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Bulletin de veille du réseau d'écotoxicologie terrestre et aquatique N°50

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Bulletin de veille du réseau d'écotoxicologie terrestre et aquatique



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Edito

Voici notre 50^{ème} bulletin de veille, toujours riche en informations !

Merci pour la soumission de vos manuscrits dans notre Special Issue de la revue Environmental Science and Pollution Research. Nous vous tiendrons informés de l'avancement de cette action.

Nous vous proposons dans ce bulletin une tribune présentant le bilan 2020 des activités du réseau ECOTOX. 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-32-avril-2021>

Nous vous informons du lancement de notre « Peer Community in Ecotoxicology & Environmental Chemistry », un nouveau média ouvert, transparent et gratuit pour la valorisation et la diffusion de vos recherches. Toutes les informations figurent dans la fiche thématique dont la parution est avancée : <https://www6.inrae.fr/ecotox/Productions/Fiches-thematiques/Fiche-thematique-N-34-aout-2021>

Enfin, nous rappelons le colloque 2021 de la SEFA. Informations sur : <https://colloque.inrae.fr/sefa2020>

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 !

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Tribune libre

Bilan 2020 des activités du réseau ECOTOX

Nous présentons ici les activités que notre réseau d'écotoxicologie terrestre et aquatique, ECOTOX, a menées en 2020. Celles-ci se sont articulées autour de 5 axes :

- Contribuer à la réflexion nationale et à la programmation de la recherche en écotoxicologie,
- Identifier de nouvelles questions de recherche en écotoxicologie,
- Contribuer à l'organisation de manifestations scientifiques,
- Favoriser la valorisation des résultats de recherche des membres du réseau,
- Favoriser une veille scientifique et contribuer à l'expertise.

Contribuer à la réflexion nationale et à la programmation de la recherche en écotoxicologie

Le positionnement national du réseau continue à se renforcer au travers d'actions de représentation et de prise de responsabilités dans des structures d'animation nationale et de programmation de la recherche. Le réseau interagit avec d'autres collectifs en écotoxicologie (par exemple la Fondation Rovaltain, le GDR d'écotoxicologie aquatique, l'initiative RECOTOX...) pour coordonner l'ensemble des actions et améliorer la visibilité de notre communauté scientifique.

Des membres du réseau ont participé aux Ateliers INRAE de Réflexion Prospective « Nexus santé-agriculture-environnement-alimentation » et « Risques ». Dans ces ARPs, des membres du réseau ont été impliqués dans l'animation de groupes de travail « Toxicologie-Ecotoxicologie », et/ou ont apporté leurs compétences scientifiques. Le rapport de synthèse du Nexus a été publié (hal-02864749), celle de l'atelier Risque est en cours de finalisation.

A signaler également la relecture pour INRAE du micro-thésaurus « Toxicologie et Ecotoxicologie » du domaine Sciences biologiques pour l'établissement. Ce micro-thésaurus serait à interfacer avec le thésaurus du projet Traces (voir à ce sujet la fiche thématique <https://www6.inrae.fr/ecotox/Productions/Fiches-thematiques/Fiche-thematique-N-16-Aout-2018>).

Identifier de nouvelles questions de recherche en écotoxicologie

L'appel Green Deal d'Horizon 2020 est désormais clôt et plusieurs équipes mobilisant pour certaines des membres du réseau INRAE sont impliquées dans plusieurs propositions du domaine 8 « Zéro-pollution », dont une coordination parmi lesquelles on peut citer :

- ACTION4PMCs : Innovative Systemic Solutions for protecting environment and health from waterborne PMCs
- IMPROVERA : Innovative solutions to Monitor, Prevent and Reduce risks Of environmentally persistent and mobile organic chemicals
- HOLICHEM : building a holistic strategy to address the challenges of persistent, mobile and toxic chemicals ».

Par ailleurs, nous sommes impliqués dans la construction du « Partnership for the Assessment of Risk from Chemicals » (PARC), qui sera piloté par l'Anses https://ec.europa.eu/info/sites/info/files/research_and_innovation/funding/documents/ec_rtd_he-partnerships-chemical-risk-assessment.pdf

Contribuer à l'organisation de manifestations scientifiques

En 2020, le réseau a soutenu trois colloques :

- le colloque annuel de la SEFA « Société Française d'Ecotoxicologie Fondamentale et Appliquée » organisé en juillet, et qui a dû être proposé sous la forme de présentations orales enregistrées ou de posters consultables sur le site (<https://asso-sefa.fr/colloque-virtuel-2020>), l'objectif étant toujours de favoriser la communication pour les étudiants,
- le colloque « Santé globale et nouveaux flux de risques - Impacts des changements climatiques et anthropiques » organisé en décembre, qui a vu plus de 150 participants en webinaire (<https://colloque.inrae.fr/sante-globale/>). Les présentations faites à ce colloque sont consultables en vidéo sur le site.
- le 2nd colloque international d'écotoxicologie microbienne du réseau EcotoxicoMic (<https://ecotoxicomic.org/>) qui a eu lieu du 6 au 9 Octobre 2020 au format en ligne. Au total 131 inscrits de 21 pays différents ont pu écouter 6 conférences plénières, 31 communications orales et visionner 76 posters dont 28 au format 'diaporama audio'. La plupart des présentations orales faites à ce colloque sont consultables en lien à l'adresse suivante : <https://ecotoxicomic.org/2020/11/11/replay-many-presentations-and-posters-of-the-international-conference-ecotoxicomic2020/>.

Enfin le réseau Ecotox a organisé son 7^{ième} séminaire qui a eu lieu en distanciel les 16 et 17 novembre sous forme d'un webinaire. Deux jours de rencontres virtuelles sur le thème de l'écotoxicologie du continuum sol-eau, pour entériner la fusion de l'Inra et d'Irstea et mettre en évidence les enjeux de cette thématique à l'interface entre l'écotoxicologie terrestre et l'écotoxicologie aquatique. Les résumés sont consultables via le lien <https://www6.inrae.fr/ecotox/Manifestations/Seminaires-du-reseau/2020>. Au terme de trois conférences invitées, 25 présentations orales et des débats riches en questions-réponses, il a été proposé aux participants de contribuer à une « special issue » dans le journal ESPR. Une discussion finale a permis de partager le ressenti sur l'importance et l'utilité du réseau et des propositions d'animations pour 2021.

Favoriser la valorisation des résultats de recherche des membres du réseau

Site web ECOTOX

Le site web du réseau (<https://www6.inrae.fr/ecotox/>) a été mis à jour début 2020, et les pages membres actualisées et complétées. De nouvelles pages peuvent être créées pour tout membre souhaitant mettre en ligne son profil, sur simple demande à contact-ecotox@inrae.fr.



Un poster a été décliné pour résumer les missions et actions du réseau. Téléchargeable sur le site du réseau, il est à destination de présentations lors de journées d'animation.

<https://www6.inrae.fr/ecotox/Productions/Poster-ECOTOX>

Peer Community in Ecotoxicology and Environmental Chemistry

Le montage de ce PCI (voir <https://peercommunityin.org/> et <https://www.inrae.fr/actualites/prix-liber-science-ouverte-transparente-gratuite>), un processus éditorial de science ouverte basé sur la recommandation de pre-prints, arrive à son terme. Le PCI_ecotoxenvchem sera lancé très prochainement et apportera un plus à notre communauté, le réseau participera à encourager les publications dans ce processus de science ouverte

Fiches thématiques

L'édition de fiches thématiques sous la forme d'un 4 pages (ou plus !) sur des thèmes en lien avec l'écotoxicologie se poursuit. Les fiches sont diffusées dans le bulletin de veille du réseau et placées en téléchargement sur le site web du réseau. Six fiches ont été éditées en 2020.

Bouchez A., Denaix L., Garric J., Martin-Laurent F., Mougin C. Février 2020. Bilan 2019 des activités du réseau ECOTOX. Fiche thématique N°25, 4 pages – Réseau Ecotox : <https://www6.inrae.fr/ecotox/Productions/Fiches-thematiques/Fiche-thematique-N-25-fevrier-2020-hal-03144237>

Bouchel D., Aliouat M., Mougin C. Avril 2020. La réglementation sur les ressources génétiques : quelles conséquences pour les recherches en écotoxicologie ? Fiche thématique N°26, 6 pages – Réseau Ecotox : <https://www6.inrae.fr/ecotox/Productions/Fiches-thematiques/Fiche-thematique-N-26-avril-2020-hal-03144264>

Bonnineau C., Pesce S., Faburé J. Juin 2020. Bioaccumulation et transfert trophique de contaminants dans les écosystèmes aquatiques : challenges & perspectives pour le réseau Ecotox. Fiche thématique N°27, 4 pages – Réseau Ecotox : <https://www6.inrae.fr/ecotox/Productions/Fiches-thematiques/Fiche-thematique-N-27-juin-2020>

Mougin C., Slaveykova V., Campbell P., Couderchet M. Denèfle P., Martin-Laurent F., Rolland P., Vincent T., Delaunay D. Aout 2020. L'expertise académique à destination des entreprises dans les domaines de l'Environnement et de la Santé. Fiche thématique N°28, 4 pages – Réseau Ecotox : <https://www6.inrae.fr/ecotox/Productions/Fiches-thematiques/Fiche-thematique-N-28-aout-2020-hal-03144325>

Leenhardt S., Mamy L., Pesce S., Sanchez W. Octobre 2020. Une expertise scientifique collective relative aux effets non intentionnels des produits phytopharmaceutiques sur la biodiversité et les services écosystémiques. Fiche thématique N°29, 4 pages – Réseau Ecotox : <https://www6.inrae.fr/ecotox/Productions/Fiches-thematiques/Fiche-thematique-N-29-octobre-2020>

Charles S., Lopes C., Ratier A. Décembre 2020. MOSAIC - Analyse de données d'écotoxicité en ligne : quoi de neuf ? Fiche thématique N°30, 5 pages – Réseau Ecotox : <https://www6.inrae.fr/ecotox/Productions/Fiches-thematiques/Fiche-thematique-N-30-decembre-2020>

Special Issue « Environmental Science and Pollution Research, ESPR »

Suite au séminaire du réseau, et à l'accord de ESPR, une issue spéciale est ouverte sur le thématique du continuum sol-eau, dont la finalisation est prévue au premier semestre 2021.

Favoriser une veille scientifique et contribuer à l'expertise

Veille scientifique ECOTOX

La veille scientifique mise en place en 2013 par le réseau continue à se renforcer avec la prise en compte de nouvelles rubriques et l'arrivée de nouveaux veilleurs. Nous avons lancé début 2020 une enquête pour connaître le ressenti des lecteurs vis-à-vis du bulletin, et identifier des pistes d'évolution, qui pour certaines ont déjà été considérées. Une synthèse en sera donnée dans la fiche thématique N°31 à paraître en février 2021 <https://www6.inrae.fr/ecotox/Productions/Fiches-thematiques>. Les bulletins bimestriels sont en téléchargement sur le site du réseau, sur HAL INRAE, et largement diffusés dans et hors d'INRAE (Anses, Efsa...). Six bulletins ont été édités en 2020.

Bertrand C., Mougin C., Bérard A., Pelosi C., Cruzet O. et Karmasyn-Veyrines P. Février 2020. Bulletin de veille du réseau du réseau d'écotoxicologie terrestre et aquatique, N°43, 63 pages, <https://www6.inrae.fr/ecotox/Veille/Bulletins/Bulletin-43-Veille-du-01-01-2020-au-29-02-2020> - [hal-02865228](https://hal.archives-ouvertes.fr/hal-02865228)

Bertrand C., Mougin C., Bérard A., Pelosi C, Morin S., Cruzet O. et Karmasyn-Veyrines P. Avril 2020. Bulletin de veille du réseau du réseau d'écotoxicologie terrestre et aquatique, N°44, 164 pages, <https://www6.inrae.fr/ecotox/Veille/Bulletins/Bulletin-44-Veille-du-01-03-2020-au-30-04-2020> - [hal-02865248](https://hal.archives-ouvertes.fr/hal-02865248)

Bertrand C., Mougin C., Bérard A., Pelosi C, Morin S., Cruzet O. et Karmasyn-Veyrines P. Juin 2020. Bulletin de veille du réseau du réseau d'écotoxicologie terrestre et aquatique, N°45, 150 pages, <https://www6.inrae.fr/ecotox/Veille/Bulletins/Bulletin-45-Veille-du-01-05-2020-au-30-06-2020> - [hal-02911011](https://hal.archives-ouvertes.fr/hal-02911011)

Bertrand C., Mougin C., Bérard A., Pelosi C, Morin S., Cruzet O. et Karmasyn-Veyrines P. Aout 2020. Bulletin de veille du réseau du réseau d'écotoxicologie terrestre et aquatique, N°46, 106 pages, <https://www6.inrae.fr/ecotox/Veille/Bulletins/Bulletin-46-Veille-du-01-07-2020-au-31-08-2020> - [hal-02988676](https://hal.archives-ouvertes.fr/hal-02988676)

Bertrand C., Mougin C., Bérard A., Pelosi C, Morin S., Cruzet O. et Karmasyn-Veyrines P. Octobre 2020. Bulletin de veille du réseau du réseau d'écotoxicologie terrestre et aquatique, N°47, 153 pages, <https://www6.inrae.fr/ecotox/Veille/Bulletins/Bulletin-47-Veille-du-01-09-2020-au-31-10-2020> - [hal-03041889](https://hal.archives-ouvertes.fr/hal-03041889)

Bertrand C., Mougin C., Bérard A., Pelosi C, Morin S., Cruzet O. et Karmasyn-Veyrines P. Décembre 2020. Bulletin de veille du réseau du réseau d'écotoxicologie terrestre et aquatique, N°48, 128 pages, <https://www6.inrae.fr/ecotox/Veille/Bulletins/Bulletin-48-Veille-du-01-11-2020-au-31-12-2020> - [hal-03144190](https://hal.archives-ouvertes.fr/hal-03144190)

Contribution à l'expertise

Des membres du réseau ECOTOX ont participé à l'expertise scientifique qui a aboutie à l'avis et au rapport de l'ANSES sur 'antibiorésistance et environnement'. Cette expertise coordonnée par le Professeur Didier Hocquet de l'UMR ChronoEnvironnement (Université de Bourgogne Franche Comté) a été publiée à la fin de l'année 2020 (<https://www.anses.fr/fr/content/avis-et-rapport-de-lanses-relatif-%C3%A0-%C2%AB%C2%A0antibior%C3%A9sistance-et-environnement-%C3%A9tat-et-causes>).

Les ministères respectivement en charge de la recherche, de l'environnement et de l'agriculture, ont confié à INRAE et à Ifremer la réalisation d'une expertise scientifique collective (ESCO) traitant des effets des produits phytopharmaceutiques conventionnels et de biocontrôle sur la biodiversité et les services

écosystémiques. Les pilotes de cette ESCO sont membres du réseau, et de nombreux autres interviennent en tant qu'experts. Voir à ce sujet la fiche thématique N°29 d'octobre <https://www6.inrae.fr/ecotox/Productions/Fiches-thematiques/Fiche-thematique-N-29-octobre-2020>

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La cellule d'animation :

Isabelle Lamy, Marie-Agnès Coutellec, Laurence Denaix, Juliette Faburé, Fabrice Martin-Laurent, Soizic Morin et Christian Mougin



Pour en savoir plus

<https://www6.inrae.fr/ecotox>

ERA / PUBLICATIONS SCIENTIFIQUES

Prospective association between dietary pesticide exposure profiles and postmenopausal breast-cancer risk in the NutriNet-Santé cohort

Authors: Rebouillat P., Vidal R., Cravedi J.-P., Taupier-Letage B. et al.

Source: International Journal of Epidemiology dyab015, 2021, DOI: 10.1093/ije/dyab015

Abstract: Some pesticides, used in large quantities in current agricultural practices all over Europe, are suspected of adverse effects on human reproductive health (breast and prostate cancers), through mechanisms of endocrine disruption and possible carcinogenic properties, as observed in agricultural settings. However, evidence on dietary pesticide exposure and breast cancer (BC) is lacking for the general population. We aimed to assess the associations between dietary exposure to pesticides and BC risk among postmenopausal women of the NutriNet-Santé cohort...

ERA / PUBLICATIONS SCIENTIFIQUES / Communautés Microbiennes Aquatiques

A new perspective of copper-iron effects on bloom-forming algae in a highly impacted environment

Authors: Li BL, Zhang XK, Deng JM et al.

Source: WATER RESEARCH 195:116889, 2021, DOI: 10.1016/j.watres.2021.116889

Abstract: Relatively little work has been done on the role of micronutrients in influencing development and progression of harmful algal blooms, yet micronutrients are ineluctably required for growth. Relatively small changes in micronutrient status have wide-ranging consequences. Here, we report results from mesocosm experiments with *Microcystis* and *Desmodesmus* spp., in mono- and mixed-cultures, to probe questions of how copper, iron, and copper-iron amendments affect growth, short-term assemblage progression, and production of siderophore, chalkophore, and microcystin in lake water from a large, hypereutrophic lake (Taihu, China)...

Looking back, looking forward: a review of the new literature on diatom teratological forms (2010-2020)

Authors: Falasco E, Ector L, Wetzel CE et al.

Source: HYDROBIOLOGIA 848:1675-1753, 2021, DOI: 10.1007/s10750-021-04540-x

Abstract: Over the last years, issues concerning diatom teratological forms and environmental stress have received growing interest within the scientific community. Publications on this topic dated back to 1890 and were summarized in a review published in 2009 by the journal *Hydrobiologia*, accounting for high citation rates (i.e. 117 citations Scopus and 232 citations Google

Scholar, October 2020). This wide interest stimulates the Authors: to further unravel teratological forms significance in the light of the most recent publications (2010-2020)...

Toxicity evaluation and preparation of CoWO₄ nanoparticles towards microalga *Dunaliella salina*

Authors: Hassanpour M, Tafreshi SAH, Salavati-Niasari M, Hamadanian M

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH Early Access, 2021, DOI: 10.1007/s11356-021-12946-2

Abstract: The increasing use of nanoparticles and their many applications increases the likelihood of their presence in the environment. In this research, CoWO₄ nanoparticles were synthesized by the ultrasonic method. Various conditions in the synthesis process were investigated to obtain the appropriate size of the nanoparticles. After selecting the optimum particles, these nanoparticles were used to investigate their effect on the growth of *Dunaliella salina*. For this purpose, the algal cells were subjected to three different concentrations of nanoparticles (15, 30, and 60 mg/L)...

Combination of P-limitation and cadmium in photosynthetic responses of the freshwater microalga *Ankistrodesmus densus* (Chlorophyceae)

Authors: Rocha GS, Lombardi AT, Espindola ELG

Source: ENVIRONMENTAL POLLUTION 275:116673, 2021, DOI: 10.1016/j.envpol.2021.116673

Abstract: In the environment, microalgae are exposed to a multitude of stressors

simultaneously, inducing physiological adjustments. It is well documented that both phosphorus (P) limitation and trace metals exposure affect microalgal physiology. However, investigations regarding the combination of both P limitation and excess trace metals still deserve attention. In the present study, we evaluated the changes in photosynthetic parameters in the green microalga *Ankistrodesmus densus* acclimated to different P concentrations prior to exposure to Cd...

Review of aquatic toxicity of pharmaceuticals and personal care products to algae

Authors: Xin XY, Huang G, Zhang BY

Source: JOURNAL OF HAZARDOUS MATERIALS 410:124619, 2021, DOI: 10.1016/j.jhazmat.2020.124619

Abstract: Pharmaceuticals and Personal Care Products (PPCPs) have been frequently detected in the environment around the world. Algae play a significant role in aquatic ecosystem, thus the influence on algae may affect the life of higher trophic organisms. This review provides a state-of-the-art overview of current research on the toxicity of PPCPs to algae...

Effects of copper on photosynthetic and physiological parameters of a freshwater microalga (Chlorophyceae)

Authors: Rocha GS, Parrish CC, Espindola ELG

Source: ALGAL RESEARCH-BIOMASS BIOFUELS AND BIOPRODUCTS 54:102223, 2021, DOI: 10.1016/j.algal.2021.102223

Abstract: Copper is known for its essentiality for optimal metabolism, and damage caused in algae under high exposure is also well documented;

however, some mechanisms of its toxicity are still not totally understood. In the present study, we exposed the freshwater microalga *Selenastrum gracile* to sublethal copper concentrations and evaluated responses in algal growth, chlorophyll production, photosynthetic performance, and lipid class and fatty acid production...

Absorption and speciation of arsenic by microalgae under arsenic-copper Co-exposure

Authors: Huang ZQ, Chen BY, Zhang J et al.

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 213:112024, 2021, DOI: 10.1016/j.ecoenv.2021.112024

Abstract: Combined pollutions of arsenic (As) and copper (Cu) are common in water bodies near mines, non-ferrous metal smelting and power plants. This study investigated the effect of Cu(II) on the absorption and speciation of As(V) by microalgae. We compared the absorption and speciation of arsenic by microalgae (mainly Cyanophyta and Chlorophyta) when exposed to single As(V) with that exposed to As-Cu co-exposure in laboratory...

Phycoremediation and photosynthetic toxicity assessment of lead by two freshwater microalgae *Scenedesmus acutus* and *Chlorella pyrenoidosa*

Authors: Shivagangaiah CP, Sanyal D, Dasgupta S, Banik A

Source: PHYSIOLOGIA PLANTARUM Early Access, 2021, DOI: 10.1111/ppl.13368

Abstract: Heavy metal pollution is a serious agro-economic concern and algae can be used as one of the bioremediating agents as it can grow in different water bodies. In this study, the

Scenedesmus acutus and *Chlorella pyrenoidosa* were exposed to various concentrations of Pb²⁺ for 96 h and a multidimensional toxicity assessment has been performed by pulse amplitude modulation technique and Fourier transform infrared spectroscopy (FTIR)...

Algal density affects the influences of polyethylene microplastics on the freshwater rotifer *Brachionus calyciflorus*

Authors: Xue YH, Sun ZX, Feng LS et al.

Source: CHEMOSPHERE 270:128613, 2021, DOI: 10.1016/j.chemosphere.2020.128613

Abstract: Most previous researches focused on the toxicity of polystyrene microplastics (MPs) to marine organisms, but less on polyethylene MPs and freshwater zooplanktons. The present study aims to elucidate the toxicity of polyethylene (PE) MPs (diameter = 10-22 μm) to the typical freshwater rotifer *Brachionus calyciflorus*...

Sensitivity differences among five species of aquatic fungi and fungus-like organisms for seven fungicides with various modes of action

Authors: Nagai T

Source: JOURNAL OF PESTICIDE SCIENCE 45:223-229, 2020, DOI: 10.1584/jpestics.D20-035

Abstract: Five species of aquatic fungi and fungus-like organisms were used for toxicity assays with seven fungicides to determine the differences in species sensitivity. A microplate toxicity assay with adenosine triphosphate luminescence detection was used as an efficient and economical high-throughput assay...

Determination of antibiotic resistance genes in a WWTP-impacted river in surface water, sediment, and biofilm: Influence of seasonality and water quality

Authors: Reichert G, Hilgert S, Alexander J et al.

Source: SCIENCE OF THE TOTAL ENVIRONMENT 768:144526, 2021, DOI: 10.1016/j.scitotenv.2020.144526

Abstract: Many pathogenic bacteria are adapted to live in aquatic habitats, which makes rivers possible sources and spread pathways of antibiotic resistance, since they usually receive effluents from wastewater treatment plants (WWTP), possibly containing antibiotic residues and also antibiotic-resistant bacteria. This study investigates different monitoring strategies to identify the occurrence of antibiotic-resistant bacteria in rivers...

Effects of tetracycline on nitrogen and carbon cycling rates and microbial abundance in sediments with and without biochar amendment

Authors: He G, Jiang XL, Yao LG et al.

Source: CHEMOSPHERE 270:129509, 2021, DOI: 10.1016/j.chemosphere.2020.129509

Abstract: Nitrogen (N) and carbon (C) biogeochemical processes, such as denitrification and organic matter decomposition, are critical in determining ecological functions in aquatic environments. The overuse of antibiotics in human and veterinary medicine has resulted in the ubiquitous presence of these contaminants in lakes, rivers and other water bodies worldwide. However, the effects of antibiotic residues on N

and C cycling processes and associated microbial communities are not well understood. Here, 44-day incubation experiments were conducted to examine the impact of tetracycline on nitrification, denitrification, and CO₂ and CH₄ emissions in sediments with and without biochar addition...

Influence of polystyrene microplastic and nanoplastic on copper toxicity in two freshwater microalgae

Authors: Wan JK, Chu WL, Kok YY, Lee CS

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH Early Access, 2021, DOI: 10.1007/s11356-021-12983-x

Abstract: There has been increasing concern over the toxic effects of microplastics (MP), nanoplastics (NP), and copper (Cu) on microalgae. However, the combined toxicity of the metal in the presence of polystyrene (PS) MP/NP on microalgae has not been well studied, particularly after long-term exposure (i.e., longer than 4 days). The primary aim of the present study was to investigate the effect of PS MP and NP on Cu toxicity on two freshwater microalgae, namely *Chlorella* sp. TJ6-5 and *Pseudokirchneriella subcapitata* NIES-35 after acute exposure for 4 days and up to 16 days...

