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ECOTOX

Bulletin de veille du réseau d'écotoxicologie terrestre et aquatique

N°36, décembre 2018

Réalisé par l'équipe de veille sur la période du 1er novembre 2018 au 31 décembre 2018.
Colette Bertrand, Olivier Crouzet, Christian Mougin et Christine Sireyjol (UMR 1402 EcoSys)
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Edito

Voici notre 36ème bulletin de veille. Vous y trouverez de nombreuses informations en lien avec l'écotoxicologie, la toxicologie et les activités du réseau.

Nous vous informons que la réunion 7 février 2019 autour de l'initiative Recotox (https://www.recotox.eu/) annoncée dans notre précédent bulletin est annulée. Nous la reprogrammerons durant le premier semestre 2019.

Vous trouverez dans ce bulletin une tribune libre présentant la normalisation de méthodes de mesure pour valoriser les résultats de la recherche en écotoxicologie terrestre. Le texte est également disponible sous forme de fiche thématique en téléchargement sur notre site ECOTOX : https://www6.inra.fr/ecotox/Productions/Fiches-thematiques/Fiche-thematique-N-18-Decembre-2018

Les articles de notre Special Issue 2018 de la revue ESPR sont mentionnés dans la rubrique Publication des membres du réseau ECOTOX, et la SI est signalée page 45.

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

L'équipe d'animation du réseau ECOTOX et l'équipe de veille vous présentent leurs meilleurs voeux pour l'année 2019.

Bonne lecture !

Contact : contact-ecotox@inra.fr

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Tribune libre

La normalisation de méthodes de mesure pour valoriser les résultats de la recherche en écotoxicologie terrestre

La surveillance de notre environnement, impacté par les contaminations chimiques, est primordiale pour détecter des dangers, la santé des écosystèmes ou de l'Homme, et pour mener des actions de gestion. L'intérêt des méthodes biologiques pour l'évaluation de la qualité de l'environnement n'est plus à démontrer. Ainsi, de nombreuses méthodes de mesure sont développées par les laboratoires lors de la mise en œuvre de programmes d'expérimentation ou d'observation. Par ailleurs, les développements du commerce international et des exigences de qualité dans les laboratoires conduisent à la nécessité d'une harmonisation de ces méthodes. L'enjeu de programmes de normalisation est donc de valoriser et de diffuser les travaux issus le plus souvent du monde de la recherche, afin de mettre à disposition des normes basées sur des méthodes validées, partagées et acceptées par une communauté internationale, et dont pourront s'emparer la recherche académique ou privée, la société civile...

La normalisation se décline au niveau national (Association française de normalisation : AFNOR), européen (Comité Européen de Normalisation : CEN) et international (Organisation Internationale de Normalisation : ISO).

Il existe de très nombreux groupes de travail en normalisation qui prennent en compte une grande diversité de problématiques. Cette fiche traite spécifiquement de normalisation de méthodes en lien avec la qualité du sol, à l'AFNOR et à l'ISO. Il existe également une activité de standardisation de méthodes d'essais (lignes directrices) au sein de l'Organisation de Coopération et de Développement Économiques (OCDE).

Les principes de l'élaboration des normes internationales

-Les normes répondent à un besoin. Les demandes sont exprimées par la recherche, la réglementation, l'industrie, ou tout autre partie prenante. Ainsi, les scientifiques y voient une forme supplémentaire de valorisation de leurs activités. L'élaboration de normes est de plus en plus considérée par les instances d'évaluation de la recherche. L'intérêt d'une norme est formulé par le demandeur à l'instance de normalisation de son pays, l'AFNOR en France.

-Les normes sont fondées sur une expertise mondiale. Les textes sont proposés sous la forme d'un NWIP (New Work Item Proposal) à l'ISO. Les projets peuvent parfois s'appuyer sur un document de normalisation national. Les normes sont ensuite élaborées par des groupes d'experts internationaux, dans un processus multi-étapes qui va conduire à la publication d'une norme internationale (IS, International Standard). Réunis en comités techniques, les experts adoptent une position commune sur les termes de la norme, incluant leur champ d'application, leurs définitions clés et leur contenu.

-Les normes ISO sont le fruit d'un processus multipartite. Les comités techniques sont constitués des experts des organismes de recherche et des industries concernées, mais aussi, parfois, des représentants de la société civile.

-Les normes ISO se fondent sur un consensus. L'élaboration des normes s'inscrit dans une démarche consensuelle et l'ensemble des observations des parties prenantes sont prises en compte.

Deux types de textes normatifs sont produits : des Spécifications Techniques (TS) ou des Normes Internationales (IS) si un essai inter-laboratoires international a été mis en place. Il est également possible de produire des documents informatifs sous forme de Rapports Techniques (TR) qui peuvent être assimilés à un état de l'art sur un sujet spécifique.

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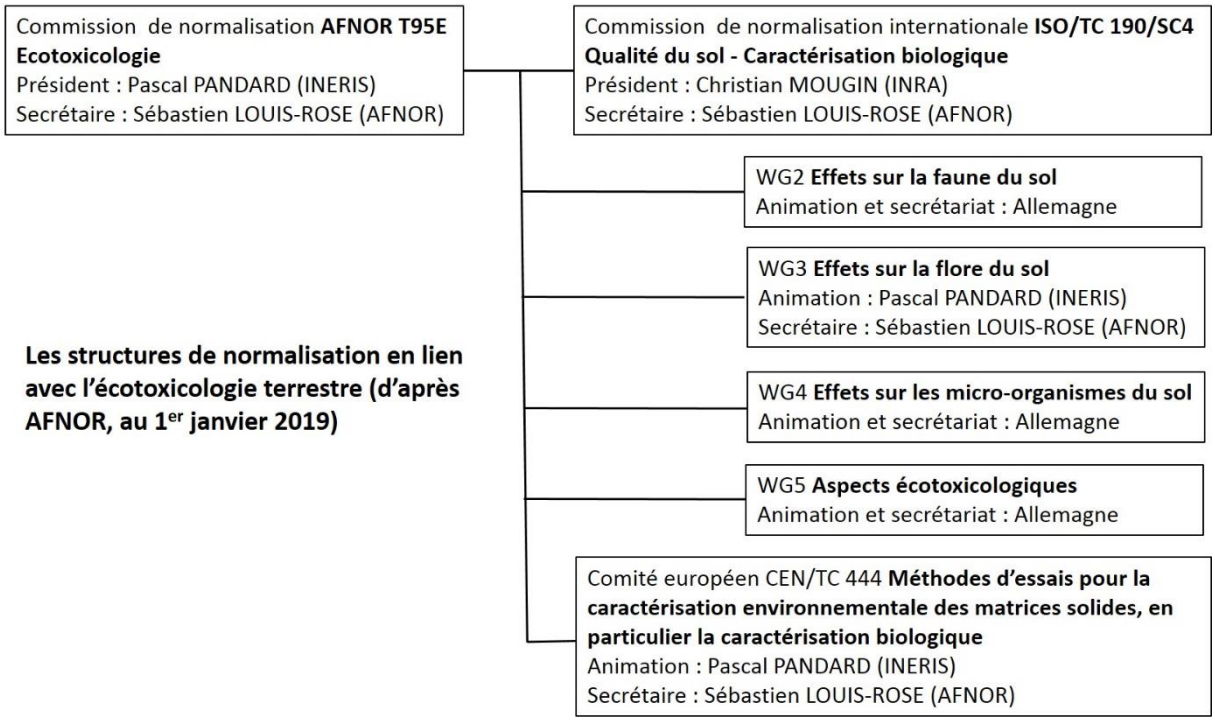
Les structures de normalisation en lien avec l'écotoxicologie terrestre

L'AFNOR a mis en place la commission de normalisation AFNOR/T95E, "Ecotoxicologie" qui traite du compartiment terrestre et du compartiment aquatique, ainsi que de l'écotoxicologie des déchets. Cette commission a pour objectif d'établir des protocoles normalisés français, de les promouvoir éventuellement au niveau européen ou international, ainsi que de suivre et contribuer aux travaux menés à l'échelle européenne et internationale.

La commission AFNOR/T95E participe aux travaux de l'ISO/TC 190/SC4 « Qualité du sol- Caractérisation biologique ». Ce sous-comité élabore des méthodes normalisées d'évaluation de la qualité du sol à l'aide d'organismes biologiques tels que les micro-organismes, les végétaux et les invertébrés, ou encore à l'aide de marqueurs enzymatiques ou lipidiques. Il s'agit d'essais de toxicité, de détermination des effets de contaminants du sol sur la reproduction ou le développement d'organismes, du fonctionnement des sols… Les normes d'appliquent aux sols et matériaux de type sols (sols agricoles, ou provenant de sites contaminés ou industriels…).

Elle participe également aux travaux du comité européen CEN/TC 444 « Méthodes d'essais pour la caractérisation environnementale des matrices solides ».



Les structures de normalisation en lien avec l'écotoxicologie terrestre (d'après AFNOR, au 1er janvier 2019)

Les étapes de l'élaboration d'une norme

L'élaboration d'un texte de norme est un processus interactif entre le porteur de projet désigné, les experts de la commission AFNOR/T95E et ceux de l'ISO (selon le WG approprié de l'ISO/TC 190/SC4). Les différentes étapes généralement nécessaires à l'élaboration d'une norme sont décrites dans le tableau ci-après.

Étape	Chef de projet	Experts AFNOR T95/E	Membres ISO/TC 190/SC4	Parties intéressées
1 **Proposition**	Propose à la commission française de normalisation un nouveau projet de norme et rédige un premier document de travail (NWIP)	Définissent avec le chef de projet la position française au regard du projet, et contribuent à la rédaction du NWIP	Se positionnent sur la proposition à la fois sur son intérêt sur leur niveau d'implication. Approuvent le NWIP pour l'inscrire au programme de travail	Peuvent émettre un avis sur le NWIP
2 **Projet de comité**	Rédige le projet de comité (CD) et discute les avis des groupes de travail	Donnent un avis sur le CD	Contribuent à l'élaboration du CD au niveau du groupe de travail et donnent leurs avis lors de la consultation sur le CD	
3 **Essai circulaire**	Organise un essai circulaire international (généralement sur la base du texte CD), analyse les résultats et produit une synthèse de l'essai circulaire	Proposent des participants à l'essai	Proposent des participants à l'essai	
4 **Projet de norme internationale**	Rédige le projet de norme internationale (DIS) en vue de sa soumission au vote	Participent à l'enquête publique française sur le DIS	Contribuent à l'élaboration du DIS au niveau du groupe de travail, votent sur le projet DIS	Émettent un avis lors de l'enquête publique française sur le DIS
5 **Projet final de norme internationale**	Rédige le projet final de norme internationale (FDIS) en vue de sa soumission au vote	Donnent leur avis sur le FDIS	Contribuent à l'élaboration du FDIS au niveau du groupe de travail, votent sur le projet FDIS	
6 **Publication de la norme internationale**	Publication de la normale internationale et française			

NWIP, New Work Item Proposal ; CD, Committee Draft ; DIS, Draft of International Standard ; FDIS, Final Draft of International Standard

Les réunions de la commission AFNOR/T95E sont généralement trimestrielles, celles des groupes de travail ISO sont le plus souvent semestrielles (une réunion annuelle et une réunion intermédiaire). De ce fait, l'élaboration d'une norme est un processus lent qui nécessite souvent 3 ans d'efforts jusqu'à sa publication ! Les normes sont ensuite examinées tous les 5 ans, révisées si besoin ou retirées du catalogue.

Conclusion

La normalisation de méthodes de mesure offre des perspectives intéressantes pour valoriser les résultats de la recherche en écotoxicologie. Elle mobilise un nombre croissant de collègues du réseau ECOTOX dans le champ de l'écotoxicologie terrestre, mais également dans celui de l'écotoxicologie aquatique. N'hésitez pas à nous contacter pour contribuer aux travaux de normalisation !

Contacts

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sebastien.louisrose@afnor.org

Pour en savoir plus

https://www.afnor.org/
https://norminfo.afnor.org/structure/afnort95e/ecotoxicologie/1951
https://www.iso.org/fr/standards.html
http://www.oecd.org/fr/env/ess/essais/lignesdirectricesdelocdepourlesessaisdeproduitschimiques.htm
http://www.inra.fr/Entreprises-Monde-agricole/Resultats-innovation-transfert/Toutes-les-actualites/impact-des-pesticides

Quelques éléments de bibliographie

Petric I., Philippot L., Abbate C., Bispo A., Chesnot T., Hallin S., Laval K., Lebeau T., Lemanceau P., Leyval C., Lindström K., Pandard P., Romero E., Sarr A., Schloter M., Simonet P., Smalla K., Wilke B.-M., Martin-Laurent F., Inter-laboratory evaluation of the ISO standard 11063 "Soil quality - Method to directly extract DNA from soil samples". J Microbiol Methods 84:454-460, 2011, doi: 10.1016/j.mimet.2011.01.016

Römbke J., Bernard J., Martin-Laurent F., Standard methods for the assessment of structural and functional diversity of soil organisms: A review. Integr Environ Assess Manag 14(4):463-479, 2018, doi: 10.1002/ieam.4046. Epub 2018 May 16

Cheviron N., Grondin V., Marrauld C., Poiroux F., Bertrand I., Abadie J., Pandard P., Ailhas J., Dubois C., Malý S., Marques C., González Huecas C., Alonso A., Marquina Díaz D., Mougin C., Inter-laboratory evaluation of the ISO standard "Soil quality - Measurement of enzyme activity patterns in soil samples using colorimetric substrates in micro-well plates" (en préparation).

Quelques exemples de normes portées par des chercheurs INRA dans le champ des méthodes de caractérisation biologique de la qualité des sols

ISO/TS 29843-2:2011. Soil quality - Determination of soil microbial diversity - Part 2: Method by Phospholipid fatty acid analysis (PLFA) using the "simple PLFA extraction method" (C. Hénault).

ISO 11063 2012 Soil quality -- Method to directly extract DNA from soil samples (F. Martin-Laurent).

ISO 17601:2016 Soil quality - Estimation of abundance of selected microbial gene sequences by quantitative PCR from DNA directly extracted from soil (F. Martin-Laurent).

ISO 20130:2018. Soil quality - Measurement of enzyme activity patterns in soil samples using colorimetric substrates in micro-well plates (N. Cheviron).

ISO/TS 20131-1:2018. Soil quality - Easy laboratory assessments of soil denitrification, a process source of N2O emissions - Part 1: Soil denitrifying enzymes activities (C. Hénault).

ISO/TS 20131-2:2018. Soil quality - Easy laboratory assessments of soil denitrification, a process source of N2O emissions - Part 2: Assessment of the capacity of soils to reduce N_2O (C. Hénault).

ISO 23753-1 (vote final en cours). Soil quality - Determination of dehydrogenase activity in soils - Part 1: Method using triphenyltetrazolium chloride (TTC)) (N. Cheviron).

ISO 23753-2 (vote final en cours). Soil quality - Determination of dehydrogenase activity in soils - Part 2: Method using iodotetrazolium chloride (INT) (N. Cheviron).

Le catalogue des normes publiées par l'ISO/TC 190 - Qualité du sol est disponible à l'URL suivante : https://www.iso.org/fr/committee/54328/x/catalogue/

ERA /Publications scientifiques / Ecotoxicologie spatiale / Ecotoxicologie du paysage

Associations of residential exposure to agricultural pesticides with asthma prevalence in adolescence: The PIAMA birth cohort

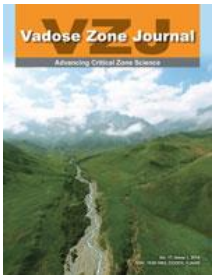
Authors: Bukalasa, JS; Brunekreef, B; Brouwer, M; Koppelman, GH; Wijga, AH; Huss, A; Gehring, U

Source: ENVIRONMENT INTERNATIONAL, 121:435-442, 2018, DOI: 10.1016/j.envint.2018.09.029

Abstract: To investigate the associations of residential pesticide exposure with the prevalence of asthma and related symptoms within a Dutch birth cohort study. In this cross-sectional analysis, we included participants of the PIAMA birth cohort study with data on residential pesticide exposure and asthma from parent-completed questionnaires at age 14, collected in 2012 (N = 1473). We used spatial data on the presence of individual crops (cereals, open field vegetables, commercial crops, open field floriculture/bulbs, corn and potatoes) and pesticide application on these crops to estimate residential exposure to pesticides with known irritant properties for the respiratory system within distances of 100, 500, and 1000 m of the participants' homes. Logistic regression was used to estimate associations between exposure and outcomes, adjusting for potential confounders. No associations were found between living within 100, 500 and 1000 m of agricultural fields likely treated with pesticides and symptoms of asthma… There was no association between living near agricultural fields likely treated with pesticides and asthma and related respiratory symptoms, among our study participants.

Accès au document

OMERE: A Long-Term Observatory of Soil and Water Resources, in Interaction with Agricultural and Land Management in Mediterranean Hilly Catchments



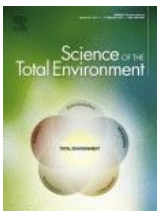
Authors: Molenat, J; Raclot, D; Zitouna, R ...

Source: VADOSE ZONE JOURNAL, 17(1), 2018, DOI: 10.2136/vzj2018.04.0086

Abstract: To account for the diversity of agricultural and ecosystem situations in hilly Mediterranean areas, the agro-hydrological observatory OMERE (Observatoire Mediterraneen de l'Environnement Rural et de l'Eau) monitors two farmed catchments-one in northern Tunisia and the other in southern France. Mediterranean regions are typified by a highly variable climate… In this context, OMERE aims to document the impacts of agricultural and land management on mass fluxes in Mediterranean farmed headwater catchments. The observation strategy is motivated by monitoring water, sediment, and contaminant fluxes and hydrologic and climatic variables at different spatial scales from cultivated plots and landscape elements to the catchment scale. These measurements have been performed at a fine time resolution over a long-term scale and by surveying land use, agricultural practices, and soil surface characteristics. The long-term observation strategy intends to support integrative multidisciplinary research for elucidating the conditions that improve soil and water management and delivery of ecosystem services in a Mediterranean rainfed cultivated context. The observatory has led to scientific insights regarding three scientific objectives: (i) to better understand the fluxes of water, erosion, and contaminants, especially pesticides, and of their natural and anthropogenic drivers on short- and long-term scales; (ii) to analyze the aggregate effects of farming and land management on mass fluxes across scales, from plot to catchment or landscape scales; and (iii) to derive new scenarios for sustainable agricultural management and improved delivery of ecosystem services.

Accès au document

Disturbance of ecological habitat distribution driven by a chemical barrier of domestic and agricultural discharges: An experimental approach to test habitat fragmentation



Authors: Araujo, CVM; Gonzalez-Ortegon, E; Pintado-Herrera, MG; Biel-Maeso, M; Lara-Martin, PA; Tovar-Sanchez, A; Blasco, J

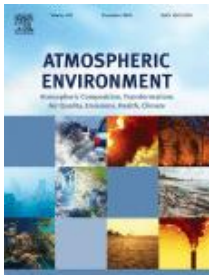
Source: SCIENCE OF THE TOTAL ENVIRONMENT, 651:2820-2829 , 2019, DOI: 10.1016/j.scitotenv.2018.10.200

Abstract: Contamination is an important factor for determining the pattern of habitat selection by organisms. Since many organisms are able to move from contaminated to more favorable habitats, we aimed to: (i) verify if the contamination along the river Guadalete (Spain) could generate a chemical barrier, restricting the displacement of

freshwater shrimps (*Atyaephyra desmarestii*) and (ii) discriminate the role of the contaminants concerning the preference response by the shrimps. A desmarestii was experimentally tested in a multi-compartmented, non-forced exposure system, simulating the spatial arrangement of the samples just like their distribution in the environment. Water and sediment samples were chemically characterized by analyses of 98 chemical compounds and 19 inorganic elements. Shrimps selected the less contaminated water and sediment samples, with two marked preference patterns: (i) upstream displacement avoiding the sample located at the point of pollutant discharges and those samples downstream from this point and (ii) fragmentation of the population with spatial isolation of the upstream and downstream populations. The preference was related to the avoidance of artificial sweeteners, flame retardants, fragrances, PAHs, PCBs, pesticides, UV filters and some inorganic elements. The threat of contamination was related to its potential to isolate populations due to the chemical fragmentation of their habitat.

Accès au document

Spatial and temporal distribution of current-use pesticides in ambient air of Provence-Alpes-Cote-d'Azur Region and Corsica, France



Authors: Desert, M; Ravier, S; Gille, G; Quinapallo, A; Armengaud, A; Pochet, G; Savelli, JL; Wortham, H; Quivet, E

Source: ATMOSPHERIC ENVIRONMENT, 192, DOI: 10.1016/j.atmosenv.2018.08.054

Abstract: A total of 59 current-use pesticides were monitored in ambient air samples collected from February 2012 to December 2017, at two rural and six urban sites in Provence-Alpes-Cote-d'Azur Region and Corsica, France. 45 of searched active substances were detected at least in one sample, at frequencies ranging from 0.1 to 98.6%. Among the most frequently detected pesticides, we found the herbicide Pendimethalin (64.6%), the fungicide Tebuconazole (65.9%), and the insecticides Chlorpyrifos (71.5%) and Lindane (98.6%). A wide range of atmospheric concentrations was measured from few pg m(-3) to several hundreds of ng m(-3), with a maximum concentration of 407.79 ng m(-3) for Chlorpyrifos (Cavaillon, May 2012). 17 active substances exceeded an atmospheric concentration of 1 ng m(-3) for at least one sample, including Folpet (147 times/162 detections), Chlorpyrifos (56/520), and Pendimethalin (29/464). The spatial distribution shows that pesticides were detected both in the eight rural and urban sampling sites, suggesting an atmospheric transport from agricultural areas to cities. Classifying the 8 sampling sites according to samples composition, two types of site were observed.... Inter-annual variation suggests a downward trend which is consistent with the regional sales data.

Accès au document

ERA / Publications scientifiques / Pesticides et microbiologie

The effects of nicosulfuron and glyphosate on microbial activity of different soils

PLANTA DANINHA

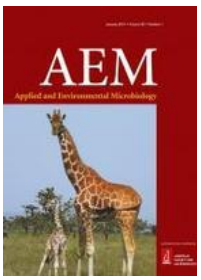
Authors: Santric, L; Radivojevic, L; Gajic-Umiljendic, J; Saric-Krsmanovic, M; Durovic-Pejcev, R

Source: PLANTA DANINHA, 36 DOI: 10.1590/S0100-83582018360100103

Abstract: The effects of the nicosulfuron and glyphosate herbicides on microbial activity in two soils with different physical and chemical properties (loam and sand) were investigated. Nicosulfuron was applied at the rates of 0.3, 0.6, 3.0 and 30.0 mg kg(-1) soil and glyphosate at 32.6, 65.2, 326.0 and 3260.0 mg kg(-1) soil in the laboratory. (...) The results showed that the effects of nicosulfuron and glyphosate depended on treatment rate, duration of activity, test parameters and soil types. In general, application of the herbicides significantly increased the activity of dehydrogenase and urease. Nicosulfuron had a stimulating activity on microbial biomass carbon in loam, while both herbicides demonstrated negative effects on the parameter in the sandy soil.

Accès au document

Blame It on the Metabolite: 3,5-Dichloroaniline Rather than the Parent Compound Is Responsible for the Decreasing Diversity and Function of Soil Microorganisms



Authors: Vasileiadis, S; Puglisi, E; Papadopoulou, ES; Karpouzas, DG...

Source: APPLIED AND ENVIRONMENTAL MICROBIOLOGY, 84 DOI: 10.1128/AEM.01536-18

Abstract: Pesticides are key stressors of soil microorganisms with reciprocal effects on ecosystem functioning. These effects have been mainly attributed to the parent compounds, while the impact of their transformation products (TPs) has been largely overlooked. (...) 3,5-Dichloroaniline (3,5-DCA), the main iprodione TP, was identified as a key explanatory factor for the persistent reduction in enzymatic activities and potential nitrification (PN) and for the observed structural changes in the bacterial and fungal communities. (...) A subsequent study in a fallow agricultural soil (soil B) showed limited formation of 3,5-DCA, which concurred with the lack of effects on nitrification. Direct 3,5-DCA application in soil B induced a dose-dependent reduction of PN and NO 3 -N, which recovered with time. In vitro assays

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with terrestrial AOM verified the greater toxicity of 3,5-DCA over iprodione. "*Candidatus Nitrosotalea sinensis*" Nd2 was the most sensitive AOM to both compounds. (...) Our findings are expected to advance environmental risk assessment, highlighting the potential of ammonia-oxidizing microorganisms as indicators of the soil microbial toxicity of pesticides and stressing the need to consider the contribution of TPs to pesticide soil microbial toxicity.

Accès au document

Impact of foliar fungicides on target and non-target soil microbial communities in cucumber crops

Authors: Santisima-Trinidad, ABL; Montiel-Rozas, MD; Diez-Rojo, MA; Pascual, JA; Ros, M

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY, 166, DOI: 10.1016/j.ecoenv.2018.09.074

Abstract: The application of foliar fungicides to horticultural crops has raised public concerns worldwide. In fact, it has been demonstrated that such fungicides have an impact on non-target microorganisms in the rhizosphere. (...), we found that these treatments also controlled other fungal pathogens affecting cucumber crops, particularly penthiopyrad, which was more effective. Once the fungicide application period was over, the effect decreased, although fungicide traces remained in the soil. Furthermore, microbial soil community analysis indicated that both fungicide treatments affect fungal communities to a greater extent than bacterial communities.

