PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 :		(11) International Publication Number:
A61K 35/78, 31/20	A1	WO 92/03142
		(43) International Publication Date: 5 March 1992 (05.03.92)

(21) International Application Number: PCT/HU91/00038

(22) International Filing Date: 23 August 1991 (23.08.91)

(30) Priority data:
5312/90 24 August 1990 (24.08.90) HU

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(81) Designated States: AT (European patent), BE (European patent), CA, CH (European patent), DE (European patent), DK (European patent), ES (European patent), FI, FR (European patent), GB (European patent), GR (European patent), IT (European patent), JP, LU (European patent), NL (European patent), NO, PL, SE (European patent), SU+,US.

Published
With international search report.

(54) Title: COMPOSITION FOR THE TOPICAL TREATMENT OF PSORIASIS

(57) Abstract

The invention relates to a pharmaceutical composition suitable for the topical treatment of psoriasis comprising an aqueous and/or pharmaceutically acceptable organic solvent, preferably ethanolic extract of young corn-crops and/or corn-beard and/or nodulous corn-stalk and/or corn-cob and gamma-linolic acid as active ingredient admixed with one or more solid and/or liquid carriers and/or other additives.

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Composition for the topical treatment of psoriasis

The invention relates to compositions suitable for the topical treatment of psoriasis as well as to the process for the preparation of said compositions.

The compositions according to the invention contain the extract of different parts of maize plant (Zea mays) together with gamma-linolic acid as active ingredient.

The different clinical and laboratory investigations have clearly shown that the psoriasis is generally not induced by a single cause, but by the complex resultant of different procedures being with one another in casual relation.

The incidence of the psoriasis is different but it occurs all over the world, men and women can equally suffer from it and the number of the patients amounts to 0.3-4.8% of the entire population. The illness can occur at any age, but most frequently people of the age from 10 to 30 years get ill.

The psoriasis belongs to the group of papulosquamous diseases which can be characterized by silverous squamae, considerable desquamation and anarchic cell division (karyokinesis). At the beginning papules having a diameter of 3-5 mm and covered with parakeratosis appear which can gradually join and/or increase and so can form plaques having a diameter of several cm. Cell kinetic investigations prove that the reproduction of the epidermic cells takes place very quickly. In normal case the time of a cell cycle is about 311 hours, whereas the same is shortened to 36 hours in case of psoriasis patients. The clinical picture shows generally a progression at the edges and a central improvement. Most characteristic is the occurrence on the elbow, on the knee and on the scalp.

Psoriasis is the inherited deficiency of the

epidermic regulation as well as the disorder of the haemostase owing to which one has to face with both local and systemic effect in connection with the various clinical forms of psoriasis.

The function of inheritance in the formation of psoriasis nowadays is generally acknowledged and it is believed to be in connection with the Cw6 psoriatic gene. Various authors are of different opinion as to the mode and process of the inheritance but in general the so called polygenic, multifactorial inheritance procedure is accepted.

The fact of the inheritability can be supported e.g. by the following observations:

- the mass incidence on certain geographical territories
- the incidence within families is more frequent,
- it is also proved by genetic investigations.

The local disorder of the relevant biochemical regulation belongs to the complex patogenetic factors as well. The injury of the cAMP system can cause disorder in the epidermic autoregulation, so e.g. upon administration of lithium (which decreases the cAMP level) the psoriasis declines, however the inhibitors of enzymes (e.g. phosphordiesterase-PDE) decomposing the cAMP system, (e.g. Theophillin) influence advantageously the disease.

The immune system, the arachidonic acid system as well as the polyamine metabolism and the various proteinases may also have a significant function in the formation of the disease as these systems differently influence the metabolism of the cyclic nucleotides.

Particularly discussed is the function of the arachidonic acid system as the drugs enhancing the level of free arachidonic acid (e.g. the non-steroid antiphlogistics) make the psoriasis worse.

It is also proved by several clinical and biological tests that in case of psoriasis the level of the free arachidonic acid and their derivatives (12-hydroxy-eicosatetraenoic acid, 12-ETE) is increased in the epidermic layer of the skin.

