

Chapter 7

Bioconversion of Seri Waste to Value-Added Products: Innovations in Sericulture Industry

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ABSTRACT

The conversion of waste into vermicompost is seen as an opportunity by different workers that may be advantageous in terms of improving the structure and physical conditions of the soil, increase the water retention capacity and availability of phosphorous to the growing plants, prevention of leaching loss of soluble inorganic nitrogen, and addition of nutrients/essential micro nutrients. It is observed that the vermicompost obtained from seri waste has better nutrient value as compared to conventional fertilizers. The success of sericulture industry in future will depend on sustainability of organic fertilizers both in terms of nutrient management and environmental protection. Similarly, the waste can be used for biogas production, as activated carbon, feed for the livestock, etc. are the opportunities of converting waste into value-added products. This chapter will review the different types of waste that is produced from sericulture and can be used to form value-added services.

INTRODUCTION

Waste is ‘any substance or object which the holder discards or intends to discard’ (Waste Framework Directive 75/442/EEC 1975). The compelling need to harness the potentials of the numerous agro-industrial by-products and the so-called “Wastes” as part to increase the economy of farmers. Recycling is the retrieval of ingredients to style novel outputs and condense the magnitude of virgin untreated constituents desirable to encounter customer demands (REI Report, 2016). It involves Recycling includes the three steps, collection and processing, manufacturing, and purchasing new products made from recycled materials, which create a continuous loop. Recycling has been reported from ancient times as early as when broken American rock equipment were reused for different purposes (Blakeman, 2004). It is considered as an indispensable chunk of Sustainable Material Management, a process that accentuates the fruitful and sustainable material use throughout their life span, while curtailing their ambient effects at the same time. Moreover, as per the report, recycling and recycled goods frolic a portentous social and economic duty. It was estimated that there are 1.57, \$76030 and \$14101 jobs, wages and tax revenues, respectively for 907 tons of recyclable waste for collection and recycling.

The domestication of plants and animals with modern technology has caused a conspicuous impact on atmosphere, hydrosphere and lithosphere (Larson & Fuller, 2014). It characterizes on a particular sort of evolutionary process motivated by human selection, hence performs a critical part in Darwin’s theory of evolution (Jensen, 2014). The major domesticated insect, which has been commercially exploited is the mulberry silkworm (*Bombyx mori* L.), accounting for the major share in total silk production (89%) (Patil et al., 2009). Sericulture, is a cost effective technique practiced in about 25 countries all over the world. The main sericulture product is the natural silk fiber. Over the years man have utilized silk to produce textiles of great value and beauty. Silk Industry provides employment to 30 million families in countries such as China, India, Brazil, Bulgaria, Vietnam, Korea and Thailand (Kim et al., 2010).

Sericulture is an agro-based employment-intensive occupation for rural and semi urban areas, and mostly practiced by average economy people. Mulberry is an essential crop for silkworm production. The main use of mulberry globally is to produce silk but in some countries, it is also appreciated for its fruit delicious vegetable, medicinal properties in infusions, landscaping and as animal feed etc. sericulture had been such an important industry that mulberry was not used for any other purposes in Japan. However, with the recent decline of sericulture industry, mulberry has been re-evaluated for other purposes, such as medicinal, fruit and animal production (Singhal et al. 2005a, 2005b, 2005a). Recently, importance of natural products is being invigorated to lessen various health discrepancies. The association between health and diet is well documented and the consumers’ trend reflects conscience towards their dietary habits. Probing these links has led to the emergence of functional, nutraceuticals and pharma foods, now taking hold over global nutrition market. The different phytochemicals in diet could provide protection against several threats like free radical formation, degenerative disorders and lifestyle related diseases but still role of active ingredients should be unveiled. It has a exciting nutritional profile containing proteins, phenolics, flavonoids and anthocyanins that increases its significance as promising nature’s functional tonic.

The breeding of insects is associated to the problem of waste, such as excreta and leaf waste. A major issue of the silk industry is the need to make the most efficient use of natural fibers, but also to utilize the waste products. Besides the main product of cocoons, a series of secondary products have unique economic value, if properly done. It involves a large scale of inter-reliant technologies from which results different by products and wastes. These ones may however be turned into new commercial products with a high

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