IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

A REVIEW BASED ON DEVELOPMENT OF ATENOLOL TABLET BY USING TAMARIND KERNEL POWDER AS A NATURAL DISINTEGRANT.

[1]Aakanksha Dattatray Pagar, [2]Jayshree Sambhaji Bhadane

[1]Student, [2]Assistant Professor Department of Pharmaceutics

Loknete Dr. J. D. Pawar College of Pharmacy, Manur, Kalwan, Nashik- 423501, Maharashtra, Nashik, India.

ABSTRACT: The viability of employing tamarind kernel powder as a natural disintegrant in atenolol tablet formulations is examined in this study. Different amounts of TKP were added to atenolol tablets, and the tablets' hardness, friability, disintegration time, and rate of dissolution were assessed. The findings showed that TKP considerably improved the atenolol tablets' dissolving and disintegration profiles. The enhanced tablet properties of the optimized formulation demonstrated TKP's potential as a safe and efficient disintegrant in atenolol tablet formulations and scripts.

Key words: Tamarind Kernel Powder, Atenolol, Natural disintegrant.

INTRODUCTION:

Introduction Atenolol is a commonly prescribed beta-blocker medicine used to treat hypertension, angina, and other cardiovascular disorders. However, its limited solubility and sluggish dissolution rate can result in low bioavailability

and efficacy[1,2]. To overcome this issue, researchers investigated the use of natural disintegrants to improve the breakdown of atenolol tablets. tamarind tree seeds are the basis of tamarind kernel powder, a naturally occurring polysaccharide. Its distinct features, such as high-water absorption capacity and swelling index, make it a promising natural disintegrant in tablet formulations. This study intends to investigate the viability of employing tamarind kernel powder as a natural disintegrant in atenolol tablet formulations and evaluate its effects[3].

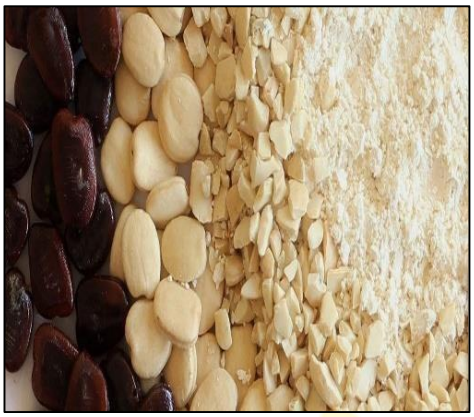


figure 1. tamarind seeds

figure 2. tamarind kernel powder

Tamarind Kernel Powder Properties[4]:

- Composition of polysaccharides: High in polysaccharides, mainly galactose, glucose, and xylose.
- Capacity to swell: Absorbs water, increasing in volume by up to ten times.
- Mucoadhesive qualities: Promotes disintegration by binding to mucous membranes.
- Solubility: Water-soluble, allowing for quick hydration[4].
- Disintegrant: Promotes the dissolving and disintegration of tablets.
- Stabilizer: Keeps suspensions from settling and separating.
- Antioxidant: Shows signs of antioxidant action.
- Anti-inflammatory: Demonstrates functions that reduce inflammation.
- Healing wounds: Quickens the healing process.
- pH: 5.5 to 7.5.
- Thickener: Makes an aqueous solution more viscous.
- Compressibility: Sufficient for the production of tablets Good.
- Flowability: Flowability is demonstrated for simple processing.

