Bulletin de veille du réseau d'écotoxicologie terrestre et aquatique

ECOTOX

N°33, juin 2018

Réalisé par l'équipe de veille sur la période du 1er mai 2018 au 30 juin 2018.
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Edito

Voici notre 33ème bulletin de veille. Vous y trouverez de nombreuses informations en lien avec l'écotoxicologie, la toxicologie et les activités du réseau.

L'actualité traite toujours de néonicotinoïdes, de glyphosate…

Notre Special Issue concernant le séminaire Ecotox de décembre 2017 dans la revue Environmental Sciences et Pollution Research sera prochainement éditée. La plupart des articles est déjà en ligne.

Nous rappelons le Forum SEM à Rovaltain en octobre : http://fcsrovaltain.org/sem2018.html

Nous vous proposons dans ce bulletin une tribune libre proposant le bilan 2017 des activités de notre réseau. Le texte est également disponible sous forme de fiche thématique en téléchargement sur notre site ECOTOX : http://www6.inra.fr/ecotox/Productions/Fiches-thematiques

N'oubliez pas de nous transmettre les informations que vous souhaitez diffuser. Pour vos étudiants, de nombreuses offres de doctorat circulent en ce moment via la liste de diffusion.

Notre réseau s'agrandissant, notre moteur de recherche n'est pas à jour pour la détection des publications de l'ensemble des membres du réseau. Vous pouvez donc nous adresser vos pdfs et nous les signalerons.

L'équipe de veille vous souhaite d'agréables vacances.

Contact : contact-ecotox@inra.fr

SOMMAIRE

Tribune libre

Bilan 2017 des activités du réseau ECOTOX

Nous vous présentons les activités que notre réseau d'écotoxicologie terrestre et aquatique, ECOTOX, a menées en 2017. Celles-ci s'articulent autour de 4 axes :

-Contribution à la réflexion scientifique, à la programmation et à l'animation de la recherche en écotoxicologie,

-Accroissement de la visibilité de l'écotoxicologie et de ses acteurs, dans et hors de l'INRA,

-Valorisation et dissémination des résultats de la recherche,

-Initiation de projets de recherche et le développement d'infrastructures et d'outils dédiés.

Le réseau est co-animé par C. Mougin, A. Bouchez, L. Denaix et F. Martin-Laurent (INRA) ainsi que par J. Garric (Irstea). Il reçoit des soutiens des 2 instituts.

Contribution à la réflexion scientifique, à la programmation et à l'animation de la recherche en écotoxicologie

Le positionnement national du réseau a été également renforcé 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 les autres structures d'animation en écotoxicologie pour coordonner l'ensemble des actions et améliorer la visibilité de notre communauté scientifique. Ainsi, il ambitionne d'être la force majeure de l'animation scientifique en écotoxicologie, en partenariat avec d'autres réseaux ou groupements intervenants sur les questions plus spécifiques (écotoxicologie microbienne, écotoxicologie animale aquatique…).

Dans le cadre du rapprochement INRA/Irstea en cours, nous avons initié début 2018 une réflexion coordonnée autour de l'écotoxicologie, avec la rédaction d'un document « Risques chimiques et écotoxicologie » transmis aux directions scientifiques et départements de recherche concernés au sein des 2 instituts. Cette réflexion est à poursuivre en 2018.

Le contour du réseau a été étendu avec l'abonnement à sa liste de diffusion des experts écotoxicologues/toxicologues du GT Risques d'AllEnvi, les membres du réseau EcoBASC du LabEx BASC, ainsi que les membres de l'initiative Recotox.

Initiation de projets de recherche et développement d'infrastructures et d'outils dédiés

Notre réflexion concernant la mise en place de réunions semestrielles sur le modèle de celle du réseau R2A2 (MP GISA) n'a toutefois pas été finalisée en 2017. Sur une journée, ces réunions offriraient des présentations autour d'un thème et des ateliers de discussion, dans le but de faire émerger des consortiums porteurs de projets de recherche.

Par ailleurs, le réseau a été sollicité par la DV Env pour réfléchir au portage ou une participation à un projet dans le cadre de l'AAP : SFS-04-2019-2020: Integrated health approaches and alternatives to pesticide use. Des contacts sont pris avec un consortium en construction au niveau Européen.

Le réseau interagit également avec l'initiative Recotox pour favoriser l'émergence de projets sur les sites du réseau.

Ces points ont été discutés lors de notre séminaire de décembre 2017.

Accroissement de la visibilité de l'écotoxicologie et de ses acteurs, dans et hors de l'INRA

Soutien à l'organisation de colloques et séminaires

En 2017, le réseau a contribué à l'organisation de 2 manifestations scientifiques au cours lesquelles ses membres ont pu présenter leurs résultats.

-Ecotoxicomic, 1er colloque international d'Ecotoxicologie Microbienne du 21 au 24 novembre à Lyon (qui a réuni 170 participants en provenance de 25 pays, https://ecotoxicomic.sciencesconf.org/),

-6ème séminaire du Réseau d'Ecotoxicologie Terrestre et Aquatique, Alixan, du 4 au 5 décembre à Alixan, en interaction avec la Fondation Rovaltain

Le séminaire Ecotox, qui a réuni une cinquantaine de participants, a bénéficié du soutien financier des départements Environnement et Agronomie, Santé des Plantes et Environnement, Ecologie des Forêts, Prairies et Milieux Aquatiques de l'INRA. Il a été également soutenu par le réseau EcoBASC du LabEx BASC (ANR-11-LABX-0034), le réseau RECOTOX (via l'alliance AllEnvi), et le département EAUX d'Irstea.

Les actes du séminaire sont disponibles sur le site du réseau et sur l'archive ouverte ProdINRA :

Bouchez A., Denaix L., Garric J., Martin-Laurent F., Mougin C. 2017. Actes du 6ème séminaire du Réseau d'Ecotoxicologie Terrestre et Aquatique. Alixan, décembre. 85 pages - https://prodinra.inra.fr/record/414749

Veille thématique ECOTOX

La veille documentaire mise en place en 2013 par le réseau continue à se renforcer avec la prise en compte de nouvelles rubriques.

Les bulletins bimestriels sont en téléchargement sur le site du réseau, sur ProdINRA, et largement diffusés dans et hors de l'INRA. Les retours des lecteurs sont très positifs et encourageants. Outre la communauté scientifique des écotoxicologues, des agences nationales et européennes, plusieurs instituts techniques et bureaux d'étude sont abonnés au bulletin.

Six bulletins ont été édités en 2017.

Pelosi C., Mougin C., Sireyjol C. Février 2017. Bulletin de veille du Réseau des Ecotoxicologues de l'INRA, N°25, 53 pages, https://www6.inra.fr/ecotox/Veille/Bulletins-de-veille/Bulletin-25-Veille-du-01-01-2017-au-28-02-2017 ; http://prodinra.inra.fr/record/417881

Pelosi C., Mougin C., Sireyjol C. Avril 2017. Bulletin de veille du réseau d'écotoxicologie terrestre et aquatique, N°26, 50 pages, https://www6.inra.fr/ecotox/Veille/Bulletins-de-veille/Bulletin-26-Veille-du-01-03-2017-au-30-04-2017 ; http://prodinra.inra.fr/record/417882

Pelosi C., Mougin C., Sireyjol C., Goulas A. Juin 2017. Bulletin de veille du réseau du réseau d'écotoxicologie terrestre et aquatique, N°27, 44 pages, https://www6.inra.fr/ecotox/Veille/Bulletins-de-veille/Bulletin-27-Veille-du-01-05-2017-au-30-06-2017 ; http://prodinra.inra.fr/record/417883

Pelosi C., Mougin C., Sireyjol C., Goulas A. Aout 2017. Bulletin de veille du réseau du réseau d'écotoxicologie terrestre et aquatique, N°28, 49 pages, https://www6.inra.fr/ecotox/Veille/Bulletins-de-veille/Bulletin-28-Veille-du-01-07-2017-au-31-08-2017 ; http://prodinra.inra.fr/record/417886

Pelosi C., Mougin C., Sireyjol C., Goulas A. Octobre 2017. Bulletin de veille du réseau du réseau d'écotoxicologie terrestre et aquatique, N°29, 54 pages, https://www6.inra.fr/ecotox/Veille/Bulletins-de-veille/Bulletin-29-Veille-du-01-09-2017-au-10-11-2017 ; http://prodinra.inra.fr/record/417893

Pelosi C., Mougin C., Sireyjol C., Goulas A. Décembre 2017. Bulletin de veille du réseau du réseau d'écotoxicologie terrestre et aquatique, N°30, 43 pages, https://www6.inra.fr/ecotox/Veille/Bulletins-de-veille/Bulletin-30-Veille-du-11-11-2017-au-31-12-2017 ; http://prodinra.inra.fr/record/417898

Valorisation et dissémination des résultats de la recherche

Special Issues dans des journaux scientifiques

Le 1er colloque international d'Ecotoxicologie Microbienne a permis d'ouvrir 2 topics 'Microbial ecotoxicology, l'un dans Frontiers in Microbiology et l'autre dans Frontiers in Environmental Science.

Le 6ème séminaire d'Alixan a donné lieu à l'édition d'une Special Issue de la revue ESPR à paraitre fin 2018, « ECOTOX, new questions for terrestrial and aquatic ecotoxicology ».

Collection « Ecotoxicologie » ISTE

Les membres du réseau sont impliqués dans le comité éditorial de la collection, en tant que coordinateurs des volumes et en tant qu'auteurs des chapitres : https://iste-editions.fr/collections/serie-ecotoxicologie

L'année 2017 a vu la publication de 2 volumes de la collection.

Péry A., Garric J. (Editeurs). 2017. Les effets écotoxicologiques - De la molécule à la population. ISTE Editions, Londres, volume 1, 242 pages, ISBN 978-1-78405-275-1

Bernard C., Mougin C., Péry A. (Editeurs) 2017. Ecotoxicologie, des communautés au fonctionnement des écosystèmes. ISTE Editions, Londres, volume 2, 382 pages, ISBN 9-781-78405-315-4

Fiches thématiques

L'édition de fiches thématiques sous la forme de 4 pages (ou 6 !) sur des thèmes divers en lien avec l'écotoxicologie s'est poursuivie.

Six fiches ont ainsi été rédigées, diffusées dans le bulletin de veille du réseau, et placées en téléchargement sur le site du réseau et sur l'archive ouverte ProdINRA.

Sanchez W. Février 2017. L'écotoxicologie a désormais son Forum. Fiche thématique N°7, 4 pages - Réseau Ecotox : https://www6.inra.fr/ecotox/Productions/Fiches-thematiques/Fiche-thematique-N-7-Fevrier-2017 ; http://prodinra.inra.fr/record/409922

Siaussat S., Lallier F. Avril 2017. Écophysiologie / Écotoxicologie, une spécialité de master formant les spécialistes de demain en écophysiologie et écotoxicologie. Fiche thématique N°8, 4 pages - Réseau Ecotox : https://www6.inra.fr/ecotox/Productions/Fiches-thematiques/Fiche-thematique-N-8-Avril-2017 ; http://prodinra.inra.fr/record/409923

Mench M. Juin 2017. Phytomanagement de sols contaminés et/ou dégradés : de la sélection des assemblages plantes-microorganismes aux processus et fonctions écologiques sources de services écosystémiques. Fiche thématique N°9, 7 pages - Réseau Ecotox : https://www6.inra.fr/ecotox/Productions/Fiches-thematiques/Fiche-thematique-N-9-Juin-2017 ; http://prodinra.inra.fr/record/409924

Cheviron N., Grondin V., Jaulin A., Mougin C. Aout 2017. Biochem-Env : une plateforme de biochimie pour la recherche en environnement et agriculture. Fiche thématique N°10, 4 pages - Réseau Ecotox : https://www6.inra.fr/ecotox/Productions/Fiches-thematiques/Fiche-thematique-N-10-Aout-2017 ; http://prodinra.inra.fr/record/402687

Feidt C., Delannoy M. Octobre 2017. La biodisponibilité relative, un outil pour l'éco(toxico)logie trophique ? Fiche thématique N°11, 4 pages - Réseau Ecotox : https://www6.inra.fr/ecotox/Productions/Fiches-thematiques/Fiche-thematique-N-11-Octobre-2017 ; http://prodinra.inra.fr/record/410828

Mougin C., Artige E., Marchand F., Mondy S., Ratié C., Sellier N. Décembre 2017. BRC4Env, un réseau de Centres de Ressources Biologiques au service des recherches en environnement et en agronomie. Fiche thématique N°12, 5 pages - Réseau Ecotox : https://www6.inra.fr/ecotox/Productions/Fiches-thematiques/Fiche-thematique-N-12-Decembre-2017 ; http://prodinra.inra.fr/record/417575

Projet IST TRACE

La constitution d'un thésaurus en écotoxicologie a été initiée par C. Sireyjol avec l'accueil d'une étudiante de M2, en partenariat avec l'unité IST de Versailles (S. Aubin). Rapidement, cette action a évolué vers le projet TRACE : Thesaurus pour la Recherche et l'Analyse de Contenus en Écotoxicologie.

Le projet vise à constituer un référentiel terminologique partagée par le collectif de recherche « Ecotox » et en faire un élément central du système d'information du réseau Ecotox afin de faciliter l'analyse, le traitement et le partage des connaissances (publications, documents de travail, données de la recherche…), et de faciliter le transfert des productions de ce collectif vers les différents utilisateurs (recherche, monde socio-économique…).

Expertise

A la demande du collège de direction de l'INRA, plusieurs membres du réseau sont intervenus dans le cadre d'une expertise pour les Services de l'Etat de la Meuse.

Plusieurs membres du réseau participent à des travaux de normalisation de méthodes. Des textes ont ainsi été publiés par l'OCDE. Mais l'implication la plus importante se fait dans le cadre de l'AFNOR (Commission T95E Écotoxicologie) et de l'ISO (Commission TC190/SC 04 « méthodes biologiques »).

Une actualité reprenant en partie ces travaux de normalisation a été postée sur le site de l'INRA : http://www.inra.fr/Entreprises-Monde-agricole/Resultats-innovation-transfert/Toutes-les-actualites/impact-des-pesticides

Contacts

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Pour en savoir plus

https://www6.inra.fr/ecotox

ERA /Publications scientifiques Pesticides et microbiologie

Identification of new metabolic pathways in the enantioselective fungicide tebuconazole biodegradation by *Bacillus sp* 3B6

Authors: Youness, M; Sancelme, M; Combourieu, B; Besse-Hoggan, P

Source: JOURNAL OF HAZARDOUS MATERIALS, 351 160-168; 10.1016/j.jhazmat.2018.02.048 2018

Abstract: The use of triazole fungicides in various fields ranging from agriculture to therapy, can cause long-term undesirable effects on different organisms... Their occurrence in various water bodies has increased and tebuconazole, in particular, is often detected, sometimes in high concentration. Only a few bacterial and fungal strains have been isolated and found to biotransform this fungicide, described as not easily biodegradable. Therefore, a broad screening of microorganisms, isolated from various environmental compartments or from commercially-available strain collections, allowed us to find six bacterial strains able to biotransform tebuconazole. The most efficient one was studied further: this environmental strain *Bacillus sp.* 3B6 biotransforms the fungicide enantioselectively (ee = 18%) into two hydroxylated metabolites, one of them being transformed in its turn to alkene by a biotic dehydration reaction.

This original enantioselective pathway shows that racemic pesticides should be treated by the environmental risk assessment authorities as a mixture of two compounds because persistence, biodegradation, bioaccumulation and toxicity often show chiral dependence.

Accès au document

Effects of light, microorganisms, farming chemicals and water content on the degradation of microcystin-LR in agricultural soils

Authors: Cao, Q; Steinman, AD; Yao, L; Xie, LQ

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY, 156 141-147; 10.1016/j.ecoenv.2018.03.030 2018

Abstract: An experiment was conducted to investigate the effect of farming activities on microcystin-LR (MC-LR) degradation in soils. Three farming activities were assessed: 1) fertilization via addition of different nitrogen sources and organic matter; 2) pesticide application by addition of different commercial pesticides; and 3) irrigation by addition of different amount of water. The contribution of the two major degradation processes of MC-LR in soils, photodegradation and biodegradation, were also evaluated. MC-LR was added into the soil samples to create a concentration of 500 mug kg(-1) for each treatment. Results showed that natural degradation of MC-LR in soils was mainly by biodegradation rather than photodegradation. MC-degradation was stimulated by the addition of NaNO3 and humic acid, whereas degradation was inhibited by addition of NH_4Cl, glucose, and glycine. Application of high concentrations of glyphosate and chlorothalonil significantly inhibited the degradation of MC-LR in soils and the half-life was almost twice as long as the control. No significant effect was found by addition of $CO(NH_2)(2)$ and dimethoate. Both low (10%) and high water content (60%) could lead to inhibition of MC-LR degradation.

Accès au document

Impact of fomesafen on the soil microbial communities in soybean fields in Northeastern China

Authors: Wu, XH; Zhang, Y; Du, PQ; Xu, J; Dong, FS; Liu, XG; Zheng, YQ

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY, 148 169-176; 10.1016/j.ecoenv.2017.10.003 2018

Abstract: Fomesafen, a widely adopted residual herbicide, is used throughout the soybean region of northern China for the spring planting. However, the ecological risks of using fomesafen in soil remain unknown. The aim of this work was to evaluate the impact of fomesafen on the microbial community structure of soil using laboratory and field experiments. Under laboratory conditions, the application of fomesafen at concentrations of 3.75 and 37.5 mg/kg decreased the basal respiration (RB) and microbial biomass carbon (MBC). In contrast, treatment with 375 mg/kg of fomesafen resulted in a significant decrease in the Re, MBC, abundance of both Gram + and Gram bacteria, and fungal biomass. Analysis of variance showed that the treatment accounted for most of the variance (38.3%) observed in the soil microbial communities. Furthermore, the field experiment showed that long-term fomesafen application in continuously cropped soybean fields affected the soil bacterial community composition by increasing the relative average abundance of Proteobacteria and Actinobacteria species and decreasing the abundance of Verrucomicrobia species. In addition, Acidobacteria and Chloroflexi species showed a pattern of activation-inhibition. Taken together, our results suggest that the application of fomesafen can affect the community structure of soil bacteria in the spring planting soybean region of northern China.

Accès au document

Bioaugmentation of chlorothalonil-contaminated soil with hydrolytically or reductively dehalogenating strain and its effect on soil microbial community

Authors: Xu, XH; Liu, XM; Zhang, L; Mu, Y; Zhu, XY; Fang, JY

Source: JOURNAL OF HAZARDOUS MATERIALS, 351 240-249; 10.1016/j.jhazmat.2018.03.002 2018

Abstract: Although bioaugmentation of pollutant-contaminated sites is a great concern, there are few reports on the relationships among indigenous microbial consortia, exogenous inocula, and pollutants in a bioaugmentation process. In this study, bioaugmentation with Pseudochrobactrum sp. BSQ1 and Massilia sp. BLM18, which can hydrolytically and reductively dehalogenate chlorothalonil (TPN), respectively, was studied for its ability to remove TPN from soil; the alteration of the soil microbial community during the bioaugmentation process was investigated. The results showed that TPN (50 mg/kg) was completely removed in both bioaugmentation treatments within 35 days with half-lives of 6.8 and 9.8 days for strains BSQ1 and BLM18 respectively. In high concentration of TPN-treated soils (100 mg/kg), the bioaugmentation with strains BSQ1 and BLM18 respectively reduced 76.7% and 62.0% of TPN within 35 days. The TPN treatment significantly decreased bacterial richness and diversity and improved the growth of bacteria related to the elimination of chlorinated organic pollutants. However, little influence on soil microbial community was observed for each inoculation treatment (without TPN treatment), showing that TPN treatment is the main force for the shift in indigenous consortia.

Accès au document

Impact of antibiotics of anthropogenic origin on bacterial soil communities in agricultural ecosystems. Review

Authors: Radu, E; Woegerbauer, M; Oismuller, M; Kreuzinger, N

Source: 20TH INTERNATIONAL SYMPOSIUM - THE ENVIRONMENT AND THE INDUSTRY (SIMI 2017), 255-264; 10.21698/simi.2017.0033 2017

Proceedings Paper in the 20th International Symposium on The Environment and the Industry (SIMI)

Abstract: Soil is considered to be the most diverse microbiological ecosystem on Earth. Microbial soil biodiversity is substantially influenced by animal husbandry, intensive agricultural practices and soil cultivation (tillage, crop rotation, irrigation, organic and inorganic fertilization, application of pesticides etc.). Soil mismanagement represents a worldwide topic that impairs natural ecosystem sustainability as a first consequence. In order to understand and correctly apply soil management practices a deep insight in ecological processes is necessary. Soil microbiota have a great impact on both natural processes (biogeochemical cycles) as well as various other aspects that could influence human health and the quality of life (micro-or macro-contaminants, pharmaceuticals, fertilizers, phytosanitary products). Pharmaceuticals, especially antibiotics are intensively used in animal husbandry either as therapeutic agents or for prophylactic measures. Antibiotics of microbial, semi-synthetic or synthetic origin impact the metabolism of bacteria: at subinhibitory concentrations they act as hormetic intercellular messengers stimulating gene expression. Higher amounts have bacteriostatic or bactericidal effects according to their mode of action. Both result in a profound modulation of bacterial community structure and biodiversity by boosting genotypic and phenotypic variability and induction of antibiotic resistance. They also pose an indirect effect on the communities (generating different genotypic and phenotypic variability such as antibiotic resistance). Agricultural management practices like application of organic fertilizers (e.g. manure) expose soil microbiota to a variety of hazardous agents of anthropogenic origin including antibiotics, antibiotic resistant bacteria and antibiotic resistance genes which interact with the indigenous soil resistome. This paper describes the impact of human land-use, especially the ecological effects of antibiotics on natural ecosystems and the increase of antibiotic resistance in soil communities.

Accès au document

The Effect of Diflufenican and Its Mixture with S-metolachlor and Metribuzin on Nitrogenase and Microbial Activity of Soil under Yellow Lupine (*Lupinus luteus* L.)

Authors: Niewiadomska, A; Skrzypczak, G; Sobiech, L; Wolna-Maruwka, A; Borowiak, K; Budka, A

Source: TARIM BILIMLERI DERGISI-JOURNAL OF AGRICULTURAL SCIENCES, 24 (1):130-142; 2018

Abstract: The aim of the study was to evaluate the effect of the active substance of diflufenican and its combination with s-metolachlor or metribuzin, applied to yellow lupine, on the nitrogenase activity, the population size of selected groups of microorganisms, the activity of soil enzymes and their sensitivity to the tested preparations. All analysed preparations caused a reduction in the total number of bacteria and the number of actinobacteria and oligotrophic bacteria at the beginning of the vegetation period of yellow lupine. In the combination where diflufenican was used separately a stimulatory effect on nitrogenase activity was observed.

