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Preparation and *In vitro*/*In vivo* evaluation of controlled release gliclazide pellets using gum kondagogu (*Cochlospermum gossypium DC*) as a hydrophilic matrix

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Natural gums in controlled drug delivery systems to deliver the bioactive agents have been hampered by the synthetic polymers in pharmaceutical industry. The main benefits of the natural gums are their being non-toxic, biodegradable, biocompatible, abundantly available, and cost effective. The main objective of the investigation is to develop matrix sustain release pellets of poorly soluble Gliclazide using natural gum, Gum Kondagogu(GK) (*Cochlospermum gossypium DC*) a native tree gum exudate belonging to the family Bixaceae. Gliclazide Pellets (60mg) were prepared by direct powder layer technique using different concentrations of (10-30%) gum kondagogu. The formulations were subjected to drug and excipients compatibility studies using FT-IR, DSC, and XRD. Swelling and hydration rate of polymers at different pH were determined. In vitro dissolution studies in 0.1 M HCl, and pH 7.4 phosphate buffers were employed in comparison with commercially available extended release formulation (Diamicron XD60mg). The release rate profiles were evaluated through different kinetic equation zero-order, first-order, Higuchi, Hixon-Crowell and Korsemeyer and Peppas models. The relative bioavailability of the sustained release gliclazide pellets was studied in Albino Wistar rats after oral administration in a fast state using a DiamicronXD 60mg as a reference. Coating blend with 20% gum kondagogu acquired perfect sustained release properties and good relative bioavailability similar to that of reference. Thus it could be concluded that gum kondagogu could be a controlled release matrix polymer and be a suitable substituent to existing synthetic polymers in the pharmaceutical industry.