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Bulletin de veille du réseau d'écotoxicologie terrestre et aquatique

ECOTOX N°49, Février 2021

Réalisé par l'équipe de veille sur la période du 1er janvier au 28 février 2021.
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Edito

Voici notre 49ème bulletin de veille, toujours riche en informations ! Nous poursuivons avec ce bulletin une rubrique concernant les plastiques dans l'environnement. Par ailleurs, nous vous signalons une veille sur ce même sujet initiée par l'Ineris. Nous allons observer l'évolution de ce dispositif pour juger de la pertinence du maintien de notre veille sur cette thématique.

Nous vous rappelons la Special Issue ECOTOXINRAE20 sans la revue Environmental Science and Pollution Research. Il est encore temps de nous contacter (celanim-ecotox@inrae.fr) si vous souhaitez soumettre un article, la date limite est fixée au 31 mars 2021.

Nous vous proposons dans ce bulletin la tribune : le dispositif de veille ECOTOX : point d'étape et perspectives, qui présente les résultats de l'enquête à laquelle vous avez répondu l'an dernier. Nous avons intégré certaines de vos remarques dès ce numéro, avec la volonté de concerver le caractère informatif tout en réduisant la longueur du bulletin. Nous proposons pour cela un nouveau format de référence.
Le texte est également disponible sous forme de fiche thématique en téléchargement sur notre site ECOTOX :
https://www6.inrae.fr/ecotox/Productions/Fiches-thematiques/Fiche-thematique-N-31-fevrier-2021

N'oubliez pas de nous transmettre les informations que vous souhaitez diffuser, notamment vos publications que nous pourrions avoir oubliées.

L'équipe vous souhaite une bonne lecture de ce bulletin !

Contact : veille-ecotox@inrae.fr

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Tribune libre

Le dispositif de veille ECOTOX : point d'étape et perspectives

Le dispositif de veille ECOTOX a été lancé en 2012 à l'initiative du Réseau des Ecotoxicologues de l'INRA, devenu aujourd'hui ECOTOX, le réseau d'écotoxicologie terrestre et aquatique. L'objectif de ce dispositif était de capitaliser plusieurs types d'information (scientifique, réglementaire, sociétale…) en lien avec l'écotoxicologie, et de produire des documents de synthèse diffusables aux membres du réseau, puis à un public élargi. Le bulletin est également adressé à différents services INRAE, de l'Anses et de l'Efsa.

La veille ECOTOX est centrée sur l'évaluation du risque environnemental et sur la contribution de l'écotoxicologie à cette évaluation. Une attention particulière est portée au devenir et aux effets des produits phytopharmaceutiques sur le vivant, sans pour autant exclure les autres risques de contamination chimique des écosystèmes.

La veille ECOTOX s'inscrit également dans une approche globale et un suivi des débats, des textes règlementaires et des faits de société liés à la perception de ce risque, et aux conséquences de l'usage des produits chimiques et de leur dissémination dans l'environnement. Par son approche transversale, elle vient en appui du réseau ECOTOX dans sa réflexion et ses questionnements scientifiques.

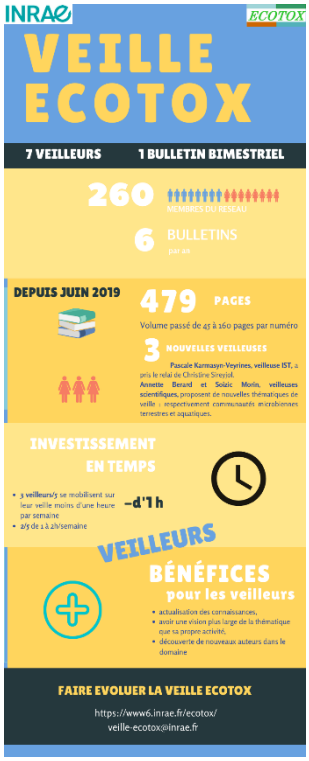
Nous vous incitons à consulter la page dédiée à la veille sur le site du réseau https://www6.inrae.fr/ecotox/Veille pour de plus amples informations, et redécouvrir nos bulletins.

Les résultats de notre enquête 2020 auprès des lecteurs

Après 7 années d'existence de la veille et l'édition de 42 bulletins, nous avons lancé début 2020 une enquête pour connaitre le ressenti des lecteurs vis-à-vis du bulletin, et identifier des pistes d'évolution.

Nancy Nicolas, étudiante du Master 2 Veille Stratégique et Organisation des Connaissances a géré cette enquête pour le compte de la DipSO INRAE. Un questionnaire a été élaboré et adressé aux abonnés de la liste de diffusion du bulletin, et notamment du réseau ECOTOX.

Dans leur majorité (74%), les lecteurs ayant répondu à notre enquête sont des chercheurs ou enseignants-chercheurs INRAE ou hors INRAE (Ifremer, IRD, OFB…). D'autres collègues se sont également déclarés intéressés par le bulletin, de même que des doctorants, des collègues du secteur privé, de fondations scientifiques, groupement d'intérêt scientifique…



Les attentes des lecteurs

Les attentes des lecteurs du bulletin concernent majoritairement la découverte de sujets, thématiques scientifiques en marge de leurs sujets de recherche, mais aussi de participer et suivre l'activité du réseau. Les lecteurs apprécient également de pouvoir accéder à des aspects non scientifiques, comme les évolutions règlementaires et normatives, mais également les débats et publications des médias sur des sujets liés à l'écotoxicologie.

Le bulletin permet d'avoir une vision globale de l'actualité scientifique et médiatique liée à l'écotoxicologie, de compléter les suivis bibliographiques personnels et représente un gain de temps et une garantie de la fiabilité des sources.

Toutefois, certains regrettent de devoir survoler le bulletin par manque de temps : problème de la profusion de courriels, et trop grande quantité d'information délivrée par le bulletin.

Les rubriques et leur intérêt

Selon les bulletins et les informations disponibles, une quinzaine de rubriques sont offertes aux lecteurs.

Les rubriques les plus appréciées concernent les publications des membres du réseau, la revue de presse écotoxicologie, les aspects règlementaires, le droit et la politique de l'environnement, les avis, expertises et normes.

L'intérêt des lecteurs pour les thématiques scientifiques dépend bien évidemment de leurs thèmes de recherches : pesticides et microbiologie ainsi que pesticides et faune sauvage sont très appréciés.

A noter également un intérêt certain pour des thématiques plus récentes ou plus spécialisées : pesticides et climat, écotoxicologie spatiale et du paysage, pesticides et santé des agriculteurs, méthodes alternatives et biopesticides, communautés microbiennes aquatiques….

D'une façon générale, 75% des répondants considèrent les informations du bulletin utiles à très utiles pour leurs activités scientifiques.

Les pistes d'évolution

Concernant le contenu, les principales remarques sont synthétisées ci-dessous, complétées par quelques éléments rapides de réponse :

-La veille est fortement axée « pesticides ». Comme rappelé en introduction, c'est un choix éditorial au lancement du projet, mais d'autres contaminants sont également pris en compte (émergents, plastiques, métaux, perturbateurs endocriniens…). Les articles les concernant pourraient être plus développés, notamment en lien avec la biogéochimie.

-Les aspects règlementaires (à l'international…) concernant la mise sur le marché des composés, leur interdiction, les lignes directrices OCDE…) ou méthodologiques (génotoxicité, AOP...) mériteraient d'être renforcés. Nous proposons, sans être exhaustifs, quelques informations sur ces sujets.

-Les questions d'exposition des opérateurs et des riverains aux pesticides, le lien avec la santé, les controverses figurent également parmi les attentes des lecteurs. Cette thématique nous parait importante et nous souhaitons la renforcer par la mobilisation d'un nouveau veilleur.

-Il est également souligné un manque éventuel concernant l'évaluation biologique de la qualité des milieux, la surveillance de l'exposition et les effets non intentionnels (via des observatoires nationaux), la dégradation de la biodiversité, la relation avec les services écosystémiques. A ce niveau, un lien pourrait être fait avec les matériels, dispositifs expérimentaux, infrastructures de recherche…

-Certains lecteurs aimeraient que les aspects de bioremédiation, de remédiation (passive/active) des sols contaminés; des fonctions écologiques soient plus développés. Ici aussi, nous proposons régulièrement quelques informations.

-Des rubriques recherche/partenariat et relations science/société, éthique scientifique seraient aussi appréciées.

-Enfin, nous avons aussi décidé, en raison de la périodicité du bulletin, de ne plus diffuser d'offres d'emploi ni d'informations sur les colloques, qui sont vite périmées. Le site ECOTOX pourrait être un relai pour cela.

Concernant la forme, il est conseillé de mieux regrouper les articles (notamment actualités, presse…) par thème et non par acteurs, et de diminuer la longueur du bulletin, souvent jugé trop dense ! La périodicité bimestrielle est très majoritairement satisfaisante. Si la longueur des articles semble convenir, comme leur présentation, la longueur (croissante !) des bulletins reste un point important de vigilance.

En conclusion

Les retours à notre enquête confirment le grand intérêt des lecteurs pour le bulletin de veille Ecotox et les rubriques déjà proposées et l'équipe de veille les en remercie.

L'équipe a une réflexion permanente concernant le contenu et la forme du bulletin, et souhaite toujours le développer pour répondre aux besoins/attentes des lecteurs. Toutefois l'ajout, comme le renforcement de nouvelles rubriques passent par plusieurs points importants :

-La prise en compte des différentes URL, organismes à surveiller, qui nous ont été remontés, pour compléter les moteurs de recherche,

-La réduction de la longueur du bulletin. Nous allons notamment retravailler le format des références bibliographiques. Différents modèles sont déjà testés et seront adoptés en 2021. Mais nous ne pouvons pas non plus garantir l'exhaustivité de l'ensemble des sujets traités, et pour certaines rubriques, une sélection d'informations restera proposée.

-Mais surtout, la prise en compte de nouvelles rubriques passe par la mobilisation de nouveaux veilleurs qui seraient de même de les prendre en charge. Cette répartition est aussi le moyen d'optimiser le temps que chacun peut consacrer à cette activité de veille. Les volontaires peuvent contacter l'équipe : veille-ecotox@inrae.fr et un accompagnement leur sera proposé par la DipSO.

Contacts

L'enquête a été réalisée pat Nancy Nicolas, DipSO.
L'équipe de veille est actuellement composée de Colette Bertrand et Christian Mougin (UMR 1402 EcoSys), Annette Berard et Céline Pélosi (UMR 1114 EMMAH), Soizic Morin (UR 1454 EABX), Olivier Crouzet (UPFS – OFB) et Pascale Karmasyn-Veyrines (DipSO).

Pour en savoir plus

https://www6.inrae.fr/ecotox/Veille

ERA / PUBLICATIONS SCIENTIFIQUES / Communautés Microbiennes Aquatiques

Do water quality, land use, or benthic diatoms drive macroinvertebrate functional feeding groups in a subtropical mountain stream?

Authors: Wang XZ, Zhang YY, Tan X, Zheng Y, Zhang QF

Source: INLAND WATERS Early Access, 2020, DOI:10.1080/20442041.2020.1816111

Abstract: The aim of our study was to quantify the contributions of abiotic factors (water quality and land use at different scales) and biotic factors (important primary producers, such as epilithic diatoms) to the variation of functional feeding groups (FFGs) of macroinvertebrates in the Jinshui River, upper Han River Basin, China, a subtropical mountain river. We found that water quality, especially the fluoride ion (F-), metals (chromium and cadmium), and chemical oxygen demand, significantly correlated with FFGs, and that the benthic diatom community, especially Ceratoneis arcus var. linearis f. recta and Denticula tenuis, explained a high proportion of the variation in FFGs...

Microalgal Cd resistance and its exertions on pigments, biomass and lipid profiles

Authors: Nanda M, Chand B, Bisht T, Kumar V, Vlaskin MS

Source: BIOREMEDIATION JOURNAL Early Access, 2020, DOI:10.1080/10889868.2020.1867049

Abstract: This study highlights freshwater oleaginous microalgae as efficient vectors for development of eco-friendly environmental solutions. An effective hybrid approach has been presented here for cadmium tolerance complementing with enhanced lipid productivity in four freshwater oleaginous microalgae viz., *Chlorella singularis*, *Chlorella sorokiniana*, *Chlorella minutissima* and *Scenedesmus abundans* that can be utilized for bioremediation as well as biofuel generation. The biomass and lipid accumulation was not inhibited by Cd, instead it increased under the influence of lower concentrations of cadmium. However, very high concentrations of Cd (300 mg/L) inhibited both biomass and lipid yield...

A simple and rapid algal assay kit to assess toxicity of heavy metal contaminated water

Authors: Eom H, Park M, Jang A, Kim S, Oh SE

Source: ENVIRONMENTAL POLLUTION 269:116135, 2021, DOI:10.1016/j.envpol.2020.116135

Abstract: This study presents a novel algal-based toxicity test suitable for simple and rapid assessment of heavy metal (Hg2+, Cr6+, Cd2+, Pb2+, or As3+)-contaminated water. A closed-system kit-type algal assay was developed using Chlorella vulgaris. A strong correlation between oxygen concentrations in the headspace of the assay kits and chlorophyll a production indicates that oxygen evolution in the gaseous phase is able to represent algal photosynthetic activity and serve as the end-point in algal toxicity tests...

Distribution of antibiotics in water, sediments and biofilm in an urban river (Cordoba, Argentina, LA)

Authors: Valdes ME, Santos LHMLM, Castro MCR, Giorgi A et al.

Source: ENVIRONMENTAL POLLUTION 269:116133, 2021, DOI: 10.1016/j.envpol.2020.116133

Abstract: In this study, we evaluated the distribution of up to forty-three antibiotics and 4 metabolites residues in different environmental compartments of an urban river receiving both diffuse and point sources of pollution.

Downstream the WWTP there was an association of antibiotics levels in biofilms with ash-free dry weight, opposite to chlorophyll-a (indicative of heterotrophic communities)...

A review on control of harmful algal blooms by plant-derived allelochemicals

Authors: Zhu XQ, Dao GH, Tao Y, Zhan XM, Hu HY

Source: JOURNAL OF HAZARDOUS MATERIALS 401:123403, 2021, DOI: 10.1016/j.jhazmat.2020.123403

Abstract: This paper demonstrated the development of allelochemicals with algicidal effects, including the development history of allelopathy, the application methods, the reported allelopathic plants and their derived allelochemicals. Allelopathy is a promising strategy to control Harmful algal blooms (HABs) as the effectiveness of allelochemicals on inhibiting microalgae cells has been discovered and confirmed for many years...

Metal(loid) accumulation levels in submerged macrophytes and epiphytic biofilms and correlations with metal(loid) levels in the surrounding water and sediments

Authors: Fan MM, Xia PH, Chen WS, Wang TY et al.

Source: SCIENCE OF THE TOTAL ENVIRONMENT 758:143878, 2021, DOI: 10.1016/j.scitotenv.2020.143878

Abstract: Surface water, sediments, submerged macrophytes (*Potamogeton lucens* L. and *Myriophyllum verticillatum* L.) and their epiphytic biofilms were collected to analyze the levels of Pb, Cd, Cu, Cr, Hg and As in Caohai wetland (China). MExcept for Hg and Cr, most of the metal(loid) concentrations in epiphytic biofilms were higher than those in submerged macrophytes...

A scientometric analysis of ecotoxicological studies with the herbicide atrazine and microalgae and cyanobacteria as test organisms

Authors: Castro MS, Barbosa FG, Guimaraes PS, Martins CDG, Zanette J

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH Early Access, 2021, DOI: 10.1007/s11356-020-12213-w

Abstract: A scientometric study was conducted to analyze the evolution of research on ATZ. The study also looked at the use of microalgae and cyanobacteria as biological models for toxicity tests during the period from 1959 to 2019, in the category of toxicology of Web of Science. The results show an increase in the number of scientific publications mainly in the USA, Canada, and China...

Transcriptomics reveals the action mechanisms and cellular targets of citrate-coated silver nanoparticles in a ubiquitous aquatic fungus

Authors: Barros D, Pradhan A, Pascoal C, Cassio F

Source: ENVIRONMENTAL POLLUTION 268:115913, 2021, DOI: 10.1016/j.envpol.2020.115913

Abstract: We employed transcriptomics to better understand silver nanoparticles (AgNP) toxicity and disentangle the role of Ag ions (Ag+) in the overall toxicity towards aquatic fungi. To that end, the worldwide-distributed aquatic fungus Articulospora tetracladia, that plays a central role in organic matter turnover in freshwaters, was selected and exposed for 3 days to citrate-coated AgNPs (similar to 20 nm) and Ag+ at concentrations inhibiting 20% of growth (EC20)...

Aquatic Toxicity of Photocatalyst Nanoparticles to Green Microalgae *Chlorella vulgaris*

Authors: Adochite C, Andronic L

Source: WATER 13:77, 2021, DOI: 10.3390/w13010077

Abstract: In this review, several aspects are reviewed: the *Chlorella vulgaris* culture monitoring and growth parameters, the effect of different nanoparticles on *Chlorella vulgaris*, the toxicity of photocatalyst nanoparticles, and the mechanism of photocatalyst during oxidative stress on the photosynthetic mechanism of *Chlorella vulgaris*.

Assessment of cytotoxicity biomarkers on the microalga *Chlamydomonas reinhardtii* exposed to emerging and priority pollutants

Authors: Miguez L, Esperanza M, Seoane M, Cid A

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 208:111646, 2021, DOI:10.1016/j.ecoenv.2020.111646

Abstract: Cultures of the freshwater microalga Chlamydomonas reinhardtii were exposed for 24 h to four chemicals, three emerging pollutants (benzophenone-3, bisphenol A and oxytetracycline) and one priority substance (atrazine). Some toxicity responses showed a similar pattern; a decrease in growth rate, vitality and photosynthetic efficiency and an increase in autofluorescence and in the number of cells with depolarised cytoplasmic membrane and were found for all chemicals tested...

Does diclofenac act like a photosynthetic herbicide on green algae? *Chlamydomonas reinhardtii* synchronous culture -based study with atrazine as reference

Authors: Majewska M, arshkova D, Pokora W, Bascik-Remisiewicz A et al.

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 208:111630, 2021, DOI: 10.1016/j.ecoenv.2020.111630

Abstract: Synchronized *Chlamydomonas reinhardtii* cultures (strain CC-1690, wild type) were exposed to diclofenac sodium salt (135 mg/L) or atrazine (77.6 µg/L). The two toxicants differently influenced C. reinhardtii cells. Both substances decreased photosynthetic "vitality" (PI performance index) of the cells, albeit for different reasons...

Bioconcentration of glyphosate in wetland biofilms

Authors: Beecraft L, Rooney R

Source: SCIENCE OF THE TOTAL ENVIRONMENT 756:143993, 2021, DOI: 10.1016/j.scitotenv.2020.143993

Abstract: Wetland biofilms were exposed to the herbicide glyphosate via in situ field exposures and controlled microcosm experiments to measure bioconcentration and metabolism of glyphosate by biofilm organisms. Concentrations of glyphosate in biofilms were two to four orders of magnitude higher than the surrounding water, bioconcentration factors averaged 835 and 199 L.kg-1 in field and lab-exposed biofilms, respectively.

Toxicity of Herbicide Mixtures to Tropical Freshwater Microalgae Using a Multispecies Test

Authors: Stone S, Adams MS, Stauber JL, Jolley DF, Warne MS

Source: ENVIRONMENTAL TOXICOLOGY AND CHEMISTRY Early Access, 2020, DOI: 10.1002/etc.4932

Abstract: A novel multispecies toxicity test was used to assess the toxicity of diuron and hexazinone, 2 herbicides commonly detected within the Great Barrier Reef catchment area, to a community of 3 tropical freshwater microalgae: *Monoraphidium arcuatum*, *Nannochloropsis*-like sp., and *Pediastrum duplex*. Diuron was the most toxic herbicide. Toxicity testing on 2 commercial formulations (Barrage, 13.2% hexazinone and 48.6% diuron; Diurex, 90% diuron) showed that additives in the commercial formulations did not significantly increase the toxicity of diuron...

Accumulation and cellular toxicity of engineered metallic nanoparticle in freshwater microalgae: Current status and future challenges

Authors: Mahana A, Guliy OI, Mehta SK

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 208:111662, 2021, DOI: 10.1016/j.ecoenv.2020.111662

Abstract: In this review, the current status of our understanding of mechanisms of uptake and toxicity of MNPs and metal ions released from MNPs after dissolution in the surrounding environment were discussed. Also, the trophic transfer of MNPs in aquatic food webs was analyzed. Approximately all metallic nanoparticles cause toxicity in algae…

Effects of sulfonamide antibiotics on aquatic microbial community composition and functions

Authors: Paumelle M, Donnadieu F, Joly M, Besse-Hoggan P, Artigas J

Source: ENVIRONMENT INTERNATIONAL 146:106198, DOI: 10.1016/j.envint.2020.106198

Abstract: Using a stream microcosm approach, the respective impact of two sulfonamide antibiotics (sulfamethoxazole and sulfamethazine) on the ability of microbial heterotrophs to decompose alder leaves was investigated in the presence or absence of periphyton. Results showed that the presence of periphyton enriched water with oxygen and labile dissolved organic carbon forms...

Effect of algicidal compound N omega-acetylhistamine on physiological response and algal toxins in *Heterosigma akashiwo*

Authors: Zhu QY, Wu BY, Zhao L

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 208:111423, 2021, DOI: 10.1016/j.ecoenv.2020.111423

Abstract: The toxic alga *Heterosigma akashiwo* (Raphidophyceae) is known to form harmful algal blooms (HABs), which can have serious negative effects on the aquatic ecosystem and human life. Previous study has shown that N omega acetylhistamine (N-AcH), an algicidal compound secreted by algicidal bacteria *Bacillus* sp. Strain B1, can inhibit the growth of H. akashiwo. In this study, the algicidal mechanism of N-AcH against H. akashiwo was explored, and the changes of toxicity of H. akashiwo treated with N-AcH were investigated.

Characterizing lentic habitats in golf courses and adjacent green spaces: water quality, water chemistry, pesticide concentrations, and algal concentrations

Authors: Piacente JN, Milanovich JR, Berg MB, Hoellein TJ, et al.

Source: JOURNAL OF FRESHWATER ECOLOGY 35, 2020, DOI: 10.1080/02705060.2020.1853622

Abstract: Lentic ecosystems in urban green spaces, such as parks, golf courses or forest preserves, could provide important habitat for organisms within the urban matrix. However, there is a lack of data comparing lentic habitats across these land-use types. We quantified the area of golf courses and forest preserve habitats in the Chicago Metropolitan Region. We measured

pesticide concentrations, water chemistry, physicochemical parameters and algal composition in lentic habitats of golf courses and forest preserves...

Combined Toxicity of TiO2 Nanospherical Particles and TiO2 Nanotubes to Two Microalgae with Different Morphology

Authors: Wang Z, Jin SG, Zhang F, Wang DG

Source: NANOMATERIALS 10:2559, 2020, DOI: 10.3390/nano10122559

Abstract: The joint activity of multiple engineered nanoparticles (ENPs) has attracted much attention in recent years. The mixture toxicity of multiple ENPs with different dimensions is much less understood. Herein, we investigated the toxicity of the binary mixture of TiO2 nanospherical particles (NPs) and TiO2 nanotubes (NTs) to two freshwater algae with different morphology, namely, *Scenedesmus obliquus* and *Chlorella pyrenoidosa*.

How marine diatoms cope with metal challenge: Insights from the morphotype-dependent metal tolerance in *Phaeodactylum tricornutum*

Authors: Ma J, Zhou BB, Chen FY, Pan K

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 208:111715, 2021, DOI: 10.1016/j.ecoenv.2020.111715

Abstract: Metal tolerance in marine diatoms vary between morphotypes, strains, and species due to their long-term adaptations to stochastic environments. The mechanisms underlying this highly variable trait remain a matter of interest in ecotoxicology. In this study, we used several cutting-edge techniques, including a non-invasive micro test technique, atomic force microscopy, and X-ray photoelectron spectroscopy to examine cadmium (Cd) accumulation and tolerance in the three morphotypes of *Phaeodactylum tricornutum*...

Glyphosate Accelerates the Proliferation of *Microcystis aeruginosa*, a Dominant Species in Cyanobacterial Blooms

Authors: Wang WJ, Jiang M, Sheng YQ

Source: ENVIRONMENTAL TOXICOLOGY AND CHEMISTRY Early Access, 2021, DOI: 10.1002/etc.4942Q

Abstract: Glyphosate is a commonly used herbicide known for its high performance in killing certain plants and grasses; however, its use is regulated due to its harmful effects on the aquatic environment. The present study investigated and compared the toxic mechanisms of glyphosate on *Microcystis aeruginosa* (a toxin-producing cyanobacterium)...

Response of microbial community to the lysis of Phaeocystis globosa induced by a biological algicide, prodigiosin

Authors: Zhang HJ, Xie WJ, Hou FR, Hu J, et al.

Source: ENVIRONMENTAL POLLUTION 265:115047, 2020, DOI: 10.1016/j.envpol.2020.115047

Abstract: Terminating harmful algal blooms by using algicidal agents is a strong disturbance event in marine environment, which has powerful structural influences on microbial ecosystems. Here, we conducted *Phaeocystis globosa* microcosms to investigate the dynamics, assembly processes, and co-occurrence patterns of microbial communities in response to algicidal process induced by a highly efficient algicidal agent, prodigiosin, by using 16S rRNA gene amplicon sequencing...

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Toxicity Going Nano: Ionic Versus Engineered Cu Nanoparticles Impacts on the Physiological Fitness of the Model Diatom *Phaeodactylum tricornutum*

Authors: Franzitta M, Feijao E, Cabrita MT, Gameiro C et al.

Source: FRONTIERS IN MARINE SCIENCE 7:539827, 2020, DOI: 10.3389/fmars.2020.539827

Abstract: Increasing input of Metal Engineered Nano Particles (MeENPs) in marine ecosystems has raised concerns about their potential toxicity on phytoplankton. Given the lack of knowledge on MeENPs impact on these important primary producers, the effects of Copper Oxide (CuO) ENPs on growth, physiology, pigment profiles, fatty acid (FA) metabolism, and oxidative stress were investigated in the model diatom *Pheodactylum tricomutum*, to provide suitable biomarkers of CuO ENP exposure versus its ionic counterpart...

Characterisation of bacterial communities from an active mining site and assessment of its potential metal solubilising activity

Authors: Lopes AR, Madureira D, Diaz A, Santos S et al.

Source: JOURNAL OF ENVIRONMENTAL CHEMICAL ENGINEERING 8:104495, 2020, DOI: 10.1016/j.jece.2020.104495

Abstract: The present work is the first report characterising bacterial communities recovered from sulphide ore from a Portuguese active mine (Neves-Corvo) and collecting samples from three independent processing stages (feed/tailings/paste), at three sampling periods over 15 months. The recovered bacterial communities demonstrated low richness and heterogeneity (intra/inter-samples)...

Dissipation of pyridaphenthion by cyanobacteria: Insights into cellular degradation, detoxification and metabolic regulation

Authors: Hamed SM, Hozzein N, Selim S, Mohamed HS, AbdElgawad H

Source: JOURNAL OF HAZARDOUS MATERIALS 402:123787, 2021, DOI: 10.1016/j.jhazmat.2020.123787

Abstract: To understand pyridaphenthion (PY) toxicity, detoxification and degradation in cyanobacteria, we performed a comparative study in the two diazotrophic cyanobacteria; *Anabaena laxa* and *Nostoc muscorum*. Compared to *A. laxa*, *N. muscorum* efficiently showed high PY accumulation and degradation to a safe environmentally product; 6-hydroxy-2-phenylpyridazin-3(2 H)-one. PY inhibited cell growth, reduced Chl a content and photosynthesis related enzymes (PEPC and RuBisCo) activities in both species, and induced oxidative damage.

Testing the response of benthic diatom assemblages to common riverine contaminants

Authors: Vidal T, Santos M, Santos JI, Luis AT et al.