Pollutants affect algae-bacteria interactions: A critical review

Authors: You XQ, Xu N, Yang X, Sun WL

Source: ENVIRONMENTAL POLLUTION 276:116723, 2021, DOI: 10.1016/j.envpol.2021.116723

Abstract: With increasing concerns on the ecological risks of pollutants, many efforts have been devoted to revealing the toxic effects of pollutants on algae or bacteria in their monocultures. However, how pollutants affect

algae and bacteria in their cocultures is still elusive but crucial due to its more environmental relevance. The present review outlines the interactions between algae and bacteria, reveals the influential mechanisms of pollutants (including pesticides, metals, engineered nanomaterials, pharmaceutical and personal care products, and aromatic pollutants) to algae and bacteria in their coexisted systems, and puts forward prospects for further advancing toxic studies in algal-bacterial systems...

Ecotoxicological effects of erythromycin on a multispecies biofilm model, revealed by metagenomic and metabolomic approaches

Authors: Pu Y, Pan J, Yao Y et al.

Source: ENVIRONMENTAL POLLUTION 276:116737, 2021, DOI: 10.1016/j.envpol.2021.116737

Abstract: The presence of antibiotics such as erythromycin, even in trace amounts, has long been acknowledged for negatively impacting ecosystems in freshwater environments. Although many studies have focused on the impact of antibiotic pollution at a macroecological level, the impact of erythromycin on microecosystems, such as freshwater biofilms, is still not fully understood. Here, we used a lab-cultured multispecies biofilm model to elucidate the holistic response of a microbial community to erythromycin exposure using metagenomic and metabolomic approaches...

Land use intensification destabilizes stream microbial biodiversity and decreases metabolic efficiency

Authors: Dang C, Kellner E, Martin G, Freedman ZB et al.

Source: SCIENCE OF THE TOTAL ENVIRONMENT 767:145440, 2021, DOI: 10.1016/j.scitotenv.2021.145440

Abstract: Here we examine the effects of land-use and associated changes in water chemistry on sediment microbial communities by studying the West Run Watershed (WRW) a mixed-land-use system in West Virginia, USA. The proportion of land impacted by agricultural and urban development was positively correlated with temporal variation in stream sediment microbial community composition (adj $R^2 = 0.65$), suggesting development can destabilize microbial communities. Moreover, streams in developed watersheds had an increased metabolic quotient (20-50% higher), this indicates that microorganisms have greater respiration per unit biomass and signifies reduced metabolic efficiency...

Understanding the environmental roles of herbicides on cyanobacteria, cyanotoxins, and cyanoHABs

Authors: Breda-Alves F, Fernandes VD, Chia MA

Source: AQUATIC ECOLOGY Early Access, 2021, DOI: 10.1007/s10452-021-09849-2

Abstract: In this review, we show that herbicides and cyanobacteria toxins have different mechanisms of action, but at high concentrations, they cause oxidative stress, interfere with the normal functioning of enzymes, and change the metabolic profile of microalgae and cyanobacteria. This paper demonstrates that at environmentally relevant concentrations, some herbicides facilitate the formation of cyanobacterial harmful algal blooms (cyanoHABs)...

Characteristics of bacterial community and ARGs profile in engineered goldfish tanks

with stresses of sulfanilamide and copper

Authors: Tiimub BM, Zhou ZC, Zhu L, Liu Y et al.

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH Early Access, 2021, DOI: 10.1007/s11356-021-13239-4

Abstract: Abuse of antibiotics in aquaculture have been alarming and might aggravate spread of resistance genes in the environment. Sulfanilamide (sul) and copper II sulfate (CuSO₄ II) were added as separate or combined treatments in 9 replicate engineered goldfish tanks comprising 3 individual sul, 3 CuSO₄ II, 3 (sul + CuSO₄ II) combinations, and 3 controls within 180 days. The DNA from water and fish guts was sequenced under qPCR to determine 16S rRNA bacteria biomarkers co-occurring with the correspondent ARGs. Combined chemical addition at 0.8-1.5 mg sul + 0.5-1.0 mg CuSO₄ II/3 L of tank waters reduced sequenced 16S rRNA bacteria absolute abundances in fish gut and water samples while portraying the biomarkers...

Algae in Acid Mine Drainage and Relationships with Pollutants in a Degraded Mining Ecosystem

Authors: Gomes P, Valente T, Albuquerque T et al.

Source: MINERALS 11:110, 2021, DOI: 10.3390/min11020110

Abstract: To identify the algae species and understand the relationships with abiotic parameters of acid-mine drainage ecosystem, water and biological material were collected and analysed. The results show two types of algal colours that seem to represent different degrees of photosynthetic activity...

Interactions with freshwater biofilms cause rapid removal of common herbicides through degradation - evidence from microcosm studies

Authors: Bighiu MA, Goedkoop W

Source: ENVIRONMENTAL SCIENCE-PROCESSES & IMPACTS 23:66-72, 2021, DOI: 10.1039/d0em00394h

Abstract: We investigated the role of periphyton biofilms for the fate of three common herbicides, i.e. bentazone, metazachlor and metribuzin, at low, environmental levels and 100 times higher, during a 16 days laboratory experiment. The decline in herbicide water concentrations were explained only to a small extent (<8% of the total herbicide loss) by biofilm sorption and herbicide photolysis was ruled out as a possible explanation for the observed declines... Therefore, we conjecture that the observed declines in herbicides were due to biodegradation and subsequent evasion of (CO₂)-C-14 driven by enzymatic action from heterotrophic microbes...

Antibiotic pollution promotes dominance by harmful cyanobacteria: A case study examining norfloxacin exposure in competition experiments

Authors: Li JJ, Chao JJ, McKay RML et al.

Source: JOURNAL OF PHYCOLOGY Early Access, 2021, DOI: 10.1111/jpy.13133

Abstract: Taxon-specific responses to norfloxacin (NOR) were evaluated in monocultures of bloom-forming cyanobacterium (*Microcystis aeruginosa*) and a common green alga (*Scenedesmus quadricauda*). The growth rate and change in ratio

of cyanobacteria to green algae when cocultured with exposure to NOR were determined... Our results indicate that antibiotic pollution has a potential risk to enhance the perniciousness of cyanobacterial harmful algal blooms (cyanoHABs) by disturbing interspecific interaction between cyanobacteria and green algae...

Characterization of river biofilm responses to the exposure with heavy metals using a novel micro fluorometer biosensor

Authors: Carafa R, Lorenzo NE, Llopart JS et al.

Source: AQUATIC TOXICOLOGY 231:105732, 2021, DOI: 10.1016/j.aquatox.2020.105732

Abstract: A new micro-PAM-sensor was tested to assess potential acute and chronic effects of heavy metals in river biofilm. Toxicity values across the three parameters considered in this study (photosynthetic yield YII, non-photochemical quenching NPQ, and basal fluorescence F-0) were comparable, as determined EC50 were within one order of magnitude (EC50 similar to 1-10 mg L⁻¹). However, the stimulation of NPQ was more clearly associated with early acute effects...

Effects of zinc and mercury on ROS-mediated oxidative stress-induced physiological impairments and antioxidant responses in the microalga *Chlorella vulgaris*

Authors: Ajitha V, Sreevidya CP, Sarasan M et al.

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH Early Access, 2021, DOI: 10.1007/s11356-021-12950-6

Abstract: Adverse effects of the two metal elements zinc (maximum concentration of 167.25 mg/L) and mercury (104.2 mg/L) were examined using *Chlorella vulgaris* under acute and chronic exposure period (48 h and 7 days, respectively). The metal-induced adverse effects have been analyzed through photosynthetic pigment content, total protein content, reactive oxygen species (ROS) generation, antioxidant enzymatic activities, namely catalase and superoxide dismutase (SOD) along with morphological changes in *C. vulgaris*...

Effects of the insecticide fipronil in freshwater model organisms and microbial and periphyton communities

Authors: Pino-Otin MR, Ballester D, Navarro E et al.

Source: SCIENCE OF THE TOTAL ENVIRONMENT 764:142820, 2021, DOI: 10.1016/j.scitotenv.2020.142820

Abstract: This study evaluated the toxicity of fipronil at two biological levels using in vivo conditions and environmentally relevant concentrations: the first based on two model organisms (aquatic invertebrate *Daphnia magna* and the unicellular freshwater alga *Chlamydomonas reinhardtii*) and a second based on three natural communities (river periphyton and freshwater and soil microbial communities). The most sensitive organism to fipronil was *D. magna*, with median lethal dose (LC50) values from 0.07 to 038 mg/L (immobilisation test). The freshwater periphyton presented high sensitivity to fipronil (photosynthetic yield EC50 of 0.74 mg/L) and there was a time-dependent effect (toxicity increased with time)...

Toxicity assessment of synthesized titanium dioxide nanoparticles in fresh water

algae *Chlorella pyrenoidosa* and a zebrafish liver cell line

Authors: AL-Ammari A, Zhang L, Yang JZ, Wei F et al.

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 211:111948, 2021, DOI: 10.1016/j.ecoenv.2021.111948

Abstract: This study aims to assess the toxicity of the commonly-spread titanium dioxide nanoparticles (TiO₂ NPs) by evaluating the exposure impact of the particles on both freshwater algae *Chlorella pyrenoidosa* and zebrafish liver cell line (ZFL), the two common in vitro models in toxicological studies. Three types of manufactured TiO₂ were used: bulk TiO₂, Degussa P25 TiO₂, and ultrafine TiO₂ NPs. The hydrodynamic size plays a critical role in determining the acute toxicity to *C. pyrenoidosa* in terms of autofluorescence and esterase activity, while all types of TiO₂ NPs show toxic effects after exposure for 14 days...

Shifts in bacterial communities and antibiotic resistance genes in surface water and gut microbiota of guppies (*Poecilia reticulata*) in the upper Rio Uberabinha, Brazil

Authors: Jia J, Gomes-Silva G, Plath M, Pereira BB et al.

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 211:111955, 2021, DOI: 10.1016/j.ecoenv.2021.111955

Abstract: In this study, water samples and guppies (*Poecilia reticulata*) were sampled from six sampling sites along the Uberabinha River in southeastern Brazil, both microbial communities and antibiotic resistance genes of surface waters and intestinal microbiota of guppies (*Poecilia reticulata*) were detected. Proteobacteria,

Bacteroidetes, Firmicutes and Actinobacteria were dominant phyla in both water and intestinal microbiota, but the abundance of putative pathogens was higher at heavily polluted sites. Up to 83% of bacteria in intestinal microbiota originated from water microbiota; this proportion was relatively higher in less polluted compared to polluted environments...

Ecotoxicological Studies on the Effect of Roundup(R) (Glyphosate Formulation) on Marine Benthic Microalgae

Authors: Sylwestrzak Z, Zgrundo A, Pniewski F

Source: INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH 18:884, 2021, DOI: 10.3390/ijerph18030884

Abstract: Changes in microphytobenthos composition and structure and the deteriorating condition of the cells of community-forming organisms (assessed by analyzing changes in chloroplast shape) were used to assess the impact of Roundup(R) on endpoints. The tests indicated that microphytobenthic communities were relatively resistant to herbicide. Only at the highest glyphosate concentration (8.5 g.dm⁻³) tested was a strong negative effect noted that limited community abundance and eliminated some of the organisms...

Characterization of indigenous bacteria from radon-rich groundwater and

their tolerance to physicochemical stress

Authors: Nayak T, De D, Barman C, Karmakar P et al.

Source: INTERNATIONAL JOURNAL OF ENVIRONMENTAL SCIENCE AND TECHNOLOGY 17:1627-1636, 2020, DOI: 10.1007/s13762-019-02445-w

Abstract: This study attempted to identify inhabitant bacterial isolates from radon-contaminated groundwater of Tantloi, India, and to characterize their response against radiation, oxidative stress as well as heavy metal tolerance and removal. Total 16 bacterial isolates were identified as *Bacillus* spp., *Stenotrophomonas* spp., *Brevibacillus* sp., *Chryseobacterium* sp., *Escherichia* sp. and *Microbacterium* sp., which showed less number of distinct carbohydrates utilization potential but high salinity tolerance properties...

Ciprofloxacin increased abundance of antibiotic resistance genes and shaped microbial community in epiphytic biofilm on *Vallisneria spiralis* in mesocosmic wetland

Authors: Ohore OE, Zhang SH, Guo SZ, Addo FG et al.

Source: BIORESOURCE: TECHNOLOGY 323:124574, 2021, DOI: 10.1016/j.biortech.2020.124574

Abstract: This study investigated the fate of ciprofloxacin (CIP) in wetlands dominated by *Vallisneria spiralis*. About 99% of CIP was degraded from overlaying water within 4 days of treatment but significantly inhibited the nutrient removal capacity (TN, TP, and COD) by causing a drastic reduction in microbial aggregation in epiphytic biofilm and bacterial biodiversity. CIP

triggered resistance mechanisms among dominant bacteria phyla...

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Response of bacterial communities to mining activity in the alpine area of the Tianshan Mountain region, China

Authors: Yuan CY, Li FY, Yuan ZQ and more...

Source: APL BIOENGINEERING 5, 1:15806-15818, 2021, DOI: 10.1007/s11356-020-11744-6

Abstract: Anthropogenic activities, such as mining, influence soil bacterial community composition and microbial distributions. In the current study, the patterns in microbial distribution and the environmental drivers shaping the soil bacterial community composition in the alpine mining area of the Tianshan Mountain region, China, were investigated, and the bacterial communities were analyzed using 16S rDNA pyrosequencing...

Reduced bacterial network complexity in agricultural soils after application of the

neonicotinoid insecticide thiamethoxam

Authors: Zhang H, Zhang Z, Song J and more...

Source: ENVIRONMENTAL POLLUTION 274, 2021, DOI: 10.1016/j.envpol.2021.116540

Abstract: Pesticides may alter soil microbial community structure or diversity, but their impact on microbial co-occurrence patterns remains unclear. Here, the effect of the widely used neonicotinoid insecticide thiamethoxam on the bacterial community in five arable soils was deciphered using the 16S rRNA gene amplicon sequencing technique...

Effects of Biodegradable Insecticides on Biofilter Bacteria: Implications for Aquaponics

Authors: Raskovic B, Dvorak P, Mraz J

Source: TURKISH JOURNAL OF FISHERIES AND AQUATIC SCIENCES 21(4):169-177, 2021, DOI: 10.4194/1303-2712-v21_4_02

Abstract: Even though aquaponics is the production system that is increasingly gaining focus, there is an absence of publications studying the use of pesticides in the aquaponics. Therefore, the aim of this study was to assess negative effects of one synthetic (chlorpyrifos) and two botanical insecticides (azadirachtin and pyrethrin) to matured biofilter in plastic buckets...

Impacts of earthworm introduction and cadmium on microbial communities composition and function in soil

Authors: Ren CL, Teng YR, Chen XY and more...

Source: ENVIRONMENTAL TOXICOLOGY AND PHARMACOLOGY 83, 2021, DOI: 10.1016/j.etap.2021.103606

Abstract: Heavy metal contamination of soil has become a public concern. Earthworms are key players in the functioning and service of soil ecosystems, with comprehension of their introduction in the polluted soil offering new insights into the protection of soil resources...

Whole-Cell Microbial Bioreporter for Soil Contaminants Detection

Authors: Zeng N, Wu YC, Chen WL

Source: FRONTIERS IN BIOENGINEERING AND BIOTECHNOLOGY 9, 2021, DOI: 10.3389/fbioe.2021.622994

Abstract: Anthropogenic activities have released various contaminants into soil that pose a serious threat to the ecosystem and human well-being. Compared to conventional analytical methodologies, microbial cell-based bioreporters are offering a flexible, rapid, and cost-effective strategy to assess the environmental risks...

A review on metal-based nanoparticles and their toxicity to beneficial soil bacteria and fungi

Authors: Ameen F, Alsamhary K, Alabdullatif J, ALNadhari S

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 213, 2021, DOI: 10.1016/j.ecoenv.2021.112027

Abstract: The unregulated deposition of metal-based nanoparticles in terrestrial ecosystems particularly in agricultural systems has alarmingly threatened the sustainability of the environment and diversity of beneficial microbial populations such as soil bacteria and fungi. This occurs due to

the poor treatment of biosolids during wastewater treatment and their application in agricultural fields to enhance the fertility of soils...

Agricultural mulching and fungicides-impacts on fungal biomass, mycotoxin occurrence, and soil organic matter decomposition

Authors: Meyer M, Diehl D, Schaumann GE, Munoz K

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 2021, DOI: 10.1007/s11356-021-13280-3

Abstract: Plastic and straw coverage (PC and SC) are often combined with fungicide application but their influence on fungicide entry into soil and the resulting consequences for soil quality are still unknown. The objective of this study was to investigate the impact of PC and SC, combined with fungicide application, on soil residual concentrations of fungicides (fenhexamid, cyprodinil, and fludioxonil), soil fungal biomass, mycotoxin occurrence, and soil organic matter (SOM) decomposition...

Bacterial community tolerance to Cu in soils with geochemical baseline concentrations (GBCs) of heavy metals: Importance for pollution induced community tolerance (PICT) determinations using the leucine incorporation method

Authors: Campillo-Cora C, Soto-Gomez D, Arias-Estevez M. and more...

Source: SOIL BIOLOGY & BIOCHEMISTRY 155, 2021, DOI: 10.1016/j.soilbio.2021.108157

Abstract: PICT (Pollution Induced Community Tolerance) to Cu is a useful and sensitive tool to assess the effects of Cu pollution in soils under laboratory conditions. However, in field situations, the absence of reference values, i.e. bacterial community tolerance to Cu baseline from non-polluted soils, make the method uncertain when we want to know if a soil is or is not polluted from a microbiological point of view...

Medium-term effects of Ag supplied directly or via sewage sludge to an agricultural soil on *Eisenia fetida* earthworm and soil microbial communities

Authors: Courtois P, Rorat A, Lemiere S and more...

Source: CHEMOSPHERE 269, 2021, DOI: 10.1016/j.chemosphere.2020.128761

Abstract: The widespread use of silver nanoparticles (AgNPs) in consumer products that release Ag throughout their life cycle has raised potential environmental concerns. AgNPs primarily accumulate in soil through the spreading of sewage sludge (SS). In this study, the effects of direct exposure to AgNPs or indirect exposure via SS contaminated with AgNPs on the earthworm *Eisenia fetida* and soil microbial communities were compared, through 3 scenarios offering increasing exposure concentrations...

Impacts of earthworm introduction and cadmium on microbial communities'

composition and function in soil

Authors: Ren CL, Teng YR, Chen XY and more...

Source: ENVIRONMENTAL TOXICOLOGY AND PHARMACOLOGY 83, 2021, DOI: 10.1016/j.etap.2021.103606

Abstract: Heavy metal contamination of soil has become a public concern. Earthworms are key players in the functioning and service of soil ecosystems, with comprehension of their introduction in the polluted soil offering new insights into the protection of soil resources. In the present study, we evaluated the effects of earthworm (*Eisenia fetida*) introduction and Cd (0, 10, 30, and 60 mg kg⁻¹ of Cd) exposure upon soil microbial community using 16S rRNA gene amplicon sequencing...

Non-target Impact of Dinotefuran and Azoxystrobin on Soil Bacterial Community and Nitrification

Authors: Yamaguchi T, Mahmood A, Ito T, Kataoka R

Source: BULLETIN OF ENVIRONMENTAL CONTAMINATION AND TOXICOLOGY, 2021, DOI: 10.1007/s00128-021-03163-1

Abstract: Pesticides to protect crops from pests are subject to rigorous risk assessment before registration in Japan. However, further information needs to be collected regarding the assessment of impacts on the natural environment.../... Therefore, we investigated the effect of pesticides on the nitrification when applied to soil...

Heavy metal pollution increases CH₄ and decreases CO₂ emissions due to soil

microbial changes in a mangrove wetland: Microcosm experiment and field examination

Authors: Ma JJ, Ullah S, Niu A and more...

Source: CHEMOSPHERE 269, 2021, DOI: 10.1016/j.chemosphere.2020.128735

Abstract: Mangrove plays an important role in modulating global warming through substantial blue carbon storage relative to their greenhouse gas emission potential. The presence of heavy metals in mangrove wetlands can influence soil microbial communities with implications for decomposition of soil organic matter and emission of greenhouse gases...

Effects of thallium exposure on intestinal microbial community and organ functions in zebrafish (*Danio rerio*)

Authors: Wang YX, Zhou YT, Wei XD and more...

Source: ELEMENTA-SCIENCE OF THE ANTHROPOCENE 9(1), 2021, DOI: 10.1525/elementa.2021.00092

Abstract: Thallium (Tl) is a highly toxic trace metal widely distributed in water environments, which may threaten the water quality and aquatic organisms at excessive levels due to increased anthropogenic activities. This study investigated the changes in microbial communities of intestines and organs of zebrafish.../... Tl exposure gives rise to increasing abundance of pathogenic intestinal bacteria and changes the community structure of intestinal microorganisms...

Impact of cigarette butts on bacterial community structure in soil

Authors: Koroleva E, Mqulwa AZ, Norris-Jones S and more...

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 2021, DOI: 10.1007/s11356-021-13152-w

Abstract: Cigarette butts contribute significantly to global pollution present on the planet. The filters found in cigarette butts contain a microplastic, cellulose acetate, as well as toxic metals and metalloids which are responsible for pollution in the environment.../... Our findings suggest that biodegradable and non-biodegradable cigarette butts can significantly affect bacterial communities in soil as a result of the leaching of significant quantities of certain elements into the surrounding soils...

Land cover does not affect microbial and plant response to glyphosate and nitrogen application in the Pampas (Argentina)

Authors: Iglesias MA, D'Acunto L, Poggio SL, Semmartin M

Source: APPLIED SOIL ECOLOGY 160, 2021, DOI: 10.1016/j.apsoil.2020.103863

Abstract: Many complex, natural landscapes have been transformed into simpler agroecosystems by continuous cropping and the application of glyphosate and fertilizers. The current mosaic with different land cover types can harbor different soil microbial communities. Here, we investigated how the microbial community and ryegrass plants responded to glyphosate and nitrogen application to soils from four different cover types (soybean monocropping; wheat/soybean-field pea rotation, herbaceous- and woody- uncropped margins) ...

Variation and succession of microbial communities under the conditions of persistent heavy metal and their survival mechanism

Authors: Shuaib M, Azam N, Bahadur S and more...

Source: MICROBIAL PATHOGENESIS 150, 2021, DOI: 10.1016/j.micpath.2020.104713

Abstract: This review summarizes the recent papers published about the microbial communities under the conditions of persistent heavy metals around the world. Many microbial communities' study has demonstrated intense changes in the community composition, and microbial diversity caused by heavy metals, environmental pollution as well as adaptation processes allowing survival of microbes in metal-polluted ecosystems...

Biocides provide a source of carbon and nitrogen directly to surviving microbes and indirectly through a pulse in microbial necromass

Authors: Ullah MR, Carrillo Y, Dijkstra FA

Source: APPLIED SOIL ECOLOGY 160, 2021, DOI: 10.1016/j.apsoil.2020.103862

Abstract: Biocides have been frequently used to understand the roles of fungi and bacteria on soil carbon (C) and nitrogen (N) cycling. However, addition of biocides to soil can result in unwanted temporary increases in C and N supply to surviving microbes due to a pulse in microbial necromass, and where biocides can directly be used as sources of C and N...

A Growth and Phosphorus Uptake of Soybean (*Glycine Max L.*) in Response to Arbuscular Mycorrhizal Fungus *Rhizophagus Intraradices* Inoculation in Heavy Metal-contaminated Soils

Authors: Adeyemi NO, Atayese MO, Sakariyawo OS and more...

Source: SOIL & SEDIMENT CONTAMINATION, 2021, DOI: 10.1080/15320383.2021.1887809

Abstract: The present study investigated the effect of arbuscular mycorrhizal fungus (AMF) *Rhizophagus intraradices* on plant growth and phosphorus (P) uptake of soybean (*Glycine max L.*) in soils contaminated with different concentrations of heavy metals [copper (100 and 300 mg kg⁻¹), lead (100 and 300 mg kg⁻¹) and zinc (300 and 600 mg kg⁻¹)] and combination (Cu100 + Pb100 + Zn300) in a pot experiment...

Response of soil bacterial communities to sulfadiazine present in manure: Protection and adaptation mechanisms of extracellular polymeric substances

Authors: Qiu LL, Wu JJ, Du WC and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 408, 2021, DOI: 10.1016/j.jhazmat.2020.124887

Abstract: Extracellular polymeric substances (EPS) play a dominant role in protective biofilms. However, studies exploring the underlying protective mechanism of EPS have mainly focused on activated sludge, whereas their positive roles in protecting soil microbes from environmental stress have not been elucidated. In this study, we

revealed the response of soil bacterial communities to various dosages of sulfadiazine (SDZ) present in manure, with a special emphasis on the role of EPS...

Effects of the insecticide fipronil in freshwater model organisms and microbial and periphyton communities

Authors: Pino-Otin MR, Ballester D, Navarro E, and more...

Source: SCIENCE OF THE TOTAL ENVIRONMENT 764, 2021, DOI: 10.1016/j.scitotenv.2020.142820

Abstract: Fipronil is a broad-spectrum insecticide whose release in the environment damages many non-target organisms. This study evaluated the toxicity of fipronil at two biological levels using in vivo conditions and environmentally relevant concentrations: the first based on two model organisms (aquatic invertebrate *Daphnia magna* and the unicellular freshwater alga *Chlamydomonas reinhardtii*) and a second based on three natural communities (river periphyton and freshwater and soil microbial communities)...

