess all of the endocrine pathways. Objective: Our objective was to explore the literature, guidelines and databases to identify relevant and reliable test methods which could be used for prioritization and regulatory pre-validation of EDCs in missing and urgent key areas. Methods: Abstracts of articles referenced in PubMed were automatically screened using an updated version of the AOP-helpFinder text mining approach…

Single and mixed exposure to cadmium and mercury in *Drosophila melanogaster*: Molecular responses and impact on post-embryonic development

Authors: Frat L, Chertemps T, Pesce E, Bozzolan F et al.

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 220: 112377, 2021 DO I10.1016/j.ecoenv.2021.112377

Abstract: Heavy metals, like many other chemical elements, are naturally present in the environment; however, the concentrations of these metals in various environmental matrices have increased through their intensive use in many human activities (such as industry, mining and agriculture). Among the heavy metals, cadmium (Cd) and mercury (Hg) induce a wide variety of defects in animals. While the effects of these heavy metals have been widely documented, a single exposure paradigm is

typically used. Few studies have focused on evaluating combined exposure to these metals. However, in the environment, animals are confronted with a plethora of substances simultaneously; thus, the presence and origin of such substances must be determined to reduce the sources of contamination. Using the model of the fruit fly Drosophila melanogaster, for which many tools are readily available, we investigated how different concentrations of Cd and Hg in single and combined exposures impact post-embryonic development…

Risk of Anticoagulant Rodenticide Exposure for Mammals and Birds in Parc National des Pyrenees, France

Authors: Lestrade M, Vergne T, Guinat C, Berny P et al.

Source: JOURNAL OF WILDLIFE DISEASES 57(3): 637-642, 2021, DOI 10.7589/JWD-D-20-00125

Abstract: The extensive use of anticoagulant rodenticides (ARs) to control rodent populations poses intoxication risks for wildlife: persistence of ARs in rodents can cause secondary exposure and poisoning of predators or scavengers. We investigated risk factors for wildlife exposure to ARs in the Parc National des Pyrenees (PNP), France, using a multivariable logistic regression analysis. A total of 157 liver samples were collected from carcasses of 10 mammal and three bird species found in the PNP between 2010 and 2018 and screened for presence of AR residues…

Direct photodegradation of 36 organic micropollutants under simulated solar radiation: Comparison with free-water surface constructed wetland and influence of chemical structure

Authors: Mathon B, Ferreol M, Coquery M, Choubert JM et al.

Source: JOURNAL OF HAZARDOUS MATERIALS 407: 124801, 2021, DOI 10.1016/j.jhazmat.2020.124801

Abstract: Micropollutants such as pharmaceuticals and pesticides are still found in treated municipal effluent and are discharged into the natural environment. Natural direct photodegradation may be one pathway for removing these micropollutants in treatment processes such as free-water surface constructed wetlands (CW). This work was set out to evaluate the half-life (t(1/2)) of direct photodegradation of 36 micropollutants under controlled conditions of light exposure close to solar radiation…

Introduction: Beyond the Production of Ignorance: The Pervasiveness of Industry Influence through the Tools of Chemical Regulation

Authors: Henry E, Thomas V, Aguiton SA, Deplaude MO, Jas N

Source: SCIENCE TECHNOLOGY & HUMAN VALUES Article Number 01622439211026749, 2021, DOI 10.1177/01622439211026749

Abstract: Research on the influence of industry on chemical regulation has mostly been conducted within the framework of the production of ignorance. This special issue extends this research by looking at how industry asserts its interests--not just in the scientific sphere but also at other stages of policy-making and regulatory process--with a specific focus on the types of tools or instruments industry has used. Bringing together sociologists and historians specialized in Science

and Technology Studies (STS), the articles of the special issue study the arenas in which instruments and practical guidelines for public policy are negotiated or used. The aim is to observe the devices in the making or in action, from the selection of actors to the production of thresholds, criteria, and other technical regulations…

Biochar and activated carbons preparation from invasive algae Sargassum spp. for Chlordecone availability reduction in contaminated soils

Authors: Ranguin R, Delannoy M, Yacou C, Jean-Marius C et al.

Source: JOURNAL OF ENVIRONMENTAL CHEMICAL ENGINEERING 9(4): 105280, 2021, DOI 10.1016/j.jece.2021.105280

Abstract: This work aims to valorize an invasive brown macroalga (Sargassum spp. consisting of two species Sargassum fluitans and Sargassum natans) by producing biochars (BCs) and activated carbons (ACs). Its abundant and frequent occurrence along the Caribbean coastlines, Florida, Gulf of Mexico during the last past nine years, have triggered human health concerns and have negatively impacted local economy, ecology and the environment. In this paper, BCs and ACs were developed to assess the reduction of chlordecone (CLD) environmental availability in artificial and tropical contaminated soils. Such innovative approach was proposed to limit CLD bio-availability to fauna and outdoor reared-animals…

Evaluation of environmental contamination by toxic trace elements in Kazakhstan based on reviews of available scientific data

Authors: Baubekova A, Akindykova A, Mamirova A, Dumat C et al.

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH Eraly access, 2021, DOI 10.1007/s11356-021-14979-z

Abstract: The environmental situation concerning pollution by (eco)toxic and persistent trace elements in Kazakhstan has been investigated by analytical reviews of scientific studies published over the past 20 years reporting concentrations of 10 toxic trace elements (TTE) observed in soil, sediments, or surface water. A database of 62 articles published in Kazakh, Russian, or English covered the majority of the territory of the country for soil and water samples but to a lesser extent for sediments. Reported concentrations were summarized using statistical parameters, then spatialized and finally classified in contamination classes according to local legislation….