The characteristic types of psoriasis are as follows:

1) Psoriasis guttata: disseminated phenomena having a diameter of 0.5-1.5 cm are present on the whole skin.
2) Plaque form: the appearance is similar to the previously mentioned type but the phenomena are prolonged and accompanied with inflammation.
3) Palmar-plantar psoriasis: a less inflamed scaly, thickened alteration which can be rent at the edges and sterile blisters may occur.
4) Scalp psoriasis: moderately inflamed, strongly scaly, generally itching, circumscribed phenomena, possibly covering the whole scalp, without any loss of hair.

The complicated forms of psoriasis are as follows:

1) Erythroderma psoriasis: inflammatory and scaly symptoms appear on the whole skin, the plaques and papules are totally joined.
2) Psoriasis pustulosa: is generally localized to the palm and planta, sometimes spreads on the whole skin surface. It is very severe, fatal disease.
3) Psoriasis arthropathy: besides the characteristic symptoms of the skin, arthritis develops too, mainly (and initially) on one of the hands.

According to our present knowledge all types of psoriasis are treated symptomatically. The local

treatment has different aims: a) supression of the inflammatory reactions; b) removal of the accumulated squamae; c) decrease of the ephithelial cell activity; and d) prevention of the superinfection of the injured skin surface.

In uncomplicated cases these requirements can be satisfied partly with local treatment and in complicated cases partly with local treatment and partly with internal treatment carried out simultaneously.

According to the state of art the following materials have been suggested so far for local treatment.

Coal-tar and tar of vegetable origin have been best known and widely used active ingredient which were applied in a concentration of 3-10% in form of ointments, painting and bath compositions. Nowadays however the use of these materials is avoided due to their carcinogenic side effects.

The phototherapy has also been known for a long time as it has been observed that the sunshine is very useful in the treatment of most types of psoriasis. This therapy can be used alone or in combination with photosensitizing drugs.

The different bathes represent a very important additional treatment for all types of psoriasis diseases. Depending on the composition of the medicinal water partly the removal of the squamae partly a decrease of the inflammatory symptoms can be achieved.

Formerly dithranol, the synthetic version of crysarobin of plant origin, was also used for the treatment of psoriasis but due to its definite irritating side effect and pigmenting properties it is no longer applied.

The most efficient antiphlogistics and proliferation inhibiting materials are the corticosteroids (e.g.

Dermovate=21-chloro-9-fluoro-11beta17-dihydroxy-16beta-methylpregna-1,4-diene-3,20-dion; Diproderm=9-fluoro-11beta,17,21-trihydroxy-16beta-methylpregna-1,4-diene-3,20-dion-17,21-dipropionate; Diploren) which can be used for the treatment of all types of psoriasis.

These drugs have symptomatic effect and relatively shortly after interrupting the treatment recidivation takes place, their long-lasting use, however, can result in atrophy of the connective tissues, and certain habituation to it can also be observed. Therefore for long-lasting treatment only steroides showing less side-effects (e.g. Hydrocortison, Prednisolon) are suitable. Treatment with systemic corticosteroids can be taken into consideration only in complicated cases, but only for short period.

For the time being the most frequently used agents for systemic treatments - exclusively in severe cases - are the aromatic derivatives of vitamine A, the so called retinoids (e.g. Tigason=etretinate). These drugs, however, can only be applied very carefully as they have serious side effects (e.g. increase of the serum lipid level, hypertension, teratogenesis).

According to the aforementioned the treatment of psoriasis has not been solved sufficiently yet. All the known compositions have side effects, and the fact that only a few topical compositions are known proves that good results can be achieved only with the oral compositions.

The object of our invention was to ensure a topical composition for the treatment of psoriasis.

Further object of our invention was to develop a composition without any harmful side effect (e.g. carcinogenic, teratogenic, bone marrow damaging, adrenal disfunction producing effect, etc.) during the use of which no pigmentation, dehydratation, atrophy, super-

infection on the injured skin surface occur and its application is not limited by interaction with other drugs.

Surprisingly it has been found that a composition comprising the aqueous and/or pharmacologically acceptable organic solvent, preferably ethanolic extract of the young crop and/or beard (silk) and/or nodulous stalk and/or cob of maize plant and gamma-linolic acid can be used for the treatment of psoriasis without any side effect.

It is known from HUP No. 195,915 (USP No. 4,950,481) that the aqueous and/or ethanolic extract of the young crop and/or bread and/or nodulous stalk and/or cob of maize possesses skin sedative and skin regenerative effect.