Accès au document

ERA / Publications scientifiques Pesticides et vers de terre

Influence of soil temperature and moisture on biochemical biomarkers in earthworm and microbial activity after exposure to propiconazole and chlorantraniliprole

Authors: Hackenberger, DK; Palijan, G; Loncaric, Z; Glavas, OJ; Hackenberger, BK

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY, 148 480-489; 10.1016/j.ecoenv.2017.10.072 2018

Abstract: Predicted climate change could impact the effects that various chemicals have on organisms. The aim of this study is to assess how change in temperature and soil moisture affect biochemical biomarkers in *Eisenia fetida* earthworm and microbial activity in their excrements after exposure to a fungicide - propiconazole (PCZ) and an insecticide - chlorantraniliprole (CAP). For seven days, earthworms were exposed to the pesticides under four environmental conditions comprising combinations of two different temperatures (20 degrees C and 25 degrees C) and two different soil water holding capacities (30% and 50%)... The temperature and the soil moisture affected enzyme activities and organism's response to pesticides. Interestingly, the AChE activity was induced by both pesticides at a higher temperature tested. The most important two-way interaction that was determined occurred between the concentration and temperature applied. DHA and BFA, as markers of microbial activity, were unevenly affected by PCZ, CAP and environmental conditions. The results of this experiment demonstrate that experiments with at least two different environmental conditions can give a very good insight into interaction of environmental factors should play a more important role in the risk assessments for pesticides.

Accès au document

Effects of a novel neonicotinoid insecticide cycloxaprid on earthworm, Eisenia fetida

Qi, SZ; Wang, DH; Zhu, LZ; Teng, MM; Wang, CJ; Xue, XF; Wu, LM

ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25 (14):14138-14147; SI 10.1007/s11356-018-1624-z 2018

Cycloxaprid (CYC) is a novel neonicotinoid insecticide with high activity against resistant pests but is safe for mammals. The toxic effects of CYC on earthworms (*Eisenia fetida*) were studied in this paper. (...) Our study shows for the first time that negative impacts could be induced by CYC on earthworms under both acute and chronic exposure through oxidative stress and gene regulation. (...)

Accès au document

Combined effects of four pesticides and heavy metal chromium (VI) on the earthworm using avoidance behavior as an endpoint

Yang, GL; Chen, C; Yu, YJ; Zhao, HY; Wang, W; Wang, YH; Cai, LM; He, YP

ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY, 157 191-200; 10.1016/j.ecoenv.2018.03.067 2018

(...) In the present study, we aimed to investigate the individual and combined effects of four pesticides [fenobucarb (FEN), chlorpyrifos (CPF), clothianidin (CLO), acetochlor (ACE)] and one heavy metal chromium [Cr(VI)] on the earthworm (*Eisenia fetida*) using avoidance behavior as an endpoint. (...) our data strongly pointed out that the avoidance tests could be used to assess the effects of combined effects.

Accès au document

Acute toxicity of chemical pesticides and plant-derived essential oil on the behavior and development of earthworms, *Eudrilus eugeniae* (Kinberg) and *Eisenia fetida* Savigny)

Vasantha-Srinivasan, P; Senthil-Nathan, S; Ponsankar, A; Thanigaivel, A; Chellappandian, M; Edwin, ES; Selin-Rani, S

ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25 (11):10371-10382; SI 10.1007/s11356-017-9236-6 2018

Comparative toxicity of two chemical pesticides (temephos and monocrotophos) versus a plant-derived betel leaf oil Piper betle (L.) to earthworm *Eudrilus eugeniae* (Kinberg) and redworm *Eisenia fetida* Savigny, (...) was evaluated. (...) our study implied the risk assessment associated with the chemical pesticides and also recommends plant-derived harmless P. betle oil against beneficial species as an alternative pest control agent.

Accès au document

ERA / Publications scientifiques Faune et pesticides

Assessment of atrazine toxicity to the estuarine phytoplankter, *Dunaliella tertiolecta* (Chlorophyta), under varying nutrient conditions

Flood, S; Burkholder, J; Cope, G

ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25 (12):11409-11423; SI 10.1007/s11356-018-1310-1 2018

(...) The goals of this research were to establish a robust protocol for testing the effects of atrazine on estuarine phytoplankton, and then to use that protocol to compare the effects of atrazine exposure with and without nutrient enrichment on a cosmopolitan estuarine/marine alga, *Dunaliella tertiolecta* (Chlorophyta). (...)

Accès au document

Oxidative stress and DNA damage induced by spinosad exposure in *Spodoptera frugiperda* Sf9 cells

Xu, WP; Yang, MJ; Gao, JF; Zhang, Y; Tao, LM

FOOD AND AGRICULTURAL IMMUNOLOGY, 29 (1):171-181; 10.1080/09540105.2017.1364708 2018

(...) In order to elucidate the effects of spinosad on oxidative stress and genotoxicity in Sf9 cells, the levels of lipid peroxidation, the activity of antioxidative enzymes, and DNA damage were measured. (...) Our results indicate that spinosad effectively induced oxidative stress and DNA damage in Sf9 cells.

Accès au document

Effects of biochar on the fate and toxicity of herbicide fenoxaprop-ethyl in soil

Jing, X; Wang, TF; Yang, JL; Wang, YL

ROYAL SOCIETY OPEN SCIENCE, 5 (5): 10.1098/rsos.171875 2018

Biochar, as a soil amendment in agriculture, has attracted considerable attention. In the study, the fate and toxicity of the herbicide fenoxaprop-ethyl were evaluated in soils with and without 5% rice husk biochar amendment. (...) The results suggested that the application of biochar may reduce the risks of fenoxaprop-ethyl in the soil environment.

Accès au document

Enhancement of chronic bee paralysis virus levels in honeybees acute exposed to imidacloprid: A Chinese case study

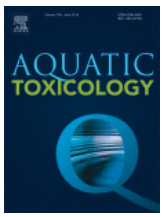
Diao, QY; Li, BB; Zhao, HX; Wu, YY; Guo, R; Dai, PL; Chen, DF

SCIENCE OF THE TOTAL ENVIRONMENT, 630 487-494; 10.1016/j.scitotenv.2018.02.258 2018

(...) To reveal the potential relationship between acute pesticides and viruses, we applied different doses of imidacloprid to adult bees that were primarily infected with low levels (4.3 x 10(5) genome copies) of chronic bee paralysis virus (CBPV) to observe whether the acute oral toxicity of imidacloprid was able to elevate the level of CBPV.(...)

Accès au document

Toxicokinetic and toxicodynamic studies of carbaryl alone or in binary mixtures with azinphos methyl in the freshwater gastropod *Planorbarius corneus*



Cacciatore, LC; Guerrero, NRV; Cochon, AC

AQUATIC TOXICOLOGY, 199 276-284; 10.1016/j.aquatox.2018.04.005 2018

(...) This study aimed to (1) assess the inhibitory effects of carbaryl on B-esterase activity in soft tissues and hemolymph of *Planorbarius corneus*; (2) establish whether binary mixtures of carbaryl and azinphos-methyl depart or not from a model of concentration addition on the inhibition of cholinesterase activity; (3) determine the bioconcentration and elimination of the pesticides. (...) These results suggest that exposure of *Planorbarius comeus* (...) do not change the toxicokinetic parameters of the parent compounds.

Accès au document

The impact of pesticides on the macroinvertebrate community in the water channels of the Rio Negro and Neuquen Valley, North Patagonia (Argentina)

Macchi, P; Loewy, RM; Lares, B; Latini, L; Monza,

ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25 (11):10668-10678; SI 10.1007/s11356-018-1330-x 2018

(...) We conclude that macroinvertebrate assemblages in drainage channels were highly affected by chlorpyrifos levels.

Accès au document

Glyphosate toxicity for animals

Gill, JPK; Sethi, N; Mohan, A; Datta, S; Girdhar, M

ENVIRONMENTAL CHEMISTRY LETTERS, 16 (2):401-426; 10.1007/s10311-017-0689-0 2018

(...) We review toxicological effects of glyphosate and metabolites on organisms of the kingdom animalia, both unicellular and multicellular organisms. (...) Toxicological effects like genotoxicity, cytotoxicity, nuclear aberration, hormonal disruption, chromosomal aberrations and DNA damage have also been observed in higher vertebrates like humans.

Accès au document

Pesticides Could Alter Amphibian Skin Microbiomes and the Effects of *Batrachochytrium dendrobatidis*

frontiers in Microbiology

Mccoy, KA; Peralta, AL

FRONTIERS IN MICROBIOLOGY, 9 10.3389/fmicb.2018.00748 2018

Accès au document

Seasonal sensitivity of *Gammarus pulex* towards the pyrethroid cypermethrin

Dalhoff, K; Gottardi, M; Rinnan, A; Rasmussen, JJ; Cedergreen, N

CHEMOSPHERE, 200 632-640; 10.1016/j.chemosphere.2018.02.153 2018

(...) the crustacean *Gammarus pulex* was collected once a month for 16 months and acclimated to 10 degrees C for four days before being exposed to a 90 min pulse of cypermethrin. In vitro cytochrome P450 activity, total lipid content, total protein content, and dry weight were measured (...). We suggest prolonged acclimation times of sampled macroinvertebrates to constant laboratory conditions in order to even out possible seasonal differences in sensitivity.

Accès au document

Meta-Analysis of Fish Early Life Stage Tests-Association of Toxic Ratios and Acute-to-Chronic Ratios with Modes of Action

Scholz, S; Schreiber, R; Armitage, J; Mayer, P; Escher, BI; Lidzba, A; Leonard, M; Altenburger, R

ENVIRONMENTAL TOXICOLOGY AND CHEMISTRY, 37 (4):955-969; 10.1002/etc.4090 2018

(...) To analyze whether certain modes of action are related to high toxic ratios (i.e., ratios between baseline toxicity and experimental effect) and/or acute-to-chronic ratios (ACRs) in the fish ELS test, effect concentrations (ECs) for 183 compounds were extracted from the US Environmental Protection Agency's ecotoxicity database. (...) endpoints targeted to the modes of action of compounds with enhanced toxic ratios or ACRs could be used to trigger fish ELS tests or even replace these tests.

Accès au document

Response of the Mayfly (*Cloeon dipterum*) to Chronic Exposure to Thiamethoxam in Outdoor Mesocosms

Pickford, DB; Finnegan, MC; Baxter, LR; Bohmer, W; Hanson, ML; Stegger, P; Hommen, U; Hoekstra, PF; Hamer, M

ENVIRONMENTAL TOXICOLOGY AND CHEMISTRY, 37 (4):1040-1050; 10.1002/etc.4028 2018

(...) To address the uncertainty associated with possible impacts from environmental exposures, a chronic (35-d) outdoor mesocosm study with a formulated product containing thiamethoxam was conducted. (...) these results indicate that populations of *C. dipterum* and similarly sensitive aquatic insects are unlikely to be significantly impacted by thiamethoxam exposure in natural systems represented by the conditions in our study.

Accès au document

ERA / Publications scientifiques Méthodes et pesticides

Lower tier toxicity risk assessment of agriculture pesticides detected on the Rio Madre de Dios watershed, Costa Rica

Arias-Andres, M; Ramo, R; Torres, FM; Ugalde, R; Grandas, L; Ruepert, C; Castillo, LE; Van den Brink, PJ; Gunnarsson, JS

ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25 (14):13312-13321; SI 10.1007/s11356-016-7875-7 2018

(...) We performed a first tier risk assessment of the maximum measured concentrations of 32 pesticides detected over 4 years in the River Madre de Dios (RMD) and

its coastal lagoon on the Caribbean coast of Costa Rica. Species sensitivity distributions (SSDs) were plotted in order to derive HC5 values for each pesticide. (...) Overall, these results show a possible toxicity of detected pesticides to aquatic organisms and provide a comparison of Costa Rican national guidelines with more refined methods for risk assessment based on SSDs.(...)

Accès au document

A framework for linking population model development with ecological risk assessment objectives

Raimondo, S; Etterson, M; Pollesch, N; Garber, K; Kanarek, A; Lehmann, W; Awkerman, J

INTEGRATED ENVIRONMENTAL ASSESSMENT AND MANAGEMENT, 14 (3):369-380

(...) We propose a framework for developing and applying population models in regulatory decision making that focuses on trade-offs of generality, realism, and precision for both ERAs and models. (...) The proposed framework will assist risk assessors and managers to identify models of appropriate complexity and to understand the utility and limitations of a model's output and associated uncertainty in the context of their assessment goals.

Accès au document

Development and validation of a physiology based model for the prediction of pharmacokinetics/toxicokinetics in rabbits

Mavroudis, PD; Hermes, HE; Teutonico, D; Preuss, TG

PLOS ONE, 13 (3): 10.1371/journal.pone.0194294 2018

(...) In the present work, a rabbit PBPK/TK model is developed and evaluated with data available from the literature.(...) This result indicates a good predictive capacity of the model, which enables its use for risk assessment modelling and simulations.

Accès au document

A Standardized Tritrophic Small-Scale System (TriCosm) for the Assessment of Stressor-Induced Effects on Aquatic Community Dynamics

Riedl, V; Agatz, A; Benstead, R; Ashauer, R

ENVIRONMENTAL TOXICOLOGY AND CHEMISTRY, 37 (4):1051-1060; 10.1002/etc.4032 2018

(...) indirect effects on ecological interactions can only be detected in multispecies tests. (...) In the present study we describe the development of the TriCosm, a repeatable aquatic multispecies test with 3 trophic levels and increased statistical power. (...)

Accès au document

Boric acid as reference substance for ecotoxicity tests in tropical artificial soil

Niemeyer, JC; Carniel, LSC; de Santo, FB; Silva, M; Klauberg, O

ECOTOXICOLOGY, 27 (4):395-401; 10.1007/s10646-018-1915-7 2018

(...) Boric acid (BA) has been recommended as reference substance in some standardized tests in OECD soil, but no data are available for Tropical Artificial Soil (TAS). For this purpose, avoidance tests with *Eisenia andrei*, lethality tests with *E. andrei* and *Folsomia candida*, and reproduction tests with *E. andrei*, *Enchytraeus crypticus* and *F. candida* were carried out in TAS (5% organic matter), following ISO guidelines, and compared between two laboratories. (...)

Accès au document

ERA / Règlementation des pesticides

European Commission Pollinating insects: Commission proposes actions to stop their decline

The new **Communiqué de presse de la Communauté Européenne 01/06/2018**

Measures include a **new indicator to improve monitoring** and data, and better coordination of EU action across different sectors and policies to address the social and economic implications of the decline in pollinating insects.

The Commission is proposing:

- Measures to improve knowledge of pollinator decline, including the causes and consequences. An EU monitoring process for pollinators will provide quality data on the status and trends of pollinator species. The Commission is also proposing a list of habitats important to pollinating insects, and assessment of their condition based on reporting of Member States under the Habitats Directive. In addition, the **Commission is also proposing to launch a project to monitor the presence of pesticides in the environment.** Horizon 2020 will continue to promote research and innovation in this area.

-Measures to tackle the causes of the decline, such as action plans for the habitats …..For the full list of measures here.

Accès au document

Something from nothing? Ensuring the safety of chemical mixtures

Brochure de 2 pages publiée par le centre de recherche JCR en Mai 2018

The assessment and management of mixtures is only partly covered by current legislation, which focuses on single substances in isolated sectors.

Methodology to address mixture risks is available, yet many knowledge gaps need to be filled. In particular, real co-exposure patterns are mostly unknown. JRC is performing research on new strategies to assess the combination effects of chemicals.

Accès au document

Review of the 1st Watch List under the Water Framework Directive

EC report published: 2018-06-26

Corporate author: Directorate-General for Research and Innovation The surface water Watch List (WL) under the Water Framework Directive (WFD) is a mechanism for obtaining high-quality Union-wide monitoring data on potential water pollutants for the purpose of determining the risk they pose and thus whether Environmental Quality Standards (EQS) should be set for them at EU level. .. The main objectives of this report are:

- To present an overview of the data gathered during the 1st year of monitoring of the 1st WL
- To assess whether this WL dataset is sufficient to determine the risk posed by the WL substances
- To propose new substance(s) to be included in the second WL.

Accès au document

Regulation (EC) 1107/2009 on the placing of plant protection products on the market - EU Law and Publications

Rapport d'évaluation de la règlementation 2018-06-05.

Corporate author(s): Directorate-General for Parliamentary Research Services. 588 p. Regulation (EC) 1107/2009 lays down the main instruments for placing effective plant protection products (using pesticide substances) on the market that are safe for humans, animals and the environment, while at the same time ensuring effective functioning of the internal market and improved agricultural production. This European Implementation Assessment found that the above objectives, while largely relevant to real needs, are not being achieved in practice. In particular, implementation of the main instruments of the regulation – substance approval, plant protection products authorisation and enforcement of the regulatory decisions taken in the frame of the approvals and authorisations, is problematic, which also affect other related EU policies...

Accès au document

Authorisation processes of plant protection products from a scientific point of view

Scientific opinion 5. Brussels, 4 June 2018, 76p.

This scientific opinion responds to a request for scientific advice on how to render the current EU dual system for approval and authorisation of plant protection products (PPPs), more transparent, effective and efficient. PPPs are more commonly referred to as 'pesticides'. The advice takes the form of several recommendations. Although recognising that the EU has made significant progress in the effectiveness of its authorisation system for PPPs, the Group of Chief Scientific Advisors feels there is room for improvement regarding: clarity on protection goals and their communication; structural aspects of the system concerning who does what and when; impacts of widespread and prophylactic use of PPPs on the environment; post-market vigilance; sharing of knowledge and the capacity of expertise; availability and quality of pre-market studies; ways to address hazards, risks, costs and benefits; and preventing the misuse of science in value-based disagreements.

Accès au document

Loi Agriculture et alimentation : les sénateurs raffolent des pesticides

Que choisir. 15/06/2018

… Les membres de la Commission des affaires économiques du Sénat n'ont rien trouvé de mieux à faire que s'obstiner à démolir les quelques avancées environnementales incontestables du projet de loi Agriculture et alimentation adopté fin mai par l'Assemblée nationale.

Alors que son article 15 exigeait enfin la séparation des activités de vente et de conseil des produits phytosanitaires – une mesure réclamée depuis longtemps et indispensable pour faire baisser l'utilisation des pesticides en agriculture – ils ont tout simplement réécrit l'article. Du coup, rien ne change : les coopératives et le négoce agricole vont continuer à assurer tout à la fois les activités de vente et celles de « conseil spécifique », autrement dit celui qui détermine l'acte d'achat de pesticides par les agriculteurs !

Autre démantèlement, celui de l'article 14. Celui voté par l'Assemblée nationale encadrait fortement la vente de produits phytosanitaires... Les sénateurs ont tout simplement supprimé l'article 14...

Accès au document

Néonicotinoïdes : les alternatives existent mais ne sont pas toutes immédiatement opérationnelles

Actu environnement présente l'avis de l'ANSES (3 tomes)

... "Pour une majorité des usages des produits phytopharmaceutiques à base de néonicotinoïdes, des alternatives (chimiques et non chimiques) suffisamment efficaces, et opérationnelles ont pu être identifiées", souligne l'Agence de sécurité sanitaire (Anses), dans son avis final publié le 30 mai. "En revanche, il n'a pas été possible d'identifier des substances ou familles de substances chimiques qui présenteraient de façon globale un profil de risque moins défavorable que les néonicotinoïdes", ajoute-t-elle. Sur les 130 usages des néonicotinoïdes étudiés, six ne rencontrent aucune alternative suffisamment efficace et huit reposent sur une alternative chimique, appartenant à la même famille de substance, les pyréthrinoïdes... Cet avis final est essentiel pour la mise en œuvre de l'interdiction des néonicotinoïdes, à compter du 1er septembre 2018...

Accès au document

Pourquoi les agriculteurs ont tant de mal à lâcher les phyto

Actu-environnement 07/06/2018 rend compte de la table ronde organisée au Sénat dont la video est en ligne sur le site du sénat

... Une table ronde, réunissant l'Anses, l'Inra, les ministères de l'Agriculture et de la Transition écologique, et les Chambres d'agriculture, était organisée mercredi 6 juin au Sénat sur cette question.

La réduction des phyto ne fait plus débat. "Notre modèle agricole est extrêmement dépendant aux produits phytosanitaires… Mais le système atteint ses limites... résume Patrick Dehaumont, directeur général de l'alimentation au ministère de l'Agriculture et de l'Alimentation.

La cancérogénéité du glyphosate n'est pas la question

... D'ailleurs, si elle assume sa "différence d'appréciation" avec le Centre international de la recherche sur le cancer (Circ) sur la cancérogénicité du glyphosate, l'Anses n'écarte pas d'autres risques. Elle planche actuellement sur la toxicité de la substance, et devrait présenter ses conclusions à l'automne..." Il faut garder une palette de substances actives correctives dont nous pourrions avoir besoin, y compris en termes de santé publique (par exemple, les insecticides pour lutter contre le chikungunya)", estime le directeur de l'agence...

Accès au document

Produits phytos : audit en Alsace et en Bretagne par un service de l'UE

Agrisalon 07/06/2018

Une mission d'audit a été menée dans le Grand Est et en Bretagne par la Direction générale santé et sécurité alimentaire de la Commission européenne sur la **question des produits phytosanitaires**...

Il s'agit d'évaluer les mesures prises par l'Etat afin de mettre en œuvre la directive de la Commission « **sur une utilisation des pesticides compatible avec le développement durable** (Directive 2009/128/CE du 21 octobre 2009) », selon un communiqué de la mission d'audit.

« En France, la mission d'audit étudie particulièrement les mesures prises dans le cadre des plans **Ecophyto** … « L'audit a pour objectif d'évaluer les systèmes de contrôle officiels en place....

« C'est la première fois au niveau européen qu'une commission d'audit est missionnée.. a souligné René Louail, du **comité de soutien aux victimes de pesticides**...

Accès au document

Le Ministère de l'agriculture reçoit les apiculteurs impactés par les mortalités d'abeilles

Communiqué de presse du Ministère 07/06/2018

Rappel : l'UNAF qui demande l'interdiction des néonicotinoïdes avait organisé une journée d'action des apiculteurs ce 07 Juin.

Le Ministre de l'agriculture et de l'alimentation … a demandé à son Cabinet de recevoir une délégation d'apiculteurs menés par l'Union nationale de l'apiculture française (UNAF) et la Fédération française des apiculteurs professionnels (FFAP) afin d'examiner ces phénomènes de mortalités et leurs impacts pour les apiculteurs.