Accès au document

ERA / Publications scientifiques / Pesticides et vers de terre

How to assess the feeding activity in ecotoxicological laboratory tests using enchytraeids?

Authors: Bart, S; Roudine, S; Amosse, J; Mougin, C; Pery, ARR; Pelosi, C

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25:33844-33848, 2018, DOI: 10.1007/s11356-018-1701-3

Abstract: Enchytraeids are recognized as relevant soil bioindicators of chemical stress in agroecosystems. In laboratory, the reproduction test was found to be sensitive to reveal chemical impacts on enchytraeids. However, it does not allow to assess the impacts on ecological functions in which enchytraeids are involved. The objectives of this study were (i) to explore the feasibility of the bait-lamina test with enchytraeids under laboratory conditions and (ii) to compare its sensitivity with the Enchytraeid Reproduction Test. (...) However, no impact was found on the feeding activity of enchytraeids. The bait-lamina test thus appeared less sensitive than the Enchytraeid Reproduction Test to the tested fungicides. (...) It would deserve to be used to explore longer-exposure effects through the repeated addition of bait-lamina sticks.

Accès au document

Aporrectodea caliginosa, a relevant earthworm species for a posteriori pesticide risk assessment: current knowledge and recommendations for culture and experimental design

Authors: Bart, S; Amosse, J; Lowe, CN; Mougin, C; Pery, ARR; Pelosi, C

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25:33867-33881, DOI: 10.1007/s11356-018-2579-9

Abstract: (...) The current model species for standardized tests is *Eisenia fetida* or *Eisenia andrei*. However, these species are absent from agricultural soils and often less sensitive to pesticides than other earthworm species found in mineral soils. To move towards a better assessment of pesticide effects on non-target organisms, there is a need to perform a posteriori tests using relevant species. The endogeic species *Aporrectodea caliginosa* (Savigny, 1826) is representative of cultivated fields in temperate regions and is suggested as a relevant model test species. (...) advice and recommendations are given for the establishment of laboratory cultures and experiments using this soil-dwelling earthworm species.

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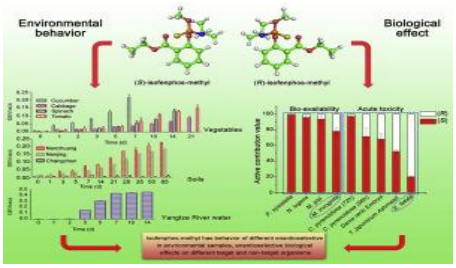
ERA / Publications scientifiques / Faune et pesticides

Stereoselective environmental behavior and biological effect of the chiral organophosphorus insecticide isofenphos methyl



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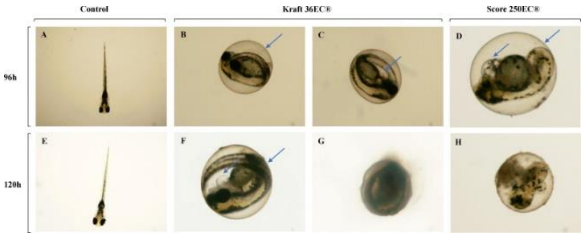
Authors: Gao, BB; Zhang, ZX; Li, LS; Kaziem, AE; He, ZZ; Yang, QW; Qing, PY; Zhang, Q; Wang, MH

Source: SCIENCE OF THE TOTAL ENVIRONMENT, 648:703-710, DOI: 10.1016/j.scitotenv.2018.08.182

Abstract: The enantiomeric environmental behaviors, bioactivities and toxicities of isofenphos methyl enantiomers were characterized systematically in this study. (R) Isofenphos methyl was degraded preferentially in Yangtze River water and different types of vegetables with an enantiomeric fraction (EF) of 0.6 to 0.96. However, (R) isofenphos methyl was amplified in both Nanjing (EF = 032) and Nanchang (EF - 027) soil. Our investigations found that there no bidirectional chiral inversion occurred in either Yangtze River water or soils. The bioactivity of (S) isofenphos methyl was higher than that of its (R) enantiomer against different insect targets, (...). (S) Isofenphos methyl showed higher toxicity for the nontarget organism (1.1 to 32 times). However, (R) isofenphos methyl possesses 4.0 times more potency than the (S)-form for the nontarget soil organism *Eisenia foetida*. (...)

Accès au document

Lethal and sublethal toxicity of abamectin and difenoconazole (individually and in mixture) to early life stages of zebrafish



Authors: Sanches, ALM; Daam, MA; Freitas, EC; Godoy, AA; Meireles, G; Almeida, AR; Domingues, I; Espindola, ELG

Source: CHEMOSPHERE, 210:531-538, DOI: 10.1016/j.chemosphere.2018.07.027

Abstract: In recent years, the need for the development of alternative test methods for the conventional acute fish toxicity test (AFT) (...). In addition, concerns have been raised on the potential risks related with environmentally realistic pesticide mixtures (...). The insecticide/acaricide abamectin and the fungicide difenoconazole are the main pesticides that are intensively used in Brazilian strawberry crop (...). The aim of the present study was therefore to evaluate the lethal and sublethal toxicity of single and mixture exposures of these pesticides to zebrafish early life stages (embryos and juveniles). (...) the order of life stage sensitivity was juvenile > adult> embryo. The pesticide mixture revealed a dose-level dependent deviation of the independent action model, with antagonism at low dose levels and synergism at high dose levels. Sublethal parameters (especially those related with locomotion) were considerably more sensitive than lethality. Subsequently, the inclusion of sublethal parameters may greatly improve the (...) risk assessment evaluations.

Accès au document

Effect of Temperature on the Toxicity of Biorational Insecticides against *Sitophilus oryzae* (Linnaeus) in Stored Wheat

Authors: Malik, G; Qadir, A; Khan, HAA

Source: PAKISTAN JOURNAL OF ZOOLOGY, 50:1569-1572, DOI: 10.17582/journal.pjz/2018.50.4.sc10

The rice weevil, *Sitophilus oryzae* (Coleoptera: Curculionidae), is an important pest of stored grains including wheat, maize and rice. (...) successful pesticide management could be compromised by prevailing environmental temperature since it has a significant effect on the toxicities of insecticides. (...) the present study evaluated the effect of post-treatment temperature (20, 25 and 30° C) on the toxicity of four insecticides viz., spinosad, emamectin benzoate, lufenuron and thiamethoxam. (...). The toxicities of spinosad, emamectin benzoate, lufenuron and thiamethoxam increased 2.65, 1.59, 1.64 and 3.00 folds (positive temperature coefficient), respectively, with increasing temperature. (...) all the tested insecticides may provide effective control of rice weevils under high temperature conditions.

Accès au document

Pesticide residues in Indian raw honeys, an indicator of environmental pollution

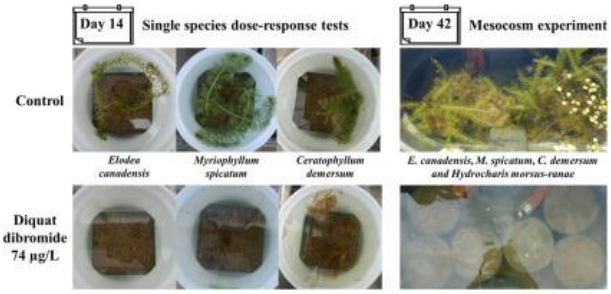
Source: Kumar, A; Gill, JPS; Bedi, JS; Kumar, A

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25:34005-34016, DOI: 10.1007/s11356-018-3312-4

Abstract: Honey has multifaceted beneficial properties, but polluted environment and unapproved apicultural practices have led to its contamination. In this study, QuEChERS method followed by chromatographic analysis by GC-ECD/FTD and GC-MS was validated and used for determination of 24 pesticides in 100 raw honey samples from various floral origins of Northern India. Matrix-matched calibrations showed that the method was selective and linear (r(2)>0.99) with detection limit <9.1ngg(-1) for all the studied pesticides except for monocrotophos (21.3ngg(-1)). The average recoveries at different fortification levels ranged from 86.0 to 107.7% with relative standard deviation <20%. Pesticide residues were detected in 19.0% samples, and most prevalent compounds detected were dichlorvos in 6.0% samples followed by monocrotophos (5.0%), profenofos (5.0%), permethrin (4.0%), ethion (3.0%), and lindane (3.0%) with concentrations ranging from 58.8 to 225.5, from 96.0 to 430.1, from 14.6 to 43.2, from 27.8 to 39.6, from 25.6 to 28.0, and from 19.6 to 99.2ng g(-1), respectively.

Accès au document

Macrophytes are highly sensitive to the herbicide diquat dibromide in test systems of varying complexity



Authors: Sesin, V; Dalton, RL; Boutin, C; Robinson, SA; Bartlett, AJ; Pick, FR

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY, 165:325-333, DOI: 10.1016/j.ecoenv.2018.08.033

Abstract: The herbicide diquat dibromide is used in North America to manage nuisance macrophytes. However, its effect on native macrophytes is less clear and it could cause indirect effects on other aquatic biota. This study determined the sensitivity of both native and non-native macrophytes grown in test systems with varying complexity to diquat dibromide (...). In an outdoor mesocosm experiment and single species greenhouse concentration-response tests, *Elodea canadensis* Michx., *Myriophyllum spicatum* L., *Ceratophyllum demersum* L. and *Hydrocharis morsus-ranae* L. were exposed to a range of diquat di-bromide concentrations (4.7-1153 µg/L), (...). The mesocosm experiment contained all four plant taxa in the same system along with caged amphipods (Hyalella azteca Saus.), tadpoles (Lithobates pipiens Schreber), phytoplankton and periphyton; (...). In both test systems, severe direct effects of diquat di-bromide on macrophytes were detected, (...) in both test systems at 74 mu g/L. The most sensitive species in the single species tests, E. canadensis, showed almost 100% mortality at concentrations below the HPLC-based method detection limit of 5 mu g/L. (...) no difference in severity between (...) complexity of test systems. These results suggest that diquat dibromide could be applied at a considerably lower label rate, depending on the characteristics of the waterbody, (...).

Accès au document

ERA / Publications scientifiques / Méthodes et pesticides

How to assess the feeding activity in ecotoxicological laboratory tests using enchytraeids?

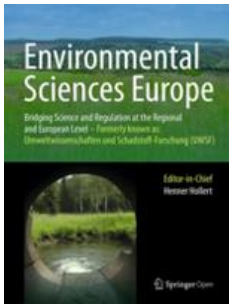
Authors: Bart, S; Roudine, S; Amosse, J; Mougin, C; Pery, ARR; Pelosi, C

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25:33844-33848, 2018, DOI: 10.1007/s11356-018-1701-3

Abstract: Enchytraeids are recognized as relevant soil bioindicators of chemical stress in agroecosystems. In laboratory, the reproduction test was found to be sensitive to reveal chemical impacts on enchytraeids. However, it does not allow to assess the impacts on ecological functions in which enchytraeids are involved. The objectives of this study were (i) to explore the feasibility of the bait-lamina test with enchytraeids under laboratory conditions and (ii) to compare its sensitivity with the Enchytraeid Reproduction Test. (...) However, no impact was found on the feeding activity of enchytraeids. The bait-lamina test thus appeared less sensitive than the Enchytraeid Reproduction Test to the tested fungicides. (...) It would deserve to be used to explore longer-exposure effects through the repeated addition of bait-lamina sticks.

Accès au document

Limits of Concern: suggestions for the operationalisation of a concept to determine the relevance of adverse effects in the ERA of GMOs



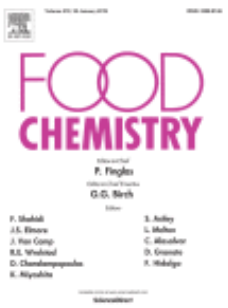
Authors: Dolezel, M; Miklau, M; Heissenberger, A; Reichenbecher, W

Source: ENVIRONMENTAL SCIENCES EUROPE, 30:39, 2018, DOI: 10.1186/s12302-018-0169-6

Abstract: The European Food Safety Authority proposed a concept for the environmental risk assessment of genetically modified plants in the EU that is based on the definition of thresholds for the acceptability of potential adverse effects on the environment. This concept, called Limits of Concern (LoC), needs to be further refined to be implemented in the environmental risk assessment of genetically modified organisms. (...) We make specific recommendations for the setting and use of LoC for each type of genetically modified plant. The LoC concept can be suitably applied for the environmental risk assessment of genetically modified organisms, if the different protection goals in agro-environments are specifically considered. Not only biodiversity protection goals but also agricultural protection goals need to be addressed. The different ecosystem services provided by weeds inside and outside agricultural fields have to be considered for genetically modified herbicide-tolerant crops. (...) If additional impacts on agro-biodiversity resulting from the cultivation of genetically modified plants are to be avoided, then high protection levels and low thresholds for acceptable effects (i.e. LoC) should be set.

Accès au document

Simultaneous determination and risk assessment of fipronil and its metabolites in sugarcane, using GC-ECD and confirmation by GC-MS/MS



Authors: Biswas, S; Mondal, R; Mukherjee, A; Sarkar, M; Kole, RK

Source: FOOD CHEMISTRY, 272:559-567, DOI: 10.1016/j.foodchem.2018.08.087

Abstract: A sensitive gas chromatographic method using a modified QuEChERS technique is reported for simultaneous determination, dissipation and risk assessment of fipronil and its metabolites in sugarcane and soil. (...) Fipronil dissipated with half-life (T-1/2) of 2.8-4.3 days while for total fipronil it was 3.7-6.0 days following application of fipronil (5% SC) in sugarcane fields (...). Estimated pre-harvest intervals (PHI) for fipronil were 20.3-27.0 days in sugarcane plants, and for total fipronil the corresponding values were 28.2-37.8 days. (...) Potential risk exists towards algae and soil macro-organism (RQs > 1), but for earthworms it was safe (RQs < 1).

Accès au document

Droit et politique de l'environnement

Projet LIFE CONCERT REACH - Concerting experimental data and in silico models for REACH

Descriptif de ce projet mené par l'Italie financé par l'Europe dans le cadre du programme LIFE

Objectives: ... to evaluate the potential **impact of chemical substances in Europe**, before and after REACH, by integrating experimental data on registered substances into **computer data processing (in-silico) tools**... the project will establish anetwork of systems offering non-testing methods.

Quantitative Structure Activity Relationship (QSAR) models can be used to support the regulatory assessment of chemicals. The network will bring together three tools widely used and supported by authorities and industry: the Danish (Q)SAR database for in-silico models, the VEGA platform, and the AMBIT database for the read-across workflow and data from the registered substances. These will be integrated into the largest network of in-silico tools in the world, with the aim of reshaping the strategy of evaluating chemical substances.

Expected results: The main result will be **a network of non-testing methods (NTMs) for exploring the properties of new chemicals by using the data gathered within REACH**. This network will:

- Support the European Chemicals Agency (ECHA) in improving the use of NTMs
- Contain the most freely available in-silico models
- Make QSAR and commercial in-silico models freely available

In particular, the project will produce:

- About 100 freely available in-silico models within a single platform, VEGA
- About 80 QSAR model reporting formats (QMRF) to facilitate the use of QSARs
- A protocol for the improved use of non-testing methods (NTMs), both individually and in an integrated way, as well as a protocol on how to manage conflicting values from different NTMs
- A programme to use data on registered substances without disclosing proprietary data, adopting a grouping strategy
- A collection of chemical structures (>50 000) with their available experimental values
- A harmonised protocol to relate experimental values of high quality with a structured procedure to document the development of QSARs
- The inclusion of in-silico models in the AMBIT platform of the European Chemical Industry Council…

Duration : 01-SEP-2018 to 28-FEB -2022

Accès au document

Projet LIFE – ADSORB - A performing Depollution System for Runoff water preserving Biodiversity

Descriptif de ce projet mené par a France et financé par l'Europe dans le programme LIFE

Objectives: LIFE-ADSORB will establish a demonstration site at the **Bois De Boulogne** to prove the efficiency of a novel means of **reducing pollution in rainwater runoff into the natural environment**. This will focus on reducing levels of metals, suspended matter, hydrocarbons and other toxic compounds (phthalates, alkylphenols, perfluorinated compounds, etc.) found in storm water runoff from roads. The choice of demonstration site in a public park that is classified as 'natural heritage to be protected' is designed to show that improved management of polluted rainwater is compatible with the preservation of natural heritage and biodiversity.

The project has designed a solution that can be adapted to existing infrastructure and replicated in both densely populated and rural areas, as well as being suitable for industrial applications... This will add to the knowledge base for the development, follow-up and evaluation of initiatives related to rain water depollution. Thus, LIFE ADSORB will

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contribute to the implementation of the Water Framework Directive, Urban Wastewater Directive, Floods Directive and Bathing Water Directive.

Expected results:

- A new prototype treatment infrastructure, combining several effective technical solutions related to retention and depollution, with key recommendations (directly issued from the simulation performed on the prototype) on how to upgrade its functioning
- An operational design-support tool to adapt the infrastructure and the adsorbent material to other territories and sectors
- Recommendations for technology transfer based on monitoring of performance
- Improved quality of treated runoff water: a 95% reduction in the concentration of mineral and organic micropollutants; a 12.8 tonnes/year reduction in the flow of suspended matter; a substantial reduction in bacteria concentrations; a 98% reduction in the frequency of discharge of wastewater into the Seine
- Improving the quality of treated water will allow its reuse, thus creating a new water resource (potentially: 200 000 m3/year)
- A 10% increase in the Ecological Quality Indicators (EcoQOs) of the site through the revegetation of the prototype (planted filter) and other supporting measures to promote species diversity.

Coordinator Ville de Paris

Partners Centre d'Etudes et d'expertise sur les Risques, l'Environnement, la Mobilité et l'Aménagement, Université Paris-Est Créteil, AgroParisTech, Institut des Sciences et Industries du vivant et de l'Environnement, Ecole Nationale des Ponts et des Chaussées, Bureau d'Ingénierie de Recherche et Développement en Ecologie, **Institut National de la Recherche Agronomique (INRA).**

Duration 01-JUL-2018 to 30-JUN -2023

Accès au document

Projet LIFE SURFING - SURFactant enhanced chemical oxidation for remediatING DNAPL

Objectives: The LIFE SURFING project aims to fully eradicate pervasive pollutants in sites contaminated by **Lindane**. Regional authorities in Aragon, Spain, will demonstrate the benefits of combining techniques from surfactant enhanced aquifer remediation and surfactant-enhanced in situ chemical oxidation to **extract Lindane residues** from even the smallest fractures in rocks and remove it from natural environments completely...

Duration : 01-JAN-2019 to 30-JUN -2022

Accès au document

LIFE AgRemSO3il - Agrochemical remediation of farm soils by combining solarization and ozonation techniques

Objectives: The main objective of LIFE AgRemSO3il is to develop and fine-tune a new technology to **remediate soils** that combines on-site solarisation and ozonation techniques. The project will build a prototype of its Agremsoil technology and test different methods for soil remediation and disinfection...

Expected results:

- Management of pesticide degradation in agriculture soils in real farm conditions without generating any other residue
- Removal of at least 75% of pesticides in the soil
- Development of an ozonisation plus solarisation method optimised for farm conditions (Agremsoil prototype)
- Implementation of the prototype in medium-sized and large farms with drip irrigation systems;
- Dissemination of results among potential users, technical staff at regional authorities, relevant stakeholders and public authorities in the EU.

Coordinator: Instituto Murciano de Investigación y Desarrollo Agrario y Alimentario
Duration : 01-JUL-2018 to 30-JUN -2022

Accès au document

Droit et règlementation des pesticides

Protection des cultures : les évolutions réglementaires se précisent

Perspectives agricoles N°461, Decembre 2018

Cet article presente les évolutions règlementaires effectives, contenues dans

- le Plan ecophyto 2 avec un objectif de réduction de l'usage des produits phytosanitaires de 25% en 2020 et 50% en 2025 (produits de biocontrôle exclus)

- L'évolution des CEPP certificats d'économie de produits phytopharmaceutiques

- le biocontrôle (452 produits commerciaux sur la liste officielle qui correspondent à 83 substances actives)

- L'interdiction des néonicotinoides depuis le 01/09/2018

- La définition des perturbateurs endocriniens par l'union européenne depuis avril 2018

Accès au document

Polluants organiques persistants : le Conseil arrête sa position

Communiqué de presse du CE 28/11/2018

... Le Conseil a adopté ce jour sa position sur le règlement de refonte concernant les polluants organiques persistants du 29 avril 2004, la liste des substances hautement toxiques arrêtée par les Nations unies. Depuis 2004, la production, l'utilisation et le commerce de ces substances ont été progressivement interdits et un système de dénonciation nominative a été mis en place pour sanctionner les personnes qui enfreignent les règles…

Accès au document

Textes adoptés - Polluants organiques persistants

Amendements du Parlement européen, adoptés le 15 novembre 2018, à la proposition de règlement du Parlement européen et du Conseil concernant les polluants organiques persistants (refonte) (COM(2018)0144 - C8-0124/2018 - 2018/0070(COD))

Accès au document

Chemicals and pesticides fact sheet

Synthèse de 5 pages sur la règlementation européenne des pesticides réalisée par le comité PEST.

Rappel de la règlementation et présentation du rôle du parlement Européen

A. Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
B. Classification, packaging and labelling
C.Export and import of dangerous substances
D. Major accidents
E. Sustainable use of pesticides
F. Biocidal products
G. Persistent organic pollutants (POPs)
H. Asbestos
I. Detergents

EU - Commission drops move to soften pesticides EDC ban

Chemicalwatch 07/11/2018

Perturbateurs endocriniens : pas de modification de la règlementation. Le critère d'exposition négligible reste de vigueur ... plus restrictif pour les épandages que la notion de risque négligible.

The EU executive had sought to change the wording of the plant protection products (PPP) Regulation to '**negligible risk**' instead of 'negligible exposure' to determine exceptions from a ban on EDCs, but faced heavy criticism from NGOs which called the move "deeply troubling". Member states discussed the amendment at a meeting of the Standing Committee on Plants, Animals, Food and Feed (SCoPAFF) on 23-24 October.

Hormone disruptors are banned in pesticides in the EU, except if industry can prove **'negligible exposure'** – for example in conditions where this is well controlled, such as in closed areas where workers wear protection.

... the use of pesticides in open fields can contaminate the surrounding environment, putting residents, animals and ecosystems at risk.

Accès au document

Major Danish study identifies nine new EDCs

Chemical Watch 01/11/2018

Commente un rapport réalisé par le Centre danois : Centre on Endocrine disrupters.

Ce rapport intitulé List of Endocrine Disrupting Chemicals (29 pages) a été rédigé en Décembre 2017 et amendé en Septembre 2018 pour aboutir à une liste consolidée identidiant 9 nouveaux perturbateurs endocriniens (dont des pesticides). Ceux ci n'ont pas encore été identifiés comme tels par la Communauté Européenne.

Des produits suspectés d'être des perturbateurs endocriniens ont été évalués sur la base des critères de l'OMS et de la Communauté Européenne et en tenant compte des publications scientifiques.

L'annexe du rapport (256 pages) comporte des fiches qui rapellent les modes d'action et listent les effets observés par les chercheurs sur les substances actives suivantes dont certaines sont des pesticide :

- **Deltamethrin**… a pyrethroid ester **insecticide used in pest control**
- **Prochloraz ...** a broad-spectrum imidazole **fungicide**
- **Octamethylcyclotetrasiloxane**
- **Tris(methylphenyl)phosphate**
- **Salicylic acid** … encompass **bacteriostatic, fungicidal** and keratolytic effects.
- **Fenitrothion** (voir page 131) Fenitrothion is an organophosphate **isecticide and acaricide** and the usage is assumed to be below 100 tonnes per annum
- **Bifenthrin**, a **pyrethroid insecticide.**
- **Di-n-pentylphthalate (DPP)**
- **Bisphenol AF (BPAF)** analog to **Bisphenol A**
- **Isobutyl paraben**

Extraits de la présentation de Chemicalwatch qui souligne les effets de ces pertirbateurs endocriniens

The Danish environment ministry has published a major study that identifies nine new substances as endocrine disruptors based on "solid scientific evidence".

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- bisphenol AF – humans and environment;
- di-n-pentylphthalate – humans;
- fenitrothion – humans;
- isobutyl paraben – humans;
- octamethylcyclotetrasiloxane (D4) – humans;
- prochloraz – humans and environment;
- triclocarban – humans;
- tris(methylphenyl) phosphate – humans; and
- salicylic acid – humans.

All nine chemicals can be termed EDCs based on the EU's new criteria for pesticides that came into force in June, a report from the study said. None of the substances have yet been subject to evaluation under the EU regulatory system

Accès au document

Règlementation des pesticides / Avis EFSA ANSES OCDE

EFSA - Recommendations on the use of the proportionality approach in the framework of risk assessment for pesticide residues

EFSA Supporting Publications 14 November 2018,

Technical Report, doi: 10.2903/sp.efsa.2018.EN-1503

The technical report reflects the outcome of the discussions and agreements that were reached in 2017 in the pesticides peer review meeting on residues and maximum residue levels regarding the principles and guidance for application of the proportionality concept in the risk assessment methodologies used at European level for the estimation of the maximum residue levels for pesticides. In addition, practical experiences on the use of the proportionality approach gained by EFSA have been included in this document. Specific cases that are not fully covered by the general principles of the proportionality concept outlined in the OECD guidance document and further recommendations are reported...

Accès au document

ANSES - Arrivée à échéance d'autorisations de produits à base de glyphosate

Anses, novembre 2018

Dans le cadre de la réapprobation de la substance active glyphosate, l'Anses a pris 132 décisions notifiant l'arrivée à échéance des autorisations de mise sur le marché ou de permis de produits phytopharmaceutiques à base de glyphosate.

liste des produits concernés (130 autorisations de mise sur le marché de produits phytopharmaceutiques et 2 permis de commerce parallèle...dont le Round up).

