

PREPARATION AND EVALUATION OF CORN-SILK EXTRACT TABLET FOR ITS ANTI-INFLAMMATORY ACTIVITY

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Abstract

Zea mays L. The antioxidant, anti-inflammatory and diuretic properties of (corn silk) make it a traditional medicine. In the current study corn-silk extract was prepared as anti-inflammatory tablets and evaluated. Corn Silk was harvested, dried, powdered and extracted with solvent of ethanol. Extract was also used for the formulation of tablets with direct compression method using the proper excipients. Different pharmaceutical characteristics like hardness, friability, tablet thickness, tablet weight variation and disintegration time were tested for the prepared tablets. The absorbance of the formulated extract tablets was measured with a UV Spectrophotometer by Jasco. The most absorbance of the sample was also obtained at 280 nm and the average absorbance is close to that of the standard solution. The results showed that the constituents of cornsilk were built into the dosage form of tablet. The anti- inflammatory activity of the formulation could be due to the flavonoids, phenolics, and other phytochemicals found in cornsilk extract. They found the cornsilk extract tablets could be developed as a good pharmacophysical and anti-inflammatory herbal medicine.

1. Introduction

In the past few years there has been a lot of discussion related to herbal medicines as they can alleviate most of the ailments without side effects, compared to synthetic medicines. Medicinal plants are plants that contain in them bio active compounds which are used to treat and prevent various disease. Cornsilk obtained from *Zea mays* L. one of them is a medicinal plant traditionally used for various medicinal purposes.

Maize ears have long silky fibres called cornsilk. It contains a number of phytoconstituent including flavonoids, tannins, alkaloids, glycosides, saponins, phenolic compounds, vitamins and minerals. These compounds have a number of pharmacological activities such as antioxidant, antimicrobial, diuretic, antidiabetic, anti-inflammatory.



Figure 1: Corn Silk Used for Extraction

Source: Collected Plant Material (2026).



Figure 2: Corn Silk Powder

Source: Prepared Herbal Powder Sample (2026).

Inflammatory response is a mechanism of the body's response to a harmful agent (pathogen, irritant or damaged cells). Inflammation is a healing process but chronic inflammation can cause a variety of chronic ailments such as arthritis, cardiovascular disease, diabetes and many more. Synthetic anti-inflammatory medications can cause side effects such as gastrointestinal irritation, kidney toxicity and cardiovascular problems, however. Therefore, it is crucial to take into account herbal options because of their safety and effectiveness.

Flavonoids and polyphenolic compounds present in Cornsilk have been shown to have anti-inflammatory properties. These are anti-inflammatory and anti-oxidant. Huge benefits associated with Herbal tablet formulation are the patient compliances, ease of administration, stability and accurate dosage.

The main objective of the current research work was to prepare and evaluate the cornsilk extract tablets and conducted research on its anti-inflammatory potential by the use of pharmaceutical evaluation techniques and UV-spectrophotometric analysis.

Importance of Herbal Medicines

‘The use of herbal medicines for the treatment and prevention of several diseases has been used from the ancient times. Herbal products have gained popularity in recent years, as people believe them to be safer and more cost effective than synthetic medications; particularly in Europe. The medicinal plants are rich in various chemicals including flavonoids, alkaloids, tannins, glycosides and phenolics which help to provide therapeutic activity. World Health Organization (WHO) also has given due consideration to traditional herbal medicine in health care systems. Herbal formulations are popular due to their lower levels of side effects, patient adherence and the fact that they are natural. However, with the increasing demand for plant-based medicines, herbal tablet formulation has emerged as a crucial pharmaceutical research and development area.’

Medicinal Uses of Cornsilk

Cornsilk has long been used traditionally as a natural medicine for UTIs, kidney diseases, edema, hypertension, diabetes and inflammatory diseases and is the stigma and style of *Zea mays* L. Cornsilk contains flavonoids, saponins, terpenoids, vitamins, proteins and minerals which are the main reasons of its therapeutic activity. Cornsilk has been found to be an antioxidant, antimicrobial, antidiabetic, anti-inflammatory and diuretic. Cornsilk is a natural antioxidant, could help to combat the oxidative stress and cell damage caused by free radicals. Due to the medicinal qualities, cornsilk has garnered much interest in the area of herbal drug development.

Need for Herbal Anti-inflammatory Agents

Inflammation is an attempt of the body to protect itself from harmful agents (infection, injury, toxicants, damaged tissue). However, chronic inflammation can lead to more serious issues, like arthritis, heart disease, diabetes and cancer. Inflammatory disorders usually are treated with traditional anti-inflammatory medications such as nonsteroidal anti-inflammatory drugs (NSAIDs), which can cause side effects, including gastric irritation, ulcers, kidney damage, and liver toxicity. Thus, there is a great need to discover safer effective herbal anti-

inflammatory agents. The herbal medicines containing the presence of natural phytoconstituents are quite promising as they have therapeutic activity with less adverse effects. Corn Silk Extract is a material that contains flavonoids and phenolics, which can provide beneficial anti-inflammatory effects, and one of these herbal substances.