Transfer of sulfidized silver from silver nanoparticles, in sewage sludge, to plants and primary consumers in agricultural soil environment

Authors: Courtois P, de Vaufleury A, Grosser A, Lors C et al.

Source: SCIENCE OF THE TOTAL ENVIRONMENT 777: 145900, 2021, DOI 10.1016/j.scitotenv.2021.145900

Abstract: Consumer products containing silver nanoparticles (AgNPs) release silver (Ag) to the environment, particularly wastewater. Sewage sludge (SS), which contains numerous contaminants including Ag, is recycled by spreading on agricultural land. Although slight impacts and bioaccumulation of Ag sulfide (Ag2S, the main species found in SS) in terrestrial

organisms have been demonstrated, possible trophic transfer into plants and subsequently animal species has not been examined. Accordingly, the present study experimentally measured the transfer of Ag from AgNPs and sulfidized Ag into plants and primary consumers and compared their bioavailability…

Potential of preventive bioremediation to reduce environmental contamination by pesticides in an agricultural context: A case study with the herbicide 2,4-D

Authors: Carles L, Martin-Laurent F, Devers M, Spor A et al.

Source: JOURNAL OF HAZARDOUS MATERIALS 416: 125740, 2021, DOI 10.1016/j.jhazmat.2021.125740

Abstract: One of the major problems with pesticides is linked to the non-negligible proportion of the sprayed active ingredient that does not reach its intended target and contaminates environmental compartments. Here, we have implemented and provided new insights to the preventive bioremediation process based on the simultaneous application of the pesticide with pesticide-degrading microorganisms to reduce the risk of leaching into the environment. This study pioneers such a practice, in an actual farming context. The 2,4-dichlorophenoxyacetic acid herbicide (2,4-D) and one of its bacterial mineralizing-strains (Cupriavidus necator JMP134) were used as models. The 2,4-D biodegradation was studied in soil microcosms planted with sensitive (mustard) and insensitive (wheat) plants…

Efficiency of dihydroxamic and trihydroxamic siderochelates to extract uranium and plutonium from contaminated soils

Authors: Fevrier L, Coppin F, Pierrisnard S, Bourdillon M et al.

Source: JOURNAL OF ENVIRONMENTAL RADIOACTIVITY 235: 106645, 2021, DOI 10.1016/j.jenvrad.2021.106645

Abstract: Actinide-based mineral phases occurring in contaminated soils can be solubilized by organic chelators excreted by plants, such as citrate. Herein, the efficiency of citrate towards U and Pu extraction is compared to that of siderophores, whose primary function is the acquisition of iron(III) as an essential nutrient and growth factor for many soil microorganisms. To that end, we selected desferrioxamine B (DFB) as an emblematic bacterial trishydroxamic siderophore and a synthetic analog, abbreviated (LCy,Pr)H2, of the tetradentate rhodotorulic acid (RA) produced by yeasts. Firstly, the uranyl speciation with both ligands was assessed in the pH range 2 & 11 by potentiometry and visible absorption spectrophotometry…

Collective scientific assessment as a relevant tool to inform public debate and policymaking: an illustration about the effects of plant protection products on biodiversity and ecosystem services

Authors: Pesce S, Mamy L, Achard AL, Le Gall M et al.

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH Early Access, 2021, DOI 10.1007/s11356-021-14863-w

Abstract: Several sustainable development goals cannot be achieved without implementing a new generation of environmental measures to better preserve or restore biodiversity and ecosystem services. However, understanding and addressing biodiversity loss and ecosystem degradation is a challenging problem that is not solvable without integrating the best and latest science. It is crucial to enhance the legibility of this knowledge for decision-makers and policymakers following good-practice standards of scientific assessment. This is the main objective of collective scientific assessments (CSAs), as carried out by the French National Research Institute for Agriculture, Food and the Environment (INRAE) since the early 2000s following a documented procedure to inform public policy and foster public debate on complex interdisciplinary issues…

Resistance in the Genus Spodoptera: Key Insect Detoxification Genes

Authors: Hilliou F, Chertemps T, Maibeche M, Le Goff G

Source: INSECTS 12(6): 544, 2021, DOI 10.3390/insects12060544

Abstract: Simple Summary The moth larvae are among the most damaging pest species on crops worldwide. In this review, we focus on the genus Spodoptera, which can feed on many crops such as rice, cotton or corn. The massive use of insecticides to control these insects has led to the development of resistance. Here, we aim to compare the resistance mechanisms of four species (Spodoptera exigua, Spodoptera frugiperda, Spodoptera littoralis and Spodoptera litura) and highlight the role of enzymes and transporters in resistance to help us understand the molecular basis of their origin. The genus Spodoptera (Lepidoptera: Noctuidae) includes species that are among the most important crop pests in the world. These polyphagous species are able to feed on many plants, including corn, rice and cotton. In addition to their ability to adapt to toxic compounds produced by plants, they have developed resistance to the chemical insecticides used for their control…

Evaluation of DGT and DGT-PROFS modeling approach to estimate desorption kinetics of Cs in soils

Authors: Ciffroy P, Carasco L, Orjollet D, Simonucci C, Fevrier L

Source: JOURNAL OF ENVIRONMENTAL RADIOACTIVITY 235: 106646, 2021, DOI 10.1016/j.jenvrad.2021.106646

Abstract: The aim of this paper is to assess the suitability of DGT to extract kinetic rates of desorption of cesium (Cs) from soils. For this purpose, laboratory experiments with a natural soil spiked with Cs were carried out under three different contamination conditions, reflecting either an increase in Cs contamination level or an ageing of the contamination within the soil. The experimental results, i.e. the Cs accumulation kinetics onto DGT probes were interpreted by the DGT-PROFS model. The latter calculates the partitioning of Cs between two particulate pools, describing weak and strong interactions respectively, as well as kinetic rates describing exchange reactions…

Genomic analysis of the *Bacillus megaterium* Mes11: New insights into nitroreductase genes associated with the degradation of mesotrione

Authors: Carles L, Donnadieu F, Wawrzyniak A, Besse-Hoggan Pascale) et al.