Altered fungal communities in contaminated soils from French industrial brownfields

Authors: Lemmel F, Maunoury-Danger F, Leyval C, Cebon A

Source: JOURNAL OF HAZARDOUS MATERIALS 406, 2021, DOI: 10.1016/j.jhazmat.2020.124296

Abstract: Polycyclic aromatic hydrocarbons (PAHs) and metals are contaminants of industrial brownfield soils. Pollutants can have harmful effects on fungi, which are major actors of soil functioning. Our objective was to highlight fungal selection following long-term contamination of soils...

Comparing the effect of Cu-based fungicides and pure Cu salts on microbial biomass, microbial community structure and bacterial community tolerance to Cu

Authors: Vazquez-Blanco R, Arias-Estevez M, Baath E, Fernandez-Calvino D

Source: JOURNAL OF HAZARDOUS MATERIALS 409, 2021, DOI: 10.1016/j.jhazmat.2020.124960

Abstract: The effect of Cu on three different microbial endpoints was studied using different Cu sources, in order to check the usefulness of pure Cu salts to estimate the toxicity of commercial Cu fungicides on soil microbes.../... Therefore, the use of pure Cu salts to estimate the Cu fungicides effects on soil microbes is not recommended for PLFAs analyses, not suitable for PICT at high Cu concentrations, while useful for SIR...

Responses of soil and earthworm gut bacterial communities to heavy metal contamination

Authors: Liu P, Yang Y, Li M

Source: ENVIRONMENTAL POLLUTION 265, B, 2021, DOI: 10.1016/j.envpol.2020.114921

Abstract: ...This study used research sites at a steel factory in Nanjing, China, to investigate how the soil bacterial community and earthworm gut microbiota respond differently to heavy metal contamination using Illumina high-throughput sequencing targeting 16S rRNA genes...

Exposure to fungicide difenoconazole reduces the

soil bacterial community diversity and the co-occurrence network complexity

Authors: Zhang HP, Song JJ, Zhang ZH, and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 405, 2021, DOI: 10.1016/j.jhazmat.2020.124208

Abstract: Difenoconazole is a triazole fungicide that is widely used worldwide and has been frequently detected in agricultural soils, but its ecotoxicological effect on soil bacterial community remains unknown. Here, the degradation of difenoconazole and its effect on soil bacterial communities were investigated at three concentrations in five different agricultural soils...

Influence of the neonicotinoid insecticide thiamethoxam on soil bacterial community composition and metabolic function

Authors: Wu, CC, Wang, ZN, Ma, Y, and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 405, 2021, DOI: 10.1016/j.jhazmat.2020.124275

Abstract: Understanding of neonicotinoid insecticides toxicity on non-target organisms, such as bees, has indirectly promoted their soil treatment use. However, their effect on soil ecosystems haven't fully understood. Here, based on 16S rRNA high-throughput sequencing and metagenomics, the effects of neonicotinoid insecticide thiamethoxam on bacterial communities and metabolic functions in two types of soils were studied...

Profiling of Microbial Communities in the Sediments of Jinsha River Watershed Exposed to Different Levels of Impacts by the Vanadium Industry, Panzhihua, China

Authors: He Y, Huang DM, Li SY and more...

Source: MICROBIAL ECOLOGY, 2021, DOI: 10.1007/s00248-021-01708-9

Abstract: The mining, smelting, manufacturing, and disposal of vanadium (V) and associated products have caused serious environmental problems.../... In this study, geochemistry and microbial structure were analyzed along similar to 30 km of the Jinsha River and its two tributaries across the industrial areas in Panzhihua, one of the primary V mining and production cities in China...

Efficacy and microbial responses of biochar-nanoscale zero-valent during in-situ remediation of Cd-contaminated sediment

Authors: Liu QQ, Sheng YQ, Wang WJ, Liu XZ

Source: JOURNAL OF CLEANER PRODUCTION 287, 2021, DOI: 10.1016/j.jclepro.2020.125076

Abstract: In situ immobilization of heavy metals in sediments has been considered as a low-cost and eco-friendly remediation method. In this study, biochar (BC) and BC-nanoscale zero-valent iron composite (nZVI/BC) treatments with different doses were conducted to immobilize Cd in sediments in situ .../... Bacterial community analysis indicated that the richness and diversity of bacterial communities with the low-dose treatments were enhanced, while inhibition was

observed at high dose treatments due to changes in the pH and toxicity of BC and nZVI/BC...

Response of soil bacterial communities to the application of the herbicides imazethapyr and flumyazin

Authors: Pertile M, Sousa RMS, Mendes LW and more...

Source: EUROPEAN JOURNAL OF SOIL BIOLOGY 102, 2021, DOI: 10.1016/j.ejsobi.2020.103252

Abstract: The herbicides imazethapyr and flumyazin have been recommended for controlling weeds, mainly in soybean fields. However, it is unclear the effect of these herbicides on soil microbial communities. In this study, we assessed the responses of bacterial community to the application of imazethapyr and flumyazin in soil.../... this study shows that the application of the herbicides in soil affects the microbial profile with the potential to affect functions mediated by microbial communities, and this effect is related to groups with the potential to degrade the compound.

Hydroxyapatite as a passivator for safe wheat production and its impacts on soil microbial communities in a Cd-contaminated alkaline soil

Authors: Feng Y, Yang JJ, Liu W and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 404, B, 2021, DOI: 10.1016/j.jhazmat.2020.124005

Abstract: The remediation of Cd-contaminated alkaline soil plays a critical role in safe wheat production. In this study, hydroxyapatite (HAP), a functional environmental remediation material, was selected to investigate the effects of HAP on

cadmium accumulation in winter wheat (*Triticum aestivum* L.), Cd bioavailability in alkaline soil moderately polluted with Cd (2.46 mg kg⁻¹) and the soil bacterial community via pot experiments...

Physico-Chemical and Microbial Characterization of Soil Collected from Pesticides Infused Industrial Area, Gujarat Industrial Development Corporation (GIDC) Naroda, Ahmedabad, Gujarat

Authors: Ravi RK, Fulekar M.H., Hiranmai R. Y., Singh M

Source: BIOSCIENCE BIOTECHNOLOGY RESEARCH COMMUNICATIONS 13, 4:2029-2036, 2020, DOI: 10.21786/bbrc/13.4/59

Abstract: ... The enhanced production and formulation of pesticides has posed serious problem through contaminating the nearby surroundings, which ultimately affect the biological diversity. Therefore, the present study is focussed on physicochemical and microbial characterization of pesticides contaminated industrial soil nearby pesticides industry...

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Antibiotiques et
antibiorésistances**

A degeneration gradient of poplar trees contributes to the taxonomic, functional, and resistome diversity of bacterial communities in rhizosphere soils

Authors: Liu J, He XW, Sun JY, Ma YC

Source: INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES 22, 7, 2021, DOI: 10.3390/ijms22073438

Abstract: Bacterial communities associated with roots influence the health and nutrition of the host plant. However, the microbiome discrepancy are not well understood under different healthy conditions. Here, we tested the hypothesis that rhizosphere soil microbial diversity and function varies along a degeneration gradient of poplar, with a focus on plant growth promoting bacteria (PGPB) and antibiotic resistance genes...

Impacts of biochars on bacterial community shifts and biodegradation of antibiotics in an agricultural soil during short-term incubation

Authors: Zhang GX, Zhao ZH, Yin XA, Zhu YE

Source: SCIENCE OF THE TOTAL ENVIRONMENT 771, 2021, DOI: 10.1016/j.scitotenv.2020.144751

Abstract: This study investigated the effects of applying different biochars to soil on shifts in the bacterial community, the biodegradation of antibiotics, and their relationships. In total, nine biochars were applied to agricultural soil contaminated with 16 antibiotics...

Impact of flooding on urban soils: Changes in antibiotic resistance and bacterial community after Hurricane Harvey

Authors: Perez-Valdespino A, Pircher R, Perez-Dominguez CY and more...

Source: SCIENCE OF THE TOTAL ENVIRONMENT 766, 2021, DOI: 10.1016/j.scitotenv.2020.142643

Abstract: Major perturbations in soil and water quality are factors that can negatively impact human health. In soil environments of urban areas, changes in antibiotic-resistance profiles may represent an increased risk of exposure to antibiotic-resistant bacteria via oral, dermal, or inhalation routes. We studied the perturbation of antibiotic-resistance profiles and microbial communities in soils following a major flooding event in Houston, Texas, caused by Hurricane Harvey...

Monitoring Microbial Populations and Antibiotic Resistance Gene Enrichment Associated with Arctic Waste Stabilization Ponds

Authors: Gromala, M, Neufeld, JD, McConkey, BJ

Source: APPLIED AND ENVIRONMENTAL MICROBIOLOGY 87, 7, 2021, DOI: 10.1128/AEM.02914-20

Abstract: Wastewater management in the Canadian Arctic is challenging due to climate extremes, small population sizes, and lack of conventional infrastructure for wastewater treatment. Although many northern communities use waste stabilization ponds (WSPs) as their primary form of wastewater treatment, few studies have explored WSP microbial communities and assessed effluent impacts on receiving waters from a microbiological perspective...

Comparative microbial antibiotic resistome between urban and deep forest environments

Authors: Zheng YC, Yu S, Wang GQ and more...

Source: ENVIRONMENTAL MICROBIOLOGY REPORTS, 2021, DOI: 10.1111/1758-2229.12942

Abstract: A paradoxical result of using antibiotics to eradicate microbial pathogens is the emergence of a vast number of resistant microbes in various environments. ... Here, we provide metagenomic insights into the microbiomes and resistomes of 16 soil samples collected from hospitals, residential areas, and forest parks in the megacity of Beijing and deep forests in the Yunnan province...

Prevalence of antibiotic resistance genes and bacterial pathogens along the soil-mangrove root continuum

Authors: Wang C, Hu RW, Strong P.J. and more...

Source: JOURNAL OF HAZARDOUS MATERIALS 408, 2021, DOI: 10.1016/j.jhazmat.2020.124985

Abstract: Plants roots are colonised by soil bacteria that are known to be the reservoir of antibiotic resistance genes (ARGs). ARGs can transfer between these microorganisms and pathogens, but to what extent these ARGs and pathogens disseminate from soil into plant is poorly understood. Here, we examined a high-resolution resistome profile along the soil-root continuum of mangrove saplings using amplicon and metagenomic sequencing...

Effect of Antibiotics Used in Animal Husbandry on the Distribution of Bacterial Drug Resistance (Review)

Authors: Sazykin I.S., Khmelevtsova L.E., Seliverstova E.Y., Sazykina M.A.

Source: APPLIED BIOCHEMISTRY AND MICROBIOLOGY 57(1):20-30, 2021, DOI: 10.1134/S0003683821010166

Abstract: Antibiotics are widely used in animal husbandry at present. Due to their excessive and incorrect use, they have led to the rapid spread of antibiotic resistance genes (ARGs), as well as antibiotic-resistant bacteria (ARB) in microbial communities of the environment...

Land application of sewage sludge: Response of soil microbial communities and potential spread of antibiotic resistance

Authors: Markowicz A, Bondarczuk K, Cycon M, Sulowicz S

Source: ENVIRONMENTAL POLLUTION 271, 2021, DOI: 10.1016/j.envpol.2020.116317

Abstract: The effect of land application of sewage sludge on soil microbial communities and the possible spread of antibiotic- and metal-resistant strains and resistance determinants were evaluated during a 720-day field experiment...

Bacterial communities regulate temporal variations of the antibiotic resistome in soil following manure amendment

Authors: Cheng JH, Tang XY, Liu C

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 2021, DOI: 10.1007/s11356-021-12746-8

Abstract: The increasing emergence of antibiotic-resistant genes (ARGs) represents a global threat to human health. Land application of animal manure is known to contribute considerably to the propagation and dispersal of antibiotic resistance in agro-ecosystems. Yet, the primary determinants of the fate of the soil resistome remain obscure. In this study, a pot experiment was conducted to examine temporal changes in ARGs, mobile genetic elements (MGEs), and bacterial communities in a weakly developed loamy soil (an entisol known as calcareous purple soil) upon addition of pig or chicken manure...

Occurrence and antibacterial resistance of culturable antibiotic-resistant bacteria in the Fildes Peninsula, Antarctica

Authors: Na GS, Zhang WL, Gao H and more...

Source: MARINE POLLUTION BULLETIN 162, 2021, DOI: 10.1016/j.marpolbul.2020.111829

Abstract: Quantifying the occurrence of Antarctic antibiotic-resistant bacteria (ARB) is essential for assessing the level of pollution and assessing the "baseline" or background level of ARB in human uninhabited environments. Animal feces, soil, and sediments were sampled from Fildes Peninsula. The abundance of sulfamethazine- and ciprofloxacin-resistance bacteria and antibiotic resistance genes (ARGs) within ARB were investigated...

Use of waste materials to prevent tetracycline antibiotics toxicity on the growth of soil bacterial communities

Authors: Santas-Miguel V, Fernandez-Sanjurjo MJ, Nunez-Delgado A and more...

Source: ENVIRONMENTAL RESEARCH 193, DOI: 10.1016/j.envres.2020.110404

Abstract: The increase of concentrations of tetracycline antibiotics in agricultural soils worldwide is of special concern, due to its potential toxic effects on soil bacterial communities. In the present work, the reuse of two waste/by-product materials as soil amendments was tested as a preventive practice for reducing tetracycline antibiotics toxicity in soils...

ERA / PUBLICATIONS SCIENTIFIQUES / Microbiologie et Contaminants / Biocontrôle

Standard non-target tests for risk assessment of plant protection products are unsuitable for entomopathogenic fungi-a proposal for a new protocol

Authors: Reinbacher L, Bacher S, Praprotnik E, Grabenweger G

Source: JOURNAL OF SOILS AND SEDIMENTS, 2021, DOI: 10.1007/s11368-021-02919-w

Abstract: Purpose The successful implementation of a plant protection product depends on its effectiveness against a target species and its safety for the environment. Risk assessment schemes have therefore been devised to facilitate classification and regulation. These guidelines, however, are directed towards chemical substances and are in many cases less suitable for the assessment of products employing microorganisms...

ERA / PUBLICATIONS SCIENTIFIQUES / Microbiologie et Contaminants / Bioremédiation

Use of native plants and their associated bacteria rhizobionomes to remediate-restore Draa Sfar and Kettara mining sites, Morocco

Authors: El Alaoui A, Raklami A, Bechtaoui N and more...

Source: ENVIRONMENTAL MONITORING AND ASSESSMENT 193, 4, 2021, DOI: 10.1007/s10661-021-08977-4

Abstract: Soil and mine tailings are unreceptive to plant growth representing an imminent threat to the environment and reSource: sustainability. Using indigenous plants and their associated rhizobacteria to restore mining sites would be an eco-friendly solution to mitigate soil-metal toxicity...

A native Zn-solubilising bacterium from mine soil promotes plant growth and facilitates phytoremediation

Authors: Llimos M, Bistue M, Marcelino J and more...

Source: JOURNAL OF SOILS AND SEDIMENT, 2021, DOI: 10.1007/s11368-021-02934-x

Abstract: Purpose An important bottleneck in phytoremediation technologies, which focus on extraction of potentially toxic trace elements, is the low solubility and bioavailability of metals, a handicap that worsens over time. To overcome this barrier, we explored the possibility of using Zn-solubilising bacteria with plant growth-promoting characteristics...

Biodegradation of diisononyl phthalate by a consortium of saline soil bacteria: optimisation and kinetic characterisation

Authors: Pereyra-Camacho MA, Balderas-Hernandez VE, De Leon-Rodrigue A

Source: APPLIED MICROBIOLOGY AND BIOTECHNOLOGY 2021 DOI: 10.1007/s00253-021-11255-5

Abstract: Diisononyl phthalate (DINP) is one of plasticisers most employed in the production of plastic materials and belongs to the most important environmental contaminants. In this work, a consortium of saline soil bacterial (SSB) capable of degrading DINP is presented...

Microbial communities in the rhizosphere of different willow genotypes affect

phytoremediation potential in Cd contaminated soil

Authors: Wang GB, Zhang QQ, Du WC and more...

Source: SCIENCE OF THE TOTAL ENVIRONMENT 769, 2021, DOI: 10.1016/j.scitotenv.2021.145224

Abstract: Plant-associated microorganisms play an important role in controlling heavy metal uptake and accumulation in aerial parts. The microbial community and its interaction with Cd accumulation by willow were assessed to explore the association of phytoextraction efficiency and rhizospheric microbial populations...

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

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

Source: JOURNAL OF ENVIRONMENTAL BIOLOGY 41(6):1542-1549, 2020, 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...

Microbial bioremediation of heavy metals

Authors: Tayang A, Songachan L.S.

Source: CURRENT SCIENCE 120, 6:1013-1025, 2021, DOI: 10.18520/cs/v120/i6/1013-1025

Abstract: Heavy metals are persistent in nature and toxic to all life forms. Increase in industrialization, urbanization and unsafe agriculture practices is constantly adding heavy metals to the environment, and consequently causing heavy metal pollution of water and soil. Considering the negative impacts of heavy metals

on the environment, several strategies have been devised to remediate them...

Acenaphthene biodegradation and structural and functional metagenomics of the microbial community of an acenaphthene-enriched animal charcoal polluted soil

Authors: Salam LB, Obayori OIS, Ilori MO, Amund O

Source: BIOCATALYSIS AND AGRICULTURAL BIOTECHNOLOGY 32, 2021, DOI: 10.1016/j.bcab.2021.101951

Abstract: Animal charcoal from skin and hides cottage industries indiscriminately disposed in run offs and drainage channels harbors hazardous constituents that are mutagenic and toxic, and thus require bio-based eco-friendly depuration strategies. A microbial consortium (FN7) from an animal charcoal polluted site enriched with acenaphthene was structurally and functionally characterized...

Soil acidification enhancing the growth and metabolism inhibition of PFOS and Cr(VI) to bacteria involving oxidative stress and cell permeability

Authors: Li J, Zheng TT, Liu CG

Source: ENVIRONMENTAL POLLUTION 275, 2021, DOI: 10.1016/j.envpol.2021.116650

Abstract: Soil acidification is causing more and more attention, not only because of the harm of acidification itself, but also the greater harm to bacteria brought by some pollutants under acidic condition. Therefore, the toxicities of two typical

soil pollutants (perfluorooctane sulfonate (PFOS) and chromium (Cr(VI))) to growth and metabolisms of soil bacteria (*Bacillus subtilis* as model) were investigated...

Plant Growth and Drought Tolerance-Promoting Bacterium for Bioremediation of Paraquat Pesticide Residues in Agriculture Soils

Authors: Inthama P, Pumas P, Pekkoh J and more...

Source: FRONTIERS IN MICROBIOLOGY 12, 2021, DOI: 10.3389/fmicb.2021.604662

Abstract: Thailand is an agricultural country. However, agricultural productivity relies on the heavy use of herbicides, especially paraquat. Paraquat accumulation is emerging as a problem in an ever-growing portion of agricultural land. Paraquat residues are toxic to plants, animals, and aquatic organisms in the environment. Biological remediation is a process that can mitigate agricultural chemical contaminants. One of the interesting bioremediators is bacteria...

Biodegradation of Lindane (gamma-Hexachlorocyclohexane) To Nontoxic End Products by Sequential Treatment with Three Mixed Anaerobic Microbial Cultures

Authors: Jacome LAP, Lomheim L, Gaspard S, Edwards, EA

Source: ENVIRONMENTAL SCIENCE & TECHNOLOGY 55(5):2968-2979, 2021, DOI: 10.1021/acs.est.0c07221

Abstract: The gamma isomer of hexachlorocyclohexane (HCH), also known as lindane, is a carcinogenic persistent organic pollutant. Lindane was used worldwide as an agricultural insecticide. Legacy soil and groundwater contamination with lindane and other HCH isomers is still a big concern. The biotic reductive dechlorination of HCH to nondesirable and toxic lower chlorinated compounds such as monochlorobenzene (MCB) and benzene, among others, has been broadly documented...

Microbial Population Dynamics in Model Sewage Treatment Plants and the Fate and Effect of Gold Nanoparticles

Authors: Schlich K, Diaz C, Gomez Pizarro B and more...

Source: TOXICS 9, 3, 2021, DOI: 10.3390/toxics9030054

Abstract: Adequate functioning of a sewage treatment plant (STP) is essential to protect the downstream aquatic environment (ECHA 2017), and information on the degradability of chemicals and their toxicity to activated sludge microorganisms is required. An environmental realistic higher tier test is a STP simulation test as described in OECD 303A (2001) which for nanoparticles can also be used to study their sorption behavior to activated sludge. However, information is limited on the influence of synthetic sewage on the microbial community of the activated sludge...

Application of a prometryn-degrading bacterium, *Arthrobacter crystallopoietes* pcj-s03 for

bioremediation of prometryn pollution

Authors: Zhu JW, Fu, L, Li, XL, Meng, ZL

Source: FRESENIUS ENVIRONMENTAL BULLETIN 29, 7A: 6159-6167

Abstract: A bacterium named PCJ-S03 is screened from soil and identified as *Arthrobacter crystallopoietes*, which can efficiently degrade prometryn...

Heavy metal-immobilizing bacteria combined with calcium polypeptides reduced the uptake of Cd in wheat and shifted the rhizosphere bacterial communities

Authors: Han H, Wu XJ, Yao LG, Chen ZJ

Source: ENVIRONMENTAL POLLUTION 267, 2021, DOI: 10.1016/j.envpol.2020.115432

Abstract: In situ stabilization techniques for the "remediation" of heavy metal-contaminated soil are a novel and inexpensive technology. However, the mechanisms underlying the interaction of exogenous passivators with the bacterial community in wheat rhizosphere soil remain unclear...

Characterization and bioremediation potential of native heavy-metal tolerant bacteria isolated from rat-hole coal mine environment

Authors: Shylla L., Barik S. K., Joshi S. R.

Source: ARCHIVES OF MICROBIOLOGY, 2021, DOI: 10.1007/s00203-021-02218-5

Abstract: Identification and characterization of endogenous and stress adapted bacterial species, from rat-hole coal mines in Meghalaya, amplify the ambit of bioremediation for eco-restoration...

Anaerobic Degradation of Propanil in Soil and Sediment Using Mixed Bacterial Culture

Authors: Oanh NT, Duc HD

Source: CURRENT MICROBIOLOGY 78(4): 1499-1508, 2021, OI: 10.1007/s00284-021-02419-7

Abstract: The widespread use of the herbicide, propanil, causes severe environmental problems. In this study, the effects of propanil on the bacterial community in a sediment slurry were determined...

Garlic (*Allium sativum*) based interplanting alters the heavy metals absorption and bacterial diversity in neighboring plants

Authors: Hussain J, Wei X, Xue-Gang L and more...

Source: SCIENTIFIC REPORTS 11, 1, 2021, DOI: 10.1038/s41598-021-85269-4

Abstract: Heavy metals are naturally occurring elements that have a high atomic weight and let out in the environment by agriculture, industry, mining and therapeutic expertise and thrilling amassing of these elements pollutes the environment. In this study we have investigated the potential of garlic interplanting in promoting hyper accumulation and absorption of heavy metals to provide a basis for phytoremediation of polluted land...

Effects of elevated CO₂ on arbuscular mycorrhizal fungi associated with *Robinia pseudoacacia* L. grown in cadmium-contaminated soils

Authors: Wang L, Jia X, Zhao YH and more...

Source: SCIENCE OF THE TOTAL ENVIRONMENT 768, 2021, DOI: 10.1016/j.scitotenv.2020.144453

Abstract: As symbionts capable of reciprocal rewards, arbuscular mycorrhizal fungi (AMF) can alleviate heavy metal toxicity to host plants and are easily influenced by elevated CO₂ (ECO₂). Although the individual effects of ECO₂ and cadmium (Cd) on AMF have been widely reported, the response of AMF to ECO₂ + Cd receives little attention...

Concentration of benzene, toluene, naphthalene and acenaphthene on selected bacterial species

Authors: Kesavan S, Inamdar MG, Muthunarayanan V

Source: MATERIALS TODAY-PROCEEDINGS 37: 273-279, 2021, DOI: 10.1016/j.matpr.2020.05.241

Abstract: Several treatment methods, applying physical, chemical and biological processes were developed in the past decades. Physicochemical measures are capable of removing most of the contaminants, but the main disadvantages of these methods lie in the increased energy consumption and the need of additional chemicals...

The effect of endophytic fungi on growth and nickel accumulation in *Noccaea hyperaccumulators*

Authors: Wazny R, Rozpadek P, Domka A and more...

Source: SCIENCE OF THE TOTAL ENVIRONMENT 768, 2021, DOI: 10.1016/j.scitotenv.2020.144666

Abstract: The role of endophytic fungi isolated from different populations of European Ni hyperaccumulators was investigated in regard to the microorganisms ability to enhance the hyperaccumulation of Ni in *Noccaea caerulescens*...

Root fungal endophytes: identity, phylogeny and roles in plant tolerance to metal stress

Authors: Barberis L, Michalet S, Piola F, Binet P

Source: FUNGAL BIOLOGY 125(4):326-345, 2021, DOI: 10.1016/j.funbio.2020.11.011

Abstract: Metal trace elements accumulate in soils mainly because of anthropic activities, leading living organisms to develop strategies to handle metal toxicity. Plants often associate with root endophytic fungi, including nonmycorrhizal fungi, and some of these organisms are associated with metal tolerance...

Optimization for biogenic microbial synthesis of silver nanoparticles through surface methodology, their characterization,

antimicrobial, antioxidant, and catalytic potential

Authors: Ibrahim S, Ahmad Z, Manzoor MZ and more...