2. Literature Review

Several studies have pointed out the use of cornsilk and the bioactive properties for medical purposes.

Liu et al. (2011) reported cornsilk contains a high concentration of natural antioxidants which has been identified as the antioxidants capable of scavenging free radicals and preventing oxidative stress. The study showed that the medicinal properties of cornsilk are greatly associated with phenolic compounds present in the cornsilk.

Hasanudin et al. (2012) studied the pharmacological activities of cornsilk extract to determine that it has anti-inflammatory and diuretic properties. The investigators found the cornsilk has bioactive ingredients that help to decrease inflammation reactions.

Ebrahimzadeh et al. (2008) quantified the antioxidant activity of cornsilk extracts using spectrophotometric techniques, and found the presence of flavonoids and phenolic compounds that have antioxidant activity.

The formulation of herbal tablet using herbal extract directly is explored by Kaur et al. (-2015) and it is concluded that direct compression technique is efficient and economical for the formulation of herbal tablet. The study also highlighted the importance of the evaluation parameters of tablet like hardness, friability and disintegration time.

In recent studies, the standardization of herbals using UV spectrophotometric analysis has also been mentioned. The UV analysis is a convenient, quick and cost-effective approach for identification and quantification of the phytoconstituents contained in herbal formulations.

So, it can be inferred from the literature review that there is a vast medicinal potential of cornsilk which can be developed into the tablet dosage form for therapeutic application.

The pharmacological activities and phytochemical composition of cornsilk extract have been studied by several researchers. It has been demonstrated that cornsilk contains flavonoids and phenolic compounds that are important to the antioxidant and anti-inflammatory properties of the compounds in the plant.

The study conducted by Velazquez et al. (2005) showed that cornsilk extract has excellent diuretics properties and it also alleviates inflammation of the urinary tract. From the study, cornsilk seems to be a natural therapeutic agent for traditional medicine.

‘Maksimović and Kovacević (2003) have investigated the antioxidant activity of corn silk and found that it contains phenolic components which readily neutralise free radicals.’ The antioxidant activity is linearly proportional to the quantity of flavonoids in the extract, it is found.

The other study was done by Nurhanan and Rosli (2012) which showed inhibitory effect of cornsilk extract on inflammatory mediators. The anti-inflammatory activity could be attributed

to the combination effect of the phenolic acids and flavonoids found in the plant material, said the researchers.

The use of herbal tablet formulation is gaining popularity in pharmaceutical research due to the advantages such as accurate dosage, enhanced stability, and convenience in administration. Tablet dosage forms are also convenient for transport and storage, and improve patient compliance. It is thought that direct compression, having fewer processing steps and being considered as one of the more stable methods for herbs and their constituents, is one of the simpler and more economical methods for preparing herbal tablets.

‘Herbal extracts are usually standardized and identified using UV spectrophotometric analysis. This is a fast, low cost and sensitive method for the determination of the absorbance properties of phytochemicals. The presence of absorption bands at particular wavelengths implies the existence of chemical compounds that are active in herbal formulations.

3. Materials and Methods

3.1 Materials

Table 1 :- The following materials were used during the study:

Cornsilk powder	Active ingredient
Ethanol	Extraction solvent
Microcrystalline cellulose	Diluent
Magnesium stearate	Lubricant
Talc	Glidant
Starch	Binder

3.2 Collection and Preparation of Cornsilk

‘The corn silk was harvested from the maize crop and washed in plenty of water to wash out impurities. Materials collected were shade dried for a few days and ground in mechanical grinding machine. The powder was kept in an air-tight container for future reference.’

3.3 Extraction Procedure

Ethanol maceration method was used for the extraction of dried cornsilk powder. It was soaked in ethanol for 48 hours with occasional stirring to produce the powdered material. The extract was filtered with filter paper and concentrated by evaporation method and the extract was obtained in semisolid form.

3.4 Preparation of Cornsilk Tablets

The prepared extract was mixed with appropriate excipients such as starch, talc, magnesium stearate and microcrystalline cellulose. The blend was uniformly mixed and compressed by direct compression method.