Source: INTERNATIONAL BIODETERIORATION & BIODEGRADATION 162: 105254, 2021, DOI 10.1016/j.ibiod.2021.105254

Abstract: Mesotrione is among the most recently marketed herbicides belonging to the triketone family and applied on maize crops. A Bacillus megaterium Mes11 strain isolated from an agricultural soil was able to completely transform 1 mM of mesotrione, alone or in a mixture with 1 mM of nicosulfuron and/or S-metolachlor herbicides, in 5 h. Its complete genome contains one circular chromosome (5,191,612 bp) and nine plasmids (from 45,372 to 169,684 bp). Genome analysis revealed that 10 genes encoded oxygen-insensitive nitroreductases of which only one (NfrA2) was shown to be involved in the first step of mesotrione transformation "in cellulo "...

The NORMAN Association and the European Partnership for Chemicals Risk Assessment (PARC): let's cooperate!

Authors: Dulio V, Koschorreck J, van Bavel B, van den Brink P et al.

Source: ENVIRONMENTAL SCIENCES EUROPE 32(1): 100, 2020, DOI 10.1186/s12302-020-00375-w

Abstract: The Partnership for Chemicals Risk Assessment (PARC) is currently under development as a joint research and innovation programme to strengthen the scientific basis for chemical risk assessment in the EU. The plan is to bring chemical risk assessors and managers together with scientists to accelerate method development and the production of necessary data and knowledge, and to facilitate the transition to next-generation evidence-based risk assessment, a non-toxic environment and the European Green Deal. The NORMAN Network is an independent, well-established and competent network of more than 80 organisations in the field of emerging substances and has enormous potential to contribute to the implementation of the PARC partnership. NORMAN stands ready to provide expert advice to PARC, drawing on its long experience in the development, harmonisation and testing of advanced tools in relation to chemicals of emerging concern and in support of a European Early Warning System to unravel the risks of contaminants of emerging concern (CECs) and close the gap between research and innovation and regulatory processes...

Copper Content and Export in European Vineyard Soils Influenced by Climate and Soil Properties

Authors: Droz B, Payraudeau S, Martin JAR, Toth G et al.

Source: ENVIRONMENTAL SCIENCE & TECHNOLOGY 55(11): 7327-7334, 2021, DOI 10.1021/acs.est.0c02093

Abstract: Copper-based fungicides (Cu-f) are used in European (EU) vineyards to prevent fungal diseases. Soil physicochemical properties locally govern the variation of the total copper content (Cu-t) in EU vineyards. However, variables controlling Cu-t distribution at a larger scale are poorly known. Here, machine learning techniques were used to identify governing variables and to predict the Cu-t distribution in EU vineyards. Precipitation, aridity and soil organic carbon are key variables explaining together 45% of Cu-t distribution across EU vineyards. This underlines the effect of both climate and soil properties on Cu-t distribution. The average net export of Cu at

the EU scale is 0.29 kg Cu ha(-1), which is 2 orders of magnitude less than the net accumulation of Cu (24.8 kg Cu ha(-1)). Four scenarios of Cuf application were compared…

Effects of thorium on bacterial, microalgal and micromeiofaunal community structures in a periphytic biofilm

Authors: Doose C, Morin S, Malbezin L, Vedrenne J et al.

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 218: 112276, 2021, DOI 10.1016/j.ecoenv.2021.112276

Abstract: Few ecotoxicity studies are available on thorium (Th) which hinders the ability to evaluate its ecotoxicological risk. Its release in the environment is often associated with the extraction of rare earth elements and uranium, as well as the field applications of phosphate fertilizers. This study investigates the effects of Th on microbial communities of periphytic biofilms. Ceramic plates were left to colonize for one month in the laboratory with a biofilm sampled from Cap Rouge river (QC, Canada). Plates were randomly placed in channels containing culture media representing three different conditions: a control condition (C0; background Th concentrations of 0.004 +/- 0.002 nM), a low Th concentration condition (C1; 0.18 +/- 0.09 nM Th) and a moderately high Th condition (C10; 8.7 +/- 3.4 nM) for up to 4 weeks…

Occurrence of pesticides and their transformation products in headwater streams: Contamination status and effect of ponds on contaminant concentrations

Authors: Le Cor F, Slaby S, Dufour V, Iuretig A et al.

Source: SCIENCE OF THE TOTAL ENVIRONMENT 788: 147715, 2021, DOI 10.1016/j.scitotenv.2021.147715

Abstract: In France, more than 90% of monitored watercourses are contaminated with pesticides. This high contamination level increases at the head of agricultural watersheds, where dilution capacities are low and transport from treated lands is direct. Ponds, numerous around headwater streams, could provide additional protection against pesticide pollution. Because of their long hydraulic residence time and large water volumes, they mitigate pesticide concentrations between upstream and downstream rivers. However, pesticide transformation products may also be responsible for the degradation of environments, owing to their presence at high concentrations and their persistence, but related data are scarce, particularly because of their high level of molecular diversity…

A method to assess glyphosate, glufosinate and aminomethylphosphonic acid in soil and earthworms

Authors: Delhomme O, Hernandez A, Chimjarn S, Bertrand C et al.

