

## Biotechnology-2013: Response surface optimization of potassium extraction from waste banana pseudo stem - Narayana Saibaba K - GITAM Institute of Technology

Narayana Saibaba K V<sup>1</sup>, Sarvamangala D<sup>1</sup>, Ravi Vital Kandisa<sup>1</sup>, R Gopinadh<sup>1</sup> and P King<sup>2</sup>

<sup>1</sup> GITAM University, India

<sup>2</sup> Andhra University, India

An easy, green, and abundantly to be had agricultural waste fabric, banana pseudo-stem (BPS) turned into tested as uncooked cloth for the extraction of potassium. The results of numerous procedure parameters including temperature, initial pH, contact time, banana pseudo-stem dosage and size of banana pseudo-stem debris on potassium extraction efficiency were studied by way of going for walks batch experiments in Erlenmeyer flasks. response surface methodology (RSM) was used to layout the experimental runs. Modelling and optimization of process variables to gain most extraction of potassium from raw fabric have been completed the usage of RSM. The maximum extraction efficiency of potassium turned into found to be eighty-three. ninety-six% at a temperature of 400 C, pH of 1, touch time of 30 min, BPS weight of 26.076 g and preliminary BPS size of three hundred. The consequences revealed that banana pseudo-stem may be used as accurate source for potassium extraction.

In latest years, herbal fibers have validated that they can update them synthetic polymer opposite numbers. natural fibers are cheap and bio-degradable while having properly sound abatement capabilities, low abrasively, and no fitness risks. natural fibers are extracted from various plant components and are classified accordingly. presently, herbal fibers along with kenaf, rice husk, banana, and bamboo are abundantly available in growing nations together with Malaysia, Indonesia, Thailand, and other Asian countries. they've not, but, been optimally applied. At present those fibers are used as traditional merchandise for the manufacturing of yarn, ropes, cordage, and matting in addition to articles like wall table mats, handbags, and handbags. among herbal fibers, banana is one of the oldest cultivated vegetation inside the international. The word 'banan' itself comes from the Arabic language, meaning 'finger', in which it belongs to the Musaceae circle of relatives and Musa genus. There are about three hundred species of banana, however, only 20 varieties are used for consumption. about 50 million metric lots of bananas are produced each yr in the Asian, African, chinese language, and American subtropical regions. Banana fiber has feasible makes use of in composite structures and superior era.

To enhance mechanical houses in composite structures, fiber loading, fiber duration, and mercerization effect had been extensively investigated. Phua et al.

investigated the mechanical houses of starch-grafted-polypropylene/kenaf fiber composites with fiber loadings of 10, 20, and 30 wt%. these biocomposites had been prepared thru the compound melting and compression molding strategies. They discovered that mechanical homes progressed with multiplied fiber loadings. The effect of fiber content on the mechanical properties of hemp and basalt fiber strengthened phenol formaldehyde composites had been investigated by means of Öztürk, who fabricated fibers reinforced composites with fiber loadings of 20, 32, 40, forty-eight, 56 and 63 vol%. He referred to that tensile energy improved with expanded fiber loadings of as much as forty vol%. however, mechanical homes reduced above this price. For each composite, elongation at smash increased as the fiber quantity fraction accelerated. furthermore, the maximum tensile energy of Napier grass fiber/polyester composites elevated with improved fiber loadings of up to twenty-five%, supplying an best volume fraction for a the fiber reinforced composite. similarly, the reduced energy of the composite with a 30% fiber quantity fraction ended in fiber entanglements that created longer fiber lengths. The effect of various fiber weights at the mechanical properties of sisal fiber phenol formaldehyde composites turned into discussed by Maya et al. They found that as fiber content material multiplied, the mechanical energy of the composite turned into also elevated with an most effective cost of 54 wt% fibers loading. currently, the foremost findings on fiber loading are nonetheless inconsistent due to compounding parameters at some point of composite instruction.

An experimental study was achieved to research and characterize the effect of fiber length at the mechanical homes of herbal fiber composite systems. The consequences of fiber period at the mechanical conduct of coir fiber-strengthened epoxy composites become performed by means of Das et al., who located that tensile energy reached its most cost at 12 mm fiber length. The prediction of most advantageous fiber duration for banana epoxy composites changed into mentioned via Venkateshwaran et al., who located that will increase in fiber period and weight ratio multiplied tensile power and modulus as much as a 15 mm fiber period. The impact of fiber period at the tensile houses of epoxy resin composites reinforced with kenaf/PALF fibers become examined through Aji et al, who discovered that an most

efficient maximum tensile energy become recorded at a fiber duration of zero.25 mm, even as a fiber period of two mm reduced tensile modulus overall performance because of weak interface bonding between the matrix and reinforcement.

The effect of fiber loading, fiber duration, and alkaline remedy content material on banana fiber strengthened thermoset turned into evaluated the usage of the container–Benhken design. on this examine, three independent variables have been considered and geared up using a 2-element interplay version. The outcomes showed proper agreement among tensile strength experimental and expected values for R2, predicted R2, and altered R2. The maximum tensile strength changed into obtained with optimum situations with a fiber period of 3.25 mm, NaOH content material of five.45 (wt%), and fiber loading of 29.86 (wt%). The expected tensile strength changed into 23. seventy-three MPa, close to its experimental fee of twenty-two.86 MPa. similarly, maximum composite tensile power changed into multiplied up to 22% with the aid of the epoxy-resin system. the existing paper has showed that the

BBD method is a cost-effective way of accumulating most efficient values of mechanical conduct within the shortest time frame. further, an optimization of the matrix changes specially the impact of nano-fillers at the mechanical and bodily properties of the natural fiber polymer composites the usage of BBD method is exciting to find out.

### Biography

Narayana Saibaba K V is doing his current research and working at GITAM University, India

[kvnsai@yahoo.com](mailto:kvnsai@yahoo.com)