Pour les produits de la gamme « professionnelle », la fin de vente et de distribution des produits est fixée au 15/03/2019 et la fin d'utilisation des produits et des stocks est fixée au 15/06/2019. Pour les produits de la gamme « amateurs », aucun délai de grâce n'est accordé ...

Accès au document

BFR - A comparative assessment of the CLP calculation method and in vivo testing for the classification of plant protection products

BfR 22/11/2018

L'organisme allemand BFR German Federal Institute for Risk Assessment présente sa publication A comparative assessment of the CLP calculation method and in vivo testing for the classification of plant protection products https://doi.org/10.1016/j.yrtph.2018.11.012

... The CLP calculation method is an alternative method based on the concentration addition of all adverse substances in a mixture. Our analysis revealed that oral and inhalation toxicity was underestimated for approximately 45% of the in vivo classified products by the CLP calculation method as compared to in vivo testing. Hence, we suggest the development of an integrated assessment strategy, weighing all available information and considering relevant parameters influencing predictivity and uncertainty.

Online in Regulatory Toxicology and Pharmacology

Accès au document

EFSA - Pesticides : nouvelle date butoir pour l'évaluation des risques cumulés

EFSA 05/12/2018

Pesticides: new deadline for cumulative risk assessments

... L'évaluation complète des risques liés aux effets cumulatifs des pesticides sur les systèmes nerveux et thyroïdien humains est désormais prévue en **juin 2019.**

Le délai a été prolongé afin de prendre en compte les commentaires reçus lors d'une consultation publique portant sur l'établissement des groupes d'évaluation cumulative (CAG) des pesticides (Public consultation on the establishment of cumulative assessment groups of pesticides for their effects on the nervous system Juin 2018).

Par ailleurs, la Commission européenne et les États membres de l'UE se sont mis d'accord sur un ensemble d'hypothèses concernant certains aspect de gestion des risques liés à l'exposition cumulée qu'ils ont demandé à l'EFSA de prendre en compte dans ses évaluations. Ces développements impliquent que l'EFSA et son partenaire dans ce projet – l'Institut national néerlandais pour la santé publique et

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l'environnement (RIVM) – vont retravailler la section des évaluations portant sur l'exposition.

Les nouvelles évaluations bénéficieront des travaux récents effectués pour l'EFSA qui permettront une utilisation plus précise des données de consommation et des informations sur les effets de la transformation des aliments sur les niveaux de résidus.

Les évaluations des risques cumulés publiées en juin 2019 comprendront également une analyse des incertitudes qui aidera les parties intéressées à comprendre de quelle manière les résultats pourraient être affectés par les limites dans les connaissances scientifiques disponibles et par les hypothèses utilisées lors de ce processus…

Accès au document

EFSA - Peer review of the pesticide risk assessment for the active substance bromoxynil

Efsa Journal 13 December 2018

doi: 10.2903/j.efsa.2018.5490

Accès au document

EFSA - Peer review of the pesticide risk assessment of the active substance napropamide-M

EFSA Journal 12 November 2018

doi: 10.2903/j.efsa.2018.5465

... The conclusions were reached on the basis of the evaluation of the representative uses of napropamide-M as a herbicide on winter oilseed rape and brassica vegetable crops. The reliable endpoints, appropriate for use in regulatory risk assessment, are presented. Missing information identified as being required by the regulatory framework is listed. Concerns are identified.

Accès au document

EFSA - Peer review of the pesticide risk assessment of the active substance clodinafop

EFSA Journal 16 November 2018

doi: 10.2903/j.efsa.2018.5467

Accès au document

ANSES - Elucider les causes d'un phénomène indésirable en phytopharmacovigilance : l'exemple du prosulfocarbe sur des pommes

Extrait de la revue de l'ANSES Vigil'ANSES N°6 Oct 2018

L'Anses a mis en place à partir de 2015 un dispositif appelé phytopharmacovigilance (PPV), unique en Europe. Son objectif est de recueillir et d'analyser tout signal ou alerte concernant un possible phénomène/effet indésirable lié à ces produits, à partir de notifications spontanées, d'études scientifiques postérieures à celles ayant été analysées pour l'AMM ou de données recueillies en routine.

Les signaux peuvent provenir de sources variées, dont, notamment, les firmes détentrices des AMM.

Un exemple illustrant ce dispositif est présenté ci- dessous.

… En 2016, un détenteur d'AMM de produits à base de la substance active prosulfocarbe a signalé à l'Anses par l'intermédiaire du dispositif de PPV le fait que des dépassements de la limite maximale de résidus (LMR) autorisée du prosulfocarbe étaient régulièrement observés lors de contrôles systématiques réalisés sur des pommes à récolte tardive, les rendant non commercialisables...

Accès au document

ANSES – Glyphosate : l'Anses lance une évaluation comparative avec les alternatives disponibles

Communiqué ANSES 29/11/2018

Suite à la réapprobation pour cinq ans de la substance active au niveau européen en décembre 2017, l'Anses réévalue les autorisations de mise sur le marché des produits à base de glyphosate.

... Actuellement, 190 produits à base de glyphosate bénéficient d'une autorisation de mise sur le marché (AMM) ou d'un permis de commerce parallèle en France.

… En s'appuyant sur les éléments qui lui seront fournis sur les alternatives disponibles et d'usage courant en France, notamment par l'INRA, l'Anses comparera, pour chaque usage, les produits à base de glyphosate avec les méthodes non chimiques de prévention ou de lutte disponibles. Pour chaque produit à base de glyphosate, les usages pour lesquels il existe une alternative répondant aux critères de substitution seront donc interdits.

L'Agence vient également de notifier aux industriels la fin de validité au 15 décembre 2018 de 132 AMM qui n'ont pas fait l'objet d'une demande de renouvellement, avec un délai maximal d'utilisation des produits déjà détenus par les professionnels au 15 juin 2019.

… l'utilisation des produits à base de glyphosate sera interdite à compter du 1er janvier 2019 pour tous les usages non professionnels

Accès au document

ANSES - Produits à base de métam-sodium : l'Anses annonce le retrait des autorisations de mise sur le marché

Communiqué de presse de l'ANSES05/11/2018

... l'Anses a réévalué les dossiers et notifié aux industriels son **intention** de retirer l'ensemble des autorisations de mise sur le marché pour les produits à base de métam-sodium. A cette occasion, l'Anses rappelle l'importance de la phytopharmacovigilance et l'obligation qui incombe aux professionnels de déclarer tout effet indésirable sur l'Homme et l'environnement impliquant un produit phytopharmaceutique.

Le métam-sodium est une substance active utilisée pour lutter contre les bioagresseurs, tels que les champignons du sol ou les nématodes (des vers du sol dont certains s'attaquent aux cultures). Ces produits servent à désinfecter les sols avant l'installation d'une culture. Ils sont notamment employés sur des cultures maraîchères

Accès au document

Règlementation des pesticides / Débats parlementaires

Commission launches a feedback mechanism on harmonised risk indicators

29/11/2018

La commission européenne a mis consultation publique un projet de Directive " amending **Directive 2009/128/EC** of the European Parliament and of the Council as regards the establishment of **harmonised risk indicators**".

Cette proposition est en ligne.

Nota : L'annexe présente 2 indicateurs : l'un basé sur le danger des substances actives , l'autre sur le nombre d'autorisations de mise sur le marché).

… This proposal will establish EU-wide risk indicators based on data on pesticide sales and the properties of the active substances in them. The indicators will show changes in the potential risks from pesticide use for human health and the environment.

Extraits: (5) Article 15(4) of Directive 2009/128/EC requires the Commission to calculate risk indicators at Union level using statistical data collected in accordance with Union legislation concerning statistics on plant protection products and other relevant data, **in order to estimate trends in risks from pesticide use...**

12) By combining the statistics produced in accordance with Regulation (EC) No 1185/2009 and the information on active substances in accordance with Regulation (EC) No 1107/2009, including if they are **low risk active substances, candidates for substitution, or other active substances,** a method of calculation can be established to produce a hazard-based harmonised risk indicator which estimates potential risks from pesticide use.

... (14) In order to calculate harmonised risk indicators **to reflect the relative risk of using plant protection products** containing different categories of approved active substances and non-approved active substances, **weighting factors should be established for this purpose…**

Accès au document

Parlement européen comité PEST : Vote on the PEST draft report on EU authorisation procedure for pesticides

07/12/2018

Ce comité PEST a été mis en place en février 2018 pour statuer sur le dispositif AMM d'autorisation de mise sur le marché des pesticides. Ce rapport qui sera discuté et voté par le parlement en Février comporte 71 recommandations (pages 10-14 du doct joint) En voici quelques unes :

4. demande à la Commission et aux États membres, d'appliquer dûment le **principe de précaution**...
5. estime qu'il conviendrait d'accorder une plus grande attention à la consommation **généralisée et prophylactique** des produits phytopharmaceutiques et à leurs effets sur l'environnement dans le système de l'UE
6. demande la création d'un système efficace de **vigilance après la mise sur le marché**
18. demande que **l'accès public des études dans leur intégralité** soit accordé, sous une forme lisible par ordinateur
24. invite la Commission à garantir que toute substance active est évaluée sur la base des **utilisations les plus fréquentes** et des **formulations** les plus utilisées
27. demande à la Commission et aux États membres de veiller à ce que les tests essentiels (par exemple, les **tests écotoxicologiques** mis à jour pour les **organismes du sol** et l'évaluation de la **concentration dans l'environnement** et des résidus présents dans les poussières, le vent, l'air et l'eau) et les méthodes scientifiques les plus avancées soient inclus dans l'évaluation des risques
28. demande à la Commission de proposer une modification du règlement afin d'y inclure un **système de surveillance consécutive à la mise sur le marché** comparable à la pharmacovigilance…
31. demande que les données recueillies dans le cadre de la surveillance environnementale consécutive à la mise sur le marché soient utilisées pour vérifier l'exactitude des **concentrations environnementales prévues** (CEP) dans les **modèles de devenir**
44. demande un examen systématique des études disponibles sur les effets cancérogènes du **glyphosate...**

Accès au document

California Criticized for Adopting Inadequate Measures to Restrict the Highly Toxic Chlorpyrifos

Beyond Pesticides, 06/12/2018

De nombreux articles circulent sur internet concernant la règlementation de l'usage du Chlorpyrifos aux états unis. L'administration Trump n'ayant toujours pas interdit ce pesticide, la Californie a adopté des mesures intérimaires pour en restrendre l'usage "Chlorpyrifos Interim Recommended Permit Conditions". Les associations trouvent ces mesures insuffisantes.

... Regulators at the California Department of Pesticide Regulation (CDPR) issued interim restrictions on the compound while the agency works on a formal regulatory process to list chlorpyrifos as a "toxic air contaminant" and develop permanent restrictions on its use…

The interim measures in California include: banning aerial application of chlorpyrifos; ending its use on many crops — except for those determined to be "critical"... establishing a quarter-mile buffer zone for 24 hours after any application of the pesticide; and requiring a 24/7/365, 150-foot application setback from houses, businesses, schools, and other sensitive sites. ..... in the summer of 2018, the U.S. Court of Appeals for the Ninth Circuit issued its decision in a suit… asking that the 2017 Pruitt EPA order reversing the ban be vacated… The court ordered EPA to finalize its proposed ban on chlorpyrifos.

The Trump administration said it would appeal the court's decision and, indeed, in the fall of 2018, the EPA and its new administrator, Andrew Wheeler, requested that the Ninth Circuit Court rehear the chlorpyrifos case in an en banc proceeding.

Accès au document

European Parliament adopts position on third amendment to the carcinogens

27/11/2018

The Employment and Social Affairs Committee of the European Parliament adopted the European Commission's proposal to further update the rules that **protect workers' health** from the specific risks arising from exposure to **carcinogens or mutagens**... the proposal includes exposure limits and/or skin notations for five additional cancer-causing substances (**Cadmium** and its inorganic compounds, **Beryllium** and inorganic beryllium compounds, **Arsenic acid** and its salts, as well as inorganic arsenic compounds, Formaldehyde, 4,4'-Methylene-bis(2-chloroaniline) ("MOCA"))...

Accès au document

EU – Commission Communication on endocrine disruptors

On 7 November, the European Commission has issued a communication on endocrine disruptors, which outlines further steps. The Commission will launch a comprehensive screening of the **legislation** applicable to endocrine disruptors through a Fitness Check that will build on the data already collected and analysed. … The Fitness Check will also include a public consultation.

The Communication also outlines initiatives … to ensure the implementation of existing policies on endocrine disruptors. This includes the identification of endocrine disruptors, improving communication throughout supply chains by using Safety Data Sheets as established under REACH, and taking forward the scientific assessment of endocrine disruptors with further regulatory action...

Commission's Communication

Accès au document

EU - Commission adopts REACH nano changes

chemicalwatch 03/12/2018

La Commission européenne a révisé des annexes de REACH pour préciser quelles informations _y compris sur les risques_ les fabricants doivent fournir dans leurs dossiers d'AMM.

... The new requirements will enable both companies and authorities to "systematically" assess the **hazardous properties of nanomaterials**, how they are used safely, and what risks they may pose to our health and the environment.... This information will help EU authorities to identify if further risk management measures are needed.

Accès au document

Publications des membres du réseau ECOTOX

Towards the development of a high throughput screening approach for *Mytilus edulis* hemocytes: A case study on silicon-based nanomaterials

Authors: Barrick, A; Mouneyrac, C; Manier, N; De Lantivy, L; Jrad, N; Chatel, A

Source: MARINE ENVIRONMENTAL RESEARCH, 142:306-318, 2018,

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DOI: 10.1016/j.marenvres.2018.10.014

Abstract: To have an understanding of potential mechanistic effects, sublethal endpoints able to discriminate between nanomaterials with similar physical and chemical features need to be used. In this sense, quantitative PCR was used to measure a battery of genes linked to a wide array of different cellular processes. Gene expression was measured in *Mytilus edulis* hemocytes following an in vitro and in vivo exposure to pure silicon (40 nm) and carbon-coated silicon (40 and 75 nm) after 24 h. Partial least squares discriminant analysis and correlation analysis were used to develop an integrative model, describing the relationship between genes, to identify which genes were important in describing responses to engineered nanomaterial exposure. The results suggested that some discriminations could be made based on the presence of a carbon coating or the alteration of size which could inform industrial patterns on ways to reduce the ecotoxicological impact of their product. The results also indicate that HTS on Mytilus hemocytes may be integrated into a safer-by-design approach but additional characterization of nanomaterial behavior in media is required to determine if it is a suitable alternative to in vivo testing.

Accès au document

Molecular isolation and characterization of the kisspeptin system, KISS and GPR54 genes in roach Rutilus rutilus

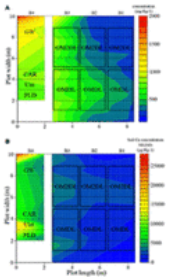
Authors: Geraudie, P; Gerbron, M; Lockyer, AE; Jobling, S; Minier, C

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25(36):36759-36764, 2018, DOI: 10.1007/s11356-018-3299-x

Abstract: The reproduction of vertebrates is regulated by endocrine and neuro-endocrine signaling molecules acting along the brain-pituitary-gonad (BPG) axis. The understanding of the neuroendocrine role played in reproductive function has been recently revolutionized since the KiSS1/GPR54 (KiSS1r) system was discovered in 2003 in human and mice. Kisspeptins, neuropeptides that are encoded by the KiSS genes, have been recognized as essential in the regulation of the gonadotropic axis. They have been shown to play key roles in puberty onset and reproduction by regulating the gonadotropin secretion in mammals while physiological roles in vertebrates are still poorly known. In order to provide new knowledge on basic reproductive physiology in fish as well as new tools to assess impacts of endocrine disrupting compounds (EDCs), the neurotransmitter system, i.e., gene/receptor, KISS/GPR54 might constitute an appropriate biomarker. This study provides new understandings on the neuroendocrine regulation of roach reproduction as well as new molecular tools to be used as biomarkers of endocrine disruption. This work completes the set of biomarkers already validated in this species.

Accès au document

Phytomanagement and Remediation of Cu-Contaminated Soils by High Yielding Crops at a Former Wood Preservation Site: Sunflower Biomass and Ionome



Authors: Mench, MJ; Dellise, M; Bes, CM; Marchand, L; Kolbas, A; Le Coustumer, P; Oustriere, N

Source: FRONTIERS IN ECOLOGY AND EVOLUTION, 6, 2018, DOI: 10.3389/fevo.2018.00123

Abstract: This long-term field trial aimed at remediating a Cu-contaminated soil to promote crop production and soil functions at a former wood preservation site. Twenty-eight field plots with total topsoil Cu in the 198-1,169 mg kg(-1) range were assessed…

In overall, there is a net gain in soil physico-chemical properties and underlying soil functions. HIGHLIGHTS - Compost incorporated into Cu-contaminated soils improves the sunflower growth. - Soil organic matter increases in compost-amended soils. - Extractable soil Cu decreases in compost-amended soils. - Shoot Cu removal by sunflower reaches 26-88 g Cu ha(-1) year(-1).

Accès au document

ECOTOX, new questions for terrestrial and aquatic ecotoxicology

Authors: Mougin, C; Bouchez, A; Denaix, L; Garric, J; Martin-Laurent, F

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25(34):33841-33843, 2018, DOI: 10.1007/s11356-018-3179-4

Accès au document

BRC4Env, a network of Biological Resource Centres for research in environmental and agricultural sciences

Authors: Mougin, C; Artige, E; Marchand, F; Mondy, S; Ratie, C; Sellier, N; Castagnone-Sereno, P; D'Acier, AC; Esmenjaud, D; Faivre-Primot, C; Granjon, L; Hamelet, V; Lange, F; Pages, S; Rimet, F; Ris, N; Salle, G

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25(34):33849-33857, 2018, DOI: 10.1007/s11356-018-1973-7

Abstract: The Biological Resource Centre for the Environment BRC4Env is a network of Biological Resource Centres (BRCs) and collections whose leading objectives are to improve the visibility of genetic and biological resources maintained by its BRCs and collections and to facilitate their use by a large research community, from agriculture research to life sciences and environmental sciences. Its

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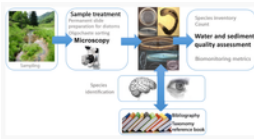
added value relies on sharing skills, harmonizing practices, triggering projects in comparative biology, and ultimately proposing a single-entry portal to facilitate access to documented samples, taking into account the partnership policies of research institutions as well as the legal frame which varies with the biological nature of resources. BRC4Env currently includes three BRCs: the Centre for Soil Genetic Resources of the platform GenoSol, in partnership with the European Conservatory of Soil Samples; the Egg Parasitoids Collection (EP-Coll); and the collection of ichthyological samples, Colisa. BRC4Env is also associated to several biological collections: microbial consortia (entomopathogenic bacteria, freshwater microalgae...), terrestrial arthropods, nematodes (plant parasitic, entomopathogenic, animal parasitic...), and small mammals. The BRCs and collections of BRC4Env are involved in partnership with academic scientists, as well as private companies, in the fields of medicinal mining, biocontrol, sustainable agriculture, and additional sectors. Moreover, the staff of the BRCs is involved in many training courses for students from French licence degree to Ph.D, engineers, as well as ongoing training.

Accès au document

Development and implementation of eco-genomic tools for aquatic ecosystem biomonitoring: the SYNAQUA French-Swiss program



Authors: Lefrancois, E; Apotheloz-Perret-Gentil, L

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25(34):33858-33866, 2018, DOI: 10.1007/s11356-018-2172-2

Abstract: The effectiveness of environmental protection measures is based on the early identification and diagnosis of anthropogenic pressures. Similarly, restoration actions require precise monitoring of changes in the ecological quality of ecosystems, in order to highlight their effectiveness. Monitoring the ecological quality relies on bioindicators, which are organisms revealing the pressures exerted on the environment through the composition of their communities. Their implementation, based on the morphological identification of species, is expensive because it requires time and experts in taxonomy. Recent genomic tools should provide access to reliable and high-throughput environmental monitoring by directly inferring the composition of bioindicators' communities from their DNA (metabarcoding). The French-Swiss program SYNAQUA (INTERREG France-Switzerland 2017-2019) proposes to use and validate the tools of environmental genomic for biomonitoring and aims ultimately at their implementation in the regulatory bio-surveillance. SYNAQUA will test the metabarcoding approach focusing on two bioindicators, diatoms, and aquatic oligochaetes, which are used in freshwater biomonitoring in France and Switzerland. To go towards the renewal of current biomonitoring practices, SYNAQUA will (1) bring together different actors: scientists, environmental managers, consulting firms, and biotechnological companies, (2) apply this approach on a large scale to demonstrate its relevance, (3) propose robust and reliable tools, and (4) raise public awareness and train the various actors likely to use these new tools. Biomonitoring approaches based on such environmental genomic tools should address the European need for reliable, higher-throughput monitoring to improve the protection of aquatic environments under multiple pressures, guide their restoration, and follow their evolution.

Accès au document

Aporrectodea caliginosa, a relevant earthworm species for a posteriori pesticide risk assessment: current knowledge and recommendations for culture and experimental design

Authors: Bart, S; Amosse, J; Lowe, CN; Mougin, C; Pery, ARR; Pelosi, C

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25(34):33867-33881, 2018, DOI: 10.1007/s11356-018-2579-9

Abstract: Ecotoxicological tests with earthworms are widely used and are mandatory for the risk assessment of pesticides prior to registration and commercial use. The current model species for standardized tests is *Eisenia fetida* or *Eisenia andrei*. However, these species are absent from agricultural soils and often less sensitive to pesticides than other earthworm species found in mineral soils. To move towards a better assessment of pesticide effects on non-target organisms, there is a need to perform a posteriori tests using relevant species. The endogeic species *Aporrectodea caliginosa* (Savigny, 1826) is representative of cultivated fields in temperate regions and is suggested as a relevant model test species. After providing information on its taxonomy, biology, and ecology, we reviewed current knowledge concerning its sensitivity towards pesticides. Moreover, we highlighted research gaps and promising perspectives. Finally, advice and recommendations are given for the establishment of laboratory cultures and experiments using this soil-dwelling earthworm species.

Accès au document

RECOTOX, a French initiative in ecotoxicology-toxicology to monitor, understand and mitigate the ecotoxicological impacts of pollutants in socioagroecosystems

Authors: Mougin, C; Gouy, V; Bretagnolle, V; Berthou, J;...

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25(34):33882-33894, 2018, DOI: 10.1007/s11356-018-2716-5

Abstract: RECOTOX is a cross-cutting initiative promoting an integrated research to respond to the challenges of

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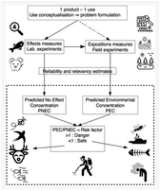
monitoring, understanding, and mitigating environmental and health impacts of pesticides in agroecosystems. The added value of RECOTOX is to develop a common culture around spatial ecotoxicology including the whole chain of pressure-exposure-impact, while strengthening an integrated network of in natura specifically equipped sites. In particular, it promotes transversal approaches at relevant socioecological system scales, to capitalize knowledge, expertise, and ongoing research in ecotoxicology and, to a lesser extent, environmental toxicology. Thus, it will open existing research infrastructures in environmental sciences to research programs in ecotoxicology of pesticides.

Accès au document

Biocontrol, new questions for Ecotoxicology?

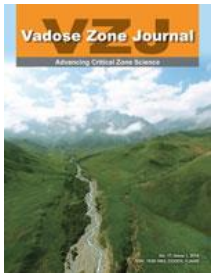


Authors: Amichot, M; Joly, P; Martin-Laurent, F; Siaussat, D; Lavoir, AV

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25(34):33895-33900, 2018, DOI: 10.1007/s11356-018-3356-5

Accès au document

AgrHyS: An Observatory of Response Times in Agro-Hydro Systems



Authors: Fovet, O; Ruiz, L; Gruau, G; Akkal, N; Aquilina, L; Busnot, S; Dupas, R; Durand, P; Faucheux, M..

Source: VADOSE ZONE JOURNAL 17(1), 2018, **DOI:** 10.2136/vzj2018.04.0066

Abstract: The AgrHyS is a long-term agro-hydrological observatory dedicated to studying the processes controlling hydro-chemical fluxes in headwater catchments in response to the effects of agricultural. AgrHyS is composed of instrumented catchments located in western France in a temperate oceanic climate that are characterized by shallow groundwater (hydrology, geochemistry, agricultural and soil sciences, hydrogeology, bioclimatology, and ecology. Here we describe the observatory sites, observation strategy, data management policy, and data access. The objective is to show how AgrHyS has contributed to research in hydrological and environmental sciences through a review of major insights of the research. This analysis highlights the role of AgrHyS in linking, validating, and enriching successive and complementary projects conducted over the last 25 yr. The second objectives to invite new collaborations with a large scientific community for future research.

Accès au document

How to assess the feeding activity in ecotoxicological laboratory tests using enchytraeids?

Authors: Bart, S; Roudine, S; Amosse, J; Mougin, C; Pery, ARR; Pelosi, C

Source: ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 25:33844-33848, 2018, DOI: 10.1007/s11356-018-1701-3

Abstract: Enchytraeids are recognized as relevant soil bioindicators of chemical stress in agroecosystems. In laboratory, the reproduction test was found to be sensitive to reveal chemical impacts on enchytraeids. However, it does not allow to assess the impacts on ecological functions in which enchytraeids are involved. The objectives of this study were (i) to explore the feasibility of the bait-lamina test with enchytraeids under laboratory conditions and (ii) to compare its sensitivity with the Enchytraeid Reproduction Test. (...) However, no impact was found on the feeding activity of enchytraeids. The bait-lamina test thus appeared less sensitive than the Enchytraeid Reproduction Test to the tested fungicides. (...) It would deserve to be used to explore longer-exposure effects through the repeated addition of bait-lamina sticks.

