

Proposals for NORMAN Joint Programme of Activities 2022

Title	Contaminants of Emerging Concern (CECs) in soil and terrestrial organisms from different trophic levels
Type of activity	Research and Collaboration
Leader	National and Kapodistrian University of Athens (NKUA)
Topic / activities	<p>Background / Justification for the proposed activity:</p> <p>Long-term biomonitoring studies using wildlife are an important source of information for understanding the potential harmful effects (persistence, bioaccumulation) of CECs, both in ecological receptors and in humans. Therefore, these studies can be a key tool for assessing the effectiveness of regulation and other mitigation measures, which are used for reducing exposure in environmental pollutants and support better chemicals management. The wide-scope target, suspect and non-target screening of biota samples is becoming an important issue in Europe, since pollutants present in biota are highly probably bio-accumulative (B) and persistent (P), and thus fulfilling two out of three PBT criteria considered under REACH legislation.</p> <p>Through the implementation of the EU funded LIFE APEX program (LIFE17 ENV/SK/000355), coordinated by EI, high throughput wide-scope target, suspect and non-target screening methodologies have been applied in apex predators and their prey, collected from different European countries. NKUA has developed and applied LC-MS/MS, GC-MS/MS, LC-ESI-QTOFMS and GC-APCI-QTOFMS analytical methodologies for the determination of CECs in those samples. Based on the results, the presence of hundreds of CECs in apex predators and potential bioaccumulation and biomagnification phenomena through the aquatic food web were unraveled.</p> <p>Although biomonitoring studies in the aquatic ecosystems are already under implementation and sufficient data is provided to European authorities and regulatory bodies through NORMAN, there is a lack of knowledge concerning the presence of CECs and their potential bioaccumulation in the terrestrial environment. The establishment of the new NORMAN Working Group on "CECs in Soil and Terrestrial environment", aims to shed light on the occurrence of CECs in the terrestrial ecosystem. On this context, the proposed activity focuses on the in-depth data compilation regarding the presence of CECs in terrestrial biota from the existing literature and the application of an extended HRMS biomonitoring study in terrestrial samples from different trophic levels.</p> <p>Description of the proposed activity and expected outcomes for 2022 (and beyond):</p> <p>The proposed activities aim to reduce knowledge gaps and investigate the presence of CECs in terrestrial biota specimens. Expected activities include:</p> <ul style="list-style-type: none"> • Review of sample preparation protocols and analytical strategies for the determination of CECs in soil and terrestrial biota samples • Critical review on the profile of CECs detected in different matrices (soil, liver, muscle tissue, eggs, feathers, blood and feces) • Investigation of potential bioaccumulation in the upper trophic levels of the terrestrial food chain • Comparison of CECs detected in aquatic <i>versus</i> terrestrial biota samples based on their physicochemical properties • Collection of ca. 10 samples from a European country representing various trophic levels (e.g. worms, birds of prey, raptors) and their analysis by wide-scope target (>2,200 CECs), suspect (>65,000 CECs), and non-target screening methodologies. The design of the study will be defined in consultation with the experts of the WG on "CECs in Soil and Terrestrial environment" • Collection of different matrices of analysis (ca. 4 samples) from the same specimen of a raptor (such as liver, muscle tissue, feathers, blood) and analysis by wide-scope target (>2,200 CECs), suspect (>65,000 CECs) and non-target screening methodologies • Publication on analytical methodologies for the presence of CECs in terrestrial biota samples <p>Added value / Link with other NORMAN activities and / or other projects</p> <p>The proposed activities of the present JPA link with the activities of various NORMAN WGs, as WG Prioritization of emerging substances and Cross-Working Group Activity Non-target Screening (NTS). Furthermore, the contribution to NORMAN Database System with data from the terrestrial ecosystem can be achieved through the proposed activities.</p> <ul style="list-style-type: none"> • NORMAN Database System (NDS) and its EMPODAT module on Chemical Occurrence Data (upload of DCTs with results of wide-scope target analysis) • The Digital Sample Freezing Platform and Retrospective Screening (upload of HRMS data) • NormaNEWS (suspect & non-target contaminants in terrestrial biota samples) • Expanding the chemical domain of current non-target screening methodologies (JPA2020) (application in terrestrial organisms) • Prioritization of CECs based on monitoring data from terrestrial biota • NORMAN Ecotoxicology Database (extend the existing PNECs to be applicable to terrestrial biota) • Dissemination of monitoring data from the terrestrial environment to the European competent authorities and regulatory bodies, through NORMAN meetings



Participants	Prof. Nikolaos S. Thomaidis (NKUA), Dr. Jaroslav Slobodnik (EI), Dr. Valeria Dulio (INERIS), Dr. Olivier Crouzet (OFB), Dr. Olivier Cardoso (OFB), Experts of the WG on “CECs in Soil and Terrestrial environment, NORMAN members willing to contribute.
Proposed in-kind contribution	A review paper on the determination and the occurrence of CECs in terrestrial environment (soil and biota).
Contribution needed from NORMAN Association¹	<ul style="list-style-type: none"> • EI: Gathering of samples from Environmental Specimen Banks, Natural History Museums or Research Collections (shipment costs). Dissemination of this activities through the NORMAN website. • NKUA: Analysis costs (consumables, reagents, reference standards and isotopically labelled compounds) to perform wide-scope target, suspect and non-target screening) • INERIS: Risk assessment and prioritisation of the detected CECs • OFB: Design of the sampling and monitoring campaign. Assessment of the detected CECs profile (driving factors, exposure, transfer and bioaccumulation) <p>Total requested: € 8,000.00</p>

¹ Please, provide here a transparent justification of the requested resources and of the in-kind contribution, thereby distinguishing between the costs associated with “person-months” for the organisation, the “travelling costs” for invited speakers and the costs for the logistics (e.g. meals, room rental etc.)