…. le Ministre a mis en place fin 2017 un dispositif permettant aux apiculteurs de déclarer leurs pertes…

Les services du ministère de l'agriculture vont établir un **état des lieux précis** des mortalités, sur l'ensemble du territoire... Ce recensement … permettra d'expertiser les dispositifs d'accompagnement les plus adaptés au regard de la situation des exploitants. … le projet de loi pour l'équilibre des relations commerciales dans le secteur agricole et alimentaire et une alimentation saine et durable prévoit un **élargissement de l'interdiction de l'usage des néonicotinoïdes aux produits fonctionnant avec un mode d'action identique.**

Enfin, le gouvernement va saisir l'ANSES très prochainement pour analyser les moyens de renforcer le dispositif réglementaire de protection des abeilles et autres insectes pollinisateurs…

Accès au document

ERA / Avis et expertises EFSA ANSES OCDE

ISO 20244:2018 - Soil quality - Screening method for water content - Determination by refractometry

Publication date: 2018-06- **Edition:** 1 **Number of pages:** 6 - Technical Committee: ISO/TC 190/SC 3 Chemical and physical characterization

This document specifies a method for rapid determination of water content in soils. The method is based on refractive index measurement of a sucrose solution after it is mixed with a soil sample.

It is applicable to the determination of water content in geological or geotechnical research as well as geotechnical engineering. In addition, it can be used for commercial work in a variety of fields, e.g. agriculture and civil engineering.

Accès au document

ISO 11260:2018 - Soil quality - Determination of effective cation exchange capacity and base saturation level using barium chloride solution

Publication date: 2018-05- **Edition:** 2 **Number of pages:** 12- Technical Committee: ISO/TC 190/SC 3 Chemical and physical characterization

This document specifies a method for the determination of the cation exchange capacity (CEC) at the pH of the soil and for the determination of the content of exchangeable sodium, potassium, calcium and magnesium in soil.

This document is applicable to all types of air-dried soil samples. ISO 11464 can be used for pre-treatment.

Accès au document

ISO/TS 16751:2018 - Soil quality - Environmental availability of non-polar organic compounds -- Determination of the potential bioavailable fraction and the non-bioavailable fraction

Date de publication : 2018-06- **Edition :** 2 **Nombre de pages :** 36.- Comité technique : ISO/TC 190/SC 4 Caractérisation biologique

ISO/TS 16751:2018 specifies an extraction method to determine the bioavailable (potential and environmental available) fraction and the non-bioavailable fraction of a contaminant in soil using a "receiver phase" for an organic contaminant with strong sorbing or complexing properties, for example, Tenax®[1] or cyclodextrin, respectively.

Accès au document

ISO 15952:2018 - Qualité du sol - Effets des polluants vis-à-vis des escargots juvéniles (Helicidae)

Norme publiée en Juin 2018- **Nombre de pages :** 36 Comité technique : ISO/TC 190/SC4 Caractérisation biologique

Le document s'applique à une méthode semi-statique pour la détermination des effets de contaminants sur la croissance et la survie d'escargots juvéniles, généralement *Helix aspersa aspersa* Müller. Les animaux sont exposés par les voies cutanée et digestive à un substrat d'essai (sol artificiel ou naturel selon l'objectif de l'étude) auquel sont ajoutées des quantités définies:

Accès au document

ISO 23611-1:2018 - Qualité du sol - Prélèvement des invertébrés du sol

Partie 1: Tri manuel et extraction des vers de terre norme ISO publiée en Mai 2018

Le document spécifie une méthode pour le prélèvement et la manipulation de vers de terre sur le terrain, comme prérequis à l'utilisation de ces animaux en tant que bio-indicateurs.

Accès au document

OCDE - Guidance Document on Residues in Rotational Crops Series on Pesticides No° 97

OEDC Series on Pesticides **No. 97** ENV/JM/MONO(2018)9 **22-May-2018**

Accès au document

OCDE - Chemical Safety and Biosavety News N° 37

July 2018 Ce numéro compte 50 pages

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4. Notification & Reporting Tools 12

Accès au document

OECD - Essai n° 319B

Essai mis en ligne le 26/06/2018

Détermination de la clairance intrinsèque in vitro sur la fraction subcellulaire S9 du foie de truite arc-en-ciel (RT-S9) https://doi.org/10.1787/20745834

Voir aussi :Test No. 319A: Determination of in vitro intrinsic clearance using cryopreserved rainbow trout hepatocytes (RT-HEP)

Accès au document

OECD - The costs and benefits of regulating chemicals

L'OCDE présente le projet SACAME stands for the Socio-economic Analysis of Chemicals by Allowing a better quantification and monetisation of Morbidity and Environmental impacts.

Measuring the economic value of the effects of chemicals on ecological systems and human health, Anna Alberini

chemical Risk Assessment and Translation to Socio-Economic Assessments, Weihsueh A

Accès au document

EFSA - Document d'orientation sur les nanotechnologies dans l'alimentation

Communiqué EFSA 04/07/2018

L'EFSA a publié un nouveau document d'orientation relatif à l'évaluation des dossiers portant sur des applications en nanosciences ou nanotechnologies. Le document fournit des recommandations pratiques sur les types de tests requis et les méthodes de test qui peuvent être appliquées.

Guidance on the human and animal risk assessment of the application of nanoscience and nanotechnologies in agri/food/feed

... Il couvre des domaines tels que les aliments nouveaux, les matériaux en contact avec les aliments, les additifs destinés à l'alimentation humaine ou animale ou encore **les pesticides.** Il s'adresse à toutes les parties intéressées, en particulier les évaluateurs du risque, les gestionnaires du risque et les pétitionnaires.

Le document d'orientation entre à présent dans une phase pilote, sa finalisation étant prévue fin 2019…

Accès au document

EFSA - Reporting data on pesticide residues in food and feed according to Regulation (EC) No 396/2005

Avis / Guidance de f'EFSA du 04 Mai 2018 mais en ligne le 28 Juin published in the EFSA Journal

This document is a consolidated version of the past 3 years' guidance defining the appropriate SSD codes to describe the samples and the analytical results and it gives directions for the reporting of the pesticide residues monitoring data starting with the data generated in 2017 onwards. These provisions take into account the experience of both the previous reporting seasons and the new legislation applicable in 2017.

Accès au document

EFSA - Microplastics and nanoplastics in food and seafood

Avis EFSA adopté en mai et mis en ligne le 23 Juin 2018

... Toxicity and toxicokinetic data are lacking for both microplastics and nanoplastics for a **human risk assessment.** It is recommended that analytical methods should be further developed for microplastics and nanoplastics and standardised, in order to assess their presence, identity and to quantify their amount in food. Furthermore, quality assurance should be in place and demonstrated. For microplastics and nanoplastics, occurrence data in food, including effects of food processing, in particular, for the smaller sized particles …should be

generated. Research on the toxicokinetics and toxicit…, are needed as is research on the degradation of microplastics and potential formation of nanoplastics in the human GI tract.

Accès au document

EFSA - Bee health: data partnership a 'milestone' in European campaign

EFSA site 29/06/2018

Ce communiqué de presse présente la manifestation organisée par le Parlement Européen Bee Week **et met en avant les proposition de l'EFSA**

Accès au document

EGSA - Terms of reference for an EU Bee Partnership

EFSA technical report May 2018 Article , PDF

.... This document describes the terms of reference developed by and for this EU Bee Partnership DG. The objective of the EU Bee Partnership is to improve data collection, management, sharing and communications **to achieve a holistic approach to the assessment of bee health in Europe and beyond.** It will consider honey bees, with the potential for subsequent expansion to include bumble bees and solitary bees. Six broad themes of potential work were identified, including an inventory of data on the health of honey bees, bumble bees and solitary bees. During the first 12 months, the Partnership will focus on one or more of these six themes, using a 'proof of concept' approach...

Accès au document

EFSA -Guidance on identifying endocrine disruptors published

EFSA 07/06/2018 and the European Chemicals Agency (ECHA) have published their guidance on how to identify substances with endocrine disrupting properties in pesticides and biocides...

The guidance will be used for the assessment of biocides from today (7 June). For pesticides, it will be used in the assessments of those substances for which a decision is scheduled on or **after 10 November 2018**. This is because the criteria for identifying endocrine disruptors in pesticides were agreed later than those for biocides.

Guidance

Accès au document

L'EFSA évalue les utilisations de néonicotinoïdes en cas d'urgence

EFSA evaluates emergency uses: L'EFSA a examiné le fondement scientifique des autorisations d'urgence accordées à des pesticides néonicotinoïdes dans sept États membres de l'UE en 2017.

Dans son rapport, l'EFSA a évalué, pays par pays, si d'autres pesticides auraient pu remplacer les produits néonicotinoïdes et analysé la disponibilité de solutions de remplacement non insecticides.

... En 2017, l'EFSA a développé une méthodologie permettant d'évaluer les demandes d'utilisation d'insecticides lorsqu'il existe un danger sérieux pour la santé des plantes. La Commission européenne a par conséquent demandé à l'EFSA d'appliquer cette méthodologie pour évaluer les autorisations exceptionnelles de pesticides néonicotinoïdes accordées en 2017 par la Bulgarie, l'Estonie, la Finlande, la Hongrie, la Lettonie, la Lituanie et la Roumanie.

Les rapports se penchent uniquement sur la justification apportée pour délivrer les autorisations d'urgence…

En mai 2018, après approbation par les États membres, la Commission européenne a appliqué des restrictions supplémentaires à l'utilisation de néonicotinoïdes sur la base d'une nouvelle évaluation des risques menée par l'EFSA

- Evaluation of the emergency authorisations granted by Bulgaria for plant protection products containing clothianidin, imidacloprid or thiamethoxam
    - by Estonia
    - by Finland
    - by Hungary
    - by Latvia
    - by Lithuania
    - by Romania

Accès au document

EFSA - Consultation EFSA Chemical mixtures – have your say on draft approach

Site EFSA 26/06/2018

EFSA has launched a public consultation on its draft guidance on harmonised methodologies for assessing combined exposure to multiple chemicals. A second related consultation concerns how EFSA proposes to address the **genotoxicity of chemical mixtures…**

The proposed guidance document and related statement provide a practical framework to help assess the combined toxicities of chemicals in different areas of scientific assessments relevant to EFSA, such as pesticides, contaminants and food additives. EFSA used feedback from a previous public consultation held in 2016 to define the scope of this proposed framework.

- Public consultation: Draft guidance on harmonised methodologies for human health, animal health and ecological risk assessment of combined exposure to multiple chemicals

- Public consultation: Draft statement on genotoxicity assessment of chemical mixture

Accès au document

ANSES - Lancement de la campagne exploratoire nationale de mesure des résidus de pesticides dans l'air

Site de l'ANSES 25/06/2018

L'Anses, l'Ineris en tant que membre du laboratoire central de surveillance de la qualité de l'air (LCSQA) et le réseau des Associations Agréées pour la Surveillance de la Qualité de l'Air (AASQA) fédéré par ATMO France lancent ce jour une campagne de mesure des résidus de pesticides dans l'air. Cette première campagne nationale vise à améliorer les connaissances sur les **pesticides** présents dans l'air ambiant et ainsi mieux connaître **l'exposition de la population** sur le territoire national. Cette campagne permettra à terme de définir une stratégie de surveillance des pesticides dans l'air.

La mise en place d'une surveillance des résidus de pesticides dans l'air au niveau national est une priorité définie dans le cadre du **plan d'action gouvernemental sur les produits phytopharmaceutiques et du plan national de réduction des émissions de polluants atmosphériques (PREPA) 2017-2021.**

Cette campagne s'appuie sur le rapport d'expertise ANSES publié en octobre 2017..." Proposition de modalités pour une surveillance des pesticides dans l'air ambiant. 306 p."... un partenariat a été mis en place entre l'Anses, l'Ineris et la Fédération ATMO France pour la définition et la réalisation de cette campagne. Celle-ci est conduite dans le cadre du dispositif de **phytopharmacovigilance** mis en œuvre par l'Anses.

80 substances actives analysées sur 50 sites de prélèvements

… Les substances ciblées entrent dans la composition des produits phytopharmaceutiques ainsi que de certains biocides, médicaments vétérinaires et antiparasitaires à usage humain...

Accès au document

ERA / Règlementation des pesticides / Textes officiels

Plant protection products authorisation: Committee debate with national authorities

Le parlement européen a mis en place une ***Commission spéciale sur la procédure d'autorisation des pesticides par*** l'Union. Elle s'est réunie le 26 Avril 2018. At its 2nd meeting, on 26 April 2018, the Special Committee on the Union's authorisation procedure for pesticides held an exchange of views with representatives of the competent authorities of France (ANSES), Sweden (KEMI) and the United Kingdom (HSE).

- Draft programme
- Questions to participants
- Answers KEMI
- Answers ANSES
- Answers HSE

Accès au document

European Commission - Insectes pollinisateurs: propositions de la Commission pour enrayer leur déclin

Communiqué de presse UE : COM(2018) 395 final du 1.6.2018 : 16 pages

A noter : pas de mention de l'interdiction des insecticides néonicotinoïdes ou du glyphosate…

Les nouvelles mesures prévoient un nouvel indicateur pour améliorer la surveillance et les données, et une meilleure coordination de l'action de l'UE entre différents secteurs et domaines politiques pour remédier aux conséquences sociales et économiques de la diminution des insectes pollinisateurs.

PRIORITÉ N° I: Améliorer les connaissances sur le déclin des pollinisateurs, ses causes et ses conséquences

PRIORITÉ N° II: Lutter contre les causes du déclin des pollinisateurs dont : Perte d'habitats et page 5 : L'utilisation de pesticides

Extrait : ... En 2013, l'Autorité européenne de sécurité des aliments (EFSA) a élaboré un document d'orientation pour renforcer l'évaluation des risques actuelle en incluant, entre autres, les effets chroniques et les espèces d'abeilles sauvages au nombre des éléments à traiter dans l'évaluation. Cependant, ce document d'orientation n'a pas encore été approuvé par les États membres; d'autres actions seront donc nécessaires pour assurer sa mise en œuvre.

En 2013, la Commission a restreint l'utilisation de trois pesticides néonicotinoïdes après qu'il a été démontré qu'ils présentaient des risques élevés pour les abeilles. En février 2018, l'examen des éléments probants par l'EFSA a confirmé ces risques.

Comme cela est indiqué dans le règlement (CE) n° 1107/200927, il est important de prendre des mesures adéquates pour **atténuer ces risques**.

La proposition de la Commission de restreindre davantage l'utilisation de trois pesticides néonicotinoïdes a été approuvée par les États membres le 27 avril 201831.

En outre, la directive 2009/128/CE32 prévoit une série d'actions visant à favoriser une **utilisation des pesticides approuvés compatible avec le développement durable**...

Accès au document

Vie du réseau Ecotox

Appel à projets de recherche – Biodiversité des sols et agro-écologie

L'agence française pour la biodiversité (AFB) lance le 1er juin 2018 un appel à projets de recherche (APR) pour soutenir des projets qui étudieront des pratiques agro-écologiques et itinéraires techniques favorables à la biodiversité des sols et à ses fonctions.

Par cet appel à projets, l'AFB souhaite soutenir les acteurs de la recherche investis sur les questions de l'agro-écologie et de la **préservation des sols,** dans un contexte de transition écologique.

Les équipes pourront proposer des projets de recherche qui visent à étudier les pratiques agro-écologiques et/ou itinéraires techniques favorables à la biodiversité des sols et à ses fonctions afin de comprendre leurs interactions et d'évaluer leur dynamique.

Deux types de travaux seront privilégiés :

-des états des lieux de connaissances opérationnelles sur les pratiques agro-écologiques couramment mises en œuvre sur le territoire ;
-des expérimentations au sein de réseau d'exploitations agricoles sur les pratiques innovantes, et ceci dans différents contextes agro-pédo-climatiques en France (Métropole comme Outre-mer)…

Accès au document

Offres de contrats et appels à candidature diffusées sur le site ECOTOX

Appel a candidature pour thèse en écotoxicologie aquatique : DICL'EAU : Evaluation des effets du diclofénac sur un mollusque gastéropode par des approches transcriptomiques, métabolomiques et macroscopiques couplées.
Date limite de candidature : 18 juillet, début : novembre 2018

Offre de contrat post doc : thesis on modeling-projection in agro-ecosystem
Research topic: understand long-term agro-ecosystem resilience and sustainability in response to land use practices and global change
CDD basé à Versailles : chargé d'inventaire des données mobilisables pour la phytopharmacovigilance

Offre de thèse : Petites bêtes mais grands effets: Comment les collemboles influencent ils la décomposition de la matière organique?

Offre de thèse au LIEC : Évaluer les effets combinés de multiples facteurs de stress (ruissellement agricole et changement climatique) sur les communautés aquatiques

Publications des membres du réseau Ecotox

Genotoxic and Cytotoxic Effects on the Immune Cells of the Freshwater Bivalve Dreissena polymorpha Exposed to the Environmental Neurotoxin BMAA

Authors: Lepoutre, A; Milliote, N; Bonnard, M; Palos-Ladeiro, M; Rioult, D; Bonnard, I; Bastien, F; Faassen, E; Geffard, A; Lance, E

Source: TOXINS, 10 (3): 10.3390/toxins10030106 2018

Abstract: environmental neurotoxin beta-N-Methylamino-L-alanine (BMAA) has been pointed out to be involved in human neurodegenerative diseases. This molecule is known to be bioaccumulated by bivalves. However, little data about its toxic effects on freshwater mussels is available, particularly on the hemolymphatic compartment and its hemocyte cells involved in various physiological processes such as immune defenses, digestion and excretion, tissue repair, and shell production. Here we exposed *Dreissena polymorpha* to dissolved BMAA, at the environmental concentration of 7.5 mu g of/mussel/3 days, during 21 days followed by 14 days of depuration in clear water, with the objective of assessing the BMAA presence in the hemolymphatic compartment, as well as the impact of the hemocyte cells in terms of potential cytotoxicity, immunotoxicity, and genotoxiciy. Data showed that hemocytes were in contact with BMAA. The presence of BMAA in hemolymph did not induce significant effect on hemocytes phagocytosis activity. However, significant DNA damage on hemocytes occurred during the first week (days 3 and 8) of BMAA exposure, followed by an increase of hemocyte mortality after 2 weeks of exposure. Those effects might be an indirect consequence of the BMAA-induced oxidative stress in cells. However, DNA strand breaks and mortality did not persist during the entire exposure, despite the BMAA persistence in the hemolymph, suggesting potential induction of some DNA-repair mechanisms.

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Accès au document

Environmental and human health issues related to pesticides: from usage and environmental fate to impact

Authors: Budzinski, H; Couderchet, M

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25 (15):14277-14279; SI 10.1007/s11356-018-1738-3 2018

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Accès au document

Carotenoid distribution in wild Japanese tree frogs (*Hyla japonica*) exposed to ionizing radiation in Fukushima

Authors: Giraudeau, M; Bonzom, JM; Ducatez, S; Beaugelin-Seiller, K; Deviche, P; Lengagne, T; Cavalie, I; Camilleri, V; Adam-Guillermin, C; McGraw, KJ

Source: SCIENTIFIC REPORTS, 8 10.1038/s41598-018-25495-5 2018

Abstract: The nuclear accident in the Fukushima prefecture released a large amount of artificial radionuclides that might have short-and long-term biological effects on wildlife. Ionizing radiation can be a harmful source of reactive oxygen species, and previous studies have already shown reduced fitness effects in exposed animals in Chernobyl. Due to their potential health benefits, carotenoid pigments might be used by animals to limit detrimental effects of ionizing radiation exposure. Here, we examined concentrations of carotenoids in blood (i.e. a snapshot of levels in circulation), liver (endogenous carotenoid reserves), and the vocal sac skin (sexual signal) in relation to the total radiation dose rates absorbed by individual (TDR from 0.2 to 34 mu Gy/h) Japanese tree frogs (*Hyla japonica*). We found high within-site variability of TDRs, but no significant effects of the TDR on tissue carotenoid levels, suggesting that carotenoid distribution in amphibians might be less sensitive to ionizing radiation exposure than in other organisms or that the potential deleterious effects of radiation exposure might be less significant or more difficult to detect in Fukushima than in Chernobyl due to, among other things, differences in the abundance and mixture of each radionuclide.

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Accès au document

Source of Ca, Cd, Cu, Fe, K, Mg, Mn, Mo and Zn in grains of sunflower (*Helianthus annuus*) grown in nutrient solution: root uptake or remobilization from vegetative organs?

Authors: Linero, O; Cornu, JY; de Diego, A; Bussiere, S; Coriou, C; Thunot, S; Robert, T; Nguyen, C

Source: PLANT AND SOIL, 424 (1-2):435-450; SI 10.1007/s11104-017-3552-y 2018

Abstract: This study investigated the possible source organs delivering several trace elements to seeds (root uptake versus net remobilization), by studying changes in biomass and element contents in the plant organs. Sunflowers were grown in a greenhouse using a nutrient solution enriched with Cd. Four samplings were performed from the early flowering to the seeds physiological maturity. The low grain Ca indicated that phloem was likely the main route for transporting the elements to seeds. Excluding roots, the mass balance of the elements indicated the following contribution of the net remobilization to the total quantities in seeds at maturity: Mg = 50%, Cd = 14%, Cu = 35%, Fe = 29%, Mn = 19%, Zn = 12%. Source organs were mainly the receptacle and the stem. No significant net remobilization was observed for Ca, K and Mo. The amount of trace elements accumulated in vegetative parts can be redistributed to seeds in an extent that depended on the element. Due to the important contribution of root uptake to the content in seeds at maturity, the availability of elements in soil during the reproductive stages is an important point to consider.

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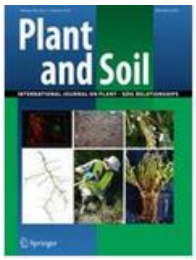
Accès au document

Contribution of remobilization to the loading of cadmium in durum wheat grains: impact of post-anthesis nitrogen supply



Authors: Yan, BF; Nguyen, C; Pokrovsky, OS; Candaudap, F; Coriou, C; Bussiere, S; Robert, T; Cornu, JY

Source: PLANT AND SOIL, 424 (1-2):591-606; SI 10.1007/s11104-018-3560-6 2018

Abstract: This study focuses on quantifying the contribution of remobilization to the amount of cadmium accumulated in durum wheat grains. The impact of post-anthesis N supply was tested in two cultivars that differ in their shoot biomass partitioning. Two French durum wheat cultivars were grown hydroponically and exposed to 100 nM Cd. After anthesis, the plants were fed with a solution enriched in the stable isotope Cd-111 to trace the Cd newly absorbed, and subjected or not to nitrogen deprivation. Plants were sampled at anthesis and grain maturity to assess the post-anthesis fluxes of Cd and N among organs. Cd remobilized from pre-anthesis stores contributed to more than half of the Cd accumulated in mature grains. Cd was mainly remobilized from stem and poorly remobilized from leaves. Stopping N supply during grain filling enhanced N remobilization but had no impact on post-anthesis uptake and remobilization of Cd, and thereby, on Cd concentration in grains. No difference was observed between the two cultivars in the contribution of Cd remobilization and its dependence toward post-anthesis N supply. Cd remobilization significantly contributes to the accumulation of Cd in durum wheat grains. Cd remobilization is not tightly linked with N remobilization and behaves like a senescent-independent process in durum wheat.