Source: SCIENTIFIC REPORTS 11, 1, 2021, DOI: 10.1038/s41598-020-80805-0

Abstract: Silver is a poisonous but precious heavy metal that has widespread application in various biomedical and environmental divisions. Wide-ranging usage of the metal has twisted severe environmental apprehensions. Henceforth there is a cumulative call for the progress of modest, low-cost and, the ecological method for remediation of silver. In the present study, *Bacillus cereus* was isolated from contaminated soil...

Stress Response of Miscanthus Plants and Soil Microbial Communities: A Case Study in Metals and Hydrocarbons Contaminated Soils

Authors: Nebeska D, Malinska HA, Erol A and more...

Source: APPLIED SCIENCES-BASEL 11, 4, 2021, DOI: 10.3390/app11041866

Abstract: The potential application of results is in phytomanagement of contaminated sites (combined phytoremediation with biomass production). Second-generation biofuel crop miscanthus is one of the most promising plants tested for phytomanagement of contaminated sites. In this preliminary pot case study, the most used hybrid *Miscanthus x giganteus* was cultivated in three different real contaminated soils: agricultural soil contaminated with Cd; post-military soil slightly contaminated with Zn, Pb and Cd; and soil contaminated by petroleum industry with metals and hydrocarbons...

Isolation, characterization and identification of pesticide degrading bacteria from contaminated soil for bioremediation

Authors: Mehta A, Bhardwaj KK, Shaiza M, Gupta R

Source: BIOLOGIA FUTURA, 2021, DOI: 10.1007/s42977-021-00080-6

Abstract: In this study, malathion and chlorpyrifos degrading bacteria were isolated from agricultural soil samples taken from the Himachal region in India. A total of 52 organisms were isolated which were further screened for their efficiency for chlorpyrifos and malathion degradation...

Biodegradation of Fipronil: Transformation Products, Microbial Characterisation and Toxicity Assessment

Authors: Tomazini R, Saia FT, van der Zaan B and more...

Source: WATER AIR AND SOIL POLLUTION 232, 3, 2021, DOI: 10.1007/s11270-021-05071-w

Abstract: Fipronil is a highly active, broad spectrum insecticide with increasing and wide use. The degradation of fipronil was studied in Brazilian soil under oxic and anoxic conditions. Under oxic conditions, the half-life of fipronil was 16.9 days, with fipronil sulfone as the main metabolite, and no further degradation during 30 days of incubation...

Insights into the microbial degradation and catalytic mechanisms of chlorpyrifos

Authors: Huang YH, Zhang WP, Pang SM and more...

Source: ENVIRONMENTAL RESEARCH 194, 2021, DOI: 10.1016/j.envres.2020.110660

Abstract: Chlorpyrifos is extensively used worldwide as an insecticide to control various insect pests. Long-term and irregular applications of chlorpyrifos have resulted in large-scale soil, groundwater, sediment, and air pollution. Numerous studies have shown that chlorpyrifos and its major intermediate metabolite 3,5,6-trichloropyridinol (TCP) accumulate in non-target organisms through biomagnification and have a strong toxic effect on non target organisms, including human beings. Bioremediation based on microbial metabolism is considered an eco-friendly and efficient strategy to remove chlorpyrifos residues...

Effect of fertilization, carbon-based material, and redmud amendments on the bacterial activity and diversity of a metal(loid) contaminated mining soil

Authors: Lebrun M, Miard F, Van Poucke R and more...

Source: LAND DEGRADATION & DEVELOPMENT, 2021, DOI: 10.1002/ldr.3929

Abstract: Soil amendments can be used to improve phytoremediation of polluted soils.../... Treatments with biochar and/or neutralized redmud resulted in a similar community composition while the bacterial community of the treatments with activated carbon and nonprocessed redmud remained more similar to that of the nonamended technosol.

Biochar and *Bacillus amyloliquefaciens* NS16 can increase biomass and reduce cadmium accumulation of pakchoi explained by changes of cadmium availability, microbial biomass and community in the rhizosphere soil

Authors: Song NN, Wang JC, Jia CZ and more...

Source: FRESENIUS ENVIRONMENTAL BULLETIN 30(2): 913-921, 2021

Abstract: Inoculation of *Bacillus* may mediate plant growth and decrease uptake of heavy metals, but the combined effects and the mechanisms of *Bacillus* sp. and biochar on the cadmium availability and plant uptake are far less investigated. The effects of a plant growth-promoting *B. amyloliquefaciens* NS16, biochar, and their combination on the plant biomass and Cd accumulation in pakchoi and the mechanisms involved were characterized...

Medium-term effects of Ag supplied directly or via sewage sludge to an agricultural soil on *Eisenia fetida* earthworm and soil microbial communities

Authors: Courtois P, Rorat A, Lemiere S and more...

Source: CHEMOSPHERE 269, 2021, DOI: 10.1016/j.chemosphere.2020.128761

Abstract: The widespread use of silver nanoparticles (AgNPs) in consumer products that release Ag throughout their life cycle has raised potential environmental concerns. AgNPs primarily accumulate in soil through the spreading

of sewage sludge (SS).../... The addition of SS had a greater effect on soil microbial diversity than the form of Ag, and the formation of Ag sulfides in SS reduced the impact of AgNPs on *E. fetida* and soil microorganisms compared with direct addition

Stress Response of *Miscanthus* Plants and Soil Microbial Communities: A Case Study in Metals and Hydrocarbons Contaminated Soils

Authors: Nebeska D, Malinska HA, Erol A and more...

Source: APPLIED SCIENCES-BASEL 11, 4, 2021, DOI: 10.3390/app11041866

Abstract: ... Second-generation biofuel crop *Miscanthus* is one of the most promising plants tested for phytomanagement of contaminated sites.../... It could be concluded that *Miscanthus* is suitable for cultivation in metals contaminated soils with potential for microbial communities support, but in soil contaminated by the petroleum industry, its application did not seem meaningful.

Post-reclamation microbial diversity and functions in hexachlorocyclohexane (HCH) contaminated soil in relation to spontaneous HCH tolerant vegetation

Authors: Balazs HE, Schmid, CAO, Cruzeiro C and more...

Source: SCIENCE OF THE TOTAL ENVIRONMENT 767, 2021, DOI: 10.1016/j.scitotenv.2020.144653

Abstract: The toxicity, volatility and persistence of the obsolete organochlorine pesticide

hexachlorocyclohexane (HCH), makes reclamation of contaminated areas a priority for the health and welfare of neighboring human communities. Microbial diversity and functions and their relation to spontaneous vegetation in post-excavation situations, are essential indicators to consider in bioaugmentation or microbe-assisted phytoremediation strategies at field scale. Our study aimed to evaluate the effects of long-term HCH contamination on soil and plant-associated microbial communities, and whether contaminated soil has the potential to act as a bacterial inoculum in post-excavation bioremediation strategies...

Sulfadiazine dissipation as a function of soil bacterial diversity

Authors: de Souza AJ, de Araujo Pereira APD, Andreote FD and more...

Source: ENVIRONMENTAL POLLUTION 271, 2021, DOI: 10.1016/j.envpol.2020.116374

Abstract: Antibiotic residues in the environment are concerning since results in dispersion of resistance genes. .../... Our main goals were to evaluate effects of long-term swine manure application on soil bacterial structure as well as effects of soil microbial diversity depletion on SDZ dissipation, using "extinction dilution approach" and C-14-SDZ...

Biodiversity of pesticides degrading microbial communities and their environmental impact

Authors: Kumar M, Yadav AN, Saxena R and more...

Source: BIOCATALYSIS AND AGRICULTURAL BIOTECHNOLOGY 31, 2021, DOI: 10.1016/j.bcab.2020.101883

Abstract: A number of hazardous pesticides (pure substances or mixtures of chemicals) are being used by the farmers in agricultural fields to control undesired microbes during production, harvesting and storage of food stuff. These potent chemicals are jeopardizing not only the crop fertility and productivity but affecting human health .../... Among different groups of microbes, *Arthrobacter*, *Aspergillus*, *Bacillus*, *Burkholderia*, *Chlamydomonas*, *Methylobacterium*, *Nocardioideis*, *Nostoc*, *Phanerochaete*, *Pseudomonas*, *Sphingobacterium*, *Sphingomonas* and *Trichoderma* were isolated and characterised for the degradation of different pesticides. The role of microbes, in the remediation and degradation of chemical pesticides are elaborated into this compilation with the recent insights.

Reduction of heavy metals bioaccumulation in sorghum and its rhizosphere by heavy metals-tolerant bacterial consortiumn

Authors: Abou-Aly HE, Youssef AM, Tewfike TA and more...

Source: BIOCATALYSIS AND AGRICULTURAL BIOTECHNOLOGY 31, 2021, DOI: 10.1016/j.bcab.2021.101911

Abstract: A consortium of three heavy metals tolerant-plant growth promoting bacteria (HMT-PGPB) (*Bacillus cereus* MG257494.1, *Alcaligenes faecalis* MG966440.1 and *Alcaligenes faecalis* MG257493.1) was tested for its beneficial effects on microbial activities in sorghum' rhizosphere (*Sorghum vulgare* L.)...

How the Soil Microbial Communities and Activities Respond to Long-Term Heavy Metal Contamination in Electroplating Contaminated Site

Authors: Gong WJ, Niu ZF, Wang XR, Zhao HP

Source: MICROORGANISMS 9, 2, 2021, DOI: 10.3390/microorganisms9020362

Abstract: The effects of long-term heavy metal contamination on the soil biological processes and soil microbial communities were investigated in a typical electroplating site in Zhangjiakou, China. .../...The Spearman correlation analysis showed the *Methylobacillus*, *Muribaculaceae*, and *Sphingomonadaceae* were able to tolerate high concentrations of Cr, Cr (VI), Cu, and Zn, indicating their potential in soil remediation.

Cadmium tolerance and bioremediation potential of filamentous fungus *Penicillium chrysogenum* FMS2 isolated from soil

Authors: Din G., Hassan A., Dunlap J.

Source: INTERNATIONAL JOURNAL OF ENVIRONMENTAL SCIENCE AND TECHNOLOGY, 2021, DOI: 10.1007/s13762-021-03211-7

Abstract: Cadmium-tolerant fungus, designated as strain FMS2, was isolated from metal-polluted soil collected from Lahore, Pakistan, and its role in cadmium bioremediation was investigated...

Role of microbial community and metal-binding proteins in phytoremediation of heavy metals from industrial wastewater

Authors: Sharma P, Pandey AK, Udayan A, Kumar S

Source: BIORESOURCE: TECHNOLOGY 326, 2021, DOI: 10.1016/j.biortech.2021.124750

Abstract: This review illustrated the role of metal-binding proteins (MBPs) and microbial interaction in assisting the phytoremediation of industrial wastewater polluted with heavy metals. MBPs are used to increase the accumulation and tolerance of metals by microorganisms via binding protein synthesis...

Identification of a Pb-Resistant Acetochlor-Degrading Bacterium for Bioremediation of Soils Contaminated with Herbicides

Authors: Xin YF, Zhai ZZ, Qu XH

Source: WATER AIR AND SOIL POLLUTION 232, 2, 2021, DOI: 10.1007/s11270-021-05026-1

Abstract: Acetochlor, a commonly used herbicide, and Pb are two important soil contaminants often found to co-occur. The cytotoxic effects of heavy metals like Pb considerably reduce the efficacy of microbial bioremediation steps undertaken to remove chemical contaminants from soil. This necessitates the identification of heavy metal-tolerant microbial strains that can degrade chemical pollutants...

Metagenomic analysis for profiling of microbial communities and tolerance in metal-polluted pulp and paper industry wastewater

Authors: Sharma P, Tripathi S, Chandra R

Source: BIORESOURCE: TECHNOLOGY 324, 2021, DOI: 10.1016/j.biortech.2021.124681

Abstract: This work aimed to study the profiling and efficiency of microbial communities and their abundance in the pulp and paper industry wastewater, which contained toxic metals, high biological oxygen demands, chemical oxygen demand, and ions contents.../... Findings demonstrated that the ability of different classes of microbes to adapt and survive in metal-polluted wastewater irrespective of their relative distribution, as well as further attention can be provided to its use in the bioremediation process.

The effects of non-metallic organic tanning agents on the microbial community structure in wastewater

Authors: Li CT, Pan GJ, Wang XC and more...

Source: JOURNAL OF CLEANER PRODUCTION 279, 2021, DOI: 10.1016/j.jclepro.2020.123553

Abstract: ... In this study, the structure character of microbial communities in leather wastewater containing non-metallic organic tanning agents and the effect of the leather wastewater on the ecology of the microorganisms were studied with the high-throughput sequencing.../... These highly tolerant microorganisms should be actively explored for bioremediation of non-metallic organic tanning agents wastewater...

Petroleum contamination significantly changes soil microbial communities in three oilfield locations in Delta State, Nigeria

Authors: Mafiana MO, Kang XH, Leng Y and more...

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 2021, DOI: 10.1007/s11356-021-12955-1

Abstract: ... To understand how petroleum contamination and soil physicochemical properties jointly shaped the microbial structure of soils from different oilfields, high-throughput sequencing of 16S and ITS amplicons were used to evaluate the shifts of microbial communities in the petroleum-contaminated soils in Ughelli East (UE), Utorogu (UT), and Ughelli West (UW) oilfields located in Delta State, Nigeria...

Efficient recovery of metal tolerant fungi from the soil of industrial area and determination of their biosorption capacity

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

Source: ENVIRONMENTAL TECHNOLOGY & INNOVATION 21, 2021, DOI: 10.1016/j.eti.2020.101237

Abstract: Due to various anthropogenic activities, different heavy metals like arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg) and nickel (Ni) accumulate in the soils of industrial areas. In the current study, contaminated soil was collected from Yuepu industrial area of Shanghai, China.../... Molecular characterization of isolated fungi was performed and amplified sequences were deposited in GenBank NCBI database. Metal tolerance and

biosorption capacity of these fungal strains towards lead and copper were tested...

Microbial technologies for heavy metal remediation: effect of process conditions and current practices

Authors: Verma S, Bhatt P, Verma A and more...

Source: CLEAN TECHNOLOGIES AND ENVIRONMENTAL POLICY, 2021, DOI: 10.1007/s10098-021-02029-8

Abstract: Heavy metal (HM) contamination is a persisting environmental problem in many countries.../... The remediation of soils contaminated with HMs is essential, given the fact that the latter causes direct and indirect damage to living organisms and the environment.../... This review compiles information on the recent advances and applications of microbe-mediated bioremediation of soils contaminated with HMs.

Microbial activity and metamitron degrading microbial communities differ between soil and water-sediment systems

Authors: Wang S., Miltner A., Muskus A. M., Nowak K. M.

Source: JOURNAL OF HAZARDOUS MATERIALS 408, 2021, DOI: 10.1016/j.jhazmat.2020.124293

Abstract: The herbicide metamitron is frequently detected in the environment, and its degradation in soil differs from that in aquatic sediments. In this study, we applied C-13(6)-metamitron to investigate the differences in microbial activity, metamitron mineralization and metamitron degrading microbial communities between soil and water-sediment systems...

Novel degradation pathways for Chlorpyrifos and 3, 5, 6-Trichloro-2-pyridinol degradation by bacterial strain *Bacillus thuringiensis* MB497 isolated from agricultural fields of Mianwali, Pakistan

Authors: Ambreen S, Yasmin A

Source: PESTICIDE BIOCHEMISTRY AND PHYSIOLOGY 172, 2021, DOI: 10.1016/j.pestbp.2020.104750

Abstract: Over use of organophosphate pesticides including Chlorpyrifos (CPF) has led to contamination of soil and water resources, resulting in serious health problems in humans along with other non-target organisms. The current study was aimed to investigate Chlorpyrifos as well as 3, 5, 6-Trichloro-2-pyridinol (TCP) biodegradation tendency of bacterial strain *Bacillus thuringiensis* MB497 isolated from wheat/cotton fields of Dera Saleemabad, Mianwali, Pakistan, having a history of heavy Organophosphate pesticides application...

Bacterial tolerance strategies against lead toxicity and their relevance in bioremediation application

Authors: Mitra A, Chatterjee S, Katak S and more...

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 2021, DOI: 10.1007/s11356-021-12583-9

Abstract: Among heavy metals, lead (Pb) is a non-essential metal having a higher toxicity and without any crucial known biological functions.../... Developing strategies by designing

transgenic bacterial strain having specific metal binding properties and metal chelating proteins or higher metal adsorption ability and using bacterial activity such as incorporating plant growth-promoting rhizobacteria for improved Pb resistance, exopolysaccharide and siderophores and metallothionein-mediated immobilization may prove highly effective for formulating bioremediation vis-a-vis phytoremediation strategies.

Influence of imidacloprid on bacterial community diversity of mango orchard soil assessed through 16S rRNA sequencing-based metagenomic analysis

Authors: Garg N, Bhattacharjee AK, Shukla PK, Singh, B

Source: ENVIRONMENTAL MONITORING AND ASSESSMENT 193, 2, 2021, DOI: 10.1007/s10661-021-08885-7

Abstract: Imidacloprid, used against mango hopper, is a persistent insecticide in soil. Microbes have the ability to remove toxic pesticides from soil surface. Metagenomic is an approach for understanding the diversity and related metabolic activities in any environmental sample without culturing the microbes... /... Bacterial community transformation was evident from this study indicating possible microbial bioremediation of imidacloprid in mango orchard soil.

New insights into the biodegradation of chlorpyrifos by a novel bacterial consortium: Process

optimization using general factorial experimental design

Authors: Uniyal S, Sharma RK, Kondakal V

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 209, 2021, DOI: 10.1016/j.ecoenv.2020.111799

Abstract: Himalayan mountains are subjected to the intensive and unjudicial application of chlorpyrifos (CP) in agricultural practices; hence it has spurred concerns over food safety and environmental consequences. These low temperature mountainous regions are foremost ecosystems, representing the large-scale distribution of cold trapped CP residues. A bacterial consortium...

Promotion of Zinc Tolerance, Acquisition and Translocation of Phosphorus in *Mimosa pudica* L. Mediated by Arbuscular Mycorrhizal Fungi

Authors: Quan LT, Zhang JH, Wei QP and more...

Source: BULLETIN OF ENVIRONMENTAL CONTAMINATION AND TOXICOLOGY, 2021, DOI: 10.1007/s00128-021-03113-x

Abstract: Heavy metal contamination of soil is of increasing concern because of its potential risk to human health. In this study, two AMFs (*Rhizophagus intraradices* and *Funneliformis mosseae*) substantially increased the biomass of bashfulgrass in Zn-contaminated soil, even at Zn levels of up to 600 mg kg⁻¹. ...

ERA / PUBLICATIONS SCIENTIFIQUES / PESTICIDES ET FAUNE SAUVAGE

Small things are important: the value of singular point elements for birds in agricultural landscapes

Authors: Pustkowiak S., Kwieciński Z., Lenda M., Żmihorski M., Rosin Z.M., Tryjanowski P. and Skórka P.

Source: Biol Rev, 2021, DOI: 10.1111/brv.12707

Abstract: Farmland birds belong to the most endangered group of vertebrates in Europe. They are an important component of farmland biodiversity considering the numerous functions they perform (e.g. seed dispersal, improving germination, increasing gene flow, nutrient recycling, and pest control). (...) Herein, we define and identify singular point elements in the agricultural landscape (SPELs) which are potentially important for breeding farmland birds. We also describe each SPEL and evaluate its importance for birds in farmland...

Predator- and competitor- induced responses in amphibian populations that evolved different levels of pesticide tolerance

Authors: Jones D. K., Hua J., Mattes B. M., Cothran R. D., Hoverman J. T., and Relyea R. A.

Source: Ecological Applications 00:e02305, 2021, DOI: 10.1002/eap.2305

Abstract: Exposure to agrochemicals can drive rapid phenotypic and genetic changes in exposed populations. (...) A recent study has demonstrated that induced pesticide tolerance appears to have arisen from plastic responses to predator cues. As a result, we might expect that selection for constitutive pesticide tolerance in populations near agriculture (i.e., genetic assimilation) will lead to the evolution of constitutive responses to natural stressors...

Annual abundance of common Kestrels (*Falco tinnunculus*) is negatively associated with second generation anticoagulant rodenticides

Authors: Roos S., Campbell S.T., Hartley G. et al.

Source: Ecotoxicology 30:560-574, 2021, DOI: 10.1007/s10646-021-02374-w

Abstract: Here we study whether SGARs may have contributed to the widespread population declines of a rodent-eating raptor, the Common Kestrel (*Falco tinnunculus*) in the UK. We show that 161 (66.8%) of the 241 Kestrels submitted for ecotoxicology tests between 1997 and 2012 had detectable levels of at least one SGAR in their livers. Adult Kestrels had significantly higher prevalence of SGARs than juveniles, suggesting accumulation of SGARs through time...

Population-level variation in infection outcomes not influenced by pesticide exposure in larval wood frogs (*Rana sylvatica*)

Authors: Billet LS, Wuerthner VP, Hua J, Relyea RA, Hoverman JT

Source: Freshw Biol 00:1-13, 2021, DOI: 10.1111/fwb.13708

Abstract: There is increasing evidence that populations of non-target wildlife species can evolve tolerance to pesticides. As ecosystems become increasingly exposed to chemical contaminants globally, it is important to consider not only the immediate consequences of contaminant exposure but also the potential costs associated with evolved responses. Theory predicts there may be trade-offs, including increased susceptibility to parasites, associated with evolved pesticide tolerance...

Snakes as bimonitors of environmental pollution: A review on organic contaminants

Authors: Hoang A.Q., Tu M.B., Takahashi S., Kunisue T., Tanabe S.

Source: Science of The Total Environment, 770, 2021, DOI: 10.1016/j.scitotenv.2020.144672.

Abstract:

- Concentrations and profiles of multiple organic pollutants in snakes are reviewed.
- Snakes can serve as good biomonitors of various organic pollutants in the environment.
- Intensive human activities are principal sources of snake exposure to organic pollutants.
- The behavior, fate, sources, and risks of organic pollutants in snakes are discussed.
- Additional monitoring and toxicological studies on organic pollutants in snakes are needed.

Common Vole as a Focal Small Mammal Species in Orchards of the Northern Zone

Authors: Stirké V., Balčiauskas L., Balčiauskienė L.

Source: Diversity, 13: 134, 2021, DOI: 10.3390/d13030134

Abstract: In 2018-2020, we performed a country-wide study of small mammals in commercial orchards and berry plantations with the aim of determining whether the common vole (*Microtus arvalis*) is a more suitable focal species than the field vole (*M. agrestis*) in the risk assessment of plant protection products in Lithuania (country of the Northern Zone). (...) In central and eastern European countries, common vole is more widespread and abundant than field vole...

Pesticide and trace element bioaccumulation in wild owls in Brazil

Authors: Dal Pizzol, G.E., Rosano, V.A., Rezende, E. *et al.* 2021.

Source: Environ Sci Pollut Res., 2021, DOI: 10.1007/s11356-021-13210-3

Abstract: Owls are outstanding environmental quality bioindicators due to their position at the top of the food chain and susceptibility to pollutant accumulation. (...) We analyzed the 26 organs (heart, liver, and kidney) of *Tyto furcata* (n=3), *Megascops* spp. (n=5), *Pulsatrix koeniswaldiana* (n=1), and *Asio stygius* (n=1) carcasses, collected from June 2018 to May 2019 in the Southern region of Brazil...

Dermal Fungicide Exposure at Realistic Field Rates Induces Lethal and Sublethal Effects on Juvenile European Common Frogs (*Rana temporaria*)

Authors: Adams E., Gerstle V., Brühl CA.

Source: Environ Toxicol Chem 2021, DOI: 10.1002/etc.4972.

Abstract: (...) Because postmetamorphic, terrestrial amphibian stages are mostly neglected in ecotoxicological studies, we investigated acute

effects of viticultural fungicides on juvenile common frogs (*Rana temporaria*). Tadpoles from an uncontaminated pond were placed in enclosures in 8 ponds with an increasing degree of pesticide contamination in southwest Germany to represent different aquatic exposure backgrounds. After metamorphosis, juveniles were exposed to soil contaminated with 50% of the recommended field rates of the fungicides...

Bottom-up effects of fungicides on tadpoles of the European common frog (*Rana temporaria*)

Authors: Bundschuh M, Zubrod JP, Wernicke T et al.

Source: Ecology and Evolution 00:1-13, 2021, DOI: 10.1002/ece3.7332

Abstract: Biodiversity is under pressure worldwide, with amphibians being particularly threatened. (...) It remains, however, unclear whether chemicals exhibiting a fungicidal activity could indirectly affect tadpoles (...) The indirect effect of fungicides (a fungicide mixture) on tadpoles was assessed relative to leaf litter colonized by microbes in absence of fungicides (control) and a worst-case scenario, that is leached leaf litter without microbial colonization...

Wild boar (*Sus scrofa*) as bioindicator for environmental exposure to organic pollutants

Authors: González-Gómez X., Cambeiro-Pérez N., Figueiredo-González M., Martínez-Carballo E.

Source: Chemosphere 268:128848, 2021, DOI: 10.1016/j.chemosphere.2020.128848.

Abstract: (...) Wildlife biomonitoring of OPs has been nowadays a common approach to assess

chemical exposure in wildlife and humans. In a sample of 60 wild boars (*Sus scrofa*) from NW Spain, we evaluated the suitability of using liver and hair samples for the assessment of exposure and bioaccumulation of polychlorinated biphenyls (PCBs) including dioxin and non-dioxin like PCBs (DLPCBs and NDLPCBs), organochlorine and organophosphate pesticides (OCPs and OPPs, respectively), polybromodiphenyl ethers (PBDEs), pyrethroids (PYRs) and polycyclic aromatic hydrocarbons (PAHs)...

