Valorization of cocoa and cashew residues through vermicomposting to improve agricultural productivity in Côte d'Ivoire

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Cocoa and cashew residues are produced in huge quantities, in West Africa, posing disposal problems thus threatening environmental health. In Côte d'Ivoire alone, for example, more than 4.2 million tons of cocoa residues and 7.02 million tons of cashew apple residues are produced per year. Cocoa and cashew residues contain high contents of lignocellulosic fibrous material such as phenol, lignin, tannin, and cellulose. Disposal of lignocellulosic wastes is a major challenge since they are known to decompose very slowly in the natural environment because of their chemical and structural complexity. Moreover, these residues usually harbor fungal spores and other pests that can infect crops and, therefore, lead to decrease in crop productivity. However, crop residues are valuable for agriculture in developing countries. The use of crop residues in agriculture is not only linked to their richness in nutrients but also to their ability to control soils' runoff and erosion. Thus, crop residues deserve treatment or conditioning to reduce the risks associated with their use. This is possible if producers have the possibility to bear the cost.

Vermicomposting is considered more suitable because it is low-cost, environmentally friendly and sustainable, and allows fairly good stabilization of organic residues before their use as fertilizer or soil conditioner. The bio-treatment of residues using earthworms results in two useful products: earthworm's biomass and the vermicompost. Earthworm's biomass can be used for animal feeds or life fish baits, while the vermicompost is a nutrient-rich organic soil fertilizer.

Eudrilus eugeniae (Kinberg,1867), one of the most common and widely earthworm used in vermicomposting under tropical and sub-tropical conditions, has been successfully used in vermicomposting of a variety of crop residues. But little is known about its efficacy in the vermicomposting of cocoa and cashew residues. Investigating the potential of using *E. eugeniae* in bio-treatment of cocoa and cashew residues is a prerequisite to wide-spread utilization of this species in the vermicomposting of these wastes.

The objective of this project was to treat cocoa and cashew wastes using vermicomposting to improve soil fertility in Côte d'Ivoire. Thus, physico-chemical characteristics of both residues were determined at the laboratory scale and the capacity of the earthworm *Eudrilus eugeniae* to feed on cocoa and cashew residues was evaluated.

Keywords : Valorisation, cocoa and cashew residues, vermicomposting, *Eudrilus eugeniae*.