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"Solidarity in a competing world — fair use of resources"

The Uptake of Nicotine from the Soil: An Example for the "Horizontal Transfer of Natural Products"

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Abstract

Within the last decade numerous contaminations of plant derives commodities with problematic natural products such as nicotine, pyrrolizidine or tropane alkaloids have been reported by the European Food Safety Authority (EFSA). Until recently, the sources of these contaminations were unknown.

The goal of our current project "Nicotine contaminations in plants derived foods and commodities" funded by German Egyptian Research Fund (GERF - 01DH14019) was the identification of the potential sources of nicotine contamination in spice and medicinal plants. The centre of focus corresponds to the question, whether or not the uptake of the alkaloid from the nicotine contaminated soils could be responsible for the observed contaminations. The results shall contribute to avoid - or at least to minimise – such contaminations in the future.

Together with our cooperation partners in Egypt from Kafrelsheikh University we were able to document that – at least in part – the uptake of nicotine (i.e. leached out from cigarette butts) is responsible for the observed contaminations, which are thought to be problematic for human health.

Based on the results of our studies the concept of "Natural Product transfer" was established: plants take up substances from the soil, which previously have been leached out from rotting plant materials. This novel discovered phenomenon opens new doors for many further practical approaches. In this sense, new projects had been outlined for further funding. Together with the AGERI (Cairo) we will analyse, to which extent the horizontal transfer of natural products represents a general source for contaminations in plants derived foods and commodities. Another project is scheduled as cooperation with Mansoura University. This approach is aimed to investigate to what extent the horizontal transfer of natural products could be the basis for the production of functional plant derived foods.

Keywords: Soil contamination

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