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Research article on HERBAL ANTIMICROBIAL, ANTISEPTIC DUSTING POWDER OF, SEEDS OF DAUCUS CAROTA L., CURCUMA LONGA, LEAVES OF AZADIRACHTA INDICA, SEEDS OF TRACHYSPERMUM AMMI.

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Sonali B. Kotwal* Department of Pharmaceutics Mahadev Kanchan College Of Pharmaceutical Education And Research,Uruli kanchan. Pune*Corresponding Author kotwalsonali910@gmail.com

Sonali Y.Shitole Department of Pharmaceutics Mahadev Kanchan College Of Pharmaceutical Education And Research,Uruli kanchan. Pune

Ravi D. Hole Department of Pharmaceutics Mahadev Kanchan College Of Pharmaceutical Education And Research,Uruli kanchan. Pune

Kunal R Hake Department of Pharmaceutics Mahadev Kanchan College Of Pharmaceutical Education And Research,Uruli kanchan. Pune

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ABSTRACT:

Various emollients, creams are used on skin, their is necessity for therapeutic antimicrobial agent with symptomatic reduction in the irritability. This Herbal antimicrobial antiseptic dusting powder, named as per the ingredients in it. This herbal antiseptic, antimicrobial Dusting powders contain Seeds of daucus carota l., curcuma longa, leaves of azadirachta indica,trachyspermum ammi and excipients. This dusting powder is easy to administration, cost effective and also safe and effective to use. Antimicrobial antiseptic dusting powder cool the skin, reduces inflammation.This is used to cleanses skin seborrhea, to protect the skin from external irritations.

INTRODUCTION

This antimicrobial antiseptic dusting powder contain

Table 1: categories of active constituent.

Sr. no.	Biological name of plant	Part used	Active ingredient	category
1	Daucus Carota L.	Seeds	Terpenes Sesquiterpenes	Antimicrobial
2	Curcuma Longa	Rhizomes	Curcumin	Antimicrobial
3	Azadirachta Indica,	Leaves	Azadirachtin A-GAzadirachtin E	Antimicrobial
4	Trachyspermum Ammi.	Seeds	Thymol	Antiseptic

MATERIAL AND METHOD:

INGREDIENTS:

Daucus Carota L:

The main components of carrot-seed EO were β-bisabolene (80.49%), α-asarone (8.8%), and cis-α-bergamoten (5.51%). Mixtures of terpenes and sesquiterpenes from carrot-seed EO exhibited a high antimicrobial activity [1]

Table 2: Antimicrobial Activity of Daucus carota sativa Essential Oil [2] Curcuma Longa:

Microorganism	Dilution	MIC, mg/mL	MEC, mg/mL
Candida albican	1:32	15.63	-
	1:16	-	31.25
Staphylococcus aureus	1:512	0.976	-
	1:512	-	1.95

Turmeric is a natural antiseptic and antibacterial agent that can be used as an effective disinfectant. It act as anti-microbial agent due to presence of active ingredient curcumin. A medicinal preparation consisting of a powder or a mixture of several powders.

Table 3: Antimicrobial Activity of rhizomes of curcuma longa.[3]

Sr.No	Micro-organism	Test Agent	MIC(µg/mL)
1	S. aureus strain	Curcumin	187.5

Azadiracta indica:

The Methanolic extract of A.Indica has considerable antimicrobial activity against S. Mutans, E. Faecalis and S. Aureus. Neem leaf is effective in treating eczema, ringworm, acne, anti-inflammatory, antiheperglycemic properties and it is used to heal chronic wounds , diabetic food and gangrene developing conditions. azadirachtin A-G and azadirachtin E are the active constituent present in leaves of Azadiracta indica.[4]

Table 4: Antimicrobial Activity of leaves of azadiracta indica[5]

Sr.No	Microoranism	Test Agent	MIC	MBC
1	Strptococcus mutans	Azadiracta indica	125 µg	250 µg
2	Enterococcus faecalis	Azadiracta indica	500 µg	1mg
3	Staphylococcus aureous	Azadiracta indica	250 µg	500 µg

TRACHYSPEMUM AMNI:

Ajwain is an erect annual herb anti- inflammatory ,antifungal ,antipyretic ,ant filarial, analgesic and antioxidant activity have been confirmed. [6] The seeds of ajwain contain thymol which acts as antiseptic and germicidal.