Accès au document

OZCAR: The French Network of Critical Zone Observatories

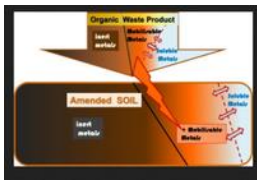
Authors: Gaillardet, J; Braud, I; Hankard, F; Anquetin, S; Bour, O; Dorfliger, N; de Dreuzy, JR; Galle, S; Galy, C; …

Source: VADOSE ZONE JOURNAL 17(1), 2018, DOI: 10.2136/vzj2018.04.0067

Abstract: The French critical zone initiative, called OZCAR (Observatoires de la Zone Critique-Application et Recherche or Critical Zone Observatories-Application and Research) is a National Research Infrastructure (RI). OZCAR-RI is a network of instrumented sites, bringing together 21 pre-existing research observatories monitoring different compartments of the zone situated between "the rock and the sky," the Earth's skin or critical zone (CZ), over the long term. These observatories are regionally based and have specific initial scientific questions, monitoring strategies, databases, and modeling activities…. The vision for OZCAR strategic development aims at designing an open infrastructure, building a national CZ community able to share a systemic representation of the CZ, and educating a new generation of scientists more apt to tackle the wicked problem of the Anthropocene. OZCAR articulates around: (i) a set of common scientific questions and cross-cutting scientific activities using the wealth of OZCAR-RI observatories, (ii) an ambitious instrumental development program, and (iii) a better interaction between data and models to integrate the different time and spatial scales. Internationally, OZCAR-RI aims at strengthening the CZ community by providing a model of organization for pre-existing observatories and by offering CZ instrumented sites. OZCAR is one of two French mirrors of the European Strategy Forum on Research Infrastructure (eLTER-ESFRI) project.

Accès au document

Trace metal availability in soil horizons amended with various urban waste composts during 17 years - Monitoring and modelling



Authors: Cambier, P; Michaud, A; Paradelo, R; Germain, M; Mercier, V; Guerin-Lebourg, A; Revallier, A; Houot, S

Source: SCIENCE OF THE TOTAL ENVIRONMENT, 651: 2961-2974, 2019, DOI: 10.1016/j.scitotenv.2018.10.013

Abstract: … The increase of total trace metal contents in amended topsoils can be predicted by a mass balance approach, but the evolution of their available fractions is a more intricate issue. We aimed at modelling this evolution by using the dataset of a long-term field experiment of OWP applications (manure and three urban waste composts). Two operationally-defined fractions of 6 trace metals have been quantified in the OWP and amended topsoils between 2002 and 2015: the soluble and potentially available metals, extracted in 0.01 M CaCl2 and 0.05 M EDTA solutions, respectively. The potentially available metals have progressively increased in amended topsoils, at rates depending on elements and types of OWP. For Zn, these increases corresponded in average to inputs of potentially available Zn from OWP. But the soil stocks of potentially available Cu increased faster than from the inputs of EDTA-extractable Cu, showing linear regression slopes between 1.4 and 2.5, depending on OWP type. The influence of OWP has been provisionally interpreted in the light of their efficiency to increase soil organic matter and their inputs of reactive oxides. Soluble copper has increased with repeated amendments. But soluble cadmium, nickel and zinc have generally decreased, as they are influenced by changing soil variables such as pH and organic matter. Statistic models were used to unravel the relationships between soluble and EDTA-extractable metals and other soil variables. For Cu, the most satisfactory models just relate soluble and potentially available Cu. Developing such models could contribute to predict the long-term effects of a precise scenario of agricultural OWP recycling upon available trace metals in soils.

Accès au document

Gold nanoparticle trophic transfer from natural biofilm to grazer fish

Authors: Perrier, F; Baudrimont, M; Mornet, S; Mesmer-Dudons, N; Lacomme, S; Etcheverria, B; Simon, O;

Source: GOLD BULLETIN 51(4):163-173, 2018, DOI: 10.1007/s13404-018-0241-4

Abstract: … This study focused on gold nanoparticle (AuNP, PEG-coated, 10nm diameter) transfer using an experimental benthic food chain which included two trophic levels: natural river biofilm and grazer fish Hypostomus plecostomus. AuNP biofilm accumulation was assessed via water AuNP concentrations and total biofilm mass. An extended range of six AuNP concentrations in water …was set. A dose-dependent relation between gold concentrations in water and natural river biofilm was observed after a 48-h exposure. This pointed out the high propensity of natural biofilms to accumulate gold. Additionally, total biofilm mass appeared to influence AuNP accumulation at the highest exposure levels. This first step enables the set-up of the transfer experiment in which grazer fish were exposed for 21days to natural biofilms, previously contaminated by low AuNP concentrations in water …. Gold was quantified in eight fish organs, and histology was observed. Gold was transferred from biofilms to fish; bioaccumulation was organ- and exposure level-dependent. Interestingly, the brain showed significant gold accumulation at the highest exposure level (NP1). Histological observations indicated distinct inflammatory responses in fish liver, spleen, and muscle. The overall results suggest the potential hazards of subchronic nanoparticle exposure in aquatic organisms.

Accès au document

Adsorption of Aclonifen, Alachlor, Cd and Cu onto Natural River Suspended Matter in the Context of Multi-Pollutions: Influence of Contaminant Co-Presence and Order of Input into the Aqueous Solution

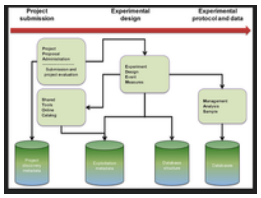
Authors: El Azzi, D; Laurent, F; Roussiez, V; Chou, L; Guiresse, M; Probst, JL

Source: WATER,10(9), 2018, DOI: 10.3390/w10091222

Abstract: In the environment, a pollutant is rarely present alone, and other contaminants can influence its fate. To investigate the influence of the presence of other pollutants on the sorption of pesticides and trace metals (TM), the adsorption of Aclonifen, alachlor, Cd and Cu onto suspended particulate matter (SPM) was studied. SPM was isolated during the flood event of May 2010 in the Save agricultural watershed of SW France. Adsorption equilibrium was reached after 2 h of contact with SPM for pesticides and 24 h for TM. To simulate natural conditions, the SPM load allowing a maximum adsorption of pollutants was set at 1 g L-1 and the concentration of pollutants at 10 g L-1. These factors being established, the co-presence experiments showed that most contaminants were influenced by the presence of other pollutant(s) in the water, trace metals to a lesser extent than pesticides. The mutual influence can be either competition for the same adsorption sites or formation of new complexes between pollutants. These phenomena can modify the adsorption capacities of each pollutant. The order of introduction into the aqueous solution also influenced the amount of adsorption of pollutants onto SPM. These results open new perspectives on the fate of pollutants.

Accès au document

How to Integrate Experimental Research Approaches in Ecological and Environmental Studies: AnaEE France as an Example



Authors: Clobert, J; Chanzy, A; Le Galliard, JF; Chabbi, A; Greiveldinger, L; Caquet, T; Loreau, M; Mougin, C; Pichot, C; Roy, J; Saint-Andre, L

Source: FRONTIERS IN ECOLOGY AND EVOLUTION, 6, 2018, DOI: 10.3389/fevo.2018.00043

Abstract: … experimentation on ecosystems is necessary to improve our knowledge of processes and to propose scientifically sound management strategies. Experimental platforms able to manipulate key factors of global change and including state of the art observation methodologies are available worldwide but how to best integrate them has been rarely addressed. Here, we present and discuss the case of the national research infrastructure AnaEE France dedicated to the study of continental ecosystems and designed to congregate complementary experimental approaches in order to facilitate their access and use through a range of distributed and shared services. The conceptual design of AnaEE France includes five modules. Three modules gather experimental facilities along a gradient of experimental control ranging from highly controlled Ecotron facilities, semi-natural field mesocosms to in natura experimental sites covering major continental ecosystems (forests, croplands, grasslands, and lakes). In addition, AnaEE France also includes shared instruments that can be implemented in experiments and analytical platforms specifically dedicated to environmental biology. To promote reuse of data, generalize results and improve predictive models, AnaEE France further gathers modeling and information systems. The implementation of AnaEE France allowed for mutual synergies, improved the technical skills, stimulated new experiments and helped our scientific community to enter into the big data sharing era.

Accès au document

Boosting DNA metabarcoding for biomonitoring with phylogenetic estimation of operational taxonomic units' ecological profiles

Authors: Keck, F; Vasselon, V; Rimet, F; Bouchez, A; Kahlert, M

Source: MOLECULAR ECOLOGY RESOURCES, 18(6):1299-1309, 2018, DOI: 10.1111/1755-0998.12919

Abstract: DNA metabarcoding has been introduced as a revolutionary way to identify organisms and monitor ecosystems. However, the potential of this approach for biomonitoring remains partially unfulfilled because a significant part of the sampled DNA cannot be affiliated to species due to incomplete reference libraries. Thus, biotic indices, which are based on the estimated abundances of species in a community and their ecological profiles, can be inaccurate. We propose to compute biotic indices using phylogenetic imputation of operational taxonomic units (OTUs') ecological profiles (OTU-PITI approach). First, OTUs sequences are inserted within a reference phylogeny. Second, OTUs' ecological profiles are estimated on the basis of their phylogenetic relationships with reference species whose ecology is known. Based on these ecological profiles, biotic indices can be computed using all available OTUs. Using freshwater diatoms as a case study, we show that short DNA barcodes can be placed accurately within a phylogeny and their ecological preferences estimated with a satisfactory level of precision. In the light of these results, we tested the approach with a data set of 139 environmental samples of benthic river diatoms for which the same biotic index (specific sensitivity index) was calculated using (a) traditional microscopy, (b) OTUs with taxonomic assignment approach, (c) OTUs with phylogenetic estimation of ecological profiles (OTU-PITI) and (d) OTU with taxonomic assignment completed by the phylogenetic approach (OTU-PITI) for unclassified OTUs. Using traditional microscopy as a reference, we found that the combination of the OTUs' taxonomic assignment completed by the phylogenetic method performed satisfactorily and substantially better than the other methods tested.

Accès au document

Veterinary pharmaceutical residues from natural water to tap water: Sales, occurrence and fate

Authors: Charuaud, L; Jarde, E; Jaffrezic, A; Thomas, MF; Le Bot, B

Source: JOURNAL OF HAZARDOUS MATERIALS, 361:169-186, 2019, DOI: 10.1016/j.jhazmat.2018.08.075

Abstract: … This review focuses on studies from 2007 to 2017. Sixty-eight different veterinary pharmaceutical residues (VPRs) have been quantified worldwide in natural waters at concentrations ranging from nanograms per liter (ng L-1) to several micrograms per liter (mu g L-1). An extensive up-to-date on sales and tonnages of VPs worldwide has been performed. Tetracyclines (TCs) antibiotics are the most sold veterinary pharmaceuticals worldwide. (…) Photo-degradation appears to be the major degradation pathway in SW. This review then reports occurrences of VPRs found in tap water, and presents data on VPRs removal in drinking water treatment plants (DWTPs) at each step of the process. VPRs have been quantified in tap water at ng L-1 concentration levels in four studies of the eleven studies dealing with VPRs occurrence in tap water. Overall removals of VPRs in DWTPs generally exceed 90% and advanced treatment processes (oxidation processes, adsorption on activated carbon, membrane filtration) greatly contribute to these removals. However, studies performed on full-scale DWTPs are scarce. A large majority of fate studies in DWTPs have been conducted under laboratory at environmentally irrelevant conditions (high concentration of VPRs (mg L-1), use of deionized water instead of natural water, high concentration of oxidant, high contact time etc.). Also, studies on VPRs occurrence and fate in tap water focus on antibiotics. There is a scientific gap on the occurrence and fate of antiparatic drugs in tap waters.

Accès au document

High-temporal resolution landscape changes related to anthropogenic activities over the past millennium in the Vosges Mountains (France)

Authors: Mariet, AL; Walter-Simonnet, AV; Gimbert, F; Cloquet, C; Begeot, C

Source: AMBIO, 47(8), 2018, DOI: 10.1007/s13280-018-1044-9

Abstract: Iron mining activities in the Bruche valley (Vosges Mountains, France) date historically from the Roman period to the mid-nineteenth century. The geochemical and palynological study of a core from the peat bog of Le Champ du Feu allows highlighting impacts of these activities over the past millennium. Trace metal contamination is recorded for lead (Pb), arsenic, zinc, and antimony during the Middle Ages, the sixteenth century, and from cal. ad 1750-1900, with several sources distinguished by Pb isotope analyses. Forest exploitation is attested by the palynological analysis of the core, with exploitation of Fagus for smelting processes and cutting of Abies for agro-pastoralism. This approach highlights several patterns of contamination, corresponding to the mixing sources and the contamination intensity, which can be linked to the pollen assemblage zones. Hence, anthropogenic activities such as mining and farming led to long-term modification of the landscape composition in this mountainous area.

Accès au document

European large perialpine lakes under anthropogenic pressures and climate change: present status, research gaps and future challenges

Authors: Salmaso, N; Anneville, O; Straile, D; Viaroli, P

Source: HYDROBIOLOGIA, 824(1):1-32, 2018, DOI: 10.1007/s10750-018-3758-x

Abstract: The aim of this review is to introduce and critically comment the main research topics considered in a selection of papers on the European large perialpine lakes (LPL) presented at the XXXIII congress of the International Society of Limnology in 2016. Besides highlighting ongoing research advancements in the LPL, the review provides a critical overview of the scientific information available on the large lake's ecosystems, identifying a few emerging research topics (e.g., aquatic omics' and high frequency monitoring). Many limnological investigations are linked to the concept of scientific monitoring, following a problem solving approach connected with the management of water resources. Experimental studies and modeling are restricted to specific niches. Overall, the scientific knowledge is quite scattered, showing hot-spots of specialized or integrated research in specific lakes and areas. The advancement of new knowledge in the LPL should rely on a better integration of scientific disciplines using multidisciplinary approaches, and on the continuous adoption of new advanced technologies and tools, contributing, besides basic research, to the next generation monitoring approaches. Finally, the preservation of LPL has to rely on water protection policies addressed towards the sustainable development of both terrestrial and aquatic ecosystems, following the green and blue infrastructure concepts.

Accès au document

Amendment of soil by biochars and activated carbons to reduce chlordecone bioavailability in piglets

Authors: Delannoy, M; Yehya, S; Techer, D; Razafitianamaharavo, A; Richard, A; Caria, G; Baroudi, M; Montarges-Pelletier, E; Rychen, G; Feidt, C

Source: CHEMOSPHERE 210:486-494, 2018, DOI: 10.1016/j.chemosphere.2018.05.181

Abstract: Chlordecone (Kepone or CLD) is a highly persistent pesticide formerly used in French West Indies. Nowadays high levels of this pesticide are still found in soils which represent a subsequent source of contamination for outdoor-reared animals. In that context, sequestering matrices like biochars or activated carbons (ACs) are believed to efficiently decrease the bioavailability of such compounds when added to contaminated soils. The present study intends to test the respective efficiency of soil amendment strategies using commercial ACs or biochars (obtained by a 500 degrees C or 700 degrees C pyrolysis of 4 distinct type of wood). This study involved three experimental steps. The first one characterized specific surface areas of biochars and ACs. The second one assessed CLD-availability of contaminated artificial soils (50 mu g g(-1) of Dry Matter) amended with 5% of biochar or AC (mass basis). The third one assessed CLD bioavailability of those artificial soils through an in vivo assay. To limit ethically the number of animals, selections of the most promising media were performed between each experimental steps. Forty-four castrated male 40-day-old piglets were exposed during 10 days by amended artificial soils according to their group (n = 4). Only treatment groups exposed through amended soil with AC presented a significant decrease of concentrations of CLD in liver and adipose tissue in comparison with the control group (p < 0.001). A non-significant decrease was obtained by amending artificial soil with biochars. This decrease was particularly high for a coconut shell activated carbon were relative bioavailability was found lower than 3.2% for both tissues. This study leads to conclude that AC introduced in CLD contaminated soil should strongly reduce CLD bioavailability.

Accès au document

Combined toxic effects and DNA damage to two plant species exposed to binary metal mixtures (Cd/Pb)

Authors: Lanier, C; Bernard, F; Dumez, S; Leclercq-Dransart, J; Lemiere, S; …

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY, 167:278-287, 2019, DOI: 10.1016/j.ecoenv.2018.10.010

Abstract: Acute and long-term (3-, 10- and 56-day exposure) laboratory toxicity tests were carried out to assess the individual and combined toxic effects of cadmium (Cd) and lead (Pb) in Brassica oleracea and Trifolium repens. In addition to morphological parameters, this work also used comet assay to address endpoints in relation to genotoxicity. Bioaccumulation was measured to demonstrate the influence of the mixture on the concentrations of each metal in the plant. The statistical method reported by Ince et al. (1999) was used to evaluate the types of interaction between Cd and Pb in each treatment and concerning their combined effect. This study concludes that the combined effects of binary metal combinations of Cd/Pb on morphological parameters are most often additive, sometimes antagonistic and more rarely synergistic, thus extending the findings of previous publications on this subject. DNA damage analysis revealed concentration- and time-dependent interactions. Synergistic effects of mixed metals (more breaks than individually applied metals) are observed in T. repens after a short exposure. Antagonistic effects are statistically significant after 10 days-exposure, suggesting competition between metals…. This supports the idea that there may be competition between metals and also strengthens the hypothesis that long-term reparation mechanisms may be implemented. Cd/Pb co-exposure does not significantly influence the bioaccumulation of each metal. It is nevertheless important to note that a statistically significant 'interaction' is not necessarily biologically relevant and should therefore be considered with caution when assessing heavy metals combined effects.

Accès au document

Sensitivities of seven algal species to triclosan, fluoxetine and their mixtures

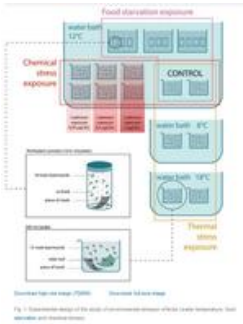
Authors: Bi, R; Zeng, XF; Mu, L; Hou, LP; Liu, WH; Li, P; Chen, HX; Li, D; Bouchez, A; Tang, JX; Xie, LT

Source: SCIENTIFIC REPORTS, 8, 2018, DOI: 10.1038/s41598-018-33785-1

Abstract: Increasing release of pharmaceuticals and personal care products (PPCPs) into aquatic ecosystems is a growing environmental concern. Triclosan and fluoxetine are two widely used PPCPs and frequently detected in aquatic ecosystems. In this study, the sensitivities of 7 algal species from 4 genera to triclosan, fluoxetine and their mixture were evaluated. The results showed that the inhibitory effect on algal growth (EC50-96h) of triclosan varied with 50 times differences among the 7 algal species. Chlorella ellipsoidea was the least susceptible species and Dunaliella parva was the most sensitive species to triclosan. The inhibitory effect of fluoxetine was less variable than triclosan. Slightly higher toxicity of fluoxetine than triclosan was shown in the 7 tested algal species. No consistent pattern of the effects from mixture of triclosan and fluoxetine was observed among the 7 algal species and among the 4 genera. Additive effects of the mixture occured in 4 species and antagonistic effects in the other 3 species but no synergistic effect was detected. The algal species might show some sign of phylogenetic response to triclosan, as evidenced by the wide range of differences in their sensitivity at the genus level. This study provides important data which could be beneficial for biomonitoring programs on the ecological risk (algal species diversity) of these two chemicals.

Accès au document

Natural variability and modulation by environmental stressors of global genomic cytosine methylation levels in a freshwater crustacean, *Gammarus fossarum*



Authors: Cribiu, P; Chaumot, A; Geffard, O; Ravanat, JL; Bastide, T; Delorme, N; Queau, H; Galliat, S; Devaux, A; Bony, S

Source: AQUATIC TOXICOLOGY, 205: 11-18, 2018, DOI: 10.1016/j.aquatox.2018.09.015

Abstract: To improve the assessment of aquatic organism responses to environmental stressors, there is an interest in studying epigenetic marks in addition to other validated biomarkers. Indeed, the epigenetic marks may be influenced by the surrounding environment. Non-model invertebrates such as gammarids are sentinel organisms representative of the diversity of natural stream communities. Despite their ecologically relevance, the epigenetic responses have been to date poorly documented in these species. The present study explores the measurement of the global cytosine methylation level in the genome of the freshwater crustacean *Gammarus fossarum*. In a first step, natural variability of global cytosine methylation level (basal level) was assessed by studying the effect of sex, age and sampling site of organisms. Results showed a significant effect of age and sampling site. In a second step, effects of water temperature and food starvation were studied. For both factors, a hypermethylation was observed after 1 month of exposure. In a third step, gammarids were exposed to a range of environmentally relevant cadmium concentrations (0.05-5 mu g/L) in order to assess the effect of a chemical stress. Whatever the cadmium concentration used, a significant hypomethylation was observed after 14 days followed by a trend for hypermethylation after 1 month of exposure. These results are the first ones dealing with the 5C-methylation status in gammarids. The results constitute potential markers of environmental stresses in relevant sentinel species widely used in ecotoxicological studies.

Accès au document

Assessment of the ecotoxicological impact of natural and synthetic beta-triketone herbicides on the diversity and activity of the soil bacterial community using omic approaches

Authors: Romdhane, S; Devers-Lamrani, M; Beguet, J; Bertrand, C; Calvayrac, C; Salvia, MV; Ben Jrad, A; Dayan, FE; Spor, A; Barthelmebs, L; Martin-Laurent, F

Source: SCIENCE OF THE TOTAL ENVIRONMENT, 651:241-249, 2019, DOI: 10.1016/j.scitotenv.2018.09.159

Abstract: The emergence of pesticides of natural origin appears as an environmental-friendly alternative to synthetic pesticides for managing weeds. To verify this assumption, leptospermone, a natural beta-triketone herbicide, and sulcotrione, a synthetic one, were applied to soil microcosms at 0x (control), 1x or 10x recommended field dose. The fate of these two herbicides (i.e. dissipation and formation of transformation products) was monitored to assess the scenario of exposure of soil microorganisms to natural and synthetic herbicides. Ecotoxicological impact of both herbicides was explored by monitoring soil bacterial diversity and activity using next-generation sequencing of 16S rRNA gene amplicons and soil metabolomics. Both leptospermone and sulcotrione fully dissipated over the incubation period. During their dissipation, transformation products of natural and synthetic beta-triketone were detected. Hydroxy-leptospermone was almost completely dissipated by the end of the experiment, while CMBA, the major metabolite of sulcotrione, remained in soil microcosms. After 8 days of exposure, the diversity and structure of the soil bacterial community treated with leptospermone was significantly modified, while less significant changes were observed for sulcotrione. For both herbicides, the diversity of the soil bacterial community was still not completely recovered by the end of the experiment (45 days). The combined use of next-generation sequencing and metabolomic approaches allowed us to assess the ecotoxicological impact of natural and synthetic pesticides on non-target soil microorganisms and to detect potential biomarkers of soil exposure to beta-triketones.

Accès au document

Environmental availability of sulfamethoxazole and its acetylated metabolite added to soils via sludge compost or bovine manure

Authors: Goulas, A; Sertillanges, N; Brimo, K; Garnier, P; Bergheaud, V; Dumeny, V; Benoit, P; Haudin, CS

Source: SCIENCE OF THE TOTAL ENVIRONMENT, 651: 506-515, 2019, DOI: 10.1016/j.scitotenv.2018.09.100

Abstract: The fate of antibiotics and their metabolites in soils after application of organic waste depends on their environmental availability, which depends on the quality and biodegradability of the added exogenous organic matter (EOM). This study aimed at better understanding the fate of sulfamethoxazole (SMX) and N-acetyl-sulfamethox-azole (AcSMX) metabolite added to soils via sludge compost or cow manure application, during a 28-day incubation. Experimental results obtained for mineralized, extractable, and non-extractable fractions as well as EOM mineralization were used to couple SMX and AcSMX dynamics to the EOM evolution using the COP-Soil model. According to various mechanisms of extraction, CaCl2, EDTA and cyclodextrin solutions extracted contrasted available fractions (31-96% on day 0), resulting in different sets of parameter values in the model. CaCl2 extraction was the best method to assess the sulfonamide availability, leading to low relative root mean squared errors and best simulations of SMX and AcSMX dynamics. The decrease of SMX and AcSMX availability over time went with the formation of non-extractable residues, mostly of physicochemical origin. Using the COP-Soil model, the co-metabolism was assumed to be responsible for the formation of biogenic non-extractable residues and the low mineralization of SMX and AcSMX.