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Accès au document

River biofilm community changes related to pharmaceutical loads emitted by a wastewater treatment plant

Authors: Chonova, T; Labanowski, J; Cournoyer, B; Chardon, C; Keck, F; Laurent, E; Mondamert, L; Vasselon, V; Wiest, L; Bouchez, A

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25 (10):9254-9264; SI 10.1007/s11356-017-0024-0 2018

Abstract: Wastewater treatment plants (WWTP) are the main sources of a broad spectrum of pharmaceuticals found in freshwater ecosystems. These pollutants raise environmental health concerns because of their highly bioactive nature and their chronic releases. Despite this, pharmaceuticals' effects on aquatic environments are poorly defined. Biofilms represent a major part of the microbial life in rivers and streams. They can drive key metabolic cycles and their organizations reflect exposures to changing chemical, physical, and biological constraints. This study estimated the concentrations, over a 3-year period, of ten pharmaceuticals and five nutrients in a river contaminated by a conventional WWTP fed by urban and hospital wastewaters. Variations in these concentrations were related to biofilm bacterial community dynamics. Rock biofilms had developed over defined periods and were harvested at four locations in the river from the up- and downstream WWTP discharge point. Pharmaceuticals were found in all locations in concentrations ranging from not being detected to 192 ng L^{-1}. Despite the high dilution factor of the WWTP effluents by the receiving river, pharmaceuticals were found more concentrated downstream than upstream the WWTP. Shifts in bacterial community structures linked to the environmental emission of pharmaceuticals were superior to seasonal community changes. A community structure from a site located downstream but close to the WWTP was more strongly associated with high pharmaceutical loads and different from those of biofilm samples from the WWTP upstream or far downstream sites. These latter sites were more strongly associated with high nutrient contents. Low environmental concentrations of pharmaceuticals can thus be transferred from WWTP effluents to a connected stream and induce bacterial aquatic community changes over time.

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Accès au document

The SIPIBEL project: treatment of hospital and urban wastewater in a conventional urban wastewater treatment plant

Authors: Chonova, T; Lecomte, V; Bertrand-Krajewski, JL; Bouchez, A; Labanowski, J; Dagot, C; Levi, Y; Perrodin, Y; Wiest, L; Gonzalez-Ospina, A; Cournoyer, B; Sebastian, C

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25 (10):9197-9206; SI 10.1007/s11356-017-9302-0 2018

Abstract: Hospital wastewater (HWW) receives increasing attention because of its specific composition and higher concentrations of some micropollutants. Better knowledge of HWW is needed in order to improve management strategies and to ensure the preservation of wastewater treatment efficiency and freshwater ecosystems. This context pushed forward the development of a pilot study site named Site Pilote de Bellecombe (SIPIBEL), which collects and treats HWW separately from urban wastewater, applying the same conventional treatment process. This particular configuration offers the opportunity for various scientific investigations. It enables to compare hospital and urban wastewater, the efficiency of the two parallel treatment lines, and the composition of the resulting hospital and urban treated effluents, as well as the evaluation of their effects on the environment. The study site takes into account environmental, economic, and social issues...

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Accès au document

Influence of metal contamination in soil on metabolic profiles of *Miscanthus x giganteus* belowground parts and associated bacterial communities

Authors: Pham, HN; Pham, PA; Nguyen, TTH; Meiffren, G; Brothier, E; Lamy, I; Michalet, S; Dijoux-Franca, MG; Nazaret, S

Source: APPLIED SOIL ECOLOGY, 125 10.1016/j.apsoil.2018.01.004 2018

Abstract: Miscanthus x giganteus is well known for its ability to grow on metal contaminated soils. However, little is known concerning its metabolic changes including secondary metabolites under metal pressure. These changes might impact the diversity and function of associated bacterial populations. Thus, this study focused on evaluating the modifications of secondary metabolism production of *M. x giganteus* belowground parts (i.e. roots and rhizomes), and of rhizosphere bacterial communities under diverse contaminated conditions. Samples of *M. x giganteus* roots and rhizomes were collected from 3 sites exhibiting a gradient of metal pollution and extracted with MeOH:H_2O. Secondary metabolic profiles of root and rhizome extracts were analyzed by UHPLC/DAD/ESI-QTOF. The structure and diversity of rhizosphere communities were studied using high-throughput sequencing. The results showed out the modification of the secondary metabolic profiles of *M. x giganteus* belowground parts, when they are grown on diversely contaminated soils. Major increased metabolites were identified as 3- and 5-feruloylquinic acid whereas decreased compound was 4-feruloylquinic acid. Metal contamination also led to a shift in rhizosphere bacterial composition and structure as well as the selection of some opportunistic pathogenic genera such as Pseudomonas or Stenotrophomonas but there was only a weak effect on the bacterial diversity and richness. In the context of a moderate metal contamination in agricultural soil slight changes were seen in the secondary metabolic

profiles of *M. x giganteus* roots and rhizomes and their associated bacterial communities. Whether the metal-induced changes allow plants to recruit beneficial microbes that favor the adaptation process to this stress need to be further investigated.

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Accès au document

Combined Influence of Oxygenation and Salinity on Aggregation Kinetics of the Silver Reference Nanomaterial NM-300K

Authors: Devoille, L; Revel, M; Batana, C; Feltin, N; Giamberini, L; Chatel, A; Mouneyrac, C

Source: ENVIRONMENTAL TOXICOLOGY AND CHEMISTRY, 37 (4):1007-1013; 10.1002/etc.4052 2018

Abstract: The combined influence of oxygenation and salinity on agglomeration and/or aggregation kinetics of the silver (Ag) nanomaterial NM-300K was investigated, and the relationship between its physicochemical fate and toxicity toward an estuarine bivalve was established. The results showed that the presence of NaCl under certain oxygen conditions (8.5 ppm) promoted the formation of AgCl aggregates that could be linked to toxicity effects on aquatic organisms. (C) 2017 SETAC

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Accès au document

Toxicokinetic and toxicodynamic of depleted uranium in the zebrafish, *Danio rerio*

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

Source: AQUATIC TOXICOLOGY, 197 9-18; 10.1016/j.aquatox.2017.12.013 2018

Abstract: This study investigated the accumulation pattern and biological effects (genotoxicity and histopathology) to adult zebrafish (male and female) exposed to a nominal waterborne concentration of 20 mu g L-1 of depleted uranium (DU) for 28 days followed by 27 days of depuration. Accumulation pattern showed that (i) DU accumulated in brain, (ii) levels in digestive tract were higher than those measured in gills and (iii) levels remained high in kidney, brain and ovary despite the 27 days of depuration period. Genotoxicity, assessed by comet assay, was significant not only during DU exposure, but also during depuration phase. Gonads, in particular the testes, were more sensitive than gills. The histology of gonads indicated severe biological damages in males. This study improved knowledge of ecotoxic profile of uranium, for which a large range of biological effects has already been demonstrated.

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Accès au document

Encaged *Chironomus riparius* larvae in assessment of trace metal bioavailability and transfer in a landfill leachate collection pond

Authors: Gimbert, F; Petitjean, Q; Al-Ashoor, A; Cretenet, C; Aleya, L

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25 (12):11303-11312; SI 10.1007/s11356-016-8261-1 2018

Abstract: Household wastes may constitute a vector of environmental contamination when buried, in particular through degradation and production of leachates containing significant trace metal (TM) concentrations that may constitute a serious risk to biota. The objectives of this study were to assess the bioavailability and transfer potential of various TMs present in water and sediments in a reservoir receiving landfill leachates. An active biomonitoring approach was adopted consisting of exposing naive laboratory organisms in cages deployed in the field. Aquatic insects such as *Chironomus riparius* larvae are good candidates since they represent key organisms in the trophic functioning of aquatic ecosystems. The results show that water, suspended particles, and sediments were significantly contaminated by various TMs (As, Cd, Cu, Ni, Pb, and Zn). Their contribution to the transfer of TMs depends, however, on the specific element considered, e.g., Cd in sediments or Pb in both suspended particles and sediments. The internal fate of TMs was investigated according to their fractionation between an insoluble and a cytosolic fraction. This approach revealed different detoxification strategies capable of preventing the induction of deleterious effects at the individual scale. However, the accumulation of several TMs in C. riparius larvae tissues may also represent a significant load potentially transferable to higher trophic levels.

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Accès au document

Triclosan Lacks (Anti-) Estrogenic Effects in Zebrafish Cells but Modulates Estrogen Response in Zebrafish Embryos

Authors: Serra, H; Brion, F; Porcher, JM; Budzinski, H; Ait-Aissa, S

Source: INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES, 19 (4): 10.3390/ijms19041175 2018

Abstract: Triclosan (TCS), an antimicrobial agent widely found in the aquatic environment, is suspected to act as an endocrine disrupting compound, however mechanistic information is lacking in regards to aquatic species. This study assessed the

ability of TCS to interfere with estrogen receptor (ER) transcriptional activity, in zebrafish-specific in vitro and in vivo reporter gene assays. We report that TCS exhibits a lack of either agonistic or antagonistic effects on a panel of ER-expressing zebrafish (ZELH-zfER alpha and -zfER beta) and human (MELN) cell lines. At the organism level, TCS at concentrations of up to 0.3 mu M had no effect on ER-regulated brain aromatase gene expression in transgenic cyp19a1b-GFP zebrafish embryos. At a concentration of 1 mu M, TCS interfered with the E2 response in an ambivalent manner by potentializing a low E2 response (0.625 nM), but decreasing a high E2 response (10 nM). Altogether, our study suggests that while modulation of ER-regulated genes by TCS may occur in zebrafish, it does so irrespective of a direct binding and activation of zfERs.

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Accès au document

Assessment of *Lemna minor* (duckweed) and *Corbicula fluminea* (freshwater clam) as potential indicators of contaminated aquatic ecosystems: responses to presence of psychoactive drug mixtures

Authors: Bourioug, M; Mazzitelli, JY; Marty, P; Budzinski, H; Aleya, L; Bonnafe, E; Geret, F

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25 (12):11192-11204; SI 10.1007/s11356-017-8447-1 2018

Abstract: The pharmaceutical products are emerging pollutants continuously released into the environment, because they cannot be effectively removed by the wastewater treatment plants. In recent years, questions have been raised concerning the environmental risks related to these pollutants. The goal of this research was to evaluate the responses in *Lemna minor* after 7 days and in *Corbicula fluminea* after differing durations (1, 3, 7, and 19 days) of exposure to the psychoactive drug mixture (valproic acid, citalopram, carbamazepine, cyamemazine, hydroxyzine, oxazepam, norfluoxetine, lorazepam, fluoxetine, and sertraline) in different concentrations (0, 0 + ethanol, drug concentration (DC) 1 = river water concentration, DC2 = effluent concentration, and DC3 = 10x effluent concentration). In this aim, growth parameters of L. minor, gluthathione S-transferase (GSTs), catalase (CAT), ethoxyresorufin-O-deethylase (EROD) and/or gene expressions (pi-gst, cat, cytochrome P450 4 (cyp4), multidrug resistant 1 (mdr1), and superoxide dismutase (sod)) were measured. GST activities increased significantly in *L. minor* exposed to DC3, but no changes were found in CAT activity. In *C. fluminea*, EROD activity was induced significantly in both gill and digestive gland tissues after 3 days' exposure to DC3, while a GST increase was observed only in digestive gland tissues, suggesting that these pharmaceuticals induced an oxidative effect. Gene expression analysis revealed transient transcriptomic responses of cyp4, sod, and mdr1 under drug concentrations 2 or 3 and no change of expression for the other genes (cat and pi-gst) or condition (environmental drug concentration) tested. Finally, the data reported in this study represent important ecotoxicological information, confirming that this enzyme family (cyp4, sod, and mdr1) may be considered as a sensible and early indicator of exposure to drugs and emphasizing the involvement of selected genes in detoxification pathways.

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Accès au document

Trophic transfer and effects of gold nanoparticles (AuNPs) in *Gammarus fossarum* from contaminated periphytic biofilm

Authors: Baudrimont, M; Andrei, J; Mornet, S; Gonzalez, P; Mesmer-Dudons, N; Gourves, PY; Jaffal, A; Dedourge-Geffard, O; Geffard, A; Geffard, O; Garric, J; Feurtet-Mazel, A

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 11181-11191; SI 10.1007/s11356-017-8400-3 2018

Abstract: This work addressed the trophic transfer and effects of functionalized gold nanoparticles (AuNPs) from periphytic biofilms to the crustacean *Gammarus fossarum*. Biofilms were exposed for 48 h to 10 nm positively charged functionalized AuNPs at two concentrations, 4.6 and 46 mg/L, and crustaceans *G. fossarum* grazed on these for 7 days, with daily biofilm renewal. Gold bioaccumulation in biofilm and crustacean were measured to estimate the trophic transfer ratio of these AuNP, and, for the first time, a transcriptomic approach and transmission electron microscopy observations in the crustacean were made. These two approaches showed cellular damage caused by oxidative stress and, in particular, an impact of these AuNPs on mitochondrial respiration. Modulation of digestive enzyme activity was also observed, suggesting modifications of digestive functions. The damage due to these nanoparticles could then have vital consequences for the organisms during chronic exposure.

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Accès au document

Additive effect of calcium depletion and low resource quality on *Gammarus fossarum* (Crustacea, Amphipoda) life history traits

Authors: Rollin, M; Coulaud, R; Danger, M; Sohm, B; Flayac, J; Bec, A; Chaumot, A; Geffard, O; Felten, V

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25 (12):11264-11280; SI 10.1007/s11356-017-9390-x 2018

Abstract: *Gammarus fossarum* is an often-abundant crustacean detritivore that contributes importantly to leaf litter breakdown in oligotrophic, mainly heterotrophic, headwater streams. This species requires large amounts of Ca to moult, thus allowing growth and reproduction. Because

resource quality is tightly coupled to the organism's growth and physiological status, we hypothesised that low Ca concentration [Ca] and low food resource quality (low phosphorus [P] and/or reduced highly unsaturated fatty acid [HUFA] contents) would interactively impair molecular responses (gene expression) and reproduction of *G. fossarum*. To investigate the effects of food resources quality, we experimentally manipulated the P content of sycamore leaves and also used diatoms because they contain high amounts of HUFAs. Three resource quality treatments were tested: low quality (LQ, unmanipulated leaves: low P content), high quality 1 (HQ1; P-manipulated leaves: high P content), and high quality 2 (unmanipulated leaves supplemented with a pellet containing diatoms: high P and HUFA content). Naturally, demineralised stream water was supplemented with CaSO4 to obtain three Ca concentrations (2, 3.5, and 10.5 mg Ca L-1). For 21 days, pairs of *G. fossarum* were individually exposed to one of the nine treatments (3 [Ca] x 3 resource qualities). At the individual level, strong and significant delays in moult stage were observed in gammarids exposed to lower [Ca] and to lower resource quality, with additive effects lengthening the duration of the reproductive cycle. Effects at the molecular level were investigated by measuring expression of 12 genes involved in energy production, translation, or Ca or P homeostasis. Expression of ATP synthase beta (higher in HQ2), calcified cuticle protein (higher in HQ1 and HQ2), and tropomyosin (higher in HQ2 compared to HQ1) was significantly affected by resource quality, and significant additive effects on Ca transporting ATPase expression were induced by [Ca] and resource quality (higher for low [Ca] and higher resource quality). These results highlight the potential drastic deleterious effects of water [Ca] depletion on G. fossarum physiology, populations, and ecosystem functioning, especially in oligotrophic environments.

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Accès au document

Metal release from contaminated leaf litter and leachate toxicity for the freshwater crustacean *Gammarus fossarum*

Authors: Maunoury-Danger, F; Felten, V; Bojic, C; Fraysse, F; Ponce, MC; Dedourge-Geffard, O; Geffard, A; Guerold, F; Danger, M

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25 (12):11281-11294; SI 10.1007/s11356-017-9452-0 2018

Abstract: Industrialization has left large surfaces of contaminated soils, which may act as a source of pollution for contiguous ecosystems, either terrestrial or aquatic. When polluted sites are recolonized by plants, dispersion of leaf litter might represent a non-negligible source of contaminants, especially metals. To evaluate the risks associated to contaminated leaf litter dispersion in aquatic ecosystems, we first measured the dynamics of metal loss from leaf litter during a 48-h experimental leaching. We used aspen (*Populus tremula* L.), a common tree species on these polluted sites, and collected leaf litter on three polluted sites (settling pond of a former steel mill) and three control sites situated in the same geographic area. Then, toxicity tests were carried out on individuals of a key detritivore species widely used in ecotoxicology tests, *Gammarus fossarum* (Crustacea, Amphipoda), with uncontaminated and contaminated leaf litter leachates, using a battery of biomarkers selected for their sensitivity to metallic stress. Leaf litters collected on polluted sites exhibited not only significantly higher cadmium and zinc concentrations but also lower lignin contents. All leaf litters released high amounts of chemical elements during the leaching process, especially potassium and magnesium, and, in a lesser extent, phosphorus, calcium, and trace metals (copper, cadmium, and zinc but not lead). Toxicity tests revealed that the most important toxic effects measured on *G. fossarum* were due to leaf litter leachates by themselves, whatever the origin of litter (from polluted or control sites), confirming the toxicity of such substances, probably due to their high content in phenolic compounds. Small additional toxic effects of leachates from contaminated leaf litters were only evidenced on gammarid lipid peroxidation, indicating that contaminated leaf litter leachates might be slightly more toxic than uncontaminated ones, but in a very reduced manner. Further studies will be required to verify if these patterns are generalizable to other species and to investigate the effects of contaminated leaf litter ingestion by consumers on aquatic food webs. Nevertheless, our results do not permit to exclude potential chronic effects of an exposure to contaminated leaf litter leachates in aquatic ecosystems.

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Accès au document

Assessment of Lemna minor (duckweed) and *Corbicula fluminea* (freshwater clam) as potential indicators of contaminated aquatic ecosystems: responses to presence of psychoactive drug mixtures

Authors: Bourioug, M; Mazzitelli, JY; Marty, P; Budzinsky, H; Aleya, L; Bonnafe, E; Geret, F

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25 (12):11205-11205; SI 10.1007/s11356-018-2072-5 2018 **Language:** English **Document Type:** Correction.

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Accès au document

Determination of a new index of sexual maturity (ISM) in zebra mussel using flow cytometry: interest in ecotoxicology

Authors: Magniez, G; Franco, A; Geffard, A; Rioult, D; Bonnard, I; Delahaut, L; Joachim, S; Daniele, G; Vulliet, E; Porcher, JM; Bonnard, M

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25 (12):11252-11263; SI 10.1007/s11356-017-9256-2 2018

Abstract: The global dynamic spread of chemical contamination through the aquatic environment calls for the development of biomarkers of interest. Reproduction is a key element to be considered because it is related to the sustainability of species. Spermatogenesis is a complex process that leads to the formation of mature germ cells, whose steps and impairments need to be finely described in ecotoxicological analyses. The physiological process has been commonly described by histological analyses of gonads in different taxa. In the present paper, we describe the development of a novel technique to characterize spermatogenesis based on the analysis of the DNA content of germ cells by flow cytometry, using a DNA-intercalating agent. This new biomarker, referred to as an index of sexual maturity, proved relevant to describe the seasonal reproductive cycle of the zebra mussel, *Dreissena polymorpha* (Pallas, 1771), used as a sentinel species in the biomonitoring of continental waters and sensitive to highlight the reprotoxicity of carbamazepine (an anti-epileptic pharmaceutical) tested under ecosystemic conditions (mesocosms).

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Accès au document

Biological responses of aquatic organisms and assessment water contamination and ecotoxicity

Authors: Palos-Ladeiro, M; Geffard, A

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25 (12):11179-11180; SI 10.1007/s11356-018-1523-3 2018

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Accès au document

Implementation options for DNA-based identification into ecological status assessment under the European Water Framework Directive

Authors: Hering, D; Borja, A; Jones, JI; Pont, D; Boets, P; Bouchez, A; Bruce, K; Drakare, S; Hanfling, B; Kahlert, M; Leese, F; Meissner, K; Mergen, P; Reyjol, Y; Segurado, P; Vogler, A; Kelly, M

Source: WATER RESEARCH, 138 192-205; 10.1016/j.watres.2018.03.003 2018

Abstract: …Here, we assess the options for complementing and, perhaps, replacing morphological identification with procedures using eDNA, metabarcoding or similar approaches. We rate the applicability of DNA-based identification for the individual BQEs and water categories (rivers, lakes, transitional and coastal waters) against eleven criteria, summarised under the headlines representativeness (for example suitability of current sampling methods for DNA-based identification, errors from DNA-based species detection), sensitivity (for example capability to detect sensitive taxa, unassigned reads), precision of DNA-based identification (knowledge about uncertainty), comparability with conventional approaches (for example sensitivity of metrics to differences in DNA-based identification), cost effectiveness and environmental impact. Overall, suitability of DNA-based identification is particularly high for fish, as eDNA is a well-suited sampling approach which can replace expensive and potentially harmful methods such as gill-netting, trawling or electrofishing. Furthermore, there are attempts to replace absolute by relative abundance in metric calculations. For invertebrates and phytobenthos, the main challenges include the modification of indices and completing barcode libraries. For phytoplankton, the barcode libraries are even more problematic, due to the high taxonomic diversity in plankton samples. If current assessment concepts are kept, DNA-based identification is least appropriate for macrophytes (rivers, lakes) and angiosperms/macroalgae (transitional and coastal waters), which are surveyed rather than sampled. We discuss general implications of implementing DNA-based identification into standard ecological assessment, in particular considering any adaptations to the WFD that may be required to facilitate the transition to molecular data.

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Accès au document

Assessment of sperm quality in palaemonid prawns using Comet assay: methodological optimization

Authors: Erraud, A; Bonnard, M; Duflot, A; Geffard, A; Danger, JM; Forget-Leray, J; Xuereb, B

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25 (12):11226-11237; SI 10.1007/s11356-017-8754-6 2018

Abstract: The aim of this study was to adapt the Comet assay in spermatozoa of the marine prawn *Palaemon serratus* to use it as a marker of sperm quality. Indeed, due to the characteristics of their spermatozoa, the measurement of DNA integrity is one of the few markers which can be transferred to crustaceans to assess the quality of their semen. In the first step, the methods of collecting and maintaining spermatozoa were optimized. Cell survival was estimated during kinetics of preservation (i.e. 1, 2, 4 and 8 h) in various suspension media to define artificial seawater (ASW) as optimal. Several methods in the releasing of spermatozoa from the spermatophore of prawns were estimated with regard to their incidence both on the

efficiency of extraction and the survival of cells. Pipetting up and down turned out to be the most successful and the least invasive technique. Secondly, the transfer of Comet assay was optimized by studying various times in both cell lysis (i.e. 1, 6, 18 h) and DNA denaturation (i.e. 15, 30 and 45 min), after in vitro exposure of spermatozoa to an H2O2 gradient as model genotoxicant. Results revealed that a minimum of 1 h in cell lysis and 15 min of DNA denaturation were sufficient to obtain valuable results, linked with a low compaction of DNA in spermatozoa of *Palaemon* sp. Finally, the sensitivity of *P. serratus* spermatozoa was assessed after in vitro exposures to model genotoxicants displaying various modes of interaction with DNA (i.e. UV-C, 13.3-79.5 J m(-2); H2O2, 5-10 mu M and MMS, 0.5-5 mM) and some environmental contaminants known or suspected to be genotoxic (i.e. cadmium and diuron, 0.015-1.5 mu g L-1; carbamazepine, 0.1-10 mu g L-1) for invertebrates. The low variability of the baseline level of DNA strand breaks recorded in controls highlighted the robustness of the method. *P. serratus* spermatozoa displayed significant DNA damage from the lowest doses tested for all model genotoxicants, but conversely, no genotoxic effect of tested environmental contaminants was observed. These results, which are discussed according to the protocol tested in the present study and the comparison with literature data, could suggest a difference in the response or sensitivity of spermatozoa to environmental genotoxicity between invertebrate species, and therefore the interest of Palaemonidae prawns in ecogenotoxicology. In conclusion, the present study underlines the potential of the Comet assay as a marker to assess the contamination impact on the sperm quality in Palaemonidae prawns in view to a potential application for in situ biomonitoring surveys.

