

## Ethnopharmacologic Study of a Herbal Remedy Used in Sudanese Folk Medicine for Treatment of Herpes Zoster Disease

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### Abstract

A herbal ointment prepared from the seeds of *Lupinus termis* (Fabaceae) and leaves of *Ambrosia maritima* (Asteraceae) prescribed by a Sudanese herbalist for treatment of Herpes Zoster (shingles) was investigated by phytochemical and pharmacological procedures and clinical trials based on the ethnopharmacologic approach. The general phytochemical screening indicated the presence of sterols, triterpenes, alkaloids, flavonoids and tannins in both plants and sesquiterpene lactones only in *A.maritima*. Pharmacological screening on isolated tissues of rabbits, rats and frogs, showed neither agonistic nor antagonistic effect. Clinical trials on patients based on ethical committee consultation were undertaken to assess the therapeutic effect of three ointments prepared from extracts of the two plants. One containing a mixture of the two plants and the other two composed of only one extract of each plant. The study concluded that the ointment containing *Lupinus* was the most active, followed by the ointment containing the mixture of the two plants, and that containing only *Ambrosia* was the least active.

**Key words:** Herbal remedy, Sudanese herbalist, shingles, folk medicine, *Lupinus termis*, *Ambrosia maritima*, Ethnopharmacology

{**Citation:** Abdelmonim Osman Abdelmonim Hamed, Saad Mohamed Hussein Ayoub, Osman Seliman Elkhalfa. Ethnopharmacologic study of a herbal remedy used in Sudanese folk medicine for treatment of herpes zoster disease. American Journal of Research Communication, 2014, 2(1): 264-272} [www.usa-journals.com](http://www.usa-journals.com), ISSN: 2325-4076.

## Introduction

Herpes Zoster (shingles) is a viral skin disease causing long standing pain and expensive therapy. It is caused by reactivation in the adult years of the chicken pox virus that occurred during childhood. An ethnopharmacologic approach was undertaken to verify the activity of a herbal remedy prescribed and employed by a Sudanese herbalist (Abdelmoniem, personal communication, 2005) in treatment of shingles. He claimed that, the herbal remedy, an ointment was successfully used to give full recovery of many patients. It was composed of a mixture of seeds of *Lupinus termis* (Fabaceae) and leaves of *Ambrasia maritima* (Asteraceae), and no further details were described. It is known that the lupin seed has been used as a food since ancient times and in traditional medicine against deformities of the skin, scabby ulcers and scald heads. Extracts of the seeds were effective in the treatment of chronic eczema (Antoun and Taha, 1980), with reference to lupin alkaloids such as lupanine, angustifoline, dehydroalbine, albine, didehydromultiflorine and 13-hydroxymultiflorine reported in the literature (Mahmoud et al, 1990; Mahmoud et al, 1991; Assem et al, 2001). *A.maritima* is an erect branched aromatic herb and contains sesquiterpene lactones such as hymenin, ambrosin, damsine and neoambrosin. The leaf extract exhibited molluscicidal activity in irrigation canals in Egypt and in lowering of glucose levels in diabetic patients (Alard et al, 1991; Slaconin et al, 1988).

The composition of the herbal remedy was investigated phytochemically to identify different classes of metabolites, followed by pharmacologic screening on isolated tissues of some experimental animals. Clinical trials on 84 patients assigned in 6 groups from both sexes were undertaken by using prepared ointments composed of the powdered lupin seeds or *Ambrosia* leaves and their ethanolic extracts. The results of phytochemical, pharmacological and clinical studies of the prepared ointments are reported in the present paper.

**Materials and Methods:****Plant Material:**

The seeds of *Lupinus termis* (Fabaceae) were brought from northern Sudan and the leaves of *Ambrosia maritima* (Asteraceae) were harvested from plants growing in the banks of Blue Nile river near the city of Khartoum. The plant materials were identified at Medicinal and Aromatic Herbs Research Institute, National Centre for Research, Sudan and voucher specimens were deposited in the herbarium.

**Extraction:**

The powdered plant material (100g) of each plant was extracted by maceration at room temperature in a conical flask with 96% ethanol for 24 hrs, filtration and addition of a new portion of pure solvent and maceration for another 24 hrs. The procedure was repeated for a third time and the bulk extracts were evaporated under reduced pressure. Lupin seeds gave 4.3g and *Ambrosia* leaves 2.9 g. The prepared extracts were used for the preparation of ointments used in clinical trials.

Phytochemical screening of lupin seeds and *Ambrosia* leaves was performed according to known procedures(Harborne,1998).

**Preparation of Ointments:**

Three types of ointment were prepared: ointment L (Composed only of Lupin seeds; ointment A (composed only of *Ambrosia* leaves) and ointment LA (composed of Lupin seeds and *Ambrosia* leaves). The base compound of ointments was vaseline and the drug components were ethanolic extracts(composition I) and finely powdered material of the two plants(composition II).

The compositions of the ointment are shown in table 1.