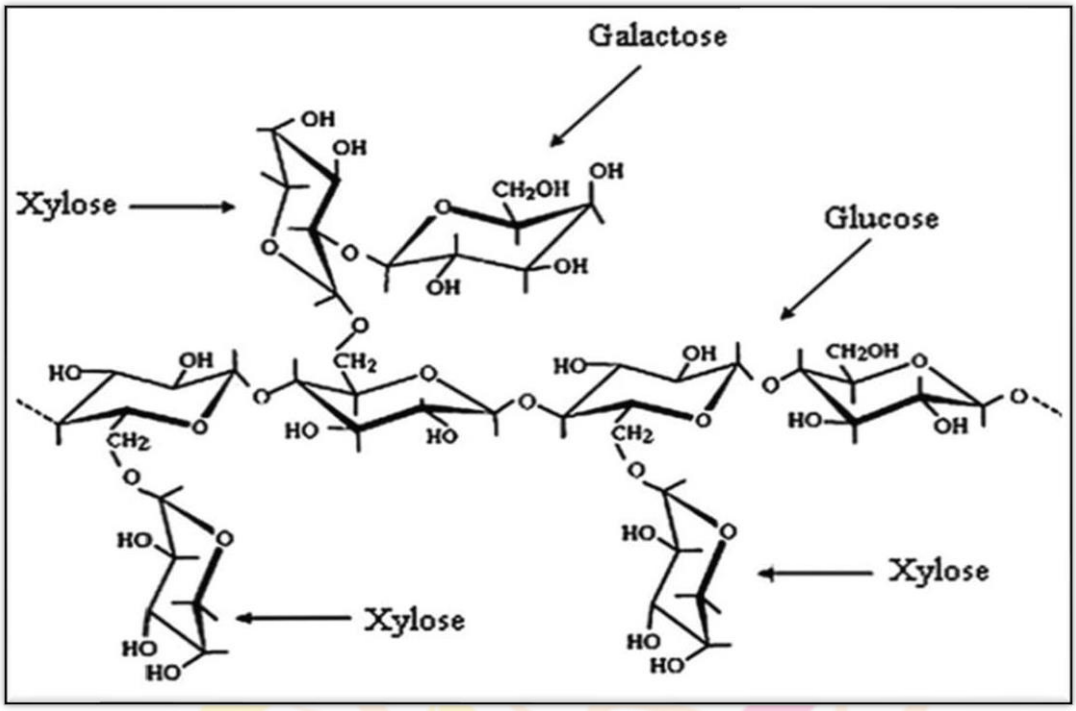
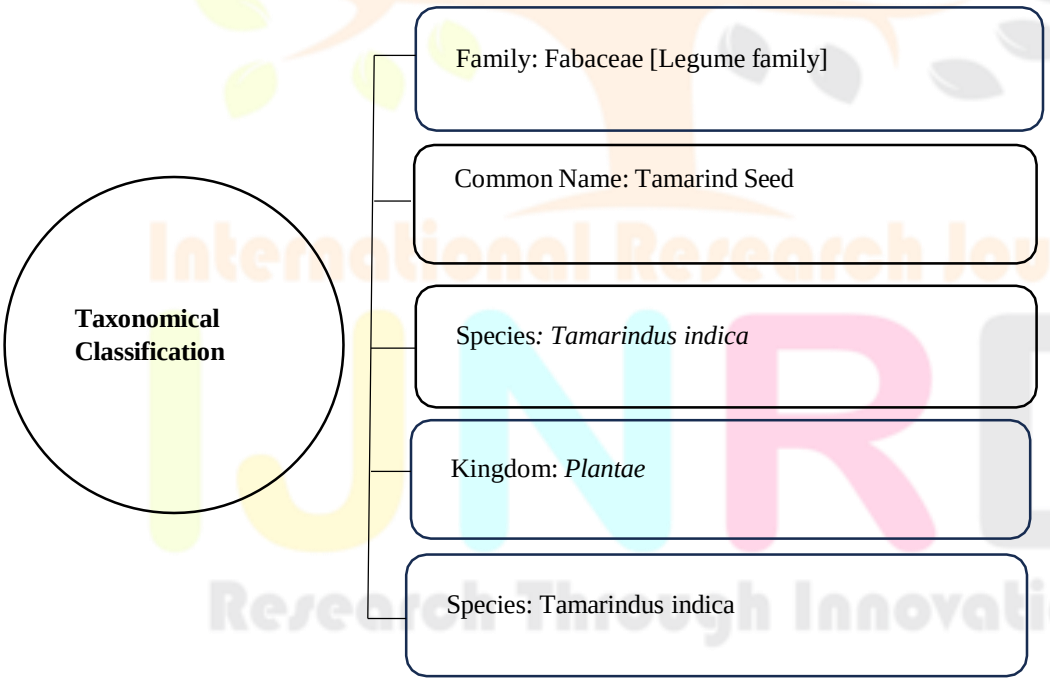
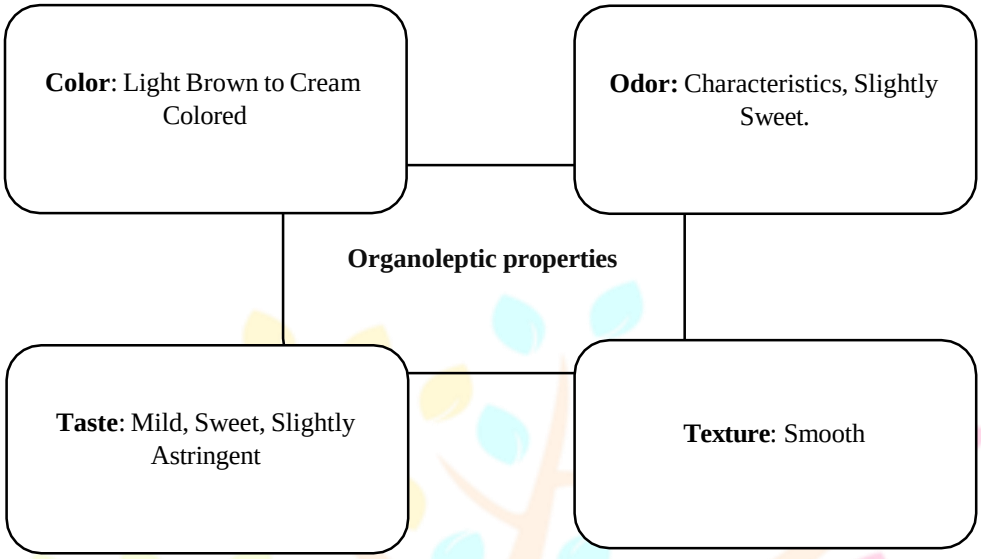