Accès au document

Effects of DEHP on post-embryonic development, nuclear receptor expression, metabolite and ecdysteroid concentrations of the moth *Spodoptera littoralis*

Authors: Aviles, A; Boulogne, I; Durand, N; Maria, A; Cordeiro, A; Bozzolan, F; Goutte, A; Alliot, F; Dacher, M; Renault, D; Maibeche, M; Siaussat, D

Source: CHEMOSPHERE, 215:,2019, DOI: 10.1016/j.chemosphere.2018.10.102

Abstract: Di (2-ethylhexyl) phthalate (DEHP) is recognized in vertebrates as an Endocrine Disrupting Chemical (EDC). … Only few studies investigated DEHP effects on insects. However, some recent studies on aquatic insects showed that DEHP could also act as an EDC by interfering with the signaling pathways of ecdysteroids, the main hormones involved in the control of insect post-embryonic development and physiology. The aim of the study was to investigate (1) the fate of DEHP within a terrestrial insect species by exposing larvae to food containing a wide range of DEHP concentrations and (2) the effects of this chemical on their post-embryonic development and metamorphosis, by using a multi-level approach. DEHP was shown to be present both in larvae and resulting stages, with higher concentrations in chrysalises and adults than in larvae. DEHP concentrations also decreased at the end of the last larval instar, suggesting the metabolic transformation or excretion of this chemical during this time. Only the two highest DEHP doses induced higher insect mortality, whereas low and intermediate concentrations increased larval food consumption without affecting body weight. Metabolic profiles showed that in control insects, the last three days before metamorphosis correspond to a metabolic transition, but with time-dependent changes in treated insects. Interestingly, DEHP treatments also alter both hemolymphatic ecdysteroid titers and expression levels of ecdysteroid response genes. These results confirm that DEHP can alter insect post-embryonic development and metamorphosis, by interfering with ecdysteroid pathways.

Accès au document

Whole genome sequences to assess the link between antibiotic and metal resistance in three coastal marine bacteria isolated from the mummichog gastrointestinal tract

Authors: Lloyd, NA; Nazaret, S; Barkay, T

Source: MARINE POLLUTION BULLETIN, 135: 514-520, 2018, DOI: 10.1016/j.marpolbul.2018.07.051

Abstract: Antibiotic resistance is a global public health issue and metal exposure can co-select for antibiotic resistance. We examined genome sequences of three multi-drug and metal resistant bacteria: one Shewanella sp., and two *Vitnio* spp., isolated from the gut of the mummichog fish (*Fundulus heteroclitus*). Our primary goal was to understand the mechanisms of co-selection. Phenotypically, the strains showed elevated resistance to arsenate, mercury, and various types of beta-lactams. The genomes contained genes of public health concern including one carbapenemase (bla(OXA-48)). Our analyses indicate that the co-selection phenotype is mediated by chromosomal resistance genes and cross-resistance. No evidence of co-resistance was found; most resistance genes were chromosomally located. Moreover, the identification of many efflux pump gene homologs indicates that cross-resistance and/or co-regulation may further contribute to resistance. We suggest that the mummichog gut microbiota may be a source of clinically relevant antibiotic resistance genes.

Accès au document

Regulatory identification of BPA as an endocrine disruptor: Context and methodology

Authors: Beausoleil, C; Emond, C; Cravedi, JP; Antignac, JP; Applanat, M; Appenzeller, BR; Beaudouin, R; Belzunces, LP; Canivenc-Lavier, MC; Chevalier, N; Chevrier, C; Elefant, E; Eustache, F; Habert, R; Kolf-Clauw, M; Le Magueresse-Battistoni, B; Mhaouty-Kodja, S; Minier, C; Multigner, L; Schroeder, H; Thonneau, P; Viguie, C; Pouzaud, F; Ormsby, JN; Rousselle, C; Verines-Jouin, L; Pasquier, E; Michel, C

Source: MOLECULAR AND CELLULAR ENDOCRINOLOGY, 475: 4-9, 2018, DOI: 10.1016/j.mce.2018.02.001

Abstract: BPA is one of the most investigated substances for its endocrine disruptor (ED) properties and it is at the same time in the center of many ED-related controversies. The analysis on how BPA fits to the regulatory identification as an ED is a challenge in terms of methodology. It is also a great opportunity to test the regulatory framework with a uniquely data-rich substance and learn valuable lessons for future cases. From this extensive database, it was considered important to engage in a detailed analysis so as to provide specific and strong evidences of ED while reflecting accurately the complexity of the response as well the multiplicity of adverse effects. An appropriate delineation of the scope of the analysis was therefore critical. Four effects namely, alterations of estrous cyclicity, mammary gland development, brain development and memory function, and metabolism, were considered to provide solid evidence of ED-mediated effects of BPA.

Accès au document

Combined toxic effects and DNA damage to two plant species exposed to binary metal mixtures (Cd/Pb)

Authors: Lanier, C; Bernard, F; Dumez, S; Leclercq-Dransart, J; Lemiere, S; …

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Abstract: Acute and long-term (3-, 10- and 56-day exposure) laboratory toxicity tests were carried out to assess the individual and combined toxic effects of cadmium (Cd) and lead (Pb) in Brassica oleracea and Trifolium repens. In addition to morphological parameters, this work also used comet assay to address endpoints in relation to genotoxicity. Bioaccumulation was measured to demonstrate the influence of the mixture on the concentrations of each metal in the plant. The statistical method reported by Ince et al. (1999) was used to evaluate the types of interaction between Cd and Pb in each treatment and concerning their combined effect. This study concludes that the combined effects of binary metal combinations of Cd/Pb on morphological parameters are most often additive, sometimes antagonistic and more rarely synergistic, thus extending the findings of previous publications on this subject. DNA damage analysis revealed concentration- and time-dependent interactions. Synergistic effects of mixed metals (more breaks than individually applied metals) are observed in T. repens after a short exposure. Antagonistic effects are statistically significant after 10 days-exposure, suggesting competition between metals…. This supports the idea that there may be competition between metals and also strengthens the hypothesis that long-term reparation mechanisms may be implemented. Cd/Pb co-exposure does not significantly influence the bioaccumulation of each metal. It is nevertheless important to note that a statistically significant 'interaction' is not necessarily biologically relevant and should therefore be considered with caution when assessing heavy metals combined effects.

Accès au document

Combination of passive and grab sampling strategies improves the assessment of pesticide occurrence and contamination levels in a large-scale watershed

Authors: Bernard, M; Boutry, S; Lissalde, S; Guibaud, G; Saut, M; Rebillard, JP; Mazzella, N

Source: SCIENCE OF THE TOTAL ENVIRONMENT, 651:684-695, 2019, DOI: 10.1016/j.scitotenv.2018.09.202

Abstract: Fifty-one monitoring stations from the Water Framework Directive network (2000/60/CE) were selected in the Adour-Garonne basin (117,650 km(2), SW France). These stations were characterized by a diversity of land use, implying different water pesticide contamination profiles. In each, Polar Organic Chemical Integrative Sampler (POCIS) deployment (14 days) and grab water samples (1 per period) were performed 6 times in 2016 in order to obtain contamination levels (29 pesticides monitored). The large

amount of data collected during this 1-year monitoring required specific graphical and map processing to compare the information provided by POCIS and grab samples. Graphical projections demonstrated that with POCIS the number of quantified pesticides and the quantification frequencies were higher than with grab samples. Additionally, projections showed that POCIS provided better temporal representativeness of monthly contamination levels. Indeed, the POCIS data showed seasonal trends which were directly linked with the use of each pesticide (application period) and the land use of each sampling site, that was not visible with the grab samples data. Map projections of the measured concentrations, using a common scale for the two sampling strategies, clearly showed the strengths of the POCIS deployment and the link between measured contamination levels, quantified pesticides and land use. Finally, this study shows that the combination of grab sample data (magnitude of contamination peaks) and POCIS data (average concentration over a given period) provided more complete and reliable knowledge of the contamination levels in the Basin than either method alone.

Accès au document

Diuron sorption isotherms in freshwater biofilms

Authors: Chaumet, B; Morin, S; Boutry, S; Mazzella, N

Source: SCIENCE OF THE TOTAL ENVIRONMENT, 651:1219-1225, 2019, DOI: 10.1016/j.scitotenv.2018.09.286

Abstract: Biofilms are excellent bioindicators for water quality assessment because of their ability to integrate contamination, and their position at the base of the trophic chain in aquatic environments. (…) The aim of this study was to describe pesticide behaviour in biofilms. Previous research highlighted that contaminant sorption was not always linear, but no study considered organic bioaccumulation isotherms and toxic impacts to biofilms concurrently. In order to characterize pesticide sorption isotherms in biofilms and the mechanisms involved in the uptake process, we simultaneously assessed bioaccumulation and toxic impact of diuron (a photosynthesis inhibiting herbicide) at the water-biofilm concentrations equilibrium. Mature biofilms grown on glass slides during one month were subsequently exposed in channels to 7 increasing concentrations of diuron from 1 to 500 mu g.L-1, plus a control condition, for 2 h with a flow velocity of 2 cm.s(-1). Then, a Langmuir isotherm equation was fitted to the bioaccumulation data, and an E-max model to toxic impact results. This study established that diuron bioaccumulation in biofilm is nonlinear, and allowed to calculate the Langmuir constant and maximal concentration of diuron potentially accumulated in biofilm (up to 17,771 mu g.g(-1)). In turn, we found that photosynthetic inhibition followed classical dose-response patterns with diuron concentrations in the water, and that EC50 could be established at 75 mu g.L-1. A continuous diffusion phenomenon was thus demonstrated but it was not linearly correlated to bioaccumulation, highlighting complex uptake mechanisms operating within the matrix. The coupling of toxicokinetic and toxicodynamic approaches provided original information about pesticide behaviour and impact in periphytic microorganisms.

Accès au document

Amendment of soil by biochars and activated carbons to reduce chlordecone bioavailability in piglets

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Accès au document

The One Health Concept: 10 Years Old and a Long Road Ahead

Authors: Destoumieux-Garzon, D; Mavingui, P; Boetsch, G; Boissier, J; Darriet, F; Duboz, P; Fritsch, C; …

Source: FRONTIERS IN VETERINARY SCIENCE, 5, 2018, DOI 10.3389/fvets.2018.00014

Abstract: …. Human and animal health has also been threatened by antimicrobial resistance, environmental pollution, and the development of multifactorial and chronic diseases. This highlighted the increasing globalization of health risks and the importance of the human-animal-ecosystem interface in the evolution and emergence of pathogens. A better knowledge of causes and consequences of certain human activities, lifestyles, and behaviors in ecosystems is crucial

for a rigorous interpretation of disease dynamics and to drive public policies. As a global good, health security must be understood on a global scale and from a global and crosscutting perspective, integrating human health, animal health, plant health, ecosystems health, and biodiversity. In this study, we discuss how crucial it is to consider ecological, evolutionary, and environmental sciences in understanding the emergence and re-emergence of infectious diseases and in facing the challenges of antimicrobial resistance. We also discuss the application of the "One Health" concept to non-communicable chronic diseases linked to exposure to multiple stresses, including toxic stress, and new lifestyles. Finally, we draw up a list of barriers that need removing and the ambitions that we must nurture for the effective application of the "One Health" concept. We conclude that the success of this One Health concept now requires breaking down the interdisciplinary barriers that still separate human and veterinary medicine from ecological, evolutionary, and environmental sciences. The development of integrative approaches should be promoted by linking the study of factors underlying stress responses to their consequences on ecosystem functioning and evolution. This knowledge is required for the development of novel control strategies inspired by environmental mechanisms leading to desired equilibrium and dynamics in healthy ecosystems and must provide in the near future a framework for more integrated operational initiatives.

Accès au document

Management initiatives in support of the soil quality of urban allotment gardens: Examples from Nantes (France)

Authors: Le Guern, C; Jean-Soro, L; Bechet, B; Lebeau, T; Bouquet, D

Source: LAND DEGRADATION & DEVELOPMENT, 29(10):3681-3692, 2018, DOI: 10.1002/ldr.3123

Abstract: Urban allotment gardens (UAGs) are important for the provision of foodstuffs, social cohesion, residents' well-being, and prevention of the formation of local heat islands during summer. The soils of these gardens however may be adversely affected by pollution threats and thus create health risks. In such cases, appropriate management becomes necessary. For several gardens exhibiting soil contamination (e.g., Pb at 100-400mgkg(-1)) in the city of Nantes, local actors collaborated, including scientists, the municipality's Parks and Open Space Department, elected officials, sanitary administration, and each site's gardeners' association. The soil characterization step was performed along with a sanitary risk evaluation and discussion of management options, based on both the pollution characteristics and local context. The most frequent option consisted of replacing the polluted soils with clean soils. Managing the excavated polluted soils on-site (e.g., for ornamental purposes) limited the economic and environmental impacts associated with this solution. Alternative solutions, including a combined system of nonaccumulative cropping vegetables at the time of phytoextraction, were also employed to maintain gardening uses. In some cases, land use (gardening) was changed into, for example, an orchard, open space, or ornamental space. A combination of solutions was introduced in several gardens. The various options available for managing polluted soils, as implemented in Nantes' UAGs and based mainly on nature-based solution, can be applied more generally in order to improve soil quality. In addition to enhancing the quality of both residents' lives and biodiversity, several solutions allow preserving or even restoring soil functions.

Accès au document

Identification of reference genes for RT-qPCR data normalization in *Gammarus fossarum* (Crustacea Amphipoda)

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

Source: SCIENTIFIC REPORTS, 8, DOI: 10.1038/s41598-018-33561-1

Abstract: Gene expression profiling via RT-qPCR is a robust technique increasingly used in ecotoxicology. Determination and validation of optimal reference genes is a requirement for initiating RT-qPCR experiments. To our best knowledge, this study is the first attempt of identifying a set of reference genes for the freshwater crustacean Gammarus fossarum. Six candidate genes (Actin, TUB, UB, SDH, Clathrin and GAPDH) were tested in order to determine the most stable ones in different stress conditions and to increase the robustness of RT-qPCR data. SDH and Clathrin appeared as the most stable ones. A validation was performed using G. fossarum samples exposed for 15 days to AgNO3, silver nanoparticles (AgNPs) 40 nm and gold nanoparticles (AuNPs) 40 nm. Effects on HSP90 were evaluated and data normalized using Clathrin and SDH. A down-regulation of HSP90 was observed when G. fossarum were exposed to AuNPs 40 nm whereas no effects were observed when G. fossarum were exposed to AgNPs 40 nm. This study highlights the importance of the preliminary determination of suitable reference genes for RT-qPCR experiments. Additionally, this study allowed, for the first time, the determination of a set of valuable genes that can be used in other RT-qPCR studies using G. fossarum as model organism.

Accès au document

Interactive Effects of Pesticides and Nutrients on Microbial Communities Responsible of Litter Decomposition in Streams

Authors: Rossi, F; Pesce, S; Mallet, C; Margoum, C; Chaumot, A; Masson, M; Artigas, J

Source: FRONTIERS IN MICROBIOLOGY, 9, 2018, DOI: 10.3389/fmicb.2018.02437

Abstract: .... In this study, we assessed the potential interaction between nutrients and a fungicide and herbicide [tebuconazole (TBZ) and S-metolachlor (S-Met), respectively] at realistic environmental concentrations on the structure (biomass, diversity) and decomposition activity of fungal and bacterial communities (leaf decay rates, extracellular enzymatic activities) associated with Alnus glutinosa (Alnus) leaves. A 40-day microcosm experiment was used to combine two nutrient conditions (mesotrophic and eutrophic) with four pesticide treatments at a nominal concentration of 15 mu g L-1 (control, TBZ and S-Met, alone

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or mixed) following a 2 x 4 full factorial design. We also investigated resulting indirect effects on Gammarus fossarum feeding rates using leaves previously exposed to each of the treatments described above. Results showed interactive effects between nutrients and pesticides, only when nutrient (i.e., nitrogen and phosphorus) concentrations were the highest (eutrophic condition). … Overall, the present study highlights that complex interactions between nutrients and xenobiotics in streams and resulting from global change can negatively affect microbial communities associated with leaf litter, although effects on higher trophic-level organisms remains unclear.

Accès au document

Impact of Lebanese practices in industry, agriculture and urbanization on soil toxicity. Evaluation of the Polycyclic Aromatic Hydrocarbons (PAHs) levels in soil

Authors: Soukarieh, B; El Hawari, K; El Husseini, M; Budzinski, H; Jaber, F

Source: CHEMOSPHERE, 210: 85-92, 2018, DOI: 10.1016/j.chemosphere.2018.06.178

Abstract: This study was carried out in order to investigate the toxicity on Lebanese soil and to show the impact of the anthropogenic activities, industrialization and urbanization, on the release of Polycyclic Aromatic Hydrocarbons (PAHs) in Lebanese soils. Hundred soil samples of different land use were screened for 17 PAHs using a UAE/GC-MS method. Detection frequency varied between 76 and 100% for most of the PAHs, where the Sigma PAHs ranged from 33.5 to 4062.9 ngg(-1). Moreover, BaPeq values varied between 0.93 and 332.4 ngg-1. BaPeq values in industrial and urban soils were 777 and 256 times higher than those in rural soil, respectively. None of the soil samples showed concentrations above the safe BaPeq value of 600 ng g(-1). Significant decrease in concentration levels of Sigma PAHs was obtained in the following order: Industrial, urban, traffic and agricultural. Furthermore, the relative high contribution of Chrysene, Benzo(a)Anthracene and Benzo(k)Fluoranthene in agricultural soils indicates that open burning remains an adopted way in Lebanon for disposal of agricultural residues, while the predominance of Benzo(ghi) Perylene and Benzo(b)Fluoranthene in industrial soils suggests the broad use of diesel powered engines in the Lebanese industrial sector. The ratios of Low Molecular Weight/High Molecular Weight and fluoranthene/fluoranthene+pyrene (Fln/Fln+Pyr) showed that PAHs in soil samples are mainly pyrogenic and created during combustion of petrol, coal, wood and other biomasses.

Accès au document

Whole-transcriptome response to wastewater treatment plant and stormwater effluents in the Asian clam, *Corbicula fluminea*

Authors: Bertucci, A; Pierron, F; Gourves, PY; Klopp, C; Lagarde, G; Pereto, C; Dufour, V; Gonzalez, P; Coynel, A; Budzinski, H; Baudrimont, M

Source: ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY, 165: 96-106, 2018, DOI: 10.1016/j.ecoenv.2018.08.090

Abstract: … RNA sequencing was used to assess the impact of a chronic exposure to wastewater treatment plant and stormwater effluents at the whole-transcriptome level and evaluate the potential physiological outcomes in the Asian clam *Corbicula fluminea*. We de-novo assembled a transcriptome from C. fluminea digestive gland and identified a set of 3,181 transcripts with altered abundance in response to water quality. The largest differences in transcriptomic profiles were observed between C. fluminea from the reference site and those exposed to wastewater treatment plant effluents. On both anthropogenically impacted sites, most differentially expressed transcripts were involved in signaling pathways in relation to energy metabolism such as mTOR and FoxO, suggesting an energy/nutrient deficit and hypoxic conditions. These conditions were likely responsible for damages to proteins and transcripts in response to wastewater treatment effluents whereas exposure to urban runoff might result in immune and endocrine disruptions. In absence of comprehensive chemical characterization, the RNAseq approach could provide information regarding the mode of action of pollutants and then be useful for the identification of which parameters must be studied at higher integration level in order to diagnose sites where the presence of complex and variable mixtures of chemicals is suspected.

Accès au document

Stimulation or inhibition: Leaf microbial decomposition in streams subjected to complex chemical contamination

Authors: Rossi, F; Mallet, C; Portelli, C; Donnadieu, F; Bonnemoy, F; Artigas, J

Soruce: SCIENCE OF THE TOTAL ENVIRONMENT, 648: 1371-1383, 2019, DOI: 10.1016/j.scitotenv.2018.08.197

Abstract: … In this study, the rates of microbial Alnus glutinosa (Alnus) leaf decay were assessed in six French watersheds displaying different land use (agricultural, urbanized, forested) and over four seasons (spring, summer, autumn, winter). In addition, for each watershed at each sampling time, both upstream(less-contaminated) and downstream (more-contaminated) sections were monitored. Toxicities (estimated as toxic units) predicted separately for pesticides and pharmaceuticals as well as environmental parameters (including nutrient levels) were related to microbial decay rates corrected for temperature and a range of fungal and bacterial community endpoints, including biomass, structure, and activity (extracellular ligninolytic and cellulolytic enzymatic activities). Results showed that agricultural and urbanized watersheds were more contaminated for nutrients and xenobiotics (higher pesticides and pharmaceuticals predicted toxicity) than forested watersheds. However, Alnus decay rates were higher in agricultural and urbanized watersheds, suggesting compensatory effects of nutrients over xenobiotics. Conversely, fungal biomass in leaves was 2-fold and 1.4-fold smaller in urbanized and agricultural watersheds than in the forested watersheds, respectively, which was mostly related to pesticide toxicity. However, no clear pattern was observed for extracellular enzymatic activities except that beta-glucosidase activity positively correlated with Alnus

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decay rates. Together, these results highlight microbial communities being more efficient for leaf decomposition in polluted watersheds than in less contaminated ones, which is probably explained by changes in microbial community structure. Overall, our study showed that realistic chemical contamination in stream ecosystems may affect the biomass of Alnus-associated microbial communities but that these communities can adapt themselves to xenobiotics and maintain ecosystem functions.

Accès au document

Vie du réseau Ecotox

INRA - Biodiversité des sols, indicatrice de leur état, actrice de leur fonctionnement.

Presse INRA 04/12/2018

Entretiens filmés de 3 chercheurs du CIAG de Dijon.

… Le sol est au carrefour du bon fonctionnement de notre agriculture, de notre alimentation et de notre environnement… S'il a longtemps été vu comme un support inerte, son patrimoine biologique est aujourd'hui apprécié pour tous les services qu'il rend aux communautés humaines. À l'Inra, il mobilise de nombreux chercheurs. Dans cette interview vidéo Pierre-Alain Maron, Inra Bourgogne Franche-Comté, Mickaël Hedde, Inra Occitanie-Montpellier et Antonio Bispo, Inra Val de Loire en livrent quelques enjeux qu'ils partageaient lors du Carrefour de l'Innovation agronomique sur la fertilité biologique des sols, le 18 octobre dernier.

Mieux connaître la diversité biologique des sols

Mieux connaître et mieux comprendre la diversité biologique des sols est essentiel pour entretenir la qualité des sols, ainsi que pour préserver ou même favoriser les services qu'ils rendent. Pour cela, on doit mieux connaître non seulement la diversité des espèces peuplant un sol mais aussi la diversité des fonctions qu'elles assurent : on parle de biodiversité fonctionnelle. Beaucoup d'interactions sont à étudier…

Du bioindicateur au biostimulant La nature de la biodiversité présente dans un sol renseigne aussi sur l'état de ce dernier. Les nématodes, par exemple, sont d'excellents bioindicateurs. Ils peuvent témoigner de contaminations en indiquant la présence de pesticides ou de métaux dans les écosystèmes, ainsi que leurs effets.

Ils peuvent également retracer les effets de certaines pratiques agricoles.

Pour renforcer la vie des sols, certaines pistes d'innovation s'attachent à trouver des « biostimulants », tels que des apports de microorganismes, d'extraits d'algues, etc…

Décoder l'ADN des sols

e Réseau de Mesures de la Qualité des Sols (RMQS) échantillonne 2200 sites en France (1 point tous les 16 km). L'information sur les sols de France est accessible à tous sur le site internet du GIS Sol. Depuis 2006, il mesure l'abondance et la diversité des microorganismes et des bactéries sur ces sites, grâce à l'ADN du sol.

.« Nous devons partager la connaissance de la biodiversité des sols avec l'ensemble de la société civile » soulignait Thierry Caquet, directeur scientifique « Environnement » de l'Inra en conclusion du colloque.

Accès au document

Appel à Manifestation d'Intérêt RECOTOX 2019

Clôture de l'appel : 28 février 2019

… Nous souhaitons que les propositions soumises en 2019 considérèrent l'une des questions suivantes :

- 1. Comment les effets des pesticides impactent-ils la biodiversité ?

- 2. Comment l'organisation des paysages module-t-elle les impacts des pesticides sur l'environnement ?

- 3. Quelle relation existe-t-il entre environnement et santé globale (Eco Health) ?

Les propositions devront également intégrer une dimension « observatoires ».

Les demandes de renseignement, ainsi que les propositions de recherches doivent être adressées par mail à l'adresse : contact-recotox@inra.fr

Ecotoxicité / Toxicité

Potential Mechanistic Link between Neonicotinoid Insecticides and Hormone-Dependent Breast Cancer

Article paru dans Environ Health Perspect. 2018, 126(11):114001. doi: 10.1289/EHP4097, Auteur: Schmidt S.

Accès au document

New Developments in the Link Between Parkinson's and Pesticides

Beyond Pesticides,20/12/2018

Commente un article publié dans Journal of Parkinson's disease : Ingestion of subthreshold doses of environmental toxins induces ascending Parkinsonism in the rat

Using low doses of the herbicide paraquat and common proteins found in food called lectins, researchers were able to recreate the symptoms of Parkinson's disease in rats. Results of this study, published in the journal Parkinson's disease, provide scientists with fresh insights into the development of the disease, and a new model to test potential remedies. Paraquat, a neurotoxic herbicide with a well-established body of literature linking it to Parkinson's disease, is currently undergoing a registration review by the U.S. Environmental Protection Agency, and groups like the Michael J Fox Foundation are calling for its ban...

Accès au document

Vietnam veterans and agent orange exposure

sciencedaily. 15/11/2018 reviews of the evidence of **health problems** that may be linked to exposure to Agent Orange and other **herbicides** used during the Vietnam War found sufficient evidence of an association for hypertension and monoclonal gammopathy of undetermined significance (MGUS). Le rapport est en ligne Report Highlights

Accès au document

Santé environnementale et maladies chroniques, le coût de l'inaction

L'Économie politique, 2018/4, p.17-29, Auteur : André Cicolella

Voir les passages :
-La santé environnementale, réponse à la crise sanitaire
-Génétique et épigénétique
-Le coût de la nourriture ultratransformée
-La sédentarité
-La pollution

Si la croissance des maladies chroniques ne peut s'expliquer par le seul effet du vieillissement, l'origine est à trouver dans les changements environnementaux ... L'alimentation n'est pas seulement un problème de nutrition, c'est aussi un vecteur de **contamination environnementale**...

