

Burmese thanaka powder and benedict's reagent to struggle the liaison dangereuse: inverse psoriasis plus intertrigo

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ABSTRACT

It has been possible for me to carry out this case report because I decided to make experimentations directly on my body, and specifically applying phytotherapeutic agent, that might be reputed biological and natural at all, and chemical reagents directly onto my groin affected by a severe inverse psoriasis with a well detectable dermatological complication, like the bacterial intertrigo. The importance of the results resides, in my view, in the fact that I made this experimentations in corpore vili (and I mean on my own corpse) during a special period of the year, the so called Moult of mammals, when usually psoriasis and each of every dermatosis and dermatitis which accompanies the psoriatic manifestation, tend to flourish.

Key words: Limonia Acidissima, Feronia Elephantum, Psoralens, Inverse psoriasis

INTRODUCTION

Aims of this brief report is to demonstrate how mild and controlled oxidation reactions, besides the photo-oxidation reactions of psoralens, well known since 1950 [1-7] can evoke the ring opening of various psoralens and angelicin precursors, in order to evoke the formation of psoralen-DNA-thymine-monoadducts, useful to treat psoriasis.

Psoralens are a class of tricyclic aromatic heterocycles that have been used as chemical probes to study DNA and RNA structures. On exposure to UV light, psoralens form chemical cross-links to the DNA bases in three steps [8-10]. The first step is intercalation of psoralen between two adjacent base pairs. The second step is formation of a monoadduct, i.e., one psoralen photoreacts to one strand of DNA. The third step is the cross-linking of the same psoralen to the other strand of DNA.

Many researchers have confirmed that the formation of monoadduct psoralen-DNA-thymine (to yield the cellular apoptosis) can be the sole responsible of the clinical attempt to cure psoriasis, where the theory is accepted, that psoriasis may have the capacity to develop when the immune system mistakes a normal skin cell for a pathogen, and sending out faulty signals that may cause overproduction of new skin cells, so that the disease could be considered as a neoplastic manifestation at all.

Besides the light-induced cross-linking of double-stranded nucleic acids by psoralens, excellent reviews have appeared, some in recent years, which summarize the chemistry of Psoralen 5-Methoxy Psoralen 8-Methoxy Psoralen 5,8-Dimethoxy Psoralen. Some of these reviews have adequately covered methods of degradation reactions of psoralens beyond the classical and well ascertained photochemical reactions.

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The methods used to degrade psoralens (primarily in order to determine their structure) have been well described, particularly in papers by Spath and his coworkers [11,12], therefore, only a brief description of three degradation reactions is more than sufficient to understand the problem. Furan-2,3-dicarboxylic acid is obtained when either psoralen or angelicin derivatives are oxidized with alkaline peroxide. Moreover alkoxy furocoumarins with an acetic acid-sulfuric acid mixture may give raise to the primitive phenol and alcohol, after the ring has been opened. Finally the lactone ring can be opened in strong sodium hydroxide solution and the resulting phenolic compound is methylated.

So I have thought the best way for me was to try to obtain the ring opening of the psoralens' precursors contained in Thanaka powder, by the aids of chemical reagents and thus I decided to try to do it onto the biological surface itself (in this case, my epidermis affected by prosiasis) by the use of an oxidizing reagent, where the constituents are all admitted in INCI.

Therefore I made up my mind to employ the Bénédict's solvent to open the ring of the structures of marmin and marmesin, which are the precursors of psoralens, as aforesaid and which go to constitute the chemical composition of leaves and bark of *Limonia acidissima*.

One liter of Benedict's solution contains 173 grams sodium citrate, 100 grams sodium carbonate, and 17.3 grams cupric sulphate pentahydrate, so that its official INCI is:

Aqua; Sodium Citrate; Sodium Carbonate; Copper Sulphate

And this phase will be designed as Phase B to add to Phase A, that is Thanaka powder to loose in water to give a pinkish paste to spread upon the areas of skin affected by psoriasis.

Stoiechometrically speaking there is not interaction between citric acid (contained in the dried pulp of the fruits) and the components of the Bénédict's reagent.

Besides, since the chemical constituents of *Limonia acidissima* number excellent bactericidal principles, I have decided to treat my inverse psoriasis accompanied by severe clinical complications like intertrigo, since its microbial component had been well ascertained, and other manifestations.

Actually, the skin in the area of my groin had become more sensitive, so the condition was really a hard

challenge to manage and treat. Lesions had caused fissures in the creases of inflamed skin, which were absolutely painful and bleeding. Because of its location, the disease had caused even irritation from rubbing and sweating (the aforementioned bacterial intertrigo), but even yeast and fungal infections were not to be excluded and so much as sexual problems because of discomfort occurred.

