SIMPOSIO AFI
RIMINI 11·12·13
GIUGNO 2025

Associazione Farmaceutici Industria
Società Scientifica

UNIVERSITÀ DEGLI STUDI FIRENZE
DICUS DIPARTIMENTO DI CHIMICA "UGO SCHIFF"
ECCELLENZA 2023-27

SILVATEAM

17

DEVELOPMENT AND EVALUATION OF TANNIN-BASED SUPPOSITORIES FOR THE PREVENTION AND TREATMENT OF VAGINAL INFECTIONS

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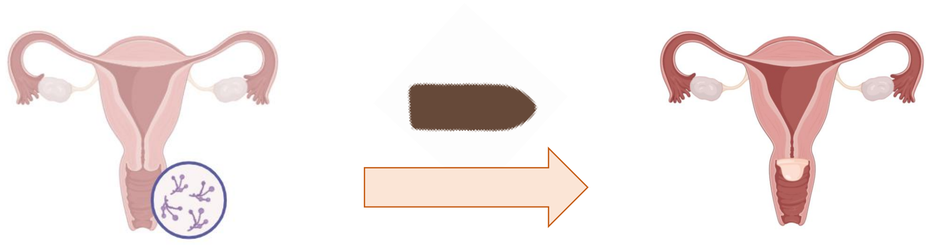
Introduction

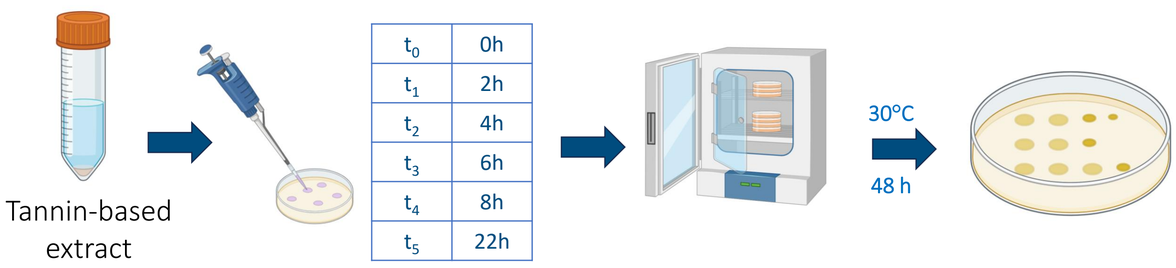
Maintaining vaginal homeostasis is crucial for women's health, as disruptions in local physiological conditions may weaken mucosal defenses and lead to infections like bacterial vaginosis and candidiasis. While antimicrobial drugs are effective, their use may contribute to resistance. To address this issue, scientific research is increasingly focused on exploring alternative approaches, such as using substances of natural origin. [1]

Aim of this work

To develop Tannin-based suppositories, for the treatment and prevention of vaginal infections



Microbiological Studies



Among the six tannin-based extracts, CO/T and CO/CR exhibited the most significant reduction in growth

Pre-formulation studies

Preformulation studies were conducted to select suitable excipients and determine the most appropriate method for preparing the suppositories, based on their appearance and consistency.

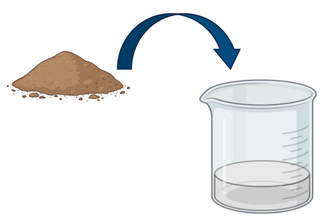
28 formulations developed

3 formulations selected

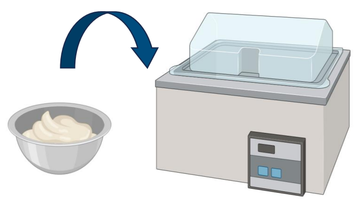
Formulation	Excipients (p/p)
GEL	Gelatin 67,5% Glycerin 12,5% H_2O 20%
PEG1	PEG 400 50% PEG 4000 50%
PEG2	PEG 400 30% PEG 4000 40% PEG 1500 30%

