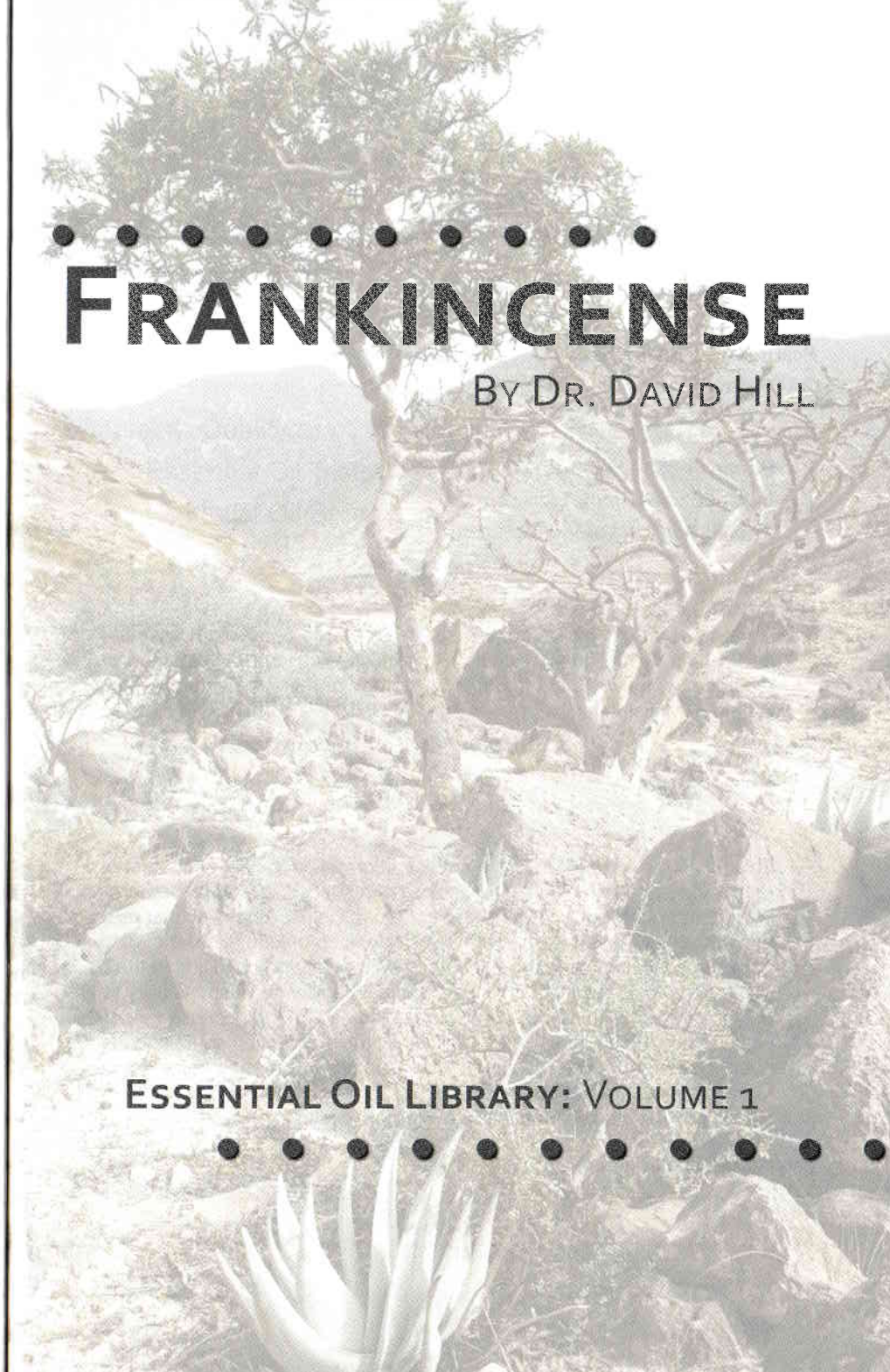

Frankincense

By Dr. David Hill

Essential Oil Library: Volume 1

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tent yet gentle means to maintain physical and spiritual health. Today, frankincense is still highly valued for its effects on the mind and body.

As our knowledge of frankincense oil and its amazing attributes increases, the worth of this valuable oil continues to rise. Frankincense, and its precious and volatile compounds, is fast becoming one of the most widely studied of all essential oils. There are a vast amount of both scientifically-documented and self-reported claims, all of which tout the value of frankincense. In my own experience, I have interacted with countless individuals who have had remarkable and quantifiable benefits using frankincense.