Source: SCIENCE OF THE TOTAL ENVIRONMENT 755:142534, 2021, DOI: 10.1016/j.scitotenv.2020.142534

Abstract: This work aimed to assess whether benthic diatom assemblages are responsive to different riverine contaminants through a previously developed rapid toxicity test, supporting future attempts towards its standardization and integration in both prospective and retrospective Environmental Risk Assessment (ERA) schemes. Two benthic diatoms assemblages likely responding similarly to

pollution (similar IPS diatom index score), were exposed for 48 h to five model contaminants (glyphosate, imidacloprid, SDS, CuSO4, and Pb)…

Biodegradation of hydrophobic pesticides by microalgae: Transformation products and impact on algae biochemical methane potential

Authors: Avila R, Peris A, Eljarrat E, Vicent T, Blanquez P

Source: SCIENCE OF THE TOTAL ENVIRONMENT 754:142114, 2021, DOI: 10.1016/j.scitotenv.2020.142114

Abstract: In this work, three hydrophobic pesticide active compounds, namely, chlorpyrifos, cypermethrin, and oxadiazon, were selected to study the potential for their removal from aqueous media by a microalgae consortium. After 7 days, total degradation (biodegradation plus photodegradation) contributed to the removal of 55% of oxadiazon, 35% of chlorpyrifos, and 14% of cypermethrin. Furthermore, more than 60% of chlorpyrifos and cypermethrin were removed by sorption onto microalgae biomass. Overall, the three pesticides showed high removal from the liquid phase. Anaerobic digestion was not inhibited by the pesticides as verified by methane production yields…

Metabolomics for early detection of stress in freshwater alga *Poterioochromonas malhamensis* exposed to silver nanoparticles

Authors: Liu W, Majumdar S, Li WW, Keller AA, Slaveykova VI

Source: SCIENTIFIC REPORTS 10:20563, 2020, DOI: 10.1038/s41598-020-77521-0

Abstract: We combine targeted metabolomics, biouptake and physiological response studies to elucidate metabolic perturbations in alga *Poterioochromonas malhamensis* induced by silver nanoparticles (AgNPs) and dissolved Ag. We show time-dependent perturbation of the metabolism of amino acids, nucleotides, fatty acids, tricarboxylic acids, photosynthesis and photorespiration by both Ag-treatments. The results suggest that dissolved Ag ions released by AgNPs are the major toxicity driver; however, AgNPs internalized in food vacuoles contributed to the perturbation of amino acid metabolism, TCA cycle and oxidative stress. The metabolic perturbations corroborate the observed physiological responses ...

Studies on Toxicity and Bioaccumulation of Cu2+ in Alga *Scenedesmus obliquus* and Its Effect on Life Table Demography of the Rotifer *Brachionus calyciflorus*

Authors: Xu XP, Yang XF, Wei XY, Xi YL, Wang XM

Source: POLISH JOURNAL OF ENVIRONMENTAL STUDIES 30:893-901, 2021, DOI: 10.15244/pjoes/123605

Abstract: We investigated the changes in algal cell density, photosynthetic pigments, superoxide dismutase (SOD) activity, and Cu2+ bioaccumulation after exposing *Scenedesmus obliquus* to 3.75, 7.5, 15, 30, and 60 μg/L Cu2+ for 72 h. We also studied the effects of Cu2+-exposed algae on the life table demographic parameters *of Brachionus calyciflorus* after 48 and 96 h of feeding. The results found that, when compared with the control, 3.75 μg/L Cu2+ significantly increased algal cell density after 48 h, while 60 μg/L Cu2+ significantly reduced algal cell density after 24 h. The rotifer population produced adaptive responses to Cu2+-exposed algae stress after 96 h of feeding, unlike after 48 h…

Structural Diversity in Early-Stage Biofilm Formation on Microplastics Depends on Environmental Medium and Polymer Properties

Authors: Ramsperger AFRM, Stellwag AC, Caspari A, Fery A et al.

Source: WATER 12:3216, 2020, DOI: 10.3390/w12113216

Abstract: We explored the early-stage biofilm formation on polyamide (PA), polyethylene terephthalate (PET), and polyvinyl chloride (PVC) after incubation in freshwater and artificial seawater and categorized the structural diversity on images obtained via scanning electron microscopy. Furthermore, by the measurement of the initial zeta-potential of the plastic materials, we found that PA with the highest negative zeta-potential tended to have the highest structural diversity, followed by PET and PVC after incubation in freshwater...

Toxicity of the herbicides diuron, propazine, tebuthiuron, and haloxyfop to the diatom *Chaetoceros muelleri*

Authors: Thomas MC, Flores F, Kaserzon S, Reeks TA, Negri AP

Source: SCIENTIFIC REPORTS 10:19592, 2020, DOI: 10.1038/s41598-020-76363-0

Abstract: To improve our understanding of the risks posed by some of these alternative herbicides on marine species under tropical conditions, we tested the effects of four herbicides on the widely distributed diatom Chaetoceros muelleri. The PSII herbicides diuron, propazine, and tebuthiuron induced substantial reductions in both 24 h effective quantum yields (Delta F/F-m ') and 3-day specific growth rates (SGR)...

Arsenic speciation and biotransformation pathways in the aquatic ecosystem: The significance of algae

Authors: Hussain MM, Wang JX, Bibi I, Shahid M et al.

Source: JOURNAL OF HAZARDOUS MATERIALS 403:124027, 2021, DOI: 10.1016/j.jhazmat.2020.124027

Abstract: The overarching attribute of this review is to briefly elaborate various As sources and its distribution in water bodies and factors affecting As biogeochemical behavior in aqueous ecosystems. This review elucidates the intriguing role of algae in biotransformation/volatilization of As in water bodies under environmentally-relevant conditions. Also, we critically delineate As sorption, uptake, oxidation and reduction pathways of As by algae and their possible role in bioremediation of As-contaminated water (e.g., drinking water, wastewater) ...

Resistance to degradation and effect of the herbicide glyphosate on the bacterioplankton community of a large river system dominated by agricultural activities

Authors: Piccini C, Fazi S, Perez G, Batani G et al.

Source: MARINE AND FRESHWATER RESEARCH 71:1026-1032, 2020, DOI: 10.1071/MF19079

Abstract: The aim of this study was to determine the effect of glyphosate on the community structure of riverine bacterioplankton and to evaluate the potential of bacterioplankton to degrade the herbicide. River water to which C-13-labelled glyphosate (10, 100 µg L-1) was added or not (control) was incubated for 6 days at the temperature measured in situ (20 degrees C). Significant differences in bacterioplankton community composition, as assessed by microfluidics-based automated ribosomal intergenic spacer analysis, were found among treatments, with differences in the presence of 100 µg L-1 of glyphosate being more pronounced, namely significant decreases in bacterial richness and diversity…

The effect of microplastics pollution in microalgal biomass production: A biochemical study

Authors: Cunha C, Lopes J, Paulo J, Faria M et al.

Source: WATER RESEARCH 186:116370, 2020, DOI: 10.1016/j.watres.2020.116370

Abstract: Here, the microalga *Phaeodactylum tricornutum* was exposed to water contaminated with 0.5 and 50 mg L-1 of polystyrene (PS) and/or polymethyl methacrylate (PMMA). Results show that the microalgal cultures exposed to lower concentrations of PS displayed a growth enhancement of up to 73% in the first stage (days 3-9) of the exponential growth phase. Surprisingly, and despite the fact that long-term exposure to MPs contamination did not impair microalgal growth, a steep decrease in biomass production (of up to 82%) was observed...

Effect of microplastics on ecosystem functioning: Microbial nitrogen removal mediated by benthic invertebrates

Authors: Huang YY, Li W, Gao J, Wang F et al.

Source: SCIENCE OF THE TOTAL ENVIRONMENT 754:142133, 2021, DOI: 10.1016/j.scitotenv.2020.142133

Abstract: We investigated the effect of microplastics on nitrogen removal in freshwater sediments where microorganisms and benthic invertebrates (i.e., chironomid larvae) co-existed. Using microcosm experiments, sediments with and without invertebrate chironomid larvae were exposed to microplastics (polyethylene) at concentrations of 0, 0.1, and 1 wt%. After 28 days of exposure, the addition of microplastics or chironomid larvae promoted the growth of denitrifying and anammox bacteria, leading to increased total nitrogen removal, in both cases...

Distinct microbial metabolic activities of biofilms colonizing microplastics in three freshwater ecosystems

Authors: Miao LZ, Yu Y, Adyel TM, Wang CQ et al.

Source: JOURNAL OF HAZARDOUS MATERIALS 403:123577, 2021, DOI: 10.1016/j.jhazmat.2020.123577

Abstract: Herein, we investigated the functional diversity of carbon metabolism in biofilms colonizing one inert (glass) and two microplastics as polyvinyl chloride (PVC) and polyethylene terephthalate (PET) substrates incubated for 44 days in situ in the Niushoushan River, the Qinhuai River, and Donghu Lake. 2D confocal laser scanning microscopy images visualized distinct micro-structures and biofilm compositions on three substrates...

ERA / PUBLICATIONS SCIENTIFIQUES / Ecotoxicologie Spatiale

Influence of different land use types on hydrochemistry and heavy metals in surface water in the lakeshore zone of the Caohai wetland, China

Authors: Hu J, Long Y, Zhou W, Zhu C, Yang Q, Zhou S & Wu P

Source: Environmental Pollution 267:115454, 2021, DOI: 10.1016/j.envpol.2020.115454

Abstract: To explore the distribution and transformation characteristics of water chemistry and heavy metals in different areas of a water body under the influence of different land uses, especially the interactions between water chemical factors and heavy metals in different areas of a water body, this study used Circos diagrams, originally used in biological genetic analysis, to visualize these interactions. The results showed that there are significant differences in the distribution of water chemical factors and heavy metals in different areas of the Caohai wetland…

Enrichment, sources and ecological risk mapping of heavy metals in agricultural soils of dhaka district employing SOM, PMF and GIS methods

Authors: Bhuiyan MAH, Karmaker SC, Bodrud-Doza M, Rakib MA, & Saha BB

Source: Chemosphere 263:128339, 2021, DOI: 10.1016/j.chemosphere.2020.128339

Abstract: Fifty-four soil samples from agricultural lands of Dhaka had been analyzed for assessing accumulation, spatial enrichment, ecological risk and sources apportionment of heavy metals using a combined approach of self-organizing map (SOM), positive matrix factorization (PMF), geographical information system (GIS), and enrichment factor (EF). The spatial projection of ecological risk values showed that the southern part of Dhaka (Keraniganj Upazila) is a high ecological risk in terms of heavy metal pollution. These risk maps in agricultural soils may play a vital role in reducing pollution sources…

Spatial distribution and eco-environmental risk assessment of heavy metals in surface sediments from a crater lake (Bosomtwe/Bosumtwi)

Authors: Amankwaa G, Yin X, Zhang L, Huang W, Cao Y, Ni X & Gyimah E

Source: Environmental Science and Pollution Research 1-14, 2020, DOI: 10.1007/s11356-020-12112-0

Abstract: Thirty samples of sediments were taken from Bosumtwi Lake in Ghana and analyzed for the contents of Fe, As, Hg, Co, Cr, Ni, Cd, and Pb. Several pollution indices (enrichment factor (EF), contamination factor (CF), geoaccumulation (Igeo), and pollution load index (PLI)) were used to determine sedimentary pollution levels, and the risk of environmental exposure was calculated using Hakanson's potential ecological risk (PER) indices…

Organochlorine pesticides (OCPs) in agricultural soils of Southern Nigeria: spatial distribution, source identification, ecotoxicological and human health risks assessment

Authors: Tesi JN, Tesi GO, Ossai JC & Agbozu IE

Source: Environmental Forensics 1-13, 2020, DOI: 10.1080/15275922.2020.1850570

Abstract: The spatial distribution, source identification, ecotoxicological, and human health risks of 20 organochlorine pesticides (OCPs) in agricultural soils in southern Nigeria were investigated in this study…

XDrift-An R package to simulate spatially explicit pesticide spray-drift exposure of non-target-species habitats at landscape scales

Authors: Bub S, Schad T & Gao Z

Source: SoftwareX 12:100610, 2020, DOI: 10.1016/j.softx.2020.100610

Abstract: *XDrift* is the R implementation of a data-driven model dealing with spray-drift exposure resulting from pesticide spray-applications. It employs the same data on spray-drift depositions as used in the regulatory risk assessment but conserves observed variability. Applied in a multi-scale modeling environment, *XDrift* projects measured drift deposition patterns into landscape scenarios…

No significant effects of insecticide use indicators and landscape variables on biocontrol in field margins

Authors: Bakker L, van der Werf W & Bianchi FJJA

Source: Agriculture, Ecosystems & Environment 308:107253, 2021, DOI: 10.1016/j.agee.2020.107253

Abstract: While there is substantial information on how insecticide use and semi-natural habitats influence biocontrol in crop fields, little is known about how local insecticide use interacts with landscape variables to govern natural biocontrol in field margins. In this 2-year study [...] we analysed egg predation and parasitism rates in field margins using three predictors for insecticide use: (i) farming system (organic or conventional), (ii) frequency of insecticide use in the adjacent focal fields, and (iii) estimated insecticide use quantity within a radius of 1 km from the sampling sites. Landscape variables were used as covariables to account for landscape effects…

ERA / PUBLICATIONS SCIENTIFIQUES / Microbiologie et Contaminants

Neonicotinoid Seed Treatments Have Significant Non-target Effects on Phyllosphere and Soil Bacterial Communities

Authors: Parizadeh M, Mimee B, Kembel SW

Source: FRONTIERS IN MICROBIOLOGY 11, 2021, DOI: 10.3389/fmicb.2020.619827

Abstract: The phyllosphere and soil are dynamic habitats for microbial communities.../... In sustainable agriculture, it is important to understand the composition of these bacterial communities, their changes in response to disturbances, and their resilience to agricultural practices…/... A few studies have demonstrated the long-term and non-target effects of neonicotinoids on agroecosystem microbiota, but the generality of these findings remains unclear...

Effects of sulfoxaflor on greenhouse vegetable soil N2O emissions and its microbial driving mechanism

Authors: Fang S, Nan H, Lv DQ and more...

Source: CHEMOSPHERE 267, 2021, DOI: 10.1016/j.chemosphere.2020.129248

Abstract: The wide application of pesticides ensures the safety of food production, but it also has a serious impact on soil ecosystem. Although sulfoxaflor as a pesticide has great potential for application due to its excellent insecticidal activity and low crossresistance, little is known about its soil environmental safety risks.../... Under 65% soil maximum water holding capacity, sulfoxaflor may broke the dynamic balance of N2O production and consumption in the denitrification process, which caused a significant increase in N2O emission...

Assessing the Effects of beta-Triketone Herbicides on the Soil Bacterial and hppd Communities: A Lab-to-Field Experiment

Authors: Thiour-Mauprivez C, Devers-Lamrani M, Bru D, and more...

Source: FRONTIERS IN MICROBIOLOGY 11, 2021, DOI: 10.3389/fmicb.2020.610298

Abstract: Maize cultivators often use beta-triketone herbicides to prevent the growth of weeds in their fields. These herbicides target the 4-HPPD enzyme of dicotyledons. This enzyme, encoded by the hppd gene, is widespread among all living organisms including soil bacteria, which are considered as "non-target organisms" by the legislation.../... In this study, we used more extensive approaches to assess with a lab-to-field

experiment the risk of beta-triketone on the abundance and the diversity of both total and hppd soil bacterial communities...

Ecotoxicological effects of copper oxide nanoparticles (nCuO) on the soil microbial community in a biosolids-amended soil

Authors: Samarajeewa AD, Velicogna JR, Schwertfeger DM. and more...

Source: SCIENCE OF THE TOTAL ENVIRONMENT 763, 2021, DOI: 10.1016/j.scitotenv.2020.143037

Abstract: This study represents a holistic approach in assessing the effects of copper oxide nanoparticles (nCuO) on microbial health and community structure in soil amended with municipal biosolids. The biosolids were amended with nCuO (<50 nm) and mixed into a sandy loam soil at measured Cu concentrations of 27, 54, 123, 265 and 627 mg Cu kg(-1) soil...

Soil microbial community structure and functionality changes in response to long-term metal and radionuclide pollution

Authors: Rogiers T, Claesen J, Van Gompel A and more...

Source: ENVIRONMENTAL MICROBIOLOGY 2021, DOI: 10.1111/1462-2920.15394

Abstract: Microbial communities are essential for a healthy soil ecosystem. Metals and radionuclides can exert a persistent pressure on the soil microbial community. However, little is known on the effect of long-term co-contamination of metals and radionuclides on the microbial community structure and functionality. We investigated the impact of historical discharges of the phosphate and nuclear industry on the microbial community in the Grote Nete river basin in Belgium...

Influence of heavy metals pollution on the formation of microbial community in gray forest soil

Authors: Malynovska IM, Kaminskyi VF, Tkachenko MA

Source: UKRAINIAN JOURNAL OF ECOLOGY 10(6):94-97, 2021, DOI: 10.15421/2020_264

Abstract: The state of microbial communities of gray forest soil contaminated with heavy metals at a dose of 5, 10, 100 MPC, in the presence and absence of vegetative corn biomass has been investigated in model experiments...

Shining new light into soil systems: Spectroscopy in microfluidic soil chips reveals microbial biogeochemistry

Authors: Pucetaite M, Ohlsson P, Persson P, Hammer E

Source: SOIL BIOLOGY & BIOCHEMISTRY 153, 2021, DOI: 10.1016/j.soilbio.2020.108078

Abstract: Microfluidic soil chips render optical access to the naturally opaque soil systems and enable direct investigation of microbial growth and interactions in micro-structurally and chemically controlled environments.../... They allow monitoring biogeochemical processes in and around soil microbial cells growing .../... Ultimately, we argue that microspectroscopy in microfluidic chips can lead to relevant breakthroughs in frontier research areas in soil science, such as (1) analysis of chemical responses of microbes to environmental triggers at micro-scale spatial resolution .../... (3) determining spatially and time resolved effects of heavy metals and organic pollutants, including microplastics...

Long-term effects of Cu(OH)(2) nanopesticide exposure on soil microbial communities

Authors: Peixoto S, Henriques I, Loureiro S

Source: ENVIRONMENTAL POLLUTION 269, 2021, DOI: 10.1016/j.envpol.2020.116113

Abstract: Copper-based (nano)pesticides in agroecosystems may result in unintended consequences on non-target soil microbial communities, due to their antimicrobial broad spectrum. We studied the impact of a commercial Cu(OH)(2)-nanopesticide, over 90 days, at single and season agricultural application doses, in the presence and absence of an edaphic organism (the isopod *Porcellionides pruinosus*), on microbial communities' function, structure and abundance....

Changes in microbial community structure due to chronic trace element concentrations in different sizes of soil aggregates

Authors: Song JW, Shen QL, Shi JC and more...

Source: ENVIRONMENTAL POLLUTION 268 B, 2021, DOI: 10.1016/j.envpol.2020.115933

Abstract: Studies on the effects of trace elements (TEs) (e.g. Cu, Cd, Zn) on soil microbial communities have provided useful information on the toxicity of TEs to microbes. However, previous studies mainly focused on the effects of TEs on microbial community structure in intact soil, while there are few studies on the impact of TEs on microbial community structure in soil aggregates...

Effect of Pesticides and Chemical Fertilizers on the Nitrogen Cycle and Functional Microbial Communities in Paddy Soils: Bangladesh Perspective

Authors: Rahman MM, Khanom A, Biswas SK

Source: BULLETIN OF ENVIRONMENTAL CONTAMINATION AND TOXICOLOGY, 2021, DOI: 10.1007/s00128-020-03092-5

Abstract: The concept of the Nitrogen (N) cycle has been modified over the years based on certain new pathways, including comammox, anammox, and DNRA (dissimilatory nitrate reduction to ammonium). Comammox, nitrification, anammox, denitrification, DNRA, and nitrogen fixation pathways play key roles in the N cycle in paddy soils. Pesticides and chemical fertilizers' effects on the N cycle in paddy soils together with the possible manifestation of these newly discovery pathways are the focus of this review...

High cadmium concentration resulted in low arbuscular mycorrhizal fungi community diversity associated to cocoa (*Theobroma cacao* L.)

Authors: Sandoval-Pineda JF, Perez-Moncada UA and more...

Source: ACTA BIOLOGICA COLOMBIANA 25(3):333-344, 2021, DOI: 10.15446/abc.v25n3.78746

Abstract: Arbuscular mycorrhizae fungi (AMF) are obligate symbionts present in rhizosphere of cocoa plants and their community diversity is modified depending on several factors, such as cadmium (Cd) presence in soil. AMF persistence on Cd natural enriched soils might be an indicator of their tolerance and their potential in biotechnological applications. In this research we characterized local AMF community structure present in cocoa rhizosphere soils with low (B-Cd: 0.1 mg kg (-1)) and high (A-Cd: 20.9 mg kg(-1)) natural Cd concentrations...

Microbial functional traits in phyllosphere are more sensitive to anthropogenic disturbance than in soil

Authors: Xiang Q, Chen QL, Zhu D and more...

Source: ENVIRONMENTAL POLLUTION 265 A, 2020, DOI: 10.1016/j.envpol.2020.114954

Abstract: Soil-plant microbiome plays a critical role in the regulation of terrestrial ecosystem function and service, including biogeochemical cycling and primary production.../... Taken together, we provide experimental evidence for the substantial impacts of anthropogenic disturbance on CNPS cycling genes in the soil-

plant system and necessitate future efforts to unravel the plant microbiome diversity and functionality under the pressure of global changes.

Post-fire redistribution of Cs-137 and algal communities in contaminated forest soils in Belarus

Authors: Dvornik A, Shamal N, Bachura Y and more...

Source: JOURNAL OF ENVIRONMENTAL RADIOACTIVITY 227, 2021, DOI: 10.1016/j.jenvrad.2020.106505

Abstract: This study was carried out in the forest area of the Gomel region of Belarus contaminated by Cs-137 following the Chernobyl accident of 1986. The aim of the study was to explore the effects of different types of wildfires on the biological availability of radionuclides and the distribution of algal communities in fire-affected soils...

Patterns in utilization of carbon sources in soil microbial communities contaminated with mine solid wastes from San Luis Potosi, Mexico

Authors: Martinez-Toledo A, Gonzalez-Mille DJ, Garcia-Arreola ME and more...

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 208, 2021, DOI: 10.1016/j.ecoenv.2020.111493

Abstract: In San Luis Potosi, Mexico, the exploitation of minerals has historically been carried out as an activity that has left in its path environmental liabilities, with high concentrations of heavy metals.../...The objective of this study is to show the biological alteration of soils due to the presence of heavy metals and metalloids like Cadmium (Cd), Copper (Cu), Lead (Pb) and Arsenic (As) and to find the relationship between contamination and risk indexes...

Long-term Impact of Gold and Platinum on Microbial Diversity in Australian Soils

Authors: Shar S, Reith F, Ball AS, Shahsavari E

Source: MICROBIAL ECOLOG, 2021, DOI: 10.1007/s00248-020-01663-x

Abstract: The effects of platinum (Pt) and gold (Au) and on the soil bacterial community was evaluated in four different Australian soil types (acidic Burn Grounds (BGR), organic matter-rich Fox Lane, high silt/metal Pinpinio (PPN), and alkali Minnipa (MNP) spiked with either Pt or Au at 1, 25, and 100 mg kg(-1) using a next-generation sequencing approach (amplicon-based, MiSeq)...

Thallium shifts the bacterial and fungal community structures in thallium mine waste rocks

Authors: Xiao EZ, Ning ZP, Sun WM and more...

Source: ENVIRONMENTAL POLLUTION 268 A, 2021, DOI: 10.1016/j.envpol.2020.115834

Abstract: Thallium (TI) is a highly toxic metalloid and is considered a priority pollutant by the US Environmental Protection Agency (EPA). Currently, few studies have investigated the distribution patterns of bacterial and fungal microbiomes in TI-impacted environments. In this study, we used high-throughput sequencing to assess the bacterial and fungal profiles along a gradient of TI contents in TI mine waste rocks in southwestern China...

Impact of an Engineered Copper-Titanium Dioxide Nanocomposite and Parent Substrates on the Bacteria Viability, Antioxidant Enzymes and Fatty Acid Profiling

Authors: Metryka O, Wasilkowski D, Nowak A and more...

Source: INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES 21:23, 2020, DOI: 10.3390/ijms21239089

Abstract: Due to the systematic increase in the production of nanomaterials (NMs) and their applications in many areas of life, issues associated with their toxicity are inevitable. In particular, the performance of heterogeneous NMs, such as nanocomposites (NCs), is unpredictable as they may inherit the properties of their individual components. Therefore, the purpose of this work was to assess the biological activity of newly synthesized Cu/TiO2-NC and the parent nanoparticle substrates Cu-NPs and TiO2-NPs on the bacterial viability, antioxidant potential and fatty acid composition of the reference *Escherichia coli* and *Bacillus subtilis* strains...

Soil rehabilitation shaped different patterns of bacterial and archaeal community in AMD-irrigated paddy soil

Authors: Wang H, Zeng YF, Guo CL and more...

Source: CHEMOSPHERE 263:128259, 2021, DOI: 10.1016/j.chemosphere.2020.128259

Abstract: Microorganisms are essential for soil rehabilitation and long-term sustainability of established plants. However, the recovery process of microorganisms in AMD-irrigated paddy soil is poorly understood at present. To verify this, we sampled AMD-irrigated paddy soils before at different rehabilitation stages by characterizing bacteria and archaea community from a chronosequence of AMD-irrigated rehabilitation to pre-disturbance levels from references sites...

Impact of anaerobically digested silver and copper oxide nanoparticles in biosolids on soil characteristics and bacterial community

Authors: Abdulsada Z, Kibbee R, Ormeci B and more...

Source: CHEMOSPHERE 263:128173, 2021, DOI: 10.1016/j.chemosphere.2020.128173

Abstract: This study investigated whether 2 and 30 mg AgNPs or CuONPs/g TS present in treated sludge (biosolids) may impact the soil health by monitoring the soil characteristics and soil bacterial community for 105 days after the application of biosolids...

Effects of liquid digestate on the valence state of vanadium in plant and soil and microbial community response

Authors: Aihemaiti A, Gao YC, Liu L and more...

Source: ENVIRONMENTAL POLLUTION 265 B, 2020, DOI: 10.1016/j.envpol.2020.114916

Abstract: Liquid digestate containing high levels of nutrients and humic and fatty acids can affect vanadium species and their plant uptake. To elucidate the effects of liquid digestate on the valence state of vanadium in soil and plant tissue, as well as its effects on the microbial community and soil properties, we grew green bristlegrass (Setaria viridis), a native plant capable of growing in vanadium mining areas, in vanadium-contaminated soils sampled from a mining area and treated it with 5% and 10% liquid digestate for 90 d, respectively...

Heavy metal induced stress on wheat: phytotoxicity and microbiological management

Authors: Rizvi A, Zaidi A, Ameen F and more...

Source: RSC ADVANCES 10(63):38379-38403, 2020, DOI: 10.1039/d0ra05610c

Abstract: Among many soil problems, heavy metal accumulation is one of the major agronomic challenges that has seriously threatened food safety.../... To mitigate the magnitude of metal induced changes, certain microorganisms have been identified, especially those belonging to the plant growth promoting rhizobacteria (PGPR) group endowed with the distinctive property of

https://doi.org/10.15454/TZR0-5997

heavy metal tolerance and exhibiting unique plant growth promoting potentials...

Nanohydroxyapatite combined with white rot fungus can effectively reduce cadmium activity and change the soil microbial population structure

Authors: Liu W, Feng Y, Wu X and more...

Source: FRESENIUS ENVIRONMENTAL BULLETIN 29(11): 9644-9653, 2020

Abstract: Bioaugmentation, an in situ remediation method for heavy metal-contaminated soil, guarantees agricultural production without reducing soil quality. This study evaluated the dynamics of cadmium in polluted soil using bioaugmentation...

Insights into the effects of heavy metal pressure driven by long-term treated wastewater irrigation on bacterial communities and nitrogen-transforming genes along vertical soil profiles

Authors: Xi BD, Yu H, Li YP and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 403, 2021, DOI: 10.1016/j.jhazmat.2020.123853

Abstract: Irrigation with treated wastewater (TWW) influences soil ecological function due to the accumulation of heavy metals (HMs) and nutrients in soils. However, the interaction between HMs and microbial processes in TWWirrigated soil has not been fully explored. We investigated the effect of HMs on bacterial communities and nitrogen-transforming (N-transforming) genes along vertical soil profiles irrigated with domestic TWW (DTWW) and industrial TWW (ITWW) for more than 30 years ../.. ITWW irrigation enhanced the denitrification capacity in topsoil; ammonia-oxidizing capacity in deeper soil was increased after long-term irrigation with DTWW and ITWW, suggesting a potential risk of nitrogen loss...

Microbial communities in rare earth mining soil after in-situ leaching mining

Authors: Liu JJ, Liu W, Zhang YB and more...

Source: SCIENCE OF THE TOTAL ENVIRONMENT 755(1):142521, 2021, DOI: 10.1016/j.scitotenv.2020.142521

Abstract: In-situ leaching technology is now widely used to exploit ion adsorption rare earth ore, which has caused serious environmental problems and deterioration of mining soil ecosystems. However, our knowledge about the influences of mining operation on the microbiota in these ecosystems is currently very limited. In this study, diversity and composition of prokaryote and ammonia-oxidizing microorganisms in rare earth mining soil after in-situ leaching practice were examined using quantitative Polymerase Chain Reaction (qPCR) and Illumina high-throughput sequencing. Results showed that in-situ leaching mining considerably impacted microbial communities of the mining soils .../...This study provides a comprehensive analysis of the prokaryotic communities and functional groups in rare earth mining soil after mining operation, as well as insight into the potential interactive mechanisms among soil microbes...

