MyrLiq®
From Commiphora myrrha, a natural painkiller with analgesic activity

A significant proportion of the world’s population experiences pain, which causes reduced quality of life and is frequently treated with analgesics. In addition to pain associated with particular illnesses or injury, hyperalgesia (increased sensitivity to pain) and allodynia (pain felt following normally non-painful stimulation) are often reported [1]. There are several types of pain: nociceptive, neurogenic, neuropathic and psychogenic, which are associated with stimulation of nociceptors, neuronal tissue damage, nerve dysfunction and psychological factors, respectively. Nociception is a process through which signals caused by harmful stimuli are transmitted to the central nervous system (CNS). Nociceptors are pain-sensitive neurons located in the skin, blood vessels, muscles, joints and junctions. The correct use of analgesics includes oral administration, regular treatment, pain-based prescription, individually tailored doses, and constant monitoring of when and how to administer the medication.

In addition to synthetic drugs, various plant extracts are known for their analgesic activity, including opium poppy alkaloids (Papaver somniferum) and Indian cannabis cannabinoids (Cannabis sativa var. indica) [2]. In addition to the monoterpens of several essential oils [3], other classes of terpenoids show analgesic action. Furanosesquiterpenes with analgesic activity, such as furanooelmames, furanooeudesmanes and furanogermacrnanes, are present in the extracts of myrrh gum resins [4]. Myrrh is the exudate produced by the bark of plants belonging to the genus Commiphora (family Burseraceae), which includes more than 150 species predominantly originating in arid tropical and subtropical regions [5]. The so-called ‘true myrrh’ is produced by Commiphora myrrha (Nees) Engl. (Fig. 1), also known as C. molmol Engl. or Balsamodendron myrrha Nees. This plant has been used to treat wounds for millennia, with medicinal uses dating back to biblical times [6]. The myrrh furanodienes: furanoeudesma-1,3-diene, lindestrene and curzerene, are mainly responsible for the aroma of myrrh and its high analgesic activity [7] (Fig. 2).

MyrLiq® is a C. myrrha liquid and powder extract produced by Biosfered (Turin, Italy) that possesses the highest content of bioactive furanodienes available on the market. MyrLiq® has been shown to exert a strong analgesic activity in a pilot clinical study.

Composition and technical specification

MyrLiq® is produced by Biosfered using a proprietary and patented method of extraction. It is characterized by a high content of bioactive furanodienes (identified by GC-MS and quantified by GC-FID). MyrLiq® is available both as a powder extract (MyrLiq®-PWD) and a fluid extract (MyrLiq®-FL).
Both products are standardized and titrated to provide 40 g of bioactive furanodienes per kg of product. MyrLiq® is stable at room temperature. The technical specifications of MyrLiq®-PWD and MyrLiq®-FL are reported in Table 1.

### Efficacy

**Preclinical studies and mechanism of action**

Myrrh is a known analgesic which was used to clean wounds and sores for more than 2,000 years until Europeans discovered morphine. Ethanolic extracts of *C. myrrha* exert analgesic effects though decreasing the PGE2 level in formalin-induced pain models [8]. Rats pre-treated with 10% suspension of curzerene or furanoeudesma-1,3-diene demonstrated increased licking latency in a hot plate test. Furanoeudesma-1,3-diene also reduced the number of writhes caused by intraperitoneal administration of acetic acid. The analgesic effects of curzerene and furanoeudesma-1,3-diene were reversed by naloxone, indicating this analgesic activity was exerted through interaction with a brain opioid mechanism [7]. The mechanisms of action related to multiple inflammation-related proteins and signal pathways have been discussed, and COX, NO formation, ROS, TNF-α, PGE2, NF-kB and MAPK have been identified as potential anti-inflammatory targets of myrrh extracts [6]. The analgesic properties of MyrLiq® have been recently reported [9].

### Clinical study

In a pilot study, 95 female and 89 male matched volunteers (aged from 18 to over 60) exhibiting different types of pain, including headache, fever-dependent pain, joint pain, muscle aches, lower back pain and menstrual cramps, were divided into two groups. The experimental group received one capsule/day containing either 200 mg or 400 mg of MyrLiq® (corresponding to 8 mg or 16 mg of bioactive furanodienes, respectively) for 20 days, while the placebo group was given the same number of capsules with no MyrLiq®. A score was recorded for all volunteers based on their previous experience with prescribed analgesics. Pain alleviation in the male volunteers was obtained with 400 mg of MyrLiq®/day for almost all pathologies, while in female volunteers, alleviation of lower back pain and fever-dependent pain was observed with only 200 mg of MyrLiq®/day. These results indicate that MyrLiq® has significant analgesic properties [9].
Safety

MyrLiq® is produced using strict procedures, and the safety of the product is ensured with advanced microbiological, chemical and molecular detection systems.

Application and use

Careful authentication of the bioactive furanodienes by GC-MS and quantification and standardization by GC-FID are necessary for preparing effective doses for analgesia. Our published findings indicate MyrLiq® is an attractive candidate for the development of novel natural preparations for reducing pain, including headache, fever-dependent pain, joint pain, muscle aches, lower back pain and menstrual cramps.

The recommended dosage of MyrLiq® is 200–400 mg/dose, depending on the type of pain. This dosage has been demonstrated to be effective when administered once a day for at least 20 days.

MyrLiq®-FL is the only alcohol-free liquid source of myrrh extract available on the market and is particularly suitable for all liquid applications, including softgels. Our technology allows custom-made MyrLiq®-FL to be prepared containing up to 500 g/kg furanodiene in any lipophilic solvent.

REFERENCES


Biosfered in a nutshell
Biosfered S.r.l. is an academic spin-off of the University of Turin, set up in 2013 by teachers and researchers from the Plant Physiology Unit, Department of Life Sciences and Systems Biology, University of Turin, Italy, and supported by the business skills of the Cooperative Sociale Arcobaleno. The company produces liquid and powder extracts from plant matrices obtained through patented techniques and technologies based on green chemistry without the use of toxic solvents. The products are chemically characterized and titrated using the most advanced analytical and mass spectrometric techniques (GC-MS, HPLC-ESI-MS/MS) and supplied to the pharmaceutical, nutraceutical, food and cosmetic industries.

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