A Finite Element Analysis of a Recurve Bow Riser using Carbon Fibre Hybrid Composites

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The utilisation of natural fibre and the waste product becomes necessary to develop the sustainability in various industries. The usage of natural fibres in the sport-oriented industries is increasing in the recent years. In this paper, we presented the finite element analysis of the hybrid carbon fibre composites of recurve bows riser. The experiments of the tensile and flexural test were conducted on the various composition of hybrid materials. The pineapple leaf fibre and kenaf fibre are varied with 5% and 10%, was respectively hybridised with 95% and 90% carbon fibre as the overall fibre content is 40%. The material properties of the best composition of 95 CF/5 PALF were used in finite element analysis. It can be concluded that the alternative design of recurve riser was suitable for the alternative material and suit to Malaysian junior archer.

Keywords: Recurve bow, Malaysian anthropometry, Static structural analysis, Natural fibre hybrid composite.