R.V. COLLEGE OF ENGINEERING, BANGALORE-560059
(Autonomous Institution Affiliated to VTU, Belgaum)

"PREPARATION OF ECO-FRIENDLY AND BIODEGRADABLE GREEN COMPOSITES"

PROJECT REPORT

Submitted by

ANUSH C SHETTY	**(1RV10BT010)**
AMEY SUNIL KALE	**(1RV10BT005)**
KUMAR KIRTI SOLANKI	**(1RV10BT020)**
VAIBHAV CHAUDHARY	**(1RV09BT060)**

Under the Guidance of

Dr. Ashwani Sharma
Assistant Professor
Department of Biotechnology,
R.V.C.E., Bangalore - 560059

Prof. M S Krupashankara
Professor
Department of Mechanical Engineering
R.V.C.E., Bangalore - 560059

in partial fulfillment for the award of degree

of

Bachelor of Engineering

IN

BIOTECHNOLOGY ENGINEERING

JAN-MAY 2014

Abstract:

Bio composites offer a significant non-food market for crop-derived fibres and resins. Considerable growth has been seen in the use of bio composites in the automotive and decking markets over the past decade or so, but application in other sectors has hitherto been limited. Nevertheless, with suitable development, the potential exists for bio composites to enter new markets and thus stimulate an increase in demand for non-food crops. Towards this objective framed were, Preparation of bio-degradable, eco-friendly green composites and to evaluate important properties of the bio composite.

The conceptualization of the idea was dealt using the fibre (Coconut, wheat) of constant weight and corn cob in the ratio varying from 0 to 40 g. The various blends were poured in the mold and subjected to heating at $40^{o}C$ continuously for 48 hrs and subsequently analyzed for uniform Tensile strength and strain percent.

The result exhibited that composite of coconut husk and wheat husk in the ratio of 15:85 gave the best tensile strength, this can be attributed to fibrous nature of coconut husk which has a predominant influence on the tensile strength. Wheat husk along with water acted as the matrix. The sample showed tensile strength of 7 N/mm^2 with a maximum strain of 26% but with a stair-stepping stress-strain curve. This behavior could be attributed to the axis of loading and the inter gradual/relative movement between the fibres with a gradual determination process along the axis of loading. The intertwining of the coconut husk initiates the crack propogation and hence the material shows the UTS of 7N/mm^2 with a strain of 26%. Addition of corn makes this composite material into a hybrid composite.

The proposed green composites are promising because they are renewable, biodegradable, and are better alternatives for nonrenewable petroleum-based composites on the basis of cost versus mechanical performance. The natural fibre composites can be very cost effective material for broad spectrum utility.