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Accès au document

Two sampling strategies for an overview of pesticide contamination in an agriculture-extensive headwater stream

Authors: Guibal, R; Lissalde, S; Leblanc, J; Cleries, K; Charriau, A; Poulier, G; Mazzella, N; Rebillard, JP; Brizard, Y; Guibaud, G

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25 (15):14280-14293; SI 10.1007/s11356-017-9883-7 2018

Abstract: Two headwaters located in southwest France were monitored for 3 and 2 years (Auvezere and Aixette watershed, respectively) with two sampling strategies: grab and passive sampling with polar organic chemical integrative sampler (POCIS). These watersheds are rural and characterized by agricultural areas with similar breeding practices, except that the Auvezere watershed contains apple production for agricultural diversification and the downstream portion of the Aixette watershed is in a peri-urban area. The agricultural activities of both are extensive, i.e., with limited supply of fertilizer and pesticides. The sampling strategies used here give specific information: grab samples for higher pesticide content and POCIS for contamination background noise and number of compounds found. Agricultural catchments in small headwater streams are characterized by a background noise of pesticide contamination in the range of 20-70 ng/L, but there may also be transient and high-peak pesticide contamination (2000-3000 ng/L) caused by rain events, poor use of pesticides, and/or the small size of the water body. This study demonstrates that between two specific runoff events, contamination was low; hence the importance of passive sampler use. While the peak pesticide concentrations seen here are a toxicity risk for aquatic life, the pesticide background noise of single compounds do not pose obvious acute nor chronic risks; however, this study did not consider the risk from synergistic "cocktail" effects. Proper tools and sampling strategies may link watershed activities (agricultural, non-agricultural) to pesticides detected in the water, and data from both grab and passive samples can contribute to discussions on environmental effects in headwaters, an area of great importance for biodiversity.

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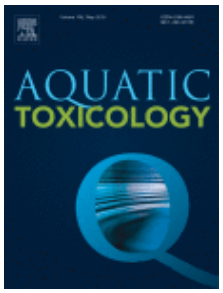
Accès au document

The influence of natural dissolved organic matter on herbicide toxicity to marine microalgae is species-dependent



Authors: Coquille, N; Menard, D; Rouxel, J; Dupraz, V; Eon, M; Pardon, P; Budzinski, H; Morin, S; Parlanti, E; Stachowski-Haberkorn, S

Source: AQUATIC TOXICOLOGY, 198 10.1016/j.aquatox.2018.02.019 018

Abstract: … This study aimed to evaluate the influence of natural DOM on the toxicity of three herbicides (diuron, irgarol and S-metolachlor), singly and in ternary mixtures, to two marine microalgae, *Chaetoceros calcitrans* and *Tetrasehnis suecica*, in monospecific, non-axenic cultures. Effects on growth, photosynthetic efficiency ((Phi'(M)) and relative lipid content were evaluated. The chemical environment (herbicide and nutrient concentrations, dissolved organic carbon and DOM optical properties) was also monitored to assess any changes during the experiments. The results show that, without DOM, the highest irgarol concentration (10.5: 0.5 mg.L-1) and the strongest mixture (M2: irgarol 0.5 mu g.L-1 + diuron 0.5 mu g.L-1 + S-metolachlor 5.0 mu g.L-1) significantly decreased all parameters for both species. Similar impacts were induced by 10.5 and M2 in *C. calcitrans* (around -56% for growth, -50% for relative lipid content and -28% for Phi'(M)), but a significantly higher toxicity of M2 was observed in *T. suecica* (-56% and -62% with 10.5 and M2 for growth, respectively), suggesting a possible interaction between molecules. With DOM added to the culture media, a significant inhibition of these three parameters was also observed with 10.5 and M2 for both species. Furthermore, DOM modulated herbicide toxicity, which was decreased for *C. calcitrans* (-51% growth at 10.5 and M2) and increased for *T. suecica* (-64% and -75% growth at 10.5 and M2, respectively). In addition to the direct and/or indirect (via

their associated bacteria) use of molecules present in natural DOM, the characterization of the chemical environment showed that the toxic effects observed on microalgae were accompanied by modifications of DOM composition and the quantity of dissolved organic carbon excreted and/or secreted by microorganisms. This toxicity modulation in presence of DOM could be explained by (i) the modification of herbicide bioavailability, (ii) a difference in cell wall composition between the two species, and/or (iii) a higher detoxification capacity of *C. calcitrans* by the use of molecules contained in DOM. This study therefore demonstrated, for the first time, the major modulating role of natural DOM on the toxicity of herbicides to marine microalgae.

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Accès au document

Genotoxicity and physiological effects of CeO_2 NPs on a freshwater bivalve (*Corbicula fluminea*)

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Source: AQUATIC TOXICOLOGY, 198 141-148; 10.1016/j.aquatox.2018.02.020 2018

Abstract: … Because of their widespread use in daily products, CeO_2 NPs are included in the OECD priority list of manufactured nanomaterials for human and environmental assessment. Indeed some studies have been conducted to assay various enzymatic biomarkers, which showed the CeO_2 NPs potential to modify anti-oxidative defenses and cellular membrane stability. Nevertheless, only a few studies were performed on their genotoxic potential. The aim of this work was to evaluate the genotoxic and physiological effects of CeO_2 NPs on a widespread freshwater bivalve *Corbicula flutninea* by using comet assay and a multi-enzymatic biomarker approach. Exposure to two CeO_2 NP concentrations during a short term experiment (6 days) was set up. The first one (10 mu g/L) was chosen in order to work with low but measurable concentrations whereas the second one was ten times higher (100 g CeO2 NPs/L). DNA damage was significantly more pronounced compared with control for both concentrations tested as early as two days of exposure and seemed to increase with time. Some enzymatic biomarkers of anti-oxidative defenses (total antioxidant capacity, catalase activity), anti-toxic mechanisms (glutathione-S-transferase activity, caspase-3 activity) or metabolism (lactate dehydrogenase activity) tended to increase after 6 days of exposure but only the induction of caspase pathway and DNA damages appeared significant for exposed organisms. In this study, time and concentration effects of CeO_2 NPs were highlighted by coupling genotoxic and cellular biomarker assessments.

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Accès au document

Interspecific differences in biochemical and behavioral biomarkers in endogeic earthworms exposed to ethyl-parathion

Authors: Jouni, F; Sanchez-Hernandez, JC; Mazzia, C; Jobin, M; Capowiez, Y; Rault, M

Source: CHEMOSPHERE, 202 85-93; 10.1016/j.chemosphere.2018.03.060 2018

Abstract: Earthworms are common organisms... However, *Eisenia* species are rarely found in agricultural soils and recent studies have pointed out endogeic species are more sensitive to pesticides than *Eisenia*. *Allolobophora chlorotica* and *Aporrectodea caliginosa* are two endogeic soil-dwelling species that are abundant in the agroecosystem. However, knowledge on pesticide impact on this ecological group of earthworms is still incipient. Herein, we compared the biochemical (acetylcholinesterase [AChE) and carboxylesterase [CbE] activities) and behavioral (burrowing, casting and feeding) biomarker responses of these two endogeic earthworm species exposed for 7 days to soils contaminated with 0.1, 1 and 10 mg kg(-1) ethyl-parathion. The results showed marked species-specific differences in both groups of biomarkers, suggesting *A. caliginosa* the most sensitive species to this organophosphorus pesticide under the exposure conditions in this study. Moreover, an in vitro inhibition trial with ethyl-paraoxon evidenced a higher sensitivity of *A. caliginosa* AChE activity compared with that of *A. chlorotica*. This finding suggested that this molecular target endpoint could contribute to the interspecific differences of behavioral responses rather than CbE activity; this latter considered a potent mechanism of OP removal. Our results suggest the inclusion of more than one endogeic earthworm species to assess toxicity from organophosphorus insecticides. However, the use of *A. caliginosa* in the environmental risk assessment framework of organophosphorus contamination is highly recommended because of its higher sensibility to this class of pesticides, in addition to its abundance in the agroecosystem.

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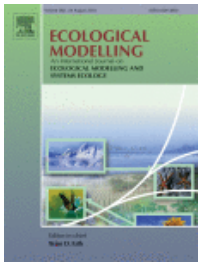
Accès au document

Effects of contaminants and trophic cascade regulation on food chain stability: Application to cadmium soil pollution on small mammals - Raptor systems



Authors: Baudrot, V; Fritsch, C; Perasso, A; Banerjee, M; Raoul, F

Source: ECOLOGICAL MODELLING, 382 33-42; 10.1016/j.ecolmodel.2018.05.002 2018

Abstract: …. Numerous theoretical and empirical studies explored the

transfer of contaminants by food ingestion between trophic levels, and how contaminant effects on survival and fecundity may change regime shifts of classical predator-prey dynamics. However, the extent to which those contaminants may influence the cascade effect of external stressors, as a change in resources (bottom-up cascade) or a variation in predator abundance (top down cascade) is still poorly understood. We develop a data-driven model to explore how soil contamination modulates the food chain stability and resilience to changes in prey nutrient and in the apex predator mortality rate. We particularly focus on the ecotoxicological impact of the trace metal, cadmium, on a widespread raptor, the barn owl (*Tyto alba*), feeding on several prey distinct by their trophic positions: herbivores (*Microtus* spp.), omnivores (wood mouse *Apodemus sylvaticus* and bank vole Myodes glareolus) and insectivores (shrews: *Crocidura* spp. and *Sorex* spp.). Our model reveals the alternative steady states in population dynamics and the occurrence and position of regime shifts where a subtle change in conditions causes a sudden shift in the ecological system. Based on mathematical modelling and bifurcation analysis, the results show for instance that under toxicity threshold, where no population decline is observed, the contaminant weakens food-chain resilience. Then at higher contamination, the toxic effects on predator releases the top-down control over prey that may increase. This range of chemical stress overturns the paradox of enrichment, a central concept in trophic cascade theory. The transition phase at the highest contamination, where the whole community collapse, exhibits multiple patterns, from smooth to abrupt, depending on external stressors and the prey population. Thus, this work provides a methodology to identify ecological traits of preys that are critical for transferring adverse effects of contaminants across the whole community.

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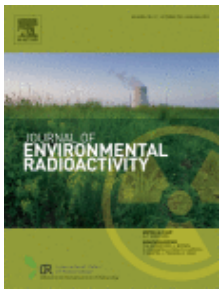
Accès au document

Influence of root exudation of white lupine (*Lupinus albus* L.) on uranium phytoavailability in a naturally uranium-rich soil



Authors: Henner, P; Bredoire, F; Tailliez, A; Coppin, F; Pierrisnard, S; Camilleri, V; Keller, C

Source: journal of environmental radioactivity, 190 39-50; 10.1016/j.jenvrad.2018.04.022 2018

Abstract: Mechanisms of uranium (U) transfer from soil to plants remain poorly understood. The kinetics of supply of U to the soil solution from solid phases could be a key point to understand its phytoavailability and implications for environmental risk assessment. Root activity, particularly the continuous release of organic acids in the rhizosphere, could have an effect on this supply. We tested the impact of citrate exudation by roots of *Lupinus albus*, either P-sufficient (P+) or P-deficient (P-), on the phytoavailability of U from a naturally contaminated soil (total content of 413 mg U kg(-1)) using a rhizotest design. Combined effects of P (P-/P+ used to modulate plant physiology) and citrate (model exudate) on the solubilization of U contained in the soils were tested in closed reactors (batch). The batch experiment showed the existence of a low U available pool (0.4% total U) and high accessibility (k(d)' around 20 L kg(-1)) which was not significantly affected by P treatment or citrate concentrations. Analysis of U, Fe, Ca, P and citrate concentrations in the batches suggested a complex combination of mechanisms and factors including desorption, resorption, precipitation, co-sorption. On rhizotest, *L. albus* plants extracted 0.5-0.75% of the total U and between 25 and 40% of the estimated available U present in the rhizotest in 5 days. Uranium accumulation at the whole plant level (20 mg U kg(d.w.)(-1), shoot to root ratio around 10(-3)) seemed to be dependent neither on the plant P nutrition status nor citrate exudation level, possibly in relation with the equivalent accessibility of U whatever the growth conditions. Yet differential translocation to shoots seemed to be positively correlated to citrate exudation.

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Accès au document

More and smaller resting eggs along a gradient for pollution by metals: dispersal, dormancy and detoxification strategies in Daphnia?

Authors: Ringot, G; Gasparini, J; Wagner, M; Albassatneh, MC; Frantz, A

Source: BIOLOGICAL JOURNAL OF THE LINNEAN SOCIETY, 124 (1):11-20; 10.1093/biolinnean/bly026 2018

Abstract: Trace metals are bioavailable, persistent and potentially harmful chemicals commonly found in cities. In metal-polluted habitats, natural populations may evolve adaptations and may be composed of individuals exhibiting detoxification mechanisms, in particular through melanization, dispersal or dormancy abilities. Interestingly, *Daphnia* cyclically produce chitinous melanized envelopes called 'ephippia' encasing the resting eggs, which allow dispersal in space and in time (dormancy). Moreover, the success of dispersal decreases with increasing ephippial size. We hypothesized that populations living in polluted ponds produce more, darker and smaller ephippia than populations from unpolluted ponds. We sampled 51 ponds distributed in the Paris region and investigated the link between concentrations of seven trace metals and the presence of *Daphnia* and ephippia, and the size and pigmentation of ephippia. First, the presence of Daphnia was not linked to local metal concentrations, which ranged gradually from low to high values. Second, the probability of the presence of ephippia in sediments increased with metal concentrations, suggesting a selective advantage of Daphnia in producing dormancy stages in polluted habitats. Third, although ephippial pigmentation was not linked to metal concentrations, ephippial size decreased with increasing metal concentrations, suggesting a selection for increased dispersal in polluted habitats. Overall, our results show that anthropogenic pollution may have important

microevolutionary consequences in urban populations, which are generally overlooked.

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Accès au document

Comparison of wavelength-dispersive X-ray fluorescence spectrometry and inductively coupled plasma optical emission spectrometry for the elementary determination in plants through the accuracy profile method

Authors: Masson, P; Dalix, T; Daugey, G; Soule, P

Source: X-RAY SPECTROMETRY, 47 (4):287-293; 10.1002/xrs.2840 2018

Abstract: Accuracy profile is a graphical method, which allows to validate an analytical method. It defines a validity of a concentration range for a given accuracy. With this tool, quantitative determinations of macroelements and microelements (Al, Ca, Fe, K, Mg, Mn, Na, P, S, and Zn) in plant samples were evaluated by the use of a wavelength-dispersive X-ray fluorescence instrument. The method uses a simple preparation procedure with only drying, grinding, and pressing samples. The measured samples were reference materials with known mineral contents. The calibration procedure was established by employing plant materials issued from interlaboratory studies. Matrix effects were corrected by employing the method of the influence coefficients on the basis of the computerized routine program linked to the equipment. The accuracy profiles of the method show the measurements (trueness and precision) collected under intermediate precision conditions and aim to compute an acceptability interval where a known proportion of future results will be located. The various types of accuracy profile behavior were exemplified. In comparison with an inductively coupled plasma optical emission spectrometry method, the use of X-ray fluorescence offers a good alternative, faster, and better precision. Inversely, inductively coupled plasma optical emission spectrometry offers an approach well suited for the trueness of measurements with very low matrix effects.

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Accès au document

Assessment of the effects of discontinuous sources of contamination through biomarker analyses on caged mussels

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Source: SCIENCE OF THE TOTAL ENVIRONMENT, 634 116-126; 10.1016/j.scitotenv.2018.03.297 2018

Abstract: The present study analysed potential adverse effects of discontinuous sources of contamination, namely the discharge of a combined sewer overflow (CSO) and of runoff in an urban area, the Bay of Santander (North Iberian Peninsula). Water samples and caged mussels were used to analyse concentrations of contaminants and biological responses. Mussels (*Mytilus galloprovincialis*) were transplanted to a marina receiving runoff from a petrol station and to a CSO discharge site. Samples were collected in synchrony with heavy rains along 62 days. Lysosomal membrane stability (LMS) and acyl-CoA oxidase (AOX) activity were measured as core biomarkers and were analysed at all sampling times. Histopathology of digestive gland and gonads, transcription levels of vitellogenin gene, volume density of black silver deposits and micronuclei formation were measured at initial and final stages of the transplant. Chemical analyses of metals, polycyclic aromatic hydrocarbons (PAHs) and endocrine disruptors were performed in water samples and mussel flesh. Mussels accumulated low concentrations of contaminants, which is in accordance with results obtained from exposure biomarkers. AOX activity decreased in all transplanted mussels after the first heavy rain, but this change seems to be related to the seasonal pattern of the enzyme activity. Mussels located close to the CSO discharge site showed a reduction in LMS after the first rain event, when compared to mussels before the transplant and to mussels from the reference location. However, thiswas attributable to natural environmental changes rather than to pollution. Values of the rest of analysed bio-markers were below threshold values reported for the study area.

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Accès au document

Effect of Geogenic Lead on Fungal and Collembolan Communities in Garden Topsoil

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Source: PEDOSPHERE, 28 (2):215-226; 10.1016/S1002-0160(18)60022-0 2018

Abstract: Geogenic lead (Pb) is considered to be less bioavailable than anthropogenic Pb and exerts less effect on the soil fauna. However, Pb contamination in vegetables has been reported in the case of geogenic anomalies, even at moderate concentrations (around 170 mg kg(-1)). In this study, we investigated collembolan communities using both taxonomic- and trait -based approaches and observed fungal communities to assess the effects of a moderate geogenic Pb anomaly on collembolans and fungi in an urban vegetable garden soil. Results indicated that geogenic Pb indeed modified fungi communities and altered the functional structure of collembolan communities in garden soils. Although geogenic Pb presented low

bioavailability, it affected soil fauna and vegetables similar to anthropogenic Pb.

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Accès au document

Behaviour of S-metolachlor and its oxanilic and ethanesulfonic acids metabolites under fresh vs. partially decomposed cover crop mulches: A laboratory study

Authors: Cassigneul, A; Benoit, P; Nobile, C; Bergheaud, V; Dumeny, V; Etievant, V; Maylin, A; Justes, E; Alletto, L

Source: SCIENCE OF THE TOTAL ENVIRONMENT, 631-632 1515-1524; 10.1016/j.scitotenv.2018.03.143 2018

Abstract: At the time of spring pre-emergent herbicide application, the soil surface in conservation agriculture is most of the time covered by cover crops (CC) mulches. The state of these mulches depends on their destruction date and on the selected species. Sorption and degradation of C-14-S-metolachlor on and within 8 decaying CC-covered (2 species x 4 initial decomposition state) soils corresponding to conservation agriculture were compared to its fate in bare soil (BS) corresponding to conventional agriculture. C-14-S-metolachlor and its metabolites distribution between mineralized, extractable and non-extractable (NER) fractions was determined at 5 dates during a 20 degrees C/84-d period. Herbicide mineralization was weak (<2%) for both CC and BS. Extractability of C-14 in BS was intermediate between CC that were decomposed 28 or 56 days and 0 or 6 days before application. Degradates consisted in up to 43% of total radioactivity, with specificities according to the CC or soil compartment. NER formation was equivalent in BS and in the much decomposed CC amended microcosms, and was stronger in less decomposed CC. S-metolachlor DT50 was 23-d in BS, and 9, 15, 39 and 25-d for CC ordered by increased decomposition state at the time of application. These results were attributed to the proportion of C-14 intercepted by CC, and to higher levels of organic matter and microbial activity in less decomposed CC as compared with more decomposed ones. Then the state of decomposition level of CC residues determines the behaviour of SMOC (S-metolachlor) sprayed on the mulch in the conditions of conservation agriculture.

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Accès au document

Baseline levels of biochemical biomarkers in the endobenthic ragworm Hediste diversicolor as useful tools in biological monitoring of estuaries under anthropogenic pressure

Authors: Barrick, A; Marion, JM; Perrein-Ettajani, H; Chatel, A; Mouneyrac, C

Source: MARINE POLLUTION BULLETIN, 129 (1):81-85; 10.1016/j.marpolbul.2018.02.006 2018

Abstract: Identification of contamination in estuarine ecosystems that are impacted by anthropogenic pressures, such as the Seine estuary, is difficult to determine without considering the role environmental variation plays on the end points selected. Currently, there is interest in identifying methods in which the influence of confounding factors can be described and accounted for. In this context, the aim of this study was to define a baseline assessment criteria (BAC) for enzymatic biomarkers in ragworms (*Hediste diversicolor*) collected in a reference site (Authie). The model took into consideration the weight, temperature and salinity of the site. Values collected in the Seine estuary were analyzed with the model to determine if differences between the sites could potentially be due to contamination or were explained by environmental variation. In general, biomarker responses from the Seine estuary fell within the range of BAC, suggesting that environmental variation could explain some of the results.

