EXECUTIVE SUMMARY
ON
MINOR RESEARCH PROJECT ENTITLED
BANANA FIBRE PROCESSING – CREATING A NICHE IN THE MARKET
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INTRODUCTION

Advances in research and technology have shown that favourable alternative sources of
the raw material for the natural fibre are annual crops or agricultural wastes (Cordeiro et al
2004). Biomass is generally used inefficiently, with very few higher value-added product
markets. However, bio-based renewable resources can provide raw materials for many new and
growing industries besides stimulating rural development, job creation and green house gas
(GHG) reduction. A greater reliance on bio-based resources and biological processes is an
inevitable part of an overall sustainability transition (Johnson 2007). Banana is one such biomass
which can be utilized effectively.

Banana fibre has high strength, good luster, light weight, good moisture absorption and
bio degradability. Highest exploitation of banana fibre for economic development is being done
in the Philippines for the production of textiles. However in India, there is lack of adequate
technology to make yarn from the fibre.

The present study, tries to process the banana fibre and study its properties and analyse
whether the properties are suitable for the fibre to be spun into a yarn.

OBJECTIVES OF THE PROJECT

1. To process the banana fibre by a) woolenisation followed by
b) enzymes

1. To study the properties of the treated fibres
   a) Physical properties- linear density and tenacity
   b) Chemical composition- cellulose content, residual gum content, lignin content, weight loss.

2. To find the optimized process which when used would enhance the spinnability of the banana fibre

SUMMARY OF THE FINDINGS

The banana fibres of the nendran variety were used as it is the commercial variety grown in Kerala. The fibres were machine extracted at Banana Research Station, Kerala Agricultural University, Kannara. Softening treatments such as woolenisation followed by enzymatic degumming was carried out on the fibres with two different scouring enzymes at varying concentrations and retention time.

The fibres were tested for the physical and mechanical properties such as tenacity and linear density. The weight loss of the fibres were recorded and expressed in percentage. The cellulose and lignin content of the samples were determined by the SITRA method and the residual gum content was calculated. From the study done it can be concluded that,

1. The fibres become more finer when degummed with enzymes after woolenisation. The fineness increases with increase in concentration and retention time.

2. The tenacity of the treated fibres decrease as the concentration of the enzymes used increases and along with the increase in retention time.

3. Weight loss is seen when the fibres are treated with enzymes. Woolenised fibres when treated with pectinase1 showed highest weight loss in each concentration at 18 hours retention time whereas with Pectinase2 highest weight loss was seen at 1 hour retention time. Hence Pectinase2 seems to be better than Pectinase1.

4. The percentage weight loss is inversely proportional to residual gum content.
5. Pectinase2 shows better activity than Pectinase1 producing fibres with lower gum content.

6. Pectinase2 at 5% concentration and 1 hour retention can be optimized and spinning trials may be carried out.

7. The treated fibres are lighter in colour, has a soft feel and are strong and they seemed to be more flexible than the raw fibres in visual observation.