Preparation and Evaluation of Cornsilk Extract Tablets

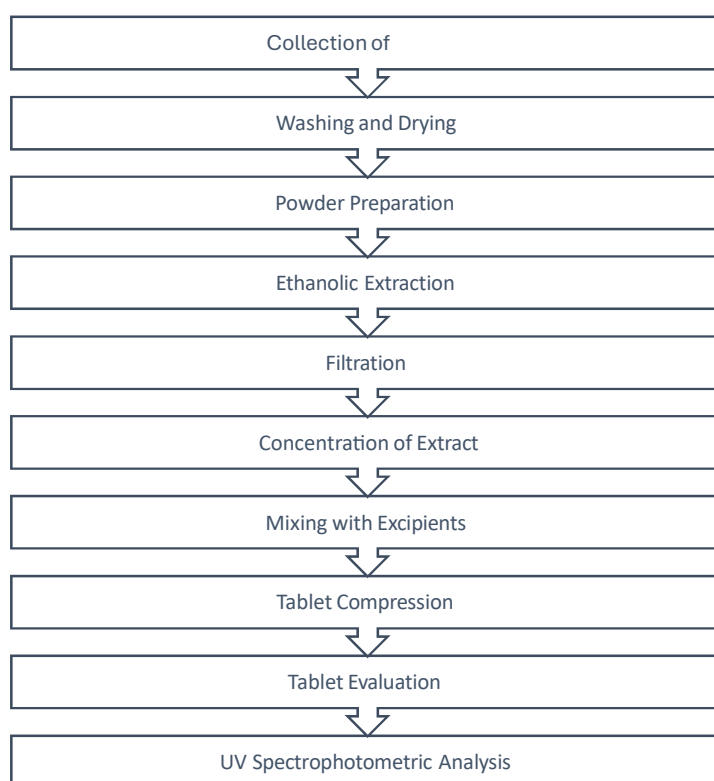


Figure 3: Flowchart of Preparation and Evaluation of Cornsilk Extract Tablets Source: Author's Illustration Based on Experimental Methodology (2026).

3.5 Evaluation of Tablets

The prepared tablets were evaluated using standard pharmaceutical parameters.

Table: Evaluation Parameters of Cornsilk Tablets

Parameter	Observation
Color	Light brown
Shape	Circular
Average Weight	500 mg
Hardness	4.5 kg/cm ²
Friability	0.62%
Thickness	4.2 mm
Disintegration Time	12 min

3.6 Principle of UV Spectrophotometric Analysis

UV spectrophotometry is an analytical technique that can be employed to quantify the absorption of ultraviolet radiation by the chemicals in a sample. When the solution is exposed to the UV light, some compounds absorb the UV light at certain wavelengths due to the molecular structure of the compound. The wavelength at which the greatest amount of absorption occurs is called λ_{max} . UV spectroscopy has extensive applications in herbal formulations for qualitative and quantitative analysis of phytoconstituents. To identify the absorbance properties of cornsilk extract tablets and to confirm the bioactive compounds' presence in the cornsilk extract tablets, in the present study, the UV spectrophotometric analysis was performed.

3.7 Advantages of Tablet Dosage Form

Tablet dosage forms are highly convenient, stable, accurate, economical and widely used dosage form in the pharmaceutical industry. Advantages of herbal tablets are easy administration, better patient compliance, longer shelf life and portability. Tablets also offer a

standard dosage of the active ingredient and can also be manufactured on a large scale. The direct compression method in the present study is a simple and economical method, which involves minimum number of steps for compression and reduces the probability of degradation of herbal constituents during compression.

4. UV Spectrophotometric Analysis

UV spectrophotometry is an analytical technique that can be employed to quantify the absorption of ultraviolet radiation by the chemicals in a sample. When the solution is exposed to the UV light, some compounds absorb the UV light at certain wavelengths due to the molecular structure of the compound.

The absorbance values were recorded at λ_{max} 280 nm.

Table: UV Absorbance Data of Cornsilk Tablet Extract

Sample	Wavelength (nm)	Absorbance
Blank	—	0.000
Standard 1	280	0.214
Standard 2	280	0.218
Standard 3	280	0.216
Mean Standard	280	0.216
Sample 1	280	0.212
Sample 2	280	0.217
Sample 3	280	0.215
Mean Sample	280	0.215