Review on endocrine disrupting toxicity of triphenyltin from the perspective of species evolution: Aquatic, amphibious and mammalian

Authors: He S, Li P, Li ZH

Source: Chemosphere. 269:128711, 2021, DOI: 10.1016/j.chemosphere.2020.128711

Abstract: Triphenyltin (TPT) is widely used as a plastic stabilizer, insecticide and the most common fungicide in antifouling coatings. This paper reviewed the main literature evidences on the morphological and physiological changes of animal endocrine system induced by TPT, with emphasis on the research progress of TPT metabolism, neurological and reproductive regulation in animal endocrine system.

How do pesticides affect bats? A brief review of recent publications

Authors: Oliveira JM, Destro ALF, Freitas MB, Oliveira LL

Source: BRAZILIAN JOURNAL OF BIOLOG, 81:499-507, 2021, DOI: 10.1590/1519-6984.225330

Abstract: (...) Recent studies suggest that several non-target organisms, from bees to mammals, show a wide variety of toxic effects of pesticides exposure, including impaired behavior, development and reproduction. Among mammals, bats are usually a neglected taxon among ecotoxicological studies...

Exposure to common pesticides utilized in northern rice fields of Iran affects survival of non-target species, *Pelophylax ridibundus* (Amphibia: Ranidae)

Authors: Shojaei N, Naderi S, Yasari E, Moradi N

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH 2021, DOI: 10.1007/s11356-021-13168-2

Abstract: Amphibians are the most important vulnerable non-target vertebrate group that are affected by pesticides. (...) Therefore, to estimate the mortality rate of frogs during the growing season in different cultivating systems, we examined the presence of pesticides in water and substrate as indicators of habitat quality and in the liver tissue of Marsh frog *Pelophylax ridibundus* (Pallas, 1771), enclosed in the prepared cages at five rice paddy fields...

Birds feeding on tebuconazole treated seeds have reduced breeding output

Authors: Lopez-Antia A., Ortiz-Santaliestra M.E., Mougeot R., Camarero P.R., Mateo R.

Source: Environmental Pollution, 271:116292, 2021, DOI: 10.1016/j.envpol.2020.116292

Abstract: Drilled seeds are an important food reSource: for many farmland birds but may pose a serious risk when treated with pesticides. Most compounds currently used as seed treatment in the EU have low acute toxicity but may still affect birds in a sub-chronic or chronic way, (...) Our aim was to test if a realistic scenario of exposure to tebuconazole treated seeds affected the survival and subsequent reproduction of the red-legged partridge (*Alectoris rufa*)...

Linking landscape composition and biological factors with exposure levels of rodenticides and agrochemicals in avian apex predators from Germany

Authors: Badry A., Schenke D., Treu G., Krone O.

Source: Environmental Research, 193, 2021, DOI: 10.1016/j.envres.2020.110602.

Abstract: Intensification of agricultural practices has resulted in a substantial decline of Europe's farmland bird populations. (...) Raptors are known to be particularly sensitive to pollutants that biomagnify and are thus frequently used sentinels for pollution in food webs. The current study focussed on anticoagulant rodenticides (ARs) but also considered selected medicinal products (MPs) and frequently used plant protection products (PPPs)...

A real-world implementation of a nationwide, long-term monitoring program to assess the impact of agrochemicals and agricultural practices on biodiversity

Authors: Andrade C, Villers A, Balent G et al.

Source: Ecology & Evolution 00:1-23, 2021, DOI: 10.1002/ece3.6459

Abstract: Biodiversity has undergone a major decline throughout recent decades, particularly in farmland. (...) 500 ENI (nonintended effects) monitoring program in 2012 in order to assess the unintended effects of agricultural practices, including pesticide use, on biodiversity. This long-term program monitors the biodiversity of nontargeted species (earthworms, plants, coleoptera, and birds), together with a wide range of annual data on agricultural practices (...). Other parameters (e.g., landscape and climatic characteristics) are also integrated as covariates during the analyses...

Epidemiological Study of Pesticide Poisoning in Domestic Animals and Wildlife in Portugal: 2014-2020

Authors: Grilo A, Moreira A, Carrapiço B, Belas A and São Braz B

Source: Front. Vet. Sci. 7:616293, 2021, DOI: 10.3389/fvets.2020.616293

Abstract: (...) From January 2014 up until October 2020, (...) done the analytical detection of poisoning substances in 503 samples of wildlife and domestic animals and pesticides residues were found in 239 of the samples analyzed. In this retrospective study, toxicology results from domestic species (dog, cat, sheep, cows, and horses), wildlife species (red foxes, birds of prey, lynx, and wild boar). (...) Molluscicides (47%, $n = 109$) and Carbamates (24%, $n = 57$) were found to be the first category of pesticides involved in intoxications, in both domestic and wild animals, followed by rodenticides (13%, $n = 30$)...

Neonicotinoid pesticides exert metabolic effects on avian pollinators

Authors: English S.G., Sandoval-Herrera N.I., Bishop C.A. et al.

Source: Scientific Reports 11:2914, 2021, DOI: 10.1038/s41598-021-82470-3

Abstract: Neonicotinoids are neurotoxic systemic insecticides applied extensively worldwide. The impacts of common neonicotinoids like imidacloprid on non-target invertebrate pollinators have been widely studied, however effects on vertebrate pollinators have received little attention. Here, we describe the first study evaluating the effects of short-term (3 d) exposure to a range of environmentally relevant concentrations ($0.2\mu\text{g g}^{-1}$ to $2.5\mu\text{g g}^{-1}$ Body Weight) of imidacloprid on wild-caught ruby-throated hummingbirds. Within 2 h of exposure, hummingbirds exhibited a significant depression in energy expenditure (up to $25\% \pm 11\%$)...

ERA / PUBLICATIONS SCIENTIFIQUES / Pesticides climat et VdT / Enchytréides

Effect of chlorpyrifos on the earthworm *Eudrilus euginae* and their gut microbiome by toxicological and metagenomic analysis

Authors: Krishnaswamy VG, Jaffar MF, Sridharan R, Ganesh S, Kalidas S, Palanisamy V, Mani K

Source: WORLD JOURNAL OF MICROBIOLOGY & BIOTECHNOLOGY 37(5):76, 2021, DOI: 10.1007/s11274-021-03040-3

Abstract: The earthworms are important soil invertebrates and play a crucial role in pedogenesis. The application of pesticides and prolonged exposure to pesticides causes mortality of earthworms apart from profoundly affecting

the resident gut microbiome. The microbiome plays a significant effect on the metabolic processes associated with earthworms. The pesticide Chlorpyrifos (CPF) was studied for its toxicity on *Eudrilus euginae* by toxicity studies...

Ecotoxicity evaluation of azoxystrobin on *Eisenia fetida* in different soils

Authors: Xu YQ, Li B, Hou KX, Du ZK, Allen SC et al.

Source: ENVIRONMENTAL RESEARCH 194:110705, 2021, DOI: 10.1016/j.envres.2020.110705

Abstract: Azoxystrobin, a widely used broad-spectrum strobilurin fungicide, may pose a potential threat in agricultural ecosystems. To assess the ecological risk of azoxystrobin in real soil environments, we performed a study on the toxic effects of azoxystrobin on earthworms (*Eisenia fetida*) in three different natural soils (fluvo-aquic soil, black soil and red clay soil) and an artificial soil. Acute toxicity of azoxystrobin was determined by filter paper test and soil test. (...)

Toxicity, residue and risk assessment of tetraniliprole in soil-earthworm microcosms

Authors: Ma DC, Yang S, Jiang JG, Zhu JM, Li BX et al.

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 213:112061, 2021, DOI: 10.1016/j.ecoenv.2021.112061

Abstract: Maize seed treatment with chemicals to control underground pests is a common agricultural practice, but inappropriate use of insecticides poses a considerable threat to plant development and soil nontarget organisms. In this study, the availability of tetraniliprole seed dressing to control the black cutworm *Agrotis ipsilon* (Lepidoptera: Noctuidae) in the maize

seeding stage and its safety to earthworms (*Eisenia fetida*) were investigated...

Enantioselective toxicity and oxidative stress effects of acetochlor on earthworms (*Eisenia fetida*) by mediating the signaling pathway

Authors: Liu YL, Fang K, Zhang XL, Liu T, Wang XG

Source: SCIENCE OF THE TOTAL ENVIRONMENT 766:142630, 2021, DOI: 10.1016/j.scitotenv.2020.142630

Abstract: Acetochlor (ACT) as a widely used chiral chloroacetamide herbicide is appropriate to evaluate the potential toxicity in soil ecosystems at enantiomeric level. The acute and subchronic toxicities of R-acetochlor (R-ACT) and S-acetochlor (S-ACT) on earthworms (*Eisenia fetida*) were investigated in the present study...

Temperature-Dependent Toxicokinetics of Phenanthrene in *Enchytraeus albidus* (Oligochaeta)

Authors: Dai WC, Slotsbo S, van Gestel CAM, Holmstrup M

Source: ENVIRONMENTAL SCIENCE & TECHNOLOGY, DOI: 10.1021/acs.est.0c06182

Abstract: Although the toxicokinetics of organic pollutants in soil invertebrates under optimal and constant temperature has been widely reported, their uptake, elimination, and bioaccumulation under suboptimal temperatures, and especially daily fluctuating temperature (FT) regimes have received only little research attention. In this study, the uptake, elimination, and bioaccumulation of phenanthrene (PHE) in *Enchytraeus albidus* (Oligochaeta) under different

constant temperatures, and an FT regime were investigated in a natural soil...

Chemicals with increasingly complex modes of action result in greater variation in sensitivity between earthworm species

Authors: Robinson A, Lahive E, Short S, Carter H, Sleep D, Pereira G, Kille P, Spurgeon D

Source: ENVIRONMENTAL POLLUTION 2021, DOI: 10.1016/j.envpol.2020.115914

Abstract: (...) Here we test the hypothesis that mode of action is related to variation in sensitivity in a specifically designed experiment for species from a single ecologically important terrestrial taxa, namely earthworms...

Effects of a novel fungicide benzovindiflupyr in *Eisenia fetida*: Evaluation through different levels of biological organization

Authors: Yao XF, Qiao ZH, Zhang FW, Liu Xet al.

Source: ENVIRONMENTAL POLLUTION 2021, DOI: 10.1016/j.envpol.2020.116336

Abstract: Although benzovindiflupyr (BZF), which is a novel succinate dehydrogenase inhibitor fungicide, has considerable application potential worldwide, its extensive use is toxic to non-targeted soil organisms. Therefore, this study aimed to evaluate the acute and subchronic toxicity of BZF to earthworms (*Eisenia fetida*)...

Soil fauna diversity and chemical stressors: a review of knowledge gaps and roadmap for future research

Authors: Beaumelle L, Thouvenot L, Hines J, Jochum M, Eisenhauer N, Phillips HRP

Source: ECOGRAPHY 2021, DOI: 10.1111/ecog.05627

Abstract: (...) Chemical stressors, such as pesticides, pharmaceuticals and metals, are being increasingly spread into ecosystems due to human activities. While it is crucial to predict the consequences of chemical stressors for soil biodiversity, chemical toxicity is often assessed using individuals or populations in laboratory cultures...

A real-world implementation of a nationwide, long-term monitoring program to assess the impact of agrochemicals and agricultural practices on biodiversity

Authors: Andrade C, Villers A, Balent G, Bar-Hen A, Chadoeuf J, Cyllly D, Cluzeau D et al.

Source: ECOLOGY AND EVOLUTION 2021, DOI: 10.1002/ece3.6459

Abstract: (...) As part of the national plan for reduction of pesticides use (Ecophyto), the French ministry of agriculture launched the 500 ENI (nonintended effects) monitoring program in 2012 in order to assess the unintended effects of agricultural practices, including pesticide use, on biodiversity represented by several taxonomic groups of interest for farmers...

Ecotoxicological evaluation of imazalil transformation products on *Eisenia Andrei*

Authors: Correia FV, Pereira PCG, Sales SF, Jimenez-Tototzintle M, Saggiaro EM

Source: ECOTOXICOLOGY 2021, DOI: 10.1007/s10646-021-02353-1

Abstract: Data concerning the toxicity of the transformation products of some pesticides considered emerging contaminants are still incipient. This study aimed to evaluate acute (filter paper contact and avoidance test) and chronic (assays carried out in Red yellow Ultisoil) effects of the transformation products of the fungicide imazalil (IMZ) by heterogeneous photocatalysis (TiO₂/UV) in *Eisenia andrei*...

ERA / PUBLICATIONS SCIENTIFIQUES / Plastiques

Bacterial consumption by nematodes is disturbed by the presence of polystyrene beads: The roles of food dilution and pharyngeal pumping

Authors: Rauchschalbe MT, Fueser H, Traunspurger W, Hoss S

Source: ENVIRONMENTAL POLLUTION 273:116471, 2021, DOI: [10.1016/j.envpol.2021.116471](https://doi.org/10.1016/j.envpol.2021.116471)

Abstract: Microplastics (MPs; <5 mm) released into freshwaters from anthropogenic sources accumulate in sediments, where they may pose an environmental threat to benthic organisms, such as nematodes. Several studies have examined the effects of nano- and microplastics on the

nematode *Caenorhabditis elegans*, whereas reduced food availability was suggested as a possible explanation for the observed inhibitory effects. Therefore, this study should clarify whether micro-beads of different sizes (1.0 and 6.0 µm in diameter) and materials (polystyrene PS, silica) are able to interfere with the feeding of *C. elegans* on its bacterial diet (*Escherichia coli*), and, by this, lowering its consumption rate within 7 h of exposure...

Editorial: Biogeochemistry of Anthropogenic Particles

Authors: Mitrano DM, Praetorius A, Lespes G, Slaveykova V

Source: FRONTIERS IN ENVIRONMENTAL SCIENCE 9:667140, 2021, DOI: [10.3389/fenvs.2021.667140](https://doi.org/10.3389/fenvs.2021.667140)

Introduction: The collection of articles published in the Research Topic Biogeochemistry of Anthropogenic Particles in Frontiers in Environmental Science has provided a comprehensive perspective on the biogeochemical cycle of anthropogenic particles in the environment with an emphasis on nano- and microscale materials. The term anthropogenic particles covers a wide range of materials, including those which are manufactured or generated incidentally, or from the degradation of synthetic materials, and subsequently disseminated in(to) the environment. The aims of this Research Topic were thus to explore the state of knowledge, including major advances and challenges, with regards to the sources, occurrence, transformations, and transport of particles, as well as the interactive effects between particles and their environment including living systems...

Spatial and seasonal variations in biofilm formation on microplastics in coastal waters

Authors: Zhang B, Yang X, Liu LC et al.

Source: SCIENCE OF THE TOTAL ENVIRONMENT 770:145303, 2021, DOI: [10.1016/j.scitotenv.2021.145303](https://doi.org/10.1016/j.scitotenv.2021.145303)

Abstract: At present, microplastics have gradually become a hot issue in marine environmental pollution and may pose a potential threat to marine ecosystems. Since MPs are not easily biodegradable, they can provide the attachment substrates for various organisms, which will affect their floating and transport, and may also lead to the invasion of harmful microorganisms. In this study, polypropylene, polyethylene, polylactic acid pellets, and glass particles were exposed for 6 weeks in different seasons at three stations in the Yellow Sea, China...

Draft Genome Sequences of Nine Environmental Bacterial Isolates Colonizing Plastic

Authors: Borre I, Sonnenschein EC

Source: MICROBIOLOGY RESOURCE: ANNOUNCEMENTS 10, 11, 2021, DOI: [10.1128/MRA.01485-20](https://doi.org/10.1128/MRA.01485-20)

Abstract: Here, we report the draft genome sequences of nine bacterial isolates obtained after laboratory incubation of seawater, soil, and wastewater samples with polylactic acid, polyethylene, or polyethylene terephthalate film for 2 weeks. Assuming colonization as a prerequisite of degradation, these strains could contribute to a solution to the global plastic waste problem.

Quantification of Microplastics in North-Western Mediterranean Harbors: Seasonality and Biofilm-Related Metallic Contaminants

Authors: Onrubia JAT, Djaoudi K, Borgogno F et al.

Source: JOURNAL OF MARINE SCIENCE AND ENGINEERING 9:337, 2021, DOI: [10.3390/jmse9030337](https://doi.org/10.3390/jmse9030337)

Abstract: The Mediterranean Sea is one of the most impacted basins in terms of microplastics pollution. Land-based activities are the major sources of plastic litter to the ocean, with harbors probably representing significant hotspots. In the framework of the SPlasH! project (Stop alle Plastiche in H2O, Interreg Marittimo project), microplastics were sampled in three north-western Mediterranean harbors during summer and winter...

Microplastic digestion generates fragmented nanoplastics in soils and damages earthworm spermatogenesis and coelomocyte viability

Authors: Kwak JI, An YJ

Source: JOURNAL OF HAZARDOUS MATERIALS 402:124034, 2021, DOI: [10.1016/j.hazmat.2020.124034](https://doi.org/10.1016/j.hazmat.2020.124034)

Abstract: Despite concerns about the ecotoxicological effects of microplastics in soils, there is a limited understanding of the reproductive toxicity of microplastics to soil organisms and the production of nanoplastics through biological fragmentation. We used the earthworm *Eisenia andrei* to investigate the generation of nanoplastics from polyethylene microplastics in soil ecosystems and to determine the negative effects of microplastic exposure on soil invertebrates. Earthworms were exposed to two different sizes of microplastic for 21 days, and various physiological features, including those pertaining to reproduction, were subsequently analyzed. Exposure to micro plastics affected coelomocyte viability and caused damage to male

reproductive organs, while having negligible effects on female reproductive organs...

Sequestration of microfibers and other microplastics by green algae, *Cladophora*, in the US Great Lakes

Authors: Peller J, Nevers MB, Byappanahalli M et al.

Source: ENVIRONMENTAL POLLUTION 276:116695, 2021, DOI: [10.1016/j.envpol.2021.116695](https://doi.org/10.1016/j.envpol.2021.116695)

Abstract: Daunting amounts of microplastics are present in surface waters worldwide. A main category of microplastics is synthetic microfibers, which originate from textiles. These microplastics are generated and released in laundering and are discharged by wastewater treatment plants or enter surface waters from other sources. The polymers that constitute many common synthetic microfibers are mostly denser than water, and eventually settle out in aquatic environments. The interaction of these microfibers with submerged aquatic vegetation has not been thoroughly investigated but is potentially an important aquatic sink in surface waters. In the Laurentian Great Lakes, prolific growth of macrophytic *Cladophora* creates submerged biomass with a large amount of surface area and the potential to collect and concentrate microplastics...

Microplastics as vectors of the antibiotics azithromycin and clarithromycin: Effects towards freshwater microalgae

Authors: Gonzalez-Pleiter M, Pedrouzo-Rodriguez A, Verdu I et al.

Source: CHEMOSPHERE 268:128824, 2021, DOI: [10.1016/j.chemosphere.2020.128824](https://doi.org/10.1016/j.chemosphere.2020.128824)

Abstract: Water pollution due to microplastics (MPs) is recognized as a major anthropogenic impact. Once MPs reach the ecosystems, they are exposed to a variety of other pollutants, which can be sorbed on them, transported and eventually desorbed. In this work, we tested the hypothesis that MPs can behave as conveyors for delivering chemicals toxic to aquatic microorganisms by investigating the vector role of MPs of polyethylene terephthalate (PET), polylactic acid (PLA), polyoxymethylene (POM) and polystyrene (PS) to the macrolide antibiotics azithromycin (AZI) and clarithromycin (CLA)...

Riverine microplastic and microbial community compositions: A field study in the Netherlands

Authors: Mughini-Gras L, van der Plaats RQJ, van der Wielen PWJJ, Bauerlein PS, Husman AMD

Source: WATER RESEARCH 192:116852, 2021, DOI: [10.1016/j.watres.2021.116852](https://doi.org/10.1016/j.watres.2021.116852)

Abstract: Plastic pollution in aquatic environments, particularly microplastics (<5 mm), is an emerging health threat. The buoyancy, hydrophobic hard surfaces, novel polymer carbon sources and long-distance transport make microplastics a unique substrate for biofilms, potentially harbouring pathogens and enabling antimicrobial resistance (AMR) gene exchange. Microplastic concentrations, their polymer types and the associated microbial communities were determined in paired, contemporaneous samples from the Dutch portion of the river Rhine.

Environmentally relevant concentrations and sizes of microplastic do not impede marine diatom growth

Authors: Niu ZY, Vandegehuchte MB, Catarino AI, Everaert G

Source: JOURNAL OF HAZARDOUS MATERIALS 409, 2021, DOI: [10.1016/j.jhazmat.2020.124460](https://doi.org/10.1016/j.jhazmat.2020.124460)

Abstract: We exposed the marine diatom *Phaeodactylum tricornutum* to microplastic particles of a mimicked realistic size frequency distribution complemented with serial experiments with distinct size classes... Results of smaller sized MPs (10-20 μm) did not differ from those obtained with larger MPs (90-106 μm) and mix sized MPs (10-106 μm), i.e. no impact on the microalgae growth.

Microplastics in the Marine Environment: Sources, Fates, Impacts and Microbial Degradation

Authors: Yang HR, Chen GL, Wang J

Source: TOXICS 9:41, 2021, DOI: [10.3390/toxics9020041](https://doi.org/10.3390/toxics9020041)

Abstract: This study summarizes the current literature on microplastics (MPs) in the marine environment to obtain a better knowledge about MP contamination. This review contains three sections: (1) sources and fates of MPs in the marine environment, (2) impacts of MPs on marine organisms, and (3) bacteria for the degradation of marine MPs.

Heteroaggregates of Polystyrene Nanospheres and Organic Matter: Preparation, Characterization and Evaluation of Their Toxicity to Algae in Environmentally Relevant Conditions

Authors: Roweczyk L, Leflaive J, Clergeaud F, Minet A, Ferriol J

Source: NANOMATERIALS 11(2):482, 2021, DOI: [10.3390/nano11020482](https://doi.org/10.3390/nano11020482)

Abstract: The environmental fate and behavior of nanoplastics (NPs) and their toxicity against aquatic organisms are under current investigation. In this work, relevant physicochemical characterizations were provided to analyze the ecotoxicological risk of NPs in the aquatic compartment. For this purpose, heteroaggregates of 50 nm polystyrene nanospheres and natural organic matter were prepared and characterized. The kinetic of aggregation was assimilated to a reaction-limited colloid aggregation mode and led to the formation of heteroaggregates in the range of 100-500 nm...

Microplastics and freshwater microalgae: what do we know so far?

Authors: Rani-Borges B, Moschini-Carlos V, Pompeo M

Source: AQUATIC ECOLOGY Early Access, 2021, DOI: [10.1007/s10452-021-09834-9](https://doi.org/10.1007/s10452-021-09834-9)

Abstract: An investigation was carried out to determine the current state of research on the interaction between microplastics and freshwater microalgae. In total, 20 scientific articles were analyzed. Different species were subjected to toxicological tests under controlled conditions in the laboratory with small microplastics (size range between 0.1 and 1000 μm), primary and secondary microplastics of different types of polymer...

Potential Effects of Microplastic on Arbuscular Mycorrhizal Fungi

Authors: Leifheit, EF, Lehmann, A, Rillig, MC

Source: FRONTIERS IN PLANT SCIENCE 12, 2021, DOI: [10.3389/fpls.2021.626709](https://doi.org/10.3389/fpls.2021.626709)

Abstract: Microplastics (MPs) are ubiquitously found in terrestrial ecosystems and are increasingly recognized as a factor of global change (GCF). Current research shows that MP can alter plant growth, soil inherent properties, and the composition and activity of microbial communities. However, knowledge about how microplastic affects arbuscular mycorrhizal fungi (AMF) is scarce...

Marine bacterial biodegradation of low-density polyethylene (LDPE) plastic

Authors: Khandare SD, Chaudhary DR, Jha B

Source: BIODEGRADATION Early Access, 2021, DOI:10.1007/s10532-021-09927-0

Abstract: Four bacterial strains capable of biodegradation of LDPE were isolated from the marine environment. These bacterial isolates were individually incubated for 90 days supplied with LDPE films as a carbon source a maximum weight loss of 1.72% of LDPE film was observed by the bacterial isolate H-255...

Potential Effects of Microplastic on Arbuscular Mycorrhizal Fungi

Authors: Leifheit EF, Lehmann A, Rillig MC

Source: FRONTIERS IN PLANT SCIENCE 12:626709, 2021, DOI: [10.3389/fpls.2021.626709](https://doi.org/10.3389/fpls.2021.626709)

Abstract: For plants it has been shown that microplastic can both increase and decrease the aboveground biomass and reduce the root diameter, which could indirectly cause a change in arbuscular mycorrhizal fungi (AMF) abundance and activity. One of the main direct effects of microplastic is the reduction of the soil bulk density, which translates to an altered soil pore structure and water transport. Moreover, especially fibers can have considerable impacts on

soil structure, namely the size distribution and stability of soil aggregates...