Source: JOURNAL OF CHROMATOGRAPHY A 1651: 462339, 2021, DOI 10.1016/j.chroma.2021.462339

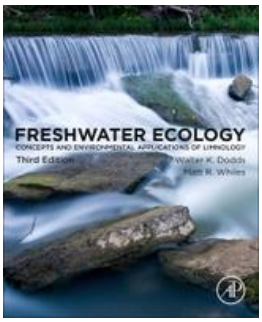
Abstract: A new sensitive and selective analytical methodology to quantify glyphosate (GLY), aminomethylphosphonic acid (AMPA), and glufosinate (GLU) in both soil and earthworms (Allolobophora chlorotica) was developed. The extraction and purification methods were optimized. The samples were extracted with

https://doi.org/10.15454/64rs-v051

various aqueous solutions (HNO3, H2O, KOH and borate buffer) and derivatized with 9-Fluorenylmethyl chloroformate (FMOC-Cl). To optimize the extraction step, a method to remove the excess FMOC-Cl was applied based on liquid-liquid extraction with diethyl ether. The purification of derivatized extracts was carried out using XLB solid phase extraction (SPE) cartridges before internal standard quantification by liquid chromatography coupled to tandem mass spectrometry (LC/MS/MS)…

OUVRAGES / RAPPORTS / ACTES DE CONGRES

Freshwater Ecology 3rd Edition: Concepts and Environmental Applications of Limnology



Walter Dodds Matt Whiles / Academic Press,

3rd April 2019 ; 998 p. ; **ISBN:** 9780128132555, **eBook ISBN:** 9780128132562

Freshwater Ecology, Third Edition, covers everything from the basic chemical and physical properties of water, to the advanced and unifying concepts of community ecology and ecosystem relationships found in continental waters. Giving students a solid foundation for both courses and future fieldwork, and updated to include key issues, including how to balance ecological and human health needs, GMOs, molecular tools, fracking, and a host of other environmental issues, this book is an ideal resource for both students and practitioners in ecology and related fields.

Accès au document

Pesticides in the Natural Environment - 1st Edition

Elsevier 06/21

Editors: Pardeep Singh Suruchi Singh ; Elsevier ; 31st January 2022 ; 320 p., ISBN: 9780323904896

Pesticides in the Natural Environment: Sources, Health Risks, and Remediation presents direct and indirect impacts of the use of pesticides on the environment, human health, and agriculture. It then goes on to explore sustainable alternatives to pesticide use, policies for regulating use, and remediation techniques. Bridging the gap between regulations and the tangible environmental threat, the book proposes practical solutions while also providing important context on the hazards of pesticides. It highlights as well the influence on climate change, offering a holistic perspective for researchers in environmental science, policymakers, and land managers.

Accès au document

Reproductive and Developmental Toxicology - 3rd Edition

Elsevier 06/21

Editor: Ramesh Gupta/Academic Press, 1st January 2022, p. 1200, ISBN: 9780323897730

Reproductive and Developmental Toxicology, Third Edition is a comprehensive and authoritative resource providing the latest literature on this complex subject, focusing on the core three components - parent, placenta, and fetus - and the continuous changes that occur in each. Enriched with relevant references describing every aspect of reproductive toxicology, this revised and updated resource addresses the

totality of the subject, discussing a broad range of topics including nanoparticles and radiation, gases and solvents, smoking, alcohol and drugs of abuse, and metals, among others. With a special focus on placental toxicity, this book is the only available reference to connect the three key risk stages and is the only resource to include reproductive and developmental toxicity in domestic animals, fish, and wildlife. Completely revised and updated to include the most recent developments in the field, Reproductive and Developmental Toxicology, Third Edition is an essential resource for advanced students and researchers in toxicology, as well as biologists, pharmacologists, and teratologists from academia, industry, and regulatory agencies.

Accès au document

Exploring the benefits of biocontrol for sustainable agriculture

IEEP 24/06/21

Exploring the benefits of biocontrol for sustainable agriculture In creating a sustainable and healthy food system, reducing the pressure on the environment is key. As a non-chemical and targeted input, biocontrol can offer a systemic and balanced solution for sustainable agriculture. This new report explores the benefits of biocontrol and the role it could play in the implementation of the European Green Deal.

Accès au document

REVUE DE PRESSE / ALTERNATIVES / BIOPESTICIDES

Essais encourageants pour un futur produit de biocontrôle en céréales

Cultivar 27/08/21

Déjà bien éprouvé sur le marché des cultures spécialisées. Le secteur du bicontrôle ne cache pas ses ambitions : **il représente déjà 11 % du CA total du marché de la protection des plantes et on parle de 30 % d'ici à 2030.** La part du marché grandes cultures devrait progresser avec les innovations à venir.

Et c'est la société Amoéba qui s'y intéresse en développant une solution dédiée aux grandes cultures. Spécialisée dans le traitement du risque microbiologique dans les secteurs de l'eau, de la santé, elle ajoute la protection des plantes à ses activités. [...]

Accès au document

Des insectes pour lutter contre les mouches en élevage

Agri-mutuel 24/08/21

Afin de réduire l'utilisation d'insecticides chimiques, l'entreprise Appi produit et commercialise des insectes auxiliaires pour lutter contre les mouches.

Spécialisée dans la production d'insectes pour la santé et la nutrition animale, la société Appi présente sa solution de biocontrôle pour lutter contre les mouches. Les insectes agissent comme traitement pour chaque stade du cycle de vie de la mouche [...]

Accès au document

https://doi.org/10.15454/64rs-v051

REVUE DE PRESSE / ASSOCIATIONS

Exposure to Common Herbicide Glyphosate Increases Spontaneous Preterm Birth Incidents

Beyond Pesticides, August 26, 2021 A recent study published in Environmental Research demonstrates that exposure to the herbicide glyphosate and its breakdown product reduces pregnancy length, increasing the risk of preterm birth. Preterm births occur when a fetus is born early or before 37 weeks of complete gestation. Premature births can result in chronic (long-term) illnesses among infants from lack of proper organ development and even death. [...]

