
Formulation & long lasting efficacy Evaluation of Herbal based Deodorant up to 48 hours by Sniff Test Method

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Abstract:

Aim of the present research is to formulate herbal based deodorant using Soxhleted alcoholic extract of Curry Leaf, Methi and Neem followed by investigating its long lasting efficacy against body odor by the way of in vivo sniff test. Test was carried out on 8 male/female volunteers of age group ranging from 16-70 Years. Expert panel had rated intensity of bad odor in scale of 1-5, with 1 being “no body odor” and 5 being “Very strong body odor”.

Current study was carried out by spraying two sprays of two product on two armpits of each volunteer e.g. left & Right armpit of each volunteer. Two test samples were selected for study of which one was deodorant with Herbal complex and perfume similarly second was deodorant product without Herbal complex and with perfume. Intensity of bad odor developed at time interval of 0, 12, 24, 36 and 48 hrs. Was rated by two experts. The only difference was addition and removal of Herbal complex. Results were calculated by plotting average of ratings given by experts. Lesser the bad odor intensity better the product efficacy. Study concludes that prototype with Herbal complex had shown excellent long lasting protection against bad odor up to 48 hrs.

Keywords: Curry Leaf, ¹Body Odor, Long lasting protection, ²Herbal complex, Deodorant, In Vivo study, Sniff Test.

¹ Body Odor refers to bad body sweet odor.

² Herbal Complex: Soxhleted alcoholic extract of Curry Leaves, Methi seeds and Neem Leaves.

INTRODUCTION:

Deodorants are substances applied to the body to affect body odor caused by bacterial growth and the smell associated with bacterial breakdown of sweat in armpits, feet and other areas of the body. Antiperspirants are typically applied to the underarms, while deodorants may also be used on feet and other areas in the form of body sprays. Deodorants are classified and regulated as cosmetics by the U.S. Food and Drug Administration (FDA). Deodorants that act as antiperspirants are classified as drugs by the FDA. If vote was taken to select the one cosmetic product that best illustrates the versatility of packaging, the deodorant would likely to be the unanimous winner. For there is no other product, that is sold in at least eight different kinds of packages. Each was developed to meet a specific marketing and convenience need and each has inherent advantages and dis-advantages. Deodorants are commonly packed in Stick – Solid, pump sprays, Pads, Squeeze bottles, Dabber units, Creams, Deodorants, Stick- Creams, Roll-ons.

The present research relates to prepare the deodorant formulations having long lasting effectiveness against body malodor using herbal ingredients and evaluation it's in vivo deodorant property. Natural deodorants work as a safeguard against social embarrassment caused by body malodor resulting from the microbial action on otherwise sterile body secretions particularly sebum and apocrine sweat. A number of health scares have surfaced regarding harmful ingredients in deodorants, including the effects of ingredients like parabens, triclosan and aluminum in deodorants. In addition, the antiperspirant vs. deodorant debate goes on, raising questions about their long-term use. Literature reveals that some herbs also have antimicrobial properties.

BACKGROUND:

Though there are many deodorants available in the market the formulators & manufacturers of cosmetics had given a special emphasis on synthetic cosmetics preparation as key ingredients. However, there are many herbs which have antimicrobial properties which is essentially primary pre-requisite for development of deodorant formulations, and herbal formulations may also provide desired deodorant properties similar to synthetic formulations. The main objective of this research work is to explore the potential of herb/s as the active ingredient/s in deodorant formulation by systematically studying various parameters and then developing a product and to subsequently evaluating its efficacy.

(Wilkinson J.B. et al, 2000) in his book Harrys cosmetology explained detail mechanism of sweat odor. In Chapter Antiperspirants and deodorants, author has explained detail formulation & Evaluation of Deodorant products along with in-vivo & in- vitro evaluation study methods.

(Laden K, 1999) Provides a review of the most recent advances in the science and technology of controlling odor and wetness. This edition includes two new chapters on antiperspirant and deodorant formulations; two new chapters on relevant patent technologies of recent years; discussions on the chemistry of aluminum/zirconium antiperspirant salts; and a modernized chapter on the structure and function of the human eccrine sweat glands.

Pharmacognosy the book written by (Kokate C.K. et al, 2007) is to contribute to rational relationship between chemical moieties of naturally occurring drugs and biological and therapeutic effects they generate.

(Sakharwade S.N., 2009) in his book *NATURALS & COSMETICS* has explained herbs and their cosmetics uses, this book also gives information of some important naturals used in cosmetics. The probable reasons for their usage in cosmetics are also discussed.