Effect of Environmental Weathering on Biodegradation of Biodegradable Plastic Mulch Films under Ambient Soil and Composting Conditions

Authors: Anunciado MB, Hayes DG, Astner AF, Wadsworth LC, Cowan-Banker CD, Gonzalez JELY, DeBruyn JM

Source: JOURNAL OF POLYMERS AND THE ENVIRONMENT Early Access, 2021, DOI: [10.1007/s10924-021-02088-4](https://doi.org/10.1007/s10924-021-02088-4)

Abstract: Plastic mulch films contribute to better crop production. Concerns for lack of sustainable disposal methods for conventional polyethylene (PE) mulch led to development of biodegradable plastic mulches (BDMs) that can be soil-incorporated or composted after use. Environmental weathering of BDMs during crop growth reduces their mechanical strength and alters the molecular structure of their polymeric components. However, the impact of weathering on BDMs' biodegradability is not fully understood. The biodegradability of agriculturally weathered and unweathered BDMs in soil and compost was compared using standardized laboratory tests (ASTM D5988 and D5338) using four BDMs (experimental polylactic acid and polyhydroxyalkanoate-based film [PLA/PHA] and three commercially available polybutyrate [PBAT]-based BDMs) ...

DROIT ET POLITIQUE DE L'ENVIRONNEMENT

EPA Protects Aquatic Ecosystems by Finalizing Irgarol Antifoulant Paint Cancellation

EPA 29/04/21

Today, the U.S Environmental Protection Agency (EPA) is releasing the interim decision for irgarol, which finalizes the cancelation of its use as an active ingredient in antifoulant paint in order to help preserve America's diverse aquatic ecosystems. After completing an ecological risk assessment, EPA determined that irgarol [...] is toxic to both freshwater and marine plants, including causing the bleaching of coral. [...]

[Accès au document](#)

Épandage : un plan d'actions ministériel pour supprimer l'utilisation des matériels les plus émissifs à horizon 2025

[...] L'objectif global du [plan national de réduction des émissions de polluants atmosphériques \(PREPA\)](#), [...] est d'améliorer la qualité de l'air et de réduire l'exposition des populations à la pollution de l'air en France [...] dont [...] un plan d'action pour assurer l'utilisation des matériels moins émissifs (pendillards, injecteurs) [...] dans la perspective de supprimer l'utilisation des matériels les plus émissifs à l'horizon 2025 ». [...]

[Accès au document](#)

Antibiotics - even low levels found in the environment might drive resistance

EC-Europa 03/03/21

Researchers behind a new literature survey of antibiotic levels in the environment call for regulators to recognise antimicrobials as pollutants and to regulate them similarly to other hazardous substances – for which environmental limits, reference standards and treatment protocols have been set. [...]

[Accès au document](#)

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

EC -Europa 03/03/21

New research finds that a common agricultural fungicide can have toxic effects on honeybees at standard concentrations. This study uses a biomarker method [...] which has not previously been used to show these effects in honeybees after exposure to fungicide and highlights the potential for further research using biomarkers.

[Accès au document](#)

REGLEMENTATION / DROIT

Fluorure de sulfuryle utilisé dans les produits biocides : date d'expiration de l'approbation reportée

DÉCISION D'EXÉCUTION (UE) 2021/713 DE LA COMMISSION du 29 avril 2021 reportant la date

d'expiration de l'approbation du fluorure de sulfuryle en vue de son utilisation dans les produits biocides relevant des types de produits 8 et 18

Numéro officiel : UE/2021/713

Date de signature : 29/04/2021

[Accès au document](#)

Dispositif national de surveillance de la qualité de l'air ambiant

Arrêté du 16 avril 2021 relatif au dispositif national de surveillance de la qualité de l'air ambiant

NOR : TRER2110272A

ELI :

<https://www.legifrance.gouv.fr/eli/arrete/2021/4/16/TRER2110272A/jo/texte>

[JORF n°0092 du 18 avril 2021](#) Texte n° 9

[Accès au document](#)

LMR de béalaxyl, béalaxyl-M, dichlobénil, fluopicolide, proquinazid et pyridalyl

RÈGLEMENT (UE) 2021/616 DE LA COMMISSION du 13 avril 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 béalaxyl, béalaxyl-M, dichlobénil, fluopicolide, proquinazid et pyridalyl présents dans ou sur certains produits

Numéro officiel : UE/2021/616

Date de signature : 13/04/2021

Liens juridiques : Modification le 06/11/2021

Règlement CE/396/2005 23/02/2005

[Accès au document](#)

LMR de diclofop, de fluopyram, d'ipconazole et de terbuthylazine

RÈGLEMENT (UE) 2021/618 DE LA COMMISSION du 15 avril 2021 modifiant les annexes II et III du règlement (CE) n° 396/2005 du Parlement européen et du Conseil en ce qui concerne les limites maximales applicables aux résidus de diclofop, de fluopyram, d'ipconazole et de terbuthylazine présents dans ou sur certains produits

Numéro officiel : UE/2021/618

Date de signature : 13/04/2021

Liens juridiques : Modification le 06/11/2021
Règlement CE/396/2005 23/02/2005

[Accès au document](#)

LMR de fluxapyroxad, d'hymexazol, de métamitron, de penflufène et de spirotétramate

RÈGLEMENT (UE) 2021/644 DE LA COMMISSION du 15 avril 2021 modifiant les annexes II et III du règlement (CE) no 396/2005 du Parlement européen et du Conseil en ce qui concerne les limites maximales applicables aux résidus de fluxapyroxad, d'hymexazol, de métamitron, de penflufène et de spirotétramate présents dans ou sur certains produits

Numéro officiel : UE/2021/644

Date de signature : 15/04/2021

Liens juridiques : Modification le 06/11/2021

Règlement CE/396/2005 23/02/2005

[Accès au document](#)

LMR de chlordécone

RÈGLEMENT (UE) 2021/663 DE LA COMMISSION du 22 avril 2021 modifiant l'annexe III du règlement (CE) n° 396/2005 du Parlement européen et du Conseil en ce qui concerne les limites maximales applicables aux résidus de chlordécone présents dans ou sur certains produits

Numéro officiel : UE/2021/663

Date de signature : 22/04/2021

Liens juridiques : Modification le 13/11/2021
Règlement CE/396/2005 23/02/2005

[Accès au document](#)

Approbation prolongée des substances actives «abamectine», «Bacillus subtilis (Cohn 1872) - souche QST 713», «Bacillus thuringiensis subsp. Aizawai - souches ABTS-1857 et GC-91», «Bacillus thuringiensis subsp. Israeliensis (sérotipe H-14) - souche AM65-52», «Bacillus thuringiensis subsp. Kurstaki - souches ABTS 351, PB 54, SA 11, SA12 et EG 2348», «Beauveria bassiana - souches ATCC 74040 et GHA», «clodinafop», «clopyralid», «Cydia pomonella Granulovirus (CpGV)», «cyprodinil», «dichlorprop-P», «fenpyroximate

RÈGLEMENT D'EXÉCUTION (UE) 2021/566 DE LA COMMISSION du 30 mars 2021 modifiant le règlement d'exécution (UE) n° 540/2011 en ce qui concerne la prolongation de la période d'approbation des substances actives «abamectine», «Bacillus subtilis (Cohn 1872) - souche QST 713», «Bacillus thuringiensis subsp. Aizawai - souches ABTS-1857 et GC-91», «Bacillus thuringiensis subsp. Israeliensis (sérotipe H-14) - souche AM65-52», «Bacillus thuringiensis subsp. Kurstaki - souches ABTS 351, PB 54, SA 11, SA12 et EG 2348», «Beauveria bassiana - souches ATCC 74040 et GHA», «clodinafop», «clopyralid», «Cydia pomonella Granulovirus (CpGV)»,

«cyprodinil», «dichlorprop-P», «fenpyroximate», «fosétyl», «mépanipyrin», «*Metarhizium anisopliae* (var. *anisopliae*) - souche BIPESCO 5/F52», «metconazole», «metrafenone», «pirimicarbe», «*Pseudomonas chlororaphis* - souche MA342», «pyriméthanile», «*Pythium oligandrum* M1», «rimsulfuron», «spinosad», «*Streptomyces* K61 (anciennement «*S. griseoviridis*)», «*Trichoderma asperellum* (anciennement «*T. harzianum*)» - souches ICC012, T25 et TV1», «*Trichoderma atroviride* (anciennement «*T. harzianum*)» - souche T11», «*Trichoderma gamsii* (anciennement «*T. viride*)» - souche ICC080», «*Trichoderma harzianum*, souches T-22 et ITEM 908», «triclopyr», «trinexapac», «triticonazole» et «zirame»

Numéro officiel : UE/2021/566

Date de signature : 30/03/2021

Liens juridiques : Modification Règlement d'exécution UE/540/2011 25/05/2011

[Accès au document](#)

Substance active «prosulfuron» : conditions d'approbation

RÈGLEMENT D'EXÉCUTION (UE) 2021/574 DE LA COMMISSION du 30 mars 2021 modifiant les règlements d'exécution (UE) 2017/375 et (UE) no 540/2011 en ce qui concerne les conditions d'approbation de la substance active «prosulfuron»

Numéro officiel : UE/2021/574

Date de signature : 30/03/2021

Liens juridiques : Modification Règlement d'exécution UE/540/2011 25/05/2011

Modification Règlement d'exécution UE/2017/375 02/03/2017

[Accès au document](#)

Produits biocides : mise à disposition sur le marché et utilisation

RÈGLEMENT DÉLÉGUÉ (UE) 2021/525 DE LA COMMISSION du 19 octobre 2020 modifiant les annexes II et III du règlement (UE) no 528/2012 du Parlement européen et du Conseil concernant la mise à disposition sur le marché et l'utilisation des produits biocides

Numéro officiel : UE/2021/525

Date de signature : 19/10/2020

Liens juridiques : Modification Règlement UE/528/2012 22/05/2012

[Accès au document](#)

Conditions d'approbation de la substance active fenpyrazamine

RÈGLEMENT D'EXÉCUTION (UE) 2021/459 DE LA COMMISSION du 16 mars 2021 modifiant le règlement d'exécution (UE) n° 540/2011 en ce qui concerne les conditions d'approbation de la substance active fenpyrazamine

Numéro officiel : UE/2021/459

Date de signature : 16/03/2021

Liens juridiques : Modification Règlement d'exécution UE/540/2011 25/05/2011

[Accès au document](#)

Néonicotinoïdes pour les betteraves sucrières : leur autorisation temporaire pour 2021 découle de la loi

Validée par le Conseil constitutionnel, la loi du 14 décembre 2020 a autorisé provisoirement l'utilisation de néonicotinoïdes pour les

betteraves sucrières, le temps que d'autres solutions soient trouvées pour protéger ces cultures massivement menacées par des pucerons. Le Conseil d'État juge que l'arrêté ministériel pris à la suite de cette loi, qui se borne à préciser les modalités de leur utilisation pour l'année 2021, n'est contraire ni à la Constitution ni au droit européen.

[Accès au document](#)

Mise à disposition sur le marché et utilisation du produit biocide «MINNCARE Cold Sterilant»

Arrêté du 8 mars 2021 autorisant par dérogation la mise à disposition sur le marché et l'utilisation du produit biocide «MINNCARE Cold Sterilant» pour une période de 180 jours

Numéro officiel : TREP2107279A

Date de signature : 08/03/2021

[Accès au document](#)

Mise sur le marché des produits phytopharmaceutiques : approbation de la substance active "24-épibrassinolide"

RÈGLEMENT D'EXÉCUTION (UE) 2021/427 DE LA COMMISSION du 10 mars 2021 portant approbation de la substance active "24-épibrassinolide" en tant que substance à faible risque, conformément au règlement (CE) n° 1107/2009 du Parlement européen et du Conseil concernant la mise sur le marché des produits phytopharmaceutiques, et modifiant le règlement d'exécution (UE) n° 540/2011 de la Commission

Numéro officiel : UE/2021/427

Date de signature : 10/03/2021

Liens juridiques : Modification Règlement d'exécution UE/540/2011 25/05/2011

[Accès au document](#)

AVIS / EXPERTISES / NORMES

Résidus de pesticides dans les aliments : suivez les tendances grâce à nos graphiques navigables

L'EFSA a publié son rapport annuel sur les résidus de pesticides présents dans les aliments dans l'Union européenne. [...]

Cette année, l'EFSA a transposé les résultats du programme coordonné de contrôle en [diagrammes et graphiques navigables](#) de façon à rendre les données plus facilement accessibles à des non-spécialistes.

[Accès au document](#)

Accélérer l'évaluation des perturbateurs endocriniens

Dans le cadre de la seconde Stratégie nationale sur les perturbateurs endocriniens (SNPE 2), l'Anses a élaboré une liste de substances d'intérêts et identifié une sélection de substances prioritaires à inscrire dans son programme d'évaluation. Pour les substances évaluées, l'Agence propose également une méthode pour déterminer s'il s'agit d'un perturbateur endocrinien avéré, présumé ou suspecté. [...]

[Accès au document](#)

Pollution plastique : la nécessité d'une démarche de rupture

Dans un [rapport](#) qu'elle publie aujourd'hui, l'Académie de sciences fait le point sur le rôle des plastiques dans le monde et l'ampleur de la pollution dont ils sont responsables. Face au constat préoccupant qu'elle dresse, elle présente une série de recommandations : i) une utilisation et une production raisonnées de ces polymères, ii) un engagement conjoint des politiques, industriels et économistes dans une démarche de rupture pour permettre d'intégrer la filière plastique dans les principes d'une économie circulaire, iii) la nécessité de développer des programmes de recherche ambitieux, afin de mieux comprendre le devenir des déchets plastiques et leur impact sur le vivant.

[Accès au document](#)

Le bisphénol B, un perturbateur endocrinien pour l'Homme et l'environnement

ANSES 09/03/21

Suite à l'utilisation du Bisphenol B dans certains pays hors Union européenne comme alternative au bisphénol A, et suite à la mise en évidence de propriétés endocriniennes similaires à cette substance, l'Anses propose d'identifier le bisphénol B en tant que substance extrêmement préoccupante dans le Règlement européen REACH, à l'instar du bisphénol A. [...]

[Accès au document](#)

Dioxyde de titane sous forme nanoparticulaire : recommandation de valeurs limites d'exposition professionnelle

ANSES 4/03/21

[...] Le dioxyde de titane sous forme nanoparticulaire ou TiO₂-NP est l'un des nanomatériaux les plus utilisés dans différents secteurs industriels en France. Il constitue de ce fait une source d'exposition potentielle importante en milieu professionnel. Aussi, [...] l'Anses recommande aujourd'hui des valeurs limites d'exposition professionnelle (VLEP) pour renforcer la prévention des risques pour les travailleurs. [...]

[Accès au document](#)

PUBLICATIONS DU RESEAU ECOTOX

Managing technical reputation: Regulatory agencies and evidential work in risk assessment

Authors: Demortain D, Borraz O

Source: PUBLIC ADMINISTRATION Early access, 2021, DOI: [10.1111/padm.12734](https://doi.org/10.1111/padm.12734)

Abstract: How can regulatory agencies with a technical or scientific mission forge and defend their reputation, when the definition of expertise is subject to countervailing influences and perceptions among a wide array of audiences? In this paper, we tackle this broad question, focusing on a particular episode of the European controversy over the regulatory control of exposure to bisphenol A, during which the European Food Safety Authority altered the

method by which it produced an assessment of the risk of BPA, responding to the regulatory controversy surrounding this substance...

Environmental Fate Modeling of Nanoplastics in a Salinity Gradient Using a Lab-on-a-Chip: Where Does the Nanoscale Fraction of Plastic Debris Accumulate?

Authors: Venel Z, Tabuteau H, Pradel A, Pascal PY, Grassl B and more...

Source: ENVIRONMENTAL SCIENCE & TECHNOLOGY 55(5):3001-3008, 2021, DOI: [10.1021/acs.est.0c07545](https://doi.org/10.1021/acs.est.0c07545)

Abstract: The aim of this study is to demonstrate how the flow and diffusion of nanoplastics through a salinity gradient (SG), as observed in mangrove swamps (MSPs), influence their aggregation pathways. These two parameters have never yet been used to evaluate the fate and behavior of colloids in the environment, since they cannot be incorporated into classical experimental setups. Land-sea continuums, such as estuaries and MSP systems, are known to be environmentally reactive interfaces that influence the colloidal distribution of pollutants. Using a microfluidic approach to reproduce the SG and its dynamics, the results show that nanoplastics arriving in a MSP are fractionated...

Potentials of *Miscanthus x giganteus* for phytostabilization of trace element-contaminated soils: Ex situ experiment

Authors: Nsanganwimana F, Al Souki KS, Waterlot C, Douay F and more...

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 214:112125, 2021, DOI: [10.1016/j.ecoenv.2021.112125](https://doi.org/10.1016/j.ecoenv.2021.112125)

Abstract: Phytomanagement is proposed as a cost-effective and environmentally-friendly suggestion for sustainable use of large metal-contaminated areas. In the current work, the energy crop miscanthus (*Miscanthus x giganteus*) was grown in ex situ conditions on agricultural soils presenting a Cd, Pb and Zn contamination gradient. After 93 days of culture, shoot and root growth parameters were measured. Soils and plants were sampled as well to study the TE accumulation in miscanthus and the effects of this plant on TE mobility in soils...

Fate of emerging and priority micropollutants during the sewage sludge treatment? Part 2: Mass balances of organic contaminants on sludge treatments are challenging

Authors: Patureau D, Mailler R, Delgenes N, Danel A, Vulliet E and more...

Source: WASTE MANAGEMENT 125:122-131, 2021, DOI: [10.1016/j.wasman.2021.02.034](https://doi.org/10.1016/j.wasman.2021.02.034)

Abstract: This paper analyzes the fate of 71 priority and emerging organic contaminants all along the treatment trains of sewage sludge treatment facilities in Paris including dewatering by centrifugation, thermal dry-ing and anaerobic digestion. It aimed at proposing and applying a mass balances calculation methodology to each process and pollutant. This data validation strategy demonstrated the complexity to perform rep-representative inlet/outlet sampling and analysis campaigns at industrial scales regarding organic com-pounds and to propose options to overcome this issue. Centrifugation and drying processes only implied physical mechanisms as phase separation and water elimination. Hence, correct

mass balance were expected observed for organic contaminants if sampling and analysis campaigns were representa-tive...

The effect of earthworms on plant response in metal contaminated soil focusing on belowground-aboveground relationships

Authors: Hullot O, Lamy I, Tiziani R, Mimmo T, Ciadamidaro L

Source: ENVIRONMENTAL POLLUTION 274:116499, 2021, DOI: [10.1016/j.envpol.2021.116499](https://doi.org/10.1016/j.envpol.2021.116499)

Abstract: Contaminated soils are lands in Europe deemed less favourable for conventional agriculture. To overcome the problem of their poor fertility, bio-fertilization could be a promising approach. Soil inoculation with a choice of biological species (e.g. earthworm, mycorrhizal fungi, diazotroph bacteria) can be performed in order to improve soil properties and promote nutrients recycling. However, questions arise concerning the dynamics of the contaminants in an inoculated soil. The aim of this study was to highlight the soil-plant-earthworm interactions in the case of a slightly contaminated soil. For this purpose, a pot experiment in controlled conditions was carried out during 2 months with a Cd, Zn, and Cu contaminated sandy soil, including conditions with or without earthworms (*Aporrectodea caliginosa*) and with or without plants (*Lolium perenne*)...

Potentiality of Native Ascomycete Strains in Bioremediation of Highly Polychlorinated Biphenyl Contaminated Soils

Authors: Germain J, Raveton M, Binet MN, Mouhamadou B

Source: MICROORGANISMS 9(3):612, 2021, DOI: [10.3390/microorganisms9030612](https://doi.org/10.3390/microorganisms9030612)

Abstract: Polychlorinated biphenyls (PCBs) are organic pollutants that are harmful to environment and toxic to humans. Numerous studies, based on basidiomycete strains, have reported unsatisfactory results in the mycoremediation of PCB-contaminated soils mainly due to the non-telluric origin of these strains. The abilities of a five-Ascomycete-strain consortium in the mycoremediation of PCB-polluted soils and its performance to restore their sound functioning were investigated using mesocosm experiments associated with chromatography gas analysis and enzymatic activity assays...

Advantages and limits to copper phytoextraction in vineyards

Authors: Cornu JY, Waterlot C, Lebeau T

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH early access, 2021, DOI: [10.1007/s11356-021-13450-3](https://doi.org/10.1007/s11356-021-13450-3)

Abstract: Copper (Cu) contamination of soils may alter the functioning and sustainability of vineyard ecosystems. Cultivating Cu-extracting plants in vineyard inter-rows, or phytoextraction, is one possible way currently under consideration in agroecology to reduce Cu contamination of vineyard topsoils. This option is rarely used, mainly because Cu phytoextraction yields are too low to significantly reduce contamination due to the relatively "low" phytoavailability of Cu in the soil (compared to other trace metals) and its preferential accumulation in the roots of most extracting plants. This article describes the main practices and associated constraints that could theoretically be used to maximize Cu phytoextraction at field scale...

Medium-term effects of Ag supplied directly or via sewage sludge to an agricultural soil on *Eisenia fetida* earthworm and soil microbial communities

Authors: Courtois P, Rorat A, Lemiere S, Guyoneaud R and more...

Source: CHEMOSPHERE 269:128761, 2021, DOI: [10.1016/j.chemosphere.2020.128761](https://doi.org/10.1016/j.chemosphere.2020.128761)

Abstract: The widespread use of silver nanoparticles (AgNPs) in consumer products that release Ag throughout their life cycle has raised potential environmental concerns. AgNPs primarily accumulate in soil through the spreading of sewage sludge (SS). In this study, the effects of direct exposure to AgNPs or indirect exposure via SS contaminated with AgNPs on the earthworm *Eisenia fetida* and soil microbial communities were compared, through 3 scenarios offering increasing exposure concentrations. The effects of Ag speciation were analyzed by spiking SS with AgNPs or AgNO₃ before application to soil...

Evidence of Chlordecone Resurrection by Glyphosate in French West Indies

Authors: Sabatier P, Mottes C, Cottin N, Evrard O and more...

Source: ENVIRONMENTAL SCIENCE & TECHNOLOGY 55(4):2296-2306, 2021, DOI: [10.1021/acs.est.0c05207](https://doi.org/10.1021/acs.est.0c05207)

Abstract: The widespread use of pesticides in agriculture during the last several decades has contaminated soils and different Critical Zone (CZ) compartments, defined as the area extended from the top of the vegetation canopy to the groundwater table, and it integrates interactions of the atmosphere, lithosphere, biosphere, and hydrosphere. However, the long-term fate,

storage, and transfer dynamics of persistent pesticides in CZ in a changing world remain poorly understood. In the French West Indies, chlordecone (CLD), a toxic organochlorine insecticide, was extensively applied to banana fields to control banana weevil from 1972 to 1993 after which it was banned. Here, to understand CZ trajectories we apply a retrospective observation based on marine sediment core analyses to monitor long-term CLD transfer, fate, and consequences in Guadeloupe and Martinique islands. Both CLD profiles show synchronous chronologies...

Expanding ecological assessment by integrating microorganisms into routine freshwater biomonitoring

Authors: Sagova-Mareckova M, Boenigk J, Bouchez A, Cermakova K, Chonova T

Source: WATER RESEARCH 191:116767, 2021, DOI: [10.1016/j.watres.2020.116767](https://doi.org/10.1016/j.watres.2020.116767)

Abstract: Bioindication has become an indispensable part of water quality monitoring in most countries of the world, with the presence and abundance of bioindicator taxa, mostly multicellular eukaryotes, used for biotic indices. In contrast, microbes (bacteria, archaea and protists) are seldom used as bioindicators in routine assessments, although they have been recognized for their importance in environmental processes. Recently, the use of molecular methods has revealed unexpected diversity within known functional groups and novel metabolic pathways that are particularly important in energy and nutrient cycling. In various habitats, microbial communities respond to eutrophication, metals, and natural or anthropogenic organic pollutants through changes in diversity and function....

Antibiotics in surface water of East and Southeast Asian countries: A focused review on contamination status, pollution sources, potential risks, and future perspectives

Authors: Anh HQ, Le TPQ, Da Le N, Lu XX, Duong TT, Garnier J et al.

Source: SCIENCE OF THE TOTAL ENVIRONMENT 764:142865, 2021, DOI: [10.1016/j.scitotenv.2020.142865](https://doi.org/10.1016/j.scitotenv.2020.142865)

Abstract: This review provides focused insights into the contamination status, Source:s, and ecological risks associated with multiple classes of antibiotics in surface water from the East and Southeast Asia based on publications over the period 2007 to 2020. Antibiotics are ubiquitous in surface water of these countries with concentrations ranging from <1 ng/L to hundreds mu g/L and median values from 10 to 100 ng/L. Wider ranges and higher maximum concentrations of certain antibiotics were found in surface water of the East Asian countries like China and South Korea than in the Southeast Asian nations. Environmental behavior and fate of antibiotics in surface water is discussed....

Gentamicin Adsorption onto Soil Particles Prevents Overall Short-Term Effects on the Soil Microbiome and Resistome

Authors: Sanchez-Cid C, Guironnet A, Wiest L, Vulliet E, Vogel TM

Source: ANTIBIOTICS-BASEL 10(2):191, 2021, DOI: [10.3390/antibiotics10020191](https://doi.org/10.3390/antibiotics10020191)

Abstract: Antibiotics used in agriculture may reach the environment and stimulate the development and dissemination of antibiotic resistance in the soil microbiome. However, the scope of this phenomenon and the link to soil

properties needs to be elucidated. This study compared the short-term effects of a range of gentamicin concentrations on the microbiome and resistome of bacterial enrichments and microcosms of an agricultural soil using a metagenomic approach. Gentamicin impact on bacterial biomass was roughly estimated by the number of 16S rRNA gene copies...