Accès au document

Perturbateurs endocriniens : informer le consommateur… vraiment?

Générations futures 26/08/21

A partir du 1er janvier 2022, les fabricants de produits contenant des substances classées comme perturbateurs endocriniens (PE) devront « mettre à disposition du public » des informations sur la présence de ces substances, selon un décret publié mercredi au Journal officiel.

Cette information des consommateurs se fera à travers la mise en ligne et en « open data » (des données en accès public et exploitables sur internet) de « la liste de ces produits et des substances que chacun d'entre eux contient ». [...]

Accès au document

Mildiou : les viticulteurs bio (et les autres) autorisés à dépasser le seuil légal de cuivre

Alerte environnement 12/08/21

Habituée à se scandaliser pour un rien, Générations Futures est aux abonnés absents. Et pourtant, un arrêté paru ce dimanche au Journal officiel autorise temporairement les viticulteurs à dépasser la quantité maximum autorisée de traitements à base de cuivre pour lutter contre le mildiou. [...]

Sont concernés les viticulteurs conventionnels comme les viticulteurs bio. Le lobby bio finançant Générations Futures, l'ONG ne va pas mordre la main qui la nourrit généreusement (en échange d'opérations visant à discréditer à tout prix le conventionnel à lui substituer du bio), elle préfère se taire. [...]

Pour rappel, le cuivre n'est pas biodégradable, tue les lombrics, dégrade les sols sur le long terme, est toxique pour l'être humain et perturbateur endocrinien. Pourtant le bio ne peut toujours pas s'en passer. Mais donne des leçons et tire à boulets rouges sur le conventionnel…

Accès au document

Study identifies the presence of organochlorine pesticides among South China Sea coral reefs

Beyond Pesticides, August 12, 2021

A recent study published in Chemosphere identifies the concentration, consequences, and potential sources of 22 organochlorine pesticides (OCPs) among corals in the South China Sea (SCS) for the first time. SCS corals exhibit a higher affinity toward bioaccumulation of OCPs, which are legacy

persistent organic pollutants (POPs) under the Stockholm Convention—a global treaty to eliminate POPs. The study finds the distribution of OCPs in coral tissue matches that of the surrounding oceanic air samples. Hence, atmospheric concentrations of OCPs—influenced by continental air masses—migrate from the atmosphere to seawater through gas exchange. [...]

Accès au document

Biden EPA Reapproves Paraquat with Weaker Protections than Trump Administration Proposed

Beyond Pesticides, August 10, 2021

President Biden's Environmental Protection Agency (EPA), under Administrator Michael Regan, is set to reapprove the highly hazardous herbicide paraquat with fewer protections than those proposed by the Trump administration. Despite strong links to Parkinson's, and bans on the herbicide in the European Union, China, Brazil, and many other countries, EPA's press release inexplicably states, "No direct one-to-one alternatives to paraquat are available." [...]

Accès au document

Pesticides and Other Volatile Chemicals Cause Air Pollution Linked to Premature Deaths

Beyond Pesticides, July 29, 2021

Between 340,000 and 900,000 premature deaths each year can be linked to air pollution caused by the release of volatile organic compounds, such as pesticides, paints, and cleaning agents, from anthropogenic sources. The findings, published in Atmospheric Chemistry and Physics, included an international team of over 50 scientists, lead by researchers at the University of Colorado, Boulder. [...]

While the connection between air pollution and direct sources of particulate matter in the atmosphere have a large body of supporting literature, there is little understanding of the impact caused by other chemical products that humans use. [...]

This new research finds that anthropogenic secondary organic aerosols (ASOAs), including intermediate and semi-volatile organic compounds like pesticides, paints, cleaners, and other personal care products, are a major, underrepresented source of PM2.5 mortality. [...]

Accès au document

A tale of disruption: looking back at one decade of Europe's (unkept) promises to address endocrine disrupting pesticides

HEAL 29/07/21

Under the European Green Deal and related Farm-to-Fork strategy, the European Commission has committed to reduce the overall use and risk of all chemical pesticides by 50%, as well as the use and risk of high-risk pesticides by 50%, by 2030. At the time of writing, it remains however difficult to see how those lofty promises will become reality. By way of example, this article focuses on the controversial implementation of the ban of pesticides that are harmful to our health via our hormonal system (known as endocrine disrupting pesticides), which we believe is illustrative of the serious loopholes requiring urgent fixing in Europe's safety assessment and regulation of harmful pesticides. [...]

Accès au document

https://doi.org/10.15454/64rs-v051

Debilitating Ear Blisters Plague Long Island Turtle Populations from Pesticide Use

Beyond Pesticides, August 5, 2021

A recent report by Turtle Rescue of the Hamptons finds Long Island, New York turtles are experiencing higher rates of deadly aural abscesses or ear blisters from pesticide use. Previous research documents role chemical exposure from environmental toxicants play in inner ear abscess formation among turtles However, synergism (collaboration) between viral infection and toxic chemical exposure increases aural abscess instances. [...]

Accès au document

JUSTICE : Epandage des pesticides à proximité des habitations

Générations futures 27/07/21

Nouvelle victoire pour nos ONG, nouveau désaveu pour le gouvernement !

A la suite des recours déposés par nos organisations*, le Conseil d'Etat (CE) vient de rendre une décision majeure dans la lutte contre les pesticides, en annulant, car insuffisamment protectrices, plusieurs dispositions encadrant leur épandage près des habitations :

- insuffisance des distances minimales pour les produits suspectés d'être cancérogènes, mutagènes ou toxiques pour la reproduction (CMR 2) - plusieurs pesticides relevant de cette catégorie-,

- absence d'information réelle des riverains en amont des épandages,

- insuffisante protection des riverains et travailleurs. [...]

