

The Anal-retentive's Guide to Oil of Abramelin

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Oil of Abramelin constitutes one of the essential magical tools for the Thelemic magician. The instructions for its manufacture come originally from *The Book of the Sacred Magic of Abramelin the Mage* (S.L. MacGregor Mathers translation):

You shall prepare the sacred oil in this manner: Take of myrrh in tears, one part; of fine cinnamon, two parts; of galangal half a part; and the half of the total weight of these drugs of the best oil olive. The which aromatics you shall mix together according unto the art of the apothecary, and shall make thereof a balsam, the which you shall keep in a glass vial which you shall put within the cupboard (formed by the interior) of the altar.

Aleister Crowley gave his own recipe, derived from this, in *Magick in Theory and Practice*:

This oil is compounded of four substances. The basis of all is the oil of the olive...In this are dissolved three other oils; oil of myrrh, oil of cinnamon, oil of galangal...This oil cannot be prepared from crude myrrh, cinnamon, and galangal. The attempt to do so only gives a brown mud with which the oil will not mix. These substances must themselves be refined into pure oils before the final combination.

Crowley gave precise proportions for the oil in his commentary to the *Book of the Law, The Law is For All*:

Oil of Abramelin: take eight parts of oil of cinnamon, four of oil of myrrh, two of oil of galangal, seven of olive oil.

The reader may notice that Crowley's formula keeps the same proportions as those given in *Abramelin*, although the constituents listed in the latter are in crude form (myrrh "in tears" for example), while Crowley advocates the use of pure essential oils. Crowley also measures the olive oil as half the *volume* of the other oils rather than half the *weight*. This method produces an oil of considerably greater strength than would be obtained through the "art of the apothecary" performed upon the raw materials. It is even more unlikely that Crowley's method was that used by the author of *Abramelin* when we consider that the magician is instructed in that work to anoint his eyes with the oil before going into the temple. Following this procedure with Crowley's oil would result in the immediate need for medical attention due to the caustic property of pure cinnamon oil.

It may be that few Thelemites are aware that the recipe from *Abramelin* is certainly a corrupt translation of, or at least a variant based on a verse from the Tanakh, Exodus 30:23-25, where Yahavah commands Moses to make the oil of anointing thus (KJV translation):

23 Take thou also unto thee principal spices, of pure myrrh five hundred [shekels], and of sweet cinnamon half so much, [even] two hundred and fifty [shekels], and of sweet calamus two hundred and fifty [shekels], 24 And of cassia five hundred [shekels], after the shekel of the sanctuary, and of oil olive an hin: 25 And thou shalt make it an oil of holy ointment, an ointment compounded after the art of the apothecary: it shall be an holy anointing oil.

There are major differences between this recipe and that given by *Abramelin*. First, the *Abramelin* formula omits cassia from the list of spices and specifies galangal rather than “sweet calamus.” Second, the amounts of the ingredients are specified in precise weights and measures, the shekel for weight, and the hin for volume. Third, the proportions are quite different. Where *Abramelin* gives proportions of 4:2:1 for the cinnamon, myrrh, and galangal, Exodus gives proportions of 1:2:1. Even if we add the two parts of cassia to the total for cinnamon¹, the proportions are only 3:2:1².

If the passage from *Abramelin* is a mistranslation, it is small wonder, for Mathers’ translation was from an 18th century French translation of a 17th century German translation of a supposed Hebrew original³, now lost, published in the 15th century. Even if accurately transmitted through several centuries and translations, there are reasons to suspect that the recipe given is either simply an error, a blind, or intentionally altered. The wording of the *Abramelin* formula is close enough to the wording in Exodus that it is impossible to entertain the idea that they were conceived of independently. The most parsimonious explanation is that the author made an error in transcription, albeit a rather grave one. However, for a Jew, making the holy anointing oil according to the recipe given in the Tanakh and anointing oneself with it would be a grave violation of the Mosaic Law.⁴ A recipe significantly different in its details would not carry the same censure. The formula may have been changed by the author of *Abramelin* for purely practical or aesthetic reasons as well – he may have found the recipe in Exodus too difficult to interpret, for example. *The Greater Key of Solomon* is more direct in citing Exodus as the source for the recipe for the anointing oil:

¹ Cassia, *Cinnamomum Cassia*, is known in the United States as “cinnamon” due to its gross similarity to the “true cinnamon,” *Cinnamomum zeylanicum*. There are perhaps 16 different species of *Cinnamomum*, of which *zeylanicum* is universally considered the best for perfumery and culinary uses.