Indicator species and co-occurrence pattern of sediment bacterial community in relation to alkaline copper mine drainage contamination

Authors: Yuan QS, Wang PF, Wang C and more...

https://doi.org/10.15454/TZR0-5997

Source: ECOLOGICAL INDICATORS 120, 2021, DOI: 10.1016/j.ecolind.2020.106884

Abstract: Contamination of alkaline copper mine drainage (AlkCuMD) causes serious damages to riverine ecosystem. Sediment bacterial community, as the fundamental component of biogeochemical processes, has been applied as an effective ecological indicator for various pollutants, but little is known about its relation to AlkCuMD. In this study, the composition variation, indicator species, and co-occurrence pattern of sediment bacterial community were studied in the Jinsha River, a typical AlkCuMD polluted large river in southwestern China…

ERA / PUBLICATIONS SCIENTIFIQUES / Microbiologie et Contaminants / Antibiotiques et Antibiorésistances

Farm dust resistomes and bacterial microbiomes in European poultry and pig farms

Authors: Luiken REC, Van Gompel L, Bossers A and more...

Source: ENVIRONMENT INTERNATIONAL 143, 2020, DOI: 10.1016/j.envint.2020.105971

Abstract: ... We describe the resistome and bacterial microbiome of pig and poultry farm dust and their relation with animal feces resistomes and bacterial microbiomes, and on-farm antimicrobial usage (AMU). In addition, the relation between dust and farmers' stool resistomes was explored...

Microbial community composition and antimicrobial resistance in agricultural soils fertilized with livestock manure from conventional farming in Northern Italy

Authors: Laconi A, Mughini-Gras L, Tolosi R and more...

Source: SCIENCE OF THE TOTAL ENVIRONMENT 760, 2021, DOI: 10.1016/j.scitotenv.2020.143404

Abstract: Antimicrobials are commonly used in conventional livestock production and manure is widely applied to agricultural lands as fertilizer. This practice raises questions regarding the effects of fertilization on (i) soil microbiota composition and (ii) .../... This study showed that manure application has little effect on soil microbiome but may contribute to the dissemination of specific ARGs into the environment. Moreover, flumequine residues seem to enhance the emergence of oqxA and qnrS in soil…

Antibiotic contamination amplifies the impact of foreign antibiotic-resistant bacteria on soil bacterial community

Authors: Xu H, Chen ZY, Wu XY and more...

Source: SCIENCE OF THE TOTAL ENVIRONMENT 758, 2021, DOI: 10.1016/j.scitotenv.2020.143693

Abstract: Human activities are stimulating the presence of foreign antibiotic-resistance bacteria (ARB) in soils and antibiotic-contaminated soils are increasing continuously in the world. However, little is known about the impacts of foreign ARB on the indigenous bacterial community in antibiotic-contaminated soil. Herein, using a microcosm experiment we studied the soil bacterial community composition and function (presented with niche structure and niche breadth) in the response to a model ARB (multidrug-resistant Escherichia coli) amendment in the absence and presence of tetracycline contamination...

Adding a complex microbial agent twice to the composting of laying-hen manure promoted doxycycline degradation with a low risk on spreading tetracycline resistance genes

Authors: Liang JD, Jin YM, Wen X and more...

Source: ENVIRONMENTAL POLLUTION 265 A, 2020, DOI: 10.1016/j.envpol.2020.114202

Abstract: Poultry manure is a reservoir for antibiotics and antibiotic resistance genes and composting is an effective biological treatment for manure. This study explored the effect of using two methods of adding a complex microbial agent to the composting of laying-hen manure on doxycycline degradation and tetracycline resistance genes elimination...

Cadmium enhances conjugative plasmid transfer to a fresh water microbial community

Authors: Pu Q, Fan XT, Li H and more...

Source: ENVIRONMENTAL POLLUTION 268 B, 2021, DOI: 10.1016/j.envpol.2020.115903

Abstract: Co-selection of antibiotic resistance genes (ARGs) by heavy metals might facilitate the spread of ARGs in the environments. Cadmium contamination is ubiquitous, while, it remains unknown the extent to which cadmium (Cd2+) impact plasmid-mediated transfer of ARGs in aquatic bacterial communities. In the present study, we found that Cd2+ amendment at sub-inhibitory concentration significantly increased conjugation frequency of RP4 plasmid from Pseudomonas putida KT2442 to a fresh water microbial community by liquid mating method...

The microbial network property as a bio-indicator of antibiotic transmission in the environment

Authors: Gao Q, Gao SH, Bates C and more...

Source: SCIENCE OF THE TOTAL ENVIRONMENT 758, 2021, DOI: 10.1016/j.scitotenv.2020.143712

Abstract: Interspecies interaction is an essential mechanism for bacterial communities to develop antibiotic resistance via horizontal gene transfer. Nonetheless, how bacterial interactions vary along the environmental transmission of antibiotics and the underpinnings remain unclear. To address it, we explore potential microbial associations by analyzing bacterial networks generated from 16S rRNA gene sequences and functional networks containing a large number of antibiotic-resistance genes (ARGs)...

The Toxicity Exerted by the Antibiotic Sulfadiazine on the Growth of Soil Bacterial Communities May Increase over Time

Authors: Santas-Miguel, V, Rodriguez-Gonzalez, L, Nunez-Delgado A and more...

Source: INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH 17:23, 2020, DOI: 10.3390/ijerph17238773

Abstract: The toxicity exerted by the antibiotic sulfadiazine on the growth of soil bacterial communities was studied in two agricultural soils for a period of 100 days...

Application of Erythromycin and/or *Raoultella* sp. Strain MC3 Alters the Metabolic Activity of Soil Microbial Communities as Revealed by the Community Level Physiological Profiling Approach

Authors: Cycon M, Markowicz A, Wasik T and more...

Source: MICROORGANISMS 8:12, 2020, DOI: 10.3390/microorganisms8121860

Abstract: Erythromycin (EM), a macrolide antibiotic, by influencing the biodiversity of microorganisms, might change the catabolic activity of the entire soil microbial community. Hence, the goal of this study was to determine the metabolic biodiversity in soil treated with EM (1 and 10 mg/kg soil) using the community-level physiological profiling (CLPP) method during a 90-day experiment...

Let's Get Physical: Bacterial-Fungal Interactions and Their Consequences in Agriculture and Health

Authors: Steffan BN, Venkatesh N, Keller NP

Source: JOURNAL OF FUNGI 6:4, 2020, DOI: 10.3390/jof6040243

Abstract: Fungi serve as a biological scaffold for bacterial attachment. In some specialized interactions, the bacteria will invade the fungal host, which in turn provides protection and nutrients for the bacteria. Mechanisms of the physical interactions between fungi and bacteria have been studied in both clinical and agricultural settings, as discussed in this review. Fungi and bacteria that are a part of these dynamic interactions can have altered growth and development as well as changes in microbial fitness as it pertains to antibiotic resistance, nutrient acquisition, and microbial dispersal...

ERA / PUBLICATIONS SCIENTIFIQUES / Microbiologie et Contaminants / Biocontrôle

Control of Southern Root-knot Nematodes on Tomato and Regulation of Soil Bacterial Community by Biofumigation with *Zanthoxylum bungeanum* Seed

Authors: Wang XY, Shi WC, Wang JL and more...

Source: HORTICULTURAL PLANT JOURNAL 7(1):49-58, 2021, DOI: 10.1016/j.hpj.2020.12.005

Abstract: Biofumigation is an environmentally friendly strategy used to control nematodes and plant diseases. The volatile oil of Zanthoxylum bungeanum has high insecticidal and antibacterial activity. However, it is not known if the seed of *Z. bungeanum* is a suitable material for biofumigation to control southern root-knot nematodes (SRKN) on tomato, and how it may regulate the soil bacterial community structure...

Interaction and Effects of Bacteria Addition on Dichlorodiphenyltrichloroethane Biodegradation by Daedalea dickinsii

Authors: Rizqi HD, Purnomo AS, Kamei I

Source: CURRENT MICROBIOLOGY, 2021, DOI: 10.1007/s00284-020-02305-8

Abstract: The residue of organochlorine pesticides (OCPs) has been a major pollution problem in our environment. Dichlorodiphenyltrichloroethane (DDT) is one of the most common persistent OCPs that continue to pose a serious risk to human health and the environment. Some treatment methods have been developed to reduce and minimize the adverse impacts of the use of DDT, including biodegradation with brown-rot fungi (BRF). However, DDT degradation using BRF has still low degradation rate and needs a long incubation time. Therefore, the ability of BRF need to be enhanced to degrade DDT. Interaction and effect of bacteria addition on biodegradation of DDT by brown-rot fungus *Daedalea dickinsii* were investigated...

https://doi.org/10.15454/TZR0-5997

ERA / PUBLICATIONS SCIENTIFIQUES / Microbiologie et Contaminants / Bioremédiation

Influence of destructive bacteria and red clover (*Trifolium pratense* L.) on the pesticides degradation in the soil

Authors: Nazarova EA, Nazarov AV, Egorova DO, Ananina LN

Source: ENVIRONMENTAL GEOCHEMISTRY AND HEALTH 2021, DOI: 10.1007/s10653-021-00821-5

Abstract: ... Microbial degradation of organochlorine compounds is the most eco-friendly method of polluted soil recultivation. Effective degradation of lindane and DDT soil pollution under the influence of introduced destructive bacteria was shown in the laboratory conditions...

Herbicide bioremediation: from strains to bacterial communities

Authors: Pileggi M, Pileggi SAV, Sadowsk, MJ

Source: HELIYON 6:12, 2020, DOI: 10.1016/j.heliyon.2020.e05767

Abstract: There is high demand for herbicides based on the necessity to increase crop production to satisfy world-wide demands. Nevertheless, there are negative impacts of herbicide use.../... Some herbicides damage non-target microorganisms via directed interference with host metabolism and via oxidative stress mechanisms. For these reasons, it is necessary to identify sustainable, efficient methods to mitigate these environmental liabilities...

Quantitative and qualitative basement of microbial presence during phytoremediation of heavy metal polluted soil using *Chromolaena odorata*

Authors: Omoregie, GO, Ogofure, AG, Ikhajiagbe, B, Anoliefo, GO

Source: OVIDIUS UNIVERSITY ANNALS OF CHEMISTRY 31(2):145-151, 2020, DOI: 10.2478/auoc-2020-0023

Abstract: The presence and impact of bulk and rhizosphere microorganisms in contaminated soils can be huge, given that they have the ability to increase plants tolerance against abiotic stress, and also enhance plant growth, while supporting hastened remediation of disturbed soils. The present study quantitatively and qualitatively assessed presence of cultural fungi and bacteria during phytoremediation of heavy metal polluted soils using *Chromolaena odorata*...

Influence of arbuscular mycorrhizal fungi on glyphosate dissipation rate in okra cultivated sodic soil of Tamil Nadu

Authors: Brindhavani PM, Janaki P, Gomadhi G and more...

Source: JOURNAL OF ENVIRONMENTAL BIOLOGY 41(6):1542-1549, 2021, DOI: 10.22438/jeb/41/6/MRN-1351

Abstract: To elucidate the influence of non target Arbuscular Mycorrhizal (AM) fungi on glyphosate dissipation in okra cultivated sodic soil of Tamil Nadu.../... The higher rates of glyphosate showed enhanced persistence of glyphosate and its metabolite AMPA in soil, hence application of AM fungi 100 kg hail with lower glyphosate rate of 6 ml/L can be recommended for okra cultivated sodic soil with the safer waiting period of after 45 days harvest…

Isolation, Biochemical and Genomic Characterization of Glyphosate Tolerant Bacteria to Perform Microbe-Assisted Phytoremediation

Authors: Massot F, Gkorezis P, Van Hamme J and more...

Source: FRONTIERS IN MICROBIOLOGY 11, 2021, DOI: 10.3389/fmicb.2020.598507

Abstract: The large-scale use of the herbicide glyphosate leads to growing ecotoxicological and human health concerns. Microbe-assisted phytoremediation arises as a good option to remove, contain, or degrade glyphosate from soils and waterbodies, and thus avoid further spreading to non-target areas. To achieve this, availability of plant-colonizing, glyphosate-tolerant and -degrading strains is required and at the same time, it must be linked to plant-microorganism interaction studies focusing on a substantive ability to colonize the roots and degrade or transform the herbicide....

Integrated remediation approach for metal polluted soils using plants, nanomaterials and root-associated bacteria

Authors: Zand AD, Heir AV, Khodaei H

Source: JOURNAL OF DISPERSION SCIENCE AND TECHNOLOGY, 2021, DOI: 10.1080/01932691.2021.1878900

Abstract: Soil is a major sink for heavy metals released into the environment. The remediation of Pb-polluted soils brings a techno-economical challenge for researchers and decision makers. Phytoremediation enhanced by PGPR or nanomaterials, individually, have been studied to remove contaminants such as heavy metals from soil, but association of both PGPR and nanomaterials in phytoremediation of Pb contaminated soil has remained scant...

Heavy-metal resistance mechanisms developed by bacteria from Lerma-Chapala basin

Authors: Arroyo-Herrera I, Roman-Ponce B, Resendiz-Martinez AL and more...

Source: ARCHIVES OF MICROBIOLOGY 2021, DOI: 10.1007/s00203-020-02140-2

Abstract: Heavy-metal (HM) contamination is a huge environmental problem in many countries including Mexico. Currently, microorganisms with multiple heavy-metal resistance and/or plant-promoting characteristics have been widely used for bioremediation of HM-contaminated soils. The aim of the study was isolated bacteria with multiple heavy-metal resistance and to determinate the resistance mechanism developed by these organisms...

Arbuscular mycorrhizal fungi promote lead immobilization by increasing the polysaccharide content within pectin and inducing cell wall peroxidase activity

Authors: Zhang XY, Hu WT, Xie XA and more...

Source: CHEMOSPHERE 267, 2021, DOI: 10.1016/j.chemosphere.2020.128924

Abstract: The mechanism by which arbuscular mycorrhizal (AM) fungi immobilize lead (Pb) within the cell wall is unclear. Therefore, the aim of this study was to investigate the mechanism by which AM fungi immobilize Pb within the cell wall by measuring the Pb content in the cell wall, the polysaccharide and the uronic acid contents of different cell wall fractions, and the activity of cell wall peroxidase...

Arbuscular mycorrhizal fungi and biochar influence simazine decomposition and leaching

Authors: Cheng HG, Wang JY, Tu CL and more…

Source: GLOBAL CHANGE BIOLOGY BIOENERGY 2021, DOI: 10.1111/gcbb.12802

Abstract: The application of biochar to land has been promoted as a strategy for sequestering carbon in soils, for improving soil fertility and remediating soil pollution. However, the implications of biochar amendments on mycorrhizal associations and pesticide decomposition in agricultural soils are poorly understood...

Fungal endophytes: Futuristic tool in recent research area of phytoremediation

Authors: Nandy S, Das T, Tudu CK and more...

Source: SOUTH AFRICAN JOURNAL OF BOTANY 134:285-295, 2020, DOI: 10.1016/j.sajb.2020.02.015

Abstract: Endophytic fungi interact with their hosts via different mode of action, that includes many physiological and mechanical control mechanisms, which have attributed cumulatively to their better survival potential. Moreover, the interaction influences the overall productivity of the host organisms, their growth enhancement, and efficient carbon metabolism processes. In some cases, host-endophyte symbiotic co-evolution strategy is exploited against critical environmental conditions like heavy metal pollution, soil contamination through different phytoremediation processes...

The Improving Conditions for the Aerobic Bacteria Performing the Degradation of Obsolete Pesticides in Polluted Soils

Authors: Doolotkeldieva T, Bobusheva S, Konurbaeva M

Source: AIR SOIL AND WATER RESEARCH 14, 2021, DOI: 10.1177/1178622120982590

Abstract: Currently, in the territory of Kyrgyzstan, 50 storage facilities of obsolete pesticides exist; they store about 5000 tons of these hazardous chemicals. The storage conditions have become unusable for a long time. They pose a serious threat to the people living there, livestock, and the environment. The main purpose of this research was the use of selected bacteria with cytochrome P450 genes for the bioremediation of polluted soils around the burial sites in model soil experiments...

Blended municipal compost and biosolids materials for mine reclamation: Long-term field studies to explore metal mobility, soil fertility and microbial communities

Authors: Asemaninejad A, Langley S, Mackinnon T and more...

Source: SCIENCE OF THE TOTAL ENVIRONMENT 760, 2021, DOI: 10.1016/j.scitotenv.2020.143393

Abstract: Application of stable soil amendments is often the key to successful phytostabilization and rehabilitation of mine tailings, and microbial guilds are primary drivers of many geochemical processes promoted by these amendments. Field studies were set up at a tailings management area near Sudbury, Ontario to examine performance of

blends of lime stabilized municipal biosolids and compost at nine different rates over thick (1 m) municipal compost covers plantedwith agricultural crops...

Bacterial catabolism of s-triazine herbicides: biochemistry, evolution and application

Authors: Esquirol L, Peat TS, Sugrue E and more...

Source: Book Series: Advances in Microbial Physiology 76:129-186, 2021, DOI: 10.1016/bs.ampbs.2020.01.004

Abstract: ... In this review, we cover the discovery and characterization of bacterial strains, metabolic pathways and enzymes that catabolize the s-triazines. We also consider the evolution of these new enzymes and pathways and discuss the practical applications that have been considered for these bacteria and enzymes...

Nitrate-assisted biodegradation of polycyclic aromatic hydrocarbons (PAHs) in the water-level-fluctuation zone of the three Gorges Reservoir, China: Insights from in situ microbial interaction analyses and a microcosmic experiment

Authors: Han XK, Wang FW, Zhang D and more...

Source: ENVIRONMENTAL POLLUTION 268: B, 2021, DOI: 10.1016/j.envpol.2020.115693

Abstract: An increase in polycyclic aromatic hydrocarbon (PAH) pollution poses significant challenges to human and ecosystem health in the Three Gorges Reservoir (TGR) of the Yangtze River. Based on the combination of PAH analysis with qPCR and high-throughput sequencing of bacteria, 32 topsoil samples collected from 16 sites along the TGR were used to investigate the distribution and biodegradation pathways of PAHs in the water-level-fluctuation zone (WLFZ)...

A novel constructed carbonate-mineralized functional bacterial consortium for high-efficiency cadmium biomineralization

Authors: Yin TT, Lin H, Dong YB and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 401, 2021, DOI: 10.1016/j.jhazmat.2020.123269

Abstract: A stable, urease-producing consortium (UPC) was constructed for high-efficiency cadmium (Cd) ion mineralization via a short-term and efficient acclimation process (five acclimation transfers)...

Application of mixed bacteria-loaded biochar to enhance uranium and cadmium immobilization in a co-contaminated soil

Authors: Qi X, Gou JL, Chen XM and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 401, 2021, DOI: 10.1016/j.jhazmat.2020.123823

Abstract: This research explored the effect of biochar pyrolyzed from five different materials on U and Cd immobilization in soil. The results showed that all biochars improved the soil properties and microbial metabolic activities, and effectively immobilized U and Cd, especially corn stalk biochar. Subsequently, three strains Bacillus subtilis, Bacillus cereus, and Citrobacter sp. were mixed in a 3:3:2 proportion as a kind of mixed bacteria (MB9) that could adsorb U and Cd effectively...

Reducing cadmium bioavailability and accumulation in vegetable by an alkalizing bacterial strain

Authors: Zhang J, Wang X, Zhang LX and more...

Source: SCIENCE OF THE TOTAL ENVIRONMENT 758, 2021, DOI: 10.1016/j.scitotenv.2020.143596

Abstract: Cadmium (Cd) contamination in agricultural soils is a widespread environmental problem that can affect food safety and human health. Effective remediation methods are needed to reduce Cd bioavailability in soil and Cd accumulation in food crops. In the present study, we isolated a Cd-resistant and alkalizing bacterium strain XT4 froma Cd-contaminated soil and evaluated its potential application in Cd bioremediation...

Lab-scale evaluation of the microbial bioremediation of Cr(VI): contributions of biosorption, bioreduction, and biomineralization

Authors: Yan X, Liu XY, Zhang MJ and more...

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 2021, DOI: 10.1007/s11356-020-11852-3

Abstract: Bioremediation of Cr(VI) by microorganisms has attracted immense research interests. There are three different mechanisms for bioremediation of Cr(VI): biosorption, bioreduction, and biomineralization. Identifying the relative contributions of these different mechanisms to Cr(VI) bioremediation can provide valuable information to enhance the final result...

Effect of heavy metal-induced stress on two extremophilic microbial communities from Caviahue-Copahue, Argentina

Authors: Massello FL, Donati E

Source: ENVIRONMENTAL POLLUTION 268 B, 2021, DOI: 10.1016/j.envpol.2020.115709

Abstract: Metal pollution is a great concern worldwide and the development of new technologies for more sustainable extraction methods as well as for the remediation of polluted sites is essential. Extremophilic microorganisms are attractive for this purpose since they have poly-resistance mechanisms which make them versatile. In this work, we sampled an acidic river and a hot spring of Caviahue-Copahue volcanic environment. The indigenous microbial communities were exposed to five heavy metals (Cd, Co, Cu, Ni and Zn) in batch-cultures favouring different metabolisms of biotechnological interest....

Microbial Cd(II) and Cr(VI) resistance mechanisms and application in bioremediation

Authors: Xia X, Wu SJ, Zhou ZJ, Wang GJ

Source: JOURNAL OF HAZARDOUS MATERIALS 401, 2021, DOI: 10.1016/j.jhazmat.2020.143685

Abstract: The heavy metals cadmium (Cd) and chromium (Cr) are extensively used in industry and result in water and soil contamination.../...This review focuses on the highlighting of novel achievements on microbial Cd(II) and Cr(VI) resistance mechanisms and their bioremediation applications...

Combined ozonation and solarization for the removal of pesticides from soil: Effects on soil microbial communities

Authors: Diaz-Lopez M, Nicolas E, Lopez-Mondejar R and more...

Source: SCIENCE OF THE TOTAL ENVIRONMENT 758, 2021, DOI: 10.1016/j.scitotenv.2020.143950

Abstract: Pesticides have been used extensively in agriculture to control pests and soil-borne diseases. Most of these pesticides can persist in soil in harmful concentrations due to their intrinsic characteristics and their interactions with soil. Soil solarization has been demonstrated to enhance pesticide degradation under field conditions. Recently, ozonation has been suggested as a feasible method for reducing the pesticide load in agricultural fields. However, the effects of ozonation in the soil microbial community have not been studied so far. Here, we evaluate the combined effects of solarization and

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ozonation on the microbial community of a Mediterranean soil...

Rhizoremediation of Cu(II) ions from contaminated soil using plant growth promoting bacteria: an outlook on pyrolysis conditions on plant residues for methylene orange dye biosorption

Authors: Yaashikaa PR, Kumar PS, Varjani S, Saravanan A

Source: BIOENGINEERED 11(1):175-187, 2020, DOI: 10.1080/21655979.2020.1728034

Abstract: Rhizoremediation is one of the most accepted, cost-effective bioremediation techniques focusing on the application of rhizospheric microorganisms in combination with plants for the remediation of organic and inorganic pollutants from the contaminated sites. This work focuses on isolation and identification of metal resistant bacteria to grow on medium with the copper ion concentration of 1500 mg/L...

Immobilization of Cd Using Mixed Enterobacter and Comamonas Bacterial Reagents in Pot Experiments with *Brassica rapa* L.

Authors: Wang X, Hu K, Xu Q and more...

Source: ENVIRONMENTAL SCIENCE & TECHNOLOGY 54(24):15731-15741, 2020, DOI: 10.1021/acs.est.0c03114

Abstract : Enterobacter sp. A11 and *Comamonas* sp. A23 were isolated and identified. Coculturing these two strains with Cd(II) led to the production of biofilm, H2S, and succinic acid (SA), and Cd(II) was adsorbed by cells and formed CdS precipitates...

Interaction and Effects of Bacteria Addition on Dichlorodiphenyltrichloroethane Biodegradation by *Daedalea dickinsii*

Authors: Rizqi HD, Purnomo AS, Kamei I

Source: CURRENT MICROBIOLOGY, 2021, DOI: 10.1007/s00284-020-02305-8

Abstract: The residue of organochlorine pesticides (OCPs) has been a major pollution problem in our environment.../... Some treatment methods have been developed to reduce and minimize the adverse impacts of the use of DDT, including biodegradation with brown-rot fungi (BRF). However, DDT degradation using BRF has still low degradation rate and needs a long incubation time. Therefore, the ability of BRF need to be enhanced to degrade DDT. Interaction and effect of bacteria addition on biodegradation of DDT by brown-rot fungus *Daedalea dickinsii* were investigated...

Biosorption of iron ions through microalgae from wastewater and soil: Optimization and comparative study

Authors: Zada S, Lu HT, Khan S and more...

Source: CHEMOSPHERE 265, 2021, DOI: 10.1016/j.chemosphere.2020.129172

Abstract: Microalgae play a significant role in wastewater and soil-bioremediation due to their low-cost and ecofriendly nature. In this study, 21 strains of microalgae were evaluated during removal of iron Fe2+ from aqueous solutions. Out of 21 strains, five strains *(S. obliquus, C. fusca, C. saccharophila, A. braunn, and Leptolyngbya* JSC-1) were selected based on their comparative tolerance for the iron Fe2+. These strains were further studied for their Fe2+ removal efficiency...

Bioaugmentation of acetamiprid-contaminated soil with *Pigmentiphaga* sp.

strain D-2 and its effect on the soil microbial community

Authors: Yang HX, Zhang YL, Chuang SC and more...

Source: ECOTOXICOLOGY 2021, DOI: 10.1007/s10646-020-02336-8

Abstract: Bioaugmentation, a strategy based on microbiome engineering, has been proposed for bioremediation of pollutant-contaminated environments. However, the complex microbiome engineering processes for soil bioaugmentation, involving interactions among the exogenous inoculum, soil environment, and indigenous microbial microbiome, remain largely unknown...

Enrichment and characterization of an effective hexavalent chromium-reducing microbial community YEM001

Authors: Lyu YC, Yang T, Liu, HR and more...

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH 2021, DOI: 10.1007/s11356-020-11863-0

Abstract: Chromium (Cr) is one of the most widely used heavy metals in industrial processes, resulting in water and soil pollution that seriously threaten environmental safety. In this paper, we have directionally enriched a Cr(VI)-reducing bacterial community YEM001 from no-Cr(VI) polluted pond sedimental sludge by selectively growing it in Cr(VI)-containing media...

Advances in fungal-assisted phytoremediation of heavy metals: A review

Authors: Khalid M, Ur-Rahman S, Hassani D and more...

Source: PEDOSPHERE 31(3):475-495, 2021, DOI: 10.1016/S1002-0160(20)60091-1

Abstract: Trace metals such as manganese (Mn), copper (Cu), zinc (Zn), and iron (Fe) are essential for many biological processes in plant life cycles. However, in excess, they can be toxic and disrupt plant growth processes, which is economically undesirable for crop production. For this reason, processes such as homeostasis and transport control of these trace metals are of constant interest to scientists studying heavily contaminated habitats...

Bacterial Strains Isolated from Heavy Metals Contaminated Soil and Wastewater with Potential to Oxidize Arsenite

Authors: Sher S, Ghani A, Sultan S, Rehman A

Source: ENVIRONMENTAL PROCESSES-AN INTERNATIONAL JOURNAL 2021, DOI: 10.1007/s40710-020-00488-7

Abstract: The objective is to develop low cost wastewater treatment systems for the efficient removal of toxic heavy metal ions including arsenic (As). For this, two bacterial strains, one gram negative and other gram positive dubbed as IT6 and S12, were isolated from arsenic contaminated wastewater and soil samples from Sheikhupura, Pakistan. The bacterial isolates were checked for their ability to resist various metal ions and antibiotics and were identified on the basis of 16S rRNA ribotyping...

Remediation of vanadium contaminated soil by alfalfa (*Medicago sativa* L.) combined with vanadium-resistant bacterial strain

Authors: Gan CD, Chen T, Yang JY

Source: ENVIRONMENTAL TECHNOLOGY & INNOVATION 20, 2020, DOI: 10.1016/j.eti.2020.101090

Abstract: Vanadium (V) in soils exerts toxic effects on human health. To develop a plant-microorganism combined remediation strategy for V-contaminated soil, pot experiments were conducted with alfalfa (*Medicago sativa* L.) and V-

resistant bacterial strain Arthrobacter sp. 5k4-8-1 in different levels of V-contaminated soil...

Interactive effect of compost application and inoculation with the fungus *Claroideoglomus claroideum* in *Oenothera picensis* plants growing in mine tailings

Authors: Perez R, Tapia Y, Antilen M and more...

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 208, 2021, DOI: 10.1016/j.ecoenv.2020.111495

Abstract: Different techniques have been developed for the remediation of Cu contaminated soils, being the phytoremediation a sustainable and environmentally friendly strategy, but its use in mine tailings is scarce. Arbuscular mycorrhizal fungi (AMF) can decrease the Cu concentration in plants by favouring the stabilization of this metal through different mechanisms such as the production of glomalin, immobilization in the fungal wall of hyphae and spores, and the storage of Cu in vacuoles. Additionally, the use of organic amendments promotes the beneficial effects produced by AMF and improves plant growth...

Nanoscale zerovalent iron, carbon nanotubes and biochar facilitated the phytoremediation of cadmium contaminated sediments by changing cadmium fractions, sediments properties and bacterial community structure

Authors: Gong XM, Huang DL, Liu, YG and more...

