plant-based alternative for the oral prevention and treatment of inflamed oral mucosa and gingivitis, and for patients with increased levels of plaque. Because it is gentle on the mucosa, this rinse is also suitable for long-term use.

Information of the product described in the article:

Tradename:
Tebodont®

Manufacturer:
Dr. Wild & Co. AG

Contact address for further information:

Dr. Wild & Co. AG
Hofackerstrasse 8
4132 Muttenz
Switzerland

www.wild-pharma.com
info@wild-pharma.com

In another double-blind, randomised study (n=49) conducted by Soukoulis and Hirsch (7), the efficacy of a topically applied gel with 2.5% tea tree oil versus a chlorhexidine gel (0.2%) and a placebo gel was studied in plaque and chronic gingivitis. The duration of the study was 8 weeks. No adverse effects were reported in this study. The tea tree oil group showed significant improvement in the PBI (Papillary Bleeding Index) and the GI (Gingival Index), Both indices provide objectifiable information about gum health. No improvement was shown in the PSS (plaque staining score).

In summary, products containing up to 3% tea tree oil can be used successfully to combat oral microorganisms and thus inhibit plaque formation, and are a well tolerated alternative for the treatment and prevention of inflammatory symptoms in the gums and oral mucosa. ■

Author's address:
Dr. Andreas Hasler
Dr. Wild & Co. AG
Hofackerstr. 8
4132 Muttenz

List of literature:

1. W. Hoffmann-Axthelm. Lexikon der Zahnmedizin. Quintessenz Verlags GmbH, Berlin, 2000, 6. Auflage.
2. J. Reichling, F. Iten, R. Saller. Australisches Teebaumöl, Pharmazeutische Qualität, Wirksamkeit und Toxizität, Schweiz. Medizin. Zeitschr. Phytotherapie, 2003, 3, 32-39.
3. LJ. Walsh, J. Longstaff. The antimicrobial effects of an essential oil on selected oral pathogens. Periodontology, 1987, 8, 11-15.
4. E. Kulik, K. Lenkeit, J. Meyer. Antimikrobielle Wirkung von Teebaumöl auf orale Mikroorganismen, Acta Med. Dent. Helv. 2000, 5, 125-130.
5. R. Saller, J. Reichling. Teebau-Öl, Deutsche Apotheker Zeitung 1995, 135, 3180-3188.
6. UP. Saxer, A. Stäuble, SH. Szabo, G. Menghini, Wirkung einer Mundspülung mit Teebaumöl auf Plaque und Entzündung, Schweiz. Montsschri. Zahnmed., 2003, 113, 985-990.
7. S. Soukoulis, R. Hirsch, The effect of a tea tree oil-containing gel on plaque and chronic gingivitis, Australian Dental Journal, 2004, 49, 78-83.

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Tea tree oil in oral care

This special issue is presented by:

Dr. Wild & Co. AG, CH-4132 Muttenz, www.wild-pharma.com

Tea tree oil in oral care

Australian tea tree oil (Melaleuca aetheroleum, oil of melaleuca) and products made with it are being used with increasing success as a natural alternative for dental care and prevention. The medicinal product chlorhexidine is very commonly used to treat and prevent oral infections. Chlorhexidine is very effective but it is also associated with adverse effects such as brown discolouration of the teeth and surface of the tongue, changes to the mucosa, taste irritation, contact allergies, and intra-oral pathogen adaptation (1).

Andreas Hasler

Introduction

Knowledge of the therapeutic properties of the leaves of the Australian tea tree can be traced back to the Bundjalung Aborigines in northern New South Wales in Australia, who used the leaves of Melaleuca alternifolia as many as several thousands of years ago for sore throats, colds, insect stings and bites, for wound care, and to combat a variety of fungal infections. During the Second World War, tea tree oil was widely used medically as a local antiseptic for Australian soldiers. Due to the increasing availability of penicillin and other antibiotics in the 1940s, tea tree oil lost popularity as an antiseptic (2). With the inclusion of ethnomedicine and naturopathy in the pharmaceutical and medical sciences, and as the resistance problems due to extensive antibiotic use became apparent, tea tree oil was ‚rediscovered' in the 1970s.