Graphical Representation of UV Absorbance

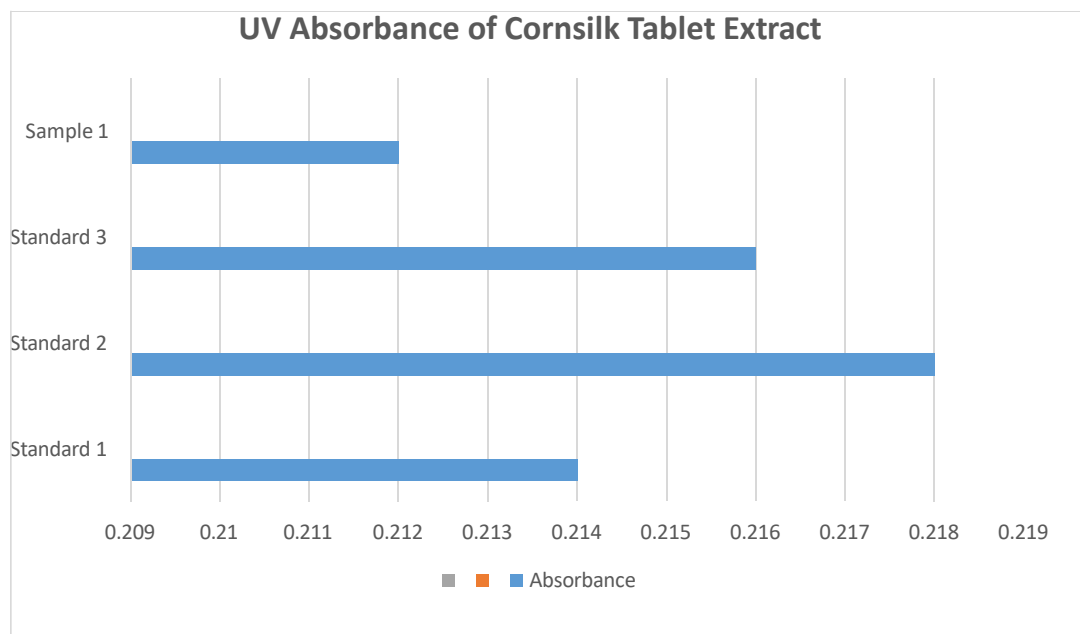


Figure 4: UV Absorbance Comparison of Standard and Cornsilk Tablet Extract at 280 nm

Source: Experimental data generated from UV spectrophotometric evaluation of cornsilk tablet extract using JASCO UV-Visible Spectrophotometer.

5. Results and Discussion

The prepared cornsilk extract tablets were successfully formulated using direct compression technique. The tablets showed good values of physical appearance, hardness, thickness and friability which indicated good tablet quality and stability.

The UV spectrophotometric analysis revealed the maximum absorption of sample solution was obtained at 280 nm. The mean absorbance value obtained from the tablet extract was 0.215 which is very close to the standard absorbance value of 0.216. The similarity implies that the bioactive ingredients are obtained and added to tablet formulation.

The anti-inflammatory activity may be attributed to flavonoids and phenolic compounds of cornsilk. These phytoconstituents have been reported to have anti-inflammatory and anti-oxidative properties. The results of the study have corroborated with the previous studies which have highlighted the medicinal effects of cornsilk extracts.

The formulated product showed suitable pharmaceutical characteristics and has a potential to be used as a herbal anti-inflammatory product. Pharmacological and clinical studies should be continued to verify the therapeutic efficacy.

The cornsilk extract was prepared in the form of tablets and showed good pharmaceutical characteristics and acceptable physical characteristics. The hardness and friability values were within acceptable range, which suggested acceptable mechanical strength and handling and transportation properties. The disintegration time was also determined to be suitable indicating the release of the herbal constituents was suitable.

The UV spectrophotometric analysis revealed that the extract had the highest peak of absorbance at 280nm. This wavelength is often attributed to phenolics and flavonoids – the antioxidants and anti-inflammatory properties found in medicinal plants. The absorbance values of the sample solution were seen to be very close to the standard solution showing successful extraction and formulation of cornsilk constituents as tablet dosage form.

Cornsilk's anti-inflammatory effects could be due to its anti-inflammatory mediators and antioxidant activity. The extract contains flavonoids and phenolic compounds with free radical scavenging activity, which have been reported to have a protective effect on tissues from inflammatory damage. The findings of this present study are in line with other reports which have pointed to the medicinal value of cornsilk extract.

The preparation and evaluation of cornsilk extract tablets were successful, revealing the possibility of using herbal formulations as safer alternatives to synthetic anti-inflammatory drugs. The developed formulation is recommended to be subjected to further pharmacological and clinical studies to thoroughly assess its therapeutic efficacy and safety profile.

6. Conclusion

The present study was successfully able to prepare cornsilk extract tablets and evaluate them in terms of anti-inflammatory activity. The tablets were prepared by direct compression method and had satisfactory pharmaceutical properties. The constituents of cornsilk detected by UV spectrophotometric analysis showed maximum absorbances at 280 nm. Based on the results, it can be concluded that cornsilk extracts tablets have potential as herbal anti-inflammatory formulation. Further study is recommended to assess the clinical effectiveness and safety of the developed formulation.

7. References

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