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 208, 2021, DOI: 10.1016/j.ecoenv.2020.111510

Abstract: Environment functional materials have been widely used, but whether their effects on the contaminated environment could facilitate phytoremediation is not yet well understood. In this study, starch stabilized nanoscale zerovalent iron (SN), multiwall carbon nanotubes (MW) and tea waste derived biochar (TB) were used to facilitate the phytoremediation of cadmium (Cd) contaminated sediments by *Boehmeria nivea* (L.) Gaudich...

Pb phytostabilization by fast-growing trees inoculated with Pb-resistant plant growth-promoting endophytic bacterium

Authors: Yongpisanphop, J., Babel, S., Kruatrachue, M., Pokethitiyook, P.

Source: POLLUTION 6, 4: 923-934, 2020, DOI: 10.22059/poll.2020.299801.768

Abstract: Inoculation of endophytic bacteria has been accepted as a promising technique to assist phytostabilization of heavy metal-contaminated soils. This study investigated the effects of inoculating a bacterial strain closely related to Pseudomonas pyschrophila on the plant growth, and phytostabilization of fast-growing trees Acacia mangium and Eucalyptus camaldulensis, growing on artificial spiked soil with Pb up to 1500 mg/kg...

Rhizoremediation of Cu(II) ions from contaminated soil using plant growth promoting bacteria: an outlook on pyrolysis conditions on plant residues for methylene orange dye biosorption

Authors: Yaashikaa PR, Kumar PS, Varjani S, Saravanan A

Source: BIOENGINEERED 11(1):175-187, 2020, DOI: 10.1080/21655979.2020.1728034

Abstract: Rhizoremediation is one of the most accepted, cost-effective bioremediation

techniques focusing on the application of rhizospheric microorganisms in combination with plants for the remediation of organic and inorganic pollutants from the contaminated sites. This work focuses on isolation and identification of metal resistant bacteria to grow on medium with the copper ion concentration of 1500 mg/L...

Chlorpyrifos degradation by plant growth-promoting *Alcaligenes faecalis* bacteria isolated from oil-contaminated soil

Authors: Yadav, U, Kushwaha, S, Anand, V, and more...

Source: BIOREMEDIATION JOURNAL 2021, DOI: 10.1080/10889868.2020.1837066

Abstract: Chlorpyrifos (Chlp), one of the major organophosphates is extensively used in agriculture to control pests. With a half-life of 7-120 d, it may persist for up to one year in soil depending on the soil conditions and affect the soil microflora. Chlp degradation by soil microbes proves to be an effective and environment friendly method to remove it from the soil. This study aims to identify and characterize Chlp degrading soil microbes...

Biosorption of heavy metals by dry biomass of metal tolerant bacterial biosorbents: an efficient metal clean-up strategy

Authors: Rizvi A, Ahmed B, Zaidi A, Khan MS

Source: ENVIRONMENTAL MONITORING AND ASSESSMENT 192:12, 2020, DOI: 10.1007/s10661-020-08758-5

Abstract: Heavy metals discharge at an unrestrained rate from various industries into the environment pose serious human health problems. Considering this, the present study aimed at exploring the metal biosorbing potentials of bacterial strains recovered from polluted soils. The bacterial strains (CPSB1, BM2 and CAZ3) belonging to genera Pseudomonas, Bacillus and Azotobacter expressing multi-metal tolerance ability were identified to species level as *P. aeruginosa*, *B. subtilis* and *A. chroococcum*, respectively, by 16S rRNA partial gene sequence analysis...

Mitigation of Nickel Toxicity and Growth Promotion in Sesame through the Application of a Bacterial Endophyte and Zeolite in Nickel Contaminated Soil

Authors: Naveed M, Bukhari SS, Mustafa A and more...

Source: INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH 17:23, 2020, DOI: 10.3390/ijerph17238859

Abstract: Nickel (Ni) bioavailable fraction in the soil is of utmost importance because of its involvement in plant growth and environmental feedbacks. High concentrations of Ni in the soil environment, especially in the root zone, may retard plant growth that ultimately results in reduced plant biomass and yield. However, endophytic microorganisms have great potential to reduce the toxicity of Ni, especially when applied together with zeolite. The present research work was conducted to evaluate the potential effects of an endophytic bacterium Caulobacter sp. MN13 in combination with zeolite…

Draft Genome Sequence of *Stenotrophomonas* sp. Strain SbOxS2, an Antimony-Oxidizing Bacterium Isolated from Stibnite Mine Tailing Soil

Authors: Hamamura N, Nakajima N, Yamamura S

Source: MICROBIOLOGY RESOURCE ANNOUNCEMENTS 9:49, 2020, DOI: 10.1128/MRA.01219-20

Abstract: The antimony-oxidizing *Stenotrophomonas* sp. strain SbOxS2 was isolated from stibnite mine tailing soil. The draft genome sequence of strain SbOxS2 comprises 4.76 Mbp

with 4,211 predicted protein-coding sequences. This genome will provide useful information for characterizing the molecular mechanisms associated with heavy metal resistance within the genus Stenotrophomonas.

Cadmium level and soil type played a selective role in the endophytic bacterial community of hyperaccumulator Sedum alfredii Hance

AUthors: Qiong W, Pan FS, Xu XM and more...

Source: CHEMOSPHERE 263:127986, 2021, DOI: 10.1016/j.chemosphere.2020.127986

Abstract: Phytoremediation technology has been applied for heavy metal elimination for many years, however little research about the difference of remediation efficiency of hyperaccumulator in different soils was reported. Here, a pot experiment was conducted with a cadmium (Cd)/zinc hyperaccumulator Sedum alfredii Hance grown on different types of soils and the differences of its endophytic bacterial community were elucidated...

Inoculation of *Bacillus* spp. Modulate the soil bacterial communities and available nutrients in the rhizosphere of vetiver plant irrigated with acid mine drainage

Authors: Daraz U, Li Y, Sun QY and more...

Source: CHEMOSPHERE 263:128345, 2021, DOI: 10.1016/j.chemosphere.2020.128345

Abstract: Acid mine drainage (AMD) is one of an important pollution sources associated with mining activities and often inhibits plant growth. Plant growth promoting bacteria has received extensive attention for enhancing adaptability of plants growing in AMD polluted soils. The present study investigated the effect of plant growth promoting Bacillus spp. (strains UM5, UM10, UM13, UM15 and UM20) to improve vetiver (Chrysopogon zizanioides L.) adaptability in a soil irrigated with 50% AMD...

Distinction between Cr and other heavy-metal-resistant bacteria involved in C/N cycling in contaminated soils of copper producing sites

Authors: Zhang J, Shi Q, Fan SK and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 402:123454, 2021, DOI: 10.1016/j.jhazmat.2020.123454

Abstract: For typical copper producing provinces of Heilongjiang, Henan, Inner Mongolia, Jiangxi, Shandong, Tibet, and Yunnan in China, 90 % of sampling sites were heavily polluted with multiple heavy metals. Soil heterogeneity and mutual interference of multimetals are obstacles to explore bacterial resistance pathways in contaminated field soils. Through analyses of contamination indices and bioindicators, combined with multivariate statistical models, the antioxidant enzyme activity, urease-induced precipitation of heavy metals, excretion of extracellular polymeric substances (EPS) were attributed to different types of heavy metals...

In-depth study to decipher mechanisms underlying *Arabidopsis thaliana* tolerance to metal(loid) soil contamination in association with biochar and/or bacteria

Authors: Simiele M, Sferra G, Lebrun M and more...

Source: ENVIRONMENTAL AND EXPERIMENTAL BOTANY 182:104335, 2021, DOI: 10.1016/j.envexpbot.2020.104335

Abstract: Metal(loid)s are toxic to animal life, human health and plants; therefore, their removal from polluted areas is imperative in order to minimize their impact on the ecosystems. The use of plant-amendment-microorganism synergy is a promising option, but not yet fully explored, to manage lands contaminated with metal(loid)s.

However, molecular factors and mechanisms underlying this interaction are almost unknown...

Colonization and performance of a pyrene-degrading bacterium *Mycolicibacterium* sp. Pyr9 on root surfaces of white clover

AUthors: Yan, J, Gu YJ, Chen ZG and more...

Source: CHEMOSPHERE 263:127918, 2021, DOI: 10.1016/j.chemosphere.2020.127918

Abstract: Some rhizosphere bacteria could colonize on the root surface of plants, or even form biofilm to promote plant growth, enhance plant resistance to harsh external environments and block the soil contamination. In this study, to explore the effects of pyrene-degrading bacterium on root surface on plant uptake of pyrene, a pyrene-degrading bacterium *Mycolicibacterium* sp. Pyr9 was isolated from the root surface of *Eleusine indica* L. Gaertn...

Fungal Endophytes for Grass Based Bioremediation: An Endophytic Consortium Isolated from *Agrostis stolonifera* Stimulates the Growth of Festuca arundinacea in Lead Contaminated Soil

Authors: Soldi E, Casey C, Murphy BR, Hodkinson TR

Source: JOURNAL OF FUNGI 6:4, 2020, DOI: 10.3390/jof6040254

Abstract: Bioremediation is an ecologically-friendly approach for the restoration of heavy metal-contaminated sites and can exploit environmental microorganisms such as bacteria and fungi. These microorganisms are capable of removing and/or deactivating pollutants from contaminated substrates through biological and chemical reactions. Moreover, they interact with the natural flora, protecting and stimulating plant growth in these harsh conditions. In this study, we isolated a group of endophytic fungi from Agrostis stolonifera grasses growing on toxic waste from an abandoned lead mine (up to 47,990 Pb mg/kg) and identified them using DNA sequencing (nrITS barcoding)...

Identification of a novel strain of fungus *Kalmusia italica* from untouched marine soil and its heavy metal tolerance activity

Authors: Sumathi S, Priyanka V, Krishnapriya V, Suganya K

Source: BIOREMEDIATION JOURNAL 2020, DOI: 10.1080/10889868.2020.1853029

Abstract: Heavy metal pollution is one of the most important environmental problems. Heavy metal discharge to the atmosphere has increased currently because of industrial activity and technological growth and creates serious problems for the climate, soil, and water supplies. Many conventional techniques were used for heavy metals separation and treatment. Micro-organisms play a significant role in the bioremediation of polluted soil and waste products from heavy metals. The most common heavy metal tolerant microbes are fungi and yeast. Fungal isolates are potential microbes that are tolerant of heavy metals. The research aims to isolate and classify the fungal species collected from the soil...

Evaluation of Metal Tolerance of Fungal Strains Isolated from Contaminated Mining Soil of Nanjing, China

Authors: Liaquat F, Munis MFH, Haroon U and more...

Source: BIOLOGY-BASEL 9:12, 2020, DOI: 10.3390/biology9120469

Abstract: In this study, cadmium, chromium, and lead tolerant microbes have been isolated from contaminated mining soil and characterized. Molecular characterization of isolated fungi was

performed and amplified sequences were deposited in the GenBank NCBI database. Metal tolerance of the various strains has been determined...

Filamentous fungi with high paraquat-degrading activity isolated from contaminated agricultural soils in northern Thailand

Authors: Wongputtisin P, Supo C, Suwannarach N and more...

Source: LETTERS IN APPLIED MICROBIOLOGY 72(4):467-475, 2021, DOI: 10.1111/lam.13439

Abstract: The contamination of paraquat (1,1 '-dimethyl-4,4 '-bipyridylium dichloride) herbicide from the farming area has become a public concern in many countries. This herbicide harms to human health and negatively effects the soil fertility. Several methods have been introduced for the remediation of paraquat. In this study, 20 isolates of the paraquat-tolerant fungi were isolated from the contaminated soil samples in northern Thailand...

Fungus *Aspergillus niger* Processes Exogenous Zinc Nanoparticles into a Biogenic Oxalate Mineral

Authors: Sebesta M, Urik M, Bujdos M and more...

Source: JOURNAL OF FUNGI 6:4, 2020, DOI: 10.3390/jof6040210

Abstract: Zinc oxide nanoparticles (ZnO NPs) belong to the most widely used nanoparticles in both commercial products and industrial applications. Hence, they are frequently released into the environment. Soil fungi can affect the mobilization of zinc from ZnO NPs in soils, and thus they can heavily influence the mobility and bioavailability of zinc there...

Novel aroA of Glyphosate-Tolerant Bacterium *Pseudomonas* sp. Strain HA-09 Isolated from Roundup-Contaminated Garden Soils in Iran

Authors: Ghaderitabar H, Mousavi A, Salmanian AH, Hadi F

Source: IRANIAN JOURNAL OF BIOTECHNOLOGY 18(3):80-87, 2020, DOI: 10.30498/IJB.2020.204133.2597

Abstract: Glyphosate is a non-selective systemic herbicide with a broad spectrum of weed control that inhibits a key enzyme, 5-enolpyruvylshikimate-3-phosphate (EPSP) synthase, in the shikimate pathway. Isolation and analysis of the epsps (aroA) gene responsible for glyphosate-tolerance in bacteria from Roundup-contaminated soils was the aim of this study.../... The genus of bacterium was identified as Pseudomonas sp. strain HA-09. The isolated aroA(HA-09) gene from this bacterium was approximately 2.2 kb in size. Bioassay of E. coli expressing this gene showed high tolerance to glyphosate (up to 300 mM)...

Antagonic and plant growth-promoting effects of bacteria isolated from mine tailings at El Fraile, Mexico

Authors: Herrera-Quiterio A, Toledo-Hernandez E, Aguirre-Noyola JL, and more...

Source: REVISTA ARGENTINA DE MICROBIOLOGIA 52(3):231-239, 2020, DOI: 10.1016/j.ram.2019.08.003

Abstract: Mine tailings contain high concentrations of heavy metals such as As, Pb, Cu, Mn, and Fe, which are detrimental to the health of humans and the environment. In tailings at the El Fraile mine in Guerrero, Mexico, some plant species are apparently tolerant of heavy metals and can be found growing in the tailings. These plants could be associating with heavy metal-tolerant bacteria that promote plant growth and improve biomass production, and these bacteria could be a useful alternative for bacteria-assisted phytoremediation. The objective of this study was to isolate bacteria detected in the mine tailings at El Fraile-Taxco .../...The bacteria isolated from the rhizosphere exhibited the greatest

https://doi.org/10.15454/TZR0-5997

ability to fix nitrogen and produced indole acetic acid, gibberellins, siderophore, and lytic enzymes. In addition, the isolates collected from the soil samples demonstrated ability to solubilize phosphate.

Effective sequestration of chromium by bacterial biosorption: a review

Authors: John R, Rajan AP

Source: PREPARATIVE BIOCHEMISTRY & BIOTECHNOLOGY 2021, DOI: 10.1080/10826068.2020.1861010

Abstract: Bioremediation is an important function of microorganisms in relation to contaminated soils, wastewater and effluent. Microbes have always been demonstrated to be cost-efficient in the treatment of industrial effluents containing heavy metals like chromium(VI).../... This review is focused on the different biosorbent features appropriate in the removal of chromium; different types of bioreactors; and the evolution of research with an overview of bioabsorption.

Enhancement of dicarboximide fungicide degradation by two bacterial cocultures of *Providencia stuartii* JD and *Brevundimonas naejangsanensis* J3

Authors: Zhang C, Wu XM, Wu YY and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 403, 2021, DOI: 10.1016/j.jhazmat.2020.123888

Abstract: Bioremediation is commonly conducted by microbial consortia rather than individual species in natural environments. Biodegradation of dicarboximide fungicides in brunisolic soil were significantly enhanced by two bacterial cocultures of *Providencia stuartii* JD and *Brevundimonas naejangsanensis* J3…

A newly isolated bacterium *Comamonas* sp. XL8 alleviates the toxicity of cadmium exposure in rice seedlings by accumulating cadmium

Authors: Shi ZJ, Qi XL, Zeng XA and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 403, 2021, DOI: 10.1016/j.jhazmat.2020.123824

Abstract: Cadmium (Cd) is a typical heavy-metal highly accumulating in crops and drinking water, thus posing a severe health risk for human health. In this study, we firstly isolated 24 Cd-resistant bacteria from the heavy-metals contaminated soil at Daye Iron Ore, in which Comamonas sp. XL8 exhibited a high resistance and strong accumulation capacity to Cd.../... Our results reveal the biochemical process of Cd accumulation in Comamonas sp. XL8 by forming CdNPs, showing that it has great potential for effective bioremediation of environmental Cd exposure.

Dissipation of pyridaphenthion by cyanobacteria: Insights into cellular degradation, detoxification and metabolic regulation

Authors: Hamed SM, Hozzein N, Selim S and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 402, 2021, DOI: 10.1016/j.jhazmat.2020.123787

Abstract: Excessive use of organophosphorus pesticides such as pyridaphenthion (PY) to constrain insects induced crop loss, results in soil and water sources contamination. Cyanobacteria are sensitive biological indicators and promising tools for bioremediation of soil and water pollutants. To understand PY toxicity, detoxification and degradation in cyanobacteria, we performed a comparative study in the two diazotrophic cyanobacteria *Ana-baena laxa* and *Nostoc muscorum*.

Biochar applications combined with paddy-upland rotation cropping systems benefit the safe use of PAH-contaminated soils: From risk assessment to microbial ecology

Authors: Ni N, Li XN, Yao S and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 404, A, 2020, DOI: 10.1016/j.jhazmat.2020.124123

Abstract: This study aimed to establish a method allowing the safe use of polycyclic aromatic hydrocarbon (PAH)contaminated soils through the combination of biochar applications and different cropping systems. The impact of biochar applications under different cropping systems on the human health risks of PAHs and soil microbiology was elucidated. .../... Overall, the combination of PURC systems and low-temperature-pyrolyzed nutrient-rich biochar could efficiently reduce the human health risks of PAHs and improve soil microbial ecology in agricultural fields.

The imidacloprid remediation, soil fertility enhancement and microbial community change in soil by *Rhodopseudomonas capsulata* using effluent as carbon source

Authors: Wu P, Zhang XW, Niu T and more...

Source: ENVIRONMENTAL POLLUTION 267, 2020, DOI: 10.1016/j.envpol.2020.114254

Abstract: The effects of *Rhodopseudomonas capsulata* (*R. capsulata*) in the treated effluent of soybean processing wastewater (SPW) on the remediation of imidacloprid in soil, soil fertility, and the microbial community structure in soil were studied. Compared with the control group, with the addition of effluent containing *R. capsulata*, imidacloprid was effectively removed, soil fertility was enhanced, and the microbial community structure was improved…

Isolation of culturable mycota from Argentinean soils exposed or not-exposed to pesticides and determination of glyphosate tolerance of fungal species in media supplied with the herbicide

Authors: Aluffi ME, Soledad Carranza CS, Benito N and more...

Source: REVISTA ARGENTINA DE MICROBIOLOGIA 52(3):221-230, 2020, DOI: 10.1016/j.ram.2019.11.003

Abstract: The current agricultural system has led to the development of glyphosate (GP)-resistant weeds, causing an increase in GP doses and applications. Native mycota of pesticide-contaminated sites are the major source of pesticide-degrading microorganisms. The aims of the present study were to isolate the GP-tolerant culturable mycota in two soils with different pesticide exposure from Cordoba, Argentina, and to evaluate the growth parameters in native fungal isolates in the presence of GP and the effective dose that caused 50% growth reduction.../... This study provides valuable data for further studies that would allow to know the metabolic capacity of these fungal species that can be potential candidates for GP removal from contaminated environments.

Biosorption of heavy metal arsenic from Industrial Sewage of Davangere District, Karnataka, India, using indigenous fungal isolates

Authors: Tanvi DA, Pratam KM, Lohit RT and more...

Source: SN APPLIED SCIENCES 2:11, 2020, DOI: 10.1007/s42452-020-03622-0

Abstract: Contamination of soil and water bodies with heavy metals like arsenic (As) is of major concern, since arsenic is non-biodegradable, toxic and causes ill effects to gastrointestinal system, skin, liver, kidney or neurological functions. ../.. In this context, biosorption with indigenous

microbiota has gained more interest in recent years as it is cost-effective, eco-friendly approach and with no adverse effects. In the present study, arsenic (As III)-resistant strains of fungi were isolated from soil samples collected from various locations of industrial sewage disposal sites of Davangere District, India, and screened. Among five fungal isolates, *Aspergillus* spp APR-1 and APR-2 showed greater resistance to arsenic in the laboratory conditions.../... Industrial scale application perhaps is taken up using selected fungal strains and mitigates the arsenic pollution in urban sewage…

Resistance to degradation and effect of the herbicide glyphosate on the bacterioplankton community of a large river system dominated by agricultural activities

Authors: Piccini C, Fazi S, Perez G and more...

Source: MARINE AND FRESHWATER RESEARCH 71(8):1026-1032, 2020, DOI: 10.1071/MF19079

Abstract: Glyphosate-based herbicides are widely used for several crops, such as transgenic soybean and forestry. The aim of this study was to determine the effect of glyphosate on the community structure of riverine bacterioplankton and to evaluate the potential of bacterioplankton to degrade the herbicide. River water to which C-13-labelled glyphosate (10, 100 mu g L-1) was added or not (control) was incubated for 6 days at the temperature measured in situ (20 degrees C)…

Novel aroA of Glyphosate-Tolerant Bacterium *Pseudomonas* sp. Strain HA-09 Isolated from Roundup-Contaminated Garden Soils in Iran

Authors: Ghaderitabar H, Mousavi A, Salmanian AH, Hadi F

Source: IRANIAN JOURNAL OF BIOTECHNOLOGY 18(3):80-87, 2020, DOI: 10.30498/IJB.2020.204133.2597

Abstract: Isolation and analysis of the epsps (aroA) gene responsible for glyphosate-tolerance in bacteria from Roundup-contaminated soils was the aim of this study.../...The genus of bacterium was identified as *Pseudomonas* sp. strain HA-09. The isolated aroA(HA-09) gene from this bacterium was approximately 2.2 kb in size. Bioassay of E. coli expressing this gene showed high tolerance to glyphosate (up to 300 mM)…

Beneficial bacteria associated with *Mimosa pudica* and potential to sustain plant growth-promoting traits under heavy metals stress

Authors: Abdullahi S, Haris H, Zarkasi KZ and more...

Source: BIOREMEDIATION JOURNAL, 2021, DOI: 10.1080/10889868.2020.1837724

Abstract: The study was carried out to isolate and screen indigenous rhizobacteria associated with Mimosa pudica in ex-tin mining soil with the potential to sustain plant growth-promoting (PGP) traits under heavy metals (HM) stress condition.

The Aromatic Plant Clary Sage Shaped Bacterial Communities in the Roots and in the Trace Element-Contaminated Soil More Than Mycorrhizal Inoculation - A Two-Year Monitoring Field Trial

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

Source: FRONTIERS IN MICROBIOLOGY 11, 2020, DOI: 10.3389/fmicb.2020.586050

Abstract: To cope with soil contamination by trace elements (TE), phytomanagement has attracted much attention as being an eco-friendly

https://doi.org/10.15454/TZR0-5997

and cost-effective green approach. In this context, aromatic plants could represent a good option not only to immobilize TE, but also to use their biomass to extract essential oils, resulting in high added-value products suitable for non-food valorization. However, the influence of aromatic plants cultivation on the bacterial community structure and functioning in the rhizosphere microbiota remains unknown. Thus, the present study aims at determining in TE-aged contaminated soil (Pb - 394 ppm, Zn - 443 ppm, and Cd - 7ppm, respectively...) the effects of perennial clary sage (*Salvia sclarea* L.) cultivation, during two successive years of growth and inoculated with arbuscular mycorrhizal fungi, on rhizosphere bacterial diversity and community structure…

A novel pathway for initial biotransformation of dinitroaniline herbicide butralin from a newly isolated bacterium *Sphingopyxis* sp. strain HMH

Authors: Ghatge S, Yang Y, Moon S, and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 402, 2021, DOI: 10.1016/j.jhazmat.2020.123510

Abstract: Butralin (N -secButyl-4-tert-butyl-2,6-dinitroaniline) is a highly persistent dinitroaniline herbicide frequently detected in the environment. In this study, butralin-degrading soil bacterium, *Sphingopyxis* sp. strain HMH was isolated from agricultural soil samples. .../.... The metabolites from butralin degradation by strain HMH and purified NfnB were identified using ultra performance liquid chromatography high resolution mass spectrometry (UPLC-HRMS), and a novel mechanism of butralin degradation was proposed.

Statistical evaluation of the bioremediation performance of *Ochrobactrum thiophenivorans* and *Sphingomonas melonis* bacteria on Imidacloprid insecticide in artificial agricultural field

Authors: Erguven GO, Demirci U

Source: JOURNAL OF ENVIRONMENTAL HEALTH SCIENCE AND ENGINEERING 18(2):395-402, 2020, DOI: 10.1007/s40201-019-00391-w

Abstract: Background Pesticides are applied directly on the soil or on the vegetation, and thus, they can reach the receiving environment easily. In this way, environmental damage that stems from pesticides also affects public health and the natural habitat. Pesticides are one of the most harmful pollutant groups in terms of human health, fauna and the environment. They penetrate the application field and the applicator right after the application and start to show adverse effects. Methods The bioremediation of the Imidacloprid (C9H(10)ClN(5)O(2)) insecticide, which is used commonly in Mediterranean climate, was compared with some soil bacteria in artificially prepared fields.

Intra- and intersexual interactions shape microbial community dynamics in the rhizosphere of *Populus cathayana* females and males exposed to excess Zn

Authors: Liu M, Wang YT, Liu XC and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 402, 2021, DOI: 10.1016/j.jhazmat.2020.123783

Abstract: In this study, we intended to investigate the responses of rhizospheric bacterial communities of Populus cathayana to excess Zn under different planting patterns. The results suggested that intersexual and intrasexual interactions strongly affect plant growth and Zn extraction in both sexes, as well as rhizosphere-

https://doi.org/10.15454/TZR0-5997

associated bacterial com-munity structures.../...These results indicated that the sex of neighboring plants affected sexual differences in the choice of specific bacterial colonizations for phytoextraction and tolerance to Zn-contaminated soils, which might regulate the spatial segregation and phytoremediation potential of P. cathayana females and males under heavy metal contaminated soils…

Arbuscular mycorrhizal fungi-induced mitigation of heavy metal phytotoxicity in metal contaminated soils: A critical review

Authors: Riaz M, Kamran M, Fang YZ and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 402, 2021, DOI: 10.1016/j.jhazmat.2020.123919

Abstract: This review summarized the current knowledge regarding AMF assisted remediation of heavy metals and some of the strategies used by mycorrhizal fungi to cope with stressful environments. Moreover, this review provides the information of both molecular and physiological responses of mycorrhizal plants as well as AMF to heavy metal stress which could be helpful for exploring new insight into the mechanisms of HMs remediation by utilizing AMF...

ERA / PUBLICATIONS SCIENTIFIQUES / Pesticides et Faune Sauvage

Characterizing imidacloprid and metabolites in songbird blood with applications for diagnosing field exposures

Authors: Eng ML, Hao C, Watts C, Sun F, Morrissey CA

Source: Sci Total Environ 760:143409, 2021, DOI: 10.1016/j.scitotenv.2020.143409

Abstract: Neonicotinoids are the most widely used insecticides globally, but their rapid metabolism in vertebrates makes diagnosing wildlife exposure challenging. More detailed information on the pattern of imidacloprid metabolites over time could be used to better approximate the timing and level of exposure. Here, we applied recently developed sensitive analytical methods to measure imidacloprid (IMI) parent compound along with an expanded suite of metabolites (...) and six other neonicotinoids in adult red-winged blackbirds (Agelaius phoeniceus) ...

Imidacloprid seed coating poses a risk of acute toxicity to small farmland birds: A weight-of-evidence analysis using data from the grayish baywing *Agelaioides badius*

Authors: Poliserpi MB, Cristos DS, Brodeur JC

Source: Science of The Total Environment 763, 2021, DOI: 10.1016/j.scitotenv.2020.142957

Abstract: The aim of this study was to estimate the risk posed by imidacloprid (IMI) seed coating to passerine birds of the Pampa Region of Argentina using data specifically generated with the grayish baywing (*Agelaioides badius*). Imidacloprid seed coating poses a risk of lethality to farmland birds:

- Imidacloprid is highly toxic to grayish cowbirds: LD50 = 57.11 mg/kg body weight

- 7–10% of daily intake as treated seeds is enough to cause mortality

- Number of coated-seeds spilled and eaten in a bout can cause mortality...

No evidence for a link between forest herbicides and offspring sex ratio in a migratory songbird using high-throughput molecular sexing

Authors: Rivers JW, Houtz JL, Betts MG, Horton BM

https://doi.org/10.15454/TZR0-5997

Source: Conservation Physiology 5(1), 2017, DOI: 10.1093/conphys/cox054

Abstract: (...) In this study, our initial goal was to test whether herbicide application intensity was linked to offspring sex ratio in the White-crowned Sparrow (*Zonotrichia leucophrys*), (...) our secondary goal was to develop a new approach for rapidly determine offspring sex. We obtained blood samples from sparrow young during the 2013–2014 breeding seasons in regenerating conifer plantations that were treated...