The aqueous and/or ethanolic extract comprises the following active ingredients:

- carbohydrates (mono- and oligosacharides, polysacharides),
- fats, oils, fatty acids (phospholipides, glycolipides, galactolipides),
- proteins, amino acids,
- phenolic materials (flavonoides, coumarines, phenyltropanes and the phenolic materials),
- terpenes (sesquiterpenes, triterpenes, tetraterpenes),
- vitamins, volatile oils.

Out of the above components first of all the polysacharides and flavonoides possess antiphlogistic effect. The phospholipids are emulsifiers and are frequently used in cosmetic compositions as additives.

The gamma-linolic acid is an essential amino acid and being "body-friend" (histotropic), has no harmful side effect.

The Oenothera oil containing gamma-linolic acid has

been successfully used mainly for the treatment of different complicated and uncomplicated cardiovascular diseases. It was able to decrease the thrombocyte aggregation, to normalize the lipid levels, however in the popular therapy it has been also used as oral antispasmodic and antiphlogistic agent.

Surprisingly the corn extract used so far in cosmetic compositions and having mild antiphlogistic effect, together with gamma-linolic acid is efficient in the treatment of uncomplicated psoriasis diseases and after the treatment the patients became symptomless. As the composition contains only natural active ingredients it has no side effect. The active ingredients of the composition according to the invention separately are not able to ensure the desired effect, they are effective against psoriasis only in case of their common use.

Accordingly the invention relates to pharmaceutical compositions suitable for the topical treatment of psoriasis which comprises an aqueous and/or pharmaceutically acceptable organic solvent, preferably ethanolic extract of young corn-crops and/or corn-beard and/or nodulous corn-stalk and/or corn-cob together with gamma-linolic acid as active ingredient admixed with one or more solid and/or liquid carrier(s) and/or additives.

Concentration of the active ingredient is preferably 15-75% by weight.

A further object of the invention is a process for the preparation of a pharmaceutical composition suitable for the topical treatment of psoriasis in which the aqueous and/or pharmaceutically acceptable organic solvent, preferably ethanolic extract of young corn-crop and/or corn-beard and/or nodulous corn-stalk and /or corn-cob and gamma-linolic acid as active ingredient are admixed with one or more solid and/or liquid carrier(s)

and/or additive(s) and the mixture thus obtained is formed into cream, emulsion or solution suitable for topical use.

The corn extract used in the composition according to the invention can be prepared in a manner known per se, e.g. the method described in US P No. 4,590,481 can be used.

The extract can be prepared e.g. by extracting the optionally dried plant pieces with a 2-30-fold amount - calculated for the dry mass of the plant - of water or aqueous solution of a cosmetically acceptable organic solvent at a temperature between 15 and 95°C and separating the solid phase (plant pieces) from the liquid phase.

Alternatively, the extract can also be obtained as follows: plant pieces are crushed and steeped in the above mentioned solvents. The time of steeping can vary within a wide range, preferably between 5 and 48 hours. On industrial scale the extraction is preferred as it can be carried out within a shorter time, (e.g. 30-60 minutes).

After the extraction or steeping the product obtained may be sterilized by heating it one or more times, preferably three-times to 80°C and heating it at this temperature for a short period.

For the extraction generally water or the aqueous solution of a water-miscible pharmaceutically acceptable organic solvent, e.g. ethanol is used.

The pharmaceutical compositions according to the invention contain the active ingredient and one or more pharmaceutically acceptable solid and/or liquid carrier(s) and/or additives.

The compositions according to the invention may contain as solid carrier for example talc, zinc-oxide, bentonite, kaolin, colloidal silica, titanium-dioxide,

corn-starch, potato starch. Solid emulsifying agents, e.g. fats, fatty alcohols, fatty acid, fatty acid esters, waxes can also be used as solid carriers.

The compositions according to the invention may contain as liquid carriers one or more pharmaceutically acceptable, to the skin non-irritative liquid solvent(s), e.g. water, ethanol or animal or vegetable oil.

The compositions according to the invention may contain as carrier and emulsifier respectively in the cosmetic industry generally used fats, oils, waxes, fatty acids and esters and glycerides thereof obtained with higher alcohols.

The fatty acids may be straight or branched having 12-18 carbon atoms, may be saturated or unsaturated and may also be substituted with one or more hydroxy group(s).