Suppositories preparation method

1. Tannin solubilization in liquid excipients

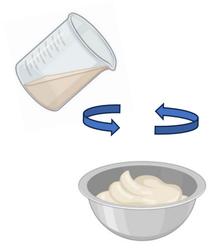


2. Melting of solid excipients



3. Heating of liquid phase at the same temperature of solid excipients

4. Mixing and homogenization of solid and liquid phases

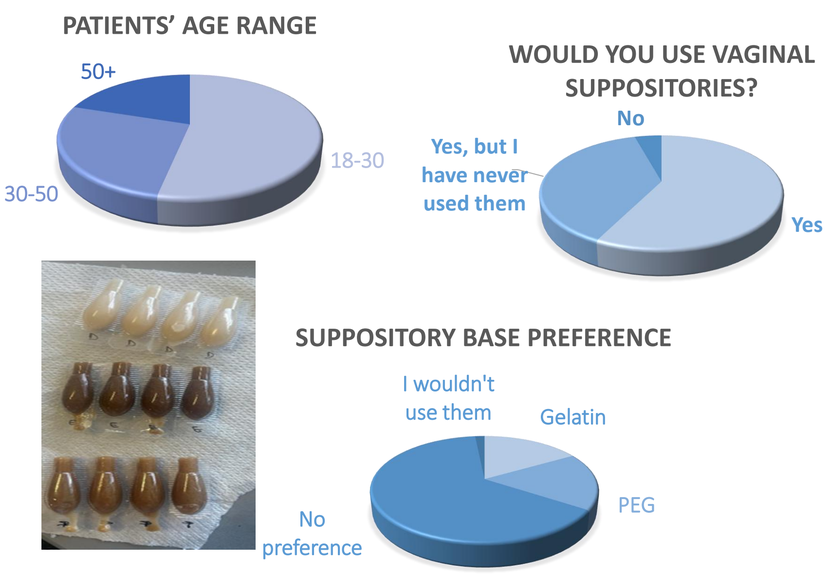


5. Pour the mixture into the molds

9 Formulations loaded both individually and in a 50:50 mixture CO/T and CO/CR

Characterization

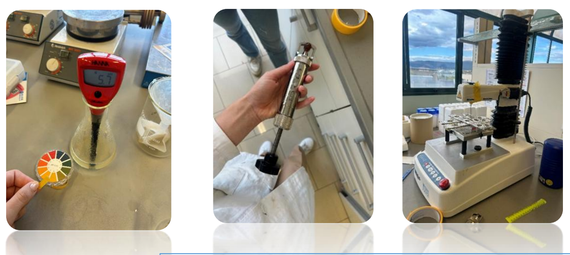
Patient compliance evaluation



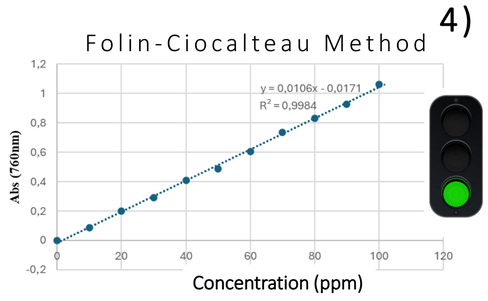
Physical-chemical properties

2) pH (5.5-5.8)

3) Hardness (3.8-11 Kg)



4) Release studies



All formulations released tannin completely within **60 minutes**

1) Mass uniformity

5) Content uniformity test

Only gelatin-based CO/T suppositories failed content uniformity due to a stable excipient-extract complex hindering dissolution.

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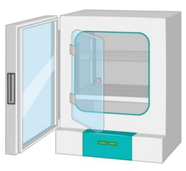
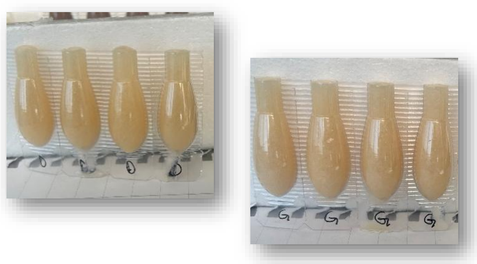
6) Disintegration test

7) Storage stability

25°C
40% HR





Conclusion

All formulations showed good results in the characterization tests; however, the PEG-based suppositories containing only the CO/T extract yielded the best outcomes

Future Perspectives

To analyze other potential actions at the vaginal level, investigate their underlying mechanisms, and identify the primary mode of action, with the aim of classifying the formulation as a substance-based medical device.

References

[1] Singh, Preeti, et al. "Natural Antimicrobial Monoterpenes as Potential Therapeutic Agents in Vaginal Infections: A Review." *Journal of Pure & Applied Microbiology* 18.4 (2024).

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