Frankincense – the resin with healing power

medical Beauty Forum 2015 (4), 12-16

Frankincense ("Boswellia") has become rather important in various cultures and religions: the resilience of the tree growing in the Asian and African semi deserts is legendary and the tribal knowledge on the mystic and healing powers of its resin fills entire libraries. Today’s science still appreciates its specific properties. What is it that makes frankincense so valuable?

Certainly not the excellent hot glue characteristics of the resin that already have been known in ancient times. In the German language, the clue is in the family name since boswellia belongs to the – literally translated – “balm tree family” or burseraceae (incense tree family): it supplies a balm.

Balsms or balsams\(^1\) are highly viscous herbal excretions. The non-aqueous liquids are rich in resins such as frankincense, benjamin (benzoin), myrrh and Peruvian balsam and contain

- essential oils,
- free acids,
- aromatic esters of the cinnamon and benzoic acids and aromatic aldehydes.

Ointments, oleogels and creams often are called balms today. In this context the term refers to an agreeably smelling and calming skin care product. The field of application of frankincense resin however is rather diversified and comprises

- dermatology and skin care,
- chronic inflammatory intestinal diseases,
- rheumatic diseases,
- respiratory diseases,
- tumours.

Accordingly, boswellia is integrated into ointments (topical, rectal), creams (topical), capsules (peroral), pills (peroral) and suppositories (rectal). The Indian frankincense has been included as a monograph in the European Pharmacopoeia (Ph. Eur.). The pharmaceutical term is olibanum. Despite of numerous in vitro and in vivo studies however not a single EU licensed frankincense-based conventional proprietary medicinal product is available on the market today.\(^2\) In consequence of the above mentioned monograph however compounding pharmacies prepare individual extemporaneous formulations.

Boswellia resin extracts are used in extemporaneous formulations and in skin care as well as in the adjuvant corneotherapy\(^3\) to treat skin disorders and support the prevention of skin disorders in the case of

- inflammatory skin reactions,
- sun erythema,
- radiations,
- acne,
- rosacea,
- perioral dermatitis,
- atopic skin and barrier disorders,
- actinic keratosis,
- psoriasis.

In this context now the ingredients, their effects, their content in specific frankincense qualities and their particular manufacturing are of interest. The main frankincense types are:

- Boswellia serrata ("Indian frankincense") occurs in India and is a component of the Ayurvedic folk medicine.
- Boswellia sacra ("Arabic frankincense") originates in Egypt, Somalia, Oman and Jemen. The characteristic smoke that forms when burning the incense is used in different religious bodies and communities to consecrate (German: “weihen”) cult objects or cultic personnel which led to the German term “Weihrauch”.
- Boswellia carteri is identical with boswellia sacra.

\(^{1}\) H. Lautenschläger, Emotionsauslöser – Streifzug durch die Welt der Duftstoffe, Kosmetische Praxis 2010 (5), 10-14

\(^{2}\) G. Meyer-Chlond, Ein fast vergessenes Heilmittel, Die PTA in der Apotheke 2011 (12), 26-27

\(^{3}\) H. Lautenschläger, Grenzgänger – Kosmetische Hautpflege auf den Punkt gebracht, Beauty Forum 2010 (8), 27-29
The resin fraction of boswellia sacra respectively carteria is about 66% while boswellia serrata has about 56%. Boswellia extracts used in skin care frequently occur in powder form due to the high-molecular pentacyclic triterpene structures of the boswellic acids however are difficultly soluble. Both the preconditions are extremely disadvantageous for the preparation of acceptable skin care products with good haptic characteristics and effective dosage. Hence the cosmetic industry makes recourse to nanotechnological procedures:

- In the case of solid nanoparticles the powdery dry extracts are ground by means of milling and/or homogenizing procedures and then dispersed in watery media and stabilized with additives. Depending on the composition of the additives, the nanoparticles and their dispersions either are biodegradable or non-biodegradable.
- Liquid nanoparticles are produced by means of high pressure homogenization from standardized extracts and phosphatidylcholine (PC), the main component of biological plasma membranes. They are biodegradable and fuse with the bilayers of the skin barrier from where the different components then are released in a controlled way.

The combination with phospholipids (lecithin) increases the oral availability of the extracts. Since PC is effective against cornification disorders, the nanodispersions can also be administered for these indications. Nanodispersions can be applied on the skin either in pure form or in combination with lamellar but also PC containing base creams.

Anti-inflammatory substances

In dermal preparations 11-keto-β-boswellic acid (KBA) and 3-acetyl-11-keto-β-boswellic acid (AKBA) have anti-inflammatory effects

4 B. Meier, J. Rethage, Olibanum indicum: indischer Weihrauch – eine Übersicht, Phytotherapie 2007 (1), 1-7
5 M. Paul, J. Jauch, Efficient preparation of incensole and incensole acetate, and quantification of these bioactive diterpenes in Boswellia papyrifera by a RP-DAD-HPLC method, Nat Prod Commun. 7(3), 283-8 (2012)
8 H. Lautenschläger, Biodegradable lamellar systems in skin care, skin protection and dermatology, SOFW-Journal 139 (8), 2-8 (2013)
Corneum Barrier and Atopic Skin, J Clin Part 1: The Role of Filaggrin in the Stratum
Atopic Dermatitis and the Stratum Corneum, 13
12
11
10
9
8
7
6
5
4
3
2
1

Proteases also are activated in the case of inflammations then form due to facultative pathogenic microorganisms of the skin flora and exogenous germs. Despite their higher expressions, the anti-inflammatory cathelicidins grade the natural antimicrobial cathelicidins.

In the case of rosacea, serine proteases largely degrade the skin care of the rosacea prone skin. The inhibition of proteases explains why boswellia nanodispersions are so effective in the case of photo damaged skin. Boswellia resin acids is the inhibition of the NF-κB-signal pathway. It results from the inhibition of various proteases.

Although the essential oils gained from the resin by water vapour distillation or the resins of the characteristic smell of the resin acids for treatment of photoaged skin, they do not have pharmacologically effect. As long as these preparations has led to significant results in the case of chronic inflammatory diseases, Z Phytother 2006; 27 - P33.


Dr. Hans Lautenschläger

Conclusion

Boswellia resin extracts show a large variety of biological effects which have not yet been completely clarified. The biochemical relevance of the particular mechanisms still is controversially discussed. What is sure is that boswellia resin acids are very potent substances, which are able to influence the particular mechanisms, and thus are able to influence the formation of the inflammation-triggering leukotrienes. An enzyme is responsible for the formation of the prostaglandin-1-β-boswelic acid. Prostaglandin E_2 from arachidonic acid is the inhibition of the 5-lipoxygenase measured in-vitro.

The resin with healing power - Frankincense...