There are number of synthetic polymers are available in market for pharmaceutical formulations, but these synthetic polymers have certain disadvantages such as high cost, toxicity, environmental pollution during synthesis, non-renewable sources, side effects, and poor patient compliance. Because of these disadvantages natural polymers such as natural gums and mucilage are preferred to semi synthetic and synthetic excipients because of the following advantages: low cost and natural origin, free from side effects, biocompatible and bio-acceptable, renewable source, environmental friendly processing, local availability etc. Because of this demand for these substances are increasing and new sources are being developed.

The endopserm of *Borassus flabellifer* fruit contains a high proportion of mucilage. Literature survey revealed that comprehensive physicochemical characterization and exploration of *Borassus flabellifer* fruit mucilage (BFM) as versatile pharmaceutical excipients in pharmaceutical formulations had not been done. Hence, the present study was aimed to enhance the use of BFM as a natural plant based excipients to develop various pharmaceutical formulations and it will encourage cultivation and use of this mucilage in the pharmaceutical industry.

The disintegrating property of the BFM had been studied in comparison with commercially available superdisintegrant viz; croscarmellose sodium in the formulation of Metformin HCl FDT’s. The results indicated that the BFM exhibited better disintegrating property at lower concentration viz; 1% w/w than the croscarmellose sodium, and hence it can be used as a superdisintegrant in the tablet formulations.

The extracted BFM powder was evaluated for its binding properties in paracetamol compressed tablet. Its binding efficiency was compared with starch paste, which was used as standard binder at 10% w/v concentration. It can be observed from the results that tablets prepared using BFM at 8% w/v are comparable with tablets prepared using 10% w/v starch paste as standard binder.

The gelling potential of BFM was evaluated by formulating eight batches of diclofenac sodium gels with different concentrations of mucilage (viz; 3.0, 4.0, 5.0 and 6.0 %w/w) and compared with gum tragacanth as standard gelling agent. The results indicated that the gels prepared with 4.0%w/w of BFM were found to be more effective in comparison to that of gel with 6%w/w of gum tragacanth.

The suspending properties of BFM were evaluated comparatively with tragacanth at concentrations of 1, 1.5, 2.0 and 2.5% w/v in paracetamol suspension. The
study revealed that BFM at 2.5%w/v concentration had excellent suspending properties in paracetamol suspension formulations, compared to the traditionally used gum tragacanth.

The release retardant potential of BFM were studied by developing six batches of diclofenac sodium sustained release matrix tablets by wet granulation method with different concentrations of BFM (2.5, 5, 7.5, 10 and 12.5% w/w) and compared with guar gum as standard release retardant polymer. The study revealed that BFM exhibited controlled release at 12.5% concentration was capable of prolonging the release of drug for 12 hrs. It can be used as a potential natural release retardant for sustaining the drug release from the formulation.

The film forming potential of BFM was evaluated by formulating matrix-type transdermal therapeutic system containing diclofenac sodium with different proportions of BFM by the solvent evaporation technique. The investigation revealed that BFM appears to be suitable for use as a matrix former in the manufacturing of transdermal patches because of its satisfactory physical and mechanical properties.

The effectiveness of the BFM as a polymer in the development of a gastric floating dosage form of ranitidine HCl was compared with semi-synthetic polymer, HPMC K4M. From the study, it was evident that the mucilage manifested all the characteristics of a good pharmaceutical excipient that can be used for the formulation of floating tablets.

The potential of BFM as a biodegradable carrier for colon specific drug delivery, was evaluated by formulating colon targeted matrix tablets of olsalazine sodium by direct compression method using different concentrations viz; 5, 10, 15, 20 and 25% w/w of BFM. The *in vitro* and *in vivo* study indicated that the formulation F5 containing 25%w/w of BFM was capable of protecting the drug in upper GI tract while releasing significant of olsalazine sodium in SCF containing caecal content at the end of 24h under anaerobic conditions.

The utility of the BFM as a mucoadhesive agent of natural origin was studied by preparing five batches of sumatriptan succinate mucoadhesive tablets by using different drug-BFM ratio (viz: 1:0.25, 1:0.5, 1:0.75, 1:1 and 1:1.25). The results indicated that the mucoadhesive tablets formulated with 1:1.25 drug-BFM ratio (formulation F5) was shown all the desired properties and exhibited the extended cumulative percentage of drug release value (78.49%) after 10 hr. Thus it could be used as effective mucoadhesive agent in place of synthetic mucoadhesive agents.