Table 5: Antimicrobial activity of trachyspemum amni[7]

Sr. No.	Bacterial species	Trachyspermum Amni
1	Strptococcus mutans	Medium inhibition
2	Strptococcus oralis	Weak inhibition
3	Lactobacillus acidophilus	Medium inhibition
4	Candida albicans	Medium inhibition

EXCIPIENTS:

Talcum Powder

Talc is a powdered, selected, natural, hydrated magnesium silicate. It may contain minerals athat help to absorb moisture and to smooth the skin. [8]

Starch IP

Starch to help absorb oils and moisture and to impart fragrance [9]

Silicon Dioxide:

Silica is a common additive in food production, where it is used primarily as a flow agent in powdered foods, or to adsorb water in hygroscopic applications. [10]

METHODOLOGY

Procurement of plant material

Seeds of daucus carota l., curcuma longa, leaves of azadirachta indica,trachyspermum ammi, used in dusting powder were collected from local market .All the ingredients were macroscopically identified by Pharmacognosy section of the Institute and organoleptic evaluation was made for identification of sensory characteristics like colour, odour, taste, size, texture and fracture. [11-20] The plant material was cleaned by sorting out using a cloth duster to remove dust and air blowing to remove minute sand particles. The ingredient of the formulation was individually treated with water containing the antimicrobial agents (0.1% Potassium meta-bisulphite and 70% isopropyl alcohol). Quantitative analysis and storage Quantitative analysis of the raw material was done for standardization parameters including foreign organic matter, water soluble extractive, methanol soluble extractive total ash and acid insoluble ash. The approved raw material was packed in sterilized airtight polybags with proper labelling and stored in cool place.

Formulation of the antimicrobial, antiseptic dusting powder

1. The ingredients were individually reduced to fine particles and sieved (80 mesh) to obtain respective fine powders. Powder of each ingredient was weighed separately and thoroughly mixed together as per the quantity mentioned in Table 6.

Table 6: Formula for formulation of antiseptic, antimicrobial dusting powder.

SR	BOTANICAL NAME	NAME OF RASAYANA	PART USED	QUANTITY		
				Formulation I	Formulation II	Formulation III
1	Daucus Carota L.	carrot	seeds	5.00%	4.50%	3.50%
2	Curcuma Longa	termeric	rhizomes	1.50%	1.00%	1.20%
3	Azadirachta Indica,	neem	leaves	2.00%	2.50%	2.70%
4	Trachyspermum Ammi.	ajwain	seeds	0.20%	1.20%	1.30%
5	Excipients: 1]Srarch IP 2]Talcum IP 3]Silicon dioxide	1]Srarch IP 2]Talcum IP 3]Silicon dioxide	-	Quantity sufficient	Quantity sufficient	Quantity sufficient

The composite mixture was again sieved (80 mesh) to obtain a fine powder of the finished product i.e. dusting powder for its better therapeutic value.

2. The finished product thus obtained, was subjected to chemical treatment similar to that given to the raw material to inhibit microbial growth and dried at 60°C.

4. Dusting powdered obtained from above 3 formulations was packed in three separate sterile polythene pouches, labeled, coded and stored inside cool and dry place.

Fig- Dusting powder Formulation -I

PHYSICOCHEMICAL PARAMETERS

Estimation of total ash Powdered formulation

Weigh accurately 3 gm powder from formulation I in a tarred silica crucible. It was incinerated by gradually increasing the temperature until free from carbon and cooled to room temperature. It was kept in desiccators and weighed. The percentage of total ash was calculated with reference to the air dried sample in triplicate. [26]This procedure repeated for formulation II & formulation III.

Acid insoluble ash

Take total ash obtained in Estimation of total ash add 25 ml of dilute hydrochloric acid and boiled for 5 minutes. Obtained solution was filtered and the insoluble matter collected on ash less filter paper. The filter paper was washed with hot water and ignited in tarred crucible and cooled to room temperature and kept in dessicator. The residue was weighed and acid-insoluble ash of drug was calculated with reference to the air dried drug. [26] This procedure repeated by using total ash obtained from formulation II & formulation III.

Water soluble ash

The ash of 3 gm sample of formulation I was obtained following the method as described above. It was boiled for 5 minutes with 25 ml of water. The insoluble material was collected on the ash less filter paper and ignited in tarred crucible for 15 minutes at a temperature not exceeding 450° C, cooled and kept in desiccators. The weight of this residue was subtracted from the weight of the total ash. [26] The water soluble ash of drug with reference to the air dried drug was calculated. same procedure repeated for formulation II & formulation III.

Water soluble extractive value

100 ml of distilled water was added in 5 g of the formulation I in volumetric flask , same procedure repeated for formulation II & formulation III and 3 flasks were shaken occasionally for 6 hours and then allowed to stand for 18 hours. These three extract was filtered seerately and 25 ml of the filtrate was pipette out in a pre-weighed 100 ml beaker and evaporated to dryness on a water bath. It was kept in a hot air oven for 5 hours at l05°C, cooled to room temperature, kept in desiccators for 30 minutes and weighed. The procedure was repeated till constant weight obtained. [26]

Ethanol soluble extractive Value

100 ml of rectified spirit (ethanol) was added in 5 g of the formulation 1 in a glass stopper flask and shaken occasionally for 6 hours. Then it was allowed to stand for 18 hours. The extract was filtered and 25 ml of the filtrate was pipette out in a pre-weighed 100 ml beaker. The filtrate was evaporated to dryness on a water bath. It was kept in a hot air oven for 5 hours at 105°C, cooled to room temperature, kept in desiccators for 30 min. and weighed. The procedure was repeated till constant weight obtained. [26] Same procedure repeated for formulation II & formulation III.

