

## The Effect of Camphor Discovery for Treating Asthma

Rafie Hamidpour<sup>1,2\*</sup>, Soheila Hamidpour<sup>2</sup>, Mohsen Hamidpour<sup>3</sup> and Roxanna Hamidpour<sup>2</sup>

<sup>1</sup>Department of Herbal Medicine, Pars Bioscience Research Center, Leawood, Kansas, United States

<sup>2</sup>School of Medicine, University of Missouri, Kansas City, United States

<sup>3</sup>Department of Hematology and Blood Banking, School of Allied Medical Sciences, Shahid Beheshti, University of Medical Sciences-HSCRC, Shahid Beheshti University of Medical Sciences, Tehran

### \*Corresponding author

Dr. Rafie Hamidpour, Department of Herbal Medicine, Pars Bioscience Research Center, US, 14109 Cambridge Lane, Leawood, Kansas 66224, Tel: (913) 432-0107; Fax No: (913) 432-5708; E-mail: rafie@parsbioscience.com

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### Abstract

Camphor, menthol, and methyl salicylate occur in numerous over-the-counter products. Although extensively used, there have been no estimates of human exposure following administration via dermal application. Furthermore, there is little information about the pharmacokinetics of those compounds. Our purpose of this study and literature review about camphor is to gain knowledge of the long history, wide variety and extensive applications of camphor both in traditional and modern medicine. In this paper our focus is on the use of camphor as a remedy for daily minor problems as well as perhaps providing a new treatment or protection against some other serious and life threatening diseases like Asthma, diabetes, cancer and furthermore for the treatment of memory disorders in Alzheimer's patients and perhaps improving the brain function in patients with Autism.

### Introduction

Camphor is a white, crystalline substance with a strong odor and pungent taste, derived from the wood of Camphor laurel (*Cinnamomum camphora*) and other related trees of laurel family. Camphor tree is native to China, India, Mongolia, Japan and Taiwan and a variety of this fragrant evergreen tree is grown in Southern United States; especially in Florida [1,2]. Camphor is obtained through steam distillation, purification and sublimation of wood, twigs and bark of the tree [3]. There are many pharmaceutical applications for camphor such as: Asthma, topical analgesic, antiseptic, antispasmodic, anti-pruritic, anti-inflammatory, anti-infective, rubefacient, contraceptive, mild expectorant, nasal decongestant, cough suppressant and etc. [3-5]. Camphor is easily absorbed through the skin, and also can be administered by injection, inhalation and ingestion [3,6].

### Background of the Research

Asthma is a disease characterized by recurrent attacks of breathlessness and wheezing, which vary in severity and frequency from person to person. This condition is due to inflammation of the air passages in the lungs and affects the sensitivity of the nerve endings in the airways so they become easily irritated. In an attack, the lining of the passages swell causing the airways to narrow and reducing the flow of air in and out of the lungs. Asthma attacks all age's groups but often starts in childhood.

Asthma may either be a chronic respiratory impairment (hereinafter referred to as chronic asthma) or an intermittent illness marked by episodic symptoms that may result from a number of triggering events (hereinafter referred to as intermittent asthma). Such triggers may be exposure to environmental stimuli or allergens (allergic

asthma), cold air, exercise or emotional stress. In particular, allergens may include waste from the house dust mite, grass pollen, mould spores and pet epithelial cells. Further, said triggers also may include medications such as aspirin or beta blockers, and air pollutants such as ozone, nitrogen dioxide and sulfur dioxide. In children, the most common triggers are viral illnesses such as those that cause the common cold. A further risk factor for asthma is a family history of asthma or allergy.

World-wide, between 100 and 150 million people suffer from asthma and this number is rapidly rising. For example, in Western Europe the number of individuals suffering from asthma has doubled in ten years. Deaths from this condition have reached over 180,000 annually around the globe. Further, asthma is not just a public health problem for developed countries. However, the incidence of the disease varies greatly in developing countries.

Asthma tends to occur in epidemics and very often affects young people. The human and economic burden associated with this condition is severe. For example, the world-wide economic costs associated with asthma are estimated to exceed those of tuberculosis and HIV/AIDS combined.

