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QUALITATIVE ANALYSIS OF BIOCOMPOST PREPARED FROM COMMON WEED PLANT *LANTANA CAMARA* L. AND *PORTUNUS SANGUINOLENTUS* (HERBST, 1783) CRAB SHELL WASTES

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ABSTRACT

Modern agricultural practice has resulted in many other related problems such as depletion of soil fertility, increase in soil salinization (i.e., deposition of salt), soil and water pollution, nutrient imbalance, emergence of new pests and diseases. Composting is becoming an environmental friendly and economical alternative method for treating of solid organic waste. Composting converts the active organic portion of solid waste in to a stabilized product which can be used as a nutrient source for plant growth and/or as a conditioner to improve soil physical properties. It can improve soil structure, increase soil organic matter, suppress soil borne pathogens and enhance plant growth. This study clearly supports the view that weed pant, *Lantana camara* co-composted with crab shell, *Portunus sanguinolentus* wastes gives nutrient rich compost and that can be used as a organic soil amendment.

Key words: Compost, *Lantana camara*, *Portunus sanguinolentus*, Sustainable agriculture.

INTRODUCTION

Conventional agriculture is characterized by the use of a great amount of chemical fertilizers, synthetic pesticides and growth regulators etc., resulting in heavy reliance on non renewable resources, chemical residues in food and soil degradation, all of which bring in to question the sustainability of the conventional farming system [1-5].

Composting is becoming an environmental friendly and economical alternative method for treating of solid organic waste. Composting converts the active organic portion of solid waste in to a stabilized product which can be used as a nutrient source for plant growth and/or as a conditioner to improve soil physical properties. It can improve soil structure, increase soil organic matter, suppress soil borne pathogens and enhance plant growth [6].

Lantana camara is a low erect or subscandent, vigorous shrub with stout recurved prickles and a strong odour of black currents. It grows to 1.2-2.4 meters (or even more). It is an obnoxious weed plant. The unripe berries are known to be very toxic and the foliage is toxic to livestock. *Lantana* is listed as a Category I invasive exotic species by the Florida Exotic Pest Plant Council, which means that it is known to be "invading and disrupting native plant communities in Florida".

Portunus sanguinolentus (Herbst, 1783) is a commonly trawled, edible crab species. It often swims near the surface at night. It has rapid growth and a short life span of around 2.5 years. It feeds on small crustaceans, molluscs and detritus. It inhabits sandy and muddy substrates in shallow coastal waters from 10-30 m, but can occur at depths outside coastal waters reaching 80 m. The three blood-red spots on the back of the shell are its peculiar characteristics.

The crabs are processed by the vendors and discard the crab shell wastes are discarded in the road side. The discarded waste gets collected by municipal cleaners and is dumped in to land resulting in soil pollution. Land application of crustacean waste is not as problematic in terms of offensive odours as fin fish waste. Stabilization via composting may be beneficial to minimize problems such as odour and phytotoxicity [7]. Fresh crustacean waste contains high amount of plant nutrients compared with composted crustacean waste. However, concentrations of potassium (K), copper (Cu), and manganese (Mn) were higher in composted crustacean waste than in the fresh waste material. These composted materials are used as a soil amendment and agricultural nutrient input [8].

Thus the present study aims to compost the weed plant *Lantana camara* with shell waste of *Portunus sanguinolentus* (Herbst, 1783) and to improve the sustainable agricultural practice.

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MATERIALS AND METHODS

Weed plant and crab shell waste collection and analysis.

The obnoxious weed plants *Lantana camara* (approx. 12 to 15 cm) were collected from places in and around Vellore town. The weeds were carefully uprooted. They were carefully transported to composting site. Crab shell wastes were collected from fish market. The raw materials were processed for making efficient compost. The weed plant and crab shell were subjected to physical and chemical analysis.

Compost maintenance and harvesting

The five different combinations of inoculums (1:1, 2:1, 5:1, 10:1 and 20:1) were composted by Indian Indore method as suggested by Natural Resources Management and Environment Department (www.fao.org). On the 30^{th} day the compost was harvested. The compost was carefully collected in clean zip log bag and brought to laboratory for physical and chemical analysis.

RESULTS

The results reveal that the *Lantana camara* composted with cow dung and crab shell mixture shows highest amount of nutrient content than *Lantana camara* compost alone (Table).

DISCUSSION AND CONCLUSION

This study clearly supports that the macro and micro nutrients of the compost samples are significantly high when compared to *L. camara* alone compost. This result strongly supports the report of Bhargavi [9] that the incorporation of additional nutrients to compost can yield nutrient rich compost. This study also proves that high mineral content present in the crab shell was composted and transformed in to readily available form by the action of beneficial microbes. *L. camara* contains high amount of zinc, manganese and copper. Combination of these weed with calcium rich crab shell thus results in good quality compost rich in nutrient content. Soil with low nutrient and microbial content can be improved by adding these kind of composts.

Table 1. The nutrient content of the *Lantana camara* compost mixture (crab shell and cow dung) and *Lantana camara* compost alone.

Parameters	*L. camara* compost alone	*L. camara* compost mixture
(i) Physical		
pH	6.64	8.12
Electrical Conductivity (ms/cm)	1.12	2.15
Moisture	3.30	4.22
(ii) Chemical	0.15	0.19
Nitrogen (Kjeldahl) (%)	0.62	0.72
Phosphorous (%)	0.18	0.22
Potassium (%)	1.21	2.21
Calcium (%)	0.35	0.47
Magnesium (%)	0.19	0.21
Sulfur (%)	0.51	1.02
Sodium (%)	110.58	116.11
Zinc (mg/kg)	89.51	94.11
Iron (mg/kg)	260.12	276.17
Copper (mg/kg)	8.05	9.12
C:N	17:1	18:1

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