

**Session:** 3.01 | Additives and Their Transformation Products: Use, Emissions, Exposure, Fate, Impact and Risk Assessment

**Title:** Effects of Di-Butyl Phthalate and Di-Ethyl-Hexyl Phthalate at Environmental Doses on Health and Development of *Bombus terrestris* Microcolonies

**Abstract:** The urban environment can have a contrasted role on wild pollinator population settlement. It acts both as a refuge with high floral diversity and zero-phyto policies in Northern cities, but also presents severe constraints such as soil impermeabilization, heat islands and pollution. With the recent legislations implemented in Northern cities to reduce fossil fuel exhaust, the atmospheric pollution profile has changed, revealing organic volatile compounds from petrochemical industry, such as phthalates as main air pollutants. These molecules have endocrine disrupting effects on vertebrate models but have been less studied in invertebrates and especially in terrestrial invertebrates. In the context of the current insect decline crisis, it seems important to understand the impact of such ubiquitous molecules on their health and development as they can disrupt crucial hormonal regulations such as the ecdysteroid pathway. In this study, we exposed *Bombus terrestris* workers in microcolonies to Di-Butyl Phthalate (DnBP) and Di-Ethyl-Hexyl Phthalate (DEHP) alone and in mixture at environmental doses, found in and nearby the city of Lille, France. We investigated the effects of such exposure on microcolony health, worker mortality and larval development. Preliminary results show an increased in worker mortality caused by repeated exposure to DEHP alone and in the mixture, associated with a decrease in adult male production in microcolonies exposed to the mixture. Moreover, repeated exposure to DnBP affected worker lipid content, with increased mass in late stage larvae, suggesting transgenerational obesogenic effects of this molecule. Phthalate exposure seems thus to affect both adults and larvae of *B. terrestris*. It seems therefore important to understand the impact of those molecules on the health of insect populations and especially on bees which population trends show a severe decline since the past seventy years.

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