Tebuconazole exposure disrupts placental function and causes fetal low birth weight in rats

Authors: Ying Y, Pan P., Zou C., (...) & Ge R

Source: Chemosphere 264, Part 2, 2021, DOI: 10.1016/j.chemosphere.2020.128432.

Abstract: Tebuconazole (TEB, triazole fungicides) (...) accumulation in mammals leads to various endocrine disruptions. (...) whether the exposure of TEB during pregnancy affects the growth and development of fetus and placenta. Here, TEB was exposed to pregnant Sprague-Dawley female rats from gestational days 12–21 of 0, 25, 50 or 100 mg/kg for 10 days...

Non-invasive biomonitoring of organic pollutants using feather samples in feral pigeons (*Columba livia domestica*)

Authors: González-Gómez X, Simal-Gándara J, Alvarez LEF, López-Beceiro AM, Pérez-López M, Martínez-Carballo E

Source: Environmental Pollution 267:115672, 2021, DOI: 10.1016/j.envpol.2020.115672

Abstract: For several years, birds have been used as biomonitor species of environmental pollution. Various organic pollutants and pesticides were assessed in body feather samples of 71 feral pigeons (*Columba livia domestica*) collected from Asturias and Galicia (NW Spain). This is the first report to document pyrethroid levels in pigeons. OPs were detected in all samples with Polycyclic aromatic hydrocarbons as the major contributors...

ERA / PUBLICATIONS SCIENTIFIQUES / Pesticides/Climat et Vdt/Enchy

z Enantioselective residues and toxicity effects of the chiral triazole fungicide hexaconazole in earthworms (*Eisenia fetida*)

Authors: Tong L, Kuan F, Yalei L, Xiaolian Z, Lingxi H, Xiuguo W

Source: Environmental Pollution 270:116269, 2021, DOI: 10.1016/j.envpol.2020.116269

Abstract: The enantioselective toxic effect and environmental behavior of chiral pesticides have attracted increasing research attention. In this study, the enantioselective toxicity and residues of hexaconazole (HEX) in earthworms (*Eisenia fetida*) were investigated...

Fluoroquinolone antibiotics and organophosphate pesticides induce carbonylation on *Eisenia fetida* muscle proteins

Authors: Marquez-Lazaro J, Diaz-Pineda K, Mendez-Cuadro D, Rodriguez-Cavallo E

Source: SCIENCE OF THE TOTAL ENVIRONMENT 758:143954, 2021, DOI: 10.1016/j.scitotenv.2020.143954

Abstract: (...) in vitro studies have shown that fluoroquinolone and organophosphate pesticides residues at their maximum residue limits (MRL) can promote carbonylation of animal proteins. Though, this effect on in vivo conditions has not

yet been evaluated. Thus, *Eisenia fetida* was chosen as a model to assay their oxidant effect. For this, adult earthworms were exposed to artificial soil contaminated with ciprofloxacin, danofloxacin, fenthion, and diazinon at three concentrations (0.5, 1.0, and 1.5 MRL) for 28 days...

Biomarkers response and population biological parameters in the earthworm *Eisenia fetida* after short term exposure to atrazine herbicide

Authors: Lammertyn S, Masin, CE, Zalazar, CS, Fernandez ME

Source: ECOLOGICAL INDICATORS 121:107173, 2021, DOI: 10.1016/j.ecolind.2020.107173

Abstract: Atrazine is one of the most used herbicides and its over-application in fields can affect the soils and their associated biota. In this work, earthworms (*Eisenia fetida*) were exposed to different concentrations of atrazine to assess possible sublethal harmful effects...

Assessing single effects of sugarcane pesticides fipronil and 2,4-D on plants and soil organisms

Authors: Triques MC et al.

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 208:111622, 2021, DOI: 10.1016/j.ecoenv.2020.111622

Abstract: The continuous growth in global population since the beginning of the 20th century result in the necessity of food and energy provision favoring the intensive use of agricultural products such as pesticides. Although pesticides are important to prevent losses in the conventional chemically based agriculture, they frequently present side effects, which goes against agricultural production. The use of pesticides cause direct and indirect effects to soil organisms unbalancing essential soil processes (e.g. primary production, organic matter decomposition, nutrient cycling). Under tropical conditions, very little is known regarding the effects of pesticides to terrestrial organisms...

The biotransformation potential of *Bacillus cereus* on beta- cypermethrin to protect the earthworm (*Perionyx excavatus*) on insecticide - contaminated soil

Authors: Narayanan M, Murugan JM, Kandasamy G, Kandasamy S, Nasi, O, Rajendran M, Pugazhendhi A

Source: ARCHIVES OF AGRONOMY AND SOIL SCIENCE, DOI: 10.1080/03650340.2020.1864339

Abstract: (...) These results conclude that the biodegradation potential of *B. cereus* can protect the life of *P. excavates* from beta-cypermethrin toxicity and thus, can support the balancing of soil fertility, structure and soil biotas such as flora and fauna...

Earthworms *Eisenia fetida* recover from Roundup exposure

Authors: Pochron ST, Mirza A, Mezic M, Chung E, Ezedum Z, Geraci G and more...

Source: APPLIED SOIL ECOLOGY, 103793, 2021, DOI: 10.1016/j.apsoil.2020.103793

Abstract: Roundup herbicides, with glyphosate as their active ingredient, are used in agriculture, forestry management, horticulture and in urban settings. (...) The experiment described here sought to establish the length of time needed between herbicide application and earthworm and soil microbe recovery...

Oxidative stress and genotoxicity of nitenpyram to earthworms (*Eisenia foetida*)

Authors: Zhang WJ, Xia XM, Wang JH, Zhu LS, Wang J, Wang GC, ChenYY, Kim YM

Source: CHEMOSPHERE 264:128493, 2021, DOI: 10.1016/j.chemosphere.2020.128493

Abstract: In this study, the artificial soil poisoning method was used to explore the antioxidative stress mechanism and gene changes of earthworms (*Eisenia foetida*) after application of nitenpyram...

Joint effects of microplastic and dufulin on bioaccumulation, oxidative stress and metabolic profile of the earthworm (*Eisenia fetida*)

Authors: Sun W, Meng ZY, Li RS, Zhang RK, Jia M, Yan S, Tian SN, Zhou ZQ, Zhu WT

Source: CHEMOSPHERE 263: 128171, 2021, DOI: 10.1016/j.chemosphere.2020.128171

Abstract: (...) The knowledge about the combined exposure of pesticides and microplastics may facilitate further assessment of their ecotoxicity. In this study, we investigated joint effects of microplastic and dufulin on bioaccumulation, oxidative stress and metabolic profile of the earthworm...

Oxidative stress and DNA damage in earthworm (*Eisenia fetida*) induced by triflumezopyrim exposure

Authors: Wen SF, Liu C, Wang YW, Xue YN, Wang XT, Wang JH, Xia XM, Kim YM

Source: CHEMOSPHERE 264:128499, 2021, DOI: 10.1016/j.chemosphere.2020.128499

Abstract: (...) The future may bring development and utilization of seeds containing triflumezopyrim which will certainly impact earthworms. To evaluate the toxic effects of triflumezopyrim on earthworms, reactive oxygen species (ROS), superoxide dismutase (SOD) and catalase (CAT) activities, malondialdehyde content (MDA), glutathione S-transferase (GST), and DNA oxidative damage (8-hydroxy-2'-deoxyguanosine, 8-OHdG) were measured after 7, 14, 21, and 28 d analyzing the effects of 6 concentrations (0, 0.5, 1, 2.5, 5 and 10 mg/kg) of triflumezopyrim, respectively...

Effects of the Modern Biorational Insecticide Spinosad on the Earthworm *Eisenia fetida* (Savigny, 1826) (Annelida: Clitellata)

Authors: Sekulic J, Stojanovic M, Trakic T, Popovic F, Tsekova R

Source: ACTA ZOOLOGICA BULGARICA 15:71-77, 2020

Abstract: Effects of the biorational insecticide spinosad on the life-cycle parameters (survival, growth, cocoon production and hatching juveniles) of a non-target organism, the earthworm *Eisenia fetida*, were examined...

Toxicity of fungicides to terrestrial non-target fauna - Formulated products versus active ingredients (azoxystrobin, cyproconazole, prothioconazole, tebuconazole) - A case study with *Enchytraeus crypticus* (Oligochaeta)

Authors: Gomesa SIL, Ammendola A, Casini S, Amorim MJB

Source: SCIENCE OF THE TOTAL ENVIRONMENT 754, 2021, DOI: 0.1016/j.scitotenv.2020.142098

Abstract: In the present study, we investigated the effects of two fungicide FPs versus its a.i. (s): Amistar (R) XTRA and the respective a.i. (s) azoxystrobin and cyproconazole, and Prosaro (R) 250 EC and the respective a.i. (s) prothioconazole and tebuconazole, to the non-target soil oligochaete *Enchytraeus crypticus*...

Effect of temperature on the toxicity of imidacloprid to

Eisenia andrei and *Folsomia candida* in tropical soils

Authors: Bandeira FO, Alves PRL, Braúlio Hennig T, Toniolo T, Natal-da-Luz T, Baretta D

Source: ENVIRONMENTAL POLLUTION 267, 2020, DOI: 10.1016/j.envpol.2020.115565

Abstract: The influence of temperature on the chronic toxicity and risk of imidacloprid to soil non-target species was assessed in tropical soils. Earthworms *Eisenia andrei* and collembolans *Folsomia candida* were exposed to a tropical artificial soil (TAS) and two natural tropical soils from Brazil (Entisol and Oxisol) with increasing concentrations of imidacloprid under atmospheric temperatures of 20, 25 and 28 degrees C...

ERA / PUBLICATIONS SCIENTIFIQUES / Plastiques

The effects of high-density polyethylene and polypropylene microplastics on the soil and earthworm *Metaphire guillelmi* gut microbiota

Authors: Cheng YL, Song WH, Tian HM, Zhang KH, Li B, Du ZK, Zhang W, Wang JH et al.

Source: CHEMOSPHERE 267:129219, 2021, DOI: 10.1016/j.chemosphere.2020.129219

Abstract: As an emerging pollutant in terrestrial ecosystem, studies on the effects of microplastics on the gut microbiota of terrestrial organisms are relatively little even though gut microbiota is closely related to host health, metabolism and immunity as well as soil decomposition processes. In this study, earthworms *Metaphire guillelmi* were exposed to soil amended with 0.25% (w/w) high-density polyethylene (HDPE, 25 μm) or polypropylene (PP, 13 mu m) microplastics for 28 d...

"The Good, the Bad and the Double-Sword" Effects of Microplastics and Their Organic Additives in Marine Bacteria

Authors: Fernandez-Juarez V, Lopez-Alforja X, Frank-Comas A, Echeveste P et al.

Source: FRONTIERS IN MICROBIOLOGY 11:581118, 2021, DOI:10.3389/fmicb.2020.581118

Abstract: We exposed marine bacteria, specifically diazotrophs, to pure MPs which differ in physical properties (e.g., density, hydrophobicity, and/or size), namely, polyethylene, polypropylene, polyvinyl chloride and polystyrene, and to their most abundant associated organic additives (e.g., fluoranthene, 1,2,5,6,9,10-hexabromocyclododecane and dioctyl-phthalate). Generally, the organic additives had a deleterious effect in both autotrophic and heterotrophic bacteria and the magnitude of the effect is suggested to be dependent on bacterial size...

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

Authors: Verdu I, Gonzalez-Pleiter M, Leganes F, Rosal R, Fernandez-Pinas F

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

Abstract: The aim of this study was to evaluate the potential of microplastics (MPs) as vectors for the antimicrobial triclosan (TCS). For it, we tested low-density polyethylene (LDPE), polyamide (PA), polyethylene terephthalate (PET), polyoxymethylene (POM), polypropylene (PP), polystyrene (PS) and the biodegradable polylactic

acid (PLA). Chemical analysis of sorption and desorption of TCS by these MPs was evaluated...

Relative Influence of Plastic Debris Size and Shape, Chemical Composition and Phytoplankton-Bacteria Interactions in Driving Seawater Plastisphere Abundance, Diversity and Activity

Authors: Cheng JG, Jacquin J, Conan P, Pujo-Pay M et al.

Source: FRONTIERS IN MICROBIOLOGY 11:610231, 2021, DOI:10.3389/fmicb.2020.610231

Abstract: Polyethylene and polylactide acid together with glass controls in the forms of meso-debris (18 mm diameter) and large-microplastics (3 mm diameter), as well as small-microplastics of 100 µm diameter with spherical or irregular shapes were immerged in seawater during 2 months. Results of bacterial abundance and diversity indicated that the three classical biofilm colonization phases (primo-colonization after 3 days; growing phase after 10 days; maturation phase after 30 days) were not influenced by the size and the shape of the materials, even when a diatom bloom (*Pseudo-nitzschia* sp.) occurred after the first month of incubation. However, plastic size and shape had an effect on bacterial activity...

Norwegian Soils and Waters Contain Mesophilic, Plastic-Degrading Bacteria

Author: Charnock, C

Source: MICROORGANISMS 9:1, 2021, DOI: 10.3390/microorganisms9010094

Abstract: Plastic pollution has become one of the most critical environmental issues, as rapidly increasing production, compounded by persistence of plastic wastes in the environment, are outpacing efforts to keep ecosystems plastic-free. A switch to plastics more amenable to microbial attack is one of several possible responses. Against this background, the current study describes the isolation, enumeration and polyphasic characterization of plastic-degrading bacteria present in Norwegian terrestrial and aquatic habits...

Microplastic pollution and its relationship with the bacterial community in coastal sediments near Guangdong Province, South China

Authors: Zhang XY, Xia XJ, Dai M, Cen, JW et al.

Source: SCIENCE OF THE TOTAL ENVIRONMENT 760:144091, 2021, DOI: 10.1016/j.scitotenv.2020.144091

Abstract: This study was the first to systematically characterize microplastic (MP) pollution (i.e., its abundance, shape, size and color) and investigate its relationship with the bacterial community in coastal sediments from Guangdong, South China, by microscopic observation and Illumina sequencing. The results of this study indicated that the abundance of microplastics (MPs), which was 344 +/- 24 items/kg in 33 coastal sediments from 11 sites from South China, represented a relatively high level of MP pollution...

Soil research challenges in response to emerging agricultural soil management practices

Authors: Techen AK, Helming K, Bruggemann N, Veldkamp E et al.

Source: ADVANCES IN AGRONOMY 161:179-240, 2021, DOI: 10.1016/bs.agron.2020.01.002

Abstract: Agricultural management is a key force affecting soil processes and functions. Triggered by biophysical constraints as well as rapid structural and technological developments, new management practices are emerging with largely unknown impacts on soil processes and functions. This impedes assessments of the potential of such emerging practices for sustainable intensification,

a paradigm coined to address the growing demand for food and nonfood products. In terms of soil management, sustainable intensification means that soil productivity is increased while other soil functions and services, such as carbon storage and habitat for organisms, are simultaneously maintained or even improved. In this paper we provide an overview of research challenges to better understand how emerging soil management practices affect soil processes and functions…

Effects of Different Microplastics on Nematodes in the Soil Environment: Tracking the Extractable Additives Using an Ecotoxicological Approach

Authors: Kim SW, Waldman WR, Kim TY, Rillig MC

Source: ENVIRONMENTAL SCIENCE & TECHNOLOGY 54(21):13868-13878, 2021, DOI: 10.1021/acs.est.0c04641

Abstract: With increasing interest in the effects of microplastics on the soil environment, there is a need to thoroughly evaluate the potential adverse effects of these particles as a function of their characteristics (size, shape, and composition). In addition, extractable chemical additives from microplastics have been identified as an important toxicity pathway in the aquatic environment. However, currently, little is known about the effects of such additives on the soil environment. In this study on nematodes (Caenorhabditis elegans), we adopted an ecotoxicological approach to assess the potential effects of 13 different microplastics (0.001-1% of soil dry weight) with different characteristics and extractable additives...

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Abstract: With increasing interest in the effects of microplastics on the soil environment, there is a need to thoroughly evaluate the potential adverse effects of these particles as a function of their characteristics (size, shape, and composition). In addition, extractable chemical additives from microplastics have been identified as an important toxicity pathway in the aquatic environment. However, currently, little is known about the effects of such additives on the soil environment. In this study on nematodes (Caenorhabditis elegans), we adopted an ecotoxicological approach to assess the potential effects of 13 different microplastics (0.001-1% of soil dry weight) with different characteristics and extractable additives. We found that poly(ethylene terephthalate) (PET) fragments and polyacrylicnitrile (PAN) fibers show the highest toxicity, while high-density polyethylene (HDPE), polypropylene (PP), and polystyrene (PS) fragments induced relatively less adverse effects on nematodes…

Sorption of chemical contaminants on degradable and non-degradable microplastics: Recent progress and research trends

Authors: Torres FG, Dioses-Salinas DC, Pizarro-Ortega CI, De-la-Torre GE

Source: SCIENCE OF THE TOTAL ENVIRONMENT 757:143875, 2021, DOI: 10.1016/j.scitotenv.2020.143875

Abstract: Micooplastics (<5 mm) are ubiquitous contaminants of growing concern. These have been found in multiple environmental compartments, including remote sites where anthropogenic activity is null. Once released, microplastics interact with multiple chemicals in the environment, many of which are classified as organic contaminants or heavy metals. Some contaminants have an affinity for microplastics, attributed to certain sorption mechanisms, and thus become vectors of hazardous chemicals. Here, we focused on the sorption behavior of

degradable and non-degradable microplastics, including field and laboratory experiments…

Transfer and effects of PET microfibers in *Chironomus riparius*

Authors: Setyorini L, Michler-Kozma D, Sures B, Gabel F

Source: SCIENCE OF THE TOTAL ENVIRONMENT 757:143735, 2021, DOI: 10.1016/j.scitotenv.2020.143735

Abstract: Multiple studies in freshwater environments have verified that microplastic particles are present in water columns, sediment, and aquatic organisms. These studies indicated that certain freshwater ecosystems may act as temporary sinks of microplastic particles, leading to accumulation in the sediment and the ingestion by benthic organisms. Polyethylene terephthalate (PET) is one of the non-buoyant polymers that has been frequently found in aquatic sediments. This study aims to investigate a possible transfer of PET microfibers from aquatic to the terrestrial habitats and addressed selected effects (i.e. survival, general stress response, and growth) of PET microfibers using *Chironomus riparius*, a frequently applied model organism in ecotoxicological research…

Biomicroplastics versus conventional microplastics: An insight on the toxicity of these polymers in dragonfly larvae

Authors: Chagas TQ, Araujo APD, Malafaia G

Source: SCIENCE OF THE TOTAL ENVIRONMENT 761:143231, 2021, DOI: 10.1016/j.scitotenv.2020.143231

Abstract: The toxicological safety of products developed as alternative for conventional plastics (i.e., petroleum derivatives) inevitably demands conducting (eco)toxicological studies. Thus, the aim of the current study was to evaluate the biochemical toxicity of polyethylene microplastics (PE MPs) (representative of conventional MPs) and polylactic acid biomicroplastics (PLA BioMPs) in Aphylla williamsoni larvae used as experimental models. Animals subjected to short exposure to both pollutants (48 h), at environmentally relevant concentration (6 mg/L). At the end of the experiment, different toxicity biomarkers were evaluated. To assess the possible impact of pollutants on the nutritional status of the animals, the total protein, total soluble carbohydrate and triglyceride levels were determined. However, we did not observe differences between the groups, which suggests that PE MPs and PLA BioMPs did not affect the animals' energy metabolism, inducing them to a nutritional deficit. However, larvae exposed to PLA BioMPs have shown increased nitrite and lipid peroxidation levels, which supports the hypothesis that these pollutants increase oxidative stress processes in the animals evaluated, which can affect the animals' physiological homeostasis from different changes…

Interaction of cyanobacteria with calcium facilitates the sedimentation of microplastics in a eutrophic reservoir

Authors: Leiser R, Jongsma R, Bakenhus I, Mockel R et al.

Source: WATER RESEARCH 189:116582, 2021, DOI:10.1016/j.watres.2020.116582

Abstract: This study investigated the impact of biofilm formation and aggregation on the density of buoyant polyethylene microplastics. Biofilm formation on polyethylene films (4 x 4 x 0.15 mm) was studied in a eutrophic reservoir (Bautzen, Saxony, Germany). Additionally, aggregation dynamics of small PE microplastics (similar to 85 mu m) with cyanobacteria were investigated in laboratory experiments...

How do microplastics affect the marine microbial loop? Predation of microplastics by microzooplankton

Authors: Geng XH, Wang J, Zhang Y, Jiang Y

Source: SCIENCE OF THE TOTAL ENVIRONMENT 758:144030, 2021, DOI: 10.1016/j.scitotenv.2020.144030

Abstract: We conducted a series of feeding experiments with various concentrations of microplastic beads (ca. 1 µm) to characterize the response of the planktonic ciliated protozoan Strombidium sulcatum to microplastics and a set of additional exposure experiments with four different particle diameters of microplastics to explore whether the feeding response exhibited size selectivity. As the microplastic concentration increased, the number, body size, and biomass of ciliates decreased sharply during the exposure period...

Fate of nanoplastics in the environment: Implication of the cigarette butts

Authors: El Hadri H, Lisa JM, Gigault J, Reynaud S, Grassl B

Source: ENVIRONMENTAL POLLUTION 268 B, 115170, 2021, DOI: 10.1016/j.envpol.2020.115170

Abstract: Fate, transport and accumulation of nanoplastics have attracted considerable attention in the past few years. While actual researches have been focused on nanoplastics dispersed or aggregated in different environmental system, no study have been focused on the possibility that nanoplastics are co-transported with other natural or anthropogenic materials. Therefore, the large quantity of debris released in the environment, such as cigarette butts (CGB), could be part of the nanoplastics fate and behavior. Here we show the considerable sorption capacities of cigarette filters for nanoplastics...

Isolation of a soil bacterium for remediation of polyurethane and low-density polyethylene: a promising tool towards sustainable cleanup of the environment

Authors: Roy R, Mukherjee G, Das Gupta A and more...

Source: BIOTECH 11:1, 2021, DOI: 10.1007/s13205-020-02592-9

Abstract: A soil bacterium, designated strain AKS31, was isolated on the plastic polyurethane (PUR) and based on the molecular and biochemical analysis was tentatively assigned to the genus Pseudomonas. Preliminary studies suggested that strain AKS31 had the capability of biodegrading polyurethane (PUR) and low-density polyethylene (LDPE). This observation was confirmed by the analysis of the biodegradation products.../...A gene that could be involved in producing an esterase-like activity (PURase gene) was identified after the amplification and sequencing of a PCR product...

Greater Biofilm Formation and Increased Biodegradation of Polyethylene Film by a Microbial Consortium of *Arthrobacter* sp. and *Streptomyces* sp.

Authors: Han YN, Wei M, Han F, Fang C, Wang D, ZhongYJ, Guo CL, Shi XY, Xie ZK, Li FM

Source: MICROORGANISMS 8(12):1979, 2020, DOI: 10.3390/microorganisms8121979

Abstract: The widespread use of polyethylene (PE) mulch films has led to a significant accumulation of plastic waste in agricultural soils. The biodegradation of plastic waste by microorganisms promises to provide a cost-effective and environmentally-friendly alternative for mitigating soil plastic pollution. A large number of microorganisms capable of degrading PE have been reported, but degradation may be further enhanced by the cooperative activity of multiple microbial species...

Single and combined effects of microplastics and lead on the freshwater algae Microcystis aeruginosa

Authors: Wang S, Li Q, Huang SZ, Zhao W, Zheng Z

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 208:111664, 2021, DOI: 10.1016/j.ecoenv.2020.111664

Abstract: The present study has investigated the single and combined effects of MPs and lead (Pb) on the freshwater algal *Microcystis aeruginosa*. Results showed that Pb-only (0.05 mg.L-1) promoted the growth of algal cells, while MPs-only (1 mg L-1) resulted in growth inhibition...

A critical review of interactions between microplastics, microalgae and aquatic ecosystem function

Authors: Nava V, Leoni B

Source: WATER RESEARCH 188:116476, 2021, DOI:10.1016/j.watres.2020.116476

Abstract: In this review, we present the current state of knowledge on microalgae-microplastic interactions and summarize the potential effect on their respective fate. Microplastics can and do interact with microalgae and the available literature has suggested that the epiplastic community of microalgae differs consistently from the surrounding aquatic communities; however, it is still not clear whether this different colonization is linked to the composition of the surface or more to the availability of a "hard" substrate on which organisms can attach and grow…

Polyethylene, Polystyrene, and Polypropylene leachate impact upon marine microalgae *Dunaliella tertiolecta*

Authors: Schiavo S, Oliviero M, Chiavarini S, Dumontet S, Manzo S

Source: JOURNAL OF TOXICOLOGY AND ENVIRONMENTAL HEALTH-PART A-CURRENT ISSUES Early Access, 2020, DOI: 10.1080/15287394.2020.1860173

Abstract: The aim of this study was to examine the adverse effects of leachates of different virgin polymers, polypropylene (PP), polyethylene (PE), and polystyrene (PS) on marine microalgae *Dunaliella tertiolecta*. The tests carried out on *D. tertiolecta* included: growth inhibition, oxidative stress (DCFH-DA), and DNA damage (COMET assay). Polypropylene and PS leachates produced growth inhibition at the lowest concentration (3.1% of leachate). In contrast, a hormesis phenomenon was observed with PE leachates...

New insights into the vertical distribution and microbial degradation of microplastics in urban river sediments

Authors: Niu LH, Li YY, Li Y, Hu Q, Wang C, Hu JX, Zhang WL, Wang LF, Zhang C, Zhang HJ

Source: WATER RESEARCH 188:116449, 2021, DOI: 10.1016/j.watres.2020.116449

Abstract: This study investigated the vertical distribution of microplastics (with the size < 5 mm) and the bacterial community assemblages colonizing microplastics in urban river sediments at a depth from 0 to 50 cm. The results showed that both microplastics and associated microbial communities presented vertical profiles in river sediments. The indicative plastic-degrading bacteria with an average abundance of 4.33% was found in the surrounding sediments, while on the microplastics 21.37% was found...

Interaction between microbial communities and various plastic types under different aquatic systems

Authors: Ashar M, Fraser MA, Li JJ, Wang CS et al.

Source: MARINE ENVIRONMENTAL RESEARCH 162:105151, 2020, DOI: 10.1016/j.marenvres.2020.105151

Abstract: A mixture of weathered plastics (PE, PS, PET) was incubated with different indigenous communities under their respective habitat simulations. All microbial communities were able to form populations on all plastic surfaces with timedependent development...

https://doi.org/10.15454/TZR0-5997

Degradation of plastic waste using stimulated and naturally occurring microbial strains

Authors: Taghavi, N, Singhal, N, Zhuang, WQ, Baroutian, S

Source: CHEMOSPHERE 263:127975, 2021, DOI: 10.1016/j.chemosphere.2020.127975

Abstract: The capability of different strains derived from soil, activated sludge, farm sludge, and worms' excreta were investigated for biodegradation of high-density polyethylene, polystyrene foam, polypropylene and polyethylene terephthalate in unstimulated and stimulated conditions...

Ocean acidification alters bacterial communities on marine plastic debris

Authors: Harvey BP, Kerfahi D, Jung Y, Shin JH et al.

Source: MARINE POLLUTION BULLETIN 161:111749, 2020, DOI:10.1016/j.marpolbul.2020.111749

Abstract: The increasing quantity of plastic waste in the ocean is providing a growing and more widespread novel habitat for microbes. Here, we show that common plastic drinking bottles rapidly become colonised by novel biofilm-forming bacterial communities, and that ocean acidification greatly influences the composition of plastic biofilm assemblages.

Living in the plastic age - Different short-term microbial response to microplastics addition to arable soils with contrasting soil organic matter content and farm management legacy

Authors: Bloecker L, Watson C, Wichern F

Source: ENVIRONMENTAL POLLUTION 267, 2020, DOI: 10.1016/j.envpol.2020.115468

Abstract: Microplastics (MPs) are an emerging pollutant found in many ecosystems including soils, where they may become toxic to organisms or alter their habitat. However, little is known about the influence of MPs on soil microorganisms and processes vital to ecosystem functioning in different soils. Therefore, our objective was to investigate the short-term effects of MPs pollution on soil microorganisms in two agricultural soils with contrasting soil organic matter content and microbial biomass as caused by farm management history (organic and conventional) .../... While this study does not answer whether MPs pollution has a negative impact on soil microorganisms, it highlights the need to consider potential interactive effects of environmental factors, land use and management with MPs on soil microbial communities and their functions.

Droit et Politique de l'environnement

Préfiguration d'un réseau d'alerte aux pollutions de l'eau dans le bassin de la Durance

BRGM 24/02/21

Le bassin de la Durance alimente en eau potable plus d'un million de personnes via un hydrosystème complexe d'eau de surface et d'eau souterraine (retenues, canaux, nappe).

Le BRGM a répondu en 2018 à un appel à projets Santé Environnement lancé par l'ARS PACA, la DREAL PACA et la Région Sud, afin d'initier une démarche dynamique d'alerte aux pollutions de l'eau à l'échelle du bassin.