Constituents

Melaleuca alternifolia leaves contain approximately 1 to 2% essential oil. This oil has a pleasant odour and tastes like turpentine, nutmeg and eucalyptus. It leaves a long-lasting fresh sensation in the mouth. The essential oil is a complex combination of around 100 constituents, with the most relevant being, in addition to 1,8 -cineole (<15%), terpinen-4-ol (>30%), linalool, α-terpineol and α-pinene. Recently distilled oil has a slight allergenic potential, while oxidised tea tree oil contains oxidation products (including ascaridole, 1,2,4 trihydroxymenthane) that have a more pronounced allergenic effect. Tea tree oil stored in a closed container away from light is stable at room temperature for long periods (>10 years).

Effect and efficacy

The antibacterial and antimycotic effects of tea trea oil (3) and products containing tea tree oil (4) have been established in studies with well documented in vitro experiments. The therapeutic efficacy of tea tree oil has been investigated in clinical trials in burns, inflammation of the mouth and gums, fungal and vaginal infections (5), as has the efficacy of products containing tea tree oil in plaque, inflamed gums (6) and chronic gingivitis (7).

Antimicrobial effect

In a study by Kulik et al. (4), the bacteriostatic and bactericidal/fungicidal effect on 10 different oral microorganisms of a tea tree oil solution, a tea tree oil gel (Tebodont®), the corresponding carrier gel, a chlorhexidine digluconate solution, and a chlorhexidine digluconate gel (PlakOut® gel) were investigated in vitro. The values for the Minimum Inhibitory Concentration (MIC) for tea tree oil were in the range of 0.0293% to 1.25%, and for the tea tree gel 0.0082% to 1.25%. The values for the Minimum Bactericidal/Fungicidal Concentration (MBFC) ranged from 0.0521% to 2.5% for the tea tree oil solution and from <0.0098% to 3.33% for the tea tree oil gel. The most sensitive pathogens were Actinobacillus actinomycetemcomitans, Fusobacterium nucleatum and Porphyromonas gingivalis, while Streptococcus mutans and Prevotella intermedia reacted the least sensitively. For the two chlorhexidine digluconate controls, as expected, the values for MIH and MBFC ranged from 0.0002% and 0.0125%. The documented MIC and MBFC values are compiled in Table 1 and Table 2.

This in vitro study showed that a 2% tea tree oil solution and a tea tree oil gel with 2% tea tree oil developed for oral use (Tebodont® gel) inhibit the growth of all 10 of the oral pathogens studied. For 9 out of 10 of these pathogens this concentration was over the MBFC, meaning it had a bactericidal or fungicidal effect.

With its antimicrobial properties, the tea tree oil gel can be considered a natural alternative for treating infected oral mucosa and the periodontium.

Efficacy with plaque and gingivitis

In the double-blind, randomised study (n=26) conducted by Saxer et al. (6) the efficacy of a mouth rinse with 1.5% tea tree oil and 10% xylitol developed for oral use (Tebodont® mouth rinse) was investigated in terms of plaque formation and inflammation compared to a placebo rinse. The investigational mouth rinse significantly reduced inflammation after three months *(Figure 1)*. The amount of plaque decreased for the investigational mouth rinse, while it increased for the placebo rinse *(Figure 2)*.

