ABSTRACT: Rice Bran wax is obtained from natural sources and is abundantly available in the country. Rice bran wax is suitable for use in chocolate enrobes, as an enteric coating for candy and lozenges, as a plasticizing material in chewing gums etc. Present study attempts to find if rice bran wax is useful as ointment base. The oleaginous type ointment base is prepared by using rice bran wax and evaluated for spreadability, water number and active ingredient diffusibility. The results obtained in the present study indicate, rice bran wax can be used as a good component in ointment base, comparable with white wax.

INTRODUCTION

Rice bran is the cuticle existing between the rice and the husk of the paddy and consists of embryo and endosperm of the seeds of Oryza sativa, family Graminae. Rice bran wax is an important by product of rice bran oil industry. The wax deposits at the bottom of the crude oil and can be separated by filtration or centrifugation. The yield varies from 3 to 9% on the total oil basis.

There are several commercially important applications of rice bran wax. Hence a systematic study was carried out with an objective of exploring its utility in pharmaceutical and cosmetic field. Some uses of rice bran wax reported are formulation aid in lipstick (1), stiffening agent in topical preparation (2) and in composition for effecting cholesterol levels (3).

Research at Southern Regional Research lab. has shown that the properties of refined and bleached wax are similar to those of the presently imported carnauba wax (4). In present study, rice bran wax has been tried as a base for ointment, as it is much cheaper as compared to conventional materials.

MATERIALS AND METHODS

Rice bran wax obtained from Maheshwari solvent extraction plant, Gondia, Maharashtra.

The wax was processed for purification (5) by soxhlation. Extraction was carried out at 85°C for half on hour using ethyl acetate. The hot mixture was cooled upto 25°C. The wax obtained in thimble was subjected to decolourization by 2% H2O2 at 90°C for 1 hour. The secondary decolourization was done using 15% NaOCl at 100°C for 1 hour.

The oleaginous bases were prepared by using two waxes, rice bran wax and white wax as per formula given in the table1. Ointments were prepared by using two waxes, rice bran wax and white wax as per formula given in the table 1. Ointments were prepared by fusion method (6).
Table 1: Formulae for Ointment Bases Using Different Waxes.

| Base | White wax | Rice bran wax | Petrolatum |
|------|-----------|---------------|------------|
| 1    | 5         | -             | 95         |
| 2    | -         | 5             | 95         |
| 3    | -         | 15            | 85         |
| 4    | -         | 25            | 75         |

These ointment bases were evaluated for spreadability, water number and In-vitro drug release.

For determination of spreadability, excess of sample was applied in between two glass slides and was compressed to uniform thickness by placing 1000 –g weight for 5 minutes. A weight of 240 gm was added to the pan tied to glass slide with pulley. The time required to separate the slides was taken as a measure of spreadability.

The spreadability was calculated using formula:

\[ S = \frac{m \times l}{t} \]

\( m \)= weight tied to upper slide
\( l \)= length of glass slide
\( t \)= time taken for moving glass slide

RESULTS AND DISCUSSION

Table 2 Evaluation of Rice Bran Wax As Ointment Base

| Formulations | Spreadability | Water number (ml) | % Release of salicylic acid in 30 min |
|--------------|---------------|-------------------|-------------------------------------|
| 1            | 9.6           | 1.1              | 69.4                                |
| 2            | 19.2          | 1.0              | 55.6                                |
| 3            | 25.3          | 1.3              | 68.6                                |
| 4            | 35.2          | 1.5              | 78.6                                |

The results of spreadability test are given in Table 2. Water number is the maximum amount of water that can be added to 100g ointment base at a given temperature and it is an useful index for comparing water absorbing power of ointment base. The water numbers of bases prepared using white wax and rice bran wax are given in Table 2

Release of drug was measured on modified In-vitro ointment diffusion cell. The salicylic acid was incorporated in ointment bases as model drug by fusion method and was applied on semipermeable membrane. The amount of salicylic acid released in phosphate buffer was measured at 275 nm using Systronics UV-VIS spectrophotometer.
Rice Bran Wax is used for preparation of oleaginous base with petrolatum. Various ratios of rice bran wax and petrolatum were prepared and compared with white wax ointment base as standard (formulation1, Table-1). The results of comparison (Table-2) showed that ointment base containing rice bran wax has good spreadabililty than white wax ointment while increase in proportion of rice bran wax still increases spreadabililty and decreases consistency.

The In-vitro release values using salicylic acid as model drug from ointment diffusion cell show that formulations 2 and 3 show drug release comparable to that from white wax ointment, which may be due to decrease in consistency of base.

The water number of formulation 2 containing rice bran wax is greater than standard white wax ointment and is found to increase further with increased proportion of rice bran wax. (Water number of hydrophilic petrolatum is 4.0) (10). To conclude, rice bran wax can be a useful ingredient to formulate ointment base.

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