Objectif du projet : mettre en place une dynamique d'échanges entre les organismes concernés par une éventuelle pollution, en se dotant d'un outil commun permettant de recueillir, archiver et diffuser les informations. [...]

Le résultat : une application numérique, finalisée fin 2020, qui se présente sous forme de SIG (système d'information géographique) [...]

https://doi.org/10.15454/TZR0-5997

Biomarker study shows health effects of fungicide on honeybees, including DNA damage

New research finds that a common agricultural fungicide can have toxic effects on honeybees at standard concentrations. This study uses a biomarker method to identify cell and chemical changes in honeybees after exposure to one fungicide, one toxic metal and one toxin known to cause genetic damage; with such changes indicating stress on their biological functions. This method has not previously been used to show these effects in honeybees after exposure to fungicide and highlights the potential for further research using biomarkers.

Mesures de protection des personnes lors de l'utilisation de produits phytopharmaceutiques dans les propriétés privées, les lieux fréquentés par le public et dans les lieux à usage collectif

Arrêté du 15 janvier 2021 relatif aux mesures de protection des personnes lors de l'utilisation de produits phytopharmaceutiques dans les propriétés privées, les lieux fréquentés par le public et dans les lieux à usage collectif et modifiant l'arrêté du 4 mai 2017 relatif à la mise sur le marché et à l'utilisation des produits phytopharmaceutiques et de leurs adjuvants visés à l'article L. 253-1 du code rural et de la pêche maritime

Numéro officiel : TREL2020679A

Date de signature : 15/01/2021

Liens juridiques : Modification Arrêté 04/05/2017 NOR AGRG1632554A

Accès au document

REGLEMENTATION / Droit

Produit biocide « PHERO-BALL PIN » : mise à disposition sur le marché et utilisation autorisée par dérogation

Arrêté du 15 février 2021 autorisant par dérogation la mise à disposition sur le marché et l'utilisation du produit biocide « PHERO-BALL PIN », également appelé « PINE T PRO BALL », pour une période de 180 jours

Numéro officiel : TREP2104949A
Date de signature : 15/02/2021

Accès au document

Report de la date d'expiration de l'approbation de la métofluthrine utilisée dans les produits biocides (type de produits 18)

DÉCISION D'EXÉCUTION (UE) 2021/327 DE LA COMMISSION du 23 février 2021 reportant la date d'expiration de l'approbation de la métofluthrine en vue de son utilisation dans les produits biocides relevant du type de produits 18

Numéro officiel : UE/2021/327
Date de signature : 23/02/2021

Accès au document

Report de la date d'expiration de l'approbation de l'alphachloralose utilisée dans les produits biocides relevant du type de produits 14

DÉCISION D'EXÉCUTION (UE) 2021/333 DE LA COMMISSION du 24 février 2021 reportant la date d'expiration de l'approbation de l'alphachloralose en vue de son utilisation dans les produits biocides relevant du type de produits 14

Numéro officiel : UE/2021/333
Date de signature : 24/02/2021

https://doi.org/10.15454/TZR0-5997

Accès au document

Projet de décret de la Roumanie en matière d'information relative au traitement de surface des fruits et légumes avec des pesticides

DÉCISION D'EXÉCUTION (UE) 2021/334 DE LA COMMISSION du 23 février 2021 concernant un projet de décret notifié par la Roumanie en matière d'information relative au traitement de surface des fruits et légumes avec des pesticides

Numéro officiel : UE/2021/334
Date de signature : 23/02/2021

Accès au document

Propiconazole utilisé dans les produits biocides du type 8 : date d'expiration de l'approbation reportée

DÉCISION D'EXÉCUTION (UE) 2021/354 DE LA COMMISSION du 25 février 2021 reportant la date d'expiration de l'approbation du propiconazole en vue de son utilisation dans les produits biocides du type 8

Numéro officiel : UE/2021/354
Date de signature : 25/02/2021

Accès au document

Polluants organiques persistants en ce qui concerne le pentachlorophénol et ses sels et esters

RÈGLEMENT DÉLÉGUÉ (UE) 2021/277 DE LA COMMISSION du 16 décembre 2020 modifiant l'annexe I du règlement (UE) 2019/1021 du Parlement européen et du Conseil concernant les polluants organiques persistants en ce qui concerne le pentachlorophénol et ses sels et esters

Numéro officiel : UE/2021/277
Date de signature : 16/12/2020

Liens juridiques : Modification Règlement UE/2019/1021 20/06/2019

Accès au document

Chlore actif produit par électrolyse de chlorure de sodium approuvé en tant que substance active utilisée dans les produits biocides relevant des types de produits 2, 3, 4 et 5

RÈGLEMENT D'EXÉCUTION (UE) 2021/345 DE LA COMMISSION du 25 février 2021 approuvant le chlore actif produit par électrolyse de chlorure de sodium en tant que substance active destinée à être utilisée dans les produits biocides relevant des types de produits 2, 3, 4 et 5

Numéro officiel : UE/2021/345
Date de signature : 25/02/2021

Accès au document

Chlore actif libéré à partir d'acide hypochloreux approuvé en tant que substance active utilisée dans les produits biocides de types de produits 2, 3, 4 et 5

RÈGLEMENT D'EXÉCUTION (UE) 2021/347 DE LA COMMISSION du 25 février 2021 approuvant le chlore actif libéré à partir d'acide hypochloreux en tant que substance active destinée à être utilisée dans les produits biocides relevant des types de produits 2, 3, 4 et 5

Numéro officiel : UE/2021/347
Date de signature : 25/02/2021

Accès au document

Emploi de semences de betteraves sucrières traitées

https://doi.org/10.15454/TZR0-5997

avec des produits phytopharmaceutiques contenant les substances actives imidaclopride ou thiamethoxam : autorisation provisoire

Arrêté du 5 février 2021 autorisant provisoirement l'emploi de semences de betteraves sucrières traitées avec des produits phytopharmaceutiques contenant les substances actives imidaclopride ou thiamethoxam

Numéro officiel : AGRG2104041A
Date de signature : 05/02/2021

Accès au document

Limites maximales applicables aux résidus de tétrachlorure de carbone, de chlorothalonil, de chlorprophame, de diméthoate, d'éthoprophos, de fénamidone, de méthiocarbe, d'ométhoate, de propiconazole et de pymétrozine présents dans certains produits

RÈGLEMENT (UE) 2021/155 DE LA COMMISSION du 9 février 2021 modifiant les annexes II, III et V du règlement (CE) n° 396/2005 du Parlement européen et du Conseil en ce qui concerne les limites maximales applicables aux résidus de tétrachlorure de carbone, de chlorothalonil, de chlorprophame, de diméthoate, d'éthoprophos, de fénamidone, de méthiocarbe, d'ométhoate, de propiconazole et de pymétrozine présents dans ou sur certains produits

Numéro officiel : UE/2021/155

Date de signature : 09/02/2021
Liens juridiques : Modification le 02/09/2021 Règlement CE/396/2005 23/02/2005

Accès au document

Approbation refusée de l'esbiothrine en tant que substance active existante destinée à être utilisée dans les produits biocides

DÉCISION D'EXÉCUTION (UE) 2021/98 DE LA COMMISSION du 28 janvier 2021 refusant l'approbation de l'esbiothrine en tant que substance active existante destinée à être utilisée dans les produits biocides relevant du type de produits 18

Numéro officiel : UE/2021/98
Date de signature : 28/01/2021

Accès au document

Prolongation de la période d'approbation des substances actives «benfluraline», «dimoxystrobine», «fluazinam», «flutolanil», «mécoprop-P», «mépiquat», «métirame», «oxamyl» et «pyraclostrobine»

RÈGLEMENT D'EXÉCUTION (UE) 2021/52 DE LA COMMISSION du 22 janvier 2021 modifiant le règlement d'exécution (UE) n° 540/2011 en ce qui concerne la prolongation de la période d'approbation des substances actives «benfluraline», «dimoxystrobine», «fluazinam», «flutolanil», «mécoprop-P», «mépiquat», «métirame», «oxamyl» et «pyraclostrobine»

Numéro officiel : UE/2021/52
Date de signature : 22/01/2021
Liens juridiques : Modification Règlement d'exécution UE/540/2011 25/05/2011

Accès au document

Enregistrement, évaluation et autorisation des substances chimiques : plomb dans la grenaille de chasse utilisée à

https://doi.org/10.15454/TZR0-5997

l'intérieur ou autour de zones humides

RÈGLEMENT (UE) 2021/57 DE LA COMMISSION du 25 janvier 2021 modifiant l'annexe XVII du règlement (CE) no 1907/2006 du Parlement européen et du Conseil concernant l'enregistrement, l'évaluation et l'autorisation des substances chimiques, ainsi que les restrictions applicables à ces substances (REACH), en ce qui concerne le plomb dans la grenaille de chasse utilisée à l'intérieur ou autour de zones humides

Numéro officiel : UE/2021/57
Date de signature : 25/01/2021

Liens juridiques : Modification Règlement CE/1907/2006 18/12/2006

Accès au document

Non-approbation de la substance active «topramézone»

RÈGLEMENT D'EXÉCUTION (UE) 2021/79 DE LA COMMISSION du 27 janvier 2021 portant non-approbation de la substance active «topramézone», conformément au règlement (CE) n° 1107/2009 du Parlement européen et du Conseil concernant la mise sur le marché des produits phytopharmaceutiques

Numéro officiel : UE/2021/79

Date de signature : 27/01/2021

Accès au document

Non-approbation du dioxyde de carbone en tant que substance de base

RÈGLEMENT D'EXÉCUTION (UE) 2021/80 DE LA COMMISSION du 27 janvier 2021 portant non-approbation du dioxyde de carbone en tant que substance de base, conformément au règlement (CE) n° 1107/2009 du Parlement européen et du Conseil concernant la mise sur le marché des produits phytopharmaceutiques

Numéro officiel : UE/2021/80
Date de signature : 27/01/2021

Accès au document

Approbation de la substance de base «extrait de bulbe d'*Allium cepa* L.» : mise sur le marché des produits phytopharmaceutiques

RÈGLEMENT D'EXÉCUTION (UE) 2021/81 DE LA COMMISSION du 27 janvier 2021 portant approbation de la substance de base « extrait de bulbe d'*Allium cepa* L.» 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) no 540/2011 de la Commission

Numéro officiel : UE/2021/81
Date de signature : 27/01/2021

Liens juridiques : Modification Règlement d'exécution UE/540/2011 25/05/2011

Accès au document

AVIS / EXPERTISES / NORMES

AFNOR NF X31-233 2020. Qualité du sol - Détermination des effets des polluants sur la flore du sol - Méthode en laboratoire de détermination de la composition en acides gras foliaires pour évaluer la qualité du sol

Le présent document décrit une méthode d'évaluation de la qualité des sols et des matériaux assimilés en déterminant la composition en acides gras des feuilles de Lactuca

sativa ayant poussé sur ces sols ou matériaux assimilés et en la comparant à celle obtenue sur des sols témoins (sol de référence ou sol standard). Cette méthode est applicable à : des sols provenant de sites contaminés ; des sols amendés ; des sols après remédiation ; des matériaux de dragage non dilués ou dilués avec un sol témoin (constituant ainsi le mélange d'essai) ; des substances chimiques délibérément ajoutées à un sol témoin, constituant ainsi le mélange d'essai ; des produits résiduaires (exemple lisier, fumier, boues ou composts) délibérément ajoutés à un sol témoin, et constituant ainsi le mélange d'essai. Cette méthode n'est pas applicable à des sols dont le pH est inférieur à 4,5 ou supérieur à 8,2.

NF ISO 10872 (T90-394) 2020. Qualité de l'eau et du sol - Détermination de l'effet toxique d'échantillons de sédiment et de sol sur la croissance, la fertilité et la reproduction de *Caenorhabditis elegans* (Nematodes)

Le présent document spécifie une méthode de détermination de la toxicité d'échantillons environnementaux sur la croissance, la fertilité et la reproduction de Caenorhabditis elegans. La méthode s'applique aux sédiments d'eau douce contaminés (salinité maximale de 5 g/l) , sols et déchets, ainsi qu'à l'eau interstitielle, aux élutriats et aux extraits aqueux obtenus à partir de sédiments contaminés, sols et déchets.

PUBLICATIONS DU RESEAU ECOTOX

Learning partners schools in Guadeloupe: A tool for debate on agricultural pollution and the future of agriculture

Authors: Tonneau JP, Bonnal V, Bourgoin J, Cheval A, Jannoyer M, Chery JP, Cattan P

Source: CAHIERS AGRICULTURES 30:9, 2021, DOI: 10.1051/cagri/2020046

Abstract: The RIVAGE project aims to promote the adoption of alternative practices to manage the impacts of diffuse pollution in the Perou River watershed in Guadeloupe. The objective is to produce and share knowledge on processes, impacts and innovative practices with the actors of the territory. To facilitate results uptake, the project has created a "learning partners school". The learning partners school is a space for exchanges, a forum, developed around themes related to agricultural diffuse pollution…

Assessing the Effects of beta-Triketone Herbicides on the Soil Bacterial and hppd Communities: A Lab-to-Field Experiment

Authors: Thiour-Mauprivez C, Devers-Lamrani M, Bru D, Beguet J, Spor A, Mounier A, Alletto L, Calvayrac C, Barthelmebs L

Source: FRONTIERS IN MICROBIOLOGY 11:610298, 2021, DOI: 10.3389/fmicb.2020.610298

Abstract: Maize cultivators often use beta-triketone herbicides to prevent the growth of weeds in their fields. These herbicides target the 4-HPPD enzyme of dicotyledons. This enzyme, encoded by the hppd gene, is widespread among all living organisms including soil bacteria, which are considered as "non-target organisms" by the legislation. Within the framework of the pesticide registration process, the ecotoxicological impact of herbicides on soil microorganisms is solely based on carbon and nitrogen mineralization tests. In this study, we used mor e extensive approaches to assess with a lab-to-field experiment the risk of beta-triketone on the abundance and the diversity of both total and hppd soil bacterial communities...

Ecotoxicity of polystyrene microplastics to submerged carnivorous *Utricularia*

vulgaris plants in freshwater ecosystems

Authors: Yu HW, Zhang XL, Hu JW, Peng JF, Qu JH

Source: ENVIRONMENTAL POLLUTION 265 A, 114830, 2021, DOI: 10.1016/j.envpol.2020.114830

Abstract: Much attention is currently paid to microplastic (MP) pollution, particularly in marine systems. There is increasing concern regarding the potential toxicity of MPs to organisms at the physiological and morphological levels. However, little is known about the impact of MPs on aquatic life, despite their ubiquitous presence in freshwater ecosystems. In this study, the aquatic plant *Utricularia vulgaris* was exposed to 1, 2 and 5 mm polystyrene fluorescent MP particles at concentrations of 15, 70 and 140 mg/L for 7 days...

Plants affect the dissipation and leaching of anilide pesticides in soil mesocosms: Insights from compound-specific isotope analysis (CSIA)

Authors: Perez-Rodriguez P, Schmitt AD, Gangloff S, Masbou J, Imfeld G

Source: AGRICULTURE ECOSYSTEMS & ENVIRONMENT 308:107257, 2021, DOI: 10.1016/j.agee.2020.107257

Abstract: The soil-plant system can act as a prevailing zone of pesticide dissipation in agroecosystems, which may influence pesticide leaching following rainfall events. Here we examined the contribution of leaching, dissipation and degradation of widely used anilide pesticides in planted and unplanted mesocosms with contrasting vineyard and forest soils. The mesocosms were spiked at 25 mg/kg with acetochlor, alachlor, S-metolachlor, butachlor and metalaxyl, and followed-up for 75 days...

Mass balance approach to assess the impact of cadmium decrease in mineral phosphate fertilizers on health risk: The case-study of French agricultural soils

Authors: Carne G, Leconte S, Sirot V, Breysse N, Badot PM, Bispo A, Deportes IZ, Dumat C, Riviere G, Crepet A

Source: SCIENCE OF THE TOTAL ENVIRONMENT 760:143374, 2021, DOI: 10.1016/j.scitotenv.2020.143374

Abstract: Cadmium is a ubiquitous and highly toxic contaminant that can cause serious adverse effects. The European Food Safety Authority (EFSA) and the French Agency for Food, Environmental and Occupational Health & Safety (ANSES) have shown that the risk related to food contamination by cadmium cannot be ruled out in Europe and France. Fertilizing material is one of the main sources of cadmium contamination in the food chain on which regulators can play to reduce cadmium exposure in the population. The aim of this work was to develop a mass-balance approach integrating the various environmental sources of cadmium to estimate the effects of a decrease in cadmium concentrations in crop fertilizers on dietary exposure and on the health risk...

Chlorinated ethene biodegradation and associated bacterial taxa in multi-polluted groundwater: Insights from biomolecular markers and stable isotope analysis

Authors: Hellal J, Joulian C, Urien C, Ferreira S, Denonfoux J, Hermon L, Vuilleumier S, Imfeld G

Source: SCIENCE OF THE TOTAL ENVIRONMENT 763:142950, 2021, DOI: 10.1016/j.scitotenv.2020.142950

Abstract: Chlorinated ethenes (CEs) are most problematic pollutants in groundwater. Dehalogenating bacteria, and in particular organohalide-respiring bacteria (OHRB), can transform PCE to ethene under anaerobic

conditions, and thus contribute to bioremediation of contaminated sites. Current approaches to characterize in situ biodegradation of CEs include hydrochemical analyses, quantification of the abundance of key species (e.g. *Dehatococcoides mccartyi*) and clehalogenase genes (pceA, VCTA, bycA and tceA) involved in different steps of organohalkle respiration (OHR) by qPCR, and compound-specific isotope analysis (CSIA) of CEs. Here we combined these approaches with sequencing of 16S I-RNA gene amplicons to consider both OHRB and bacterial taxa involved in CE transformation at a multicontaminated site…

Overexposing mosquitoes to insecticides under global warming: A public health concern?

Authors: Benelli G, Wilke ABB, Bloomquist JR, Desneux N, Beier JC

Source: SCIENCE OF THE TOTAL ENVIRONMENT 762:143069, 2021, DOI: 10.1016/j.scitotenv.2020.143069

Abstract: The combined effect of global warming and insecticide exposure on the spread of mosquito-borne diseases is poorly studied. In our opinion, more resources should be diverted to this topic to further research efforts and deal with this increasing threat. It is particularly important to determine how Aedes, Anopheles, and Culex vector species cope with insecticide exposure under warming temperatures, as well as how both stressors may impact the activity of mosquito biocontrol agents…

Chromium mobility in ultramafic areas affected by mining activities in Barro Alto massif, Brazil: An isotopic study

Authors: Bolanos-Benitez V, van Hullebusch ED, Birck JL, Garnier J, Lens PNL, Tharaud M, Quantin C, Sivry Y

Source: CHEMICAL GEOLOGY 561:120000, 2021, DOI: 10.1016/j.chemgeo.2020.120000

Abstract: This work studies the potential release of Cr from solids to surface water and groundwater, and the related isotopic compositions, in a nickel laterite ore deposit from Barro Alto in Brazil (in the State of Goias). This ultramafic system is characterized by elevated concentrations of chromium (Cr)…

In-Site and Ex-Site Date Palm Exposure to Heavy Metals Involved Infra-Individual Biomarkers Upregulation

Authors: Chaabene Z, Rorat A, Kriaa W, Rekik I, Mejdoub H, Vandenbulcke F, Elleuch A

Source: PLANTS-BASEL 10(1):137, 2021, DOI: 10.3390/plants10010137

Abstract: As a tree of considerable importance in arid regions-date palm, Phoenix dactylifera L. survival in contaminated areas of Sfax city has drawn our attention. Leaf samples of the plants grown in the study area showed high levels of cadmium (Cd), copper (Cu), and chromium (Cr). On the basis of this finding, the cellular mechanisms that explain these metal accumulations were investigated in controlled conditions.

LONG-TERM stability of arsenic in iron amended contaminated soil

Authors: Kumpiene J, Carabante I, Kasiuliene A, Austruy A, Mench M

Source: ENVIRONMENTAL POLLUTION 269:116017, 2021, DOI: 10.1016/j.envpol.2020.116017

Abstract: This study aimed at elucidating the long-term efficiency of soil remediation where chemical stabilization of arsenic (As) contaminated soil using zerovalent iron (Fe) amendments was applied. A combination of chemical extraction and extended X-Ray absorption fine structure (EXAFS) spectroscopy

technique was applied on soils collected from five laboratory and field experiments in Sweden and France. All soils were treated with 1 wt% of zerovalent Fe grit 2-15 years prior to the sampling…

Determinants of non-dietary exposure to agricultural pesticides in populations living close to fields: A systematic review

Authors: Teysseire R, Manangama G, Baldi I, Carles C, Brochard P, Bedos C, Delva F

Source: SCIENCE OF THE TOTAL ENVIRONMENT 761:143294, 2021, DOI: 10.1016/j.scitotenv.2020.143294

Abstract: There is growing evidence in the scientific literature that individuals living near fields are more exposed to agricultural pesticides than people living further away. The main objective of this systematic review was to identify the non-dietary determinants of pesticide exposure related to the drift pathway in residents living in agricultural areas, including spatial indictors related to agricultural activities, hygiene practices, behaviors and sociodemographic parameters…

Inorganic elements in live vs dead nesting olive ridley marine turtles in the Mexican Pacific: Introducing a new statistical methodology in ecotoxicology

Authors: Cortes-Gomez AA, Romero D, Santos J, Rivera-Hernandez JR, Girondot M

Source: SCIENCE OF THE TOTAL ENVIRONMENT 761:143249, 2021, DOI: 10.1016/j.scitotenv.2020.143249

Abstract: This study reports the largest inorganic elements database in the blood of live marine turtles (Lepidochelys olivacea), with 241 live as well as 38 dead nesting turtles sampled and analyzed for 26 inorganic elements, including essential (Al, As, B, Ca, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, P, Se, S, V, and Zn) and non-essential elements (Cd, Li, Pb, Sr, Ti, Tl, and Hg). We compared inorganic element concentrations in live and dead olive ridleys from the arribada beach "La Escobilla" located on the Pacific coast of southeastern Mexico…

Transgenerational metabolic disorders and reproduction defects induced by benzo[a]pyrene in *Xenopus tropicalis*

Authors: Usal M, Veyrenc S, Darracq-Ghitalla-Ciock M, Regnault C, Sroda S, Fini JB, Canlet C, Tremblay-Franco M, Raveton M, Reynaud

Source: ENVIRONMENTAL POLLUTION 269:116109, 2021, DOI: 10.1016/j.envpol.2020.116109

Abstract: Metabolic disorders induced by endocrine disruptors (ED) may contribute to amphibian population declines but no transgenerational studies have evaluated this hypothesis. Here we show that *Xenopus tropicalis*, exposed from the tadpole stage, to the ED benzo[a]pyrene (BaP, 50 ng.L-1) produced F2 progeny with delayed metamorphosis and sexual maturity. At the adult stage, F2-BaP females displayed fatty liver with inflammation, tissue disorganization and metabolomic and transcriptomic signatures typical of nonalcoholic steato-hepatitis (NASH). This phenotype, similar to that observed in F0 and F1 females, was accompanied by a pancreatic insulin secretory defect...

How diatom-, invertebrate- and fish-based diagnostic tools can support the ecological assessment of rivers in a multi-pressure context: Temporal trends over the past two decades in France

Authors: Alric B, Dezerald O, Meyer A, Billoir E, Coulaud R, Larras F, Mondy CP, Usseglio-Polatera P

Source: SCIENCE OF THE TOTAL ENVIRONMENT 762:143915, 2021, DOI: 10.1016/j.scitotenv.2020.143915

Abstract: The degradation of aquatic ecosystems, induced by worldwide intensification in the use of both land and aquatic resources, has highlighted the critical need for innovative methods allowing an objective quantification and ranking of anthropogenic pressure effects on aquatic organisms. Such diagnostic tools have a great potential for defining robust management responses to anthropogenic pressures. Our objective was to explore how the outputs of three diagnostic tools (based on benthic diatoms, macroinvertebrates and fishes) could be combined to (i) disentangle the temporal effects of multiple pressures over two decades and (ii) provide policy-relevant information for stream managers and decision makers…

H-1-NMR metabolomics profiling of zebra mussel (*Dreissena polymorpha*): A field-scale monitoring tool in ecotoxicological studies

Authors: Hani YMI, Prud'Homme SM, Nuzillard JM, Bonnard I, Robert C, Nott K, Ronkart S, Dedourge-Geffard O, Geffard A

Source: ENVIRONMENTAL POLLUTION 270:116048, 2021, DOI: 10.1016/j.envpol.2020.116048

Abstract: Biomonitoring of aquatic environments requires new tools to characterize the effects of pollutants on living organisms. Zebra mussels (*Dreissena polymorpha*) from the same site in north-eastern France were caged for two months, upstream and downstream of three wastewater treatment plants (WWTPs) in the international watershed of the Meuse (Charleville-Mezieres "CM" in France, Namur "Nam" and Charleroi "Cr" in Belgium). The aim was to test H-1-NMR metabolomics for the assessment of water bodies' quality...

Efficient models for predicting durum wheat grain Cd conformity using soil variables and cultivars

Authors: Nguyen C, Roucou A, Grignon G, Cornu JY, Meleard B

Source: JOURNAL OF HAZARDOUS MATERIALS 401:123131, 2021, DOI: 10.1016/j.jhazmat.2020.123131

Abstract: Contamination of durum wheat grain by cadmium (Cd) threatens food safety and is of increasing concern because regulations concerning Cd are becoming stricter due to its toxicity. This work aimed at using soil variables and cultivar types to build models to predict whether durum wheat grain Cd will conform with current and possibly lower regulatory thresholds…

How to account for the uncertainty from standard toxicity tests in species sensitivity distributions: An example in non-target plants

Authors: Charles S, Wu D, Ducrot V

Source: PLOS ONE 16(1):e0245071, 2021, DOI: 10.1371/journal.pone.0245071

Abstract: This research proposes new perspectives accounting for the uncertainty on 50% effective rates (ER50) as interval input for species sensitivity distribution (SSD) analyses and evaluating how to include this uncertainty may influence the 5% Hazard Rate (HR5) estimation. We explored various endpoints (survival, emergence, shoot-dry-weight) for non-target plants from seven standard greenhouse studies that used different experimental approaches (vegetative vigour vs. seedling emergence) and applied seven herbicides at different growth stages…

How lasting are the effects of pesticides on earwigs? A study

based on energy metabolism, body weight and morphometry in two generations of *Forficula auricularia* from apple orchards

Authors: Le Navenant A, Brouchoud C, Capowiez Y, Rault M, Suchail S

Source: SCIENCE OF THE TOTAL ENVIRONMENT 758:143604, 2021, DOI: 10.1016/j.scitotenv.2020.143604

Abstract: Widespread use of pesticides to control pests is the dominant system in conventional apple orchards. To avoid adverse side effects, there is a growing interest in promoting alternative methods including biological control based on the use of natural enemies. The European earwig *Forficula auricularia* L. (Dermaptera: Forficuidae) is an effective predator in apple orchards. Pesticide pressure has been shown to divert energy resources which could have a negative impact on life history traits. In this study we assessed (i) whether variations in pesticide exposure could differentially impact energy reserves, body weight and morphometric parameters of F. auricularia, and (ii) whether these effects persist into the next generation reared under optimal conditions…

From bioavailability to risk assessment of polluted soil using snails: link between excess transfer and inhibition of sexual maturation

Authors: Louzon M, Devalloir Q, Gimbert F, Pauget B, Rieffel D, de Vaufleury A

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH Early Access, 2021, DOI: 10.1007/s11356-020 11556-8

Abstract: An accurate assessment of the environmental risk of soils contaminated by metal(loid)s (MEs) requires quantifying exposure and knowing the toxicity of contaminants transferred to biota. For this purpose, two indices have been developed with the bioindicator Cantareus aspersus to assess exposure (SET: sum of the excess of transfer) and risk (ERITME: evaluation of the risk of the transferred metal elements) of multi-contaminated soils…

The considerable progress of environmental health

Author: Levi Y

Source: BULLETIN DE L ACADEMIE NATIONALE DE MEDECINE 204(9):1061-1068, 2020, DOI: 10.1016/j.banm.2020.02.011

Abstract: Environmental health is not the health of the environment but deals with the impacts of the quality of the environment on public health. The relationships between environmental hazards (physical, chemical, biological) and human diseases are much better revealed, described and quantified and are of major importance…

Water quality of the Meuse watershed: Assessment using a multi-biomarker approach with caged three-spined stickleback (*Gasterosteus aculeatus* L.)