Current research shows that frankincense has a significant impact on the treatment and prevention of cancer. It has proven effective in treating tumors and bowel and respiratory conditions. Frankincense has also demonstrated clinical significance in the treatment of seizures and anxiety/depressive disorders.

One of the most pervasive health conditions today is inflammation. Indeed, it may be the most common underlying condition leading to diseased states in the body. There are many medical studies that indicate the value of frankincense essential oil in the treatment of chronic inflammatory conditions like arthritis.

In this book I will review the science and evidence supporting the medicinal use of frankincense, but I will also share some of the many experiences I have witnessed firsthand through patient care. Frankincense is indeed "liquid gold," especially to all those who have or will experience its healing and preventative health benefits.

1 QUALITY

Assuming as much personal responsibility for our health and lifestyle choices as we are able is a good practice. Essential oils are a valuable component that improves the effectiveness of those choices. Unfortunately, most users of essential oils are unaware that there is a direct correlation between the benefits they receive and the quality of the essential oil they use.

I have become very aware of the fact that essential oils are available in many different variations; unfortunately, however, the quality of the oil in most circumstances is questionable. The primary purpose of

my scrutiny stems from the realistic viewpoint that efficacy of essential oils is of the utmost importance, especially when they are used for patient care. Models of personal use serve only to intensify the need for expected benefit. Synthetic or altered compounds in essential oils may be harmful when used for medicinal purposes and hinder the beneficial qualities of the oil.

Without question, the purity of an essential oil is its most important characteristic. Why then do individuals use essential oils that are of inferior quality? Unfortunately, it can be difficult to tell the quality of an essential oil through its aromatic properties and visual examination alone.

Due to a lack of standardization and appropriate review to ensure quality, many essential oils in the public market are substandard in their quality and are lacking any therapeutic value. The commercialization of essential oils has led to the production of cheap, synthetic variations, which in many cases can do more harm than good. Commercialized farming practices have changed the yield and composition of many plants and have therefore altered the quality of most essential oils produced. The use of pesticides and other chemical agents in agriculture is also a growing concern. Chemicals are readily absorbed into the plant and can be present as secondary compounds in the essential oil they produce. There are many factors that influence the individual characteristics of each essential oil, and the alteration of essential oils through synthetic variants may have negative health consequences.

It is unfortunate that many individuals erroneously believe that all essential oils are pure and, therefore, efficacious. Proper methods of growing, harvesting, and distilling essential oils are crucial. Poor production practices and the development of synthetic essential oil variations suggest that it is impossible to accurately identify purity without scientific analysis. Deceptive labeling and marketing strategies by many oil producers and distribution channels further complicate the issue of quality.

Individuals who knowingly or unsuspectingly use inferior quality essential oils often experience disappointing outcomes. I once visited with a young woman who was upset with me. She had listened to a CD recording on which I had spoken of the remarkable attributes of essential oils and their potent healing properties. On the CD, I had specifically mentioned lavender for the treatment of burns. A few days later she received a burn while cooking in her kitchen. Remembering my comments, she quickly applied lavender to her burn and waited for the anticipated pain relief and healing of her now blistered tissue.

Almost immediately the oil began to burn, and her injury become increasingly worse in the following hours. She had made a common mistake: the impurity of the oil had further exacerbated her injury. She believed all lavender oil was the same and learned the hard way that not all essential oils on the market are of the purest quality.

In the drug and pharmaceutical industry, the purity of any product falls under the strictest scrutiny and is generally quantified to mean the absence of germs and bacteria. For essential oils, the quantifier of purity is the absence of any unnatural or synthetic substance. Additionally, all components are identified in their proper proportional amounts and are native to the plant itself. In other words, there can be no addition, enhancement, or extraction of compounds. Essential oils that meet these criteria are said to be in their "native state." It is costly to produce and maintain essential oils in this native or pure form.

To cut costs, many essential oil producers and private channel suppliers dilute their oils to increase distribution volume. The volume extension of oils is accomplished in many different ways.

Oils can be fractionated, meaning the oil has been separated into parts. They are often adulterated, which means the oil has been made impure by adding supplementary ingredients. Essential oils can also be cut, meaning that specific chemicals or compounds are isolated and then removed from the oil. Any of the above terms indicate that the oil is no longer in its pure form.

Common practices enabling a greater volume yield include blending or mixing substandard, less expensive plant species and blending impure essential oils with lesser amounts of higher grade oils. These methods are deceptive to consumers. Blending oils in this way creates stable aromatic properties and alterations of the oil's chemical constitution that are undetectable without specialized testing.