On accorde aujourd'hui plus d'importance à l'**épigénétique**, car on a mis en évidence l'impact des stress environnementaux, nutritionnels, chimiques et même psychoaffectifs sur l'**expression des gènes**… Les perturbateurs endocriniens sont un cas particulier de la Dohad...

Accès au document

Pesticides et santé des agriculteurs

Évaluation des expositions professionnelles aux pesticides utilisés dans la culture de la banane aux Antilles et description de leurs effets sanitaires

Santé publique France, 2018

Assessment of occupational exposures to pesticides used in banana cultivation in the French West Indies and description of their health effects

Auteur(s) : Gentil C, Spinosi J, Cahour L, Chaperon L, El Yamani M

Résumé : Présentation du projet Matphyto DOM

L'évaluation **rétrospective** des expositions aux pesticides des travailleurs agricoles est une démarche nécessaire pour comprendre et établir des liens entre leurs activités tout le long de leur carrière et la survenue potentielle de pathologies graves telles les cancers ou les maladies neurodégénératives en relation avec leur travail. Les outils fiables soutenus par une méthodologie précise et structurée pour dresser l'historique des expositions professionnelles sont peu nombreux.

... Nous avons utilisé trois outils dont deux construits en interne pour répondre à la question : quels sont les PPP qui ont été appliqués sur la culture de la banane au cours des dernières décennies et quels sont leurs effets sanitaires ?

Le premier outil est la construction d'une **matrice culture-exposition** (MCE) spécifique à la culture de la banane dessert aux Antilles grâce à laquelle nous avons identifié l'ensemble des PPP utilisés sur cette culture depuis les années 1960 ainsi que la fréquence et la probabilité de leur usage. Le second outil est l'élaboration de la base CipaTox ; elle a été établie pour recenser les effets sur la santé connus ou suspectés d'être associés à une exposition chronique aux substances actives (SA) des PPP homologués en France depuis 1961. Un focus a été fait sur la cancérogénicité, la mutagénicité et la reprotoxicité (CMR) ainsi que sur les potentiels effets de perturbation endocrinienne (PE). Enfin, le troisième outil, mis à disposition par le ministère de l'agriculture, sont les recensements agricoles (RA) de 1981, 1989, 2000 et 2010 qui ont permis d'identifier les caractéristiques sociodémographiques des travailleurs de la banane aux Antilles. En croisant ces trois sources de données, nous avons calculé des prévalences d'exposition professionnelle pour les quatre années du RA, aux PPP utilisés sur la banane aux Antilles, et identifier les effets sanitaires qu'ils peuvent engendrer. Nos travaux montrent que depuis 1981 et jusqu'en 2010, l'ensemble des travailleurs de la banane aux Antilles, dont le nombre est passé de 13 504 à 5 270 individus, a été exposé à au moins une substance néfaste pour la santé et considérée comme CMR ou PE. En 2015, la prévalence d'exposition à des CMR et PE des travailleurs de la banane aux Antilles reste de 100 %, toutes les exploitations utilisant au moins une substance active CMR ou PE. La spécificité de l'agriculture aux Antilles est à prendre en considération pour évaluer l'exposition des travailleurs aux PPP…

Nos travaux permettent de guider la prévention vis-à-vis des professionnels de l'agriculture en leur permettant d'identifier les substances ayant des effets néfastes sur la santé. Ils poussent à mettre en place plusieurs actions dont la promotion des méthodes alternatives de production de la banane, la limitation de l'usage des PPP, la circonscription de l'utilisation des PPP dont la SA est CMR ou PE, la sensibilisation des travailleurs à ces risques à travers des campagnes de prévention et enfin l'information et la formation des médecins généralistes et la médecine du travail pour faciliter la reconnaissance en maladies professionnelles.

voir aussi :

Imprégnation de la population antillaise par la chlordécone et certains composés organochlorés en 2013-2014 Étude Kannari: Santé publique France, 2018. 86 p.

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Ecotox / Colloques

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

2019/01/ 29 - Colloque IBMA
2019/02/20-22 - Geoecology and Desertification International Symposium
2019/03/22 - ADEME : Comment mieux connaitre l'impact des mélanges de polluants ? Point sur le premie
2019/05/05-09 - ICOBTE 15th International Conference on the Biogeochemistry of Trace Elements (ICOBTE)
2019/05/19-24 - IUPAC International Congress of Crop Protection Chemistry
2019/05/20-21 - Antibiotics Conferences | Antibiotic Resistance Conferences
2019/05/26-30 - SETAC Helsinki - SETAC Europe 29th Annual Meeting
2019/06/16-20 - ICCE 2019 - Thessaloniki, Greece
2019/07/01-03 - Antimicrobial Resistance in Animals and the Evironment (ARAE 2019)
2019/08/18-22 - Goldschmidt
2019/09/03-05 – 16ème Symposium in Pesticide Chemistry: Advances in risk assessment and management.
2019/10/06-11 - SOM - Soil Organic Matters in a stressed world
2019/11/26-27 – 4ème Rencontres nationales de la recherche sur les sites et sols pollués –

Voici ceux que nous avons ajoutés au site ces dernières semaines

2019/07/04-05 Toxicology and Applied Pharmacology

July 04-05, 2019 Valencia, Spain Theme: Explore the Insights of Exotic Tox Pathways

Accès au document

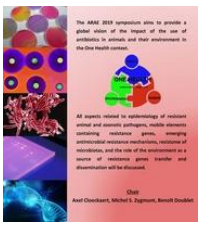
2018/04/28 - 2018/05/03 - "TransCon2019: Understanding and managing microbial biotransformation of environmental contaminants"

The TransCon2019 will be held at Ascona, Switzerland.

Abstracts submission is still open for late posters.

Accès au document

2019/07/01-03 - Antimicrobial Resistance in Animals and the Evironment (ARAE 2019)



Vinci International Convention Centre, Tours Val de Loire - France

The aim of the ARAE conference is to present a global vision of the impact of the use of antimicrobial agents in livestock production and their environment.

1- Monitoring and molecular epidemiology of antimicrobial resistance
2- Role and prevalence of antibiosis and the related resistance genes in the environment
3- Mechanisms and dissemination of antimicrobial resistance in animal and zoonotic pathogens
4- Studying antimicrobial resistance at the high throughput era
Accès au document

2019/09/03-05 – 16th Symposium in Pesticide Chemistry: Advances in risk assessment and management

Piacenza, Italy.

The Symposium will be subdivided into scientific sessions dealing with:

1. **Environmental fate in air, soil and water.** Sorption/desorption, aged and bound residues, spray drift, volatilization, leaching.
2. **Biotic processes and environmental fate.** Transformation, bioavailability, microbial ecology, microbial communities, metabolism.
3. **Monitoring of pesticides and their metabolites.** Study design, monitoring results, residues in plant & environmental compartments.
4. **Ecotoxicology into fate in real world.** Ecotox procedures, modelling & higher tier assessments.
5. **Pesticide risk assessment.** Procedures for risk assessment, uncertainty, environmental indicators.
6. **Sustainable use, IPM and stakeholders' response.** EU and stakeholders' position on pesticide use, sustainable uses, IPM vs conventional.
7. **Risk mitigation measures.** Measures related to prevention and mitigation of point and nonpoint contamination.
8. **Regulation and controversial policies.** Regulatory issues, policies, minor crops, regional authorization.

Preliminary registration opens the 1 December 2018 at https://symposiumpesticide.org

Accès au document

2019/03/22 - ADEME : Comment mieux connaitre l'impact des mélanges de polluants ? Point sur le premier appel à projets et identification des besoins de recherche futurs

Le séminaire vise à présenter, échanger et débattre sur ce premier appel à projets IMPACTS de l'ADEME sur la thématique des mélanges dans tous les milieux, et de leurs effets sur les écosystèmes et l'homme. (voir l'AP sur le site de l'ADEME).

Les inscriptions au séminaireseront ouvertes en janvier.

Accès au document

2019/11/26-27 - 4ème Rencontres nationales de la recherche sur les sites et sols pollués – ADEME

Appel à communications ouvert **jusqu'au 28 janvier 2019**.

5 thèmes vous sont proposés pour cette édition :

- Caractérisation et interprétation des résultats
- Compréhension des mécanismes et transfert de polluants
- Exposition et impacts vers le vivant
- Techniques de dépollution
- Modalités de gestion et travaux
- Villes et territoires durables

Accès au document

2019/06/16-20 ICCE 2019 - Thessaloniki, Greece

ABSTRACT SUBMISSION by 15 January 2019

Call for Papers .pdf **format**

Parmiles thèmes annoncés :

-Air pollution – chemistry and health risks
-Detection and determination of substances, including constituents and impurities, and degradation products in simulation tests and bioaccumulation studies
-Oxidation and Advanced Oxidation processes in water and wastewater treatment
-Recycling and resource reuse as tools for efficient circular economy
-Soil Pollution and Monitoring Conveners:
-Mass Spectrometry in environmental research
-Environmental problems relevant to Mediterranean sea and
-Gulf of Mexico (MedSea-GuMex)
-Innovation in drinking water treatment
-Advances in wastewater treatment
-Environmental applications of nanomaterials
-Heavy metals and other inorganic pollutants in the environment and removal technologies
-Green and sustainable chemistry strategies for agricultural and food waste biomass valorizations
-Dissolved natural organic matter pollution impact on water quality
-Analytical Chemistry in environmental monitoring and chemistry studies
-Identifying critical nutrient emission zones in landscapes: a key for reducing water eutrophication?
-Urban contaminants: control measures, remediation actions and toxicological implications
-Micropollutants in the aquatic environment

Accès au document

2019/10/06-11 - SOM - Soil Organic Matters in a stressed world

Ce congrès qui se tiendra en Australie, à Adelaide.

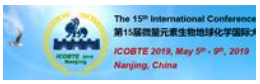
Accès au document

2019/08/18-22 - Goldschmidt

Plusieurs sessions sur l'ecotox et le devenir des polluants lors de ce colloque : International conference on geochemistry and related subjects.

Accès au document

2019/05/05-09 - ICOBTE 2019 Nanjing China



May 5th-9th 2019 in Nanjing, China.

The general theme of the 15th ICOBTE in Nanjing is "Biogeochemistry of trace elements for improved environmental sustainability and human health".

Deadline for Submission of Abstracts: **31/12/2018**

Plusieurs sessions spéciales sont organisées :

-1. Novel techniques in molecular environmental soil science

-2. Interactions between biochars and trace elements in the environment

-3. Antimony in the environment: Current research and new directions

-4. Arsenic and cadmium in rice: Current research and mitigation strategies

-5. Trace element uptake and metabolism in plants

-6. GeoNutrition: Biogeochemical aspects of micronutrients and human health

-7. Trace element dynamics in the rhizosphere

-8. Methylation and demethylation of trace elements

-9. Trace element bioavailability in aquatic and terrestrial environments and implications to human and ecological risk assessment

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-10. Phytomanagement of trace element-contaminated or enriched soils and substrates: Wider benefits and limits

-11. Biogeochemistry of trace elements in agricultural recycling

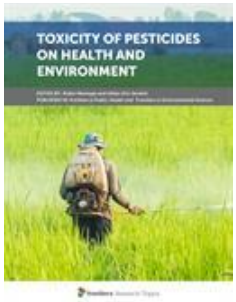
-12. Expedited investigation, risk assessment and sustainable remediation of heavy metal contaminated sites

-13. New approaches in management and remediation of contaminated sediments

Accès au document

Ouvrages / Rapports/ Actes de Congrès

Toxicity of Pesticides on Health and Environment



Edited by: Mesnage, R., Seralini, G-E., eds. (2018). Frontiers Media. doi: 10.3389/978-2-88945-644-4

Cet ouvrage de 124 pages est gratuit et accessible en ligne

This Research Topic focuses on the toxic effects of pesticides associated with large scale cultivation of genetically modified (GM) plants.

Convergent evidences suggest endocrine or nervous disrupting effects of pesticides, as well as effects on wildlife and the environment. These effects are amplified by the use of surfactants and/or combinations of different active principles.

Editorial: Toxicity of Pesticides on Health and Environment Robin Mesnage and Gilles-Eric Séralini

1. THE EFFECTS OF PESTICIDES ON HUMAN HEALTH AND THE ENVIRONMENT

Chemical Pesticides and Human Health: The Urgent Need for a New Concept in Agriculture

Glyphosate: Too Much of a Good Thing?

Toxicological Risks of Agrochemical Spray Adjuvants: Organosilicone Surfactants May Not Be Safe

Commentary: "Estrogenic and Anti-Androgenic Endocrine Disrupting Chemicals and Their Impact onthe Male Reproductive System"

Inflammatory Effects of the Plant Protection Product Stifenia (FEN560) on Vertebrates

2. UNDERSTANDING THE ASSOCIATION BETWEEN PESTICIDES AND GM PLANTS

Complex Outcomes From Insect and Weed Control With Transgenic Plants: Ecological Surprises?

Specificity and Combinatorial Effects of Bacillus Thuringiensis Cry Toxins in the Context of GMO Environmental Risk Assessment

Modified Food Safety: Weaknesses in Study Design

3. IMPROVING THE REGULATORY ASSESSMENT OF PESTICIDES AND GM CROPS

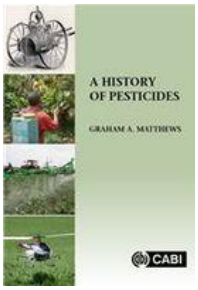
Re-registration Challenges of Glyphosate in the European Union

Enhancements Needed in GE Crop and Food Regulation in the U.S.

4. A ROLE FOR CIVIL SOCIETY IN SCIENCE

Accès au document

A History of Pesticides

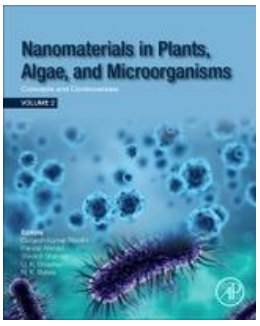


By G Matthews, Professor Emeritus. Emeritus Professor, Imperial College London, UK, September 2018, 312 Pages / 9781786394873

Prologue: Before Pesticides

-1. Pesticides in the Early Part of the 20th Century
-2. Application of Pesticides
-3. Insecticides Post-1950
-4. Herbicides
-5. Fungicides
-6. Other Pesticides
-7. Resistance to Pesticides
-8. Integrated Pest Management
-9. Health Issues
-10. Regulations and the Manufacturers of Pesticides and Related Organizations
-11. Pesticides – the Future
Annex: Common Name and Major Trade Name of Selected Pesticides
Accès au document

Nanomaterials in Plants, Algae and Microorganisms



Editors: Durgesh Kumar Tripathi, Parvaiz Ahmad, Shivesh Sharma, Devendra Chauhan, Nawal Kishore Dubey. **eBook ISBN:** 9780128116456 21st September 2018 **Page Count:** 382

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-1. Harmful phytotoxic characters of cobalt and zinc oxide nanoparticles in Algae
-2. Response of nanoparticles on aquatic ecosystem
-3. Nanoparticle and Algae Interactions: Oxidative termination, reactive oxygen species generation and synergistic toxic impacts
-4. Nanoparticles: Sources and Responses
-5. Response of nanoparticles on molecular mechanisms of aquatic plants and algae
-6. Ecotoxic effect of photocatalytic active nanoparticles on algae and aquatic plants
-7. Nanoparticles: Antifungal and Antimicrobial responses
-8. A comparative behavior of metals and oxide Nanoparticles on aquatic plants, microbes and algae
-9. Impact of nanoparticles on genomics of living organisms

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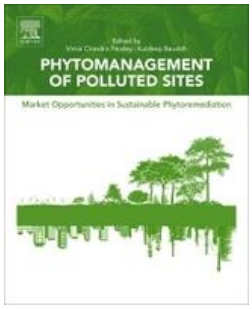
-10. Physiology, Chemistry and Biochemistry of Nanoparticles
-11. Phytotoxicity of silver nanoparticles to aquatic plants, algae and microorganisms
-12. Zinc oxide nanoparticles' impact on aquatic plants, algae and microorganisms
-13. Do nanoparticles possess ecotoxicological risks to the aquatic environment?
-14. Availability, behavior and impact of nanoparticles in the environment
-15. Ecotoxicology of carbon-based engineered nanoparticles on plants and aquatic ecosystems
-16. Uptake and translocation of nanoparticles in wetland plants
-17. Relevance of wetland plants in the synthesis of nanoparticles
-18. Toxicity assessment of cerium oxide nanoparticles in wetland plants
-19. Behavior of nanoparticles on aquatic foods and vegetables
-20. Genotoxicity of silver nanoparticles in wetland plants and algae
-21. Changes in gene expression of algae and aquatic plants in response to nanoparticles and ions

Accès au document

Phytomanagement of Polluted Sites



Editors: Vimal Chandra Pandey, Kuldeep Bauddh. **Paperback ISBN:** 9780128139127 **Imprint:** Elsevier **Published Date:** 6th December 2018 **Page Count:** 626

Accès au document

Environmental and Pollution Science - 3rd Edition

Authors: Mark Brusseau, Ian Pepper, Charles Gerba

Paperback ISBN: 9780128147191 **Imprint:** Academic Press **Published Date: 1st February 2019,** 608 pages

This third Edition is designed to give readers the tools to be able to understand and implement multi-disciplinary approaches to help solve current and future environmental pollution problems.

Table of Contents

-PART 1 Fundamental Concepts

-PART 2 Environmental Pollution

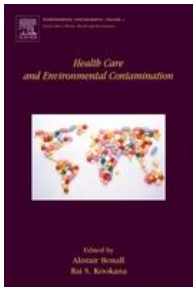
-PART 3 Remediation, Restoration, Treatment, and Reuse

-PART 4 Global Systems and the Human Dimensions to Environmental Pollution

-Epilogue: Is the Future of Pollution History?

Accès au document

Health Care and Environmental Contamination



Hardcover ISBN: 9780444638571 **Imprint:** Elsevier **Published Date:** 10th February 2018 **Page Count:** 278

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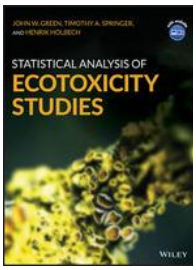
-1. Environmental Contaminants and Healthcare: An Introduction
-2. Environmental contamination from Health-Care Facilities
-3. Fate and Behaviour of Environmental Contaminants Arising from Health-Care Provision
-4. Ecotoxicological Perspectives on Health-Care and the Environment
-5. Terrestrial Ecotoxicity
-6. Environmental Contaminants of Health-Care Origin: Exposure and Potential Effects on Wildlife
-7. Pharmaceuticals in the Environment and Human Health
-8. Antibiotic and Antibiotic Resistance: Closing the Loop Between Hospitals and the Environment
-9. Antimicrobial Use and Ecotoxicological Risks from Pandemics and Epidemics
-10. Management of Waste from the Health-Care Sector
-11. Stewardship Approaches to Reducing Health-Care Contaminants
-12. Management of Environmental Contaminants from Healthcare: Sustainable Pharmacy
-13. Policy, Regulations and Risk Assessment

Accès au document

Statistical Analysis of Ecotoxicity Studies



John W. Green, Timothy A. Springer, Henrik Holbech

ISBN: 978-1-119-08834-9 August 2018 416 Pages

A guide to the issues relevant to the design, analysis, and interpretation of toxicity studies that examine chemicals for use in the environment.

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-1. An Introduction to Toxicity Experiments 1

-2. Statistical Analysis Basics 19

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-4. Analysis of Continuous Data: Regression 89

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-6. Analysis of Quantal Data: NOECs 157

-7. Analysis of Quantal Data: Regression Models 181

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-10. Time-to-Event Data 259

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-12. Species Sensitivity Distributions 293

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How to interpret the toxicity of complex environmetal mixtures?

A method combining analytical chemistry and mixture modelling approaches.

La fondation Rovaltain a mis en ligne le 17/12/2018 un webinar : conference of Valentin Dupraz, Ifremer, France.

Accès au document

Projet de Stratégie nationale sur les perturbateurs endocriniens : avis du HCSP

Haut Conseil de la Santé Publique

Rapport HCSP Dec 2018 150 pages.

La deuxième Stratégie (SNPE2) est en cours d'élaboration... Le HCSP Haut Conseil de la Santé publique a réalisé une analyse critique du projet. Parmi ses recommandations :

-Combiner l'action conduite dans le cadre des procédures de réglementation européennes avec une gestion des risques ambitieuse au plan national ....

-Harmoniser les réglementations européennes sur les substances chimiques dangereuses en y intégrant les perturbateurs endocriniens et en catégorisant ceux-ci en 3 groupes selon la preuve du danger.

- Prendre davantage en compte l'alimentation comme source d'exposition aux perturbateurs endocriniens.

Accès au document

La géostatistique pour interpréter les données de pollution des sols

ADEME & Vous : La lettre Recherche - N 25 Decembre 2018

Hélène Roussel, ADEME, présente une retrospective de la Géostatistique puis présente les projets menés par l'ADEME faisant appel à la geostatistique.

OPTIMISER LA GESTION DES SITES ET SOLS POLLUÉS AVEC LA GÉOSTATISTIQUE :

... l'ADEME continue à développer des avancées techniques, mais aussi à promouvoir l'usage de la géostatistique pour la gestion des sites pollués : Un des principaux atouts de la géostatistique concerne la gestion rapide des données. Le prélèvement d'échantillons sur un site potentiellement pollué et l'analyse de leur teneur en contaminant chimiques sont des opérations coûteuses. Aussi le nombre de données disponibles pour la caractérisation d'un site est-il toujours limité. Le programme de recherche **REPÉRAGE** a permis de mettre en oeuvre simultanément des outils de mesures rapides sur site et des méthodes géostatistiques…

... Le projet ESOPOL a pour objectif d'intégrer un module géostatistique au logiciel interne d'un appareil portable LIBS (spectroscopie sur plasma induit par laser). Cela permet, en temps réel et sur le site, d'établir une cartographie semi-quantitative des polluants métalliques au fur et à mesure de l'acquisition des mesures.

Accès au document

OECD - Land use and ecosystem services

OECD Food, Agriculture and Fisheries Papers

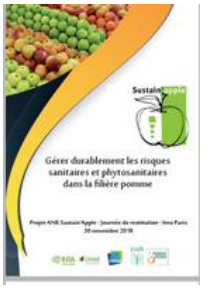
Rapport OCDE 14 Sept 2018

https://doi.org/10.1787/c7ec938e-en

This report assesses the crucial drivers of ecosystem services and proposes actions to develop a more effective policy mix... a literature review provides an overview of the state and trends of ecosystem services linked to agriculture, including issues related to land use. Secondly, results are presented from a quantitative model developed to illustrate the potential benefits of improving policy design as well as to investigate synergies and trade-offs among ecosystem services. This report also includes a review of experiences in an inventory of ecosystems in selected countries and policy initiatives that address ecosystem services linked to agriculture.

Accès au document

Gérer durablement les risques sanitaires et phytosanitaires dans la filière pomme



Brochure présentant les résultats du projet ANR Sustain'Apple présentée lors de la Journée de restitution - Inra Paris 30 novembre 2018. Nov 2018. 36 pages.

Pilote scientifique : Jean-Marie Codron, Inra

Le projet Sustain'Apple, a réuni depuis 2014, une vingtaine de chercheurs, les principales organisations de R&D (INRA, CIRAD, CTIFL, IRSTEA) ainsi que les professionnels de la filière (ANPP, ANEEFEL, INTERFEL…) pour étudier la gestion

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des risques sanitaires et phytosanitaires dans la filière pomme sur le marché domestique et international...

a noter p 32 : Évaluation des impacts environnementaux de différentes filières pommes Analyse du cycle de vie du verger à l'assiette du consommateur ...Dans le cadre du projet Sustain'apple, nous avons mis en oeuvre des Analyses du Cycle de Vie (ACV…Ces impacts sont rapportés à une unité de service rendu, à savoir 1kg de pommes dans l'assiette du consommateur final et ils peuvent être agrégés en 3 indicateurs de dommages comme suit :

- Dommages sur la santé humaine
  Dommages sur la qualité des écosystèmes
- Dommages sur les ressources

Les présentations du 30/11/2018 sont en ligne.

INRA - Guide presomption de pollution d'un sol

Ce guide a une vocation pédagogique et d'accompagnement méthodologique. Il a pour objectif d'offrir les bases de compréhension pour répondre à une suspicion de pollution des sols, voire la lever, pour structurer, prioriser et planifier son action dans le contexte des aménagements extérieurs…

Accès au document

What are the health costs of environmental pollution?

Science for environment policy

Future Brief Issue 21 December 2018. 60 pages.

Environmental pollution causes death, pain and suffering. How do we estimate the **economic impact of these health damages on society**? And what should we pay to reduce or avoid the damage? This report explores how to assign an economic value to the health impacts of pollution, with a focus on the effects of air, chemical and noise pollution. Costing health impacts has a number of uses in environmental policymaking, from communicating the burden of pollution to informing taxes on polluting activities.

Accès au document

Toxic E-Waste Chemicals in Children's Products Spurs Calls for Policy to End Recycling Exemptions for Hazardous Waste

Présentration d'une étude de l'association Health and Environment Alliance oct 2018.

Recyclage toxique : quand des déchets dangereux sont utilisés pour fabriquer de nouveaux produit . Cette étude parait alors que la reglementation européenne concernant les POPs dans les déchets est en cours de discussion

Environmental health researchers released alarming evidence [1] today that toxic brominated flame retardants, hazardous chemicals from electronic waste that are known to disrupt thyroid function and cause neurological and attention deficits in children, are contaminating recycled plastics in consumer products across Europe.