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Accès au document

Effects of chronic exposure to cadmium and temperature, alone or combined, on the threespine stickleback (*Gasterosteus aculeatus*): Interest of digestive enzymes as biomarkers

Authors: Hani, YMI; Turies, C; Palluel, O; Delahaut, L; Gaillet, V; Bado-nilles, A; Porcher, JM; Geffard, A; Dedourge-geffard, O

Source: AQUATIC TOXICOLOGY, 199 252-262; 10.1016/j.aquatox.2018.04.006 2018

Abstract: .... The first purpose of the present study was to evaluate the single and combined effects of 90 days of exposure to an environmental cadmium concentration (0.5 mu g L-1) and two water temperatures (16 and 21 degrees C) on different parameters. These parameters are involved in (i) the antioxidant system (superoxide dismutase activity-SOD- and total glutathione levels-GSH-), (ii) the energy metabolism, ie. energy reserves (glycogen, lipids, proteins) and digestive enzymes (trypsin, amylase, intestinal alkaline phosphatase-IAP-), and (iii) biometric parameters (weight, length, Fulton's condition factor, and the gonadosomatic index GSI) of threespine stickleback (*Gasterosteus aculeatus*). The second purpose was to determine the interest of the three digestive enzymes as biomarkers in comparison with the other parameters. The higher temperature (21 C) impacted the anti-oxidant and energy reserve parameters. In liver, GSH levels increased on day 60, while SOD decreased on days 15 and 90, with a significant decrease of protein and lipid energy reserves on day 90. In muscle, the higher temperature decreased SOD

activity only on day 90. *G. aculeatus* biometric parameters were also impacted by the higher temperature, which limited stickleback growth after 90 days of exposure. In female sticklebacks, the GSI peaked on day 60 and decreased sharply on day 90, while the highest values were reached at day 90 in the control groups, suggesting impaired reproduction in sticklebacks raised at 21 C. These results suggest that 21 C is an upper-limit temperature for long-term physiological processes in sticklebacks. In contrast, very low-concentration cadmium exposure had no effect on classical biomarkers (energy reserves, antioxidant parameters, biometric parameters). However, digestive enzymes showed an interesting sensitivity to cadmium, which was emphasized by high temperature. The activity of the three digestive enzymes decreased significantly on day 90 when sticklebacks were exposed to cadmium alone, while the decrease was stronger and was recorded earlier (from day 15) when they were exposed to the cadmium-temperature combination. Compared to conventional measurements, digestive enzymes responded rapidly. This could be an important advantage for them to be used as early warning tools to reflect the health status of organisms, particularly for trypsin and LAP activities.

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Accès au document

Demographic, endocrine and behavioral responses to mirex in the South polar skua

Authors: Goutte, A; Meillere, A; Barbraud, C; Budzinski, H; Labadie, P; Peluhet, L; Weimerskirch, H; Delord, K; Chastel, O

Source: SCIENCE OF THE TOTAL ENVIRONMENT, 631-632 317-325; 10.1016/j.scitotenv.2018.02.326 2018

Abstract: Population consequences of chronic exposure to multiple pollutants at low environmental doses remain speculative, because of the lack of appropriate long-term monitoring surveys. This study integrates proximate and ultimate aspects of persistent organic pollutants (POP) burden in free-living vertebrates, by coupling hormonal and behavioral endpoints, life-history traits, and population dynamics. Blood samples (N = 70) were collected in South polar skuas during two breeding periods, in 2003 and 2005, and individuals were annually monitored until 2011. Multi-state mark recapture models were used to test the effects of POP levels on demographic traits. Survival rate and long-term breeding probability were not related to individual POP levels, whereas long-term breeding success significantly decreased with increasing blood levels of mirex, an organochlorine insecticide. At the proximate level, corticosterone (stress hormone) and prolactin (parental care hormone) levels were not linked to individual POP burden. Nest defense in 2005 was significantly less intensive in chick-rearing skuas bearing higher mirex levels, suggesting reproductive behavioral impairment. Matrix population models were then built to project the rate of population decline according to increasing mirex burden. Although mirex levels were 2.8 times higher in 2003 than in 2005, the population-level effect of mirex was only detected in 2005, the year of higher corticosterone levels. The combination of endocrine traits with demographic analysis thereby enables to provide new support of synergistic interactions between pollutants and stress levels on long-term breeding outputs and population dynamics.

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Accès au document

Kinetics of polychlorinated biphenyls in bactrian camels

Authors: Jurjanz, S; Nurseitova, M; Toregozhina, Z; Konuspayeva, G; Faye, B **Author**

Source: EMIRATES JOURNAL OF FOOD AND AGRICULTURE, 30 (4):312-319; SI 10.9755/ejfa.2018.v30.i4.1667 2018

Abstract: The study aimed to determine the accumulation and depuration of polychlorinated biphenyls (PCBs) in Bactrian camels. Four lactating, two-humped camels (*Camelus bactrianus*) received 0.8 mg PCBs (1.3 mu g/kg body weight) daily for 56 days. Then, the depuration of the animals was monitored for the next 4 months. Milk, blood and hump fat of the camels were sampled every 2 weeks and analyzed. Body weight increased significantly, from approximately 550 to 613 kg, by the end of the study. The fat mass in the humps initially decreased (-2.3 kg, P < 0.05) then increased at the end of the depuration period (+ 2.0 kg, P < 0.05). At the end of the exposure period, the concentrations of the indicator PCBs were 1.6 mg/g hump fat, 0.85 mg/g milk fat and 0.56 mg/L blood serum, i.e., ten times over the background level. The concentrations in the hump fat decreased significantly during the depuration period, for congeners 28, 52, 101 and 118, but did not vary appreciably for the heavily chlorinated congeners 138, 153 and 180. The apparently stable concentrations of the heavier congeners may be an artifact of the reduced fat mass in the humps during the first part of the depuration period, combined with fat mobilization, which may mask the reduction of stored PCBs. PCB concentrations in the milk and blood were not significantly reduced during the depuration periods, as they represent the outflow of PCBs from the pool stored in the humps and have a weak affinity for lipophilic compounds, respectively. Therefore, it should be recommended to avoid the consumption of raw fat from camel hump in polluted areas because this organ would easily bioaccumulate organic pollutants during an exposure and store it over an extended period. PCB contaminants in milk would reflect the intensity of the outflow from the stored pool, and it would take a longer time in camels than in other ruminants to obtain safe food after the exposure of the animals to persistent organic pollutants.

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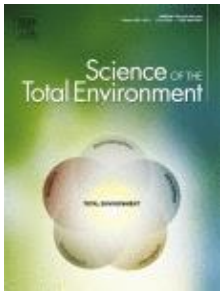
Accès au document

Pesticide fate modelling in conservation tillage: Simulating the effect of mulch and cover crop on S-metolachlor leaching



Authors: Marin-Benito, JM; Alletto, L; Barriuso, E; Bedos, C; Benoit, P; Pot, V; Mamy, L

Source: SCIENCE OF THE TOTAL ENVIRONMENT, 628-629 1508-1517; 10.1016/j.scitotenv.2018.02.144 2018

Abstract: … However, only few pesticide fate models are able to consider mulch of crop residues as well as the effect of intermediate cover crops. Thus, the objective was to develop an approach to model the effects of crop residues left at the soil surface and cover crops on the fate of pesticides. This approach consisted in (1) considering the crop residues as a soil layer with specific physical, hydrodynamic and pesticide-reactivity properties dose to that of a high organic content soil layer, and (2) introducing a correction factor of the potential evapotranspiration, estimated through a calibration step, to take into account the reduction of soil evaporation by the presence of a mulch. This approach was developed using MACRO as support pesticide model. To assess the model performances, we used the data from a field experiment designed in an irrigated maize monoculture under conservation tillage. Soil water content, water percolates, soil temperature and S-metolachlor herbicide concentrations in the leachate at 1 m depth were measured during two years. The approach chosen to simulate the mulch effects allowed MACRO to make acceptable predictions of the observed water percolation, soil temperature and to a less extent herbicide leaching. However, it showed a poor performance to simulate the soil water content. Results are discussed in terms of further modelling options to better assess the environmental risks of pesticides under conservation tillage. This approach remains to be tested against various soils, crops, pesticides and types of mulch.

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Accès au document

Towards sustainable and multifunctional agriculture in farmland landscapes: Lessons from the integrative approach of a French LTSER platform

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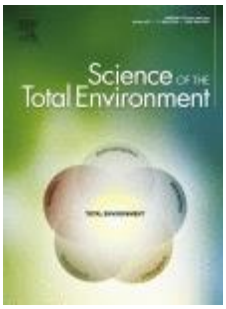
Source: SCIENCE OF THE TOTAL ENVIRONMENT, 627 822-834; 10.1016/j.scitotenv.2018.01.142 2018

Abstract: Agriculture is currently facing unprecedented challenges: ensuring food, fiber and energy production in the face of global change, maintaining the economic performance of farmers and preserving natural resources



such as bio-diversity and associated key ecosystem services for sustainable agriculture. Addressing these challenges requires innovative landscape scale farming systems that account for changing economic and environmental targets. These novel agricultural systems need to be recognized, accepted and promoted by all stakeholders, including local residents, and supported by public policies. Agroecosystems should be considered as socio-ecological systems and alternative farming systems should be based on ecological principles while taking societal needs into account. This requires an in-depth knowledge of the multiple interactions between sociological and ecological dynamics. Long Term Socio-Ecological Research platforms (LTSER) are ideal for acquiring this knowledge as they (i) are not constrained by traditional disciplinary boundaries, (ii) operate at a large spatial scale involving all stakeholders, and (iii) use systemic approaches to investigate biodiversity and ecosystem services. This study presents the socio-ecological research strategy from the LTSER "Zone Atelier Plaine & Val de Sevre" (ZA PVS), a large study area where data has been sampled since 1994. Its global aim is to identify effective solutions for agricultural development and the conservation of biodiversity in farmlands. Three main objectives are targeted by the ZAPVS. The first objective is intensive monitoring of landscape features, the main taxa present and agricultural practices. The second objective is the experimental investigation, in real fields with local farmers, of important ecosystem functions and services, in relation to pesticide use, crop production and farming socio-economic value. The third aim is to involve stakeholders through participatory research, citizen science and the dissemination of scientific results. This paper underlines the relevance of LTSERs for addressing agricultural challenges, while acknowledging that there are some yet unsolved key challenges.

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Accès au document

Unexpected metabolic disorders induced by endocrine disruptors in Xenopus tropicalis provide new lead for understanding amphibian decline

Authors: Regnault, C; Usal, M; Veyrenc, S; Couturier, K; Batandier, C; Bulteau, AL; Lejon, D; Sapin, A; Combourieu, B; Chetiveaux, M; Le May, C; Lafond, T; Raveton, M; Reynaud, S

Source: PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, 115 (19):E4416-E4425; 10.1073/pnas.1721267115 2018

Abstract: Despite numerous studies suggesting that amphibians are highly sensitive to endocrine disruptors (EDs), both their role in the decline of populations and the underlying mechanisms remain unclear. This study showed that frogs exposed throughout their life cycle to ED

concentrations low enough to be considered safe for drinking water, developed a prediabetes phenotype and, more commonly, a metabolic syndrome. Female *Xenopus tropicalis* exposed from tadpole stage to benzo(a) pyrene or triclosan at concentrations of 50 ng.L-1 displayed glucose intolerance syndrome, liver steatosis, liver mitochondrial dysfunction, liver transcriptomic signature, and pancreatic insulin hypersecretion, all typical of a prediabetes state. This metabolic syndrome led to progeny whose metamorphosis was delayed and occurred while the individuals were both smaller and lighter, all factors that have been linked to reduced adult recruitment and likelihood of reproduction. We found that F-1 animals did indeed have reduced reproductive success, demonstrating a lower fitness in ED-exposed *Xenopus*. Moreover, after 1 year of depuration, *Xenopus* that had been exposed to benzo(a) pyrene still displayed hepatic disorders and a marked insulin secretory defect resulting in glucose intolerance. Our results demonstrate that amphibians are highly sensitive to EDs at concentrations well below the thresholds reported to induce stress in other vertebrates. This study introduces EDs as a possible key contributing factor to amphibian population decline through metabolism disruption. Overall, our results show that EDs cause metabolic disorders, which is in agreement with epidemiological studies suggesting that environmental EDs might be one of the principal causes of metabolic disease in humans.

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Accès au document

Ecotoxicité / Toxicité

Addressing Complex Local and Global Issues in Environmental Exposure and Health

preliminary programm

Extraits du programme : Mobilizing Data for Healthy Environments: Platforms Facilitating Health and Environmental Exposure Linkage. Multi-Response and Multi-Pollutant Models for Environmental Exposure and Health: From Gap-Filling to Decorrelating Structure in Data. Novel Methods for Assessing Complex Exposure. Mixtures in Environmental Epidemiology. New Approaches for Environmental Health Impact Studies: Assessing Human Health Risks from Chemical and Non-Chemical Stressors

Accès au document

Stratégie nationale de santé 2018-2022

Extrait du sommaire :

B. Promouvoir des conditions de vie et de travail favorables à la santé et maîtriser les risques environnementaux

Rapport de 57 pages Ministère des solidarités et de la santé
p.20 Réduire l'exposition à des conditions d'habitat indignes et aux **pollutions intérieures**

p.21 Promouvoir la santé au travail, développer une culture de prévention dans les milieux professionnels et réduire la fréquence et la sévérité des pathologies liées aux conditions de travail
p.22 **Réduire l'exposition de la population aux pollutions extérieures** et aux substances nocives pour la santé...
Accès au document

Santé reproductive et perturbateurs endocriniens

BEH Bulletin épidémiologique hebdomadaire

La revue française BEH Bulletin Epidemiologique hebdomadaire consacre son numéro 22-23 de Juillet 2018 aux perturbateurs endocriniens et leurs effets santé sur la reproduction.

L'éditorial est signé **Sébastien Denys,** *Directeur Santé environnement, Santé publique France*

Impact sanitaire des perturbateurs endocriniens : intégrer les connaissances en vue d'agir pour réduire l'exposition humaine

Accès au document

Chlordécone : un perturbateur endocrinien emblématique affectant les Antilles françaises

Article en français. Bull Epidémiol Hebd. 2018;(22-23):480-5. Auteurs : Multigner L, Rouget F, Costet N, Monfort C, Blanchet P, Kadhel P, et al

Accès au document

La dose ne ferait-elle plus le poison ?

Gérard Pascal, Hervé Lafforgue, Dominique Parent-Massin membres de la section "Alimentation humaine" de **l'Académie d'agriculture de France**, s'en émeuvent et livrent leur propre point de vue sur la question.

Cet exposé de 8 pages revient sur les définitions et les principes de la toxicologie alimentaire

Extraits :... L'objectif de la toxicologie alimentaire est donc d'identifier la dose qui n'a pas d'effet toxique. Points abordés :

Des définitions : Le danger est, en toxicologie alimentaire, la propriété d'une molécule d'avoir un effet toxique. Le danger n'est pas synonyme de risque. Le risque est, en toxicologie, la probabilité d'être exposé au danger via la consommation d'un aliment qui contient une molécule dangereuse à une dose toxique compte tenu l'exposition.

L'exposition combine le niveau de contamination des aliments avec la quantité consommée des aliments contaminés, chez l'adulte, l'enfant et les populations sensibles.

Des courbes effet-dose :

Des valeurs toxicologiques de référence, étape ultime de la caractérisation du danger... VTR (Valeur Toxicologique de Référence)...La Valeur Toxicologique de Référence la plus utilisée pour protéger le consommateur est la Dose Journalière Acceptable (DJA) pour les seuls produits réglementés et la Dose Journalière Tolérable (DJT) pour les contaminants naturels....

De l'évaluation de l'exposition

De la caractérisation du risque

Lors de la caractérisation du risque, la DJA est comparée à l'exposition. La situation idéale recherchée est que l'exposition soit inférieure à la DJA/DJT.

Les auteurs concluent : Les relations dose effet sont beaucoup plus complexes qu'il n'y parait et, bien que certains composés présentent un comportement particulier, remettre en cause le principe de Paracelse " sola dosis fecit venenum", seule la dose fait le poison, sur lequel ont reposé jusqu'à ce jour les évaluations du risque en sécurité des aliments, serait une grave erreur.

Bien entendu, il ne s'agit pas d'ignorer les effets aux faibles doses, de même que les effets des mélanges, ces éléments feront partie des défis à relever par les toxicologues dans le futur

Accès au document

Conditional Toxicity Value (CTV) Predictor: An In Silico Approach for Generating Quantitative Risk Estimates for Chemicals

Source: *Environ Health Perspect May 2018* DOI:10.1289/EHP2998

Background: Human health assessments synthesize human, animal, and mechanistic data to produce toxicity values that are key inputs to risk-based decision making. Traditional assessments are data-, time-, and resource-intensive, and they cannot be developed for most environmental chemicals owing to a lack of appropriate data.

Objectives: As recommended by the National Research Council, we propose a solution for predicting toxicity values for data-poor chemicals through development of quantitative structure–activity relationship (QSAR) models.

Methods: We used a comprehensive database of chemicals with existing regulatory toxicity values from U.S. federal and state agencies to develop **quantitative QSAR models.** We compared QSAR-based model predictions to those based on high-throughput screening (HTS) assays.

Results: QSAR models for noncancer threshold-based values and cancer slope factors had cross-validation-based *Q*2 of 0.25–0.45, mean model errors of 0.70–1.11 log10 units, and applicability domains covering >80% of environmental chemicals. Toxicity values predicted from QSAR models developed in this study were more accurate and precise than those based on HTS assays or mean-based predictions. A publicly accessible web interface to make predictions for any chemical of interest is available at http://toxvalue.org**Conclusions:**An *in silico* tool that can predict toxicity values with an uncertainty of an order of magnitude or less can be used to quickly and quantitatively assess risks of environmental chemicals when traditional toxicity data or human health assessments are unavailable. This tool can fill a critical gap in the risk assessment and management of data-poor chemicals. https://doi.org/10.1289/EHP2998

Accès au document

Elucidating Gene-by-Environment Interactions Associated with Differential Susceptibility to Chemical Exposure

Source: *Environ Health Perspect*; June 2018, DOI:10.1289/EHP2662

Background: ….We tested the hypothesis that population variability in response to certain chemicals could elucidate a role for gene–environment interactions (GxE) in differential susceptibility.

Methods: High-throughput screening (HTS) data on thousands of chemicals in genetically heterogeneous zebrafish were leveraged to identify a candidate chemical (Abamectin) with response patterns indicative of population susceptibility differences. We tested the prediction by generating genome-wide sequence data for 276 individual zebrafish displaying susceptible (Affected) vs. resistant (Unaffected) phenotypes following identical chemical exposure.

Results: We found GxE associated with differential susceptibility in the *sox7* promoter region and then confirmed gene expression differences between phenotypic response classes.

Conclusions: The results for Abamectin in zebrafish demonstrate that GxE associated with naturally occurring, population genetic variation play a significant role in mediating individual response to chemical exposure. https://doi.org/10.1289/EHP2662

Accès au document

INRA - Effet cocktail de pesticides à faible dose par l'alimentation

Communiqué de presse INRA 27/06/2018

Les premiers résultats chez l'animal montrent des perturbations métaboliques

Présentation de la publication

Metabolic Effects of a Chronic Dietary Exposure to a Low-Dose Pesticide Cocktail in Mice: Sexual Dimorphism and Role of the Constitutive Androstane Receptor.

*Environmental Health Perspectives.*25 juin 2018. Doi https://doi.org/10.1289/EHP2877

Des chercheurs de l'Inra, en collaboration avec l'Inserm, ont étudié chez la souris les effets d'une **exposition orale chronique à un cocktail de pesticides à faible dose.** Les résultats montrent pour la première fois in vivo des perturbations métaboliques différentes selon le sexe. En effet, les mâles exposés aux pesticides prennent du poids et deviennent diabétiques. Les femelles sont protégées de ces effets mais présentent d'autres perturbations. Ces résultats viennent d'être publiés dans la revue Environmental Health Perspectives. Ils apportent notamment des arguments en faveur d'une plausibilité d'un lien pesticides-santé et confortent les résultats épidémiologiques récents montrant une relation inverse entre une consommation importante d'aliments issus de l'agriculture biologique et la probabilité de développer un

Accès au document

Argentine study links glyphosate herbicide to miscarriage, birth defects

le site associatif GM Watch commente fin Avril la parution de la publication

Environmental exposure to glyphosate and reproductive health impacts in agricultural population of Argentina

Medardo Avila-Vazquez, Flavia S. Difilippo, Bryan Mac Lean, Eduardo Maturano, Agustina Etchegoyen

Journal of Environmental Protection, 2018, 9, 241-253 http://www.scirp.org/Journal/PaperInformation.aspx?PaperID=83267

.... People living in an Argentine town in the heart of the GM soy and maize growing area suffer miscarriages at three times and birth defects at twice the national average rate, a new study shows. In addition, the study found a correlation between a high environmental exposure to glyphosate and an increased frequency of reproductive disorders (miscarriage and birth defects).....

The research was led by Dr Medardo Avila-Vazquez, a physician who has spearheaded investigations into the health of populations exposed to glyphosate herbicide spraying on GM glyphosate-tolerant soy and maize, and was carried out in the town of Monte Maíz.

The study was divided into two parts: an **epidemiological study** consisting of a household survey investigating the incidence of miscarriage and birth defects; and an **environmental analysis**, recording the various sources of local pollution and measuring the levels of commonly used pesticides in soil, water, and piles of stored grain husks. The pesticides measured were glyphosate, its metabolite AMPA, and chlorpyrifos, endosulfan, cypermethrin, atrazine, 2,4-D, and epoxiconazole. These were chosen because they are commonly used on crops in the region...

The research appeared in the same month as a study based in Indiana, USA, which correlated glyphosate herbicide exposure with shortened pregnancy length.

Accès au document

Soutien à la Marche des Cobayes

06/06/2018

Le CRIGEN soutient cette manifestation "Marche Vérité et Justice pour la Santé Environnementale." qui se tiendra du 1er mai au 30 juin 2018 concernant la crise sanitaire que représente l'explosion des maladies chroniques (cancers, diabète du type 2, obésité, malformations néonatales, troubles de la procréation, troubles neuro-développementaux, métaboliques, hormonaux...).

Accès au document

Ecotox / Colloques

Les prochains colloques sont signalés sur le site ECOTOX accès au site

Merci de nous signaler ceux que nous avons pu oublier

En voici la liste :

2018/07/21-25 19th International Conference on Heavy Metals in the Environment (ICHMET2018)
2018/08/26-30 ISES-ISEE Annual meeting "Addressing Complex Local and Global Issues in Environmental
2018/08/27-31 Ecole thématique "Transition écologique et environnement urbain" - Ecce Terra
2018/09/02-05 Eurotox 2018
2018/09/05-07 Ozone and Advanced Oxidation Solutions for Emerging Pollutants...
2018/09/12-14 10th European Conference on Pesticides and Related Organic Micropollutants in the Envi
2018/09/13 Une Europe agroécologique est-elle possible ?
2018/09/17 Colloqu'eau champ - Transferts vers les eaux Comprendre les dynamiques pour des pratiques agro-écologiques -
2018/09/24-27 ISTRO 2018 PARIS
2018/09/28 Human biomonitoring in Europe
2018/09/30-2018/10/03 Canadian Ecotoxicity Workshop | 45th CEW 2018 - Vancouver, BC - Sept. 30 - Oct
2018/10/04-05 Environmental Toxicology and Biological Systems
2018/10/11 Journée SOL & SUBSTRAT 2018 -
2018/10/11-13 Forum SEM 2018 Sante Environnement Molecules
2018/10/16-17 Colloque "CHLORDECONE-SANTE-ENVIRONNEMENT" appel à contributions
2018/10/21-26 - ICHA -8th international conference on harmful algae
2018/10/22-25 Sfecologie. International Confererence on Ecological Sciences -
2018/10/23-24- SETAC Science Symposium- Extrapolation of effects across biological levels

2018/10/24-25 Biocides Day 2018 - - ECHA - Helsinki
2018/11/08 "Qualité biologique des sols urbains - De la boîte noire à la trame brune" -
2018/11/14 Antibiorésistance : enjeux et besoins en recherche et innovation
2018/11/14-15 « Enjeux sur le sol : les dispositifs de longue durée pour répondre aux questions d
2018/11/19-23: Micro 2018 Fate and Impact of Microplastics: Knowledge, Actions and Solutions
2018/12/04-06 Soil Security and Planetary Health Conference - Sydney. Call for papers
2018/12/10-13 Functionnal Ecology Conference -
2019/05/05-09 ICOBTE 15th International Conference on the Biogeochemistry of Trace Elements (ICOBTE)
2019/05/26-30 SETAC Helsinki - SETAC Europe 29th Annual Meeting

Une Europe agroécologique est-elle possible ?