Authors: Catteau A, Bado-Nilles A, Beaudouin R, Tebby C, Joachim S, Palluel O, Turies C, Chretien N, Nott K, Ronkart S, Geffard A, Porcher JM

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 208:111407, 2021, DOI: 10.1016/j.ecoenv.2020.111407

Abstract: The use of a multi-biomarker approach with three-spined sticklebacks (*Gasterosteus aculeatus*) through an active biomonitoring strategy appears to be a promising tool in water quality assessment. The present work proposes to assess the efficiency of these tools in the discrimination of some sites in a large scale on the Meuse basin in Europe…

Screening and metabolic potential of fungal strains isolated from contaminated soil and sediment in the polychlorinated biphenyl degradation

Authors: Germain J, Raveton M, Binet MN, Mouhamadou B

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 208:111703, 2021, DOI: 10.1016/j.ecoenv.2020.111703

Abstract: Polychlorinated biphenyls (PCBs) are widespread persistent pollutants deleterious for environment and very dangerous for human kind. As the bioremediation of PCB polluted sites by model white-rot fungi is still unsatisfactory, the use of efficient native strains which have the natural capacity to develop on polluted sites may constitute a relevant alternative strategy. In this study, we isolated 12 fungal strains from PCB contaminated soil and sediment…

Macrophyte Potential to Treat Leachate Contaminated with Wood Preservatives: Plant Tolerance and Bioaccumulation Capacity

Authors: Demers E, Koiv-Vainik M, Yavari S, Mench M, Marchand L, Vincent J, Fredette C, Comeau Y, Brisson J

Source: PLANTS-BASEL 9(12):1774, 2020, DOI: 10.3390/plants9121774

Abstract: Pentachlorophenol and chromated copper arsenate (CCA) have been used worldwide as wood preservatives, but these compounds can toxify ecosystems when they leach into the soil and water. This study aimed to evaluate the capacity of four treatment wetland macrophytes, *Phalaris arundinacea*, *Typha angustifolia*, and two subspecies of *Phragmites australis*, to tolerate and treat leachates containing wood preservatives…

Long-term and large-scale releases of Trichogramma promote pesticide decrease in maize in northeastern China

Authors: Huang NX, Jaworski CC, Desneux N, Zhang F, Yang PY, Wang S

Source: ENTOMOLOGIA GENERALIS 40(4):331-335, 2020, DOI: 10.1127/entomologia/2020/0994

Abstract: The Asian corn borer, *Ostrinia furnacalis*, is one of the most important pests of corn crops in Northern China. From 2004 to 2015, a public financial support to biological control of the corn borer resulted in a significant increase in the cultivated area treated with Trichogramma dendrolimi parasitoid applications in corn field in the Jilin Province, in northeastern China. In the present study, we analyzed the impact of these parasitoid releases, from 2000 to 2015 in the Jilin province, on the control of the corn borer as well as on pesticide use...

Species-specific Cd-detoxification mechanisms in lumbricid earthworms Eisenia andrei, Eisenia fetida and their hybrids

Authors: Jaskulak M, Rorat A, Kurianska-Piatek L, Hofman S, Bigaj J, Vandenbulcke F, Plytycz B

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 208:111425, 2021, DOI: 10.1016/j.ecoenv.2020.111425

Abstract: Hermaphroditic lumbricid *Eisenia* sp. earthworms are ubiquitous and highly resistant to a variety of environmental stressors, including heavy metals. Among the progeny of laboratory mated inter-specific pairs of *Eisenia fetida* (Ea) and Eisenia andrei (Ef) there are fertile Ha hybrids derived from Ea ova fertilized by Ef spermatozoa and very rare sterile Hf hybrids from Ef ova fertilized by Ea spermatozoa.

Water-level fluctuation enhances sediment and trace metal mobility in lake littoral

Authors: Lecrivain N, Clement B, Dabrin A, Seigle-Ferrand J, Bouffard D, Naffrechoux E, Frossard V

Source: CHEMOSPHERE 264(2):128451, 2021, DOI: 10.1016/j.chemosphere.2020.128451

Abstract: Water-level fluctuation (WLF) is a widespread management action in lakes and reservoirs whose impacts on contaminant fate have seldom been investigated. We used near shore hourly measurements (n = 2122) of turbidity (contaminant proxy) and water velocity (sediment resuspension proxy) to track high-frequency contaminant dynamics during a 0.6 m change in water level observed in autumn 2017 in a large French lake…

Using the ecosystem engineer concept to test the functional effects of a decrease in earthworm abundance due to an historic metal pollution gradient

Authors: Capowiez Y, Leveque T, Pelosi C, Capowiez L, Mazzia C, Schreck E, Dumat C

Source: APPLIED SOIL ECOLOGY 158:103816, 2021, DOI: 10.1016/j.apsoil.2020.103816

Abstract: In a companion study, carried out in a fallow meadow close to a lead recycling factory, we showed that earthworms were absent in the first 20 m and then gradually increased in abundance from 30 to 110 m from the factory. Here we assessed in the same meadow whether these differences in earthworm abundance were associated with the loss of physical soil properties…

Dose-dependent genomic DNA hypermethylation and mitochondrial DNA damage in Japanese tree frogs sampled in the Fukushima Daiichi area

Authors: Gombeau K, Bonzom JM, Cavalie I, Camilleri V, Orjollet D, Dubourg N, Beaugelin-Seiller K, Bourdineaud JP, Lengagne T, Armant O, Adam-Guillermin C

Source: JOURNAL OF ENVIRONMENTAL RADIOACTIVITY 225:106429, 2020, DOI: 10.1016/j.jenvrad.2020.106429

Abstract: The long-term consequences of the nuclear disaster at the Fukushima Daiichi Nuclear Power Plant (FDNPP) that occurred on March 2011, have been scarcely studied on wildlife. We sampled Japanese tree frogs (*Dryophytes japonicus*), in a 50 km area around the FDNPP to test for an increase of DNA damages and variation of DNA methylation level…

Diffusive gradients in thin films (DGT): A suitable tool for metals/metalloids monitoring in continental waterbodies at the large network scale

Authors: Rougerie J, de Barros RM, Buzier R, Devillers D, Fondaneche P, Lissalde S, Leblanc J, Saut M, Rebillard JP, Mazzella N, Guibaud G

Source: SCIENCE OF THE TOTAL ENVIRONMENT 754:142147, 2021, DOI: 10.1016/j.scitotenv.2020.142147

Abstract: The contribution of Diffusive Gradients in Thin films (DGT) passive sampling to continental water quality monitoring was assessed in a real measurement network (6 sampling campaigns, 17 stations). Ten metals/metalloids (Al, Zn, Ni, Cd, Cu, Pb, Cr, As, Se and Sb) were studied using the control laboratory's working conditions with grab and DGT passive sampling. The DGT field deployments were robust, with a 3% sampler loss rate and a <65% average relative deviation between duplicates... (C) 2020 Elsevier B.V. All rights reserved.

Cellular and molecular complementary immune stress markers for the model species *Dreissena polymorpha*

Authors: Le Guernic A, Geffard A, Rioult D, Bigot-Clivot A, Lepretre M, Ladeiro MP

Source: FISH & SHELLFISH IMMUNOLOGY 107:452-462, Part: B, 2020, DOI: 10.1016/j.fsi.2020.10.027

Abstract: This study aimed to combine cellular and molecular analyses for better detail the effects of various stresses on a sentinel species of freshwater invertebrate. For this purpose, the hemocytes of the zebra mussel, *Dreissena polymorpha*, were exposed to different stresses at two different intensities, high or low: chemical (cadmium and ionomycin), physical (ultraviolet B), or biological ones (*Cryptosporidium parvum* and *Toxoplasma gondii*). After exposure, flow cytometry and droplet digital PCR analyses were performed on the same pools of hemocytes. Several responses related to necrosis, apoptosis, phagocytosis, production of nitric oxide and expression level of several genes related to the antioxidant, detoxification and immune systems were evaluated…

Uptake, tissue distribution and toxicological effects of environmental microplastics in early juvenile fish *Dicentrarchus labrax*

Authors: Zitouni N, Bousserrhine N, Missawi O, Boughattas I, Chevre N, Santos R, Belbekhouche S, Alphonse V, Tisserand F, Balmassiere L, Dos Santos SP, Mokni M, Guerbej H, Banni M

Source: JOURNAL OF HAZARDOUS MATERIALS 403:124055, 2021, DOI: 10.1016/j.jhazmat.2020.124055

Abstract: As the smallest environmental microplastics (EMPs), even at nanoscale, are increasingly present in the environment, their availability and physical and chemical effects on marine organisms are poorly documented. In the present study, we primarily investigated the uptake and accumulation of a mixture of environmental micro plastics (EMPs) obtained during an artificial degradation process in early-juvenile sea bass (*Dicentrarchus labrax*)…

Modelling daily and hourly loads of pharmaceuticals in urban wastewater

Authors: Pouzol T, Levi Y, Bertrand-Krajewski JL

Source: INTERNATIONAL JOURNAL OF HYGIENE AND ENVIRONMENTAL HEALTH 229:113552, 2020, DOI: 10.1016/j.ijheh.2020.113552

Abstract: Pharmaceuticals are known contaminants of the environment. Assessing and managing the risk associated to this contamination has become an important field of study in environmental sciences. Accurately sampling and measuring pharmaceuticals concentrations in wastewater or in the environment is still costly and difficult. Thus only a few studies have looked at the temporal variability of the concentrations. In parallel, models have been proposed to predict the occurrence of pharmaceuticals. They usually assume that the loads of pharmaceuticals entering a wastewater treatment plant (WWTP) are proportional to the pharmaceuticals sales…

The necessity of investigating a freshwater-marine continuum using a mesocosm approach in nanosafety: The case study of TiO2 MNM-based photocatalytic cement

Authors: Chatel A, Auffan M, Perrein-Ettajani H, Brousset L, Metais I, Chaurand P, Mouloud M, Clavaguera S, Gandolfo Y, Bruneau M, Masion A, Thiery A, Rose J, Mouneyrac C

Source: NANOIMPACT 20:100254, 2020, DOI: 10.1016/j.impact.2020.100254

Abstract: Production of Manufactured Nanomaterials (MNMs) has increased extensively due to economic interest in the current years. However, this widespread use raises concern about their impact on human and environment. Current efforts are made, both at national and international levels to help developing safer MNMs

https://doi.org/10.15454/TZR0-5997

in the market. In order to assess hazards of MNMs, it is important to take into account exposome parameters in order to link fate and behavior of MNMs to their potential toxicity. In that context, the aim of this study was to investigate the effects of TiO2 MNMs-based cement at different levels of its life cycle (TiO2MNMs, cement containing TiO2 MNMs) on two exposure mesocosm scenarios mimicking: marine conditions using the bivalve *Scrobicularia plana* and freshwater conditions using the gastropod *Planorbarius corneus* for 28 days, allowing measurements of physical-chemical parameters throughout the duration of the exposure…

Contamination issues as a challenge in quality control and quality assurance in microplastics analytics

Authors: Prata JC, Reis V, da Costa JP, Mouneyrac C, Duarte AC, Rocha-Santos T

Source: JOURNAL OF HAZARDOUS MATERIALS 403:123660, 2021, DOI: 10.1016/j.jhazmat.2020.123660

Abstract: Microplastics are widely distributed environmental contaminants. To understand their impacts on the environment and health, more high-quality results are needed. Since microplastics are present in every environment, including indoor air, proper precautions must be adopted in order to prevent contamination of samples and overestimation of environmental concentrations. Thus, to guarantee a proper quality of results, researchers must adopt strict contamination control measures. This review was conducted to understand current contamination control practices. A total of 50 studies published in 2019 were reviewed, including sampling of biota, air, soil, sediment, freshwater and saltwater, regarding 10 contamination control parameters…

OUVRAGES / RAPPORTS / ACTES DE CONGRES

Contamination of Water 1st Edition: Health Risk Assessment and Treatment Strategies

Editors: Arif Ahamad Sharf Siddiqui Pardeep Singh

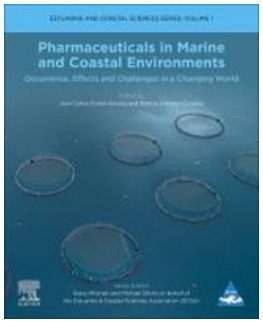
Academic press, 1st August 2021, 350 p, **ISBN:** 9780128240588

Water containing significant amounts of inorganic and organic contaminants can have serious environmental consequences and serious health implications when ingested. *Contamination of Water: Health Risk Assessment and Treatment Strategies* takes an interconnected look at the various pollutants, the source of contamination, the effects of contamination on aquatic ecosystems and human health, and what the potential mitigation strategies are. The book begins by examining the sources of potential contamination. This includes considering the current scenario of dyes, heavy metals, pesticides and oils contamination in water as well as the regions impacted due to industrialization, mining, or urbanization. The book goes on to analyze the various methods of water contamination, assess health risk and adverse effects on those impacted, and concludes with exploration of efficient low-cost treatment technologies that remove toxic pollutants from the water. *Contamination of Water: Health Risk Assessment and Treatment Strategies* incorporates both theoretical and practical information that will be useful for researchers, professors, graduate students, and professionals working on water contamination, environmental and health impacts, and the management and treatment of water resources.

Pharmaceuticals in Marine and Coastal Environments, Volume 1 - 1st Edition: Occurrence, Effects and

https://doi.org/10.15454/TZR0-5997

Challenges in a Changing World



Editors: Juan Duran-Alvarez Blanca Jimenez-Cisneros

Elsevier, 1st June 2021, 800 p., **ISBN:** 9780081029718

Pharmaceuticals in Marine and Coastal Environments: Occurrence, Effects and Challenges in a Changing World is divided into three sections that address a) coastal areas as the main entrance of pharmaceuticals into the ocean, b) the occurrence and distribution of pharmaceuticals in the environmental compartments of the ocean media, and c) the effects that such pollutants may cause to the exposed marine organisms. With its comprehensive discussions, the book provides a wide depiction of the current state-of-the-art on these topics in an effort to open new sources of investigation and find suitable solutions.

Accès au document

REVUE DE PRESSE / Associations

119 députés européens, français et sénateurs français dénoncent les failles dans l'évaluation des pesticides et exigent que l'EFSA change ses pratiques toxiques

Générations futures 25/02/21

Fin octobre 2020, une étude scientifique démontre la présence de produits toxiques dans 14 pesticides, non déclarés sur les étiquettes. Dès le 1er décembre, 9 associations2 portent plainte contre x et lancent une campagne citoyenne "Secrets Toxiques" qui mobilise plus de 14 000 signatures. Leur combat ? Remettre en question le système d'évaluation actuel et exiger le retrait de ces pesticides du marché en France et en Europe. Ce 25 février, la coalition d'associations envoie, avec le soutien de 119 députés européens, français et sénateurs, un premier courrier à l'EFSA, chargée de l'évaluation des risques dans le domaine des denrées alimentaires. [...]

Accès au document

Les pesticides dans les sols : rémanence et impact sur les systèmes mycorhiziens

Générations futures 25/02/21

[...] L'utilisation intensive et généralisée des pesticides soulève des préoccupations environnementales et sanitaires en raison de la contamination des ressources naturelles. En effet, lors de leur application, seule une fraction des pesticides appliqués atteint ses objectifs, le reste (30 à 50 %) finissant à la surface du sol et se dispersant ensuite par le biais de plusieurs processus abiotiques, notamment la volatilisation, l'érosion éolienne, le lessivage ou le ruissellement.

[...] Dans les systèmes terrestres, ils [les pesticides] constituent également une menace pour les micro-organismes du sol, qui sont à l'origine de processus pédologiques essentiels tels que le cycle du carbone et des nutriments. Comme la vie du sol fournit un large éventail de services écosystémiques, ces effets délétères des pesticides pourraient potentiellement affecter la santé du sol et donc la production agricole. [...]

Accès au document

Le Roundup impacte les fonctionnalités du microbiote intestinal chez des espèces non cibles

Générations futures 24/02/21

Le désherbant Roundup, développé par Monsanto (Bayer) dans les années 1970, est à ce jour l'herbicide non sélectif le plus utilisé en volume (6 milliards de kg sont appliqués dans le monde chaque année) et également un des pesticides que l'on retrouve le plus souvent dans les denrées alimentaires. La recherche autour du glyphosate,

le principe actif du Roundup, est très controversée. [...]

Étant donné que les effets des produits chimiques toxiques sur le microbiome intestinal ne sont pas systématiquement testés dans les tests préalables à la mise sur le marché, des inquiétudes ont été soulevées quant aux impacts potentiels des contaminants environnementaux, tels que le glyphosate. Il a alors été émis l'hypothèse selon laquelle le glyphosate pourrait contribuer au développement et à la progression de diverses maladies humaines en générant une pression de sélection sur certaines communautés microbiennes dans le microbiome intestinal humain.

Pour combler cette lacune dans les connaissances sur la toxicologie du glyphosate, deux études [...] publiées [...] décrivent des preuves de plus en plus nombreuses montrant que le désherbant a un effet néfaste indirect sur les vertébrés et les invertébrés via le microbiote intestinal. [...]

Accès au document

Breast Cancer Rates Higher Among African American Women from Disproportionate Chemical Exposure

Beyond Pesticides, February 25, 2021

A University of Michigan study finds a link between elevated rates of breast cancer incidents and chemical exposure from pesticides among African American women. Breast cancer is the most common cancer among women, causing the second most cancer-related deaths in the United States. However, breast cancer outcomes differ significantly among women of various races/ethnicities, with African American women being 40 percent more likely to die from breast cancer than women of any other race. [...]

Accès au document

Glyphosate and Other Weed Killers Create Antibiotic Resistant Bacteria in Agricultural Soils

Beyond Pesticides, February 24, 2021

Soil sprayed with weedkillers glyphosate, glufosinate, or dicamba are likely to contain higher amounts of antibiotic resistant bacteria, according to research published earlier this month in the journal Molecular Biology and Evolution. Each year in the United States, at least 2 million people develop an antibiotic resistant infection, and over 23,000 die. Authors of the study say widespread herbicide use is likely playing a role. "Our results suggest that the use of herbicides could indirectly drive antibiotic resistance evolution in agricultural soil microbiomes, which are repeatedly exposed to herbicides during weed control," said Ville Friman, PhD of the University of York in the United Kingdom. [...]

Accès au document

"Une seule santé" : la conférence en 3 questions

FNE 22/02/21

Le 17 mars 2021 de déroulera à l'École vétérinaire de Lyon VetAgroSup une conférence nationale, « Une seule santé, en pratique », co-organisée par France Nature Environnement, Humanité et Biodiversité, les médecins de l'Association santé environnement France (ASEF), les vétérinaires de la Fédération des syndicats vétérinaires français (FSVF) et la Fondation pour la recherche sur le biodiversité (FRB). Lylian Le Goff, médecin retraité, militant de Bretagne vivante et de FNE-Bretagne, membre du réseau santé environnement nous en dit plus en réponse à trois questions. [...]

Accès au document

Pesticides, OGM, Perturbateur endocriniens : approche transdisciplinaire pour un état des lieux et une

https://doi.org/10.15454/TZR0-5997

réforme en profondeur de l'expertise réglementaire dans le domaine de la toxicologie et de la sécurité environnementales

CRIIGEN 18/02/21

Le CRIIGEN vient de publier, dans une revue internationale à comité de lecture, une étude transdisciplinaire dressant un état des lieux des carences de l'expertise règlementaire [dans le domaine de la toxicologie et de la sécurité environnementales], et formulant une série de propositions concrètes pour les surmonter. Ces propositions concernent tant l'organisation de l'évaluation que les processus et protocoles d'évaluation eux-mêmes.

Accès au document

Rapport de la FNH sur les pesticides : Générations Futures réagit !

Générations futures 12/02/21

Générations Futures dénonce une mauvaise interprétation des données par certains journalistes et hommes politiques concernant le rapport récemment publié de la Fondation Nicolas Hulot (FNH) ! [...]

Accès au document

Exclusivité : des terrains de jeux contaminés par des dérives de pesticides

Générations futures 10/02/21

Une nouvelle étude scientifique montre que des terrains de jeux pour enfants ont été contaminés par des dérives de pesticides dans la province italienne du Tyrol du Sud.

32 pesticides différents ont été détectés sur les terrains de jeux pour enfants. L'équipe internationale de scientifiques d'Italie, d'Autriche et d'Allemagne conseille vivement de prendre des mesures pour la santé publique. [...]

Accès au document

Journée mondiale contre le Cancer : La lutte contre le cancer passe aussi par un environnement sain

Michèle-Rivasi 04/02/21

[…] La Commission européenne a publié hier son plan européen pour vaincre le cancer. Déclaration de Michèle RIVASI, membre de la Commission « environnement, santé publique et sécurité alimentaire » et de la commission spéciale sur la lutte contre le cancer [...]

« La meilleure thérapie contre le cancer est d'abord de ne pas en développer. Rappelons que 40 % des cancers sont évitables. L'augmentation des tumeurs cérébrales nous interpelle, celle des cancers du poumon non tabagiques également tout comme la pollution de l'air ou de l'eau. Il faut donc garantir un environnement sain pour tous et toutes, car l'origine des cancers peut se trouver prioritairement dans l'environnement naturel, surtout alimentaire. L'Europe porte cette responsabilité et doit rationaliser son combat contre les pollutions chimiques, les perturbateurs endocriniens et face aux ondes électromagnétiques, classées cancérigènes possibles par l'OMS. [...]

Accès au document

Mes ambitions pour la stratégie "Farm to Fork"

Michèle-Rivasi 04/02/21

[...]

La stratégie "de la ferme à la table" est au cœur du Green Deal européen qui vise à rendre les systèmes alimentaires équitables, sains et respectueux de l'environnement. Il est actuellement en cours de discussion au sein des commissions ENVI et AGRI. Voici mes points prioritaires :

[...] 3 Je souhaite qu'il y ait une révision de la directive sur l'utilisation durable des pesticides et les objectifs de réduction des pesticides, des engrais et des antibiotiques qui assure l'importance de poursuivre ces objectifs par des approches globales et circulaires comme les pratiques agroécologiques. Je demande que la directive inclut des objectifs obligatoires de

réduction des pesticides à l'échelle de l'UE (vers une élimination complète des pesticides synthétiques d'ici 2035). D'autre part, chaque État membre devra établir des objectifs de réduction quantitatifs solides, accompagnés de mesures de soutien bien définies garantissant la responsabilité à tous les niveaux afin de contribuer à la réalisation de ces objectifs.

4 Je suis en faveur d'une réduction de la dépendance du secteur de l'agriculture alimentaire à l'égard des intrants, notamment en soutenant un objectif de -50 % d'utilisation des pesticides en 2025 (-80 % d'ici 2030 et suppression progressive de l'utilisation des pesticides chimiques d'ici 2035). La "boîte à outils" de l'agriculteur devrait être fondée sur des mesures préventives, des pratiques agronomiques ainsi que des substances chimiques et des solutions de rechange à celles-ci, telles que la lutte biologique. De plus, je soutiens que l'autorisation de pesticides naturels à faible risque peut assurer un secteur agricole durable dans l'Union européenne. [...]

Accès au document

Aggressive Cancer in Sea Lions Linked to Ocean Pollution and Herpesvirus Precursor, Implications for Human Health

Beyond Pesticides, February 11, 2021

California sea lions (Zalophus californianus) are experiencing high rates of urogenital carcinoma (UGC) cancer incidences from the combined effect of toxic "legacy" pesticides like DDT and the viral infection Otarine herpesvirus-1 (OtHV1), according to a new study published in Frontiers in Marine Science. Previous research documents the role herpesvirus infection, genotype, and organochlorine pesticides play in sea lion cancer development. However, synergism (collaboration) between viral infection and toxic chemical exposure increases cancer development odds. [...]

Accès au document

La FNSEA dénonce « l'impasse sur les progrès »

Agri-mutuel 10/02/21

Après la publication du rapport de la Fondation Nicolas Hulot, dénonçant des financements insuffisants pour permettre la transition agricole et la sortie des produits phytosanitaires, la FNSEA regrette une simplification excessive, et rappelle que les progrès effectués ces dernières années sont réels. [...]

Le syndicat rappelle ainsi d'autres résultats : la baisse de 36 % de 2010 à 2019 de la quantité totale de substances actives de produits conventionnels, le retrait de 75 % des substances actives depuis 1990, l'augmentation des ventes de produits de biocontrôle de + 85 % en moyenne triennale, entre 2009-2011 et 2016-2018, l'augmentation de + 52 % du nombre d'exploitations certifiées HVE au premier semestre 2020. La profession s'est également mobilisée à travers le Contrat de solutions, qui liste les alternatives aux produits phytosanitaires. [...]

Accès au document

Persistent Organic Pollutants like Organochlorine Pesticides Pose Health Risk to Rare Giant Panda Subspecies

Beyond Pesticides, January 28, 2021

Persistent organic pollutants (POPs)—including banned pesticides—present a health risk to the endangered Qinling Panda (Ailuropoda melanoleuca qinlingensis), the rarest subspecies of giant pandas, according to a new Chinese study published in Environmental Pollution. Organochlorine compounds (OCs), such as organochlorine pesticides (OCPs) and polychlorinated biphenyls (PCBs), are well-known persistent organic pollutants. They were banned by the Stockholm Convention treaty in 2001 and are primary pollutants of concern (UNEP, 2009) because of their persistence, toxicity, and adverse effects on environmental and biological health. [...]

Accès au document

https://doi.org/10.15454/TZR0-5997

Beyond Pesticides Sues Sargento Foods for Mislabeling Antibiotic Use as Threat of Resistance Threat Looms

Beyond Pesticides, January 26, 2021

As the world moves toward another pandemic associated with antibiotic resistance, Beyond Pesticides sued Sargento Foods, Inc. for misleading its customers with product label claims of "no antibiotics," which is false according to the complaint. The lawsuit alleges that Sargento's cheese products are made with milk from cows raised with antibiotics and that antibiotics can be found in some of the company's finished food. [...]

Accès au document

Arrêtés anti-phytos interdits par le Conseil d'État : les maires n'étaient que la chaire à canon des ONG

Alerte-environnement 18/01/21

Le Conseil d'État a rendu le 31 décembre 2020 une décision qui fera jurisprudence : il interdit aux maires de prendre des arrêtés antiphytos sur le territoire de leur commune. C'est donc la fin d'un long feuilleton juridique qui a démarré au printemps 2019, lorsque le maire de Langouët (Ille-et-Vilaine), Daniel Cueff, a pris un arrêté interdisant l'usage des pesticides à moins de 150 m de tout bâtiment d'habitation ou professionnel. Cette décision avait été suspendue en août 2019 par le préfet.

Félicitons-nous de ce retour à la raison décidé, sans recours possible, par notre cour suprême administrative. Mais celui-ci ne doit pas nous faire croire que la guerre est gagnée. Il ne s'agissait que d'une bataille. Car ces arrêtés n'avaient rien de spontanés. Ces maires, et particulièrement le premier édile de Langouët, n'étaient que des pions envoyés par des ONG dont cet arrêt du Conseil d'Etat ne changera pas les agendas. [...]

Accès au document

Les nanomatériaux au secours de nos eaux

FNE 11/01/21

[...] Les nanomatériaux, et plus globalement les nanotechnologies, offrent aussi de nouvelles solutions pour le traitement des eaux, notamment vis-à-vis de molécules et de composés que nous ne savions pas éliminer jusqu'à présent.

Ils possèdent en effet de remarquables propriétés d'adsorption, c'est-à-dire qu'ils sont capables de fixer à leur surface des atomes, des ions ou des molécules : cette propriété les rend particulièrement précieux pour débarrasser les eaux de nombreux polluants. [...]

Accès au document

Millions of People Drinking Groundwater with Pesticides or Pesticide Degradates

Beyond Pesticides, January 15, 2021

A study of groundwater that feeds public drinking water supply finds pesticides in 41% of supply wells (and a handful of freshwater springs). Two-thirds of that 41% contain pesticide compounds per se, and one-third contain pesticide degradates — compounds resulting from biotic (or abiotic) transformation of pesticides into other compounds. There is considerable ink (digital and actual) covering the health and environmental impacts of pesticide exposures, and reporting on the issue of pesticide migration into groundwater and waterways. Beyond Pesticides maintains that organic practices in land management, and especially in agriculture, are the solution to the contamination of our waterways and groundwater. Such practices, widely adopted, would have enormous salutary effects on human health and the health of ecosystems and their inhabitants. [...]

Accès au document

https://doi.org/10.15454/TZR0-5997

Label Haute valeur environnementale: Greenwashing de l'agriculture intensive ?

Que Choisir 11/01/21

Une pomme siglée Haute valeur environnementale (HVE), mais traitée par divers pesticides… N'y aurait-il pas un problème ? Le label HVE apparaît depuis quelques années sur des aliments et des vins. Né du Grenelle de l'environnement en 2008 et porté par les ministères de l'Agriculture et de la Transition écologique, il certifie des pratiques agricoles respectueuses de l'environnement. Malgré ce blanc-seing officiel, il se fait régulièrement étriller. Ainsi, les associations France nature environnement (FNE) et Agir pour l'environnement, la Confédération paysanne et le Syndicat des transformateurs et distributeurs bio (Synabio) ont dénoncé, en décembre dernier, une « illusion de transition écologique », le qualifiant de « greenwashing massif » et de « tromperie » pour les consommateurs. [...]