Table 7: Results of Physicochemical Parameters

SR NO	NAME OF PARAMETERS	RESULTS (MEAN± SD)		
		Formulation 1	Formulation 2	Formulation 3
1	Loss on drying at 1050 C (% w/w)	9.50±0.57	9.27±0.50	8.75±0.53
2	Total ash content (% w/w)	27.20±0.78	25.25±0.70	28.25±0.78

3	Acid insoluble ash (% w/w)	4.34±0.94	3.64±0.90	2.74±0.78
4	Water soluble ash (% w/w)	8.94±0.86	8.19±0.83	6.64±0.83
5	Water soluble extractive value (% w/w)	51.05±0.98	50.45±0.98	48.65±0.98
6	Ethanol Soluble Extractive Value (% W/W)	29.74±0.82	29.74±0.80	29.74±0.80

ESTIMATION OF THE DENSITY OF FORMULATION

Bulk density

Bulk density of powder is determined by measuring the ratio of mass of an untapped powder sample and its volume including the contribution of the interperticulate void volume. Bulk density is measure by using graduated measuring cylinder. [25]

Tapped Density

The tapped density is obtained by mechanically tapping a graduated cylinder containing the sample until little further volume change is observed.10 gm formulation was filled in cylinder and the volume was measured. The final volume was measured after 100 tapping. The tapped density is calculated as mass divided by the final volume of the powder. [25]

The bulk and tapped densities were calculated and mentioned in Table no. 8

Flow properties

Angle of repose

Angle of repose was calculated by Fixed Funnel Method.The material is poured through a funnel to form a cone. The tip of the funnel should be held close to the growing cone and slowly raised as the pile grows, to minimize the impact of falling particles. Stop pouring the material when the pile reaches a predetermined height or the base a predetermined width. Rather than attempt to measure the angle of the resulting cone directly, divide the height by half the width of the base of the cone. The inverse tangent of this ratio is the angle of repose.The weighed amount (10 gm) of formulated dusting poweder was filled in the funnel. Before filling the churna the orifice of the funnel was blocked by thumb and after filling the funnel thumb was removed immediately. The space between the bottom of the funnel and the top of powder pile was maintained.[25] After emptying the powder from the funnel the height and diameter of the pile was measured and reading is mentioned in Table no. 8.

Hausner's Ratio

The Hausner Ratio was calculated from equation (1), where BD is the bulk density of the dusting powder, and TD is tapped density of the powder[21].

Hausner's ratio also measured and ratio is mentioned in Table no. 8
HR=TD/BD… Equation (1)

Carr's index

The Carr's index is frequently used in pharmaceutics as an indication of the flow ability of a powder. A Carr's index greater than 25 is considered to be an indication of poor flow ability, and below 15, of good flow ability. Carr's index of dusting was also measured and index is mentioned in Table no. 8.

The Carr Index was calculated from equation (2), where BD is the powder bulk density and TD is the powder tapped density 21. These tests were repeated three times for each sample.[25]
CI=TD-BD/TD×1…. Equation (2)

Results of Flow Property Analysis

Table 8: Results of Flow Property Analysis

SR NO	NAME OF PARAMETERS	RESULTS (MEAN± SD)		
		Formulation I	Formulation II	Formulation III
1	Bulk density (gm/cm3)	0.542±0.0030	0.535±0.0030	0.527±0.0030
2	Tap density (gm/cm3)	0.654±0.043	0.642±0.043	0.628±0.043
3	Angle of Repose (°)	28.56±0.40	27.65±0.40	25.56±0.40
4	Carr's index	20.66±0.030	16.66±0.030	16.08±0.030
5	Hausner's ratio	1.206±0.030	1.200±0.030	1.191±0.030

Phytochemical Evaluation

Table 9: Phytochemical Evaluation

S. NO	PHYTO-CONSTITUENTS	RESULTS
1	Alkaloids	Present
2	Glycosides	Present
3	Saponins	Present
4	Flavonoids	Present
5	Carbohydrates	Present
6	Phenolics	Present
7	Essential oil	Present

For the phytochemical evaluation aqueous extract of antiseptic dusting powered has been employed, screening process of dusting powder for phytoconstituents was done using specific test given in reference books 22,23,24.

Organoleptic parameters of finished product

Colour: yellowish Light brown colour
Consistency: Fine powder
Smell: Specific odour of carrot seed

RESULTS:

From the above complied data the formulation I Shows good physicochemical properties and good flow property analysis as compaired to formulation II & formulation III.

Table 10: Formula for anti-microbial, antiseptic dusting powder.

SR NO.	BOTANICAL NAME	FORMULA.
1	Daucus Carota L.	5.00%
2	Curcuma Longa	1.50%
3	Azadirachta Indica,	2.00%
4	Trachyspermum Ammi.	0.20%
5	Excipients: 1]Srarch IP 2]Talcum IP 3]Silicon dioxide	Quantity sufficient

CONCLUSION

This antimicrobial antiseptic dusting powder when applied over affected part of the body ,this will be relief itching on the skin ,absorb sweat, cool the skin, reduces inflammation, effective in treating eczema, ringworm, acne

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