(Xajigeorgiou, C. et. al, 2006) had given a protocol that can be used to investigate the effects of a range of substances that may have antimicrobial action. You can adapt it to see the effects of bactericides (that kill bacteria), bacteriostatic substances (that halt microbial growth – for example, some bactericides at low dilutions). The method could be used to compare the efficacy of a range of antimicrobials in personal hygiene products (toothpastes, mouthwashes, and deodorants), disinfectants for domestic use, or in extracts from plant materials such as garlic, herbs, spices and essential oils.

(Pierard G.E., et al, 2003) This review summarizes the physiology of eccrine, apocrine and apocrine sweat glands. The mechanisms of action of antiperspirants and deodorants are described as well as the factors influencing their efficacies. A series of tests using various measurement methods can be used to demonstrate the efficacy of antiperspirants. These include the gravimetric method, water evaporation quantification, electro dermal measurements, staining procedures, dye injections and cyanoacrylate skin surface stripping and casting replicas. Deodorant efficacy can be evaluated by sensory assessments performed by an expert panel.

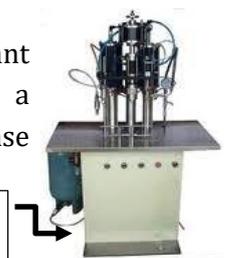
Muller V. (1994) had explained role of sweat in body odor and different factors affecting them. He had also described various product forms in which deodorants can be packed.

EXPERIMENTAL:

1. Formulation:

Current research is carried out by preparing alcoholic herbal based deodorant preparation by using Herbal complex & Base materials. Herbal complex is a combination of alcoholic Soxhlet extract of Curry leaf, Neem & Methi extract and Base materials contains humectants.

Fig.1 Deo Can Crimping Machine



Sr. No.	Ingredients	Prototype Code: HD 34	Prototype Code: BD 80
		%	
1	Ethyl Alcohol 95% W/W	Q.s. Ad. 100	Q.s. Ad. 100
2	Di-Ethyl Phthalate	1	1
3	³ Herbal complex	14.5	0
4	Deodorant Base	2	2
5	Perfume	3	3

Procedure:

Product is prepared by keeping alcohol for maturation for 7 days with DEP 1%. After maturation Herbal complex is dissolved under continuous stirring followed by addition of all remaining base ingredients except Perfume. Concentrate is then treated with charcoal & kept at chilling temperature overnight. Then concentrate is filtered & filled in container and passed for crimping.

2. In vivo evaluation:**A. Test Method:**

To determine Long Lasting Deodorant efficacy by the "Sniff Test" method.

B. Test Samples:

- a. Test Prototype (**HD34**) with Herbal complex & Fragrance
- b. Test Prototype (**BD 80**) without Herbal complex & with Fragrance

C. Selection of Volunteers/ Subjects:

To study effect of deodorant sniff test was carried out on randomly selected 8 subjects male & female of age ranging between 16 to 70 years. All were informed of the nature of the test including possible adverse reactions. Only subjects that are considered dependable and able to read understand and follow directions were requested to participate. Participants were rejected from the study if auxiliary odor intensity is too high or too low. Participants were restricted from shaving the axillae 24 hrs. Before and during the test study. Subjects were screened for auxiliary irritation prior to being accepted into the study.

D. Baseline Odor Evaluation:

Odor evaluations was made by at least 2 Experts or Expert Panel members. Experts were not allowed to chew gum, Use perfumes, colognes or other odorous personal care or clothing products that may interfere with the study. Also experts should have prior experience of conducting Sniff test & has to be ⁴certified assessor.

³ Herbal Complex: Soxhleted alcoholic extract of Curry Leaves, Methi seeds and Neem Leaves.

⁴ Certified assessor: Person certified by any board or Company to conduct Sniff test.

E. Supervised Washes:

The subjects were instructed to wash according to the following procedure,

- i. Wash right axillae for 10 seconds using disposable towel saturated with 2% aqueous solution of simple soap. Repeat above procedure for left axilla.
- ii. Wet a fresh disposable towel under running water and rinse axilla thoroughly until all soap is removed. Gently pat dry axilla using a disposable towel. Repeat above procedure for left axilla.

F. Auxiliary Odor Evaluation:

The expert panel members are the certified experts to carry out sniff test. The Expert panel were blinded to the identity of the deodorant Products under evaluation and they rated according to a scale of 1 to 5 with 1 being “no body odor” and 5 being “Very intensive body odor”. Lower the rating better the product.