Accès au document

Pesticides and Road Salt: A Toxic Mixture for Aquatic Communities

Beyond Pesticides, January 7, 2021

Insecticides and road salts adversely interact to alter aquatic ecosystems, reducing organism abundance and size, according to a study in the journal Environmental Pollution. Pesticide use is ubiquitous, and contamination in rivers and streams is historically commonplace, containing at least one or more different chemicals. Although road salts can prevent hazardous ice formation during the colder months, the study raises critical issues regarding the adverse interaction between road salts and pervasive environmental pollutants that threaten human, animal, and environmental health and safety. Authors of the study note, "Our results highlight the importance of multiple-stressor research under natural conditions. As human activities continue to imperil freshwater systems, it is vital to move beyond single-stressor experiments that exclude potentially interactive effects of chemical contaminants." [...]

Accès au document

Long-Term Roundup Exposure Found to Harm Keystone Wildlife Species

Beyond Pesticides, January 6, 2021

Long-term exposure to formulated Roundup and glyphosate results in significant harm to wildlife species that form the bottom of aquatic food chains, according to a study published in Microbiome by researchers at University of Birmingham, UK. The water flea Daphnia spp. often functions as a keystone species in lakes and ponds, and because of its ecological importance is frequently used as an indicator species in toxicity tests performed by pesticide regulators. Lead author Luisa Orsini, PhD, notes that most of this testing is flawed by limitations in its scope. [...]

Accès au document

REVUE DE PRESSE / Recherche et Medias

With a pinch of salt: How reliable are existing studies on microplastics in table salt?

EurekAlert! 25/02/21

[...] Microplastics (MPs), plastic particles smaller than a few millimeters, can now be found everywhere, but more so in seawater. As expected, MPs are harmful to both environment and health, although their exact effects are unclear.

To get a better grasp of the extent of the MP problem, it is necessary to quantify how much we are exposed to them. Table salt has been shown to contain MPs, making it an ideal study target to gauge human exposure to MPs. Although many studies have measured the concentration of MPs in different edible salts, each research group used vastly different methodologies of quantification, causing much variability between the results, and calling into question their validity. [...

Accès au document

https://doi.org/10.15454/TZR0-5997

Protective ship coatings as an underestimated source of microplastic pollution

EurekAlert! 23/02/21

Shipping traffic can be a major source of tiny plastic particles floating in the sea, especially out in the open ocean. In a paper published in the scientific journal Environmental Science & Technology, a team of German environmental geochemists based at the University of Oldenburg's Institute of Chemistry and Biology of the Marine Environment and led by Dr Barbara Scholz-Boettcher for the first time provides an overview of microplastics mass distribution in the North Sea. [...]

Accès au document

Pesticide imidacloprid threatens future for key pollinator

Science daily 27/02/21

An insecticide used to control pest infestations on squash and pumpkins significantly hinders the reproduction of ground-nesting bees -- valuable pollinators for many food crops, a new University of Guelph study has revealed.

This first-ever study of pesticide impacts on a ground-nesting bee in a real-world context found female hoary squash bees exposed to imidacloprid dug 85 per cent fewer nests, collected less pollen from crop flowers and produced 89 per cent fewer offspring than unexposed bees. [...]

Accès au document

Produits phytosanitaires dans les vins du Bordelais : une association condamnée

Agri-mutuel 25/02/21

Le tribunal judiciaire de Libourne a condamné jeudi à 125 000 euros de dommages et intérêts une association qui dénonçait la présence, dans des vins certifiés Haute valeur environnementale (HVE), de résidus de produits phytosanitaires, en quantité toutefois basses et conformes.

Le Conseil interprofessionnel du vin de Bordeaux (CIVB) – associé à 25 châteaux, viticulteurs, syndicats d'appellations, négociants – poursuivait au civil pour « dénigrement collectif » Valérie Murat, porte-parole de l'association Alerte aux toxiques, qui lutte en Gironde contre les phytosanitaires en viticulture. [...]

Accès au document

Produits phytosanitaires : des tumeurs cérébrales d'agriculteurs reconnues en maladie professionnelle

Terre-net 24/02/21

C'est encore exceptionnel. Les tumeurs cérébrales de deux agriculteurs morts ont été reconnues en maladie professionnelle, alors que des données épidémiologiques montrent un lien entre ces pathologies rares et l'utilisation de certains produits phytosanitaires. Un soulagement pour les veuves des victimes. [...]

En février 2020, le comité régional de reconnaissance des maladies professionnelles (CRRMP) de Nantes, composé de trois médecins, établit un « lien direct et essentiel » entre la maladie de Constant [éleveur de vaches laitières] et son métier d'agriculteur. « De la littérature scientifique récente, il ressort qu'une telle exposition (aux produits phyto, ndlr) est associée à un sur-risque de développer un gliome cérébral », souligne le comité dans un avis consulté par l'AFP. [...]

Accès au document

Usage des produits phytosanitaires J.-N. Jouzel, sociologue : « Des agriculteurs doivent se saisir de leurs droits »

Terre-net 24/02/21

Les agriculteurs qui développent des pathologies liées aux produits phytosanitaires s'estiment souvent « responsables de leur malheur » et ne demandent pas réparation, explique Jean-Noël Jouzel, sociologue au CNRS, auteur de

https://doi.org/10.15454/TZR0-5997

« Pesticides, comment ignorer ce que l'on sait » (2019, Presses de Sciences Po).

JN Jouzel apporte des réponses aux questions suivantes : a) Pourquoi, malgré les progrès de l'épidémiologie, peu de travailleurs sont-ils reconnus en maladie professionnelle ? b) En dépit de ces nouveaux tableaux [sur les nouvelles pathologies], pourquoi les agriculteurs font-ils peu la démarche ? c) Pourquoi parlez-vous de « savoirs inconfortables » à propos des pathologies liées aux pesticides ? [...]

Accès au document

L'exposition aux produits phytos augmente le risque de leucémie aiguë myéloïde

Agri-mutuel 24/02/21

Un lien statistique a été établi entre l'exposition professionnelle aux produits phytosanitaires et le risque de développer une leucémie aiguë myéloïde, la plus fréquente et la plus grave chez l'adulte, selon une étude du CHRU de Tours, consultée mardi par l'AFP.

Dans cette étude publiée dans Scientific Reports, quatre hématologues tourangeaux ont analysé pendant deux ans les données scientifiques publiées entre 1946 et 2020 dans trois grandes bases de données mondiales. [...]

Accès au document

Microplastic sizes in Hudson-Raritan Estuary and coastal ocean revealed

EurekAlert! 01/03/21

Rutgers scientists for the first time have pinpointed the sizes of microplastics from a highly urbanized estuarine and coastal system with numerous sources of fresh water, including the Hudson River and Raritan River.

Their study of tiny pieces of plastic in the Hudson-Raritan Estuary in New Jersey and New York indicates that stormwater could be an important source of the plastic pollution that plagues oceans, bays, rivers and other waters and threatens aquatic and other life. [...]

Accès au document

Chlordécone : tollé face au possible non-lieu dans la procédure pénale

Actu-environnement 01/03/21

Des milliers de personnes ont manifesté le 27 février à Fort-de-France (Martinique), et plus modestement à Capesterre-Belle-Eau (Guadeloupe), pour s'opposer à un possible non-lieu après la plainte pour empoisonnement déposée en 2006 par des associations de producteurs et de consommateurs guadeloupéens. Ces associations dénonçaient l'utilisation du chlordécone, insecticide organochloré cancérogène, qui a contaminé de manière durable les Antilles françaises et leurs habitants depuis 1972. [...]

Accès au document

Chlordécone : un nouveau plan pour limiter les impacts sanitaires de cette pollution

Actu-environnement 25/02/21

Le Gouvernement a présenté le quatrième plan chlordécone 2021-2027. Il vise à renforcer les mesures de protection des populations contre la pollution à cet insecticide en Guadeloupe et Martinique.

[...] Cet insecticide a été utilisé pendant des décennies contre le charançon du bananier. Près de trente ans après son interdiction, il est omniprésent dans les milieux et dans la chaîne alimentaire. [...]

Accès au document

Substances cachées dans les pesticides : des parlementaires demandent des comptes à l'Efsa

Actu-environnement 25/02/21

https://doi.org/10.15454/TZR0-5997

Cent dix neuf députés et sénateurs français et européens interpellent, dans un courrier, l'Autorité européenne de sécurité des aliments (Efsa) sur la présence de produits toxiques non déclarés et non évalués dans les produits phytosanitaires mis sur le marché. Cette démarche fait suite à la publication d'une étude, fin octobre 2020, montrant la présence de produits toxiques (résidus de pétrole, hydrocarbures polycycliques aromatiques, métaux lourds) non déclarés sur les étiquettes dans 14 pesticides. [...]

Accès au document

Plastiques en mer : un problème de taille (1/2)

Actu-environnement 24/02/21

Aussi bien dans les usages quotidiens que dans les océans, le plastique est omniprésent. Quel que soit sa taille, il pèse sur les écosystèmes. Certaines espèces l'utilisent comme nouvel habitat. Les impacts de cette « plastisphère » posent questions. [...]

Accès au document

Plastiques en mer : un problème de taille (2/2)

Actu-environnement 25/02/21

Ils [Les plastiques] représenteraient ainsi de 50 à 80 % de l'ensemble des déchets retrouvés en mer. Dans l'eau, les plastiques s'érodent, se fragmentent notamment en micro et nanoplastiques. Le suivi de ces processus n'est pas simple et pose la question de leur devenir final. Y compris pour les plastiques biodégradables. [...]

Accès au document

Loi de finances 2021 Tour d'horizon des nouveautés fiscales pouvant concerner les agriculteurs

Terre-Net 17/02/21

La loi de finances 2021 met en place […] trois crédits d'impôts spécifiques. [...]

Crédit d'impôt pour absence d'utilisation de glyphosate : les entreprises agricoles exerçant leur activité principale dans le secteur des cultures pérennes autres que les fourrages ou sur des terres arables hors surfaces en jachère ou sous serres, et déclarant ne pas utiliser de produits phytopharmaceutiques contenant du glyphosate, pourront bénéficier d'un crédit d'impôt de 2 500 € au titre de l'année de déclaration (en 2021 ou 2022). [...]

Accès au document

Glyphosate/Bretagne La FRSEA dénonce la fiabilité douteuse des tests utilisés par les « pisseurs »

Terre-Net 17/02/21

S'appuyant sur l'étude d'un toxicologue, la FRSEA Bretagne a présenté le 16 février des éléments mettant en doute la fiabilité des tests Elisa réalisés par les « pisseurs volontaires » pour mettre en évidence des taux élevés de glyphosate dans les urines. [...]

Accès au document

Néonicotinoïdes : plusieurs recours dirigés contre l'arrêté de réautorisation

Actu-environnement 23/02/21

Sept organisations annoncent déposer des recours devant les tribunaux administratifs de Lyon et de Toulouse contre l'arrêté du 5 février 2021. Par ce texte, les ministres de la Transition écologique et de l'Agriculture ont autorisé l'emploi de semences de betteraves sucrières traitées avec des insecticides néonicotinoïdes en vue de lutter contre la jaunisse induite par la présence de pucerons. [...]

Accès au document

https://doi.org/10.15454/TZR0-5997

Pollution au plomb : Carrières-sous-Poissy réclame la réparation du préjudice écologique

Actu-environnement 18/02/21

Le 10 février la commune de Carrières-sous-Poissy (Yvelines) a déposée une plainte avec constitution de partie civile devant le doyen des juges d'instruction du tribunal judiciaire de Versailles. [...] la commune avait déjà déposé une plainte contre X [...] pour mise en danger d'autrui et atteinte à l'environnement en raison de la pollution des sols au plomb et autres métaux lourds. [...]

Accès au document

Vers une meilleure protection des travailleurs en situation de poly-exposition

Actu-environnement 18/02/21

Assurer une meilleure protection des travailleurs en situation de poly-exposition, c'est-à-dire exposés cumulativement à plusieurs agents chimiques dangereux, ou à l'un de ces agents en même temps qu'un autre risque professionnel. Tel est l'objet d'une disposition de la proposition de loi relative au renforcement de la prévention en santé au travail, qui a été adoptée le 17 février en première lecture par l'Assemblée nationale. Cette disposition, introduite en commission, répond à l'accord...

Accès au document

L'utilisation du glyphosate aux Antilles libère le chlordécone

Actu-environnement 18/02/21

Les risques liés à l'utilisation d'un pesticide ne se limitent pas au danger intrinsèque des substances qui le composent. Une étude associant l'Université Savoie Mont-Blanc, le CNRS, le CEA et le Cirad, publiée le 28 janvier dans la revue Environmental Science & Technology, vient le démontrer à travers les interactions qui peuvent exister entre le glyphosate (herbicide) et le chlordécone (insecticide). [...]

Accès au document

PNPP : trois critères pour accéder à une autorisation simplifiée

Actu-environnement 18/02/21

Le ministère de l'Agriculture met en consultation, du 15 février au 8 mars 2021, le projet d'arrêté approuvant un cahier des charges pour la mise sur le marché et l'utilisation de certaines préparations naturelles peu préoccupantes (PNPP). Il concerne les PNPP composées de substances naturelles à usage biostimulant issues de parties consommables de plantes utilisées en alimentation animale ou humaine. La loi Egalim de 2018 a en effet instauré une procédure d'autorisation simplifiée pour ces...

Accès au document

L'arrêté anti-pesticides du maire de La Montagne déféré à la justice administrative

Actu-environnement 16/02/21

Les services préfectoraux n'aiment pas que les maires jouent avec les frontières de leur pouvoir, expliquait Thomas Dubreuil, avocat spécialisé en droit de l'environnement. Les faits lui donnent raison : le préfet de Loire-Atlantique a décidé de déférer l'arrêté anti-pesticides d'un nouveau genre signé le 11 janvier par le maire de La Montagne, Fabien Gracia. [...]

Accès au document

Réduction des phytosanitaires : comment valoriser les bons résultats des fermes Dephy

Actu-environnement 15/02/21

Depuis plus de dix ans, les fermes Dephy testent de nouveaux itinéraires techniques pour réduire

les traitements phytosanitaires, avec des résultats encourageants. Mais comment changer d'échelle et diffuser au plus grand nombre ces bonnes pratiques ? [...]

Accès au document

Pollution aux particules : la Hongrie condamnée, bientôt au tour de la France ?

Actu-environnement 15/02/21

La Cour de justice de l'Union européenne (CJUE) a condamné la Hongrie pour non-respect de la directive de 2008 sur la qualité de l'air ambiant ; ce pays n'a pas respecté la valeur limite journalière des particules PM10 sur son territoire, et n'a pas fait en sorte que la période de dépassement soit la plus courte possible comme l'y oblige pourtant la directive. [...]

Accès au document

Pesticides néonicotinoïdes : une dérogation et des indemnisations pour la filière de la betterave à sucre

Actu-environnement 15/02/21

Le ministre de l'Agriculture, Julien Denormandie, a réuni les acteurs de la filière betterave-sucre vendredi 5 février. Il s'agissait de faire le point sur les engagements du Gouvernement et de la filière, six mois après le lancement d'un plan d'actions, en parallèle de la dérogation pour l'utilisation de pesticides néonicotinoïdes. L'objectif est de trouver des alternatives à ces produits et de limiter/compenser les pertes liées aux ravageurs. [...]

Accès au document

Facts on the ground: How microplastics in the soil contribute to environmental pollution

EurekAlert! 11/02/21

[...] Scientists from Incheon National University, Korea, headed by Prof. Seung-Kyu Kim, now explore these questions [the accumulation of plastic debris in our environment] in their latest study published in Journal of Hazardous Materials. "Most studies on MPs have focused on the marine environment, but substantial amounts of MPs can be generated in the agricultural environment via weathering and fragmentation of plastic products used in agricultural practices. We hoped to find out the amount of MPs in Korean agricultural soils and how they change according to different agricultural practices and environmental conditions," says Prof. Kim. [...]

Accès au document

Plant-based magnetic nanoparticles with antifungal properties

EurekAlert! 10/02/21

A team of researchers from Immanuel Kant Baltic Federal University obtained magnetic nanoparticles using sweet flag (Acorus calamus). Both the roots and the leaves of this plant have antioxidant, antimicrobial, and insecticide properties. The extract of sweet flag was used as a non-toxic reagent for the manufacture of coated particles. The authors of the work also showed the efficiency of the new nanoparticles against several types of pathogenic fungi that damage cultivated plants. [...]

Accès au document

Researchers find peptide that treats, prevents killer citrus disease

EurekAlert! 08/02/21

New research affirms a unique peptide found in an Australian plant can destroy the No. 1 killer of citrus trees worldwide and help prevent infection.

Huanglongbing, HLB, or citrus greening [...] has wiped out citrus orchards across the globe, causing billions in annual production losses. [...]

However, new UC Riverside research shows that a naturally occurring peptide found in HLB-tolerant

citrus relatives, such as Australian finger lime, can not only kill the bacteria that causes the disease, it can also activate the plant's own immune system to inhibit new HLB infection. Few treatments can do both. [...]

Accès au document

Songbirds exposed to lead-contaminated water show telltale signs about human impacts

EurekAlert! 04/02/21

[…] Sentinel species, such as birds, are good indicators of environmental health, and they can send subtle warning signs that humans may be in danger next.

In an experimental exposure study, Kendra Sewall, an associate professor of biological sciences in the College of Science, […] have found that lead levels like those reported in Flint, Michigan, can interfere with the neural mechanisms of vocal development of songbirds and affect mate attraction. [...]

Accès au document

Recommendations for regional action to combat marine plastic pollution

EurekAlert! 11/02/21

Millions of tonnes of plastic waste find their way into the ocean every year. A team of researchers from the Institute for Advanced Sustainability Studies (IASS) in Potsdam has investigated the role of regional ocean governance in the fight against marine plastic pollution, highlighting why regional marine governance should be further strengthened as negotiations for a new global agreement continue. [...]

Accès au document

Produits phytosanitaires : des financements publics trop faibles pour réduire leur usage

Tere-net 09/02/21

Les financements publics de l'agriculture française, qui représentent une large part de ses revenus, sont « trop faibles et inefficaces pour accompagner la réduction de l'usage des pesticides », juge un rapport rendu public mardi par la Fondation Nicolas Hulot (FNH). [...]

Accès au document

Bayer boosté par un accord sur le glyphosate aux États-Unis

Terre-net 05/02/21

Le titre du chimiste Bayer était en hausse jeudi à la Bourse de Francfort, porté par la signature d'un accord aux États-Unis pour parer à d'éventuelles futures plaintes contre le Round'Up, son herbicide soupçonné d'être cancérogène. [...]

Accès au document

Les PFAS, polluant perturbateur endocrinien chez les goélands de l'Ile de Ré

Actu-environnement 12/02/21

Depuis quelques années, l'inquiétude face à la présence des substances perfluoroalkylées (PFAS) dans l'environnement s'accroit. [...]

Des PFAS ont d'ailleurs été retrouvées en quantité importante dans plusieurs espèces de goélands vivant toute l'année au nord de l'Ile-de-Ré (Charente-Maritime), dans la réserve naturelle nationale de Lilleau de Niges. « Nous avons constaté que les goélands marins du sud-ouest de la France sont exposés à des niveaux de PFAS comparables à des espèces fortement contaminées d'autres zones géographiques, bien que les principales sources d'émissions (liées aux activités industrielles) soient absentes dans la

https://doi.org/10.15454/TZR0-5997

région », expliquent les chercheurs du Centre d'études biologiques du CNRS de Chizé (Deux-Sèvres) et de la Ligne pour la protection des oiseaux (LPO). [...]

Accès au document

Perturbateurs endocriniens : nous élaborons une stratégie de criblage pour en étudier davantage

L'Inserm et le CNRS tentent de décrypter l'effet cocktail en matière de perturbation endocrinienne. Leur stratégie n'est pas d'étudier les effets additifs des molécules mais plutôt les synergies entre plusieurs molécules même à faible dose. Ils s'intéressent partiuclièrement au récepteur PXR, présent dans le foie et le colon. [...]

Accès au document

Réduction des phytosanitaires : le réseau Dephy recrute 2000 nouvelles fermes

Actu-environnement 04/02/21

Le réseau de démonstration des fermes Dephy recrute 2 000 nouvelles exploitations agricoles, engagées volontairement dans la réduction de l'usage des produits phytopharmaceutiques. Aujourd'hui, ce réseau est constitué de 3 000 fermes, recrutées en 2011, 2012 et 2017. [...] Le dépôt des candidatures est ouvert jusqu'au 30 avril 2021, pour une sélection des groupes en septembre 2021. [...]

Accès au document

Livestock workers face high MRSA risk

EurekAlert! 28/01/21

For Michigan State University's Felicia Wu, the surprise isn't that people who work with livestock are at higher risk of picking up antibiotic-resistant bacteria, but instead how much higher their risk levels are.

"This is a bit of a wakeup call," said Wu, John. A Hannah Distinguished Professor in the Departments of Food Science and Human Nutrition and Agricultural, Food and Resource Economics. "I don't think there was much awareness that swine workers are at such high risk, for example. Or that large animal vets are also at extremely high risk." [...]

Accès au document

Les chambres d'agriculture possèdent un dispositif adapté

Agri-mutuel 28/01/21

Avec l'entrée en vigueur, depuis le 1er janvier 2021, de la loi de séparation des activités de vente et de conseil des produits phytosanitaires, un système de conseil stratégique aux agriculteurs sera désormais obligatoire et nécessaire pour renouveler le Certiphyto à partir de 2024. Les conseillers des chambres d'agriculture peuvent apporter un conseil stratégique indépendant. [...]

Accès au document

Les munitions au plomb interdites dans les zones humides de l'Union européenne

Actu-environnement 28/01/21

La Commission européenne a signé le 25 janvier le règlement qui interdit l'utilisation de la grenaille de plomb dans les zones humides et à moins de 100 mètres de celles-ci. Cette interdiction prendra effet en février 2023 et dès février 2024 pour les pays avec plus de 20 % de zones humides sur leur territoire. [...]

Accès au document

Pollution de l'air : les bus hybrides et au GNV

permettent bien de réduire les émissions

Actu-environnement 29/01/21

Une étude en conditions réelles confirme que le renouvellement du parc de bus franciliens permet de réduire les émissions polluantes. Les bus au gaz pour véhicules offrent les meilleurs résultats parmi les motorisations évaluées. [...]

Accès au document

Déclin des insectes : le cri d'alarme de l'Académie des sciences

Actu-environnement 28/01/21

« L'érosion de la biodiversité des insectes, de plus en plus décrite et analysée dans les travaux scientifiques, représente une grave menace pour nos sociétés », alerte l'Académie des sciences dans un avis publié le 26 janvier. Cet avis s'accompagne d'une publication dans sa revue scientifique Les Comptes Rendus Biologies.

[...] Quatre causes principales expliquent cet effondrement, rappelle l'Académie : la très forte conversion des milieux terrestres, l'usage « croissant et non ciblé de pesticides à haute toxicité » dont les néonicotinoïdes, le dérèglement climatique et les espèces exotiques envahissantes. [...]

Accès au document

Écophyto 2 : le deuxième volet de l'appel à projet national est ouvert

Actu-environnement 26/01/21

L'Office français de la biodiversité (OFB) lance le deuxième volet de l'appel à projets national d'Écophyto 2. […]Doté d'1,5 M€, ce volet vise à financer de nouveaux projets selon les axes suivants : améliorer les connaissances et les outils ; encourager la recherche et l'innovation ; renforcer la surveillance de la contamination des denrées végétales, de l'eau, des sols et de l'air ; évaluer les expositions potentielles des citoyens ; connaître, surveiller et réduire les effets non intentionnels liés à l'utilisation des produits et accélérer le retrait des substances les plus préoccupantes, et sortir du glyphosate. [...]

Accès au document

Et si les maires réglementaient les pesticides via leur compétence en matière de déchets

Actu-environnement 25/01/21

La décision du Conseil d'État du 31 décembre dernier […] a dénié toute compétence [aux maires] pour réglementer les produits phytopharmaceutiques en affirmant que celle-ci relevait exclusivement d'une police spéciale confiée à l'État.

Un maire de Loire-Atlantique a signé un nouvel arrêté pour se protéger des pesticides en se fondant sur la police des déchets. [...]

Accès au document

Quand la pollution de l'air s'immisce dans le droit de l'immigration

Actu-environnement 21/01/21

Si les changements climatiques risquent de provoquer une augmentation des migrations de populations, la pollution de l'air pourrait aussi jouer un rôle. Elle devient un argument dans le traitement des titres de séjour. Ainsi, dans une décision du 18 décembre, la cour administrative d'appel de Bordeaux a enjoint l'État à délivrer un titre de séjour à une personne originaire du Bangladesh installée en France depuis 2011. [...]

Accès au document

Lubrizol : près de 5 000 personnes ont répondu à Santé publique France

Actu-Environnement 20/01/21

https://doi.org/10.15454/TZR0-5997

Le 15 janvier, Santé publique France a dévoilé les premiers chiffres de participation de son enquête sanitaire, démarrée en septembre 2020, qui cible 5 000 personnes exposées au panache des incendies des usines Lubrizol et Normandie Logistique survenus le 26 septembre 2019 à Rouen (Seine-Maritime). [...]

Accès au document

Antibiotic resistance from random DNA sequences

EurekAlert! 08/01/21

An important and still unanswered question is how new genes that cause antibiotic resistance arise. In a new study, Swedish and American researchers have shown how new genes that produce resistance can arise from completely random DNA sequences. The results have been published in the journal PLOS Genetics. [...]

Accès au document

Bacteria carried by mosquitos may protect them against pesticides

EurekAlert! 13/01/21

A common bacterial species naturally infecting mosquitoes may actually be protecting them against specific mosquito pesticides, a study has found. [...]

Scientists at the University of Reading, and the INBIOTEC-CONICET and the National University of San Juan in Argentina, studied the effect of Wolbachia on a common mosquito species and found those carrying the bacteria were less susceptible to widely used pesticides. [...]

Accès au document

The meat of the matter: Environmental dissemination of beef cattle agrochemicals

EurekAlert! 13/01/21

A recent Point of Reference article, "The meat of the matter: Environmental dissemination of beef cattle agrochemicals," published in Environmental Toxicology and Chemistry, points at synthetic chemical cocktails being emitted from cattle feed yards into the environment and how they can impact our ecosystem and our health.

[...] A less publicized impact of modern beef production is the excessive use of pharmaceuticals and pesticides, which end up in the environment. The animal production agriculture sector holds the record as the single greatest consumer of antimicrobials. Dust from feed yards typically contains antibiotics, synthetic steroids (growth hormones) and pesticides. [...]

Accès au document

Le Conseil d'Etat met fin au débat sur les arrêtés anti-pesticides

Campagne et environnement 14/01/21

Le débat avait commencé à l'été 2019, après la prise d'un arrêté anti-pesticides par Daniel Cueff, le maire de Langouët (Ille-et-Vilaine). Dans une décision du 31 décembre 2020, le Conseil d'État apporte une réponse claire aux maires anti-pesticides. Il rappelle que le législateur a organisé une police spéciale de la mise sur le marché, de la détention et de l'utilisation des produits phytopharmaceutiques et qu'elle est confiée à l'État. Autrement dit, que les maires ne sont pas habilités à prendre de tels arrêtés. [...]

Accès au document

Néonicotinoïdes sur betteraves : en cas d'usage en 2021, le choix de la culture sera limité les années suivantes

Terre-net 06/01/21

Le projet d'arrêté autorisant provisoirement l'emploi des néonicotinoïdes en traitement de semences sur betteraves sucrières a été publié, le 4 janvier 2021, pour consultation publique. Il comprend des mesures restrictives pour les cultures suivantes autorisées après betteraves. [...]

Accès au document

Pesticides : les chartes d'engagement posent une question de constitutionnalité

Actu-environnement 06/01/21

Les dispositions de la loi Egalim qui fixent le cadre législatif pour l'adoption de chartes d'engagements par les utilisateurs de pesticides sont-elles conformes à la Constitution ? C'est la question à laquelle le Conseil constitutionnel est appelé à répondre. […]

Accès au document

Un plan en faveur des pollinisateurs pour faire oublier les néonicotinoïdes

Actu-environnement 24/12/20

La réautorisation des néonicotinoïdes a laissé des traces. Le Gouvernement prépare un nouveau plan pour les pollinisateurs censé la faire oublier. Mais certaines organisations agricoles s'y opposent. [...]

Accès au document

Pollutants rapidly changing the waters near Ieodo Island

EurekAlert! 04/01/21

There has been frequent occurrence of red tide in coastal waters around Korea where the sea turns red. Red tide is a phenomenon in which phytoplankton proliferate as nutrient or sewage flow into seawater, making it appear red. This not only causes damage to the fisheries industry but also affects the marine ecosystem.

Professor Kitack Lee and Ph.D. candidate Ji-Young Moon (first author) of POSTECH's Division of Environmental Science and Engineering have confirmed that the inflow of nitrogen pollutants since the 1980s has disturbed the nutrient balance in the northeast Asian waters and is changing the species of phytoplankton responsible for red tide. The team also found that the fastest change in the oceanic conditions caused by this inflow of nitrogen pollutants is happening in the waters near the Ieodo Ocean Research Station, located downstream of the Changjiang River of China. These findings were recently introduced in the journal Limnology and Oceanography. [...]

Accès au document