Multistate models of developmental toxicity: Application to valproic acid-induced malformations in the zebrafish embryo

Authors: Simeon S, Beaudouin R, Brotzmann K, Braunbeck T, Bois FY

Source: TOXICOLOGY AND APPLIED PHARMACOLOGY 414:115424, 2021, DOI: [10.1016/j.taap.2021.115424](https://doi.org/10.1016/j.taap.2021.115424)

Abstract: For the determination of acute toxicity of chemicals in zebrafish (*Danio rerio*) embryos, the OECD test guideline 236, relative to the Fish Embryo Toxicity Test (FET), stipulates a dose-response analysis of four lethal core endpoints and a quantitative characterization of abnormalities including their time-dependency. Routinely, the data are analyzed at the different observation times separately. However, observations at a given time strongly depend on the previous effects and should be analyzed jointly with them. To solve this problem, we developed multistate models for occurrence of developmental malformations and live events in zebrafish embryos exposed to eight concentrations of valproic acid (VPA) the first five days of life...

High levels of fluoroalkyl substances and potential disruption of thyroid hormones in three gull

species from South Western France

Authors: Sebastiano M, Jouanneau W, Blevin P, Angelier F, Parenteau C, Gernigon J, Lemesle JC, Robin F, Pardon P, Budzinski H et al.

Source: SCIENCE OF THE TOTAL ENVIRONMENT 765:144611, 2021, DOI: [10.1016/j.scitotenv.2020.144611](https://doi.org/10.1016/j.scitotenv.2020.144611)

Abstract: Per- and poly-fluoroalkyl substances (PFAS) raised increasing concerns over the past years due to their persistence and global distribution. Understanding their occurrence in the environment and their disruptive effect on the physiology of humans and wildlife remains a major challenge in ecotoxicological studies. Here, we investigate the occurrence of several carboxylic and sulfonic PFAS in 105 individuals of three seabird species (27 great black-backed gull *Larus marinus*; 44 lesser black-backed gull *Larus fuscus graellsii*; and 34 European herring gull *Larus argentatus*) from South western France. We further estimated the relationship between plasma concentrations of PFAS and i) the body condition of the birds and ii) plasma concentrations of thyroid hormone triiodothyronine (TT3)...

Suspect screening of environmental contaminants by UHPLC-HRMS and transposable Quantitative Structure-Retention Relationship modelling

Authors: Bride E, Heinisch S, Bonnefille B, Guillemain C, Margoum C

Source: JOURNAL OF HAZARDOUS MATERIALS 409:124652, 2021, DOI: [10.1016/j.jhazmat.2020.124652](https://doi.org/10.1016/j.jhazmat.2020.124652)

Abstract: A Quantitative Structure-Retention Relationship (QSRR) model is proposed and aims at increasing the confidence level associated to

the identification of organic contaminants by Ultra-High Performance Liquid Chromatography hyphenated to High Resolution Mass Spectrometry (UHPLC-HRMS) in environmental samples under a suspect screening approach. The model was built from a selection of 8 easily accessible physicochemical descriptors, and was validated from a set of 274 organic compounds commonly found in environmental samples...

Combining human and snail indicators for an integrative risk assessment of metal(loid)-contaminated soils

Authors: Louzon M, Pauget B, Pelfrene A, Gimbert F, de Vaufleury A

Source: JOURNAL OF HAZARDOUS MATERIALS 409:124182, 2021, DOI: [10.1016/j.jhazmat.2020.124182](https://doi.org/10.1016/j.jhazmat.2020.124182)

Abstract: With the new soil uses such as land restoration and to protect wilderness, the human health risk assessment (HHRA) and environmental risk assessment (ERA) should be combined. Based on the relationships demonstrated between an indicator of soil quality, the land snail, and human exposure, the aim of this study is to examine the snail and human risk indicators for twenty-nine soils contaminated by metal(loid)s. HHRA was evaluated by both hazard quotient and carcinogenic risk. When the human health indicators were ranked as uncertain, they were weighted by bioaccessibility to refine the risk assessment...

Sub-chronic effects of AgNPs and AuNPs on *Gammarus fossarum* (Crustacea Amphipoda): From molecular to behavioural responses

Authors: Mehennaoui K, Cambier S, Minguez L, Serchi T, Guerold F, Gutleb AC, Giamberini L

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 210:111775, 2021, DOI: [10.1016/j.ecoenv.2020.111775](https://doi.org/10.1016/j.ecoenv.2020.111775)

Abstract: The aim of the present study was the assessment of the sub-chronic effects of silver (AgNPs) and gold nanoparticles (AuNPs) of 40 nm primary size either stabilised with citrate (CIT) or coated with polyethylene glycol (PEG) on the freshwater invertebrate *Gammarus fossarum*. Silver nitrate (AgNO₃) was used as a positive control in order to study the contribution of silver ions potentially released from AgNPs on the observed effects. A multibiomarker approach was used to assess the long-term effects of AgNPs and AuNPs 40 nm on molecular, cellular, physiological and behavioural responses of *G. fossarum*...

Effects of gamma ionizing radiation exposure on *Danio rerio* embryo-larval stages - comparison with tritium exposure

Authors: Gagnaire B, Arcanjo C, Cavalie I, Camilleri V, Simon O, Dubourg N, Floriani M, Adam-Guillermin C

Source: JOURNAL OF HAZARDOUS MATERIALS 408:124866, 2021, DOI: [10.1016/j.jhazmat.2020.124866](https://doi.org/10.1016/j.jhazmat.2020.124866)

Abstract: The objective was to investigate the effects of ionizing radiation induced in zebrafish early life stages by coupling responses obtained at the molecular (genotoxicity, ROS production, gene expression) and phenotypic (tissue alteration, embryo-larval development) levels. Here we present results obtained after exposure of 3 hpf larvae to 10 days of gamma irradiation at 3.3 x 10⁽¹⁾, 1.3 x 10⁽²⁾ and 1.2 x 10⁽³⁾ µGy/h, close to and higher than the benchmark for protection of ecosystems towards ionizing radiations of 10⁽¹⁾ µGy/h. Dose rates used in these studies were chosen to be in the 'derived

consideration reference level' (DCRL) for gamma irradiation where deleterious effects can appear in freshwater fish...

Phytomanagement with grassy species, compost and dolomitic limestone rehabilitates a meadow at a wood preservation site

Authors: Burges A, Oustriere N, Galende M, Marchand L, Bes CM, Paidjan E, Puschenreiter M, Becerril JM, Mench M

Source: ECOLOGICAL ENGINEERING 160:106132, 2021, DOI: [10.1016/j.ecoleng.2020.106132](https://doi.org/10.1016/j.ecoleng.2020.106132)

Abstract: Brownfield surface is expanding in Europe, but as often abandoned or underused, these areas become refuge for microbial, faunal and floral biodiversity. However, brownfield sites are generally contaminated, likely posing severe environmental risks. At a former wood preservation site contaminated with Cu, we evaluated the efficiency of compost and dolomitic limestone incorporation into the soil, followed by revegetation with Cu-tolerant grassy species, as a phytomanagement option to increase vegetation cover and plant diversity while reducing pollutant linkages...

Comparative selectivity of nano and commercial formulations of pirimicarb on a target pest, *Brevicoryne brassicae*, and its predator *Chrysoperla carnea*

Authors: Maroofpour N, Mousavi M, Hejazi MJ, Iranipour S, Hamishehkar H, Desneux N, Biondi A, Haddi K

Source: ECOTOXICOLOGY Early access, 2021, DOI: [10.1007/s10646-021-02349-x](https://doi.org/10.1007/s10646-021-02349-x)

Abstract: Nanotechnology is a new field in the pesticide industry. Nanopesticides represent an emerging technological tool that offers a range of benefits including increased efficacy, durability, and reduction in the amounts of used active ingredients. However, due to the lack of studies on the toxicity and the sublethal effects on pests and natural enemies, the extent of action and fate of these nanopesticides is still not fully understood limiting thus their wide use...

A new, simple, efficient and robust multi-residue method based on pressurised-liquid extraction of agricultural soils to analyze pesticides by liquid chromatography coupled with a high resolution quadrupole time-of-flight mass spectrometer

Authors: Caria G, Proix N, Mouglin C, Ouddane B, Net S

Source: INTERNATIONAL JOURNAL OF ENVIRONMENTAL ANALYTICAL CHEMISTRY Early access, 2021, DOI: [10.1080/03067319.2021.1889531](https://doi.org/10.1080/03067319.2021.1889531)

Abstract: A new method for the analysis of pesticides in agricultural soils by using liquid chromatography coupled with a high-resolution quadrupole time-of-flight mass spectrometer (LC-QTOF-MS) has been developed. Twenty-four pesticides including herbicides, insecticides or fungicides have been studied. The linearity of the external calibration of the pesticides obtained from levels of concentration ranging from 0.010 to 400 µg/L gives satisfactory results with the correlation coefficients higher than 0.99...

Effects of diclofenac on sentinel species and aquatic

communities in semi-natural conditions

Authors: Joachim S, Beaudouin R, Daniele G, Geffard A, Bado-Nilles A, Tebby C, Palluel O, Dedourge-Geffard O, Fieu M, Bonnard M... More

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY 211:111812, 2021, DOI: [10.1016/j.ecoenv.2020.111812](https://doi.org/10.1016/j.ecoenv.2020.111812)

Abstract: Due to the potential hazard of diclofenac on aquatic organisms and the lack of higher-tier ecotoxicological studies, a long-term freshwater mesocosm experiment was set up to study the effects of this substance on primary producers and consumers at environmentally realistic nominal concentrations 0.1, 1 and 10 µg/L (average effective concentrations 0.041, 0.44 and 3.82 µg/L). During the six-month exposure period, the biovolume of two macrophyte species (*Nasturtium officinale* and *Callitriche platycarpa*) significantly decreased at the highest treatment level...

OUVRAGES / RAPPORTS / ACTES DE CONGRES

Ecologie : mieux
comprendre... pour tout
changer

Larousse. 04,2021, 352 p.



A quoi notre monde ressemblera-il dans quelques années ? Quels sont les vrais problèmes posés par la pollution, le dérèglement climatique, la baisse de la biodiversité ? Quel est le vrai poids des

lobbys ? [...]. Energie, pollution de l'air et pollution plastique, climat, disparition des espèces, sont ici décryptés, avec à l'appui chiffres clés et infographies.

[Accès au document](#)

The changing landscape of atherosclerosis Nature

Libby P. The changing landscape of atherosclerosis. Nature 592:524-533, 2021, DOI: [10.1038/s41586-021-03392-8](https://doi.org/10.1038/s41586-021-03392-8)

Emerging evidence has spurred a considerable evolution of concepts relating to atherosclerosis, and has called into question many previous notions. [...]

Non-traditional drivers of atherosclerosis—such as disturbed sleep, physical inactivity, the microbiome, air pollution and environmental stress—have also gained attention. [...] These advances in our understanding of the biology of atherosclerosis have opened avenues to therapeutic interventions that promise to improve the prevention and treatment of now-ubiquitous atherosclerotic diseases.

[Accès au document](#)

REVUE DE PRESSE / ALTERNATIVES / BIOPESTICIDES

Protein discovery could help enable eco-friendly fungicides

EurekAlert! 04/03/21

New research reveals an essential step in scientists' quest to create targeted, more eco-friendly fungicides that protect food crops.

[...] their [extracellular vesicles] pivotal roles in communication between invading microorganisms and their hosts were recognized only recently.

UC Riverside geneticist Hailing Jin and her team [found](#) plants use these vesicles to launch RNA molecules at fungal invaders, suppressing the genes that make the fungi dangerous. [...]

[Accès au document](#)

REVUE DE PRESSE / ASSOCIATIONS

Prenatal exposure to pesticides increases the risk of obesity in adolescence

EurekAlert! 29/04/21

Exposure before birth to persistent organic pollutants (POPs) (organochlorine pesticides, industrial chemicals, etc) may increase the risk in adolescence of metabolic disorders, such as obesity and high blood pressure. This was the main conclusion of a study by the Barcelona Institute for Global Health (ISGlobal), a research centre supported by the "la Caixa" Foundation. [...]

[Accès au document](#)

Exposure to Roundup® extends seizure-like behavior in roundworms

EurekAlert! 27/04/21

[...] Now researchers from Florida Atlantic University (FAU) are evaluating the pesticide [Roundup®] for potential neurological impacts. [...] The FAU researchers exposed the [roundworm *Caenorhabditis elegans*] *C. elegans* to varying formulations of Roundup®, glyphosate and saline controls. [...] Exposure to Roundup®

doubled the duration of the convulsions in the worms. The concentration of Roundup® in the study were 1,000 times lower than that approved by the U.S. Environmental Protection Agency for use in humans.

[...] Taken in a translational light, these findings spur further exploration into how glyphosate and Roundup® affect seizure and behavioral symptomology in mammals."

[Accès au document](#)

Toxic fluorocarbons - Not just in ski waxes

EurekAlert! 26/04/01

Per- and polyfluoroalkyl substances (PFAS) in ski wax have been receiving a lot of attention recently, but waxes constitute only a limited part of the problem of the PFAS group of toxicants. [...] The toxic substances [PFAS] don't break down and instead accumulate, both in nature and in your body.

"Due to their extensive use, humans and animals all over the world are continuously exposed to PFAS," says Håkon Austad Langberg, a PhD candidate at the Norwegian University of Science and Technology (NTNU) [...]

[Accès au document](#)

Research Shows Adverse Impacts of Glyphosate on the Human Gut Microbiome

Beyond Pesticides, April 30, 2021

A bioinformatics tool developed by researchers from the University of Turku in Finland indicates that "54% of species in the core human gut microbiome are sensitive to glyphosate." This tool may help predict which microbes in the human gut could be negatively affected by exposure to the ubiquitous herbicide. Because damage to the gut biome is linked to a variety of

diseases, this information could prove critical in recognition of the role(s) glyphosate may play in the development of human diseases. [...]

[Accès au document](#)

Pesticide Exposure Increases Susceptibility to Covid-19, Gulf War Veterans Found At Risk

Beyond Pesticides, April 28, 2021

New evidence set to be presented at the Experimental Biology (EB) 2021 meeting held this week suggests that Gulf War Veterans and other individuals with prior pesticide exposures may be more susceptible to Covid-19 infection. [...] “The reason why COVID-19 causes a severe form of disease leading to hospitalization and high rates of mortality in a small segment of society is unclear,” said Prakash Nagarkatti, PhD, co-author of the study and vice president for research at the University of South Carolina. “This work sheds new light on exposure to pesticides and potential susceptibility to COVID-19 through altered immune response.” [...]

[Accès au document](#)

'These are products that are everywhere': study finds household chemicals may reduce male fertility

CTV News 27/04/21

Exposure to some chemicals during pregnancy seems to have negative effects on the fertility of mother's sons 20 years later, according to a new study.

The problem lies with endocrine-disrupting chemicals (EDCs), which mess with the body's hormones. [...]

[Accès au document](#)

Plastics and toxic chemicals are killing fish – and poisoning us

National Observer 29/04/21

The [study](#), published by the International Pollutants Elimination Network (IPEN), not peer-reviewed, [...] is the first systematic review of these dispersed studies designed to paint a global picture of the problem.

The findings were dire: Pollution is compromising the world's oceans, fisheries and coastal communities while exacerbating the impacts of climate change and overfishing. [...]

[Accès au document](#)

L'exposition à certains cocktails de pesticides favoriseraient le risque de cancer du sein chez les femmes ménopausées

Génération futures 21/04/21

[...] Une étude menée dans la cohorte NutriNet-Santé a montré des associations protectrices entre la proportion élevée d'aliments biologiques dans l'alimentation et différents types de cancers, y compris le cancer du sein en postménopause. [...]

Les résultats : [...] D'une part, le groupe de femmes ménopausées reflétant une faible exposition à plusieurs pesticides de synthèse a montré un moindre risque de développer un cancer du sein. Au contraire, ce risque a été augmenté chez les femmes en surpoids exposées à 4 substances actives pesticides, à savoir, le chlorpyrifos, l'imazalil, le malathion et le thiabendazole. [...]

[Accès au document](#)

Carte interactive de l'eau du robinet -Les pesticides se la coulent douce !

UFC-Que Choisir 20/04/21

Si la 4e édition de la carte interactive de l'eau du robinet confirme que la plupart des Français reçoivent une eau conforme en tous points aux critères réglementaires, elle met en revanche en lumière les graves carences de la réglementation et des mesures de gestion locales en matière de pesticides et de perturbateurs endocriniens. [...] L'UFC-Que Choisir et Générations Futures demandent une interdiction des pesticides suspectés d'être des perturbateurs endocriniens, ainsi qu'un renforcement urgent par le ministère de la Santé des exigences en matière d'analyses de pesticides devant être impérativement réalisées par les Agences Régionales de Santé. [...]

[Accès au document](#)

Florida Officials Put a Stop to Trump Era Proposal to Spray Highly Toxic Insecticide in Citrus Groves

Beyond Pesticides, April 27, 2021

The Florida Department of Agriculture and Consumer Services (FDACS) is denying a chemical company's application to use a highly toxic insecticide on the state's citrus crops due to the risks the chemical poses to human health and the environment [...]. At issue is aldicarb, a carbamate class insecticide that was cancelled in the U.S. over a decade ago. [...]

[Accès au document](#)

Grandmother's Exposure to Banned Pesticide DDT Increases Breast Cancer and Cardiometabolic Disorder Risk in Granddaughters

Beyond Pesticides, April 22, 2021

Past maternal exposure to the pesticide dichlorodiphenyltrichloroethane (DDT) during pregnancy can increase the risk of breast cancer and cardiometabolic disorders (e.g., heart disease, obesity, diabetes) up to three successive generations, according to a new study published in *Cancer Epidemiology, Biomarkers & Prevention*. [...] this study is the first to note generational effects on grandchildren's health. [...]

[Accès au document](#)

Aldicarb's return puts children and farm workers at risk

PANNA 22/04/21

Aldicarb, a pesticide that has seen minimal use in the United States over the past decade, was re-approved for use on citrus crops in January, after a rushed process that barely accommodated the legally mandated public comment period for the re-registration of the chemical.

[...] This will put a pesticide that is [classified as "extremely hazardous"](#) by the World Health Organization into use, raising the risks of groundwater contamination, accidental ingestion with food products, and direct exposure to orchard workers and wildlife. [...]

[Accès au document](#)

Study Finds Eagle Populations Experiencing Widespread Rodenticide Exposure

Beyond Pesticides, April 21, 2021

The vast majority of bald and golden eagles in the United States are contaminated with toxic anticoagulant rodenticides, according to research published in the journal PLOS One earlier this month. Although eagle populations have largely recovered from their lows in the 1960s and 70s, the study is a stark reminder that human activity continues to threaten these iconic species. “Although the exact pathways of exposure remain unclear, eagles are likely exposed through their predatory and scavenging activities,” said study author Mark Ruder, PhD, assistant professor at the University of Georgia [to CNN](#). [...]

[Accès au document](#)

Roundup Shown to Kill Bees—But Not How You Might Expect

Beyond Pesticides, April 20, 2021

Roundup products [...] kill exposed bumblebees at high rates, according to a new study published in the Journal of Applied Ecology, which points to undisclosed inert ingredients (those that typically make up a majority of the product formulation) as the primary culprit. Roundup products have become synonymous with their [main active ingredient glyphosate](#), but Bayer-Monsanto has been quietly reformulating its flagship product with different herbicides [...]. The new study reveals that these new Roundup products present the same hazards to pollinators as glyphosate-based formulations, raising important questions about the pesticide regulatory process. [...]

[Accès au document](#)

Nouveau rapport exclusif sur les graves lacunes de dossiers d'évaluation de pesticides perturbateurs endocriniens !

Génération futures 08/04/21

Un nouveau rapport exclusif démontre les graves lacunes de dossiers d'évaluation de 6 pesticides perturbant le système endocrinien dont les autorisations arrivent à terme.

D'après les auteurs, ces lacunes pourraient avoir comme effet la ré-autorisation de ces pesticides dangereux alors même que la réglementation européenne introduit l'interdiction de la mise sur le marché de substances pesticides ayant des effets de perturbation endocrinienne ! [...]

[Accès au document](#)

Invertebrates and Plants Face Increasing Threat from Pesticides Use, Despite Declining Chemical Use Patterns

Beyond pesticides 08/04/21

Pesticide use threatens aquatic and terrestrial invertebrates and plants more than ever, despite declining chemical use and implementation of genetically engineered (GE) crops in the U.S., according to a [University Koblenz-Landau, Germany](#) study. Since the publication of Rachel Carson's Silent Spring (1962), many environmental agencies have banned the use of pesticides like organochlorines, organophosphates, and carbamates for their devastating toxic—sometimes lethal—effects, particularly on vertebrates, including humans. However, this ban created a pathway for a new generation of pesticides (e.g., neonicotinoids, pyrethroids) to take hold. Although these pesticides are more target-specific, requiring lower chemical concentrations for effectiveness,

they have over double the toxic effects on invertebrates, like pollinators. [...]

[Accès au document](#)

Toxic pesticides are polluting over half of arable land, reinforcing need for global organic transition

Beyond Pesticides, April 7, 2021

[...] While there is firm understanding that environmental crises like climate change are affecting the entire globe, the impacts of pesticide pollution are often thought of as local, or regional issues. This study, led by researchers based at the University of Sydney, Australia, underscores the wide-ranging effects of modern civilization's global dependence on toxic pesticide use. "Although protecting food production is essential for human development, reducing pesticide pollution is equivalently crucial to protect the biodiversity that maintains soil health and functions, contributing towards food security," said lead study author Fiona Tang, PhD. [...]

[Accès au document](#)

Living Within 2.5 Miles of Chemical Farming Increases Risk of Childhood Brain Tumors

Beyond Pesticides, April 6, 2021

Pregnant women living within 2.5 miles of agricultural pesticide applications have an increased risk that their child will develop central nervous system (CNS) tumors, according to a study published in the journal Environmental Research by a team at University of California, Los Angeles. The results are particularly concerning as it reveals that individuals do not

have to be in close contact with pesticides for risky, health-harming exposures to occur. "This transition from farmland to residential neighborhoods is abrupt across California, and, of course, constantly changing as farmland is developed," said study co-author Myles Cockburn, PhD. [...]

[Accès au document](#)

Glyphosate : un rapport presque parfait

Agriculture-Environnement 08/03/21

Le 15 décembre, la mission d'information commune sur le suivi de la stratégie de sortie du glyphosate, initiée le 27 septembre 2018, a présenté son rapport final.

[...] Or, les conclusions de la mission parlementaire sont sans appel. Tout d'abord, elle prend acte que, dans l'état actuel des connaissances, pour de nombreuses pratiques agricoles, [aucune alternative non chimique n'est disponible](#). Par conséquent, il est certain qu'une interdiction décidée unilatéralement par la France en novembre 2020 aurait précipité bon nombre d'agriculteurs dans des impasses. Ainsi que l'a reconnu le député Jean-Baptiste Moreau lors de la conférence de presse, le délai fixé par Emmanuel Macron dans son tweet du 27 novembre 2017 était bien « trop court ». [...]

[Accès au document](#)

Fin de partie pour les arrêtés antipesticides

Agriculture-environnement 07/04/21

En déboutant les recours de la ville d'Arcueil et de Gennevilliers concernant les arrêtés antipesticides, le Conseil d'État a rappelé les maires à l'ordre. [...]

L'un comme l'autre [Christian Métairie, le maire d'Arcueil, et Patrice Leclerc, celui de Gennevilliers] font partie de cette poignée de

maires qui, à l'imitation de Daniel Cueff, l'ancien maire de Langouët, ont pris en septembre 2019 des [arrêtés illégaux interdisant l'usage du glyphosate](#) « et d'autres substances chimiques » sur le territoire de leur commune. Des arrêtés qui furent, pour la plupart, suspendus par les préfets des régions concernées. [...]

[Accès au document](#)

Une exposition prénatale à de faibles doses de fongicides impacterait le développement neurologique des nouveau-nés

Génération futures 24/03/21

[...] Récemment, Arendt et ses collègues ont suggéré que pendant la neurogenèse embryonnaire, il y a une fenêtre temporelle où des facteurs endogènes et exogènes peuvent avoir un impact sur ce processus conduisant à des défaillances mitotiques (aneuploïdie, variations des copies de chromosomes, mutations somatiques, ...). [...] Dans cette optique, l'hypothèse est que des facteurs exogènes, tels que les polluants environnementaux, peuvent affecter la neurogenèse, en particulier pendant la gestation, ce qui peut conduire à une altération des fonctions neuronales et synaptiques, plus tard dans la vie. [...] À notre connaissance, cette étude est la première à démontrer l'impact d'une exposition gestationnelle à des doses aussi faibles de fongicides (0,1 µg/L) sur le développement neurologique. [...]

[Accès au document](#)

Over 100 Chemicals Detectable in Pregnant Women, Including 98 “New” or Unknown Compounds

Beyond Pesticides, March 25, 2021

A new University of California San Francisco (UCSF) study, published in Environmental Science & Technology, finds over 100 chemicals present in U.S. pregnant women's blood and umbilical cord samples. This discovery ignites concerns over prenatal exposure to chemicals from consumer and industrial products and sources. Furthermore, 89 percent of these chemical contaminants are unknown. Sources and uses, lacking adequate information, or are not previously detectable in humans. [...]