Increasing levels of toxicity and environmental pollutants, like heavy metals, have added new and distinct challenges for plants and the oils they produce. This means that additional testing models are now becoming necessary to guarantee the safety and potency of medicinal quality essential oils.

There are many tests used to ensure the purity of essential oils. Individuals who are proficient at administering and interpreting these specialized testing procedures spend years developing the proper education and experience qualifications. The following are the most common tests used to give accurate, reliable data on the quality of essential oils.

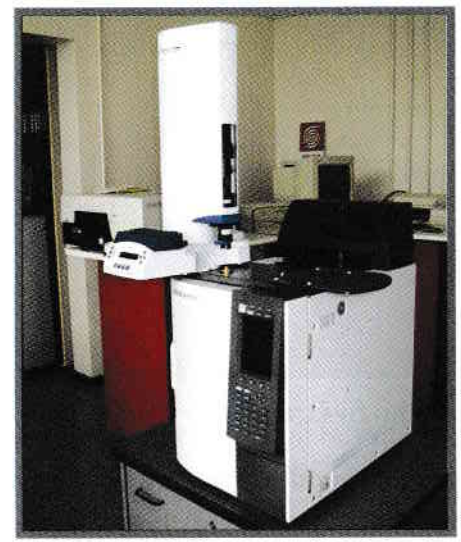
Essential Oil Tests—

Gas Chromatography

Gas Chromatography, also referred to as Gas Liquid Chromatography, or GLC, measures the constituents in a particular essential oil sample by plotting the items on a graph. When heated, the different constituents vaporize at different rates of time. The gas chromatograph measures the constituents by how long they take to

vaporize and how much of each constituent is in the sample. This test by itself is insufficient to accurately determine quality levels. Gas Chromatography determines quantity of compounds but does not

"THE GAS CHROMATOGRAPH MEASURES THE CONSTITUENTS BY HOW LONG THEY TAKE TO VAPORIZE AND HOW MUCH OF EACH CONSTITUENT IS IN THE SAMPLE."

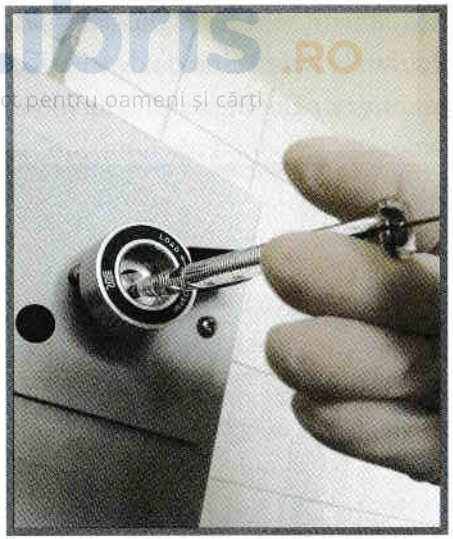


evaluate the origin of those compounds. This test is nonspecific for synthetic and natural derivatives.

Mass Spectrometry

Mass Spectrometry is used along with GLC in order to get a more accurate reading of the sample material. After the GLC finishes reading the different vapors, the compound is passed into the Mass Spectrometer where the vapors are sorted by their mass-to-charge ratio, weighed, and then the results are also charted.

In other words, the Gas Chromatograph separates the sample into its individual constituents, and the Mass Spectrometer identifies them and the percentage with which they make up the sample. Secondary comparative analysis of known chemical structure allows for detailed review of the source of each compound in the sample. Therefore, quality of the sample is more easily determined.



"THE MASS SPECTROMETER IDENTIFIES [THE INDIVIDUAL CONSTITUENTS] AND THE PERCENTAGE WITH WHICH THEY MAKE UP THE SAMPLE."

INFRARED SPECTROSCOPY (FTIR)

FTIR identifies the chemical bond functional groups by the absorption of infrared radiation that excites vibration modes in the bond. It identifies the chemical bonds of organic materials as well as any organic contaminates contained in the sample.

NIR FT RAMAN MICROSPECTROSCOPY

Raman Microspectroscopy is used to study intact cells and chromosomes. It can measure several secondary plant metabolites and is non-destructive, fast, and sensitive. It also conveniently requires only minimal sample preparation. It allows localization and identification of numerous plant components relating to their different medicinal and spice properties.[1]

HEAVY METALS TESTING

Certain tests such as Graphite Furnace Atomic Absorption (GFAA) and Inductively Plasma (ICP) show the amount of heavy metal content in essential oils. It is very important that essential oils used to support health and wellness are obtained from plants grown

in soil that is free of heavy metals and other types of toxicity so that these substances aren't absorbed into the plant material.