Suitable fatty acids are selected from the group consisting of undecenoic acid, laurylic acid, caprylic acid, myristic acid, palmitic acid, isopalmitic acid, stearic acid, isostearic acid, hydroxy-stearic acid, oleic acid, hydroxy-oleic acid, behenic acid, lanolinic acid, arachidonic acid, octyldecanoic acid, pentadecanoic acid or the mixture thereof.

Suitable fatty acid-esters are selected from the group consisting of isopropyl myristate, butyl myristate, octyldodecyl myristate, isocetyl myristate, cetyl myristate, ethyl palmitate, isopropyl palmitate, hexadecyl stearate, isopropyl isostearate, isostearyl isostearate, diisopropyl sebacate, cetyl ricinoleate, propylenglycol dipelargonate, 2-ethylhexyl isononate, hexyl laurate, 2-ethylhexyl stearate, fatty alcohol lactate having 12-16 carbon atoms, triglycerides of octanoic and dekanoic acids salicylate and the mixture thereof.

As fatty alcohol e.g. alkohols having 14-22 carbon atoms, e.g. behenyl alcohol, myristyl alcohol, arachidyl alcohol, stearyl alcohol, isostearil alcohol, cetyl alcohol, cetyl-stearyl alcohol, isocetyl alcohol, oleyl alcohol, lauryl alcohol may be mentioned.

As liquid carrier various oils or oil mixtures applied generally in the cosmetic industry can also be used. The oils act as stabilizing agent in the emulsions and ensure a cosmetically suitable viscosity for the emulsion.

Suitable oils are selected from the group consisting of aliphatic hydrocarbons (e.g. liquid paraffine, vaseline, ceresine etc), vegetable oils and fats (e.g. olive oil, almond oil, wheat-germ oil, corn-germ oil, cotton-seed oil, grape-stone oil, jojoba oil, avocado oil, castor oil, palm oil, cocoa butter etc.), animal fats and oils (e.g. cod-liver oil, blubber oil, butyrine, etc.)

The compositions according to the invention may contain as other additives e.g. one or more hygroscopic material(s), solubilizing and stabilizing agent, preservative, disinfectant, skin sedating, skin protecting, epithelium regenerating, skin re-fatting, light-protecting and aromatizing materials, vitamins, etc.

As hygroscopic materials e.g. glycerol, sorbitol, propylene glycol may be used.

As solubilizing material e.g. butyl-hydroxy-anisole, butyl-hydroxy-toluene, ethylene-diamine-tetraacetic acid, nor-dihydroguaiaretic acid may be used.

A preservative e.g. methyl parabene, p-hydroxy-benzoic acid and esters thereof, chloromethyl-iso-thiazoline, methyl-isothiazoline, phenoxetole, hexetidine, chlorohexidine-gluconate, imidazolinyl-urea can be used. If desired formaldehide and similar other

preservatives may also be used.As tonic or disinfectants e.g. menthol, camphor, lactic acid, citric acid, ethanol can be used.

As epithelium regenerating material e.g. allanthoine, panthenol, calcium pantothenate can be used.

As skin sedating material e.g. chamomile extract, azulenole, bisabolole can be used.

As skin protecting and re-fatting material e.g.cholesterol, propane-3-carboxymethyl-betaine, 1--(alkylamino)-3-(dimethylamino)-propane-3-N-oxide, propane-3-(carboxymethyl)-betaine, alkyl-dimethylamin-oxide, mono- and di-ethanolamide of cocoa acid can be used.

As light protecting (sunscreening) material e.g. octyl-dimethyl-PABA, 2-hydroxy-4-methoxy-benzophenone, 2-(ethyl-hexyl)-3-(4-methoxy-phenyl)-2-propenoate, 1-(4-methoxy-phenyl)-3-(4-tert-butyl-phenyl)-propane-1,3-dione, urocainic acid, esculine can be used.

As vitamin, e.g. A, B, B_1, C, E, F, H, P vitamin can be used.

As aromatizing material e.g. parfume oil can be used which ensures a pleasant and attractive smell for the composition.

The composition according to the invention can be formulated into different forms suitable for topical treatment, e.g. cream, ointment, emulsion, solution, tonic, gele, etc. can be prepared.

The creams and the ointments according to the invention contain 30-70% by weight of corn extract and 0.05-3% by weight of gamma-linolic acid as active ingredient.

The emulsions according to the invention contain 15--30% by weight of corn extract and 0.05-3% by weight of gamma-linolic acid as active ingredient.