² A German manuscript apparently independent of and more extensive than the French one used by Mathers specifies only one-half part cinnamon, which would bring the proportions into accord. However, this apparent error may actually argue in favor of the author’s familiarity with the Talmud. I will return to this issue in the following pages.

³ The authorship, date, and publishing history of *Abramelin* is somewhat sketchy. A Hebrew edition exists in the Bodleian Library, but according to Jewish scholar Gershom Scholem it was apparently translated from a German text. Scholem in fact is of the opinion that the author was not a Jew at all.

⁴ Oddly enough, according to the Talmud, gentiles may be anointed with the holy anointing oil without defilement. Talmud Keritot 6b states “One who uses the official anointing oil [that has been consecrated] to smear on an animal or vessels is innocent of violating the holiness of the oil, to smear on gentiles or corpses is innocent. Certainly an animal and vessels as it says “It shall not be smeared on flesh of man...” and an animal and vessels are not man. One who smears on corpses is also innocent since it is dead it is called a corpse and not a man. However, why is one who smears on gentiles innocent? They are men! No, as it says (Ezekiel 34:31) “Now, you [Israel] are My sheep, the sheep of My pasture, you are Man...” You are called Man and gentiles are not called Man.”

"Let the perfume and the holy anointing oil be made as is set forth in Exodus, and other holy books of the Bible."

Given the variety of instructions for preparing the holy anointing oil, the question arises as to which is best. The simplest method of production is certainly Crowley's. It requires only the purchase of a few drams of essential oil, today easily come by commercially, and a vessel in which to combine them. Some Thelemites may feel that the recommendation of the Prophet of the New Aeon certifies the recipe beyond further question. However, *Liber AL* specifies "Oil of Abramelin," which would seem to imply the precise recipe given in that work rather than Crowley's altered and simplified version of it. Yet, if the recipe given in *Abramelin* is merely a corrupt reference to the holy oil described in Exodus – lest we forget, the oil used to anoint King Solomon, giving him the divine authority to command the spirits according to the mythos in which *Abramelin* is rooted – then there is no question that the most authoritative formula is that found in the original Biblical sources. It is the opinion of the author that any reasonable approximation with which the individual magician is satisfied will work as a practical ritual tool. However, because the author is anal-retentive in such matters, it is also his opinion that the most difficult and arcane method is usually better than the convenient or manifestly sensible method, at least for magical purposes⁵. The following analysis is testament to this fact, and will aid those of similar inclination to pursue their folly to the accomplishment of the Work.

Let us first examine the Hebrew version of the recipe given in Exodus (author's translation):

Exodus 30:23							
ואתה	קח-לך	בשמים	ראש	מר-דרור	חמש	מאות	וקנמן-בשם
And take	unto you	spices	first, chief	freedom-myrrh	five	hundred	and sweet cinnamon
מחציתו	חמשים	ומאתים	וקנה-בשם	חמשים	ומאתים		
half of [this], even	fifty	and two hundred	and fragrant cane	fifty	and two hundred		
Exodus 30:24							
וקדה	חמש	מאות	בשקל	הקדש	ושמן	זית	הין
and cassia	five	hundred	by the shekel	[of] the holy [place]	and oil	[of] olive	a hin

Translated more naturally, in the most common translation by Jewish scholars, this becomes "Also take fine spices: of liquid myrrh, five hundred shekels; and of fragrant

⁵ In all seriousness, there is much to recommend doing things "the hard way" when it comes to the construction and keeping of magical implements. If we take seriously the sacred nature of our working tools, then we have an obligation to expend the time, labor, or money necessary to imbue them with personal significance. The ancient principle is that some sacrifice should be made. The chaos magician may reply that he can make an umbrella found on the street into a wand as powerful as any made of almond wood or lightning-struck oak by wishing it to be so. This may or may not be true, but the author has always found the depth and quality of magical operations to improve in direct proportion to the personal resources and artistry expended in their performance.