MATERIALS AND METHODS

I have Thanaka powder sent directly from Thailand (Thailand-etc-nsn) and used to pour one spoonful of it in few water to yield a pink paste to spread twice a day onto the areas of my groin, at 7.00 a.m. and at 02.00 p.m.

Every morning I used to prepare the new paste to apply routinely.

During the afternoon application, I used to spray even the Bénédict's solution after having spread the paste homogenously.

It is necessary to emphasize that during the 6 weeks of treatment I used to wear dark-cotton, or dark hemp or dark flax pants (preferably black or blue), and never white or clear coloured clothing at all and it is suggestive to stress that I have chosen to undergo this case of self medication by the use of phytotherapeutic agents in the period of the year that corresponds to the second annual Moulting in mammals, that is comprised between September and October.

Ethics

This study was performed on human subjects; thus, all patients were aware of the presence of the study and they were fully informed about the drug and its side-effects.

RESULTS

I have recorded all that I noticed during the 42 days of treatment.

During the first 7 days: I observed a dramatic smoothing of the skin by promoting the shedding of psoriatic scales and immediate whitening of the redness, which had been caused both by the inverse psoriasis and the intertrigo.

During the period comprised between the 8th day and the 21st day: I noticed a decrease of the general inflammation and relief of itching, progressive disappearance of macules (smaller than 2 cm in diameter) and patches (larger than 2 cm).

During the period comprised between the 22nd day and 28th day: I observed the gradual block of the production of cells that are routinely overproduced in psoriasis and the progressive disappearance of skin papules (elevated above the skin surface) and plaques (flat-topped and elevated above the skin surface) and all the other embossments of cutis, even the largest and most important, characterized by the typical symptoms of “calor and rubor”.

After the 28th day: the total disappearance of nodules (which were spherical and were below the skin surface) and wheals (papules characterised by severe edema).

After 4-5 months, that is in correspondence of the new first annual Moulting in mammals (april-may) no signs of blossoming of new psoriasis was evident.

DISCUSSION

To tell the truth Talamidaw, the first Burmese King Razadarit's consort before to commit suicide, ordered by her young husband who held to be true she had been infidel to him in 1384 , spread her entire body with a cosmetic paste made up with some and uncertain parts of a tree native to Burma, the Feronia elephantum (alias *Limonia acidissima*). The majorpart of Historiographers divined this flour was made by the powdered bark and dried fruits of the plant, even if some other scientist reported the paste was made by the roots but absolutely not by the gum resin extracted from Feronia, since the use of this gum was well documented as a cathartical and purgative remedy in pediatrics, and thenceforth the popular credo has been asserting for centuries that this yellowish and pinkish cream serves to cleanse skin and mucosae and to purify body and soul to encounter the deities of Death.

But the legend has it that this yellowish cream has been used by Burmese women for over 2000 years. It has a fragrant scent somewhat similar to sandalwood. The creamy paste is applied to the face in attractive designs, the most common form being a circular patch on each cheek, sometimes made stripey with the fingers known as thanaka b̄e gya, or patterned in the shape of a leaf, often also highlighting

the bridge of the nose with it at the same time. It may be applied from head to toe. Apart from cosmetic beauty, thanaka also gives a cooling sensation and provides protection from sunburn. It is believed to help remove acne and promote smooth skin. It is also an anti-fungal and promotes an indisputed whitening effect on skin spots and chloasmas.

According to Linneus' taxonomy the name of this tree is *Limonia acidissima* and belongs to the family Rutaceae (Citrus family) [13], confined to India, Pakistan, Sri Lanka and Southeast Asia and the usage of the powder of its bark, dried pulp of fruits and/or leaves is widespread throughout Far East, insofar Hindi call it Kath Bel, Javanese designate it as Kawista, Sanskrit name it Billa, Burmese appeal it Thanaka and Malaysian Belingai.

Nowadays indigenous girls and women, attempting to appear European or North-American ladies (envisaging that all that concerns Western civilization represents a totem of wellness and richness) use to treat their face skin, décolletée and arms with Thanaka and the result is a glittering white skin, so scientists and researchers began to try to discover why the chemical and biological constituents of the powdered bark of *Limonia acidissima* should favour the bleaching of the epidermis.

The pulp is applied onto bites and stings of deadly insects. It is also protective against skin cancer as it can block UV rays. The fruits and stem bark of *L. acidissima* possess larvicidal and antimicrobial activity [14]. Ahmed *et al.* [15] screened the fruit pulp of *L. acidissima* for anti-inflammatory, antipyretic and analgesic activities . A study by Darsini *et al.* 2013, revealed potent antioxidant activity of the fruit and its ability for being used in food and pharmaceutical applications [16].

The preliminary phytochemical analysis of *Limonia acidissima* plant parts showed the presence of alkaloids, flavonoids, phenols, terpenoids, tannins, fats, steroids, saponins, glycosides, gum, mucilage and fixed oils [17].