figure.3 structure of tamarind seed polysaccharide

Taxonomical Classification of Tamarind Kernel Powder[5]:



Organoleptic properties of Tamarind Kernel Powder[6]:



Chemical Composition of TKP[7]:

table 1. chemical composition

Constituents	**Percent**
Starch	0.24-0.54 %
Fat	2.39-0.54 %
Moisture	3.42-3.74 %
Protein	16.43-17.0 %
Crude fiber	1.20-1.68 %
Carbohydrates	65.1-72.2 %
Ash	2.45-3.30 %

Product Quality Specification TKM[8]:

table 2. product quality specification

Test	**Specification**
Product	TAMARIND KERNEL POWDER
Sieve Analysis (R.O.200#)	100-200 mesh 99% w/w passing
Insoluble Residue	0.25%

Preparation of tamarind kernel powder[9,10]:

To remove broken seeds, extraneous objects, and contaminants, all the tamarind seeds were screened. After that, for 35 minutes, seeds had been dried in a hot air oven set to 160°C. and they were then left to cool fully. Using a mortar and pestle, the seed coat was also manually removed. To reduce the hard kernels to coarse grits, the decorticated seeds and kernels were subsequently run through a willy grinder. An electric grinder was then used to grind the coarse grits

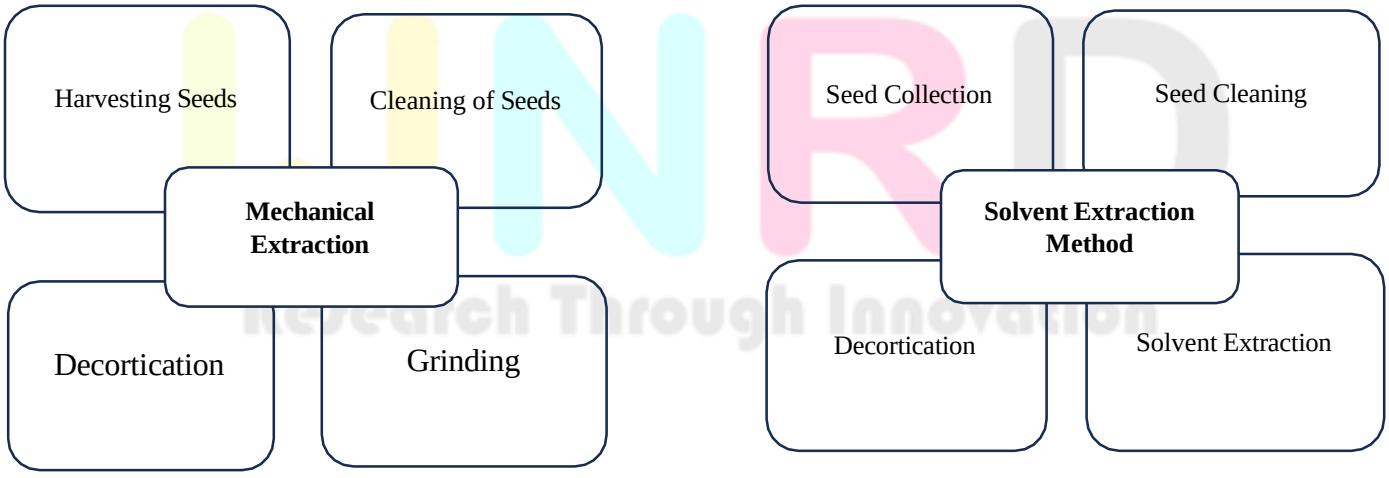
into powder. To make the lentil powder, the lentil dal was well cleaned and then in a hot air oven, dried for six hours at 60^0C. An electric grinder was also used to turn the dried dal into powder. Then, for additional research, TKP and LP were sieved through a 60-mesh screen.