*AMLP, Collectif Victimes pesticides de l'Ouest et du Nord, Eau et Rivières de Bretagne, FNE, Générations Futures, UFC Que Choisir, Vigilance OGM 16

Accès au document

Épandage des pesticides à proximité des propriétés riveraines : encore un énième passage en force du gouvernement !

Que Choisir 21/07/21

Il y a plus d'un an l'UFC-Que Choisir et 8 autres ONG déposaient deux recours devant le Conseil d'État, en réaction aux distances d'épandage des pesticides ridiculement faibles que le gouvernement avait autorisées à proximité immédiate des riverains, mais également aux "chartes d'engagement" permettant de rogner encore davantage sur ces distances. Alors que le Conseil Constitutionnel a retoqué les "chartes" de bon voisinage cousues mains par et pour les agriculteurs intensifs, et que le Conseil d'État doit prochainement rendre sa décision, le gouvernement s'entête en organisant une nouvelle parodie de consultation en pleine torpeur estivale, par le moyen d'une instruction aux préfets totalement surréaliste. [...]

Accès au document

Deer Ticks Developing Resistance to Popular Tick Control Chemical: Implications of Lyme Disease

Beyond Pesticides, July 22, 2021

A new study published in the Journal of Medical Entomology finds black-legged ticks (Ixodes scapulari) in New York are developing potential resistance to widely used tick-control

https://doi.org/10.15454/64rs-v051

pyrethroid insecticide, permethrin. The study suggests continuous use of area-wide, 4-poster devices (devices that attract deer and then apply pesticide to their head, ears, and neck) to apply insecticide treatments on deer to control tick populations promotes resistance. [...]

Accès au document

Insecticide Chlorpyrifos Interacts with Genes to Increase Autism Risk, Research Finds

Beyond Pesticides, July 20, 2021

Chlorpyrifos exposure results in the expression of genetic mutations associated with autism spectrum disorder in a laboratory model, finds research published in Environmental Health Perspectives by scientists at Johns Hopkins Bloomberg School of Public Health. "This is a step forward in showing an interplay between genetics and environment and its potential role for autism spectrum disorder," says study lead Lena Smirnova, PhD, a research associate in the Department of Environmental Health and Engineering at the Bloomberg School. [...]

Accès au document

Produits phytos et santé : le lien se précise pour six maladies graves

Terre-Net 30/06/21

Les produits phytosanitaires à nouveau pointés du doigt : il existe une « présomption forte » de lien entre l'exposition professionnelle à ces produits et six maladies graves, dont certains cancers et des troubles du cerveau, selon une vaste expertise française publiée mercredi.

Les six pathologies sont trois types de cancer (prostate, lymphomes non hodgkiniens, myélomes multiples), la maladie de Parkinson, les troubles cognitifs et une maladie respiratoire évolutive, la BPCO, selon l'expertise réalisée par l'Inserm (Institut national de la santé et de la recherche médicale). Pour les quatre premières, la « présomption forte » de lien avec l'exposition professionnelle à certains pesticides avait déjà été mise en évidence lors de la précédente expertise de l'Inserm, en 2013. [...]

Accès au document

REVUE DE PRESSE / RECHERCHE ET MEDIAS

First ever study finds microplastics in northeast Lapland

The Barents Observer 31/08/21

A research project, led by non-profit organisation Snowchange Cooperative, has found large amounts of microplastics in Näätämöjoki river and Lake Inari. The project's aim was to track the impacts of climate change in Näätämö, Vuonnijavr, Voronye and Ponoi waters, and they conducted first ever surveys on microplastics in northeast Lapland. The research has shown that the amount of microplastics in Lake Inari is similar to samples taken from lakes in Southern Finland. [...]

Accès au document

https://doi.org/10.15454/64rs-v051

Les viticulteurs pourront déroger à la réglementation sur les traitements à base de cuivre pour lutter contre le mildiou

Le Monde 08/08/21

L'ensemble des viticulteurs, que ce soit en viticulture biologique ou conventionnelle, est concerné par cet arrêté « en vigueur pour une période de cent vingt jours ».[…] Les professionnels viticoles sont, désormais, autorisés à dépasser provisoirement la réglementation sur les traitements à base de cuivre pour lutter contre le mildiou de la vigne, selon un arrêté publié, dimanche 8 août, au JO. [...]

Accès au document

Epandages agricoles : le Conseil d'État veut une plus grande protection des riverains

ENVISCOPE 21/08/21

Saisi par plusieurs organisations le Conseil d'État a rendu le 26 juillet une décision dans la lutte contre les pesticides, en annulant, car insuffisamment protectrices, plusieurs dispositions encadrant leur épandage près des habitations.

Le Conseil d'État avait été saisi par plusieurs associations (AMLP, Collectif Victimes pesticides de l'Ouest et du Nord, Eau et Rivières de Bretagne, FNE, Générations Futures, UFC Que Choisir, Vigilance OGM) sur le dossier des épandages agricoles. Dans une décision du 26 juillet, il relève l'insuffisance des distances minimales pour les produits suspectés d'être cancérogènes, mutagènes ou toxiques pour la reproduction (CMR) – plusieurs pesticides relevant de cette catégorie. [...]