cinnamon half as much, even two hundred and fifty; and of fragrant cane, two hundred and fifty; and of cassia five hundred, after the shekel of the sanctuary; and a hin of olive oil.” However, we have to examine several points of translation before we can consider turning these verses into a practical recipe. Scholars dispute several of the terms. The chief problem is the names of the plants. Historically, plant names are notoriously fluid, and even now the scientific classification and naming of different species is far from settled. To take one example, a North American plant, *Asarum canadense* is called “wild ginger” although it is of a completely different genus and species than the culinary ginger, *Zingiber officinale*, based purely on a similarity of odor. In Mathers’s translation of *Abramelin*, he specifies galangal where Exodus gives *qaneh-bosm*. On what authority is this identification based? We have no way of knowing for certain, but several different identifications have been made by other sources.

The first disputed term is “liquid myrrh,” *mor-deror*. *Mor* is the usual word for myrrh in Hebrew, which may or may not be the same substance as the resin that is now known as myrrh. The resin now called myrrh is from the shrubby tree *Commiphora myrrha* var. *molmol*, but there are probably dozens of *Commiphora* species that exude similar resins. The resin is harvested in a number of ways. The bark of older myrrh trees apparently spontaneously cracks and releases “tears” of resin that are considered of the highest quality. The bark can also be mechanically scored, causing the sap to run to the surface. The sap is allowed to dry and then collected in a solid state. What is now called myrrh is a rather bitter substance of somewhat astringent odor, while that referred to in the Bible is often described as being sweet. We also have to contend with the modifier *deror*, which literally means “freedom” in Hebrew.⁶ In the Talmud, *mor-deror* is often referred to as “distilled myrrh,” but most Jewish sources translate the term as “liquid myrrh.” In the Greek version of the Tanakh, called the Septuagint, this passage reads το ανθος σμυρνης εκλεκτης, “the choice bloom of myrrh.” “Anthos” generally means the flower of a plant, but in this context, it is used metaphorically to signify anything that irrupts to the surface, such as blood.⁷

I would propose, based on the variant Greek⁸ reading, that what is being described here is not a liquid form of myrrh, such as the undried sap of the tree or some kind of extracted myrrh oil, but the myrrh that freely flows to the surface of the tree without artificial scoring. It is also possible that the myrrh referred to comes from the very rare species *Commiphora opobalsamum*, which is the source of the famous “Balm of Gilead”⁹ or “Mecca Balsam.” This variety of myrrh is very rare, almost completely unobtainable in commercial trade, and said to have an excellent, sweet odor. The tree is said to freely

⁶ Compare KJV Leviticus 25:10, where *deror* is translated “liberty.”

⁷ We have the same sense in the English word “bloom,” such as a bloom of algae or a bloom of sweat.

⁸ The Greek Old Testament, called the Septuagint or simply LXX, is considerably older than any extant version of the scripture in Hebrew. It was translated into Greek in the late 3rd or early 2nd century before the common era, while the orthodox Hebrew text, called the “Masoretic” text, was not set down until the 6th century CE or later. Biblical scholars disagree upon which text is closer to the original Hebrew (any general statement is probably facile), but it does seem that in several cases, the Septuagint preserves readings that have become lost in the more recent Masoretic text. For example, compare Exodus 12:40 in both versions.

⁹ This is definitely *not* the product sold now as “Balm of Gilead buds,” which are the unopened buds of a species of Poplar tree, *Populus Balsamifera*. Again, the similarity of name is only due to an ostensibly similar balsamic scent. It is also definitely *not* the sap of the “Balm of Gilead fir,” *Abies balsamea*, which is a Canadian native.

exude liquid sap in hot weather without the need for mechanical scoring. Furthermore, the Jewish historian Josephus relates that the tree was brought to King Solomon by the Queen of Sheba. Regardless of the historicity of the story, the connection may be germane, for the lover in the *Song of Solomon* is described several times as smelling of sweet myrrh. This would indeed be a kingly gift, worthy of notice and renown, providing Israel with a native source for one of its most holy essences.