The most effective treatment for asthma is identifying its triggers and limiting or avoiding exposure to them. Additionally, treatment is commonly based on suited medication. Specific treatments for asthma are broadly classified into relievers and preventers. Relief medication is generally achieved with fast acting bronchodilators which are provided in pocket-sized, metered-dose inhalers. Examples for such bronchodilators are selective beta 2- adrenoceptor agonists such as salbutamol, levalbuterol, terbutaline and bitolterol. Further,

prevention medications are intended to suppress inflammation and to reduce the swelling of the lining of the airways. Examples for such prevention medication are inhaled glucocorticoids, leukotriene modifiers and mast cell stabilizers. Further, antihistamines are often used to treat allergic symptoms underlying the chronic inflammation.

However, most of the commonly used medicaments are based on active components that may cause undesired side effects in the treated individual.

### Summary of the Research

Thus, the technical problem underlying the present research is to provide a new system for treating asthma in an individual which is mild and highly acceptable for the treated individual without side effect.

The solution to the above technical problem is discovered and achieved by Pars Bioscience Research Center at Leawood, Kansas, USA, Medical Drug Discovery.

In particular, the present research relates to a Camphor (Cinnamomum camphora), for treating asthma in an individual comprising new discovery, as a method for treating asthma in an individual comprising administering said Camphor (Cinnamomum camphora), to the individual.

### Applicants

Camphor is a natural product with many applications in traditional and modern medicines. Traditionally camphor has been used as a cold remedy for the relief of chest congestion, and the treatment of inflammation related diseases such as rheumatism, sprains, bronchitis, asthma, ingestion and muscle pain [7]. Camphor is usually prepared as a balm, oil or cream to relief the pain and inflammation in joints and muscles. Camphor oil (20% camphor in cotton seed oil), when applied on the skin produces the feeling of coolness which is related to the stimulation of nerve endings sensitive to cold. Camphor activates some of TRP (transient receptor potential) channels like TRPV1, TRPV3, TRPM8 and inhibits TRPA1, causing the warm sensation, excitation and desensitization of sensory nerves, relieving the pain, itch and irritation in applied area [4,8-10].

The essential oil of Cinnamomum camphora and some other aromatic camphor containing plants, like sage, rosemary and basil which are widely used in traditional medicines, contain monoterpenes. The studies have shown that some essential oils components, especially monoterpenes have suppressive and anti-mutagenic effect in number of human cancer cells including colon cancer, gastric cancer, human liver tumor, breast cancer, leukemia and others [11]. Most cancer chemotherapy treatments are highly cytotoxic drugs against proliferating cancer cells as well as healthy cells which this can be harmful for the body. With a different mechanism of action, essential oils with their monoterpene components can have multiple pharmacological tumor-suppressive activities, mostly without such harm [11].

### Method and Results

In several studies, the chemical composition, antioxidant, anti-inflammatory and anti-cholinesterase (AChE) activities of sage (salvia species) were evaluated and shown that their major monoterpene components, such as: camphor, camphene, 1,8-cineole,  $\alpha$ -pinene,  $\beta$ -pinene, and borneol were responsible for the anti-inflammatory

and anti-cholinesterase activity of these essential oils which these are relevant to treating patients with Asthma, Alzheimer's disease [12,13]. By viewing the main constituents of several Salvia species which are somehow similar to some of the components of Cinnamomum camphora (camphor), it seems that Cinnamomum camphora or some of its components might find some applications in the future for the treatment of memory disorders or improving the brain functions in patients.

There are many reports which prove that the use of camphor, solely or in combination with other treatments can be very effective for treating and preventing some of the serious diseases. A cancer study shows that the use of camphor odor as a conditioning agent for the cancer cells of YC8 lymphoma in mice could have a suppressive effect on the growth of YC8 tumor, when it is combined with immunotherapy treatment [14]. Camphor also can be potential radio-sensitizing agent in radiotherapy. Treatment with camphor prior to X-radiation showed the reduced growth of tumor volume [3].

A camphor based drug called 714-X, was developed by a Canadian researcher more than forty years ago and it was believed by some institutions, to be effective on the treatment of some patients with cancer, especially breast and prostate cancer [15]. Padma 28 is another multi compound herbal preparation, based on camphor formulas which have shown to be effective against chronic inflammatory diseases. The result of a study indicates that Padma 28 has the ability to suppress the development of autoimmune diabetes in female non-obese-diabetic (NOD) mice which could be an experimental model for type1 diabetes mellitus in human [16].