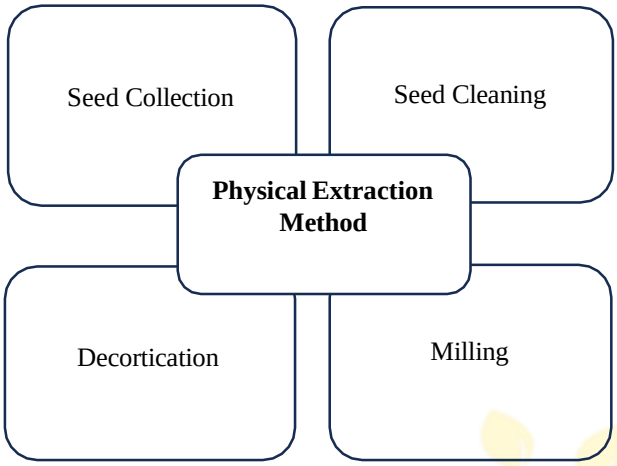
Physicochemical characterization of tamarind kernel powder[11,12]:

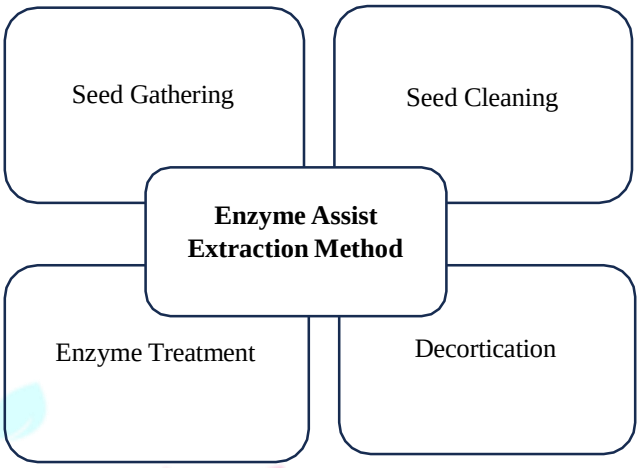
table 3. physicochemical characterization

Sr no.	Identification test for	Procedure
1.	Carbohydrates	Distilled water was used to prepare 1% of the TKP solution. The mixture in the test tube received two drops of alpha naphthol. After gently tilting the test tube, 1 milliliter of sulfuric acid concentrate was added dropwise.
2.	Proteins	1%TKP+Biuret reagent
3.	Tannins	1%TKP+5%$FeCl_3$
4.	Alkaloids	1%TKP+Dragendroffs reagent
5.	Glycosides	A solution of 1% ferric sulfate and 5% glacial acetic acid was used to dissolve pure TKP. A drop or two of sulfuric acid concentrate should be added.