In any case, for the purpose of making the holy anointing oil, it is very unlikely that Balm of Gilead can be obtained, but any high-quality *Commiphora* resin could be used. High-quality myrrh is reddish-brown (not dark brown or blackish), translucent, and has an oily sheen. When purchased in bulk, it is better to buy tears of myrrh than myrrh powder, simply because once the myrrh is ground, the quality is difficult to judge. You can see whether dirt, twigs, or inferior, opaque resins are present if you buy in tears, whereas these impurities are not evident once the resin has been powdered. *Commiphora myrrha* is the easiest to obtain, but *Commiphora holtziana*, often referred to as opopanax, is also frequently sold and is said to be less bitter¹⁰. The myrrh sold as “common myrrh” or “guggul,” although apparently from a *Commiphora* is of a fairly low grade and can be recognized by its darker color and waxy consistency.

The cinnamon and cassia listed in the Exodus formula (*qinomon* and *qidah* in Hebrew) are almost certainly the spices known by those names today. Both spices are the bark of trees of the genus *Cinnamomum* that is peeled off in thin strips and dried. In the United States, virtually all spice sold as cinnamon is actually cassia, the flavor of which is very similar to cinnamon but less refined and “hotter.” I am given to understand that in Europe, the situation is reversed, and that cassia is more rare than cinnamon. True cinnamon is sold in the United States as Ceylon Cinnamon, and is available as sticks or as a ground powder. One must be careful in buying Ceylon cinnamon; since it is a specialty item, it is often found in gourmet or specialty stores at a rather outrageous price. Either of these spices may be purchased in sticks or “quills” or else finely ground. If one has the means to grind the sticks at home, quills are preferable since ground cinnamon loses much of its essential oil rather quickly. The true cinnamon in particular has much less essential oil per ounce than cassia. Incidentally, one can always tell the difference between cassia and cinnamon by the way the sticks curl. Cinnamon sticks always curl into a single roll, but cassia bark curls from each edge to the center, so that it makes a double roll. Cinnamon is also a light-brown color and is very brittle, but cassia is a much darker reddish-brown and harder. Cassia can also be obtained in chips of bark rather than sticks – these are probably of an inferior grade.

A note on the cinnamon from the Talmud: for some reason, I have found several sources that state that the weight of the cinnamon in the formula should be *two* half-parts (500 shekels in two halves) of cinnamon instead of one. This goes against the orthodox translation of both Hebrew and Greek sources, which clearly only list one 250 shekel-measure of cinnamon, so it may not be a textually based interpretation, or it may be based on some obscure detail of Hebrew grammar that is taken to mean something unorthodox. If we add the extra 250 shekels to the 750 shekels of cassia plus cinnamon in the orthodox formula, we arrive at just the proportions of material that *Abramelin* says we should have: (2 cinnamon + 2 cassia), 2 myrrh, and 1 calamus/galangal. He just hasn't

¹⁰ It is the author's experience that even myrrh that smells bitter when burned does not have the same bitter note when infused in oil, and actually smells quite pleasant.

differentiated between cassia and cinnamon. Whether this implies that the author of *Abramelin* had studied the Talmud or is just a coincidence, I do not feel entirely qualified to judge. However, I am inclined to believe it is a coincidence because the specification of the amount of olive oil as half the weight of the other ingredients would result in requiring almost twice the amount of olive oil specified in the Exodus formula.

Another interesting variant, again, is the Greek text, which instead of cassia specifies ἰριδος, which means “iris.” This would be what is now known as “orris root,” the root of a member of the iris family, *Iris pallida*, that has no particular odorous virtue when fresh, but when dried takes on the distinct smell of the true English violet, *Viola odorata*. The variant is considered to almost certainly be a mistake, but it is tempting to wonder whether it might be accurate. After all, the Septuagint translation was done in the 3rd century BCE, and manuscripts older than any of the extant Tanakh scrolls have been found. Here, in Alexandria, for perhaps the first time ever, the sacred Hebrew scriptures were translated into a foreign language. The sages responsible for its translation lived in a city perhaps unrivaled in its cosmopolitan atmosphere, rife with Jews, Greek philosophers, Egyptian magician-priests, Buddhists, Zoroastrians, and Arabs. Might they, in the spirit of openness and tolerance that prevailed in Alexandria, have translated accurately a formula that only later was changed to jealously conceal the true secret of the holy anointing oil? Well, probably not, but it makes for a fun story.