Une conférence organisée par l'Iddri le 13/09/2018 à l' l'occasion de la sortie du rapport issu du projet TYFA - Ten Years for Agroecology in Europe - présentant un scénario de transition agroécologique pour l'Europe à l'horizon 2050. Avec des réactions de : Philippe Mauguin, PDG de l'Inra ; Olivier de Schutter, co-chair d'IPES-Food et ancien Rapporteur spécial de l'ONU sur le droit à l'alimentation ; et Dominique Potier, député de Meurthe & Moselle et rapporteur du projet Ecophyto.

Accès au document

SETAC Helsinki – SETAC Europe 29th Annual Meeting

Session proposals can be submitted until **15 August 2018**. After this, all session proposals will be evaluated by the Scientific Committee. End of September 2018, session proposers will be informed if their session is selected to be included in the call for abstracts. The scientific programme consists of **7 tracks for parallel sessions.**

Accès au document

ISES-ISEE Annual meeting Addressing Complex Local and Global Issues in Environmental Exposure and Health

The Joint Annual Meeting of the International Society of Exposure Science and the International Society for Environmental Epidemiology (ISES-ISEE 2018) will address complex, locally and globally significant topics relevant to exposure science and environmental epidemiology...

Extraits du programme: Mobilizing Data for Healthy Environments: Platforms Facilitating Health and Environmental Exposure Linkage. Multi-Response and Multi-Pollutant Models for Environmental Exposure and Health: From Gap-Filling to Decorrelating Structure in Data. Novel Methods for Assessing Complex Exposure Mixtures in Environmental Epidemiology. New Approaches for Environmental Health Impact Studies: Assessing Human Health Risks from Chemical and Non-Chemical Stressors

Accès au document

Forum SEM 2018 Sante Environnement Molecules

Forum organisé du 11 au 13/10/2018 par le Pôle scientifique de Rovaltain à Valence

Le SEM est organisé autour de 4 tables-rondes :

-Métrologie environnementale avec la participation du Ministère de la Tran-sition Ecologique et Solidaire et du Pr Kristin SCHIRMER de l'Ecole Polytech-nique de Lausanne.

-Résistance aux antibiotiques en présence de Jean-Yves MADEC de l'ANSES et de Sylvie NAZARET, chercheur au CNRS.

-Substances préoccupantes, plastiques et recyclage où interviendra le Dr Jacques RAGOT du groupe COVESTRO.

-Pesticides et alternatives à laquelle contribueront Jacques TRANIER, directeur général de Vinovalie et Philippe IMBERT du groupe CASINO.

+ ateliers thématiques sur la métrologie des perturbateurs endocriniens, les enjeux liés aux microplastiques, la qualité de l'air intérieur ou encore l'écotoxicologie microbienne ECOTOXICOMIC

Accès au document

Antibiorésistance : enjeux et besoins en recherche et innovation

Ce colloque interministériel organisé le 14/11/2018 dans le cadre de la journée européenne d'information sur les antibiotiques,par les ministères chargés de la Santé, de l'Agriculture, de la Recherche et de l'Environnement se tiendra la journée du mercredi 14 novembre 2018 au ministère des solidarités et de la santé.

Les modalités d'inscription en ligne et le programme de la journée seront diffusés début septembre.

Environmental Toxicology and Biological Systems

16th Annual Meeting on Environmental Toxicology and Biological Systems, will be organized in London UK around the theme "Evincing and Repairing the Imbalanced Tox-Eco System" 2018/10/04-05

Submit your abstract to any of the mentioned tracks.

Track 1: Environmental Science
Track 2: Ecology
Track 3: Toxicology
Track 4: Pollution and its Controlling Measures
Track 5: Occupational Health and Safety
Track 6: Life Sciences
Track 7: Biology

Track 8: Bio Medical Science
Track 9: Biotechnology
Track 10: Methods of Toxicity Testing
Accès au document

15th Euro-Global Summit on Toxicology and Applied Pharmacology

Berlin, 2018/07/02-04, Theme: Unfold and Experience the Enigma in the World of Toxicology

Accès au document

Ouvrages / rapports/ Actes de Congrès

Présentations au colloque Les apports de la génomique à l'agroécologie

Les présentations sont en ligne, en particulier celles de la session **1 : Bioagresseurs**

Laure KAISER-ARNAULD : projet ABC-PAPOGEN - Adaptation en lutte biologique - Génomique des populations de parasitoïdes

Sophie THEVENON projet AATTOL - Caractérisation des bases moléculaires de la tolérance à la Trypanosomose Animale Africaine : analyse conjointe des transcriptomes de l'hôte bovin et du parasite

François DELMOTTE : projet GANDALF - Génomique et adaptation des traits de vie des champignons impliqués dans les interactions plante-pathogène

Muriel VIAUD : projet Herbifun - Les champignons pathogènes des plantes, une source de nouveaux herbicides

Accès au document

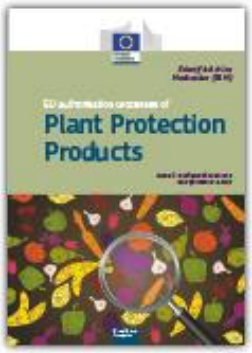
Regulation (EC) 1107/2009 on the placing of plant protection products on the market - EU Law and Publications

Rapport d'évaluation de la règlementation. Published: 2018-06-05. Corporate author(s): Directorate-General for Parliamentary Research Services. 588 p.

This European Implementation Assessment found that the above objectives, while largely relevant to real needs, are not being achieved in practice. In particular, implementation of the main instruments of the regulation – substance approval, plant protection products authorisation and enforcement of the regulatory decisions taken in the frame of the approvals and authorisations, is problematic, which also affect other related EU policies.

Accès au document

Authorisation processes of plant protection products from a scientific point of view - EU Law and Publications



Group of Chief Scientific Advisors: scientific opinion 5. Brussels, 4 June 2018. 76p.

This scientific opinion responds to a request from the European Commission formulated by Commissioner Vytenis Andriukaitis (Health and Food Safety) for scientific advice on how to render the current EU dual system for approval and authorisation of plant protection products (PPPs), more transparent, effective and efficient. PPPs are more commonly referred to as 'pesticides'. The advice takes the form of several recommendations. Although recognising that the EU has made significant progress in the effectiveness of its authorisation system for PPPs, the Group of Chief Scientific Advisors feels there is room for improvement regarding: clarity on protection goals and their communication; structural aspects of the system concerning who does what and when; impacts of widespread and prophylactic use of PPPs on the environment; post-market vigilance; sharing of knowledge and the capacity of expertise; availability and quality of pre-market studies; ways to address hazards, risks, costs and benefits; and preventing the misuse of science in value-based disagreements.

Accès au document

EU publication: Recipe for change

An agenda for a climate-smart and sustainable food system for a healthy Europe: report of the FOOD 2030 expert group.

A group of European Commission (EC) appointed experts recommend orientations for food and nutrition security research and innovation in the years to come. The report calls for a Research, Innovation and Investment Strategy (RI&IS) in line with the EC FOOD2030 initiative to deliver on four priorities: nutrition for sustainable and healthy diets; climate smart and environmentally sustainable food systems; circularity and resource efficiency of food systems; innovation and empowerment of communities.

Accès au document

SETAC Europe 28th Annual Meeting abstract book

The poster and platform presentations are now available online! (541 pages)

Download the SETAC Rome abstract book. 352 A biology-based model to analyze growth data of earthworms exposed to copper at different development stages S. Bart, J. Amossé, C. Mougin, A. Péry, INRA AgroParisTech; C. PELOSI, INRA

Accès au document

Ecosystem Services Provided by the Little Things That Run the World

Open access peer-reviewed chapter mis en ligne en Juin 2018. 37 pages.

Authors: Olga Maria Correia Chitas Ameixa, António Onofre Soares, Amadeu M.V.M. Soares and Ana I. Lillebø. DOI: 10.5772/intechopen.74847

Extraits du Résumé : ... After an extensive revision of the available literature, we used a rule-based approach to assess the provisioning, regulating and maintenance, and cultural services delivered by insects. We followed the Common International Classification of Ecosystem Services (CICES) and identiied several potential indicators that may help underpin the mapping and valuation of the services delivered by insects.

From our search, we extracted a total of 73 indicators, divided as 17 Provisional indicators, 27 Regulation and Maintenance indicators, and 29 Cultural indicators

Accès au document

ANSES - Rapport annuel 2017

Actualités ANSES 02/07/2018

Dans un contexte d'élargissement de ses compétences, l'Anses consolide son positionnement pour protéger la santé de tous. Avec un champ d'actions qui touche l'ensemble des expositions auxquelles peut être soumise la population au quotidien, l'Agence confirme ses capacités d'expertise scientifique et sa mission d'évaluation des risques dans les situations d'incertitudes.

Accès au document

Report of the 8th biopesticides expert group seminar on niche uses of highly specific biocontrol products

OCDE OEDC Series on Pesticides No. 95 March 2018

This report summarises the discussion and outcomes of an OECD Expert Group on BioPesticide (EGBP) seminar on niche uses of highly specific biocontrol products (june 2017 Paris)

... The seminar focused on process to make recommendations for improvements to the **registration of highly specific biocontrol products**...

Derniers avis de l'Autorité environnementale sur la révision du programme d'actions régional nitrates

Révision du programme d'actions régional nitrates de la région Grand-Est (30/05/2018)

- de la région Normandie (30/05/2018)

- de la région Hauts-de-France (16/05/2018)

- de la région Bretagne (30/05/2018)

Révision du programme d'actions régional nitrates de la région Nouvelle Aquitaine (16/05/2018)

Accès au document

CGEDD - Évaluation des impacts d'une interdiction d'utilisation de la créosote en France

Rapport n°010963-01 du CGEDD-(Conseil général de l'environnement et du développement durable) - Ministère de la Transition écologique et solidaire. Auteur : Catherine Mir, Éric Rebeyrotte, 04/05/2018

La créosote est un goudron destiné à imprégner le bois pour le rendre résistant aux moisissures et aux insectes. Son emploi pour cet usage biocide est ancien, mais sa composition à base d'hydrocarbures aromatiques polycycliques (HAP) la rend présumée reprotoxique et cancérogène, persistante, **toxique pour l'environnement et bioaccumulable**...

Accès au document

Stratégie nationale de santé 2018-2022

Extrait du sommaire :

B. Promouvoir des conditions de vie et de travail favorables à la santé et maîtriser les risques environnementaux

Rapport de 57 pages Ministère des solidarités et de la santé

p.20 Réduire l'exposition à des conditions d'habitat indignes et aux **pollutions intérieures**

p.21 Promouvoir la santé au travail, développer une culture de prévention dans les milieux professionnels et réduire la fréquence et la sévérité des pathologies liées aux conditions de travail

p.22 **Réduire l'exposition de la population aux pollutions extérieures** et aux substances nocives pour la santé...

p 27 Préserver l'efficacité des antibiotiques

Accès au document

Comment se porte la nature en France en 2018 ?

L'observatoire national de la biodiversité (ONB) publie en Juin 2018 son bilan 2018, une synthèse de référence pour mettre en perspective les derniers faits marquants concernant l'état de la biodiversité et les menaces qui pèsent sur elle.
En savoir plus : indicateurs-biodiversite.naturefrance.fr

Accès au document

Fate And Prediction Of Environmental Chemicals In Soils, Plants, And Aquatic Systems - CRC Press Book

April 16, 2018 by CRC Press Reference - 301 Pages

Focuses on the chemical persistence and ecotoxicological behavior of pesticides in soil, water, and plants

Table of Contents

1. Transport and Transformation of Pesticides in Soil 2. Prediction of Uptake of Some Aromatics and Pesticides by Soil 3. Accelerated Degradation of Soil Insecticides: Comparison of Field Performance and Laboratory Behavior 4. Adsorption of 2,4-D on Organoclays 5. Competitive Adsorption of 2,4-D and Phosphate in Soils 6. Adsorption of Two Weak Acids on Geothite 7. Adsorption of Maleic Hydrazide on Mineral Surfaces 8. The Euro-Soil Concept as a Basis for Chemicals Testing and Pesticide Research 9. Effect of Polymers on Adsorption of Flumequine on Kaolinite 10. Groundwater Contamination by Pesticides: Field Experiments in Shallow and Deeper Groundwater 11. Potential of Fluorescence Spectroscopy in the Study of Interactions of Pesticides with Natural Organic Matter 12. Retention of Atrazine by Humic Substances of Different Natures 13. The Binding of Pesticide Residues to Natural Organic Matter, Their Movement and Their Bioavailability 14. Conversion of Lindane to HCH Isomers and HCB in the Agricultural Field Conditions 15. Ecological Test Procedures for Organic Xenobiotics in Terrestrial Systems 16. Role of Microbial Competition on Activity of 2,4-D Degrading Alcaligenes xylosoxidans Strain Introduced into Fumigated Soil 17. Thermodynamic Properties of Halogenated Dibenzo-p-Dioxins, Dibenzofurans, and Pesticides 18. New Results and Considerations on the Bioconcentration of the Superlipophilic Persistent Chemicals Octachlorodibenzo-p-Dioxin (OCDD) and Mirex in Aquatic Organisms 19. Behavior of Soil Microflora in Pesticide Degradation 20. Modeling the Uptake of Organic Compounds into Plants 21. Influence of Soil-Water Ratio on Adsorption-Desorption Kinetics of Isoxaben in Soil 22. Toxicity and Metabolism of Cypermethrin in Earthworms 23. Determination of the Rate Constant kOH - Air Using Freon 113 as an Inert Solvent 24. Abiotic Degradation Pathways of Selected Pesticides in the Presence of Oxygen species in Aqueous Solutions

Accès au document

Introduction to Environmental Toxicology: Molecular Substructures to Ecological Landscapes, Fifth Edition

Fifth Edition - CRC Press Book dec 2017

Table of Contents

Chapter One: Introduction to Environmental Toxicology. Chapter Two: Frameworks and Paradigms for Environmental Toxicology. Chapter Three: Overview of Toxicity Testing Methods. Chapter Four: The Analysis of Exposure-Response. Chapter Five: The Fate and Transport of Contaminants. Chapter Six: Uptake and Modes of Action. Chapter Seven: Modification in Toxic Responses, Mixtures and Climate Change. Chapter Eight: Inorganic Gaseous Pollutants. Chapter Nine: Fluoride as a Contaminant of Developing Economies. Chapter Ten: Metals. Chapter Twelve: Biotransformation, Detoxification, and Biodegradation. Chapter Thirteen: Ecological Effects from Biomarkers to Populations. Chapter Fourteen: Ecological Effects: Community to Landscape Scales of Toxicological Impacts. Chapter Fifteen: Ecological Risk Assessment. Index.

Accès au document

Ecotoxicology: Perspectives on Key Issues

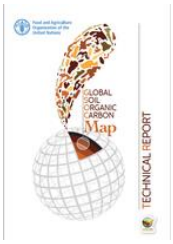
May 18, 2018 by CRC Press 295 Pages Reviews

Table of Contents

What Can Proteomics and Metalloproteomics Add to Aquatic Toxicology and Public Health?
Biodiversity and Ecotoxicology: The Case of Loricariidae Fish
Ecophysiology: Implications of Climate Change Applied to Aquatic Ecotoxicology
Marine Mammals as Environmental Sentinels Focusing on Mercury Contamination
Ecotoxicology of Pharmaceutical and Personal Care Products (PPCPs)
Risk Assessment of Organic UV Filters in Aquatic Ecosystems
Persistence of Organic Pollutants: Half Life or Mineralization and its Factors of Influence
Implementing the Current Knowledge of Uptake and Effects of **Nanoparticles** in an Adverse Outcome Pathway (AOP) Framework

Development of a Management Tool for Environmental Assessment of Organo-nitrogen Pesticides in Surface Water from Everglades and Biscayne National Parks and Big Cypress National Preserve, South Florida, USA
Conceptual Challenges in the Translation of Toxicological Research into Practice: Low-Dose Hypothesis and Dose-Response Non-monotonicity
Conventional Wastewater Treatment Plants as a Discharge and Source Point for Biota Exposure to Micro-pollutants
Monitoring of Two Taste and Odor Causing Compounds in a Drinking Water Reservoir
Biomarkers of Susceptibility for Human Exposure to Environmental Contaminants
Accès au document

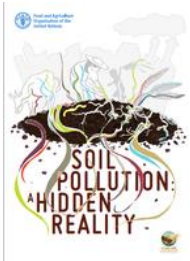
FAO - Global Soil Organic Carbon map: Technical Report



Rapport publié en 2018, 48 pages de texte puis tables par pays

Accès au document

FAO Report sounds alarm on soil pollution: Soil pollution, a hidden reality



Communiqué de presse Présentation du rapport de la FAO : Soil Pollution: A Hidden Reality (156 pages)

2 May 2018, Rome - Soil pollution poses a worrisome threat to agricultural productivity, food safety, and human health, but far too little is known about the scale and severity of that threat, warns a new FAO report released today at the start of a global symposium.

... Studies conducted so far have largely been limited to developed economies, so there are massive information gaps regarding the full nature and extent of the problem, according to FAO's survey of existing scientific literature...

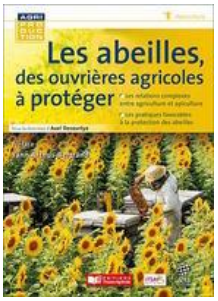
Danger to food and health

Soil pollution ... impacts food security both by impairing plant metabolism and thus reducing crop yields, as well as by making crops unsafe for consumption. Pollutants also directly **harm organisms that live in soil and make it more fertile**.

And of course soil contaminated with dangerous elements (for example, arsenic, lead, and cadmium), organic chemicals like PCBs (polychlorinated biphenyls) and PAHs (polycyclic aromatic hydrocarbons) or **pharmaceuticals** such as antibiotics or endocrine disruptors pose serious risks to human health...

Accès au document

INRA - Les abeilles, des ouvrières agricoles à protéger



Editions France Agricole, 2018, 295 pages – 45 euros

Ce livre fait un état des lieux des connaissances et démontre que face à l'urgence de changer radicalement de pratiques, des mesures concrètes issues de la concertation entre scientifiques, apiculteurs et agriculteurs, permettent d'enrichir la flore et de réduire les risques d'intoxication des abeilles.

20 auteurs dont plusieurs de l'Inra : Cédric Alaux, Jean-François Odoux, Fanny Rhoné, Bernard Vaissière

Accès au document

Santé-environnement : HEAL's vision for Europe leading the way towards a non-toxic environment

Communiqué du réseau Health and Environment Alliance (HEAL) 07/06/2018 qui présente son rapport (12 p.). Pour une Europe à la tête d'une transition vers un environnement non toxique (ci jointe) : Vision for Europe leading the transition towards a non-toxic environment and called on the European Commission to finally draw its long promised strategy for a non-toxic environment. For that, HEAL recommends 12 priorities actions.

Générations futures qui fait partie du réseau présente ce rapport en ces termes : Le document de vision résume nos positions sur les aspects problématiques actuels de l'utilisation de produits chimiques nocifs et suggère 12 actions prioritaires pour construire une **stratégie ambitieuse de transition vers un environnement non toxique, qui réduit réellement l'exposition des personnes aux produits chimiques nocifs.**

Accès au document

INSPIRATION: Europeans Strategic Research Agenda for Integrated Spatial Planning, Land Use and Soil Management

2018/05/30 : La version publique du rapport a été mise en ligne. le contact en France est le BRGM

Le projet INSPIRATION résulte d'une action du programme H2020, d'une durée de 3 ans (2015-2018) coordonné par l'Agence de l'Environnement allemande.

Il a permis d'élaborer un **agenda stratégique de recherche européen** (SRA) pour une gestion des sols et une utilisation du territoire **respectueuse de l'environnement,** socialement acceptable et économiquement abordable.

Un millier de questions de recherche ont été identifiées et regroupées selon 4 thèmes : la demande en ressource naturelle, les fonctions du capital naturel, la gestion des territoires et **les impacts à des échelles globales, européennes et locales.**

Parmi les 17 thèmes de recherche identifiés **:**
1 Évaluation environnementale intégrée et surveillance des sols en Europe
-2 Reconnaître la valeur de l'écosystème dans l'utilisation des terres agricoles
-5 Scénarios intégrés pour une bonne prise en compte du nexus sol-eau-alimentation dans les défis sociétaux
-6 Évaluation de l'efficacité du nexus sol-sédiment-eau
I-8 Economie circulaire appliquée à la gestion des territoires
-12 Développement urbain respectueux de l'environnement et socialement acceptable
-14 «Contaminants émergents» dans le sol et les eaux souterraines
-15 Gestion durable et valorisation des terres dégradées
Accès au document

Risques et bénéfices des produits phytopharmaceutiques à base de néonicotinoïdes et de leurs alternatives

L'ANSES présente sur son site l'avis publié en Mai 2018 en 3 tomes : AVIS et RAPPORT de l'Anses "Risques et bénéfices relatifs des alternatives aux produits phytopharmaceutiques comportant des néonicotinoïdes"

L'Anses recommande donc d'accélérer la mise à disposition de méthodes alternatives, efficaces et respectueuses de l'Homme et de l'environnement, pour la protection et la conduite des cultures.

Accès au document

Chlordécone : Une cartographie des sols contaminés réalisée en Martinique

Une cartographie des sols de Martinique contaminés par la chlordécone, un insecticide cancérogène, a été mise en ligne mercredi à Fort-de-France, a-t-on appris auprès de la préfecture de Martinique.

La cartographie est visible sur le site www.geomartinique.fr ou sur le site de la préfecture http://www.martinique.pref.gouv.fr/.

Ecotox / Revue de presse

Une enquête judiciaire ouverte à la suite de traces de glyphosate

L'USINENOUVELLE **08/07/2018**

Selon le leader français du conditionnement et de la vente de miel, Famille Michaud Apiculteurs, près de 12% de la production de miel est actuellement contaminée par ce fameux pesticide controversé."...

