

ECOWASTE AS A SOURCE OF BIODEGRADABLE POLYMERS**Ravi Kumar B. Misal*, Sudhir Mulay, Santosh Waghmare and Vishal Hule**

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Buldhana(MH).**ABSTRACT**

The primary goal of pre-incident waste management planning is to prepare a community to effectively manage waste, debris and materials generated by a homeland security incident, including reducing the potential amount of waste generated at the outset. The today's scenario has drastic increase in the ecowaste management as concerned for environmental health. Conversion of ecowaste into biodegradable polymers has a wide scope in the field of pharmaceuticals, packaging and food industries etc. The various ecowaste are recycle by various treatment and utilize in various selective areas like crosslinking-decrosslinking, depolymerisation in super critical fluid polymers etc.

The current study describe various application of ecowaste substance like Egg Shell, Fish Scale, Crab Shell, Wood Fibers, Rice Husk etc.

KEYWORDS: Biodegradable Polymers; Ecowaste, Depolymerisation, Egg Shell, Fruit Pees etc.

INTRODUCTION

Waste material involves the collection and disposal of both hazardous and non-hazardous waste from all the sections of a society.

Ecowaste management is a burning issue of the day. The Processing of ecowaste can generate energy, reduce the pollution caused by toxins. Formed by incineration, slow down global warming and reduce waste products in land fills and water bodies. The basic aim of today's study is to reduce the need of Synthetic polymer manufacturing and simultaneously reduce the pollution caused by them. Many Biodegradable polymers from the ecowaste materials are used videly due to their user-friendly nature.

ADVANTAGES OR BENEFITS OF WASTE MANAGEMENT

1. This Practice is highly lucrative

The journal of Waste management says that the revenues generated by the waste management would top by \$60 million by 2018. But there are only a few people who sincerely consider this as an industry into various facets of waste management like recycling and reusing, and reap the benefits.

2. Keeps the environment clean and fresh

Perhaps, the greatest advantages of waste management in keeping the environment fresh and neat. These waste disposal unit units also make the people go disease free as all the resultant waste are properly disposal and taken care of. This is the best effect of proper waste disposal.

3. Saves the earth and conserves energy

This characteristic of waste management includes specifically the recycling aspect. As recycling of waste help in reducing the cutting down of trees. This cutting of trees is mainly done for the production of paper. by using this method, we can be use the recycled waste to make quality papers rather relying on trees.

4. Reduces environmental pollution

As explained above, waste management if done in a manner not only eliminate the surrounding waste but also will reduce the intensity of the greenhouse gases like methane, carbon monoxide which is emitted from the wastes accumulated. The depth of the existing landfills and incineration will be curbed thereby cutting down the harmful factor that affect the environment.

5. Waste management will help you earn money

Can you believe if I say that what I have said above is absolutely true ? Yes waste management earn you a few extra bucks every month. Actually there are many companies which will pay you for your waste. Right from old and used bottles to tin cans and e-wastes all kinds of wastes are collected and paid. These wastes are then segregated according to the extent of pollution they cause to the environment and these wastes are recycled accordingly for various purposes. There are also crash course available which will aid you to reuse your trash. Above all by following this method you can create an awareness to your fellow people by earning money which is a win-win concept.

DISADVANTAGES OF WASTE MANAGEMENT

1. The process is not always cost-effective

Yes though it may pay cash to the contributors, the truth is this process needs a lot of money, time and land to set up a plant and run. As the amount of waste that is being contributed to the waste product unit increases, so are the no. of plants that process these resource. Setting up a huge factory obviously needs a lot of money, and this management will start fetching yields only in the long run. Hence this is not seen as a short term lucrative investment. While dumping more and more garbage in the landfills cause only \$50 per ton, which is exactly triple the cost and thus many of the companies tend to switch over to the landfill method itself.

2. The resultant product has a short life

This is also true since the resulting recycled product cannot be expected to have a durable quality. As the product itself has its origin from a durable quality. As the product itself has its origin from the remains of other trashed waste products and heaps of partially used ones. The recycled product thought is eco-friendly is expected to have a shorter life span than the intended original one.

3. The sites are often dangerous

As the wastes management sites include the landfills to recycling units under its aegis these sites are highly susceptible to fungal and bacterial growth thereby leading to various disease. Even the debris formation will be accelerated by such bacterial growth, which makes it totally unsafe for the worker who work there. It also causes a widespread pollution and release harmful chemicals. These chemicals, when mixed with drinking water or any other consumable item pose a high amount of danger to the human health.

4. The practices are not done uniformly

Still, a large scale of these waste management practices are done only as a small scale process and is mostly confined to residential homes, schools and colleges and is not practiced on a uniform manner in large industries and conglomerates. It is not even practiced globally, as the global level consists of curbing spills, ocean disposal and decreasing the tree felling.

