

**PRODUCTION OF COMPOST FROM
AGRICULTURAL CHITINIC WASTES FOR
ORGANIC FARMING AND BIOLOGICAL
CONTROL APPLICATIONS**

By

BASSANT HASSAN MOHAMED FAHMY

B.Sc. Agric. Sci. (Biotechnology), Fac. Agric., Cairo Univ., 2008

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DEDICATION

First of all, I would like to express my deepest thanks to ALLAH (God) for helping me to carry out and complete this work.

I dedicate this work to whom my heart felt my late mother thanks; to my husband, my brother and sister for their Patience, help and for all the support they lovely offered throughout the period of my post-graduation.

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Special deep appreciation is given to my late mother, my husband and my brother and sister and my best friend wala.

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ABSTRACT

The aim of this study was to produce a valuable compost through recycling of agricultural (rice straw, banana peels, pomegranate peels) and chitinic waste (shrimp shell peel) All waste materials were mixed with cattle dung as a natural source of nitrogen and composed aerobically in a pile. Rock phosphate and feldspar were used as natural sources of P and K respectively. They were used in equal amounts (1:1) at a rate of 5% from the pile size. Fungal inoculant of *Trichoderma harzianum* and *Phanerochaete chrysosporium* at ratio 1:1. were added to the pile at the rate of 5L per ton of the pile size , during the composting process, as a biodegradable agent.. The composting process was continued up to 12 weeks till maturation.. The physical and chemical analyses included temperature bulk density, moisture content, pH, EC, dry matter, organic matter, organic carbon, C/N ratio ,ash contents, ammoniacal-nitrogen (NH_4^+ -N), nitrate-nitrogen (NO_3^- N) and total N, P, K % were determined at zero time and after, 2 and 4 and 6, and 10 and 12, weeks of composting. Counts of mesophilic and thermophilic bacteria, fungi, actinomycetes and cellulose decomposers were also determined at the same intervals. Counts of total and fecal coliforms as well as *Salmonella* and *Shigella* were determined at the end of composting period.

The produced compost used with *Azotobacter chroococcum* as organic and bio-fertilizer for eggplants in a greenhouse experiment. The obtained results referred to a positive growth promoting effect of the compost product in addition to the bacterial inoculum on eggplant seedling. Compost application in addition to bacterial inoculation increased eggplant dry and fresh weight as well as improved the nutritional values of grain, i.e., total carbohydrates, total phenol and total chlorophyll. In addition, soil organic matter was increased in pots received the combined treatment with compost and the bacterial inoculum. Slight changes were recorded in soil pH and EC as a result of organic or bio fertilizer application. The examined compost product from shrimp shells might be used with the bacterial inoculum as potential soil amendments in organic farming program.

Key words: Agricultural waste, chitinic waste, *Azotobacter chroococcum*, bio fertilizer, compost, organic fertilizer, eggplant

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