L'un d'entre eux, Sylvère Obry s'est vu rejeté plus de 900 kilos de produit en juin dernier. Face à ce manque à gagner, il a, avec le soutien de l'association des apiculteurs de l'Aisne, porté plainte contre Bayer, le nouveau propriétaire de Monsanto et principal producteur du pesticide...

Accès au document

Etats-Unis : le premier procès du Round Up démarre à San Francisco

Chalenges 08/07/2018

Le Round Up est-il cancérigène ? Monsanto a-t-il volontairement caché la dangerosité de son désherbant au glyphosate ? Telles sont les questions qu'un tribunal américain va devoir examiner à partir de lundi, saisi par un particulier atteint d'un cancer en phase terminale. Si des centaines voire des milliers de procédures sont en cours aux Etats-Unis contre le géant de l'agrochimie, la plainte de Dewayne Johnson, un Américain de 46 ans qui a vaporisé du Round Up pendant plus de deux ans, est la première concernant ce produit et ses possibles effets cancérigènes à aboutir à un procès.

Le procès s'est officiellement ouvert mi-juin avec la désignation d'un juge

Accès au document

Professeur Bernard Salles : "Aujourd'hui, on ne peut pas dire que manger du maïs OGM provoque des cancers chez le rat"

Entretien de Professeur Bernard Salles de l'INRA, par Patrick Cohen sur Europe 1 à 07h56, le 04 juillet 2018

B Salles présente les résultats, à paraitre, du projet G-TwYST. Un communiqué de presse a été diffusé le 29 avril sous le titre CONCLUSIONS AND RECOMMENDATIONS et est copnsultable en ligne.

Information reprise dans de nombreux médias, ce sujet étant très controversé.

Les média réagissent : Les mais ogm ne sont pas toxiques contrairement à ce qu'a fait croire GE Seralini www.seedquest. 04/07/2018

l'Association Française des Biotechnologies végétales (AFBV) se félicite que les grands medias s'emparent enfin des résultats de ces études européennes et françaises qui avaient été communiqués dès le 31 mai 2018 par l'AFBV et qui invalident les analyses de G.E. Séralini : les maïs OGM ne sont donc pas toxiques. La polémique scientifique est terminée (voir dossier de presse joint). En vérité, c'était une *fake news* !

Voir aussi l'article du Figaro du 03/07/2018 **: Lien entre OGM et cancer : l'étude était fausse**

En 2012, une étude menée par Gilles-Éric Séralini avait trouvé un excès de tumeurs chez des rats nourris avec du maïs génétiquement modifié. Six ans plus tard, une étude plus rigoureuse invalide ces résultats inquiétants.

Quatre ans après son lancement, un projet de recherche européen visant à évaluer les risques pour la santé d'un type de maïs génétiquement modifié - le projet «G-TwYST» - vient de livrer ses conclusions. Les données brutes ne seront publiées qu'à la fin de l'année, mais un rapport divulgué fin avril permet d'en apprécier les grandes lignes: «Aucun risque potentiel pour les humains et les animaux n'a été identifié.»

Voir aussi : **GM Watch: EU funded rat feeding studies do NOT refute the Seralini study** winewaterwatch 02/07/2018

Accès au document

Le cadmium, ce « tueur » caché dans les engrais qui divise l'Europe

Le Monde, 16.03.2018

La Commission veut limiter la présence de ce métal cancérogène dans les fertilisants phosphatés. L'Espagne s'y oppose fortement, la France brille par sa discrétion.

Accès au document

Le consommateur français est-il condamné aux cerises d'importation (et aux pesticides) ?

atlantico.fr 17/06/2018

Monnaie d'échange diplomatique, devoir d'exemplarité vis-à-vis de l'électeur-consommateur pendant qu'une concurrence illégale (selon les règles environnementales) est organisée par l'Etat lui-même, constat d'échec des états généraux de l'alimentation quant au partage de la valeur ajoutée… La cerise concentre sur sa production la majorité des problèmes connus par l'agriculture française en ce moment. Et par prolongement, le consommateur français figure également parmi les grands lésés de l'histoire.

Pour comprendre ce qui ne va pas aujourd'hui dans l'agriculture française, le cas de la cerise est édifiant !

Accès au document

Less water pollution from agriculture, but worrying hotspots remain and need stronger action

Communiqué de presse de la commission 04/05/2018

The latest Commission Report on the implementation of the Nitrates Directive shows that water pollution caused by nitrates has decreased in Europe in the last two decades, **but in sectors such as agriculture good practices need to be further extended.**

... Thanks to the EU Nitrates Directive, nitrates concentrations have fallen in both surface and groundwater...

Agricultural pressures on water quality are still increasing in some areas, as some agricultural practices are heavily dependent on **fertilisers** that can cause local water quality to deteriorate...

Several Member States and regions still have a high percentage of nitrate-polluted and eutrophic waters. Based on the reported data, the highest percentage of polluted groundwater stations are found in Malta, Germany, and Spain. Regarding fresh water the highest percentage is found in Malta, Belgium and the United Kingdom...

Overall, the quality of national action programmes has improved, with tightened measures and improved methodologies to reach balanced fertilisation and **sustainable manure management.**

Some Member States are developing **innovative manure processing technologies.** However, challenges remain, such as how to properly take into account all nutrient inputs from different sources, and **how to prevent nutrient losses to water and air through effective manure management.**

- Nitrates directive implementation report
- Nitrates directive implementation report - staff working document
- Nitrates directive website

Accès au document

EU budget: Commission proposes to increase funding to support the environment and climate action

Communiqué de presse 01/06/2018

The LIFE programme is among the EU funding programmes for which the Commission is proposing the largest proportional increase, with a budget of €5.45 billion between 2021 and 2027.

... The main features of the new LIFE programme are:

An increased focus on clean energy: ....

An increased focus on nature and biodiversity: The new LIFE programme will support projects that promote best practices in relation to nature and biodiversity, as well as new, dedicated 'Strategic Nature Projects' for all Member States to help mainstream nature and biodiversity policy objectives into other policies and financing programmes, such as agriculture and rural development, ensuring a more coherent approach across sector.

Continued support of the circular economy and climate change mitigation: The new programme will continue to supportimportant EU policy objectives such as the transition to a circular economy, p**rotecting and improving the quality of the EU's air and water,** implementing the 2030 energy and climate policy framework and meeting the Union's commitments under the Paris Agreement on Climate Change.

Accès au document

EU targets 10 single-use plastic products in new proposals

euwid-recycling 28/05/2018

The European Commission presented news rules in Brussels on Monday intended to reduce plastic marine litter. According to the Commission, the rules target 10 single-use plastic products, which together account for 70 per cent of the plastic waste found along European beaches and in its seas. A variety of measures are proposed, including a ban on plastic cotton swabs, disposable cutlery, plates, straws, drink stirrers and balloon sticks. There are already affordable non-plastic alternatives to these products, meaning that they could be removed from the market, the Commission explained.

Accès au document

The new bioplastics developed in STU decompose in both soil and water

Un laboratoire slovaque a déposé un brevet pour un bio plastique de seconde génération biodegradable et biosourcé.

Accès au document

Stéphane Travert promet une loi sur l'interdiction du glyphosate d'ici 2021 en cas d'absence d'avancée

Challenges.fr le 06.06.2018

... Une loi pour interdire l'herbicide controversé glyphosate sera examinée par le Parlement en cas d'absence d'avancée sur le sujet d'ici à 2021, a affirmé mercredi 6 juin le ministre de l'Agriculture, Stéphane Travert. L'Assemblée nationale a rejeté fin mai des amendements qui visaient à graver dans la loi agriculture et alimentation cette sortie du glyphosate en 2021, le gouvernement voulant trouver d'abord une solution de remplacement pour les agriculteurs...

Après la décision de l'Union européenne en novembre de renouveler la licence de l'herbicide pour cinq ans, Emmanuel Macron avait promis que la substance, principe actif du Roundup de Monsanto et cancérogène probable, serait interdite en France "dès que des alternatives auront été trouvées, et au plus tard dans trois ans".

Accès au document

Revue de presse / Associations

EDC-Free Europe coalition urges European Commission to protect people and environment from hormone disruptors

Extrait du site de l'association 15/05/2018 qui demande à l'Union Européenne une stratégie en matière de perturbateurs endocriniens.(declaration de 8 pages en PJ)

Read our demands for an European strategy on EDCs : extrait

L'UE a l'obligation de protéger ses citoyens et l'environnement face aux atteintes des perturbateurs endocriniens ....Nos huit demandes pour une stratégie européenne Perturbateurs endocriniens...

Nous appelons le Président de la Commission européenne Jean-Claude Juncker à publier une Stratégie complète avant l'été 2018. Elle comprendrait un plan d'action ayant pour objectif un **haut niveau de protection de la santé humaine** en particulier des groupes vulnérables, et de l'environnement, des activités tangibles répondant à des objectifs clairs, un calendrier et un budget adéquat...

Parmi les propositions : accélérer l'évaluation des PE pour mettre en œuvre **leur restriction dans les pesticides et les biocides**...

Accès au document

Santé-environnement : HEAL's vision for Europe leading the way towards a non-toxic environment

Communiqué du réseau Health and Environment Alliance (HEAL) 07/06/2018 qui présente son rapport (12 p.) Pour une Europe à la tête d'une transition vers un environnement non toxique (ci jointe) : Vision for Europe leading the transition towards a non-toxic environment and called on the European Commission to finally draw its long promised strategy for a non-toxic environment. For that, HEAL recommends 12 priorities actions.

Générations futures qui fait partie du réseau pérsente ce rapprt en ces termes : Le document de vision résume nos positions sur les aspects problématiques actuels de l'utilisation de produits chimiques nocifs et suggère 12 actions prioritaires pour construire une **stratégie ambitieuse de transition vers un environnement non toxique, qui réduit réellement l'exposition des personnes aux produits chimiques nocifs.**

Accès au document

Glyphosate : la trahison du gouvernement

Communiqué inter-associatif - Générations Futures 30/05/2018

Le projet de Loi Agriculture et Alimentation débattu à l'Assemblée nationale offrait l'opportunité de concrétiser la promesse du Président Emmanuel Macron d'interdire le glyphosate en France d'ici fin 2020. ...Les députés réunis en première lecture autour du projet de Loi sur l'Agriculture et l'Alimentation ont suivi le Gouvernement en rejetant les amendements visant à inscrire dans cette loi la sortie du glyphosate...

... 34 organisations de la société civile (1) ont lancé, la seaine dernière, une pétition pour que l'engagement du Président soit tenu. Plus de 200 000 citoyens ont déjà signé cet appel.

... Pour les 34 organisations cosignataires, ce vote et la position du gouvernement sont un déni de parole donnée. Ces organisations restent, plus que jamais, mobilisées pour que le principe de précaution soit respecté...

Accès au document

Glyphosate dans du miel : des apiculteurs portent plainte contre Monsanto

leparisien.fr 07/06/2018

Le syndicat apicole de l'Aisne a porté plainte ce jeudi à Lyon contre le fabriquant d'herbicide Monsanto pour « administration de substances nuisibles ». Il dénonce un danger pour la santé...

Accès au document

FNSEA - Face aux incohérences, les agriculteurs se mobilisent

Communiqué de la FNSEA le 31/05/2018 en réaction à la loi Agriculture et Alimentation

Extrait : Alors que le projet de loi Agriculture et Alimentation vient d'être adopté en première lecture par les députés, sur le terrain, l'heure est à l'incompréhension. Certes, ce projet instaure un nouveau code de la route plus favorable à une négociation des prix qui tienne compte des coûts de production des agriculteurs.

On nous demande de garantir une alimentation saine, sûre, **durable** et accessible à tous, et dans le même temps le Gouvernement cautionne en laissant négocier des accords commerciaux avec des pays qui ne partagent pas nos exigences sociales**, environnementales et sanitaires** ou donne son aval à des importations de matières premières pour le moins peu durables...

Les agriculteurs se voient imposer une **compétition déloyale…**

Nota cet argument est également mis en avant dans le communiqué de la FNSEA du 01/06 cncernant la PAC :

Extrait : ... La Commission ne réalise pas que **la pression environnementale devient insupportable pour les agriculteurs** dans l'exercice de leur métier alors qu'ils ont déjà fait, continuent et continueront à faire beaucoup d'efforts en la matière. Elle ne réalise pas non plus l'incohérence totale d'une telle proposition avec la signature de plusieurs traités qui **ouvre notre marché à des produits ne respectant pas les mêmes standards de production...**

Accès au document

Des apiculteurs lancent un cri d'alarme devant Nicolas Hulot

agrisalon 07/06/2018

« Les abeilles meurent » : des apiculteurs ont lancé un cri d'alarme jeudi à Paris concernant des taux de mortalité « d'une exceptionnelle gravité » dans leurs ruches et reçu le soutien d'un invité surprise, le ministre Nicolas Hulot...

... Des élus, comme le député européen EELV Yannick Jadot, la députée et ex-ministre de l'écologie Delphine Batho ou encore Matthieu Orphelin (député LREM) sont venus soutenir les apiculteurs à Paris. D'autres rassemblements ont eu lieu à travers la France....Voir aussi l'article du Monde :

Mobilisation nationale des apiculteurs face à l'hécatombe des abeilles 07/06/2018

Accès au document

Dossier L'héritage toxique : Enquête sur la dépollution industrielle

La revue Politis consacre en Juin 2018 un dossier à la pollution industrielle.

Pollution industrielle : L'héritage toxique
- La pollution des sols en accusation
- Pollution : Collèges en soins intensifs
- Metaleurop, un passé empoisonné
- Romainville : Du trichlo dans le salon
- Corinne Lepage : « Il faut réparer ce qu'on a détruit au XXe siècle »

Extrait de l'article : La pollution des sols en accusation : À la « fête du trichlo » à Romainville, le 1er juin, ils faisaient la quête dans de petits cercueils : « *Un don pour le cancer ?* » Plusieurs cas de leucémies rares à Montreuil, dans le quartier de la Snem, entreprise spécialisée dans le traitement de pièces métalliques destinées à l'aéronautique (1). Plus de vingt cancers à Romainville dans le périmètre de l'ancien site de l'usine Wipelec. Chrome VI à Montreuil. Trichloréthylène (TCE) à Romainville. Sur quelle surface et jusqu'à quelle profondeur la pollution s'étend-elle sous ces deux villes de Seine-Saint-Denis fortement marquées par leur passé industriel ?...

Accès au document

Du chlordécone retrouvé dans l'eau du robinet en Guadeloupe

Le monde planete 07/06/2018

Les habitants de la commune de Gourbeyre ont consommé de l'eau contaminée en avril et en mai. Le procureur de Basse-Terre, dans le sud de l'île, s'est saisi de l'affaire... Voir aussi l'article du Monde du 07/06/2018 Scandale du chlordécone aux Antilles : « L'Etat a fait en sorte d'en dire le moins possible »

Accès au document

Dans des vignes de Provence, le lombric à la rescousse

sciencesetavenir 06/06/2018

L'arrière d'un pick-up, des kilos de terre humide grouillante de vers : pour donner un coup de pouce à la nature, un vigneron bio des Côtes-de-Provence expérimente l'épandage de lombrics dans ses vignes...

Accès au document

La Commission européenne veut agir contre le déclin des pollinisateurs

Sciencesetavenir.fr 06/069/2018

Vendredi 1er juin 2018, la Commission européenne a proposé une série de mesures pour enrayer le déclin des insectes pollinisateurs. Il s'agit de la toute première initiative de l'Union européenne pour tenter de freiner le déclin des abeilles... Présentation des mesures...

Accès au document

Carrefour veut des emballages 100% recyclables d'ici à 2025

sciencesetavenir.fr 2018/06/03 Carrefour a pour objectif d'utiliser 100% d'emballages recyclables, réutilisables ou compostables pour les produits de la marque de l'enseigne, d'ici à 2025. Leur objectif étant de passer du "jetable à une économie circulaire", ont-ils annoncé jeudi 31 mai 2018, au travers d'un communiqué...

Accès au document

Le tabac tue, mais pas simplement les fumeurs

Les effets des mégots de cigarette sur l'environnement...

.... Les détails du **coût environnemental** du tabac sont révélés dans une étude sur l'épidémie mondiale de tabagisme publiée en 2017 par l'Organisation mondiale de la santé (OMS).

... Des milliards de mégots de cigarettes remplis de produits chimiques toxiques provenant de la fumée du tabac pénètrent chaque année dans l'environnement mondial en tant que déchets. …. Ces déchets contiennent des produits chimiques, notamment de l'arsenic et des métaux lourds, qui peuvent se retrouver dans l'eau. Les mégots de cigarettes se décomposent mais ne sont pas biodégradables...

Les mégots de cigarettes contaminent les écosystèmes et les habitats et empoisonnent la vie marine et d'autres espèces sauvages qui finissent dans nos assiettes.

Accès au document

Bruxelles veut bannir les plastiques jetables

Le monde 28/05/2018

... Lundi 28 mai, dans le cadre de sa politique de réduction des émissions de carbone et de lutte contre l'invasion des mers et des océans par les déchets plastique, l'exécutif européen a rendu publique une proposition de directive visant à réduire « drastiquement » l'utilisation des produits en plastique à usage unique...

Accès au document

U. S. Department of Justice conditionally approves Bayer's proposed acquisition of Monsant

Communiqué de presse de Bayer 29/05/2018

On Tuesday, Bayer obtained conditional approval from the Antitrust Division of the United States Department of Justice (DOJ) for the proposed acquisition of Monsanto. "Receipt of the DOJ's approval brings us close to our goal of creating a **leading company in agriculture,"** said Bayer CEO Werner Baumann...

Bayer will become the sole shareholder of Monsanto Company following the receipt of outstanding approvals... **This is expected to be in approximately two months**.

Accès au document

ECOTOX / Recherche et medias

NanoFASE - nanofase-the-mesocosm-experiments-video-is-out-watch-share-enjoy!

Cette video présente les expériences menées sur des mesocosmes par l'Université de Aveiro, dans le cadre du projet NanoFASE (été 2018). The NanoFASE video includes incredible close-up photography of different ecological systems and organisms. View "Nanomaterials in Mesocosms"

Accès au document

Pourquoi certains oiseaux disparaissent de nos campagnes

Article paru dans la revue Paysans Mai Juin 2018. 4 p.

Télécharger Auteur A Fougeroux membre de l'académie d'Agriculture de France

Au coeur de la polémique qui a suivi la parution des études du CNRS et du MNHN, l'auteur indique que " ces études auraient dû prendre en compte d'autres aspects, le triptique simpliste neonicotinoides, insectes, oiseaux insectivores"

Bien d'autres facteurs interférent... les modifications du paysage agricole... l'artificialisation galopante des sols agricoles... et ses deux corollaires, la fragmentation des habitats et la pollution lumineuse.

Voir aussi l'article de Futura planête Les oiseaux disparaissent de nos campagne ou celui du journal le Monde

Accès au document

Neonics are being ingested by free-ranging animals, U of G study finds EurekAlert Science News

Eurekalert 28/06/2018

Presentation de la publication : Neonicotinoid detection in wild turkeys (*Meleagris gallopavo silvestris*) in Ontario, Canada

Published in Environmental Science and Pollution Research, the study showed that nearly 10 of the 40 wild turkey carcasses tested had detectable levels of neonicotinoids in their livers. Two types of the insecticide were found in some birds.

The researchers also found corn and soybean seeds coated with the insecticide in the digestive system of some birds..... Previous studies have found that neonic-coated seeds cause health risks in partridges, pigeons and quail. Small amounts of the insecticide have been shown to affect body mass, reproductive efforts and perhaps mortality in migratory white-crowned sparrows.

"We need to continue to assess levels of neonics in a variety of wildlife, especially those that may feed off the ground or consume plants and insects and therefore might be more likely to come into contact with them," said Nemeth.

Accès au document

New testing finds synergistic combination leads to toxicity in nanomaterials

Eurekalert. 28/06/2018

University of Oregon chemists and Oregon State University toxicologists found that biocompatible gold nanoparticles and widely used surfactants - each previously considered safe as individual components - become toxic to zebrafish embryos as they combine in a synergistic way.

The synergistic, or multiplicative effect, was discovered when using a new delivery system while testing nanomaterials, the four-member research team noted in a paper placed online April 26 and in print June 26 in ACS Nano.

Accès au document

INRA - Stress et butinage de pollen chez l'abeille

Communiqué de presse INRA Fev 2018

Le stress diminue les performances de butinage de pollen chez l'abeille mellifère.

Selon une étude menée par des chercheurs de l'unité Abeilles et Environnement de l'Inra et de l'Université Macquarie, les abeilles domestiques exposées à un stress voient leur capacité de butinage de pollen diminuer. Ce déficit de pollen pourrait provoquer un déséquilibre

nutritionnel au sein de la colonie et donc impacter son développement. Ces travaux de recherche ont été publiés dans la revue scientifique Journal of Experimental Biology.

Référence : Bordier C., Klein S., Le Conte Y., Barron A., Alaux C. (2018) Stress decreases pollen foraging performance in honeybees. Journal of Experimental Biology, doi: 10.1242/jeb.171470

Accès au document

Fungicide impairs silk production, according to study

Science daily commente la publication **Pyraclostrobin Impairs Energetic Mitochondrial Metabolism and Productive Performance of Silkworm (Lepidoptera: Bombycidae) Caterpillars**. *Journal of Economic Entomology*, 2018

... By testing an agrochemical designed to increase resistance on the mulberry plants used to feed silkworms, a research verified a rise in caterpillars' mortality and reduction in the size of cocoons. Intensive use of pesticides in monoculture systems may be the cause of silkworm crop losses in Brazil.

Accès au document

Ecological systems research: What do disturbances in the system result in?

eurekalert présente cet article paru en 2018 dans Nature Scientific Reports **volume 8**

To better understand the complex effects that disturbances have on ecological systems, the researchers have developed a simple ecosystem in the form of a microbial food web... These mini-ecosystems were subjected to different disturbance events in various experimental arrangements...

Not only the interactions within the food web are important, however: also important is the time factor...

In future studies, the researchers at UFZ will gradually increase the complexity of the ecosystem models and extend them in terms of the microbial services provided, such as **the degradation of toxic substances.**

Voir aussi le communiqué **de presse du Centre for environmental health UFZ**

Accès au document

Ecotox / Antibioresistance

Pesticide resistance: What happens if we run out?

EurekAlert commente l'article paru dans Science: Can we address the sociobiological dilemma of pesticide resistance? **DOI:** 10.1126/science.aar3780

To slow the evolutionary progression of weeds and insect pests gaining resistance to herbicides and pesticides, policymakers should provide resources for large-scale, landscape-level studies of a number of promising but untested approaches for slowing pest evolution. Such landscape studies are now more feasible because of new genomic and technological innovations that could be used to compare the efficacy of strategies for preventing weed and insect resistance.

That's the takeaway recommendation from a North Carolina State University review paper addressing pesticide resistance published today in the journal Science.

Accès au document