The solutions according to the invention contain

preferably 30-50% by weight of corn extract and 0.05-3% by weight of gamma-linolic acid as active ingredient.

The amount of water and aqueous solvent used in the compositions depends on the consistency of the desired end product. The water used is preferably deionized water and the amount thereof is generally 27-75% by weight calculated for the total amount of the composition. The cream and ointment compositions contain generally at least 20% by weight but max. 60% by weight of water, the water content of the emulsions is preferably 50-70% by weight and that of the solutions preferably 40-70% by weight.

The following non-limiting Examples show the compositions of the invention.

The corn extracts used in Examples 1, 2 and 3 were prepared according to Example 1 of HU P No. 195,915 (using water as extraction solvent), the corn extract used in Example 6 was prepared according to Example 6 of said patent specification (using ethanol as solvent) and the corn extract used in Examples 4, 5 and 7 were prepared according to Example 3 of the same patent specification.

The corn extracts used in Examples 1-5 were prepared from the crops, hypsophylls, cob, beard and nodulous stalk of the young corn plant, for the preparation of corn extracts used in Example 6 and 7 hypsophylls and crops of corn plant, and hypsophylls, cob and beard respectively, were used.

The products specified with trade marks contain the following compounds:

Hostacerin WO: fatty acid-polyglycerol ester (Hoechst AG, DE)

Lanette N: mixture of sodium-cetyl-stearyl sulfate and cetyl-stearyl alcohol (Henkel, DE)

BRIJ71: ethoxylated stearyl alcohol (JCI, USA)

BRIJ721: ethoxylated stearyl alcohol (JCI, USA)
Chremophor WO7: hydrogenated castor oil (BASF, DE)
Genagol AMS: detergent and surfactant (Hoechst, DE)
Hoe S 3495: ethoxylated fatty acid-polyglycerol ester (Hoechst, DE)

Example 1

Cream for day

Composition:	amounts (g)
Corn extract	45.0
Gamma linolic acid	0.10
Cetyl alcohol	7.65
Stearin	2.35
Castor oil	4.00
Vaseline oil	6.00
Corn-germ oil	5.00
Na-lauryl sulfate	1.00
Glycerol	5.00
Cholesterol	1.00
Vitamin A	0.05
Vitamin E	0.10
Preserving, aromatizing material	0.20
Deionized water	ad 100.00

Example 2

Night cream

Composition:	amounts (g)
Corn extract	60.00
Gamma linolic acid	0.12
Hostacerin WO	10.00
Light vaseline	5.00
Lanette N	2.00
Avocado oil	10.00
Vaseline oil	4.00
Wheat-germ oil	5.00

Example 2 continued

Composition:	amounts (g)
Cholesterol	3.00
Glycerol	0.10
Vitamin A	0.05
Vitamin E	0.05
Preserving, aromatizing material	0.02
Deionized water	ad 100.00

Example 3

Body lotion

Composition:	amounts (g)
Corn extract	40.00
Gamma-linolic acid	0.10
Cetyl alcohol	1.50
Castor oil	1.50
Corn-germ oil	3.00
Vaseline oil	1.00
BRIJ 72	2.50
BRIJ 721	1.60
Soorbitol	5.00
Glycerol	6.00
Vitamin A	0.05
Vitamin E	0.05
Preserving, aromatizing material	0.20
Deionized water	ad 100.00

Example 4

Emulsion

Composition:	amounts (g)
Corn extract	15.00
Gamma-linolic acid	0.15
Chremophor WO 7	6.00
Avocado oil	4.00
Corn-germ oil	3.00

Example 4 continued

Composition:	amounts (g)
Vaseline oil	14.00
Cetyl alcohol	1.00
Propyleneglycol	4.00
Vitamin A	0.05
Vitamin E	0.07
Preserving, aromatizing material	0.20
Deionized water	100.00

Example 5

Solution for medical treatment

Composition:	amounts (g)
Corn extract	35.00
Gamma-linolic acid	0.08
Izopropyl-alcohol	5.00
Menthol	0.03
Camphor	0.02
Sarboxethene laurate	2.00
Propyleneglycol	10.00
Vitamin B_1	0.10
Preserving, aromatizing material	0.20
Deionized water	ad 100

Example 6

Solution

Composition:	amounts (g)
Corn extract	30.00
Gamma-linolic acid	0.10
Izopropyl-alcohol	5.00
Ethanol	10.00
Menthol	0.05
Lactic acid	1.00
Sorboxethene-laurate	0.50
Propylene-glycol	10.00

