The Effect of Plasma Treatment on Tensile Strength of Ensete Ventricosum Fibres

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This study was focused on an effect of the plasma treatment on a mechanical behaviour of false banana's fibres (*Ensete Ventricosum*). The aim of the experiment was to describe the tensile strength of Ensete Ventricosum fibres which were modified by the plasma surface treatment. The fibres of Ensete Ventricosum, originally from Ethiopian region Hawassa, were used for this experiment. The fibres were prepared in the length of 100 mm. The samples were modified by the plasma treatment. Plasma was generated from a plasma generator (Plasma Reactor KPR 200 mm RM 54) while supplying the reaction gas (oxygen) and maintaining the reactor´s pressure at 0.1 Torr with the use of a vacuum pump. To determine the properties that depend on the discharge power and treatment time, the plasma treatment was conducted in the power range 200-350 W for 10-50 s. The maximum tensile force was measured immediately after the plasma treatment to determine the ultimate strength. The ultimate strength and the deformation were determined by destructive tests using the tensile testing equipment (Labortech, MPTest 5.050, sensing unit AST type KAF 50 N, Czech Republic) with a rate of deformation 5 mm min^{-1}. Fracture surfaces of fibres were studied using a scanning electron microscope (Tescan Mira 3, Czech Republic). The samples were covered with a thin layer of gold using a sputter coater (Quorum Q150R ES, United Kingdom) before SEM observation.

Keywords: Agriculture, tensile strength, Plasma treatment, Surface modification, Scanning electron microscope

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