

LES ACTIONS DE LA DGCD

DE ACTIVITEITEN VAN DE DGOS

DGDC'S ACTIVITIES

LAS ACTIVIDADES DEL DGCD

Development Cooperation Prize

The Development Cooperation Prize is annual incentive prize - financed by the Belgian Development Cooperation (DGDC) and organized by the Royal Museum for Central Africa - for students and young researchers, from Belgium or developing countries, whatever their discipline. The prize is awarded to scientific works that contribute significantly to knowledge that can be applied to development in the South. Sustainable development is to be their principal aim and poverty alleviation a priority. The prizes are attributed to Bachelor's and Master's theses, postgraduate papers, Ph.D. theses, or publications in scientific journals.

In the course of the years of the prize existence, the fields represented among the participants has remained more or less stable: the majority of files represent the exact sciences - with a very large share originating from the agricultural and applied biological sciences, followed by the human sciences and biomedical and veterinary sciences.

The prize is granted to maximum 14 students and 6 researchers and consists of an award of 1,250 € for students and 2,500 € for young researchers. Since 1998 the awards have been handed over by the Minister for Development Cooperation during a ceremony in the Royal Museum for Central Africa. The laureates from abroad are invited to Belgium especially for this occasion. Many use their stay in Belgium to establish or renew contacts with the Belgian academia in their fields of interest.

Two abstracts regarding the accomplishment of laureates from Cameroon and Bolivia awarded in 2007 are presented below.

Morphological Characterization and Sensitivity of Four Strains of *Aspergillus niger* to Three Cameroonian Essential Oils

Thierry Elvis Djonkack*

The people of Cameroon are faced with the problem that their maize and peanut harvests are contaminated by pathogenic *Aspergillus niger* fungi, also called black rot. This contamination causes loss of harvest and the production of mycotoxins, which are harmful to health.

The toxicity of the synthetic fungicides used to combat the scourge and its costs, which are exorbitant for small producers, has led to this study. It puts forward an alternative that is adapted to the local conditions, including a sustainable development aspect, making use of available resources at minimal cost, which would also lead to a return to the traditional cultivation of essential oil plants.

The study of Mr Thierry Elvis Djonkack firstly provides an in-depth understanding of the pathogenic agent through the characterization of the morphological variability of different *Aspergillus niger* strains on the basis of the substratum (maize, peanuts, ...) and the agro-ecological area. Secondly, the essential oils of *Ocimum gratissimum*, *Thymus vulgaris* and *Cymbopogon citratus* have been isolated and their effects measured with the sensitivity of the strains, based on growth inhibition.

The results lead to two initial conclusions. The characterization of the pathogenic agent is vital and the use of essential oils is a promising avenue for research into an alternative to synthetic fungicides.

This post-graduate dissertation is a very good example of transdisciplinary study including both the need for chemical research into essential oils and microbiological research into the identification of pathogenic agents in order to enhance the status of natural vegetable resources within the framework of sustainable development.

Elevated Cadmium Concentrations in Potato Tubers Due to Irrigation with River Water Contaminated by Mining in Potosí, Bolivia

Carla Oporto**

This paper focuses on a real problem in a mining area in Bolivia where farming land has been irrigated with contaminated water since approximately 1920. It informs on the exposure of farmers working in this mining area, and in similar areas in other countries, to contamination with heavy metals contained in the ground and in the irrigation water. It provides information especially on the different concentrations of metals in farming soil and in the farming products harvested on these contaminated sites. The study analyses different factors that contribute to the bio-availability of heavy metals that can be absorbed by plants. The latter constitute a risk in the human and animal food-chain. The study reveals that the levels of heavy metals (here cadmium: Cd) contained in farming products (in this case potatoes) are very high compared with the levels observed in other countries (Australia, Sweden, Norway, Poland, Belgium, etc.). On the basis of these results, the populations living in proximity of these Bolivian mining areas, and others, can be made aware of the dangers of direct and indirect toxicity of heavy metals. This will reduce the loss of human and animal lives in the mining areas where soils are often contaminated. The results show that it is imperative that farming products harvested from the land contaminated with heavy metals are analyzed, this in accordance with European and international standards for heavy metal levels that are highly toxic to humans and animals.

The technical scientific value of this paper and its impact in the sphere of environmental conservation in relation to contamination from heavy metals are clear. The fact that the concentrations of heavy metals (in this case Cadmium: Cd) observed on the experimental site exceed the standards recommended by the World Health Organization (WHO) should make the local people aware of the potential dangers (direct and indirect toxicity) of heavy metals in the food-chain. Similar studies may enable the competent authorities to draw up maps of contaminated farming land, in order to allow the local farming population to work in a sustainable way. These measures will enable the local population to avoid certain illnesses such as *itai itai*, which is caused by very high cadmium levels.

This paper is of high scientific value. The experimental protocols, the way the experiments have been carried out, the data collection, the chemical and paedological analyses, the analyses of plants, soil and soil solutions, and irrigation water, etc. as well as the way the statistical data is treated are all in strict accordance with international scientific standards. The study is also being continued within the framework of a doctoral thesis at the Katholieke Universiteit Leuven. The results are very useful to the scientific world and in particular to environmental conservation and human and animal health. The results will be able to be used both in the mining areas in the South (South Africa, Democratic Republic of the Congo, Angola, etc.) and in the North.

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