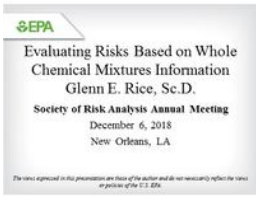
The report release coincides with a crucial vote in the European Parliament to establish and re-evaluate recycling exemptions for POPs (Persistent Organic Pollutants) in waste and with the European Commission's revision of POPs waste limits. Both decisions will determine whether toxic waste materials, such as e-waste containing brominated flame retardants, will be allowed in recycled plastics.

Ce rapport révèle que des produits de consommation, y compris des jouets, fabriqués à partir de déchets électroniques recyclés, sont contaminés par des produits chimiques toxiques...

The study, an analysis of 430 plastic children's toys, hair accessories, and kitchen utensils purchased in 19 European countries showed that 109 (25%) had elevated levels of bromine, indicating potential presence of a brominated flame retardant. The 109 samples were then analysed further for concentrations of specific brominated flame retardant chemicals which showed 50 (46%) would fail to meet the EU POPs Regulation if the product was composed of new plastic rather than recycled plastic...

Accès au document

US EPA - Evaluating Risks Based on Whole Chemical Mixtures Information



06/12/2018

Présentation faite lors du séminaire Chemical Mixtures Risk Assessment Workshop.

Rice, G. Evaluating Risks Based on Whole Chemical Mixtures Information. Society of Risk Analysis Annual Meeting, New Orleans, LA, December 02 - 06, 2018.

Accès au document

ECOTOX, New Questions for Terrestrial and Aquatic Ecotoxicology

Ce numéro spécial de la revue Environmental Science and Pollution Research, Volume 25, Issue 34 - Dec 2018 fait suite à la réunion du réseau Ecotox de Décembre 2017.

Issue Editors: Christian Mougin, Agnès Bouchez, Laurence Denaix, Jeanne Garric,Fabrice Martin-Laurent

Les articles correspondants sont mentionnés dans la rubrique “Publications des memres du réseau ECOTOX”.

Editorial ECOTOX, new questions for terrestrial and aquatic ecotoxicology Christian Mougin, Agnès Bouchez

Accès au document

Chasseurs de poisons

Film de Léna Aebi : interview d’Alexandre AEBI (chercheur Universoté de Neuchatel) lors de la collecte d'échantillons de pollen et de nectar. Il présente le projet Néonet(http://www.za-inee.org/fr/node/812; financé par RECOTOX. Ce projet consiste à réaliser une cartographie de la contamination en néonicotinoïdes en France et en Suisse.

Mis en ligne sur Youtube et ECOTOX TV

En savoir plus: Mitchell EAD, Mulhauser B, Mulot M, Mutabazi A, Glauser G and Aebi A (2017) A worldwide survey of neonicotinoids in honey. Science 358, 109–111

Accès au document

PESHMELBA : a spatialized model of water circulation and pesticide fate at the catchment sacale coupling the landscale elements with the OpenPalm couper

Auteur Emilie Rouzies et al (IRSTEA , Water resource team).

Presentation au colloque EGU 2018 Session Pesticide : fate and influence on the environment

Accès au document

Risques chimiques liés aux aliments

Ouvrage paru aux éditions Lavoisier. 10-2018. 560 p. ISBN : 9782743023881

Cet ouvrage explique, avec les principes de l'analyse de risques, comment les acteurs s'organisent pour évaluer le risque, proposer des mesures de gestion et enfin communiquer sur le risque.

-Méthodes d'évaluation du risque chimique alimentaire
-Gestion du risque
-Exemples concrets
-Perspectives et développements futurs

Accès au document

Developing spatio-temporal models for landscape-scale pesticide environmental risk assessment

Rapport de l'agence danoise Danish Environmental Protection Agency Mai 2018. 146 pages

This report investigates various aspects of **landscape-scale population-level environmental risk assessment** for the purposes of regulatory risk assessment for pesticides at EU and member state level.

We provide examples of landscape-scale population-level environmental risk assessment for birds and mammals, and terrestrial invertebrates using existing models for:

the European Brown Hare (*Lepus europeaus*),
the Skylark (*Alauda arvensis*),
and a carabid beetle (*Bembidion lampros*).

We also develop a model for Great Crested Newt (Triturus cristatus). (…) The main result of the simulations confirms that landscape context has a very large influence on the results of an environmental risk assessment.

Accès au document

Étude de la pertinence d’un dépistage du saturnisme infantile sur un site d’épandage de boues et d’eaux usées

Plaines d’Achères, Pierrelaye, Triel-sur-Seine et Carrières-sous-Poissy Rapport Santé publique France Oct 2018. 58 p.

Auteur(s) : Bassi C Version française

RÉSUMÉ : Les plaines de Méry-sur-Oise/Pierrelaye, Achères et Carrières-sous-Poissy/Triel-sur Seine dans le Val d’Oise et les Yvelines ont fait l’objet d’épandages d’eaux usées brutes ou

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partiellement traitées ayant entraîné une pollution diffuse des sols. Certaines parcelles ont progressivement évolué en zones résidentielles avec l'implantation notamment de bâtiments accueillant des enfants ou d'habitations individuelles. Dès 2007, l'ARS Île-de-France et le Siaap, avec l'appui de la Cire Île-de-France, ont mis en oeuvre des études pour cerner cette pollution et connaître les risques sanitaires sur la zone impactée. Ces études ont notamment mis en évidence la présence de plomb dans les sols à des teneurs supérieures au bruit de fond régional. La Cire a été saisie par l'ARS pour étudier la pertinence d'un dépistage du saturnisme infantile sur les zones concernées. … une évaluation du risque sanitaire a été menée pour les enfants vivant sur le site. Les calculs de risques ont été menés selon 4 scénarios d'exposition. Quel que soit le scénario d'exposition, l'évaluation sanitaire concluait qu'il n'est pas possible d'exclure la survenue d'un effet sanitaire en lien avec la présence de plomb dans les sols pour les enfants de 0 à 6 ans du site. Les conclusions de cette étude sont en faveur de mesures de réduction des expositions et d'une incitation au dépistage du saturnisme infantile. (…)

Accès au document

Évaluation des expositions professionnelles aux pesticides utilisés dans la culture de la banane aux Antilles et description de leurs effets sanitaires

Santé publique France, 2018. 56 p.

Assessment of occupational exposures to pesticides used in banana cultivation in the French West Indies and description of their health effects

Auteur(s) : Gentil C, Spinosi J, Cahour L, Chaperon L, El Yamani M Version française

RÉSUMÉ : Présentation du projet Matphyto DOM.

Accès au document

Histoire et actualité des bio-indicateurs des sols

Présentation à la journée d'échanges multi acteurs organisée le 6/11/2018 à Montpellier par Agropolis sur le thème : Quels outils pour évaluer le fonctionnement biologique des sols agricoles ?

Session 1 : Indicateurs de diversité fonctionnelle des sols

Auteurs : Mickael Hedde, Antonio Bispo, Jérôme Cortet. 16 pages

Les auteurs soulignent que les sols sont des milieux vivants, comportant une grande quantité d'organismes d'une grande diversité morphologiques et de rôles fonctionnels...

S'interesser à la faune du sol permet de developper des indicateurs biologiques d'état/de qualité des sols ou "bio indicateurs" (p6)

Il existe des bioindicateurs de contamination (p8) mais aussi de pratiques agricoles (p 9-13)

Autres interventions de la session 1 :

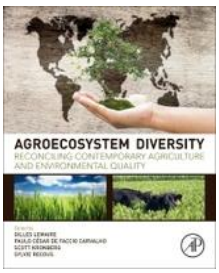
-2. Agroécologie et évolution du conseil de gestion des sols : quelles attentes vis-à-vis des indicateurs de biodiversité ? Mathieu Valé

-3. Comment mesurer cette biodiversité : exemple des nématodes, C. Villenave

-4. Retour d'expérience sur les indicateurs de biodiversité : construction d'un référentiel départemental en microbiologie du sol, Julien Halska

Accès au document

Agroecosystem Diversity



Editors: Gilles Lemaire, Paulo Carvalho, Scott Kronberg, Sylvie Recous

Oct 2018- 478 p., Academic Press

Agro-Ecosystem Diversity: Impact on Food Security and Environmental Quality presents cutting-edge exploration of developing novel farming systems and introduces landscape ecology to agronomy.

Accès au document

Ecotox / Revue de presse

Parliament and Council agree drastic cuts to plastic pollution of environment

Communiqué de presse du Parlement européen 20/12/2018

Single-use plastic items such as plates, cutlery, straws and cotton buds, will be banned in the EU under plans provisionally agreed between Parliament and Council, on Wednesday...

The provisional agreement will have to be endorsed by both Parliament and Council to become law. The Environment committee will vote on the text in January 2019.

According to the European Commission, more than 80% of marine litter is plastics.

Accès au document

Ile-de-France : Comment les sols pollués sont récupérés pour l'agriculture

20minutes 07/11/2018

2 projetssont présentés :

- Saint Cyr : Les fermes de Gally avec trois autres entreprises ont créé des jardins potagers et « une activité agricole traditionnelle » sur un site dont le sol présente de faibles traces d'hydrocarbures.

Chanteloup-les-Vignes : la communauté de commune Seine-Aval à l'agriculture a récupéré une trentaine d'hectares sur les 300 polluées aux métaux lourds. Là, sur une trentaine d'hectares, des miscanthus – appelés aussi roseaux de Chine – ont été plantés... Cette « plante zéro pollution » est cultivée sur d'anciennes terres de maraîchage polluées aux métaux lourds. Cette production est destinée à l'industrie ou à la construction

Accès au document

Pesticide sales

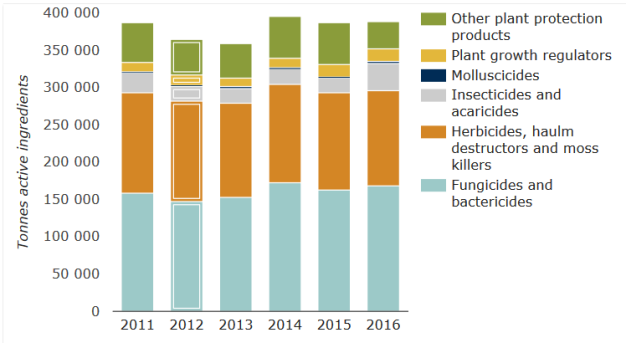
Annual Indicator Report Series (AIRS)

EEA European Environment Agency 28/11/2018

The 7th EAP (EU, 2013a) sets the objective, that by 2020 the use of plant protection products should not have any harmful effects on human health or unacceptable influence on the environment, and that such products should be used in a sustainable way...

Figure 1 depicts the total sales of pesticides (in tonnes of active ingredients) in the EU over the **2011-2016** period, including the break down by pesticide group. It shows that the total pesticide sales for this period were **relatively constant** —2016 sales were 0.6 % higher than 2011 sales. It should be noted, however, that comparing the average of the last 3 years of the series (2014-2016) with the average of the first 3 years of the series (2011-2013) shows an increase in pesticide sales of 5.6 % over the period examined. Figure 1 also shows that the shares of different pesticide sales groups remained relatively constant until 2015. Changes in 2016 may have been influenced by the update of the list of allowed pesticides, which took place in 2016…

Figure 1. Total pesticides sales, EU



Accès au document

Consumption of hazardous chemicals

EEA European Environment Agency 30/11/2018

Annual Indicator Report Series (AIRS) — In support to the monitoring of the 7th Environment Action Programme

... Risk depends on both the intrinsic hazard of chemicals and exposure to them, and while data on the hazardous properties of chemical substances is improving, the data quality is often unsatisfactory, andenvironmental and human exposure is poorly documented.

While the consumption of chemicals that are hazardous to health and the environment has declined over the years, it is not possible to equate this to a reduction in the accumulated risks to the environment and health. This is mainly because not all hazards and sources of chemical exposures have been included. The outlook towards 2020 is therefore unclear.

For further information EEA Environmental indicator report 2018

Accès au document

EPA Ignores Science, Embraces Monsanto (Bayer), and Continues Dicamba Herbicide Use

Beyond Pesticides,27/11/2018

L'association critique la décision de l'EPA du 31/10 de limiter la zone tampon du sicamba à 57 pieds au lieu des 443 pieds préconisés par les scientifiques et la Division de l'avenir et des effets sur l'environnement (EFED) de l'EPA. L'association y voit une ingérence politique dans le processus d'autorisation de mise sur le marché des pesticides.

Extraits: The U.S. Environmental Protection Agency (EPA) ignored the input of an expert weed scientist on the

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controversial herbicide **dicamba**... The scandal centers on the recent re-approval of the pesticide...

Jason Norsworthy, PhD, a weed scientist with the University of Arkansas, worked closely with Bayer's Monsanto in conducting field trials this past summer, but found high volatility and drift of the company's new dicamba-based herbicide XtendiMax**.** The product was developed in the face of widespread resistance to glyphosate-based herbicides ...

Working closely with Bayer's Monsanto, Dr. Norsworthy investigated dicamba drift on a 240 acre crops field. ..... The results indicate that a 135 meter (443 feet) buffer would be necessary to avert adverse impacts to listed species....

On October 31, EPA announced changes to dicamba's registration... **Dicamba buffer zones will be set by EPA at 57 feet.**

This decision raises a litany of structural problems within the pesticide registration process…

Advocates see this action by top-level officials in the Trump Administration as political meddling with a scientific process already structurally deficient, seriously jeopardizing the health and well-being of U.S. residents and the environment…

Accès au document

High stakes, entrenched interests and the Trump rollback of environmental regulations

abcnews 12/11/2018

Ce long article dresse un panorama des mesures prises par l'administration Trump pour revenir sur certaines avancées en matière de protection de l'environnement. Nous avons sélectionné trois mesures en lien avec les pesticides.

Extraits: Since his days on the campaign trail, President Donald Trump has promised to roll back environmental regulations, boost the use of coal and pull out of the Paris climate agreement — and he's moving toward doing all those things...

... The Environmental Protection Agency recently argued it needs until 2020 to decide on a controversial Obama-era directive expanding to smaller streams and waterways the types of wetlands protected by the federal Clean Water Act. That directive might **mean fewer pollutants released** into tributaries of larger waterways, from which millions of people get their drinking water. But the controversial rule has been fought by farming, mining and other industry groups that say it is too restrictive...

… In March 2017, then-EPA chief Scott Pruitt rejected a petition filed in 2007 by environmental groups seeking to ban **a commonly used pesticide, chlorpyrifos,** which the groups say harms health, particularly citing developmental damage to children and fetuses. The agency said it needed more time to study the chemical.

... This spring, the EPA proposed a rule dubbed Strengthening Transparency in Regulatory Science, which would restrict the use of studies as the basis for advancing environmental regulations if researchers have not released all their raw data, potentially including medical records.

... Hundreds of researchers and dozens of public health organizations said the proposal would quash important research into the effects of pollution and chemicals on health.

Accès au document

All-Ireland Pollinator Plan: Mid-term review shows a very positive start »

En Irlande le plan en faveur des pollinisateurs porte ses fruits. Présentation d'un rapport d'avancement 01/11/2018

One third of our 98 wild bee species are threatened with extinction from the island of Ireland. The All-Ireland Pollinator Plan was published in September 2015 to address this problem. It is supported by 90 governmental and non-governmental organisations and it has identified 81 actions to make Ireland, North and South, more pollinator-friendly. The All-Ireland Pollinator Plan has five objectives.

- Making Ireland pollinator-friendly (- Raising awareness of pollinators and how to protect them
- Managed pollinators – supporting beekeepers and growers
- Expanding our knowledge on pollinators and pollination service
- Collecting evidence to track change and measure success

...All-Ireland Pollinator Plan_Mid-term review

Accès au document

Les microplastiques pourraient se concentrer dans les sols

actu-environnement

Rend compte de la conférence Micro 2018 (19-23/11/2018) sur le devenir et l'impact des microplastiques (Fate and impact of microplastics).

... Selon l'Echa, ces microplastiques ajoutés aux produits risquent davantage de s'accumuler dans les milieux terrestres et d'eau douce, que dans les océans…

Pour réduire les déchets plastiques, la Commission européenne a lancé en janvier dernier une stratégie plastique et présenté en mai un projet de Directive sur la réduction de l'impact de certains produits en plastique sur l'environnement. Elle a également demandé à l'Echa de se pencher sur une éventuelle restriction à l'échelle de l'UE des microplastiques ajoutés intentionnellement. L'Echa doit évaluer les risques qu'ils représentent pour l'environnement et leur persistance. Elle se penchera également sur les plastiques oxo-dégradables. L'Agence devrait remettre son avis à la Commission en avril 2020.

Accès au document

Joint Statement from the Recycled Content.EU Coalition

La fédération européenne des Activités de la Dépollution et de l'Environnement prend position suite à l'adoption par le Parlement européen d'une motion fixant un objectif de 35% de plastique recyclé dans les bouteilles en plastique d'ici 2025.

La FEAD soutient la position du parlement Européen et invite le Conseil de l'Europe à en faire de même.

The European Federation of Waste Management and Environmental Services co-signed today, with 12 industry organisations and environmental NGOs, a joint statement to urge the Council to support the binding target of at least 35% recycled plastic in beverage bottles by 2025.

This target v is instrumental in the achievement of the objectives of the Single Use Plastics (SUP) Directive and in igniting the much supported transition towards a more circular economy...

Accès au document

Comité scientifique et technique « Gestion des éléments nutritifs et des émissions vers les milieux »

Alimagri 31/12/2018

Les ministères en charge de l'agriculture et de l'environnement ont mis en place en 2018 un comité scientifique et technique (CST) « Gestion des éléments nutritifs et des émissions vers les milieux ».

L'organisation proposée est constituée de deux instances :

-le groupe de concertation « **gestion des éléments nutritifs et des émissions vers les milieux » (GENEM)...**

-**le comité scientifique et technique (CST)** « gestion des éléments nutritifs et des émissions vers les milieux » (GENEM), composé d'experts...

Le CST peut couvrir les domaines suivants :

-Systèmes et pratiques agricoles et émissions associées :
  -Gestion de la fertilisation (N, P, K, etc.) des cultures et des prairies ;
  -Outils d'aide à la décision et de pilotage de la fertilisation ;
  -Gestion des associations et successions de cultures et des intercultures ;
  -Matériel d'épandage ; systèmes d'élevage (herbivore/granivore) ; alimentation animale ; bâtiments d'élevage et stockage des effluents ; traitement des effluents ;
  -Propriétés physiques, chimiques et biologiques des sols ;
  -Comportement des éléments nutritifs dans le sol, mobilisation par les plantes et fuites dans l'eau ;
  -**Emissions de polluants atmosphériques ;**
  -Outils de modélisation et de simulation des cultures et des prairies.
-Bassins versants et milieux aquatiques (continentaux, côtiers et marins) :
  -Transfert des nutriments dans les bassins versants (hydrologie, hydrogéologie, dynamique fluviale, transport solide, retombées atmosphériques, biogéochimie, etc.) ;
  -Structures paysagères permettant de diluer, d'intercepter ou d'éliminer les nutriments dans le bassin versant ;
  -Eutrophisation et dynamique des communautés aquatiques.

Sciences humaines et sociales : économie et marchés agricoles ; économie de l'environnement ; droit de l'environnement ; articulation et évaluation des politiques publiques ; implication des acteurs et changements de pratiques.

Composition du CST :

DELABY Luc Ingénieur de recherche à l'INRA
DROUET Jean-Louis Directeur de recherche à l'INRA (Co-Président)
DURAND Patrick Directeur de recherche à l'INRA
FELIX-FAURE Bruno Expert technique au Laboratoire Galys
FORAY Sylvain Ingénieur chargé de projets à l'IDELE
LEDUC David Conseiller à la Chambre d'agriculture de Pays de la Loire
LOUPSANS Delphine Chargée de mission à l'AFB
LOYON Laurence Ingénieur de recherche à l'IRSTEA (Co-Présidente)
MATHIAS Etienne Chef d'unité au CITEPA
SOENEN Baptiste Responsable de pôle à ARVALIS
SOUCHU Philippe Chercheur-expert à l'IFREMER
TOURNEBIZE Julien Ingénieur-chercheur à l'IRSTEA
VANDENBERGHE Christophe Ingénieur de recherche à Gembloux Agro-Bio Tech
VERNIER Françoise Ingénieur-chercheur à l'IRSTEA
VERTES Françoise Ingénieur de recherche à l'INRA
Accès au document

La vente de pesticides aux jardiniers amateurs est interdite à compter du 1er janvier

Factu-environnement 27/12/2018. C'est une disposition votée en 2015 qui va entrer en vigueur le 1er janvier prochain : l'interdiction de vendre des pesticides chimiques aux jardiniers amateurs. Ecrite une première fois dans la loi Labbé de 2014 pour une entrée en vigueur en 2022, cette mesure a été avancée à 2019 par le Sénat via la loi de transition énergétique.

Accès au document

Agriculture biologique - Le cuivre sur la sellette

Que choisir.27/11/2018

La décision de Bruxelles a suscité de nombreux commentaires dans la presse agricole et généraliste.

... La Commission européenne a voté le 27 novembre la dose maximale de cuivre autorisée en agriculture à 4 kg/ha/an lissée sur 7 ans. Une réglementation qui s'appliquera à compter du 1er février 2019 **tant en agriculture conventionnelle qu'en agriculture bio.** « Malgré la limitation de la dose maximale de cuivre à 4 kg, qui va poser des problèmes dans certains vignobles, la décision de la Commission est une réelle avancée, à condition d'avoir un

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accompagnement fort des pouvoirs publics », nous a déclaré Jacques Carroget, secrétaire national viticulture de la Fnab (Fédération nationale de l'agriculture biologique).

... l'agriculture bio n'utilise que des substances naturelles. Au premier rang de celles-ci figure le cuivre et ses dérivés, comme le sulfate ou l'hydroxyde de cuivre...

Le cuivre, naturel mais pas sans risque.

... Comme il ne pénètre pas dans la plante, le cuivre est vite rincé. Les années de forte pression de l'oïdium ou du mildiou nécessitent donc de nombreux traitements pour protéger les récoltes. Or le cuivre, même s'il s'agit d'un oligoélément, n'est pas biodégradable et s'accumule dans le sol. « Des concentrations excédentaires en cuivre ont des effets néfastes sur la croissance et le développement de la plupart des plantes, sur les communautés microbiennes et la faune des sols », notait en janvier dernier l'Institut national de la recherche agronomique (Inra), dans une expertise scientifique : « Peut-on se passer du cuivre en protection des cultures biologiques ?

... Finalisé en décembre 2017, le rapport de l'Efsa est une synthèse des travaux de l'Anses et de l'UBA... Ces études mettent en évidence les effets phytotoxiques du cuivre pour l'environnement, la faune aquatique, les mammifères et la vie des sols, dès lors que leur capacité d'absorption est dépassée. L'Efsa pointe aussi les risques sanitaires courus par les agriculteurs...

Pas d'alternatives à l'heure actuelle.

... les agriculteurs bio sont bien conscients que la restriction de l'utilisation du cuivre est inéluctable. Fini le temps où les vignerons répandaient des doses de 15 à 20 kg de cuivre par hectare sur leurs vignes, dont 90 % partaient dans la terre et rendaient les sols stériles...

Accès au document

À la rencontre des petites bêtes des toitures végétalisées

Communiqué Université Paris Saclay 11/12/2018

Sophie Joimel, Claire Chenu et Baptiste Grard, chercheurs au sein du laboratoire Écologie fonctionnelle et écotoxicologie des sols d'agrosystèmes (AgroParisTech/Inra), dévoilent leurs recherches sur la biodiversité des sols toitures végétalisées.

Presentation de la publication: Are Collembola "flying" onto green roofs? *Ecological Engineering, 111*, 117-124, DOI : 10.1016/j.ecoleng.2017.12.002

... In order to orient the ecological engineering of green roofs, it is crucial to understand the resulting biodiversity patterns. We hypothesised that a functional trait-based approach could be used to investigate different ways of colonisation. We investigated collembolan communities in both extensive and productive green roofs. Surprisingly, no difference was observed in either taxonomic or functional structures of collembolan diversity between extensive and productive green roofs...

Accès au document

Revue de presse / Alternatives / Biopesticides

Le biocontrôle peut remplacer en partie les fongicides classiques

Perspectives agricoles Dec 2018

Lorsqu'un traitement précoce des blés est nécessaire, la substitution partielle des produits phytosanitaires conventionnels par du soufre est au moins aussi efficace que le traitement chimique seul. La substitution totale est envisageable à court terme.

Arvalis a étudié la capacité du soufre à se substituer a une partie de la première application au stade 1-3 noeuds...

Accès au document

Les biofilms, une alternative aux traitements chimiques des cultures

The conversation 07/10/2018

Présente l'article : Should the biofilm mode of life be taken into consideration for microbial biocontrol agents?

... Une des alternatives aux traitements chimiques des cultures pourrait consister à utiliser des micro-organismes anti-pathogènes organisés sous forme de « biofilms », indique une étude publiée en 2017 dans la revue Microbial Biotechnology.

... Les biofilms agissent en effet comme une bulle de protection pour les micro-organismes, les préservant de la sécheresse, des composants toxiques et polluants, leur permettant ainsi de se diversifier et de se développer. Une propriété qui les rend très intéressants pour la protection des champs.