Despite the small sample size, this clinical trial showed that the investigational mouth rinse significantly reduced inflammation (Sulcus Bleeding Index) within three months, and while it did not inhibit the formation of plaque significantly, there numbers trended downward. The investigational mouth rinse did not cause any changes in the oral cavity. Based on its proven efficacy, this mouth rinse is a

Table 1:
Mean Minimum Inhibitory Concentration in %

Microorganism	Tea tree oil sol.	Tebodont gel a)	Gel base b)	PlakOut gel c)	Chlorhexidine sol.
Streptococcus mutans	0.2604	0.2084	N	< 0.0002	< 0.0004
Streptococcus sanguis	0.1563	0.2604	N	< 0.0003	< 0.0005
Streptococcus anginosus	0.1563	0.2084	N	< 0.0002	< 0.0004
Actinobacillus actinomycetemcomitans	0.0293	< 0.013	0.1302	< 0.0002	< 0.0004
Lactobacillus salivarius subsp. salivarius	0.2084	0.2604	N	< 0.0002	< 0.0004
Actinomyces naeslundii	0.1302	1.25	N	< 0.0002	< 0.0004
Fusobacterium nucleatum	0.0846	0.0912	< 0.0358	< 0.0002	< 0.0005
Prevotella intermedia	1.25	1.25	N	0.0125	0.0125
Pophyromaonas gingivalis	0.0651	0.0082	0.0911	0.0027	0.0016
Candida albicans	0.1302	0.0456	1.0417	0.0013	0.0009

a) relative to the concentration of tea tree oil
b) relative to the gel concentration; N≥5%
c) relative to the chlorhexidine concentration

Table 2:
Mean Minimum Bactericide/Fungicide Concentration in %

Microorganism	Tea tree oil sol.	Tebodont gel a)	Gel base b)	PlakOut gel c)	Chlorhexidine sol.
Streptococcus mutans	1.0417	3.33	N	0.0006	0.0016
Streptococcus sanguis	0.4167	0.625	N	< 0.0005	0.0011
Streptococcus anginosus	0.4167	0.5208	N	< 0.0005	0.0008
Actinobacillus actinomycetemcomitans	0.0521	< 0.0098	0.5208	< 0.0002	< 0.0004
Lactobacillus salivarius subsp. salivarius	1.5625	0.7292	N	< 0.0002	< 0.0007
Actinomyces naeslundii	0.5208	1.25	N	< 0.0002	< 0.0004
Fusobacterium nucleatum	0.1693	0.1172	0.1693	< 0.0002	< 0.0005
Prevotella intermedia	2.5	1.875	N	0.0125	0.0125
Pophyromaonas gingivalis	0.0651	0.013	0.117	0.0027	0.0016
Candida albicans	0.3125	0.2084	N	0.0013	0.0032

a) relative to the concentration of tea tree oil
b) relative to the gel concentration; N≥5%
c) relative to the chlorhexidine concentration

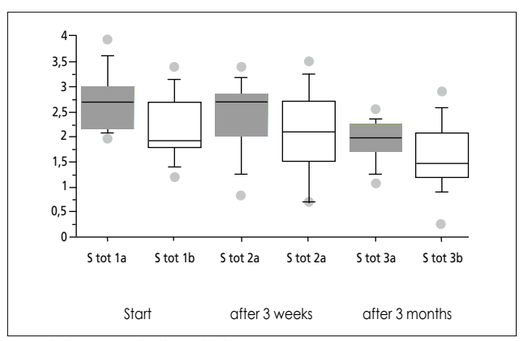

Figure 1: Sulcus bleeding index (SBI)

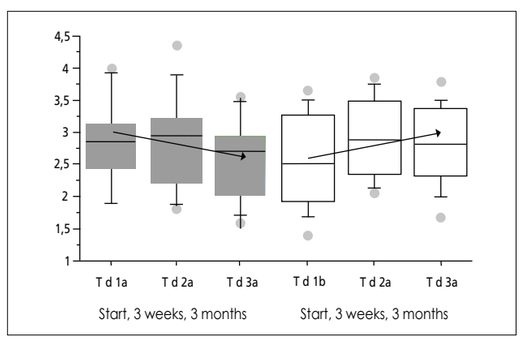

Figure 2: Plaque index gray: investigational mouth rinse