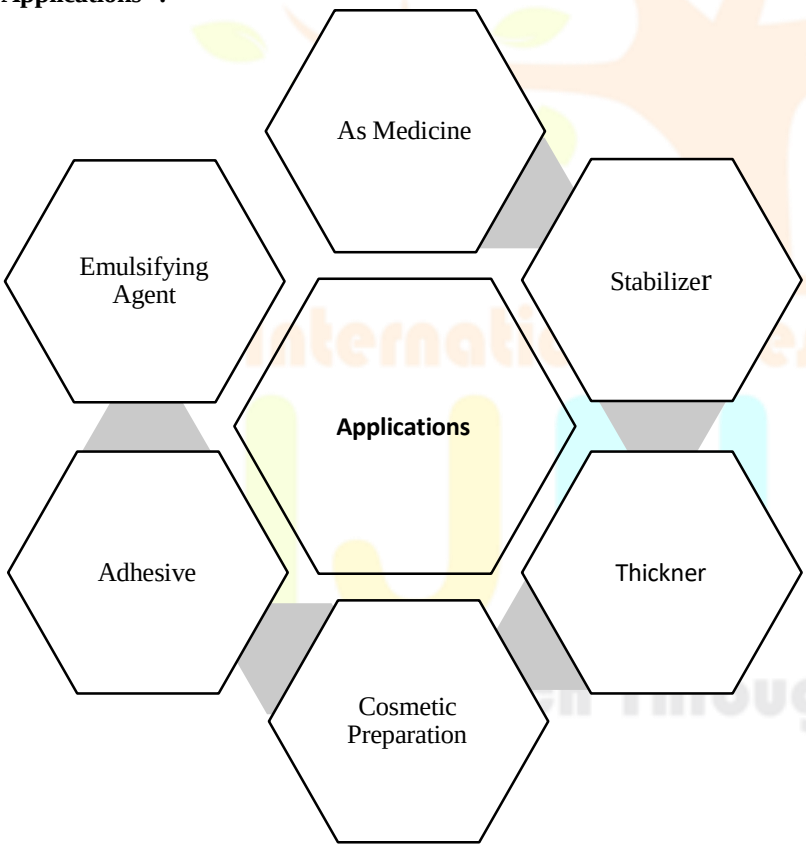
Methods of extraction of Tamarind kernel powder[13]:







Applications[14]:



CONCLUSION:

When Atenolol tablets are made using tamarind kernels powder (TKP) as a natural disintegrant, good outcomes are achieved. Due to its unique properties, TKP enhances the absorption and disintegration of tablets and offers a safe, cost-effective, and biodegradable alternative to synthetic disintegrants.

REFERENCES

[1] Kumar, A., & Sharma, S. (2018). Tamarind kernel powder: A natural disintegrant for pharmaceutical applications. Journal of Pharmaceutical Sciences, 107(10), 3421-3428.

[2] Patel, J., & Patel, R. (2020). Development and evaluation of atenolol tablets using tamarind kernel powder as a natural disintegrant. Journal of Drug Delivery and Therapeutics, 10(3), 14-20.

[3] Rao, K., & Rao, B. (2017). Tamarind kernel powder as a natural disintegrant in pharmaceutical tablets. Journal of Pharmaceutical Education and Research, 8(2), 1-8.

[4] Sharma, A., & Sharma, S. (2020). Investigation of tamarind kernel powder as a natural disintegrant in pharmaceutical tablets. Journal of Pharmaceutical Sciences, 109(3), 1231-1238.

[5] Rishabha malviya, sonalietal, A review introduction on evalution and characterization of tamarind kernel powder, polymers, 2021; 13(18): 2 – 18.

[6] Singh Sudarshan in vivo mucoadhesive strength appraisal of gum Manilkara zapota, Braz. J. Pharm. Sci., 2015; 51(3).

[7] Rashmi Manchandaetal, Tamarind Seed Polysaccharide and its Modifications- Versatile Pharmaceutical Excipients – A Review Int.J. PharmTech Res., 2014; 6(2): 412-420.

[8] Morton JF. The Tamarind (Tamarindus indica L.); Its Food, Medicinal and Industrial Uses. In Proceedings of the Florida state horticultural society. 1958;71:288-293.

[9] Mishra A, Malhotra AV. Tamarind xyloglucan: a polysaccharide with versatile application potential. Journal of Materials Chemistry. 2009;19(45):8528-36.

[10] The Plant List. (2013). Tamarindus indica. Retrieved from (link unavailable)

[11] USDA. (n.d.). Tamarindus indica. Retrieved from (link unavailable)

[12] Kumar, A., & Sharma, S. (2018). Tamarind kernel powder: A natural disintegrant for pharmaceutical applications. Journal of Pharmaceutical Sciences, 107(10), 3421-3428.

[13] Duane, A. J.,(1978): Clarified Tamarind Powder", United States Patent., 4429121.

[14] Satle, A., Dr. Agrawal, S.(2012): Solubility Enhancement Potential of Tamarind Seed Polysaccharide as GHNBPharmaceutical Excipient. Int J Pharm Biol Arch., 3(3): 456-459.