Un biofilm consiste en une communauté de micro-organismes spatialement organisée, évoluant dans une matrice principalement composée d'eau et de biopolymères. Dans cette collectivité cohabitent différents types de micro-organismes, comme les bactéries, les champignons. Certains disposent de particularités pouvant être utiles contre les pathogènes. Ces micro-organismes deviennent alors ce que les scientifiques appellent des « agents de biocontrôle », utiles pour la préservation des cultures... le biofilm pourrait offrir une protection des récoltes, tout en garantissant un impact minimum sur l'environnement – la technique du biofilm redirigeant et concentrant les mécanismes anti-pathogènes des agents de biocontrôle...

Accès au document

Première mondiale : un vaccin pour les abeilles

futura-sciences 11/12/2018

Premier vaccin au monde pour un insecte : le PrimeBEE destiné à combattre la loque américaine (une maladie du couvain de l'abeille mellifère...

... Dalial Freitak a eu l'idée de passer par un mécanisme complètement différent : la nourriture. Le chercheur s'est aperçu que des populations de mouches nourries avec des aliments contenant certaines bactéries engendraient une descendance de mouches plus résistantes à ces bactéries. Chez les abeilles, ce sont les butineuses qui rapportent le pollen à la reine pour créer de la gelée royale. Lorsque celle-ci contient des spores de Paenibacillus larvae, la reine va les digérer et les stocker dans son tissu gras. Des morceaux de bactéries vont alors se lier à une protéine appelée vitellogénine qui sert à la fabrication des oeufs. Ce qu'ont découvert Dalial Freitak et Heli Salmela, est que cette fameuse vitellogénine porte la réponse immunitaire : lorsque les larves naissent, elles sont vaccinées contre la maladie... Un brevet a été déposé en janvier 2018

Information reprise dans plusieurs médias exemple la voix du Nord 14/12/2018

Accès au document

Cette startup veut remplacer les engrais chimiques par des probiotiques

futura-sciences 10/12/2018

Il existe pourtant une alternative aux engrais polluants : les probiotiques.

Ces micro-organismes, du genre Rhizobium vivant dans les racines, fabriquent une enzyme appelée nitrogénase, et sont capables de fixer l'azote atmosphérique. Cependant, ces bactéries ne se trouvent que chez les légumineuses (trèfle, luzerne, lentilles, pois...). Les grandes céréales, comme le maïs, le soja ou le blé, sont, quant à elles, incapables de fixer l'azote ; c'est pourquoi on doit les alimenter avec des engrais chimiques.

La startup américaine, PivotBio, a réussi à développer un fertilisant naturel à base de probiotiques à appliquer sur le maïs. Ce produit, qui se présente sous forme liquide, s'applique dans le sillon lors de la plantation. Les microbes créent alors une liaison symbiotique avec les racines des plantes qui sont ainsi capables de fixer l'azote...

Accès au document

Projet LIFE WASTE4GREEN - sustainable and green agri-waste based biopesticides

WASTE4GREEN will test the effectiveness of two pesticides made from agro-industrial byproducts in protecting stone fruit crops on an area of 1.67 ha. By replacing pesticides of chemical origin, it aims to mitigate adverse effects on the environment and human health, proving that the two bioactive formulates are less toxic than conventional ones...

Duration : 01-JUL-2018 to 31-DEC -2022

Accès au document

Revue de presse / Associations

Impact des pesticides sur les insectes pollinisateurs : la France doit réformer de toute urgence son système d'évaluation | Pollinis

Note de positionnement de Pollinis 109/12/2018

Extrait : ... De nouvelles lignes directrices, établies par l'autorité sanitaire européenne (EFSA), sont bloquées depuis 2013 par le **SCoPAFF,** le comité représentant les ministères de l'agriculture des différents États membres européens.

Mais la France, comme l'a fait la Belgique, peut et doit se doter d'un véritable système d'évaluation en adoptant immédiatement ces lignes directrices et en prenant en compte les données scientifques les plus récentes.

... L'EFSA a publié une version de ce « Guidance Document » (GD) en 2013, mise à jour en 2014. Ce document fournit des lignes directrices appropriées et complètes pour l'évaluation de l'impact des pesticides sur les abeilles (*Apis mellifera*, *Bombus* spp. et abeilles solitaires), et fondées sur des études expérimentales et sur l'ensemble de la littérature scientifque disponible – une première en Europe.

L'EFSA GD reste à ce jour la méthodologie la mieux adaptée pour évaluer les risques posés par les nouvelles générations de pesticides, et la plus complète en termes de critères toxicologiques et de routes d'exposition. Il s'agit d'une étape décisive vers une évaluation complète du risque qui prendrait en compte l'ensemble des insectes pollinisateurs, et non plus seulement les abeilles.

Mais pour être adopté au niveau européen, ce document doit être approuvé par le Comité permanent des végétaux, des animaux, des denrées alimentaires et des aliments pour animaux (SCoPAFF). **Or, une majorité des États membres, réunis au sein de ce comité, refusent de l'adopter...**

Accès au document

Harmonised risk indicators : Feedback from: Pesticide Action Network Europe

Pesticide Action Network 11/12/2018

La contribution à la consultation de la commission Européenne sur sa proposition concernant les indicateurs de risques des pesticides.

PAN Europe believes that this is a positive start to developing the much

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needed harmonized risk indicators throughout the EU...

We urge the Commission and Member States to adopt these proposals and to further amend and enhance them over time in order to provide the highest level of protection for human health and the environment across the EU.

position paper consultable sur le site de PAN

Accès au document

New evidence of fraudulent manipulation of scientific results by the pesticide industry

Pesticide Action Network 16/11/2018

L'association commente la publication qui a fait l'objet de nombreux commentaires et qualifie de fraude la non prise en compte de certaines données scientifiques par les industriels.

Safety of Safety Evaluation of Pesticides: developmental neurotoxicity of chlorpyrifos and chlorpyrifos-methyl

... A scientific publication released today in the Journal of Environmental Health finds that an **industry-funded study had drawn biased and unscientific conclusion on the neurodevelopmental toxicity of Chlorpyrifos.** The authors of this critique highlight that based on the results obtained from the experiments, the industry should have reported neurodevelopmental toxicity. This was not the case...This new evidence of science manipulation sends us back to the glyphosate scandal. A renowned independent scientist had proven that Monsanto did not report carcinogenicity results to the European authorities that decided glyphosate was not carcinogenic...

Accès au document

EU Parliament report reveals the shortfalls of the current pesticide authorization system

Pesticide Action Network 06/12/2018

Salue et commente le rapport du Comité PEST du parlement Européen

... Today, the Special Committee of the European Parliament set up to investigate the European Union's authorisation procedure for pesticides (PEST committee), voted in favour on its draft report pointing out the shortfalls of the procedure and presenting recommendations...

Today the PEST Committee confirmed with its report that our current authorisation system needs a thorough reform to reach the objectives of EU law. Being supported by a great majority of Members of the PEST Committee paves the way to implement the necessary changes in our system"...

Accès au document

Multiple Pesticide Residues in Soil Raise Alarm

Beyond Pesticides 30/11/2018

S'appuie sur les résultats du projet Diverfarming pour demander une meilleure protection des sols. La publication citée est : Pesticide residues in European agricultural soils – A hidden reality unfolded.

A study published this month in Science of the Total Environment reveals numerous pesticide residues persisting in soil, harming the viability of agricultural lands and increasing risk of off-site contamination.

... the European Diverfarming project... suggest nations urgently **reevaluate conventional land use and inputs** including water, energy, fertilizers, machinery and pesticides. Researchers decrying the lack of soil protection policies endeavored to determine which pesticides had the highest soil persistence and toxicity to non-target species.

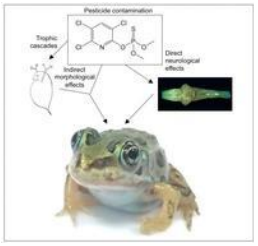
Three hundred seventeen surface soil samples were analyzed from 11 European countries... Eighty-three percent of samples contained varying degrees of pesticide residues, with 25 percent showing one pesticide residue and 58 percent showing mixtures of two or more. Only 17 percent of the tested soils had no pesticide residues detected....

... Advocates say similar data revealing pesticide persistence demands national leaders **improve environmental risk assessment procedures by evaluating both short-term and long-term environmental risks.** Researchers indicate risk assessments must be adapted to assess toxicity of **mixtures** of pesticide residues to **a wider range of soil microorganisms,** and, doing so, offer accurate assessments to farmers and elected officials alike.

Accès au document

Revue de presse / Recherche et medias

Common pesticide inhibits brain development in frogs: chlorpyifos



eurekalert.org 27/12/2018

New research published in Environmental Toxicology & Chemistry reveals that low doses of a commonly used pesticide potentially harm the Northern Leopard frog by inhibiting their brain development.

https://onlinelibrary.wiley.com/doi/10.1002/etc.4240

Accès au document

INRA - Maïs OGM MON 810 et NK603 : pas d'effets détectes sur la sante et le metabolisme des rats

Communiqué de presse INRA 12/12/2018

Ces travaux sont différents des résultats publiés par G Séralini en Aout 2012 dans la revue "Food and Chemical Toxicology" et sont, de ce fait très commentés dans la presse.

... Pendant six mois, des rats ont été nourris avec un régime contenant soit du maïs OGM (MON 810 ou NK603) soit du maïs non OGM, à différentes concentrations. Les chercheurs, par les techniques de biologie à haut débit, n'ont identifié aucun marqueur biologique significatif lié à l'alimentation au maïs transgénique. De même, ils n'ont observé aucune altération anatomo-pathologique du foie, des reins ou de l'appareil reproducteur des rats soumis aux régimes contenant ces OGM. Ces travaux, publiés le 10 décembre 2018 dans la revue Toxicological Sciences, ne mettent pas en évidence d'effet délétère lié à la consommation de ces deux maïs OGM chez le rat même pour de longues périodes d'exposition...

The GMO90+ project: absence of evidence for biologically meaningful effects of genetically modified maize based-diets on Wistar rats after 6-months feeding comparative trial, *Toxicological Sciences*, https://doi.org/10.1093/toxsci/kfy298

Accès au document

BfR - Resistant bacteria: can raw vegetables and salad pose a health risk?

Bundesinstitut für Risikobewertung

08.11.2018

Joint press release of the Julius Kühn Institute (JKI) and the BfR on a study of antimicrobial-resistant bacteria with multiple transferable resistance genes on fresh produce: The transferable resistome of produce https://doi.org/10.1128/mBio.01300-18

... Salad varieties are often offered for sale ready-cut and film-packaged. It is known that these types of fresh produce may be contaminated with bacteria that are relevant from the point of view of hygiene. A working group led by Professor Dr Kornelia Smalla from the Julius Kühn Institute (JKI) has now shown that these bacteria may also include **bacteria that are resistant to antibiotics**.

... For the purpose of analysis, the working group headed by Professor Smalla purchased mixed salads, arugula and cilantro in German supermarkets. The samples were then analysed in order to determine the total quantity of **transferable antimicrobial resistance genes** (the researchers use the term "transferable resistome") in ***Escherichia coli***, a mostly harmless intestinal bacterium, on these foods. In their analyses, the experts focused on the part of Escherichia coli bacteria that are resistant to the active substance **tetracycline**…

Accès au document

Agricultural management practices influence copper concentrations in European topsoils

Science for environment survey 518 04/12/2018

An investigation into the factors influencing Cu distribution in the topsoils of 25 EU Member States has identified that, in conjunction with other factors such as topsoil properties, land cover, and climate, such agricultural management practices play a role in influencing Cu concentration. The analysis used 21 682 soil samples from the EU-funded Land Use and Coverage Area frame Survey (LUCAS)1 and found that vineyards, olive groves, and orchards had the highest mean soil Cu concentrations of all land use categories. The findings highlight the major impact of land use and agricultural practices on soil Cu concentrations and emphasise a need for more sustainable land management practices

Accès au document

Microplastic toxins leave shellfish at mercy of predators

The guardian 28/11/2018

Présente la publication de Laurent Seuront Microplastic leachates impair behavioural vigilance and predator avoidance in a temperate intertidal gastropod

Toxins leaching from microplastics leave shellfish at the mercy of predators, research has found. The chemicals completely suppress the ability of the periwinkles to detect and avoid the crabs that eat them.

Microplastics plague the world's rivers and oceans and absorb poisonous chemicals from the water. Previous work has shown mussels are harmed by these toxins when they eat microplastics, but the latest study is the first to show disruption of the relationship between predator and prey. This is likely to disrupt the entire food chain…

Accès au document

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L'enjeu est de choisir les bons bioindicateurs pour suivre l'évolution du sol

actu-environnement 29/11/2018

Interroge Estelle Hedri, ingénieur d'études chez Valorhiz, sur l'avancement du projet BioTUBES. Ce projet vise à suivre l'évolution des milieux suite à la reconversion de friches urbaines par une approche à la fois pédologique et écologique.

Extraits concernat les bioindicateurs :

Nous sommes encore en phase de sélection. Nous nous intéressons aux échanges gazeux, à la biodiversité spécifique et fonctionnelle, au nombre d'espèces, au nombre de familles que nous allons toucher, à la vie du sol, que ce soit les nématodes, des champignons ou des bactéries. Pour ces derniers, nous allons mesurer leurs respirations, savoir s'ils sont dans une situation de stress ou pas...

Le projet BioTubes a pour objectifs de :

- développer et valider l'approche TalVeg® de restauration écologique des sols urbains ;
- développer les méthodes de suivi et d'évaluation des sols reconstruits (biodiversité, fonctions écologiques et SE), en combinant bioindicateurs microbiens, monétarisation des SE et l'évaluation du cadre réglementaire appliqué à la réutilisation des sols dégradés ;
- adapter les technologies TalVeg® et les référentiels nématofaune au contexte des sols urbains dégradés.

Accès au document

Appel à projets PNREST 2018 ADEME ANSES

L'Anses a lancé le 22 novembre 2018 un appel à projets de recherche sur le thème « Environnement-santé-travail ».

Cet appel à projets de recherche (APR) est lancé dans le cadre du Programme national de recherche en environnement-santé-travail (PNR EST) et vient en appui aux politiques publiques : il décline en particulier les priorités de recherche des plans nationaux santé environnement, santé travail, cancer et Ecophyto.

Le PNR EST ambitionne de conduire les communautés scientifiques à produire des données utiles aux différentes phases de l'analyse du risque sanitaire et, ainsi, à rapprocher recherche et expertise scientifique. L'appel à projets 2019 porte sur l'évaluation et l'analyse **des risques environnementaux pour la santé humaine,** en population générale ou au travail. Il soutiendra également des projets relatifs aux **risques pour les écosystèmes et à la qualité des milieux.** Il est ciblé sur des questions à la recherche posées par l'Anses, les ministères et les agences de l'état concernées par ces thématiques.

Des fonds supplémentaires ont été mobilisés pour financer des projets **sur les perturbateurs endocriniens.**

texte de l'APR

Accès au document

Experts list 30 questions to assess read-across uncertainty

Chemical Watch 29/11/2018

Met en avant un article méthodologique sur la prédiction de la toxicité paru dans Computational toxicologists sous le titre Assessing uncertainty in read-across: Questions to evaluate toxicity predictions based on knowledge gained from case studies.

... Although read-across is often used to fill data gaps, it is widely agreed that boosting confidence in predictions would improve regulatory acceptance... review of uncertainty issues for repeated dose toxicity...

They assessed sx case studies for alkanols, esters, and alcohols, all of which related to reading across a 'no observed adverse effect' level. "This is considered to be one of the most challenging applications of read-across," the researchers wrote in the journal Computational Toxicology.

The team defined four main categories of uncertainty for read-acoss. These link to:

- regulatory use of the read-across prediction;
- quality and relevance of the data being read across;
- arguments for read-across;
- similarity justification...

Accès au document

Application of the Ecotoxicology Knowledgebase (ECOTOX) to support environmental research and risk assessment

Poster présenté lors du SETAC North America, Sacramento, CA, November 04 - 08, 2018.

The ECOTOX Knowledgebase is a comprehensive, publicly available application providing chemical environmental toxicity data on aquatic life, terrestrial plants and wildlife compiled from over 47,000 references covering over 11,000 chemicals and over 12,000 species. (http://cfpub.epa.gov/ecotox/)... This poster describes the recent updates to the ECOTOX user interface and presents several case studies demonstrating how ECOTOX v5.0 has improved to support environmental research and risk assessment.

ECOTOX Quick User Guide

Accès au document

Gambling with antibiotics and pesticides

Communiqué de presse alarmant du Stockholm Resilience Centre présentant la publication : Antibiotic and pesticide susceptibility and the Anthropocene operating space, Nature Sustainability, doi: 10.1038/s41893-018-0164-3

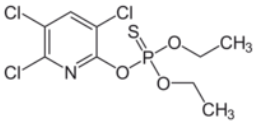
Researchers suggest that if resistance to antibiotics and pesticides goes beyond certain planetary boundaries, societies risk large-scale health and agricultural crises...

Resistance to antibiotics and pesticides is rising at alarming rates. Yet, currently there is **no global framework to track the threat to human health and crops**. The researchers suggest that if resistance to antibiotics and pesticides goes beyond these boundaries, societies risk large-scale health and agricultural crises.

The new research concludes that Gram-negative bacteria, a group of bacteria that includes well-known pathogens such as Salmonella, Klebsiella pneumoniae, and E. coli, **are already beyond the "planetary boundary",** as some strains of several species are already resistant to all or most antibiotics tested…

Accès au document

Flaws in industry-funded pesticide evaluation



eurekalert 15/11/2018

Les chercheurs ont étudié le dossier d'AMM réalisé par l'industriel producteur du chlorpyrifos : un effet santé avéré n'était pas pris en compte dans les conclusions.

Academic researchers have examined raw data from a company-funded safety evaluation of the pesticide chlorpyrifos. They discovered an effect on the brain architecture of the exposed laboratory animals at all tested doses, which was not included in the reported conclusions. Karolinska Institutet in Sweden led this independent study, which is published in the scientific journal Environmental Health.

... independent research and company-funded tests deviated, at least in terms of the conclusions drawn in the industry-funded study.

The company-funded animal test was performed to ascertain how neural development is affected by the pesticide chlorpyrifos, which is used on a wide variety of crops around the world, including some 20 EU countries. The test laboratory concluded that there was no such effect, **even at high doses.**

…. Extensive independent research has also previously indicated that chlorpyrifos adversely affects brain development, including childhood IQ, even at the low doses that consumers are generally exposed to through food.

Publication: "Safety of Safety Evaluation of Pesticides: Developmental neurotoxicity of chlorpyrifos and chlorpyrifos-methyl". Axel Mie, Christina Rudén and Philippe Grandjean. Environmental Health, online 16 November 2018

Accès au document

Saltier waterways are creating dangerous 'chemical cocktails'

eurekalert 02/12/2018

Commente une publication qui souligne le fait que dans les effets cocktail, il faut tenir compte de la salinisation des eaux continentales, salinisation liée entre autres aux engrais.

A recent study led by University of Maryland researchers found that streams and rivers across the United States have become saltier and more alkaline over the past 50 years, thanks to road deicers, fertilizers and other salty compounds that humans indirectly release into waterways. Theteam named this effect "Freshwater Salinization Syndrome."

... The results further suggest that many of these chemicals travel together throughout watersheds, forming "chemical cocktails" that can have more devastating effects on drinking water supplies and ecosystems when compared with individual contaminants alone.

The group's latest work, which includes field observations from the Washington, D.C. and Baltimore metropolitan areas, highlights the need for new and more comprehensive regulation and pollution management strategies.

... Kaushal and his colleagues' latest research project investigated the impacts of chemical cocktails created by saltier water in more detail...

The research paper, "Novel 'Chemical Cocktails' in Inland Waters are a Consequence of the Freshwater Salinization Syndrome," Sujay Kaushal, Gene Likens, Michael Pace, Shahan Haq, Kelsey Wood, Joseph Galella, Carol Morel, Thomas Doody, Barret Wessel, Pirkko Kortelainen, Antti Räike, Valerie Skinner, Ryan Utz, and Norbert Jaworski, was published December 3, 2018 in the journal Philosophical Transactions of the Royal Society B.

Accès au document

Study shows pesticide exposure can dramatically impact bees' social behaviors

phys.org 08/11/2018

Commentaire de l'article de Science : Neonicotinoid exposure disrupts bumblebee nest behavior, social networks, and thermoregulation/

Cet article a été commenté dans de nombreux media et repris dans southafricatoday du 22/11/2018

... While recent studies have suggested exposure to pesticides could have impacts on **foraging behavior,** a new study, led by James Crall, has shown that those effects may be just the tip of the iceberg.

... Using an innovative robotic platform to observe bees' behavior, Crall and co-authors including de Bivort and Naomi Pierce, the Sidney A. and John H. Hessel Professor of Biology, showed that, following exposure to the pesticide, bees spent less time nursing larvae and were less social that other bees. Additional tests showed that exposure impaired bees ability to warm the nest, and to build insulating wax caps around

CC BY

the colony. The study is described in a November 9 paper in Science.

Accès au document

NéoNet–Analyse et quantification in situ du risque lié à la rémanence des néonicotinoïdes en grandes cultures en France

Le reseau RECOTOX presente ce projet retenu dans l'appel à projet 2018. Extrait du Bulletin RECOM'TOX n°11 Aout 2018, rubrique Les actions en cours

… Alors que la loi Biodiversité 2016 prévoit l'interdiction des produits de la famille des néonicotinoïdes en septembre 2018, il n'existe aucun référentiel à l'échelle du territoire métropolitain des risques liés à la rémanence des néonicotinoïdes.

NEONET se propose d'analyser et quantifier in situ le risque lié à la rémanence des néonicotinoïdes. La rémanence des néonicotinoïdes dans l'environnement induit leur présence dans le nectar et le pollen de plantes non traitées. Néonet étudie la rémanence dans le nectar de tournesol et dans le pollen de maïs. Ces deux cultures sont très utilisées par les abeilles (domestiques notamment), mais ne sont pas forcément présentes simultanément. Des analyses chimiques sur des échantillons prélevés quantifieront le niveau d'exposition des abeilles aux cinq principaux néonicotinoïdes.

Le projet NEONET rassemble 10 partenaires et se déroule sur 20-30 sites dont un grand nombre appartiennent au réseau RECOTOX et au Réseau des Zones Atelier. NEONET est par conséquent innovant de par (i) sa couverture pédo-climatique et géographique couvrant les principales régions agricoles de France, (ii) la gamme de systèmes de culture et situations de production, (iii) la diversité des paysages agricoles. NEONET rassemble également des compétences interdisciplinaires couvrant les domaines scientifiques de l'agronomie, l'écologie, l'écotoxicologie, et les statistiques ainsi que des compétences techniques /lien avec les acteurs ADA/ACTA.

Participants au projet :

-Zone Atelier Arc Jurassien (site RECOTOX)
-Zone Atelier Armorique
-Zone Atelier Bassin du Rhône
-Zone Atelier Loire
-Zone Atelier Moselle (site RECOTOX)
-Zone Atelier Plaine & Val de Sèvre (site RECOTOX)
-Zone Atelier PYGAR
-Zone Atelier Seine (site RECOTOX)
-ITSAP
-Université de Neuchatel

Accès au document

RISQUE CHIMIQUE - Notions de base en écotoxicologie

QuarksSafetyDay 2018

Conférence de Jennifer OSES, écotoxicologue et toxicologue au sein de Pollens

postée sur youtube en Mai 2018

Accès au document

Les mésoscomes de l'Ineris pour étudier l'impact des substances chimiques

Les mésoscomes de l'Ineris pour étudier l'impact des substances chimiques

Ajoutée sur youtube le 4 juil. 2017 Entretien avec Eric Thybaud, responsable du pôle Dangers et impact sur le vivant de l'Ineris. Il présente la plateforme expérimentale des mésocosmes, qui permet d'étudier l'impact des substances chimiques sur les écosystèmes.

Accès au document

Cours video INERIS : Ineris : De la toxicologie à l'écotoxicologie

Cours mis en ligne sur Viadeo le 12/09/2016

Ecotoxicologie ; risques pour la santé des écosystèmes Eric Thybaud Toxicologie : risques pour la santé de l'Homme (DA Metatox - AgroParisTech).

Accès au document

Placer l'écotoxicologie au cœur de la surveillance environnementale

Article du bulletin d'actualité de la Fondation Rovaltain.

La Fondation Rovaltain présente le projet qu'elle pilote : Biomarqueurs et Biodiversité (B&B).

Financé par l'Agence Française pour la Biodiversité (AFB), le projet B&B s'appuie sur un consortium incluant l''Institut national de recherche en sciences et technologies pour l'environnement et l'agriculture (IRSTEA), l'UMR SEBIO et le GIP Seine Aval.

Il a pour objectif de réaliser un inventaire des biomarqueurs disponibles dans le laboratoire de recherche français, d'en évaluer le niveau de maturité opérationnelle et de définir des stratégies d'utilisation pour la surveillance opérationnelle des milieux aquatiques.

L'inventaire des biomarqueurs a été initié fin juin auprès de 23 laboratoires avant la caractérisation de la maturité de ces outils au cours d'un entretien avec Thomas MILINKOVITCH, chargé de projet affecté à B&B.

Les premiers résultats seront disponibles fin 2018. Une fiche thématique est disponible sur le site du réseau ECOTOX : https://www6.inra.fr/ecotox/Productions/Fiches-thematiques/Fiche-thematique-N-17-Octobre-2018

Accès au document

Veilles ponctuelles / Antibioresistance

BfR - Resistant bacteria: can raw vegetables and salad pose a health risk?

08.11.2018

Joint press release of the Julius Kühn Institute (JKI) and the BfR on a study of antimicrobial-resistant bacteria with multiple transferable resistance genes on fresh produce : The transferable resistome of produce: https://doi.org/10.1128/mBio.01300-18

Accès au document