Accès au document

Development of models to predict physicochemical properties of PFAS

EPA 26/08/21

Impact/Purpose:

Presentation to the American Chemical Society (ACS) Fall 2021 National Meeting August 2021. Gathering experimental data and building models to predict phychem properties for PFAS. These properties are important to the program office for registering chemicals and PFAS chemicals have limited data available in the literature. Citation:Martin, T., G. Sinclair, C. Ramsland, AND A. Williams. Development of models to predict physicochemical properties of PFAS. 2021 Fall ACS Meeting, Cincinnati, OH, August 22 - 26, 2021. https://doi.org/10.23645/epacomptox.15405891

Accès au document

The EPA is banning chlorpyrifos, a pesticide widely used on food crops, after 14 years of pressure from environmental and labor groups

The conversation 24/08/21

On Aug. 18, 2021, the U.S. Environmental Protection Agency announced that it will end use of chlorpyrifos – a pesticide associated with neurodevelopmental problems and impaired brain function in children – on all food products nationwide. Gina Solomon, a principal investigator at the Public Health Institute, clinical professor at the University of California, San Francisco and former deputy secretary at the California Environmental Protection Agency,

explains the scientific evidence that led California to ban chlorpyrifos in 2020 and why the EPA is now following suit.[...]

Accès au document

La pollution plastique du Rhône passée à la loupe - Vidéo

Actu-environnement 20/08/21

Les fleuves transportent la pollution plastique jusqu'à la mer, sous forme de macro et micro déchets. Une analyse en cours sur le Rhône va permettre de comprendre les mécanismes de fragmentation des plastiques rejetés en Méditerranée. Reportage vidéo.

[...] La mission dénommée Plastic-Rhône, est pilotée par la startup Plastic@sea, en partenariat avec la compagnie nationale du Rhône (CNR), l'agence de l'eau Rhône Méditerranée Corse (RMC) [...] et l'appui du CNRS. [...]

Accès au document

Herbicide resistance no longer a black box for scientists

PHYS.ORG 16/08/21

When agricultural weeds evolve resistance to herbicides, they do it in one of two ways. In target-site resistance, a tiny mutation in the plant's genetic code means the chemical no longer fits in the protein it's designed to attack. In non-target-site resistance, the plant deploys a whole slew of enzymes that detoxify the chemical before it can cause harm.

Target-site resistance is easy for scientists. [...]. But for non-target-site resistance, it's a guessing game. Researchers can sometimes tell what class of enzymes detoxifies the chemical, but they know next to nothing about what genes code for those enzymes. In other words, non-target-site resistance is a black box.

A University of Illinois study is the first to open that box in a new way, identifying gene regions responsible for non-target-site herbicide resistance in waterhemp.[...]

Accès au document

Metal pollution: If it's in the air—and our iPhones—it'll end up in our bones

PHYS.ORG 16/08/21

[...] A new study by Hebrew University of Jerusalem (HU) reveals the link between rates of metal production and toxic lead exposure in humans. The research team closely examined human remains from a burial ground in central Italy that was in consecutive use for 12,000 years.

They found that as worldwide lead production began and increased, so, too, did the rates of lead absorption found in people who lived during those time periods—even those not remotely involved in lead production—simply by breathing the air around them. [...]

Accès au document

Microplastics: A trojan horse for metals

Phys.org 10/08/21

The fact that microplastics can accumulate organic pollutants from the environment and transport them has been known for some time. What is new, however, is that metals can also be transported in this manner. In addition, the smaller the particles, the greater the metal accumulation on the plastic. This has been demonstrated by scientists at the Helmholtz-Zentrum Hereon in a new study. The results were published now in the Journal of Hazardous Materials Letters. [...]

https://doi.org/10.15454/64rs-v051

Accès au document

Vermont fails to protect bats from pesticides, suit claims

Seven days 16/08/21

Two environmental groups are suing Vermont's Agency of Natural Resources for allegedly failing to protect endangered bats from pesticides meant to kill mosquitoes. [...]

The groups say the agency should have required a mosquito protection district to get "incidental take" permits under Vermont's Protection of Endangered Species Act for harming five threatened and endangered bat species. [...]

A 2019 report by Huntington bat expert Jeff Parsons found that five bat species — Indiana bat, northern long-eared bat, eastern small-footed bat, little brown bat, and tri-colored bat — were all likely to suffer "acute toxic impacts" of flying though clouds of the insecticides malathion and permethrin. [...]

Accès au document

Des parcelles de betteraves détruites pour cause d'herbicide non conforme

Agri-Mutuel 14/08/21

Le ministère de l'Agriculture a ordonné la destruction de parcelles de betteraves sucrières dans le nord et l'est de la France après la détection de phénomènes de toxicité dans des champs traités avec un herbicide produit par la société Adama, a-t-on appris vendredi auprès du ministère.

Deux lots de ce produit dénommé « Marquis » ont été jugés « non conformes en raison de la présence, à des taux variables, de trois substances actives interdites dans l'Union européenne », a expliqué le ministère dans une note. [...]

Accès au document

7 years later, 2 engineers face discipline for actions that led to Mt. Polley mine disaster

CBC 11/08/21

[…] Toxic contents from a tailings pond flow down Hazeltine Creek into Polley and Quesnel Lakes near the town of Likely, B.C., on Aug. 5, 2014. Two engineers have been cited for unprofessional conduct in the course of their work at the mine.

Seven years after Canada's largest tailings spill, the two engineers who were involved have been found in breach of their professional codes of conduct. [...]

Mount Polley mine records filed with Environment Canada reported that hundreds of tonnes of arsenic and lead, as well as other heavy metals including copper and nickel, flowed out in the sludge. [...] The owner and operator of this mine, Mount Polley Mining Corporation, a subsidiary of Imperial Metals, has faced no penalties for the spill. [...]

Accès au document

Healthcare & Pharmaceuticals Bayer loses third appeals case over glyphosate weedkiller

Reuters, Aug 10

Bayer (BAYGn.DE) lost a third appeal against U.S. court verdicts that awarded damages to customers blaming their cancers on use of its glyphosate-based weedkillers, leaving the German drugs and pesticides group to pin hopes for legal relief on the U.S. Supreme Court.