The unripe fruits contain stigmasterol. Fruit pulp contains large quantity of citric acid and other fruit acids, mucilage and minerals. Citric acid is to be reputed the bleaching agent par excellence. Alkaloids, coumarins, fatty acids and sterols have been detected in the pericarp. It also contains umbelliferone, dictamnine, xanthotoxol, scoparone, xanthotoxin, isopimpinellin, isoimperatorin and marmin. Leaves contain stigmasterol, psoralen, bergapten, orientin,

vitedin, saponarin, tannins and an essential oil. Marmesin, feronolide and feronone have been isolated from the bark. Seeds contain fixed oil, carbohydrates, proteins and amino acids. Roots contain feronia lactone, geranylum belliferone, bargapten, osthol, isopimpinellin, marmesin and marmin.

It is suggestive to stress that marmin and marmesin, which are contained in the bark, the main constituent of Thanaka powder, are the very precursors of psoralens.

Psoralens are anyhow contained in the root at extremely high percentages (admitted that in some Thanaka powders from some Asian country the presence of root powder can be detected though).

After having considered the amazing and disconcerting results I have obtained, I intend to attempt to assert that there would be a natural remedy against inverse psoriasis and bacterial intertrigo, I deem one of the most vexing skin afflictions because of the implicit social and sexual discomforts.

CONCLUSION

Six weeks of a mere application of a natural paste from Burma and a simplest chemical reagent are more than sufficient to hold off psoriasis, almost for one whole year, since, everybody knows, psoriasis in the Third Millennium, can not be but held off.

And also people that can not be designed as physicians, surgeons or dermatologists, know well by now.

Statement of Human and Animal Rights

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008.

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as too often happens in the world market deriving from Far East, thanks to intervention, experience and scrupulousness of Dr. A. Valle, Morcare Ltd.

REFERENCES

- Wessely GV, Dinjaski K. Action of light on substances of the type of furo-coumarins. Monatsh. 1934;64:131.
- Lerner AB, Denton CR, Fitzpatrick TB. Clinical and experimental studies with 8-methoxysoralen in vitiligo. J Invest Dermat. 1953;20:299.
- Patzak R, Neugebauer L, Ueber Polarographische Untersuchungen von Coumari-nen II. Monatsh. 1952;83:776.
- Mukerji B. Psoralea and other indigenous drugs used in leucoderma. J Sci Ind. Research. 1956;15A:1.
- Fowlks W. The mechanism of the photodynamic effect. This Symposium, 1956:233.
- Brokke MF, Christensen BE. Psoralene I: Certain reactions of xantho-toxin. J Org Chem. 1958;23:589.
- Nakabayashi T, Tokoroyama T, Miyazaki H, Isono S. Studies on coumarin derivatives II. Ultraviolet absorption spectra of coumarin derivatives. J Pharm Soc Japan. 1953;73:669.
- Isaacs ST, She CKJ, Hearst JE, Rappoport H. Synthesis and characterization of new psoralen derivatives with superior photoreactivity with DNA and RNA. Biochem. 1977;16:1064-8.
- Johnston BH, Johnson MA, Moore CB, Hearst JE. Psoralen-DNA photoreaction: Controlled production of mono- and diadducts with nanosecond ultraviolet laser pulses. Science. 1977;906.
- Johnston BJ, Kung AH, Moore CB, Hearst JE. Kinetics of formation of deoxyribonucleic acid cross-links by 4²-(aminomethyl)-4,5',8-trimethylpsoralen. Biochem. 1981;20:735.
- Spath E. Die natürlichen Cumarine. Ber. 1937;70A:83.
- Spath E, Kuffner F. Die nattirlichen Cumarine und ihre Wirkung auf Fische. Monatsh. 1936;69:75.
- Allen BM. Malayan Fruits. An introduction to cultivated species. Donald Moore Press Ltd. Singapore, 1967.
- Rahman AA, Gopalakrishnan G, Ghose BS, Arumugam S, Himalayan B. Effect of *Feronia limonia* on mosquito larvae. Fitoterapia. 2000;71:553-5.
- Ahamed SM, Swamy SK, Jayaverra KN, Rao JV, Kumar VS. Anti-inflammatory antipyretic and analgesic activity of methanolic extract of *Feronia limonia* fruit pulp. Pharmacologyonline 2008;3:852-7.
- Darsini DTP, Maheshu V, Vishnupriya M, Nishaa S, Sasikumar JM. Antioxidant potential and amino acid analysis of underutilized tropical fruit *Limonia acidissima* L. Free Radicals and Antioxidants. 2013.
- Asha T, Ponnalam N. Preliminary studies on phytochemical and antibacterial activity of *Limonia acidissima* L. Plant part. Anc Sci Life. 2005;25:57-61.

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