Many producers of essential oils claim that their products are therapeutic grade; but when subjected to the tests listed above, they prove to be lacking in any therapeutic value. Essential oils are often chosen only for their aromatic quality instead of for the constituents that give them their proper chemical makeup.

Currently, essential oils are either reviewed for their safety as food additives or as commercial aromatics commonly used for perfumes, cosmetics, and beauty products. These types of oils are also utilized for household and commercial-grade cleaning products. There are three distinct standards which govern these two primary categories. The standards require that proper research be done to ensure safety when oils are used in the way in which they are intended within each specific market or industry.

ESSENTIAL OIL STANDARDS—

The first standard is AFNOR, an acronym for the Association French Normalization Organization Regulation. AFNOR acts as the central operator in the French standardization system, ensuring that products meet the standards required for use in the marketplace. AFNOR standards typically refer to the appropriate levels of compounds present in an essential oil. In general terms, it is an assessment for content not quality.

AFNOR actively reviews which compounds should be present in the oil but does not differentiate between synthetic and naturally-occurring variations of those compounds. It is primarily believed to be a standard developed for use in the perfume industry. Oils meeting this standard generally have no or limited medicinal value. Although their aroma may be alluring, synthetic aromatics have been proven to be less effective and in some cases damaging to health.

EC AFNOR is essentially the same as AFNOR but denotes specific analysis from France. The standards practiced for EC AFNOR are identical to AFNOR.

AFNOR and EC AFNOR chemical profiling is produced by means of the Gas Chromatography (GC/GLC) testing procedure outlined previously. By itself, the test is insufficient to determine the purity and nature of the compounds present.

The second standard is produced by ISO, the International Standards Organization. The ISO creates specifications and criteria to be used consistently in classifying materials to be produced. This standard has a broad scope of applications that include several types of industry—the essential oil industry being one of them.

The standards they produce ensure that consistent criteria are met for specific industries and for any products intended for public use. ISO standards may serve the needs of particular industrial sectors; they do not entirely address the unique needs of the aromatherapy profession. Not all essential oil data produced by the ISO and AFNOR is accurate to one another by way of comparison. Each organization offers some variables in their assessment and the standard they endeavor to enforce.

Some essential oils are labeled as AFNOR or ISO Certified. Many essential oil producers see this label claim and certification as desirable because AFNOR and ISO allege that their standard and approval process defines therapeutic quality or "therapeutic grade."

Depending on how the term "therapeutic" is defined, their claim is unwarranted and, consequently, neither standard should be seen as a quality mark for medicinal benefit. The existing definitions of therapeutic in relation to current standards refer only to the amount and chemical classification of compounds present in an essential oil. For example, in order for lavender oil to be considered lavender, it must have specific percentage values for identified constituents.

These percentage values are often expressed as a range or variable amount. Variations in each of the compounds present is an acceptable discrepancy due to unpredictability in growing conditions and the unique properties in each individual plant harvested for essential oil production.

Lavender essential oil according to AFNOR and ISO criteria should have 25 to 38% linalool, 25 to 45% linalyl acetate, and so forth. If percent values are deemed appropriate for the type of oil being analyzed, then it is considered to be within therapeutic range. This means it has the ideal composition chemically for that oil.

Ideal chemical composition does not make an oil therapeutic unless each of those compounds has been properly analyzed for its purity. It is this more refined critique of essential oils that determines their quality and therapeutic benefit. Therapeutic value can only be determined when chemical composition and purity are identified simultaneously. Current market standards and analytic practices do not meet this specialized process and offer instead a limited scope of examination through partial scientific validation.

The third review process is GRAS, which stands for Generally Regarded as Safe. A GRAS designation delineates that the product is generally recognized as safe under the conditions of the product's intended use. This standard applies specifically to essential oils used as food additives and is determined by the Federal Food and Drug Administration. Oils utilized in the food industry are standardized for chemical consistency, which means they are either completely or partially synthetic.

United States Pharmacopoeia (USP) Grade A is a standard used in both the food and fragrance industry. USP establishes minimum chemical profiles, which are generally produced through artificial manipulation of the essential oil. This is most often accomplished by adding synthetic components or by refining the oil to remove