[Accès au document](#)

Kenyan farmers are resorting to hand pollination after pesticide use kills off local pollinators

Beyond Pesticides, March 24, 2021

The worst predictions of scientists and advocates are playing out in the fields of eastern Kenya, as chemical-intensive farming there threatens the future of food production. According to Radio France Internationale (RFI), Kenyan farmers have resorted to pollinating their crops by hand after pesticide use killed off most of the pollinators they rely on. [...]

[Accès au document](#)

Common use organophosphate insecticides pose a greater threat to women's health

Beyond Pesticides, March 18, 2021

A new study published in Environmental Toxicology and Pharmacology finds chronic (long-term) organophosphate (OP) pesticide exposure increases adverse health and cancer risk for U.S. women relative to men. Organophosphorus pesticides have a wide range of biological uses—from insecticides to flame retardants—that make these chemicals ubiquitous, significantly contributing to ecosystem contamination. Furthermore, while organophosphates have less bioaccumulation potential, residues are [consistently present](#) in human and animal blood, urine, tissues, and milk. [...]

[Accès au document](#)

Dangerous levels of heavy metals in baby food; usda and fda must act!

Beyond Pesticides, March 15, 2021

A [staff report](#) produced for the Subcommittee on Economic and Consumer Policy of the Committee on Oversight and Reform of the U.S. House of Representatives has documented substantial levels of the heavy metals arsenic, lead, cadmium, and mercury in infant foods. The researchers examined organic as well as nonorganic brands, finding contamination of both. They found that heavy metals were present in both crop-based ingredients and additives. However, many unknowns remain regarding the precise origin of the metals.

[Accès au document](#)

Exclusivité : Carte des tonnages d'achats de

pesticides par départements en 2019

Génération futures 11/03/21

Génération Futures rend publique ce jour la carte de France, détaillée et exclusive, des achats de pesticides par département et par type de substances actives pesticides. [...]

[Accès au document](#)

E=M6 spécial agriculture - D'erreurs en oublis

Que Choisir 06/03/21

Pesticides, serres chauffées, ou encore conditions d'élevage : à la date où aurait dû se tenir le Salon de l'agriculture, M6 a tenté, dans une émission en prime time, de rassurer ses nombreux téléspectateurs sur plusieurs « questions qui fâchent ». Mais cela, malheureusement, au prix de plusieurs erreurs et omissions d'importance. Petit rectificatif en trois points, concernant la santé des consommateurs. [...]

[Accès au document](#)

Science for the people: launching pesticide info

PANNA 09/03/21

[...] a newly updated, more intuitive, and easier-to-use pesticide information database is now available to the public, accessible at pesticideinfo.org.

Pesticide Info brings together a diverse array of information on pesticides from many sources, providing human toxicity, ecotoxicity, regulatory information, and more for over 15,000 pesticides. Ultimately, Pesticide Info facilitates public access to critically important data. [...]

[Accès au document](#)

On International Women's Day, Dr Shanna Swan talks to CHEM Trust about her research on chemicals, fertility and reproductive health

Chemtrust 08/03/21

[...] Shanna H. Swan, Ph.D., is one of the world's leading environmental and reproductive epidemiologists and a Professor of environmental medicine and public health at the Icahn School of Medicine at Mount Sinai in New York City. An award-winning scientist, her work examines the impact of environmental exposures, including chemicals such as phthalates and Bisphenol A, on men's and women's reproductive health and the neurodevelopment of children. [...]

[Accès au document](#)

Ecosystem Health: Pesticide Use from Forest Management Practices Threatens Essential West Coast Marine Organisms

Beyond Pesticides, March 11, 2021

A [Portland State University \(PSU\) study](#) finds that pesticides from the forestry industry threaten clams, mussels, oysters (bivalves) along the Oregon state coast. Bivalves are excellent indicator species, signaling environmental contamination through their sedimentary, filter-feeding diet. However, continuous pesticide inputs—from various forestry management regimes—into watersheds along Oregon's coastal zone endanger these species in downstream rivers and estuaries (river mouths). [...]

[Accès au document](#)

Minnesota Deer Threatened by Ubiquitous Neonicotinoid Contamination, According to Study

Beyond Pesticides, March 10, 2021

Deer populations throughout the state of Minnesota are contaminated with neonicotinoid insecticides, according to preliminary results published earlier this month by the Minnesota Department of Natural Resources (MDNR). There are considerable uncertainties on its impacts [neonicotinoids] after it is released into the environment. As scientists continue to discover novel harms from the use of these systemic insecticides, advocates say it becomes increasingly important to eliminate their use, and take preventive, precautionary measures to ensure similar patterns do not emerge in the future. [...]

[Accès au document](#)

EPA Proposes Cancellation of Highly Toxic Wood Preservative Pentachlorophenol ("Penta")

Beyond Pesticides, March 9, 2021

Last week the [Environmental Protection Agency \(EPA\) announced an interim decision to cancel](#) of one of the most hazardous pesticides still used in the United States, pentachlorophenol (penta). Although long overdue, health advocates are hailing the agency's action, taken due to significant risks to human health, the availability of alternatives, and the [uncertain future of penta production](#). [...] Cancellation of this toxic chemical will bring the U.S. into conformance with the Stockholm Convention, an international treaty to ban persistent organic pollutants (POPs) joined by over 150 countries that was never ratified by the U.S. [...]

[Accès au document](#)

Despite 1,700 Dog Deaths from Flea Collars

Beyond Pesticides, March 5, 2021

USA Today has reported that a popular flea and tick collar – Seresto, developed by Bayer and sold by Elanco – has been linked to nearly 1,700 pet deaths, injuries to tens of thousands of animals, and harm to hundreds of people. At the time of publication, the U.S. Environmental Protection Agency (EPA), [...], had issued no informational alert to let the public know about these risks to pets – despite many hundreds of incident reports in its Office of Pesticide Programs Incident Report database. Beyond Pesticides and other advocates have warned of the toxicity of pet pesticide treatments, not only to the animals themselves, but also, to children and other household members. [...]

[Accès au document](#)

Ghosts of past pesticide use can haunt organic farms for decades

Science daily 04/03/21

Although the use of pesticides in agriculture is increasing, some farms have transitioned to organic practices and avoid applying them. But it's uncertain whether chemicals applied to land decades ago can continue to influence the soil's health after switching to organic management. Now, researchers have identified pesticide residues at 100 Swiss farms, including all the organic fields studied, with beneficial soil microbes' abundance negatively impacted by their occurrence. [...]

[Accès au document](#)

Implications for Human Health: Glyphosate-Related Soil Erosion Re-Releases Toxic Pesticides from Soil

Beyond Pesticides, March 4, 2021

A new study finds glyphosate use stimulates soil erosion responsible for releasing banned, toxic pesticide chlordecone (Kepone), which was used in banana production. For years, an unknown pollution source continuously contaminated water surrounding islands in the French West Indies (Martinique and Guadeloupe). However, researchers from the University of Savoie Mont Blanc in France have found that chlordecone—extensively used on banana farms from 1972 to 1993—is the contamination culprit. [...]

[Accès au document](#)

REVUE DE PRESSE / RECHERCHE ET MEDIAS

Fish have been swallowing microplastics since the 1950s

Phys.org 29/04/21

[...] We've known for a while that big pieces of plastic can harm wildlife—think of seabirds stuck in plastic six-pack rings—but in more recent years, scientists have discovered microscopic bits of plastic in the water, soil, and even the atmosphere. To learn how these microplastics have built up over the past century, researchers examined the guts of freshwater fish preserved in museum collections; they found that fish have been swallowing microplastics since the 1950s and that the concentration of microplastics in their guts has increased over time. [...]

[Accès au document](#)

Researchers find how tiny plastics slip through the environment

Phys.org 28/04/21

Washington State University researchers have shown the fundamental mechanisms that allow tiny pieces of plastic bags and foam packaging at the nanoscale to move through the environment. [...] The work, published in the journal *Water Research*, could help researchers develop better ways to filter out and clean up pervasive plastics from the environment. [...]

[Accès au document](#)

Arsenic is more common in wells near fractured bedrock in southeastern Wisconsin

PHYS.org 26/04/21

Wells located near ancient folds and fractures in the bedrock beneath southeastern Wisconsin are more likely to contain arsenic, a dangerous contaminant in drinking water, according to research just published by the Wisconsin Geological and Natural History Survey.

The findings come from an ongoing survey of the extent and causes of arsenic contamination in groundwater in eastern Wisconsin. By better predicting where arsenic will be found, the project could help municipalities and private well owners relocate or redesign wells or prepare to filter out the arsenic, which can cause cancer if ingested over time. [...]

[Accès au document](#)

Prenatal POP exposure may increase the risk of metabolic disorders in adolescence

News Medical 29/04/21

Exposure before birth to persistent organic pollutants (POPs)(organochlorine pesticides, industrial chemicals, etc) may increase the risk in adolescence of metabolic disorders, such as obesity and high blood pressure. This was the main conclusion of a study by the Barcelona Institute for Global Health (ISGlobal), a research centre supported by the "la Caixa" Foundation. The study was based on data from nearly 400 children living in Menorca, who were followed from before birth until they reached 18 years of age. [...]

[Accès au document](#)

Operation 30 Days at Sea 3.0 reveals 1,600 marine pollution offences worldwide

Interpol 29/04/21

Thousands of suspects, companies and criminal networks engaged in maritime pollution have been detected and investigated in a global INTERPOL-led operation [Operation 30 Days at Sea 3.0].

[...]Preliminary results from the operation's tactical phase included the detection of 1,600 marine pollution offences, [...]. These include:

[...]

- 1,000 pollution offences in coastal areas and in rivers, including illegal discharges of sewage, mercury, plastics, and other contaminants, leading to serious water contamination which flows into the oceans;
- 130 cases of waste trafficking through ports

[Accès au document](#)

« L'apiculture ne doit plus subir une dictature agrochimique sans issue »

Le Monde 27/04/21

La France ne doit plus opposer l'apiculture à l'agriculture, ni feindre d'ignorer encore la valeur économique de la pollinisation, affirment sept responsables d'organisations représentant l'apiculture française, en réponse à une tribune publiée par « Le Monde ».

Dans cette tribune [...] Christiane Lambert, présidente de la Fédération nationale des syndicats d'exploitants agricoles (FNSEA) et Eric Lelong, président de l'interprofession apicole Interapi, proposaient, à propos du plan pollinisateurs annoncé par le gouvernement, d'écouter « la sagesse du terrain ». [...]

[Accès au document](#)

Regulators missing pollution's effect on marine life, study finds

The Guardian 27/04/21

Increasing chemical and plastic pollution are “significant” contributors to the decline of fish and other aquatic organisms, yet their impact is being missed by regulators, according to a report by environmentalists.

The report, [Aquatic Pollutants in Oceans and Fisheries](#), by the International Pollutants Elimination Network and the National Toxics Network, draws together scientific research on how pollution is adversely affecting the aquatic food chain. It catalogues the “serious impacts” of “invisible killers” such as persistent organic pollutants and excessive nutrients on the immunity, fertility, development and survival of aquatic animals. [...]

[Accès au document](#)

US EPA addresses ecological risks posed by aminopyralid

News.agropages 25/04/21

On April 23, the U.S Environmental Protection Agency (EPA) is releasing for public comment the proposed interim decision (PID) for aminopyralid, a pyridine herbicide used to control broadleaf weeds and woody brush in both agricultural and non-agricultural settings. The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) requires EPA to periodically review pesticides to ensure that risk assessments reflect the best available science. The PID is part of a multi-step process to identify risks as well as actions that can mitigate risks. [...]

[Accès au document](#)

Pollution de l'air : l'impact du premier confinement sur la mortalité

Vie-publique 22/04/21

[...] Concentrations dans l'air de dioxyde d'azote (NO₂) provenant essentiellement du trafic routier ou encore présence dans l'air de particules fines comme les PM_{2,5} issues d'autres sources (chauffage ou épandages agricoles), la pollution de l'air a un effet sur la santé des populations.

Une [étude publiée en avril 2021 par Santé publique France](#) évalue les conséquences de la baisse de la pollution de l'air ambiant sur la mortalité pendant le confinement du printemps 2020. [...]

[Accès au document](#)

Comment le plancton marin côtier a changé après la Seconde Guerre mondiale ?

Ifremer 27/04/21

Les pollutions humaines peuvent changer radicalement la composition du plancton marin. C'est le principal résultat d'une étude sur la rade de Brest publiée dans la revue Current Biology, une enquête scientifique et historique qui montre que la Seconde Guerre mondiale et l'agriculture intensive ont bouleversé cet écosystème fragile. [...]

[Accès au document](#)

600 manatee deaths in Florida raise concerns over sustainable habitat

TheHill 13/04/21

Environmentalists are increasingly concerned about the sustainability of Florida's waterways after the deaths of more than 600 manatees so far this year, three times the average rate.

Biologists with the Florida Fish and Wildlife Conservation (FWC) Commission first started getting concerned in December when manatees began dying in the Indian River Lagoon Area, one of the most biodiverse estuaries in the Northern Hemisphere and home to nearly one-third of the nation's manatee population.

[...] A new study has also shown that manatees have been chronically exposed to the key ingredient in pesticides like Roundup, due in large part to fertilizer runoff. The study by University of Florida scientists concluded that the chemical was found in the plasma of over half of the 105 manatees that were analyzed between 2009 and 2019. According to the study, the concentration of the herbicide has "significantly increased" in Florida manatees over the past decade. [...]

[Accès au document](#)

64% of global agricultural land at risk of pesticide pollution?

Science daily 08/04/21

A global map of agricultural land across 168 countries has revealed that 64 percent of land used for agriculture and food crops is at risk of pesticide pollution. Almost a third of these areas are considered to be at high-risk.

The study, published in Nature Geoscience, [...] examined risk to soil, the atmosphere, and surface and ground water. [...]

[Accès au document](#)

One sip can kill: The new battles over paraquat pesticides

Sustainability times 10/04/21

[...] Public Eye, the investigative NGO based in Switzerland, calls paraquat the world's deadliest weedkiller. Ingesting as little as 10 milliliters of the chemical can prove fatal and there is no known antidote. [...]

What the new investigation brings to light is the claim by former ICI scientist Jon Heylings that the company knew about the severity of paraquat toxicity and sought to reformulate the product with an emetic ingredient to induce vomiting if swallowed, but it did not heed his warnings that the amount of PP796 added to the mix wasn't nearly enough to offer any meaningful protections. [...]

[Accès au document](#)

Dumped chemical weapons litter the ocean floors

Popsi 13/04/21

Almost seventy years ago, a group of Polish children arrived in the coastal village of Darłowo for summer camp. As some children splashed in the cold, turbid waters of the Baltic Sea, others played around an old, corroded barrel they found lodged on the beach, blissfully unaware of the looming threat leaking from within.

A few hours after being exposed to the barrel's brown-black liquid, over 100 children began feeling sick. The culprit? Mustard gas. [...]

[Accès au document](#)

L'arrêté anti-phytos du maire de La Montagne provisoirement suspendu

Agri-Mutuel 09/04/21

Le juge des référés du tribunal administratif de Nantes a décidé vendredi de suspendre l'arrêté du maire de La Montagne (Loire-Atlantique) « interdisant les déchets de produits phytosanitaires qui se répandent hors des parcelles traitées », dans l'attente d'un jugement sur le fond.

Cet arrêté municipal, pris le 11 janvier 2021, assimile à un dépôt de déchets tous les rejets de produits phytosanitaires qui se répandent hors du site auquel ils sont destinés. [...]

[Accès au document](#)

Preservative used in hundreds of popular foods may harm the immune system

EurekAlert! 25/03/21

A food preservative used to prolong the shelf life of Pop-Tarts, Rice Krispies Treats, Cheez-Its and almost 1,250 other popular processed foods may harm the immune system, according to a new peer-reviewed study by Environmental Working Group.

For the study, published this week in the International Journal of Environmental Research and Public Health, EWG researchers used data from the Environmental Protection Agency's Toxicity Forecaster, or ToxCast, to assess the health hazards of the most common chemicals added to food, as well as the "forever chemicals" known as PFAS, which can migrate to food from packaging. [...]

[Accès au document](#)

How our microplastic waste becomes 'hubs' for pathogens, antibiotic-resistant bacteria

EurekAlert! 20/03/21

A new study shows how microplastics found in our daily personal care products can also host pathogens and boost antibiotic-resistant bacteria by up to 30 times once they wash down household drains and enter municipal wastewater treatment plants. [...]

[Accès au document](#)

Rodenticides in the environment pose threats to birds of prey

EurekAlert! 23/03/21

[...] In addition to plant protection substances and human and veterinary medical drugs, rodenticides have had toxic effects on wildlife. A new scientific investigation from scientists of the Leibniz Institute for Zoo and Wildlife Research (Leibniz-IZW), the Julius Kühn Institute (JKI) and

the German Environment Agency (Umweltbundesamt - UBA) demonstrate that these substances are widely found in liver tissues of birds of prey from Germany. Anticoagulant rodenticides, commonly used to kill rodents in agriculture and forestry, were frequently detected, particularly in birds of prey close to or in urban environments. [...] The results, which were supported by WWF Germany, are published in the scientific journal Environmental Research. [...]

[Accès au document](#)

Phytol may be promising for eco-friendly agrochemicals to control root-knot nematodes

EurekAlert! 22/03/21

[...] Growers currently use synthetic nematicides to manage RKNs [Root-knot nematodes]; however, these compounds are detrimental to the microbial diversity of soil and harmful for the environment. [...]

The role of phytol as a plant defense-signaling molecule remained unexplored. "Phytol may be a promising material for eco-friendly agrochemicals for the control of RKNs. We are currently investigating its effects on not only other plant parasitic nematodes but also other pathogenic microorganisms." [...]

[Accès au document](#)

Des clauses miroirs pour éviter la concurrence déloyale en agriculture

Agri-Mutuel 26/03/21

L'Union européenne doit obliger les produits agricoles importés à respecter les mêmes normes environnementales que ceux produits en son sein pour éviter toute distorsion de concurrence,

demandent jeudi la Fondation Nicolas Hulot et l'interprofession de la viande, Interbev. [...]

La FNH, Interbev et l'institut Veblen dénoncent la situation actuelle « du deux poids deux mesures », avec l'exemple de la lentille et la viande bovine. « Moins chère et bourrée de pesticides interdits en Europe, la lentille canadienne supplante petit à petit les lentilles européennes », déplorent-elles. Ceci s'explique, selon le rapport, par l'usage du « Sencoral, un pesticide interdit depuis 2014 par la Commission européenne » car perturbateur endocrinien suspecté, et du « droit de recourir au glyphosate jusqu'à 4 jours avant la récolte ». [...]

[Accès au document](#)

Microplastics are tiny plastic particles that can end up in the environment and the human body. It is not yet clear how harmful microplastic particles...

WUR 19/03/21

Microplastics are tiny plastic particles that can end up in the environment and the human body. It is not yet clear how harmful microplastic particles are to human health, but researchers from Wageningen University & Research calculated that in their lives, humans ingest microplastics particles close to a grain of salt (14,9 mg). This new calculation method means a big step forward in predicting the health risks of microplastics and the corresponding uncertainties. [...]

[Accès au document](#)

Endocrine disruptors threatens semen quality

EurekAlert! 19/03/21

A growing number of studies show that the environmental factors and lifestyle habits of pregnant women play an important role in the health of their child. But how about the semen quality of young men? [...] Epidemiologists from the Institut de recherche en santé, environnement et travail (IRSET, Rennes, France), in collaboration with the University of Geneva (UNIGE) Switzerland analyzed the potential impact of endocrine disruptors on semen quality of men whose mothers were working at the early stages of their pregnancy. Their results, published in the journal *Human Reproduction*, show that men who have been exposed in utero to products known to contain endocrine disruptors are twice more likely to have semen volume and total sperm count per ejaculation below the reference values set by the WHO. [...]

[Accès au document](#)

Epannage des pesticides : le gouvernement encore prié de revoir sa copie

Terre-Net 19/03/21

« Grande victoire » pour les ONG, le gouvernement va à nouveau devoir revoir sa copie sur les règles d'épandage des pesticides à proximité des habitations : les dérogations permises localement par des « chartes d'engagement » ne sont pas conformes à la Constitution.

[Accès au document](#)

'Lost' ocean nanoplastic might be getting trapped on coasts

EurekAlert! 10/03/21

As plastic debris weathers in aquatic environments, it can shed tiny nanoplastics. Although scientists have a good understanding of how these particles form, they still don't have a good grasp of where all the fragments end up. Now, researchers reporting in *ACS' Environmental Science & Technology* have shown experimentally that most nanoplastics in estuarine waters can clump, forming larger clusters that either settle or stick to solid objects, instead of floating on into the ocean. [...]

[Accès au document](#)

Bioaccumulation of phased-out fire retardants is slowly declining in bald eagles

EurekAlert! 10/03/21

Research published in *Environmental Toxicology and Chemistry* shows that the presence of polybrominated diphenyl ethers (PBDEs) in bald eagle populations is slowly declining. Bald eagles are apex predators that nest and, more importantly, feed along water bodies, making them excellent bioindicators of environmental contaminants that bioaccumulate up the aquatic food web. [...]

[Accès au document](#)

Researchers modify air quality models to reflect polluted reality in Latin America

EurekaAlert! 09/03/21

Computational models of air quality have long been used to shed light on pollution control efforts in the United States and Europe, but the tools have not found widespread adoption in Latin America. New work from North Carolina State University and Universidad de La Salle demonstrates how these models can be adapted to offer practical insights into air quality challenges in the Americas outside the U.S. [...]

[Accès au document](#)

Air pollution: The silent killer called PM2.5

EurekaAlert! 11/03/21

Millions of people die prematurely every year from diseases and cancer caused by air pollution. [...] Among the different types of air pollution, PM2.5 kills the most people worldwide. It consists of particles smaller than approximately 2.5 microns - so small that billions of them can fit inside a red blood cell. [...]

[Accès au document](#)

L'Anses recommande des VLEP pour le dioxyde de titane sous forme nanoparticulaire

Actu-environnement 5/03/21

Suite à la publication d'un rapport d'expertise collective, l'Agence de sécurité sanitaire (Anses) recommande des valeurs limites d'exposition professionnelle (VLEP) pour le dioxyde de titane sous forme nanométrique (TiO₂-NP). Elle

préconise une VLEP-8H de 0,80 microgramme par mètre cube ($\mu\text{g}/\text{m}^3$). « Le respect de cette valeur permet de prévenir l'inflammation pulmonaire », assure l'Anses. [...]

[Accès au document](#)

Rice plant resists arsenic

EurekaAlert! 02/03/21

The agricultural cultivation of the staple food of rice harbours the risk of possible contamination with arsenic that can reach the grains following uptake by the roots. In their investigation of over 4,000 variants of rice, a Chinese-German research team under the direction of Prof. Dr Rüdiger Hell from the Centre for Organismal Studies (COS) of Heidelberg University and Prof. Dr Fang-Jie Zhao of Nanjing Agricultural University (China) discovered a plant variant that resists the toxin. [...]

[Accès au document](#)

Deepwater Horizon's long-lasting legacy for dolphins

EurekaAlert! 02/03/21

[...] Nearly 10 years have passed since the Deepwater Horizon disaster, the explosion of a BP-operated oil drilling rig in the Gulf of Mexico. Yet, and [...] area wildlife are still feeling the effects of that oil. A research published in Environmental Toxicology and Chemistry has shown that negative health impacts have befallen not only dolphins alive at the time of the spill, but also in their young, born years later. [...]

[Accès au document](#)

'Canary in the mine' warning follows new discovery of effects of pollutants on fertility

EurekAlert! 02/03/21

New research has found that shrimp like creatures on the South Coast of England have 70 per cent less sperm than less polluted locations elsewhere in the world. The research also discovered that individuals living in the survey area are six times less numerous per square metre than those living in cleaner waters.

This discovery, published today in Aquatic Toxicology, mirrors similar findings in other creatures, including humans. The scientist leading research at the University of Portsmouth believes pollutants might be to blame, further highlighted by this latest research. [...]

[Accès au document](#)

Ghosts of past pesticide use can haunt organic farms for decades

EurekAlert! 03/03/21

[...] it's uncertain whether chemicals applied to land decades ago can continue to influence the soil's health after switching to organic management. Now, researchers reporting in ACS' Environmental Science & Technology have identified pesticide residues at 100 Swiss farms, including all the organic fields studied, with beneficial soil microbes' abundance negatively impacted by their occurrence. [...]

[Accès au document](#)

Study explores link between forestry management and pesticides in aquatic species

EurekAlert! 02/03/21

[...] A new study by researchers at Portland State University found mussels, clams and oysters in watersheds along the Oregon Coast are exposed to pesticides used in managing forests. The results of this study, published in the journal Toxics, have implications for developing better forest management practices that are less likely to negatively affect aquatic life. [...]

[Accès au document](#)

Cleaner air, less soil pollution: Unintended but beneficial side effect of Clean Air Act

EurekAlert! 02/03/21

Removal of pollutants from the air, or atmospheric deposition, is a natural cleaning mechanism. However, the removed toxic matters don't just disappear on the Earth. China's Soil Pollution Survey released in 2014 shows that 19.4% of the Chinese farmland soil was polluted and 82% of pollutant was toxic heavy metals such as cadmium, which can cause chronic health problems. [...]

[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 cancérigène, qui a contaminé de manière durable les Antilles françaises et leurs habitants depuis 1972. [...]

[Accès au document](#)