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Review article

Formulation and Evaluation of Pirfenidone Sustained Release Matrix Tablets

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ABSTRACT

The goal of this study was to create a Pirfenidone sustained release matrix tablet, which is an anti-fibrotic drug. Pirfenidone is a drug that is used to treat idiopathic pulmonary fibrosis (IPF). The direct compression method was used to make the sustained release tablets. As release retarding polymers, ethyl cellulose, methyl cellulose, and HPMC were utilized. To find the best formulation, different batches (F1 to F9) were made by varying the drug polymer ratio. The FTIR peak matching technique was used to investigate the drug's compatibility with other excipients, and the substances were determined to be compatible. Angle of repose, Carr's index, Hausner's ratio, bulk density, and tapped density were all evaluated prior to compression, and the granules demonstrated the best flow qualities. Weight variation, drug content, hardness, friability, and invitro dissolution investigations were all performed on the compressed tablets, and all of the formulations passed the tests. The results of dissolution studies revealed that formulation F8 could extend the release for up to 8 hours, making it the most successful formulation in the study. It was expected to improve patient compliance while reducing administration frequency and side effects by avoiding the sudden burst release.

Keywords: Pirfenidone, HPMC, Methyl cellulose, Ethyl Cellulose, Matrix tablets, Direct compression.

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INTRODUCTION

Matrix tablets are a sort of sustained-release drug delivery method that uses a dissolution and diffusion control mechanism to release the medicine. To manage the release of medications with varying solubility properties, the drug is disseminated in swellable hydrophilic substances, an insoluble matrix of hard non swellable hydrophobic materials, or plastic materials in these tablets [1].

The solid medication particles are dispersed in a porous matrix made of hydrophilic or hydrophobic polymers in matrix tablets made by wet granulation or direct compression. Matrix tablets are a useful tool for administering oral extended-release medication. Matrix tablets are the best commercially available, low-cost sustained-release medications because they can hold huge amounts of medication and have no particular production needs. In the world of pharmaceutical technology, the introduction of the matrix tablet as a sustained release (SR) has provided a fresh breakthrough for novel drug delivery systems (NDDS) [2].

The innovative drug delivery system (NDDS) known as the sustained release matrix type drug delivery system improves the therapeutic effectiveness of medications by delivering controlled, sustained release and targeting to the targeted spot. When compared to conventional dosage forms, the main premise of a sustained release drug delivery system is to improve the pharmacokinetics, pharmacodynamics, and biopharmaceutical properties in such a way that its use is maximized, side effects are reduced, and the disease is cured efficiently. Drug tablets are made up of a combination of drug, retardant material and additives, with the drug embedded in a matrix of these materials [3].

Mechanism of Drug Release from matrix tablets

Medication diffuses out of the matrix after the outer layer exposed to the bathing solution is dissolved. The rate of dissolving of drug particles within the matrix must be substantially faster than the rate of dissolved drug leaving the matrix for this system to be diffusion regulated [4,5].

MATERIALS AND METHODS

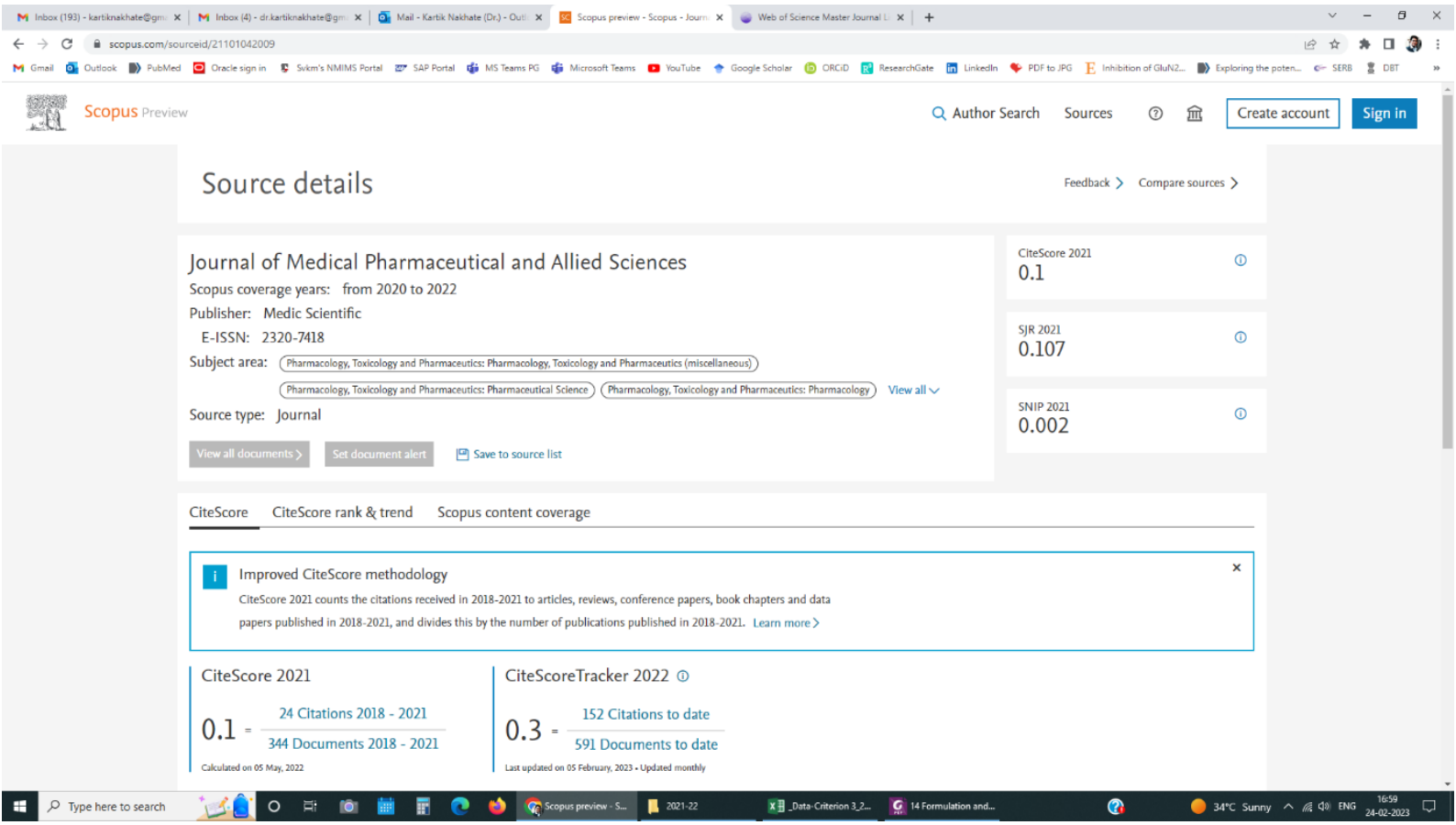
Pirfenidone was obtained from Cipla Ltd. Vikhroli, Mumbai. Ethyl cellulose, Methyl cellulose, HPMC K15M, Avicel, Dicalcium Phosphate, Magnesium stearate and talc were of analytical grade.

whole brain AChE activity. BR might prove to be a useful in the treatment of dementia seen in elderly as a memory restorative agent.

Experimental work

Preparation of Sustained Release tablet

Pirfenidone was given at a dose of 643 mg for sustained release. The Direct Compression Method was used to make the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