FORMULATION, EVALUATION AND COMPARISON OF SUSTAINED RELEASE MATRIX TABLETS USING NATURAL GUMS AND SYNTHETIC POLYMERS AS RELEASE MODIFIER

1.0 INTRODUCTION

For many decades, treatment of acute disease or a chronic illness has been mostly accomplished by delivery of drugs to patients using various pharmaceutical dosage forms including tablets, capsules, pills, suppositories, creams, ointments, liquids, aerosols, and injectables as drug carriers. Drug may be administered by variety of routes but oral administration is adopted wherever possible. It is safest, easiest and most economical route of drug administration. Amongst drugs that are administered orally, solid oral dosage forms i.e. tablets and capsules, represent the preferred class of products. Out of the two oral solid dosage forms, the tablets have number of advantages like tamper proof, low cost and speed of manufacturing, ease of administration, patient compliance and flexibility in formulation etc.

In conventional oral drug delivery systems, there is very little control over release of the drug. The effective concentration at the target site can be achieved by intermittent administration of grossly excessive doses. Which in most situations, often results in constantly changing, unpredictable and often sub-or-supra therapeutic plasma concentrations leading to marked side effects.

Sustained release, prolonged action, controlled release, extended action, depot and repository dosage forms are terms used to identify drug delivery systems that are designed to achieve a prolonged therapeutic effect by continuously releasing medication over an extended period of time after administration of single dose. In the case of injectable dosage forms, this period may vary from days to months. In the case of orally administered dosage forms, this period is measured in hrs and critically depends on the residence time of the dosage form in the GIT.

Sustained release technology is a relatively new field and as a consequence, research in the field has been extremely fertile and has produced many discoveries. More sophisticated sustained release drug delivery system constantly being developed and tested. The oral route of
administration for sustained release systems has received greater attention because of more flexibility in dosage form design. The design of oral sustained release delivery systems is subjected to several interrelated variables of considerable importance such as the type of delivery system, the disease being treated, the patient, the length of therapy and the properties of the drug.

1.1 Advantages of Sustained Release Dosage Forms:

a) The frequency of drug administration is reduced and patient compliance can be improved.
b) Drug administration can be made more convenient as well.
c) Better control of drug absorption can be attained, since the high blood level peaks that may be observed after administration of a dose of a high availability drug can be reduced.

1.2 Disadvantages of Sustained Release Dosage Forms:

a) Administration of sustained release medication does not permit the prompt termination of therapy.
b) Economic factors must also be assessed, since more costly process and equipment are involved in manufacturing of many controlled release dosage forms.

All pharmaceutical dosage forms contain many additives besides the active ingredients to assist manufacturing and to obtain the desired effect of the pharmaceutical active ingredients. The advances in drug delivery have simultaneously urged the discovery of novel excipients which are safe and fulfill specific functions and directly or indirectly influence the rate and extent of release and/or absorption. The plant derived gums and mucilages comply with many requirements of pharmaceutical excipients as they are non-toxic, stable, easily available, associated with less regulatory issues as compared to their synthetic counterpart and inexpensive; also these can be easily modified to meet the specific need. Most of these plant derived gums and mucilages are hydrophilic and gel-forming in nature. Recent trend towards the use of plant based and natural products demands the replacement of synthetic additives with natural ones. Many plant derived natural materials are studied for use in novel drug delivery systems, out of which polysaccharides, resins and tannins are most extensively studied and used.