**Table (1): Composition of ointments prepared from powdered and extracted Lupin seeds and Ambrosia leaves**

Type of ointment	Composition I	Composition II
L	100g powdered Lupin seeds In 100 Vaseline	4.3g ethanolic extract of Lupin seeds in 100g Vaseline
A	100g powdered Ambrosia Leaves in 100g Vaseline	2.9g ethanolic extract of Ambrosia leaves in 100g Vaseline
LA	50g powdered Lupin seeds +50g powdered Ambrosia Leaves in 400g Vaseline	2.15g ethanolic extract of Lupin seeds +1.45g ethanolic extract of Ambrosia leaves in 100g Vaseline

**Pharmacological Screening:**

The effects of ethanolic extracts of the two plants were investigated on different isolated tissues of rats, rabbits and frogs (Kitchen, 1984;Roizman, 2001). The isolated tissues (intestine, heart and aortic strip, uterus and rectus) were suspended in their corresponding physiological solutions and the isotonic contractions were recorded using a Harvard isotonic transducer and an isometric transducer coupled to a Harvard universal oscillograph under the following conditions: 250 mg of an extract in 10 ml of a physiological solution and starting concentration of 2.5 mg/ml and organ bath starting base 0.1 mg.

**Clinical Trials:**

The study was undertaken to assess the effect of the prepared ointments L, A and LA on herpes zoster patients. The total number of patients was 84 in 6 groups guided by post herpetic neuralgia in Ommdurman Teaching Hospital, Khartoum, Sudan.

Thirty one patients were given ointment L; 28 patients were given ointment A and 25 patients were given ointment LA. The patients were asked to apply the prescribed **ointment** twice a day (morning and evening) for four weeks and weekly visit for follow up. The records were analyzed according to the following factors: anatomical site; severity of condition; sex, age and response to treatment, according to a clinical follow up sheet (Gram,2006;Lancaster et al,1995;Chen et al,2010),table 2.

**Table 2. Clinical Study Follow up sheet**

Date: .....

Name: .....

Sex: .....

Age: .....

Residence: .....

Diagnosis: .....

Anatomical site:

Severity of condition: severe ( ); Moderate ( ); Mild ( ).

Week	Response to the treatment		
	Poor	Weak	Good
1			
2			
3			
4			

Remarks: .....

.....

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## Results

According to the results of the general phytochemical screening of the plant materials and their ethanolic extracts, the Lupin seeds contained triterpene, flavonoids, tannins, saponins and alkaloids. The Ambrosia leaves contained sesquiterpene lactones in

addition to the other constituents detected in Lupin seeds. Both plants lacked the presence of cyanogenic, anthracene and coumarin glycosides (Harborne, 1998).

Pharmacological screening of activity of extracts L, A and LA on experimental animals isolated tissues showed promising results. Thus the application of the said extracts at the concentration 20mg /25ml were without any effect on isolated tissues of rabbit's intestine, rabbit's aortic strips, rat's uterus, rat's vasso- deferens and frog rectus abdominus muscles.

Extract L in apolus dose of 0.80 mg did not affect the myocardial contractility, but increased the heart rate and decreased the flow rate. Extract A in apolus dose of 0.80 mg to the isolated rabbit's heart was without effect on the heart contractility, but decreased both the heart rate and the flow rate. The extract LA in apolus dose of 0.80mg did not show any local anaesthetic property when tested on frog-leg withdrawal reflex perpetrates.

The promising results of the phytochemical and pharmacological screening of the extracts prompted us to undertake clinical trials on volunteers bearing in mind the safe uses of lupin seeds as a food and in skin diseases (Antoun and Taha, 1980). The trials were made on 84 patients suffering from herpes zoster disease and under treatment in Omdurman Teaching Hospital, Department of Dermatology and skin diseases, the city of Omdurman, Sudan. The clinical trials were supervised by a physician – dermatologist and the patients were from both sexes at different age.

Three types of ointment were prepared designated as L, A and LA in two compositions I and II. The patients were in 6 groups and the follow –up was guided by post herpetic neuralgia and a follow – up sheet. The ointments were to be applied twice daily for four weeks(tables3;4;5;6;and7).

Table 3. Total of patients

Ointment		Total of patients	
Type	Composition		
LA	I	15	25
	II	10	
L	I	16	31
	II	15	
A	I	14	28
	II	14	
<i>Total</i>		<b>84</b>	

Table 4. Anatomical site

Site	Type of ointment and composition						Total of Patients
	LA		L		A		
	I	II	I	II	I	II	
Intercostalis	8	6	9	7	5	7	42
Ophthalmicus	4	3	5	5	6	7	30
Brachialis	3	1	2	3	3	-	12
<i>Total</i>	15	10	16	15	14	14	84

Table 5. Severity of Condition

Condition	Type of Ointment and composition						Total of Patients
	LA		L		A		
	I	II	I	II	I	II	
Severe	8	4	10	3	6	8	39
Moderate	4	4	3	8	4	5	28
Mild	3	2	3	4	4	1	17
<i>Total</i>	15	10	16	15	14	14	84

