Objectives of the Study
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This research work was aimed towards amalgamating the traditional knowledge of medicinal plants with the latest trends in Pharmaceutical Sciences, specifically for the development of an antidandruff shampoo formulation and evaluating the formulation as per current BIS and other official/unofficial guidelines. The research work was aimed towards using authenticated raw material (herbal ingredients) for the extraction of oils, evaluating their activity individually and in various combinations, selecting the best combination, followed by their formulation as cosmetics. Next, the developed cosmetic formulation was put into rigorous testing as per current BIS and other official/unofficial guidelines. Further an attempt was made for the biological evaluation of the developed formulation as per official methods.

Dandruff induced by fungus Malassezia furfur represents a fastidious cutaneous problem because of aesthetic problems. The prolonged chemical based treatments and the high rate of recurrence suggest the opportunity of alternative treatments. A large number of essential/fixed oils are mentioned in ancient texts for their beneficial effects in skin disorders including dandruff. In the present study, some of the oils were selected for the formulation of antidandruff shampoo on the basis of their ethanomedicinal importance and literature survey.

The study was designed to be performed in the following steps:

3.1 To make a complete literature survey for selection of the plants. And then to collect, identify and authenticate the plant material needed for the study.

3.2 To perform the extraction of essential oils from authenticated plant material, by hydro distillation method or cold expression method as the case may be.

3.3 To study the organoleptic and physical properties of extracted oils like appearance/colour, taste, odour, touch, solubility and specific gravity.
3.4 To perform the screening of above oils individually for antifungal activity against *Malassezia furfur* using Disc diffusion method and also determining the Minimum Inhibitory Concentration (MIC) of the oils using Micro broth dilution method.

3.5 To perform the evaluation of antifungal activity of oils in different combinations to know their synergistic or antagonist effects with each other and select the combination with best activity.

3.6 To study the thin layer chromatography fingerprint profile of selected oils.

3.7 To perform the Gas Chromatography-Mass Spectroscopy profile of selected oils to know their composition.

3.8 To select the appropriate base, active ingredients and other ingredients for the formulation of antidandruff shampoo.

3.9 To formulate antidandruff shampoo using selected base, selected active ingredients and other additives.

3.10 To evaluate the antidandruff shampoo formulation for ideal properties as prescribed in IS 7884:2004.

3.11 To evaluate the shampoo formulation by official methods as prescribed in IS 7884:2004 (for surfactant based shampoo) and by other official and unofficial methods.

3.12 To evaluate the shampoo formulation for antifungal activity against *Malassezia furfur* by Disc diffusion method and to determine the Minimum Inhibitory Concentration (MIC) of the shampoo formulation by Micro broth dilution method.

3.13 To compare the shampoo formulation with the leading herbal brands as well as non-herbal brands of antidandruff shampoos available in the market for its effectiveness in terms of viscosity, foam height/stability, detergency, surface tension, wetting time, pH, conditioning effects and antifungal activity.

3.14 To perform the safety evaluation of the shampoo formulation as mentioned in IS 4011:1997 which specified “Safety evaluation of cosmetics.”

3.15 To evaluate the physical stability of the shampoo formulation after six months.