Some of them are briefly describe below.

1. FISH SCALES^[1,2]

Fish Scales are the main waste materials of fish. It is the main source of protein rich in organic fertilizers. Microneedles produced from biopolymers films are extracted from fish scales of Tilapia (*Oreochromis* sp.) using micromolding techniques.



Fig.1 Fish Scale rich in Organic Fertilizers.

2. CRAB SHELLS.^[3,4]

The crab shell waste is also utilized for Chitin production. Chitin has high Antimicrobial activity against a wide variety of pathogenic and breakdown microorganisms. Recycled crab shell waste exhibit antimicrobial activity against medically significant pathogens. Microparticles present in crab shell have anti-inflammatory activity that could lead to the development of novel prevention and therapeutic strategies for those who suffer from inflammatory bowel disease.



Fig. 2 Crab Shell as a Source of Chitin.

3. EGG SHELLS^[5,6,7]

Discarded egg shell has no value in the date, but often used as plant fertilizers because they contain calcium. Making egg shell fertilizers are inexpensive and environmental friendly. Calcium obtained from shell can raises or neutralize the pH level of overly acidic soil. It is

mainly used as natural calcium carbonate source in combination with Hyaluronan as beneficial additive for bone graft material. It also used for extraction and quantification by ELISA of organic matrix proteins. In Pharmaceutical industry used as pharmaceutical excipients, widely used as Diluent to control drug release from the tablet.



Fig. 3 Egg Shell as a Source of Plant Fibers & Excipients.

4. CITRUS PEELS

Because of the increase in the threat of infectious disease, the need of the hour is to find some natural agents with novel mode of actions. Most of the citrus fruits peels are thrown out into the environment as a waste. Many citrus pills are used against pathogens causing GIT distraction orders. It also used for extraction of pectin. Recently it was found for its antimicrobial activity.

5. BANANA PEEL

Whole banana is used for the nutritional value. Banana peels have the Antibacterial activity against Gram positive & Gram Negative bacteria. In Pharmaceutical industry used as binding and suspending agent. Also acts as biosorbents to reduce the copper contents in the textile industry waste water.

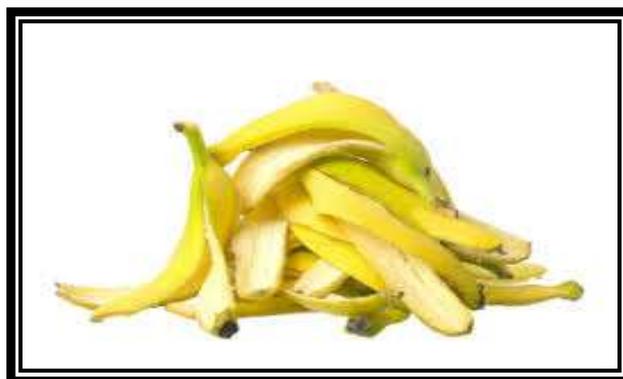


Fig.4: Banana Peel as a Biosorbent.

6. WOOD FIBRES

Chemically fibres consist of Cellulose & Lignin, so it used as a source of cellulose and lignin. Which widely used as filter aid and filter medium for filtration purpose.

7. WHITE RICE HUSK

Excipients in tablet manufacturing which is obtained from Rice Husk. Sodium dioxide obtained from Rice husk as a excipient. It is also utilize as a Adsorbent for removing heavy metals from water.



Fig. 5 Rice Husk as a Tablet Excipients.

Table-1: Various polymer derived from eco waste material.

S.No	Name of the polymer	Uses
1	Wood fibers	<ul style="list-style-type: none"> • Source of cellulose • Extraction of lignin
2	Sawdust	<ul style="list-style-type: none"> • Use in the preparation of activated carbons and test them as adsorbent of methylene blue and phenol
3	Lignocellulosic fibers	<ul style="list-style-type: none"> • Source of cellulose, hemicelluloses, lignin • Sustainable platform for production of bio-based chemical and polymers
4	Cotton fibers	<ul style="list-style-type: none"> • Source for surgical dressing and suturs
5	White rice husk ash	<ul style="list-style-type: none"> • Used as an excipient • Source for production of silica gel • Acts as adsorbent for removing heavy metals from waste water

CONCLUSION

Egg shell, Banana peel, Fish Scale etc. should not be disposed in environment which pollute the earth. Biodegradable polymers obtained from them can be used alone or blended with each other to exhibit various excipients properties like Fillers, Disintegrants, Binders,

Wetting agents etc. The proper research in this area can give ecofriendly and recycling based society which ultimately give zero discharge and sustainability.

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