**Table 6. Age of patients of both sexes**

Type of Ointment	Age of patient		Total
	Up to 30 years	Over 30 years	
LA	4	22	26
L	6	24	30
A	3	25	28
<b>Total</b>	13	71	84
<i>% patients</i>	16	84	100

**Table 7. Sex of patients**

Type of Ointment	Sex		Total
	Male	Female	
LA	2	13	15
L	18	13	31
A	17	11	28
<b>Total</b>	47	37	84
<i>% patients</i>	48	52	100

### Discussion

The detected secondary metabolites in the two plants such as sterols, triterpenes, alkaloids, flavonoids and tannins could be responsible of the activity observed. There are no reliable results or even clear evidence to claim the activity of one or more of the detected compounds bearing in mind their diverse structures and pharmacologic activities. It was observed that, the extracts L, A and AL Showed minimum effect on experimental animal isolated tissues and organs with no agonistic or antagonistic noticeable effect (Kitchen, 1984; Roizman, 2006; Rang et al, 2003). The total of 84 patients of both sexes assigned to 6 groups were exposed for a period of 4 weeks to treatment with the three ointments under the supervision of a dermatologist. Based on these data, the following was observed: Ointment L gave 90% inhibition of the



herpetic neuralgia and relief of the skin lesions in a period of two to three weeks, followed by ointment LA which gave 72% inhibition of the skin lesions for the same period and finally ointment A which gave only 50% inhibition of the skin lesions for the same period(table 8).

**Table 8. Response to the treatment**

Type of ointment	Response						Total
	Good		Weak		Poor		
	Total	%	Total	%	Total	%	
LA	18	72	7	28	0	0	25
L	28	90	3	10	0	0	31
A	14	50	14	50	0	0	28
<b>Total</b>	60		24		0		84
<b>% patients</b>	72		28		0		100

The promising results reported in treatment of eczema(Antoun and Taha,1980)with reference to lupin alkaloids could be taken as a presumptive evidence for the activity of the extracts and the prepared ointments especially ointment L.

The study concluded that ointment L containing lupin seed was the most active, followed by ointment LA containing the mixture of lupin seeds and Ambrosia leaves and ointment A containing Ambrosia leaves was the least active. According to these findings, ointment L could be recommended as a safe herbal remedy in treatment programs of shingles.

## References

- Alard, F., Greet, S., Triest(1991). Toxicity of Molluscicidal Plant *Ambrosia maritima* L. to aquatic non-target organisms. *Toxicon*. 29(6):745-750.
- Antoun, M.D., Taha, O(1980). Studies of Sudanese Plants II. Evaluation of an extract of *Lupinus termis* seeds in chronic eczema. *Phytochemistry*.44(2): 179-183.
- Assem, E., Abdel-Monem, M .A., Wink, M(2001) . Quinolizidine alkaloid profiles of *Lupinus varius orientalis* ,*L.Albus albus*,*L.hortwegii* and *L.densiflorus* .*Z Naturforsch.*(56):21-30.
- Chen, N., Yang, M., He, L., Zhan, M., Zhu,(2010). Corticosteroids for preventing Postherpetic neuralgia.Chochrane .Database of Systematic Reviews 12,CD005582, Pub.3.
- Gnam, J.( 2006). Antiviral Therapy of Herpes Zoster. *Herpes* 13, supp.1
- Harborne, J.B(1998) . *Phytochemical Methods: A Guide to Modern Techniques of Plant Analysis*. 3<sup>rd</sup> edn. Springer, UK.
- Kitchen, I.(1984), . *Textbook of in vitro practical pharmacology*. Blackwell Scientific publication, Oxford.
- Lancaster, T., Silagy, C. S(1995). Primary care management of acute herpes zoster: Systematic review of evidence from randomized controlled trials. *British Journal of General Practice*( 45): 39-45.
- Mahmoud, H. M., Saito, K., Murakoshi, I., Kadry, H., Khalifa, T., Ammar, H.(1990), A new Lupin Alkaloid (-)- $\Delta^5$ -dehydromultiflorine from the seeds of *Lupinus termis*. *J. natural products* 53( 6)1578:1580.
- Mahmoud, H., M., Saito, K., Kadry, H., Khalifa, T., Ammar, H., Murakoshi, I., (1991). Lupin alkaloids from the seeds of *Lupinus termis*. *Phytochemistry*( 30) 3111:3115.
- Hamed, *et al.*, 2014: Vol 2(1)

Rang, H., P., dale, M., M., Ritter, J., M., Moore, P., K.. Pharmacology 5<sup>th</sup> edition., Churchill Livingstone, UK(2003).

Roizman, B(2001) . Varicella Zoster virus, Sixth ICTV report.

Slocanin, I, Vargas, V., Marston, A., Hostettman, K(1988). Determination of a molluscicidal sesquiterpene lactone from *Ambrosia maritima*. J. Chromatography 457,. Chromatography.457:25-331.