A California appeals court late on Monday upheld an $86 million verdict that found Bayer responsible for a couple's cancer after using Bayer's glyphosate-based Roundup against weeds. [...]

https://doi.org/10.15454/64rs-v051

Accès au document

Pesticides, le Conseil d'État veut des textes plus stricts pour la protection des riverains

Campagne et environnement 28/7/21

Le Conseil d'État a rendu, le 27 juillet, son verdict sur les textes encadrant la pulvérisation de pesticides près des habitations. Il préconise une augmentation des zones de non-traitement pour les pesticides suspectés cancérogènes, mutagènes ou reprotoxiques, demande à ce que les mesures protègent aussi les professionnels travaillant à proximité des parcelles, et exige un cadre plus strict pour les concertations locales. Le gouvernement a six mois pour réagir. [...]

Accès au document

Impact of Estrogens Present in Environment on Health and Welfare of Animals

MDPI 20/07/21

Estrogens are a group of steroid hormones that recently have gained even more attention in the eyes of scientists. There is an ongoing discussion in the scientific community about their relevance as environmental contaminants and the danger they pose to animal health and welfare. In available literature we can find many examples of their negative effects and mechanisms that are involved with such phenomena. [...] *Animals* **2021**, *11*(7), 2152; https://doi.org/10.3390/ani11072152

Accès au document

Plastic accumulation in food may be underestimated

PHYS.org 26/07/21

A new study has found plastic accumulation in foods may be underestimated. There is also concern these microplastics will carry potentially harmful bacteria such as E. coli, which are commonly found in coastal waters, up the food chain.

Researchers from the University of Portsmouth tested a theory that microplastics covered in a biofilm coating (much like natural algae) were more likely to be ingested by oysters than microplastics that were completely clean. Although the experiment was carried out on oysters under laboratory conditions, scientists believe similar results could be found in other edible marine species that also filter seawater for food. [...]

Accès au document

Pesticides dans l'air : lancement d'un dispositif de surveillance permanent

AirParif 23/07/21

Avec la fédération Atmo France, les autres Associations Agréées de Surveillance de la Qualité de l'Air (AASQA) et l'INERIS en tant que membre du Laboratoire Central de Surveillance de la Qualité de l'Air (LCSQA), Airparif participe au lancement d'un suivi pérenne des pesticides dans l'air au niveau national. Concrètement, dès 2021, 72 molécules fongicides, herbicides ou insecticides vont à présent être suivies dans l'air ambiant sur une station de mesure en Île-de-France de façon pérenne, tels que : [...]

Accès au document

https://doi.org/10.15454/64rs-v051

Pesticides et sécurité des riverains : l'État doit renforcer les règles

Actu-environnement 27/07/21

Le Conseil d'État ordonne à l'État que les règles d'utilisation des pesticides à proximité des habitations soient complétées pour mieux protéger la population. Il donne six mois au Gouvernement pour renforcer ces règles.

Dans une décision rendue le 26 juillet, le Conseil d'État a annulé partiellement les dispositions du décret (Art.1 pour manquement d'information préalable des riverains et de l'arrêté du 27 décembre 2019 (art. 8 de l'arrêté pour non prévoyance de distances de sécurité suffisantes pour les produits classés comme suspectés d'être cancérigènes, mutagènes ou toxiques pour la reproduction (CMR 2), sur les zones de non-traitement (ZNT) des pesticides autour des habitations. [...]

Accès au document

Méditerranée : des points de vigilance persistent sur certains polluants

Actu-environnement 16/07/21

L'Institut français de recherche pour l'exploitation de la mer (Ifremer) fait le bilan de 20 ans de surveillance de la façade française méditerranéenne : des données sur plus de 68 contaminants chimiques comme les hydrocarbures, les microplastiques ou les métaux lourds. Résultat, pour 90 % des points de prélèvements, le taux de polluants est inférieur au seuil réglementaire.

Il reste néanmoins des points de vigilance : anciennes pollutions contenues dans les sédiments à proximité des anciens sites industriels ou pollutions plus actuelles préoccupantes, les molécules médicamenteuses. [...]

Accès au document

Réautorisation du glyphosate en Europe : la qualité des études réglementaires en cause

Le Monde 2/07/21

La grande majorité des 53 études qui ont fondé l'opinion des autorités européennes sur la génotoxicité du pesticide ne remplissent pas les critères de conformité attendus, estiment deux toxicologues de renommée internationale.

Les deux auteurs de cette évaluation, Siegfried Knasmueller et Armen Nersesyan, sont chercheurs à l'Institut de recherche sur le cancer du Centre hospitalo-universitaire de Vienne (Autriche) et spécialistes internationalement reconnus de toxicologie génétique. [...]

Accès au document

Towards sustainable agriculture - study identifies biodiversity-friendly alternatives to conventional wheat crop management, Germany

EC Europa

As intensive agriculture is associated with large-scale impacts on biodiversity, ecosystem services, food security and human health, it is important to shift to more sustainable, yet highly productive, farming practices. A study now assesses such practices in wheat, evaluating agricultural-management strategies at the field and landscape scales. The findings suggest that biodiversity-enhancing practices can support natural pest predation without use of agrochemicals — and that controlling pests and weeds by agrochemical

means is less relevant than expected for final crop productivity.

Source: Redlich, S., Martin, E. A., and Steffan-Dewenter, I. (2020) Sustainable landscape, soil and crop management practices enhance biodiversity and yield in conventional cereal systems. Journal of Applied Ecology, 58 (3): 507-517

Accès au document