The most controversial ingredient listed in Exodus is the *qaneh-bosm*, which literally means “fragrant cane.” Many plants have been proposed as the source for *qaneh-bosm*, including actual sugar cane (*bosm* can also be translated “sweet,” as it is in the previous verse for *qinomon-bosm*, or “sweet cinnamon”), marijuana¹¹, galangal, *Acorus calamus* (also called “sweet sedge” or “sweet flag”), and several fragrant grasses in the same family as the Thai lemongrass, *Cymbopogon citratus*. *Andropogon martinii*, also known as palmarosa grass, is of this family, and is known to have been used in Egyptian kyphi incense. It has a rose-like scent and was formerly used to adulterate pure rose oil for use in cheap perfumes. The Greek text has κλάμος, but this is no sure indication that *Acorus calamus* was intended. I have been unable to locate any authority other than Mathers himself for the identification of *qaneh-bosm* with galangal¹². There are two types of galangal in cultivation, the “greater galangal,” or *Alpinia galanga* and the “lesser galangal,” *Alpinia officinarum*, both of which are ginger-like plants used in the preparation of food and medicine in southeast Asia. Their native names are *khaa* and *kenkur*, respectively, so the similarity of sound may have been what led Mathers to make the identification. In any case, scholarly opinion tends to settle on *Acorus calamus* (also called *Acorus odoratus* in some sources), which also has a spicy ginger-like fragrance, as the *qaneh-bosm*.

This plant is very wide-spread in range and prolific in growth when cultivated, with several sub-species on different continents (the entire *Acorus* genus is believed to be old in evolutionary terms due to its primitive flower and leaf formation, hence its presence all over the world). Its use for both mundane and religious purposes is ancient. Remains of

¹¹ This identification is based on somewhat specious etymology and, I suspect, even more doubtful anthropology. It is known, however, that even in modern times, oil extractions of marijuana are used topically in Uzbekistan and parts of Afghanistan. (R. Rudgley, *The Encyclopedia of Psychoactive Substances*, St. Martin’s Press, 1998.)

¹² The term used in the text that Mathers translated into English was “calamus.”

calamus were found in the tomb of Tut-ankh-amun, and it is known to have been used in incense mixtures by both the Egyptians and Sumerians. Ancient Greek and Roman authors discuss its medical use in easing chest congestion. Cornelius Agrippa attributes it to the sun. It was often strewn on the floor of churches in England during the middle ages because the cane-like stalks themselves give a sweet fragrance when bruised. It is said to have been used in the “flying ointments” of medieval witches¹³, having psychoactive, stimulating properties in small quantities, and mescaline-like effects in larger quantities.

The various grasses mentioned earlier are a close second in terms of likelihood (or at least according to the authorities), but I find this an unlikely identification simply because the scent of ginger would seem to harmonize so much better with cinnamon and myrrh than a floral or citrus scent.

Calamus root can be bought fairly cheaply through most sources of herbal products. It is usually sold in a cut and sifted form, but the powder can also be found. As with any other herbs, it is better to buy the more whole form than the powder since the volatile oils evaporate from powders more quickly. Calamus is also used to flavor various liqueurs such as Benedictine, but I would imagine that the demand for it is generally low. This makes it important to be able to examine the product in person before buying to ensure that there is no moldy or rancid smell. It is also desirable to try to ensure that the root has not been peeled before being cut and sifted because most of the essential oils are present in the outer skin. The Asian cultivars of calamus from India and Japan are considered to have the better flavor & a higher essential oil content than the American or European varieties, but are also higher in chemical constituents that have been found to be carcinogenic when fed to rats. Calamus may be labeled as “toxic” or “poisonous” because of these findings, but it has been used for hundreds if not thousands of years as a flavoring or perfume ingredient. Of course, one has to use one’s own judgment about whether it would be suitable to use an oil compounded with calamus in cakes of light. I have not been able to find a source for fresh roots, but local herb farms may have them if calamus is grown locally. Galangal can be found in cut and sifted form, powder, or fresh from many Asian groceries. I have known at least one Brother to have made an excellent oil of Abramelin by macerating fresh galangal in gently heated olive oil. Palmarosa essential oil is fairly easy to find, but it seems that there is no market for the herb itself.