Example 6 continued

Composition:	amounts (g)
Preserving aromatizing material	0.20
Deionized water	ad 100.00

Example 7

Shampoo

Composition:	amounts (g)
Corn extract	75.00
Gamma-linolic acid	0.08
Na-lauryl sulfate	10.00
Genagol AMS	5.00
Hoe S 3495	1.00
Panthenol	2.00
Propane-3-carboxymethyl-betain	5.00
Methyl-p-hydroxy-benzoate	0.20
Aromatizing material	0.50
Deionized water	ad 100.00

The effect of the composition according to the invention were proved by the following clinical tests.

Experiment 1

The composition according to Example 1 was tested on 11 female patients of the age of 21 to 68 years and on 10 male patients of the age of 33 to 73 years. The patients suffered from psoriasis for 12 years on an average. The cream was applied to the injured skin surface 3 times a day and the treatment was continued for 3 weeks. The results obtained are summarized in Table 1. The abbreviations used have the following meaning:

N= number of the patients suffering from the given type of psoriasis

CI= considerable improvement

SI= slight improvement
D= deterioration

Table 1

Type of psoriasis	N	CI	SI	D
Plaque disseminatio	11	7	1	3
Erithroderma psoriaticum	2	1	1	-
Guttata disseminatio	2	1	1	-
Seborrhea typ.	1	1	-	-
Palmoplantaris typ.	4	4	-	-
Psoriasis localized to limbs	1	1	-	-
Total	21	15	3	3

It appears from the above Table that the condition of 71% of the patients improved considerably, in case of 15% a slight improvement and in case of 14% deterioration was observed. Especially good results were obtained in connection with the seborrhoea type and palmoplantaris type psoriasis as well as in case of psoriasis localized to limbs.

Comparative experiment 2

For comparison, the composition according to Example 1 but containing 45.0 g wheat-germ oil instead of 45 g corn extract was tested on 10 male patients of the age of 32-70 years and on 10 female patients of the age of 20-65 years. The patients suffered from psoriasis for 11 years on an average. The cream was applied to the injured surface 3 times a day and the treatment was continued for 3 weeks. The results obtained are summarized in Table 2.

Table 2

Type of psoriasis	N	CI	SI	D
Plaque disseminatio	8	1	4	3
Erithroderma psoriaticum	2	-	1	1
Guttata disseminatio	2	-	1	1
Seborrhea typ.	3	1	1	1
Palmoplantaris typ.	1	-	1	-
Psoriasis localized to limbs	4	1	1	2
Total	20	3	9	8

From the above Table it appears that the number of patients showing considerable improvement decreased (to 15%), the number of patients showing slight improvement increased (to 45%) and the amount of patients with deteriorated condition increased to 40%. Considerable improvement could be achieved only in case of one patient suffering from plaque disseminatio, seborrhoea type psoriasis and psoriasis localized to limbs, due to the skin sedative effect of the cream mostly slight improvement could only be achieved.

According to the aforementioned it can be established that the gamma-linolic acid without corn extract is not suitable for the treatment of psoriasis.

Comparative experiment 3

For further comparison the composition according to Example 1 but containing 0.01 g of wheat-germ oil instead of 0.1 g gamma-linolic acid was tested on 13 male patients of the age of 28 to 60 years and on 7 female patients of the age of 22 to 67 years. The patients suffered from psoriasis for 11 years on an average. The cream was applied to the injured skin surface 3 times a day. The treatment was continued for 3 weeks. The results obtained are summarized in Table 3.

Table 3

Type of psoriasis	N	CI	SI	D
Plaque disseminatio	10	3	4	3
Erithroderma psoriaticum	3	-	2	1
Guttata disseminatio	1	-	-	1
Seborrhea typ.	2	-	1	1
Palmoplantaris typ.	2	-	1	1
Psoriasis localized to limbs	2	-	1	1
Total	20	3	9	8

From the above Table it appears that the number of patients showing considerable improvement decreased (to 15%), the number of patients showing slight improvement increased (to 45%) and deterioration was established in 40% of the patients. Considerable improvement could be achieved only in case of plaque dissemination, in other cases the slight improvement was probably due to the mild antiphlogistic effect of the corn extract.

