

Topical formulation of lyophilized *P. coronarius* leaf and flower extracts, antimicrobial assessment of the plant

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Introduction

The medicinal use of herbs is very popular, and there is a high demand for herbal preparations among patients because of their beneficial effects (Klecáková et al., 2004). *P. coronarius* is widely used in folk medicine for the treatment of various diseases, its antimicrobial effects are well known, but scientifically less investigated and no external preparation is available of the herb yet (Valko et al., 2006). The objective of our work was to formulate O/W emulsion ointments using lyophilized *P. coronarius* flower or leaf extracts with the addition of different penetration enhancers (Hano et al., 2005; Nagy et al., 2000).

Materials and methods

Materials

SP70 sucrose ester was kindly gifted by Sisterna (Roosendaal, The Netherlands). Cetostearyl alcohol, propylene glycol, stearic acid, isopropyl myristate, conservant solution were obtained from Hungaropharma Ltd. (Budapest, Hungary). HaCaT cells were supplied from Cell Lines Service (CLS, Heidelberg, Germany). Transcutol, Tefose 63, Sedefos 75 was a kind gift from Gattefossé (Lyon, France).

Method

After the preparations were formulated in vitro release studies and texture analysis of the ointments were formulated. In addition, antimicrobial testing of the lyophilized extracts and biocompatibility investigation of

the selected excipients were carried out. Bioactive compound content had been determined by HPLC method.

Results and discussion

Texture analysis

Texture analysis revealed that the compositions have adequate consistency, those formulations, which contain Tefose 63 have slightly harder consistency.

In vitro release

The results of in vitro release studies by Franz diffusion chamber apparatus revealed, that the best release profile was achieved by that preparation, which contained SP70 sucrose ester, closely followed by those ones, which were prepared with Tefose 63.

Antimicrobial testing

P. coronarius flower was not able to inhibit or delay the growth of bacteria or fungi, but the leaf was able to delay the growth of *C. albicans* and *S. aureus* compared to the control.

MTT test

The results of MTT experiments demonstrated that the selected excipients and the preparations are safe under in vitro conditions.

Bioactive compound content

The leaf of *P. coronarius* contains a high amount of delphinidin 3-rutinoside chloride (0.3354 mg/100 mg), as well as luteolin 7-glucoside (0.2528 mg/ 100 mg) and 7-methoxycoumarin (0.2061 mg/100 mg) compared to the other components. The flower contains bergapten in a high amount (2.8370 mg/100 mg), as well as caffeic acid (1.8407 mg/100 mg), delphinidin 3-rutinoside chloride (1.7928 mg/100 mg), 7-methoxycoumarin (1.6725 mg/100 mg). The flower contains delphinidin 3-rutinoside chloride and 7-methoxycoumarin in a much higher amount, than the leaf.

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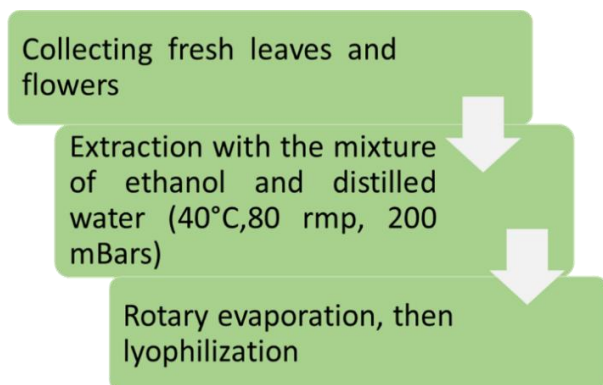


Fig. 1. The process of preparing lyophilized extracts

Conclusion

According to the results the composition and the selected excipients of the ointments have a great impact on the drug release, texture and bioavailability of the preparation. During microbiological testing, *P. coronarius* leaf was effective against *E. coli* and *S. aureus*. *P. coronarius* is a promising herb, and its topical application in antimicrobial therapy can be a useful addition to modern medical therapy.

References

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