Olive oil is obviously the same today as in Biblical times, but there is the issue of what kind of olive oil to use. Most instructions for making Abramelin oil recommend against using the first-pressed or “extra-virgin” olive oil because it imparts its own scent to the finished oil. I have no idea why this might be undesirable since I rather like the scent of olive oil. Did the ancients refine and grade olive oil the way we do today? I have no idea, and of course the recipe does not specify, either in the Hebrew or the Greek. It is probably best to leave this to personal preference rather than make any definite statements.

Now that we have examined the gross constituents of the anointing oil, we can examine how it might have been compounded. What does the text mean when it says the

¹³ I have no desire to explore the true nature of what was called witchcraft in the middle ages, but the existence of such psychoactive salves is very well attested. Several recipes are extant, which also generally include dangerous psychoactives like henbane, belladonna, and mandrake. At least one modern researcher (Karl Kiesewetter) has died as a result of attempting to re-create and test one of these formulae, so their use is not recommended.

oil should be compounded according to the “art of the apothecary?” (Some texts have “perfumer.”) There are several options. The most obvious option, that the herbs and spices were simply macerated in the oil is completely untenable. Aside from Crowley’s objection that this mixture yields a “brown mud,” which could certainly be filtered to obtain the oil, we find that the sheer volume of the herbs and spices is too large to be steeped in the amount of oil specified. It is said in the Talmud that a hin of oil would not even moisten all of the solids. I will attempt to determine below the exact proportions in modern terms, but 1500 shekels is approximately 48 pounds of myrrh, cinnamon, calamus, and cassia, and a hin of oil is approximately one US gallon. So maceration is out of the question, even if for reasons other than those specified by Crowley.¹⁴

The gross constituents might have been steam-distilled, as they usually are currently, to yield essential oils, but the yields on the amount of constituents listed would be relatively small. The Talmud states that the solids were soaked in water and that the oil was then poured over the water. The water was then heated or boiled so that the oil-soluble portions of the matter would pass into the oil, which could later be skimmed off. This seems like a perfectly likely method, but may be less than optimal in the sense that the heat applied in the process would inevitably carry off some of the volatile oils that one would otherwise want to stay in the olive oil. The solid material could also be steeped in strong alcohol for some time, after which it could be filtered out and the alcohol driven off by gentle heating or evaporation, leaving what is called a “concrete” or, since the mixture contains a resinous compound, a “resinoid.” It would contain most of the essential oils in the gross matter, but also several plant waxes, resins, and alkaloids that are soluble in alcohol, but not in olive oil. The final step of compounding this resinoid with the oil might be somewhat messy as a result, but some combination of gentle heating, stirring, and filtration would allow one to get most of the oil-soluble compounds into the oil and separate out the other substances.

Another possibility for obtaining an oil very similar to that described in Exodus would be to determine the amount of essential oils in the substances listed and then add them to the appropriate volume of olive oil. It would necessarily be an approximation, but would be far simpler than steam or solvent extraction. In order to obtain a recipe using essential oils, such as Crowley gives, from the recipe in Exodus, we must first convert the ancient measures given in that book into modern equivalents. This is no easy task if we are after precision. Ancient weights and measures are a topic of less certainty than the identity of the substances used to compound the oil. Making the problem worse, precise weights and measures are rarely needed by the average person, so it is only recently, with the emergence of scientific methods, that the issue of rigid standardization has emerged. There is also the problem of vague language. Even in the English language, a standard ounce differs in weight depending on whether one is weighing gold or chocolate. We have Avoirdupois ounces for commodities and Troy ounces for metals. Likewise, there is evidence that there were at least two shekels in use in ancient Israel, one for precious metals and one for commodities, and that the standard may have varied over time. One may find estimates ranging from 11 to 16 grams, but the usual estimate found in