The above Table clearly shows that the antiphlogistic effect of the corn extract alone is not able to decrease the occurrence of symptoms of different types of psoriasis, the composition containing no gamma-linolic acid possesses less activity than the composition according to Example 1.

Experiment 4

The composition according to Example 6 was tested on 16 male patients aged from 30 to 60 years and on 13 female patients of the age of 22 to 60 years. The patients suffered from scalp psoriasis, for 10 years on the average. The solution was applied 3 times a day and the treatment was continued for 3 weeks. The results obtained are summarized in Table 4.

Table 4

Strength of the symptoms	Before treatment		After	
	Medium	Mild	Medium	Mild
Parakeratosis	9	20	5	0
Infiltration	9	20	7	0
Burning	3	20	2	0
Itching	7	20	5	3

The Table clearly shows that the solution according to Example 6 has eliminated the mild parakeratosis, infiltration, burning and itching in all the 20 patients. That means that in case of mild symptoms an efficiency of 100% can be achieved.

In case of medium parakeratosis and infiltration 100% efficiency was achieved in 4 and 2 patients respectively out of 9 patients, however in case of medium burning the symptoms were totally eliminated in 1 patient out of 3 patients.

Treatment of patents suffering from extremely serious alteration was not carried out at all as according to clinical experiences such cases can be made symptomless - for a short period - only by systemic treatment.

What is claimed is:

1. Pharmaceutical composition suitable for the topical treatment of psoriasis which **comprises** an aqueous and/or pharmaceutically acceptable organic solvent, preferably ethanolic extract of young corn-crops and/or corn-beard and/or nodulous corn-stalk and/or corn-cob and gamma-linolic acid as active ingredient admixed with one or more solid and/or liquid carriers and/or other additives.

2. Composition as defined in Claim 1 which **comprises** the aqueous and/or pharmaceutically acceptable organic solvent, preferably ethanolic extract of young corn-crops and/or corn-beard and/or nodulous corn-stalk and/or corn-cob and gamma-linolic acid acid in an amount of 15-75% by weight calculated for the total amount of the composition and in a weight ratio from (100:1) to (950:1).

3. The composition as defined in Claim 1 or 2 which comprises the aqueous extract of young corn-crops and/or corn-beard and/or nodulous corn-stalk and/or corn-cob.

4. The composition as defined in any of Claims 1-3 which **comprises** 30-70% by weight of corn extract and 0.05-3%by weight of gamma-linolic acid as active ingredient.

5. The composition as defined in any of Claims 1-3 which **comprises** 15-30% by weight of corn extract and 0.05-3% by weight of gamma-linolic acid as active ingredient.

6. The composition as defined in any of Claims 1-3 which **comprises** 30-50% by weight of corn extract and 0.05-3% by weight of gamma-linolic acid as active ingredient.

7. The composition as defined in any of Claims 1-6 which **comprises** natural or synthetic fats, oils, fatty

alcohols, fatty acid ester and/or the derivatives thereof as carrier and/or emulsifying agent.

8. The composition as defined in Claim 7 which **comprises** cetyl alcohol, cetyl-stearyl alcohol, fatty acid-polyglycerol ester, sodium-cetyl-stearyl sulfate, stearin, castor oil, avocado oil, wheat-germ oil, vaseline oil, corn-germ oil and/or light vaseline as carrier.

9. The composition as defined in any of Claims 1-8 which **comprises** one or more emulsifier(s), solubilizing, hygroscopic, skin and epithelium regenerating, aromatizing, disinfecting material, preservatives and/or vitamin as other additives.

10. The composition as defined in Claim 9 which **comprises** sodium-lauryl sulfate, sodium-lauryl ether-sulfate, ethoxylated stearyl alcohol, hydrogenated castor oil and/or etoxylated fatty acid-polyglycerol ester as emulsifier and solubilizing agent respectively.

11. The composition defined in Claim 9 which **comprises** glycerol, sorbitol and/or propylene glycol as hygroscopic material.

12. The composition as defined in Claim 9 which **comprises** cholesterol, panthenol and/or propane-3-carboxymethyl-betain as skin and epithelium regenerating material.

13. The composition as defined in Claim 9 which **comprises** A, E, and/or B_1 vitamin and menthol, camphor and/or lactic acid as disinfectant.