1 - No body odor	4- Strong body odor
2- Weak body odor	5- Very Strong Body Odor
3- Moderate body odor	

G. Evaluation Procedure:

Test sample HD 34 & BD 80 was sprayed twice on LHS & RHS of subjects respectively. This process was done under supervision of experts to avoid any error. Volunteers were booked for 3 days’ time so that they can visit the laboratory any given time. It was also agreed that they will visit laboratory after 0, 12, 24, 36, 48 hrs. After application of products. Fix time slot was maintained & expert panel members were also present on given particular time.

1	Volunteers	8 in Numbers
2	Sex	Female, Male
3	Age	> 16 Years
4	Test Area	Armpits
5	Preliminary Phase	1 Day
6	Duration And Frequency of Application	Once in a 48 hours
7	Expert Panel Members / Experts	2 in numbers
8	Time Intervals for sniff test	0hrs. 12 hrs. 24 hrs. 36 hrs. & 48 hrs.

H. Statistical Analysis:

Expert panel members had sniffed the respective armpits of volunteers and rated as per rating scale of 1 to 5 by examining both armpits and average of ratings by 2 assessors were plotted against time intervals.

Results & Discussions:

The long lasting efficacy of deodorant product formulated using Herbal complex in alcoholic base was proved by spraying two sprays of two product on two armpits of each volunteer e.g. left & Right armpit of each volunteer. Two test samples were selected for study HD 34 & BD 80 of which one was deodorant with Herbal complex and perfume similarly second was deodorant product without Herbal complex and with perfume. Intensity of bad odor developed for deodorant with Herbal Complex & with perfume at time intervals 0, 12, 24, 36, 48 hours was found to be 1.463, 1.638, and 2.025 respectively and for deodorant without herbal extract & with perfume at same intervals were found to be 3.294, 3.756, 4.156, and 4.981 respectively. Average of ratings given by experts were plotted in graph. Lesser the bad odor intensity better the product efficacy.

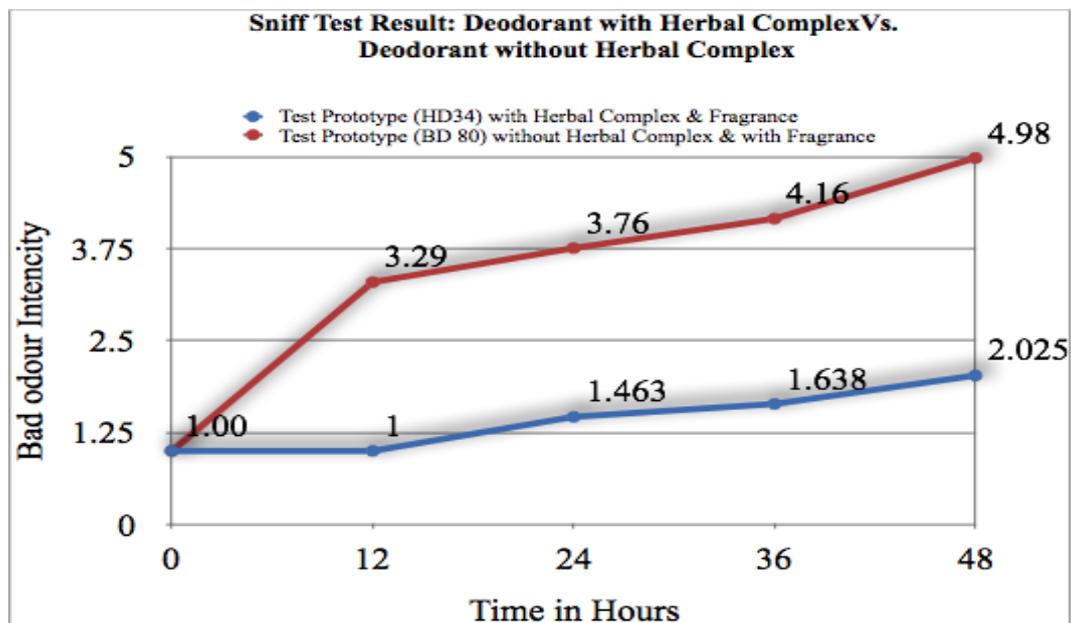


Fig. 2: Sniff Test Result: Deodorant with Herbal complex Vs. Deodorant without Herbal complex

Conclusion:

Current study concludes long lasting efficacy of herbal based deodorant up to 48 hrs. Deodorant without herbal complex after 48 hours had shown efficacy rating 2.02 i.e. Weak body odor whereas deodorant without herbal complex and with perfume shows rating 4.98 which is Very intensive body odor. Study clearly proves that addition of herbal complex helps prevent body odor with long lasting effect. This study confirms that sufficient dosage of Soxhleted alcoholic extracts of Curry leaf, Methi Seeds & Neem leaves not only effectively prevents body bad odor but also provides long lasting efficacy up to 48 hrs.

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