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## INFORMATION ON COSPHADERM® MAGNOLIA EXTRACT 98

Cosphaderm® Magnolia Extract 98 consists of 49 % magnolol and 49 % honokiol (fig. 1) and is carefully extracted from the bark by CO<sub>2</sub>-extraction.

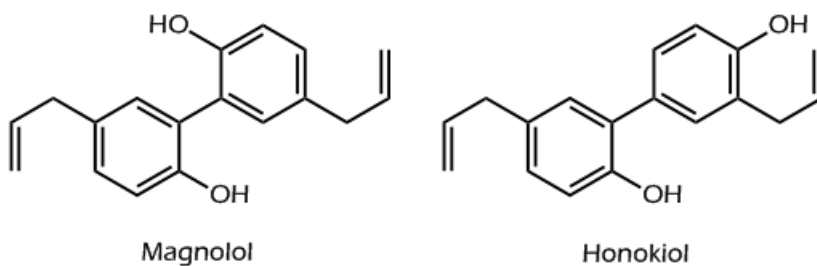


Figure1: Active substances of Cosphaderm® Magnolia Extract 98

Magnolia extract is a versatile cure of the traditional Chinese medicine because it combines a number of positive features. It inhibits the growth of bacteria and fungi as well as viral infection, has a very strong effect against caries and periodontitis, acts anti-inflammatory and is a highly effective anti-aging agent and a strong antioxidant. Therefore Magnolia plant extracts have been used for centuries.<sup>1-6</sup>

## Antimicrobial activity

Numerous publications describe the strong antimicrobial and antibacterial effect of Magnolia bark extract. It also came to the attention of dental research as the Magnolia bark extract reduces the growth of caries and periodontitis causing bacteria, which has been shown in many scientific studies<sup>7-11</sup>. Furthermore, magnolol disturbs the function of glucosyltransferase, an enzyme which is responsible for the formation of bacterial plaques<sup>12-13</sup>. From the dermatological point of view the Magnolia extract is very interesting because it is quite efficient against certain acne-causing germs.<sup>14</sup> The minimal inhibitory concentration (MIC = Minimal Inhibitory Concentration) is the lowest concentration of an antimicrobial that will inhibit the visible growth of a microorganism. Very low MICs of Magnolia bark extract are evidence of the great potential for its use in oral and skin care products.

Table 1: MIC Data of *Magnolia Officinalis* Bark Extract

Species	Category	MIC (mg/ml)
<i>Epidermophyton floccosum</i>	Dermatophyte	0.025-0.1
<i>Microsporum</i>		0.025-0.1
<i>Trichophyton mentagrophytes</i>		0.025-0.1
<i>Aspergillus niger</i>	Mould	0.025-0.1
<i>Cryptococcus neoformans</i>		0.025-0.1
<i>Candida albicans</i>	Yeast fungus	0.025-0.1
<i>Bacillus subtilis</i>	Gram positive bacterium	0.005
<i>Micrococcus luteus</i>		0.025
<i>Mycobacterium</i>		0.0075
<i>Staphylococcus aureus</i>		0.01
<i>Streptococcus mutans</i>	Gram positive caries bacterium	0.0098
<i>Streptococcus oralis</i>		0.0098
<i>Propionibacterium acnes</i>	Gram positive skin bacterium	0.0098
<i>Propionibacterium granulosum</i>		0.0077
<i>Staphylococcus epidermidis</i>		0.0098
<i>Bacteroides fragilis</i>	Gram negative bacterium	0.025
<i>Escherichia Coli</i>		0.01

<i>Actinobacillus</i>		0.025
<i>Actinomyces comitans</i>	Gram negative Parodontitis	
<i>Fusobacterium nucleatum</i>	bacterium	0.031
<i>Porphyromonas gingivalis</i>		0.008

Our own studies confirmed the published data. MIC values, measured by the bio-chemical laboratory Dr. Lehmann GmbH & Co KG, are available on request. In challenge tests according to Ph. Eur. 5.1.3 Cosphaderm® Magnolia Extract 98 showed pH-independently strong effects against yeasts and fungi even in low concentrations. The recommended application concentration is between 0.08 – 0.2 % [w/v].

The extract is fat and ethanol soluble and works synergistically in combination with diols and glycerylcaprylat (GMCY). Cosphatec GmbH investigated these synergistic effects extensively and developed Cosphaderm® MultiMEG. The perfect mixing ratio of Cosphaderm® Pentiol natural, Cosphaderm® GMCY and Cosphaderm® Magnolia Extract 98 is achieved in Cosphaderm® MultiMEG. Cosphaderm® MultiMEG is fully certifiable and very user friendly to apply as it can be added as liquid product to the finished formulation.

## Anti-inflammatory properties

Acne is based on an inflammatory disease of the sebaceous glands. The cause for acne is an interaction of various factors. This includes a hormonal imbalance because hormones stimulate the sebaceous glands, a bacterial infection, stress and the use of cosmetic products<sup>14</sup>. *Propionibacterium acnes* causes an inflammatory reaction of sebaceous glands or hair scales<sup>15-16</sup>, secretes lipases and supports the decay of tallow oil into free fatty acids which are an important trigger for inflammatory reactions. Moreover, the bacterium secretes a chemotactic factor which infiltrates the leucocytes into the hair follicles resulting in a destroyed hair follicle wall<sup>18</sup>. Therapeutic agents against acne are antimicrobial effective substances which decrease the inflammatory response or kill bacteria<sup>19</sup>. Traditional agents are Triclosan, Benzoyl peroxide, Azelaic acid, Retinoid, Tetracycline, Erythromycin und Clindamycin<sup>20</sup>. Studies revealed that Magnolia extract reduces inflammatory messenger substances and has a strong antimicrobial activity against acne triggering bacteria<sup>14</sup>.


Many of the commonly used anti-acne products have strong side effects<sup>21-25</sup>. Therefore the irritating potential of Magnolia extract was investigated by applying the Magnolia extract in concentrations of 0.1 %, 1.0 %, 5.0 %, 10.0 % and 20.0 % to the skin of 30 test persons. None of the test persons showed an irritating skin reaction neither after 30 minutes nor after one day<sup>14</sup>.

### Antioxidative effect

The antioxidant properties of Magnolia extract have been examined in many *in vitro*<sup>26</sup> and *in vivo* studies<sup>27-28</sup>. According to these studies, the antioxidative effect of Magnolia extract is approximately thousand times stronger than the effect of alpha-Tocopherol<sup>27,29</sup>. To test the effect of Cosphaderm® Magnolia Extract 98 in cosmetic products the Cosphatec GmbH has carried out a comparative test (Table 2) with mixed tocopherols which are usually used to protect the fat phase of a cosmetic formulation.

Table 2: Rancimat Test Results

Antioxidant in sunflower oil	Induction time (h)	Antioxidative Activity Index
Pure oil	11.82	
+ 0.05 % [w/v] Cosphaderm® Magnolia Extract 98	13.56	1.15
+ 0.05 % [w/v] Cosphaderm® T-70 NON GMO	14.84	1.26


 Increasing activity

The induction time indicates when the first decomposition products of the oil can be detected and becomes rancid. Compared to the pure oil the Cosphaderm® Magnolia Extract 98 contributes to protect the fat phase and to increase the durability of the oil. In direct comparison to the mixed tocopherols the extract fared less well. Cosphaderm® Magnolia Extract 98 can thus be used as an optimal booster to extend the effect of mixed tocopherols in a similar way as Cosphaderm® AP.

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