14. Process for the preparation of pharmaceutical compositions suitable for topical treatment of psoriasis which **comprises** admixing an aqueous and/or pharmaceutically acceptable organic solvent, preferably ethanolic extract of young corn-crops and/or corn-beard and/or nodulous corn-stalk and/or corn-cob and gamma-linolic acid as active ingredient with one or more solid

and/or liquid carrier(s) and/or other additives and converting the mixture thus obtained into a form suitable for topical application, preferably into a cream, emulsion or solution.

15. The process as defined in any of Claims 13-14 which **comprises** using aqueous and/or pharmaceutically acceptable organic solvent, preferably ethanolic extract of young corn-crops and/or corn-beard and/or nodulous corn-stalk and/or corn-cob and gamma-linolic acid acid in an amount of 15-75% by weight calculated for the total amount of the composition and in a weight ratio from (100:1) to (950:1) as active ingredient.

16. The process as defined in any of Claims 14-15 which **comprises** using the aqueous extract of young corn-crops and/or corn-beard and/or nodulous corn-stalk and/or corn-cob.

17. The process as defined in any of Claims 14-15 which **comprises** using 30-70% by weight of corn extract and 0.05-3%by weight of gamma-linolic acid as active ingredient.

18. The process as defined in any of Claims 14-15 which **comprises** using 15-30% by weight of corn extract and 0.05-3% by weight of gamma-linolic acid as active ingredient.

19. The process as defined in any of Claims 14-15 which **comprises** using 30-50% by weight of corn extract and 0.05-3% by weight of gamma-linolic acid as active ingredient.

20. The process as defined in any of Claims 14-19 which **comprises** using natural or synthetic fats, oils, fatty alcohols, fatty acid ester and/or the derivatives thereof as carrier and/or emulsifying agent.

21. The process as defined in Claim 20 which **comprises** using cetyl alcohol, cetyl-stearyl alcohol, fatty acid-polyglycerol ester, sodium-cetyl-stearyl

sulfate, stearin, castor oil, avocado oil, wheat-germ oil, vaseline oil, corn-germ oil and/or light vaseline as carrier.

22. The process as defined in any of Claims 14-21 which **comprises** using one or more emulsifier(s), solubilizing, hygroscopic, skin and epithelium regenerating, aromatizing, disinfecting material, preservatives and/or vitamin as other additives.

23. The process as defined in Claim 22 which **comprises** using sodium-lauryl sulfate, sodium-lauryl ethersulfate, ethoxylated stearyl alcohol, hydrogenated castor oil and/or ethoxylated fatty acid-polyglycerol ester as emulsifier and solubilizing agent respectively.

24. The process as defined in Claim 22 which **comprises** using glycerol, sorbitol and/or propylene glycol as hygroscopic material.

25. The process as defined in Claim 22 which **comprises** using cholesterol, panthenol and/or propane-3-carboxymethyl-betain as skin and epithelium regenerating material.

26. The process as defined in Claim 22 which **comprises** using A, E, and/or B_1 vitamin as vitamin.

27. The process as defined in Claim 22 which **comprises** using menthol, camphor and/or lactic acid as disinfectant.

INTERNATIONAL SEARCH REPORT

International Application No PCT/HU 91/00038

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC

Int.Cl.[5]: A 61 K 35/78, A 61 K 31/20

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
Int.Cl.[5]	A 61 K

Documentation Searched other than Minimum Documentation to the Extent that such Documents are included in the Fields Searched [8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category [10]	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
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* Special categories of cited documents: [10]

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
27 September 1991 (27.09.91)	09 October 1991 (09.10.91)
International Searching Authority	**Signature of Authorized Officer**
AUSTRIAN PATENT OFFICE	

Anhang zum internationalen Recherchenbericht über die internationale Patentanmeldung Nr.

Annex to the International Search Report on International Patent Application No. PCT/HU 91/00038

Annexe au rapport de recherche internationale relatif à la demande de brevet international n°.

In diesem Anhang sind die Mitglieder der Patentfamilien der im obengenannten internationalen Recherchenbericht angeführten Patentdokumente angegeben. Diese Angaben dienen nur zur Unterrichtung und erfolgen ohne Gewähr.

This Annex lists the patent family members relating to the patent documents cited in the above-mentioned International search report. The Austrian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

La présente annexe indique les membres de la famille de brevets relatifs aux documents de brevets cités dans le rapport de recherche internationale visé ci-dessus. Les renseignements fournis sont donnés à titre indicatif et n'engagent pas la responsabilité de l'Office autrichien des brevets.

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