

## Surface Modification of Pineapple Leaf Fibre Reinforced Polylactic Acid Composites

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**Abstract :** Natural fibres play a significant role in mass industries such as automotive, construction and sports. Many researchers have found that the natural fibres are the best replacement for the synthetic fibres in terms of cost, safety, and degradability due to the shortage of landfill and ingestion of non biodegradable plastic by animals. This study mainly revolved around pineapple leaf fibre (PALF) which is available abundantly in tropical countries and with excellent mechanical properties. The composite formed in this study is highly biodegradable as both fibre and matrix are both derived from natural based products. The matrix which is polylactic acid (PLA) is made from corn starch which gives the upper hand as both material are renewable resources are easier to degrade by bacteria or enzyme. The PALF is treated with different alkaline solution to remove excessive moisture in the fibre to provide better interfacial bonding with PLA. Thereafter the PALF is washed with distilled water several times before placing in vacuum oven at 80°C for 48 hours. The dried PALF later were mixed with PLA using extrusion method using fibre in percentage of 30 by weight. The temperature for all zone were maintained at 160°C with the screw speed of 50 rpm for better bonding and afterwards the products of the mixture were pelletized using pelletizer. The pellets were placed in the specimen-sized mould for hot compression under the temperature of 170°C at 5 MPa for 5 min and subsequently were cold pressed under room temperature at 5 MPa for 5 min. The specimen were tested for tensile and flexure strength according to American Society for Testing and Materials (ASTM) D638 and D790 respectively. The effect of surface modification on PALF with different alkali solution will be investigated and compared.

**Keywords :** natural fibre, PALF, PLA, composite

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