There are several applications known for different parts of Cinnamomum camphora tree. The study of Cinnamomum camphora leaves extract (CLE) has shown the protective effects of this extract against DNA damage and biochemical changes in mice caused by Atrazine (AT) which is one of the commonly used grasses and weed herbicides [7]. The widespread usage of AT has caused contamination in the environment, resulting in genotoxicity and biochemical disturbances in animals and human cells. In this experiment, all the tested tissues which were treated with CLE showed a significant and time dependent decrease in chromosomal abnormalities and DNA damage [7]. In the seeds of Cinnamomum camphora, two ribosome inactivating proteins (RIPs), Cinnamomin and camphorin are found which the studies have shown their inhibitory effect on the cultured carcinoma cells [17]. In addition, cinnamomin has shown to have inhibitory effect on the growth of solid melanoma in the skin of the nude mouse [17]. The application of RIPs can be very significant in drug development and crop-plant technology due to their toxicity against viruses, tumor cells, insects and plant fungal pathogens [18].

In recent years, the finding of carbon nanotubes (CNT) which are made of very light and strong fibers of one atom-thick sheet of carbons, rolled in tubes, have been very exciting developments with many applications in medicinal and industrial fields [19]. One of the most important uses of carbon nanotubes is in the cancer treatments. Single wall carbon nanotubes can be used as a drug delivery vehicle with high surface area to deliver chemotherapy drugs to the tumor cells and later, these purely carbon-made nanotubes can be excreted out of the body by biliary pathway without causing any toxicity [20]. Carbon nanotubes to this point are synthesized from purified petroleum products like methane, benzene, acetylene, and etc. However, camphor can be the environment-friendly, alternative

new option [19]. Camphor is a botanical hydrocarbon which is very cheap and can be easily cultivated without fear of shortages unlike petroleum products. Therefore, camphor is an excellent carbon source for the production of a high yield, high purity, and high efficiency carbon nanotubes in future [21].

## Discussion

Although herbal medicines and essential oils have been widely used in folk and modern alternative medicine for many years and have shown to be very effective in curing many symptoms and diseases, the misuse of them can be very harmful for the body causing serious problems [22]. Camphor intoxication has been reported in humans and especially children but mostly because of accidental ingestion or exceeding the recommended amount [3]. Camphor like any other medication should be used for certain patients with the indicated dosages and contraindications [3]. The concentration of 3% to 11% has been approved by the FDA for topical use as a pain reliever and anesthetic [23]. Camphor and other terpenoid compounds do not accumulate in the environment since many soil bacteria like *Pseudomonas putida* readily degrade these compounds [24].

Many studies have been done about the various applications and benefits of camphor in pharmaceutical, industrial and environmental fields. Camphor has been used traditionally for many years as a remedy for the relief of pain, inflammation and irritation in body and skin. Recent studies have more focus on the role of camphor in preventing and curing serious and life threatening diseases, when is used purely or combined with other treatments. The study on some of the species of Lauraceae family, shows that a number of extracts have significant antioxidant, anti-inflammation and anti-tumor activities [11,25,26]. These studies with valuable information indicate that Lauraceae tree species and other camphor containing plants could have very important potential nutraceutical and Pharmaceutical applications in the future, taking medicine just another step forward [26].

## Conclusion

In conclusion, suggests that camphor which has been used traditionally for many years, solely on patients suffering from different types of pulmonary asthma showed that the use of Camphor the present research was active, safe, non-toxic and possessed some immune-stimulatory characteristics with potent bronchodilator and anti-inflammatory properties and this was clearly indicated by the ability of the mixture to effectively reduce the two main components of the asthma disease, i.e. bronchial hyper responsiveness and airways inflammation.

It is noted at this stage that regular follow-up had been performed on a large number of these individuals treated with Camphor of the research. Different scans such as CT, X-ray, lung function and physical examination were used in the follow-up. The follow-up had been continued in some individuals for more than 8 years and under the supervision of medical doctors [27,28].

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