¹⁴ One Midrashic writer sees this as evidence of the miraculous powers of Moses, that he was able to steep so large a volume of matter in a gallon of oil and obtain enough oil back to anoint all the articles of the temple and still have enough to pour over Aaron’s head. Other writers more soberly concluded that this could not have been the method used.

dictionaries is “about half an ounce” (what kind?). Silver shekel coins unearthed in Israel weigh 14-15 grams, while scale-weights found in contiguous nations and the testimony of ancient authors place the weight closer to 17 grams. The Jewish Encyclopedia gives a value for the “shekel of the sanctuary” of 14.34 grams. The hin, a unit of liquid measure, is perhaps even more difficult to define. Most sources state that the hin was about equivalent to one US gallon. The Jewish Encyclopedia gives a larger value based on known Babylonian standards and Hellenistic sources, resulting in a hin of 1.6 gallons. After much consideration, it seems most advisable to use the values stated in the Jewish Encyclopedia for further analysis.

In the following table, I have tabulated the amounts of essential oils one might ideally expect to get out of the given materials. The percent of volatile oil is an average from several sources, as is the specific gravity, where more than one source could be found. I have also scaled down the formula to a total volume of 375 ml, but any volume could be calculated with the numbers given.

Constituent	weight (g)	% volatile oil	weight of oil (g)	specific gravity (g/ml)	volume of oil (ml)	volume of oil (fl. oz.)	%
myrrh	7170	5.25	376.42	1.0045	374.73	12.67	5.56
cinnamon	3585	.75	26.89	1.0320	26.06	.88	.39
calamus	3585	1.5	53.78	1.0745	50.05	1.69	.74
cassia	7170	3	215.10	1.0350	207.83	7.03	3.09
olive oil	5539.49			.912	6074	205.38	90.22
				Total	6732.67	227.65	100.0

375 ml formula:

Constituent	weight (g)	weight (oz.)	volume of oil (ml)	volume of oil (fl. oz.)
myrrh	399.36	11.97	20.87	.70
cinnamon	199.68	7.04	1.45	.05
calamus	199.68	7.04	2.79	.09
cassia	399.36	11.97	11.58	.39
olive oil			338.31	11.44
total			375	12.67

The table below compares all three recipes by essential oil content. The differences should be immediately apparent and will give a general indication of the relative differences in strength and odor. I have added the volumes of cinnamon and cassia from the Exodus recipe to accord with the Crowley and *Abramelin* recipes and set the volume of calamus oil as equal to one part.

Constituent	Abramelin ¹⁵	Exodus	Crowley
myrrh	15 parts	15 parts	4 parts
cinnamon	17 parts	9 parts	8 parts
calamus	2 parts	2 parts	2 parts (galangal)
olive oil	550 parts	242 parts	7 parts
essential oil:olive oil	1:16	1:9	1:0.5

From this table, it is apparent that Crowley's formula contains a greater predominance of cinnamon than either *Abramelin* itself or the Exodus formula. It differs from the Exodus formula chiefly in the great reduction in the proportion of myrrh oil. Of course, Crowley's formula also is much stronger, having more essential oil than olive oil. The *Abramelin* formula, although closer to the Exodus formula, is much lower in the proportion of essential oils, due to the specification that the olive oil should have half the weight of the other raw ingredients. An interesting feature of the Exodus formulation is that the proportions of each essential oil by volume to the volume of olive oil is quite close to the percentage by weight of essential oil in each of the raw ingredients.

Those who might object to the low proportion of essential oil in the Exodus formula should note that a 1:9 dilution of essential oil with carrier oil would not be at all unusual in current aromatherapeutic practice; in fact, it might be considered excessive. Of course, the proper proportion varies with the character of the oils used, but cinnamon and cassia oil in particular are only recommended for topical use at dilutions of one part per hundred or less due to the potential for sensitizing reactions.

¹⁵ Using the interpretation of the Abramelin formula where the "2 parts" of cinnamon are actually cassia, which is the most conservative interpretation of the text itself. The "Talmudic" interpretation given above is too speculative to justify further analysis, and in any case would result in a lower over-all yield of essential oil.