Araştırma Makalesi – Original Article

The Comparison of Grand Theriac Formulations in Canon of Avicenna and Two Manuscripts from Early Ottoman Medicine *

İbn Sînâ'nın Kânûn'unda ve Erken Dönem Osmanlı Tıbbına Ait İki Eserde Bulunan Tîryâk-ı Fârûk Formüllerinin Karşılaştırılması

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ABSTRACT

Since the earliest times in history, many works have been brought to the body on poisons, poisonings and antidotes which have attracted to mankind. Theriac is one of the most popular antidotes. According to Galen, Andromachus changed the recipe of mithridaticum and developed another compound antidote called galene. In time the name galene was changed to theriac. The theriac remedy used to use as an antidote against all kinds of venoms. It was believed that theriac both protected and cured from the venom of all poisonous animals such as snakes, spiders, scorpions, rats or mad dogs. The theriac was not only an antidote in an original sense but it was used in a very extensive way.

The theriac was carried over Turc-Islamic populations and used extensively. Also it was pronounced as tiryâq or diryaq among them. Different theriac recipes encounter in Turc-Islamic medicine. In this study, only grand theriac formulations are put emphasis on. These theriac compositions are called grand theriac (tiryâq al-fârûq), because they have ingredients much more than the others. In this work, it tried to compare the different compositions of grand theriac, which were used by Avicenna and two Ottoman medical manuscripts called Yâdigâr and Mucerreb-nâme.

Key Words: History, pharmacy, antidotes.

ÖZ

Zehirler ve zehirlenmeler tarihin en eski zamanlarından beri insanlığın dikkatini çekmiş, zehirler ve panzehirler üzerine pek çok eser vücuda getirilmiştir. Theriac ise bu panzehirler içinde en ünlülerinden biridir. Galen, mithridaticum yapımında kullanılan maddelere İmparator Neron'un özel hekimi olan Andromachus (M.S. I. yy.)'un bazı maddeleri çıkarıp ve bazı maddeler ekleyerek galene adını verdiği başka bir karışım imâl ettiğini belirtmiştir. Galene ifadesi yerine sonraları theriac ifadesinin kullanılmaya başlanmıştır. Theriac pekçok hayvanın zehrine karşı kullanılmıştır. Hatta yılan, örümcek, akrep, sıçan ve kuduz köpek ısırıkları için hem koruyucu hem de tedavi edici olduğuna inanılıyordu. Theriac sadece panzehir olarak değil bir çok hastalığa karşı da yaygın bir şekilde kullanılıyordu.

Andromachus tarafından geliştirilen bu theriac (tiryâk) bileşiminin İslâm kültürüne de geçtiğini görüyoruz. Theriac, Türk-İslam tıbbında da tiryak olarak telaffuz edilip panzehir anlamı yüklenerek kullanılagelmiştir. Zaman içerisinde farklı tiryâk formülasyonlarının oluşturulduğu ve farklı amaçlarla kullanıldığı görülmektedir. Bu formüllerden biri de Batı'da grand tiryâk olarak da isimlendirilen tiryâk-ı fârûkdur. Bu araştırmada İbn Sînâ ve iki farklı Osmanlı hekimi olan İbn Şerîf ve Şerefeddîn Sabuncuoğlu'nun verdiği tiryâk-ı fârûk formülleri karşılaştırılmıştır.

Anahtar sözcükler: Tarih, eczacılık, antidot.

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1. INTRODUCTION

The poisons and poisining have drawn attention of mankind ever since antiquities, and the voluminous works on poisons and antidotes have been written. It can be said that Nicander of Colophon was one of the prominent of who did that kind of studies in IInd century BC. Nicander was a physician, poet and Apollon priest. Among his famous works, there are two medical poem, *Theriaca* and *Alexipharmaca. Theriaca* consists of 958 couplets, and describes venomous animals and antidotes. *Alexipharmaca* consists of 630 couplets, and describes poisons and antidotes in general. Among the animals said in *Theriaca* there are viper, spider, scorpion, lizard, rat, flies, and some mythological animals. In *Alexipharmaca*, Nicander specifies the poisonous effects of wolf's bane, lead grass (frog grass), chanvrier, poison hemlock, henbane (hyoscyamus) opium, and some mushrooms. And also he explains therapeutical usage of leechs. Afterwards, *Theriaca* of Nicander have begun to be mentioned with poisons and antidotes. Thereafter, the antidote compositions such as *galene* and *theriac* have been made and used popularly.[1]

Overall, theriac is one of the popular antidotes, which has been used since ancient times to late 1800s. It is a compound drug, which contains several ingredients, and its content changes time-to-time, culture-to-culture, physician-to-physician. Additionally, Turc-Islamic physicians made different kinds of theriacs such as tiryâk-ı fârûq (grand theriac), tiryâk-ı erbaa, tiryâk-ı bershaisha etc. This article intends to compare different grand theriac contents which are mentioned by Avicenna, Ibn Sherif and Sheref al-Din Sabuncuoglu. In history of medicine literature, a similar study has not been done before. Another aim of this study is to state the differences between these grand theriac contents in a period of 400 years.

2. MATERIALS AND METHODS

As all historical study, it is important to expose the common historical backaround, at first a short history of theriac is tried to put forward. For this purpose, common history of medicine books was browsed, and the information about theriaca is collected. And also theriac usage of Islamic medicine is summarized. After that, in order to make a proper comparison the formulation of mithridaticum from *De Medicina* and the formulation of theriac from French Pharmacopoeia are studied on.[2,3] The reasons to make this study are mithridaticum is the origin of theriac and the formulation of theriac from the French Pharmacopoeia is the most recent theriac formulation found in textbooks.

In order to compare with Avicenna's Canon, two samples are chosen from early Ottoman medicine, Yâdigâr of Ibn Sherif and Mucerrebname of Sheref al-Din Sabuncuoglu. Afterwards, the ingredients of grand theriacs (tiryâq al-fârûq) in Canon of Avicenna are translated to English and Latin from Turkish translation of it. In this translation, Illustrated Polyglottic Dictionary of Plant Names written by Armenag Bedevian is used, and also internet sources are utilized. Hereafter the ingredients of tiryâq al-fârûq in Yâdigâr of Ibn Sherif and Mucerrebname of Sheref al-Din Sabuncuoglu are translated. All of these formulations are got together in a table to compare easily. As a source of Avicenna's Canon, the Turkish translation of it is used.[4] The modern Turkish translation of Ibn Sherif's Yâdigâr, and the transcribed version to the Latin alphabet of Mucerreb-nâme is utilized as a source of Ottoman grand theriac formulations from early stage of Ottoman medicine.[5,6] Although there are a large number of Ottoman manuscripts, which have theriac formulations, they have to be put out of this study in order to make a comparison easily and gather at one table.

This article is divided into six main parts. After introduction and materials and methods, it covers "A Short History of Theriac". In this part, firstly the information about mithridaticum takes place. Because it is thought that mithridaticum is the pioneer of theriac. Therefore, it has to be told how mithridaticum evolved to theriac, and hor theriac transferred to Islamic culture. Afterwards theriac in Islamic medicine was mentioned briefly. In fourth part, theriac formulations in Canon of Avicenna were stated concisely. Also in this part, three grand theriac formulations in Canon were detailed. Furthermore, it is mentioned that additional compounds in grand theriac such as viper tablets, sea onion tablets and stavesacre tablets. Similarly, in fifth and sixth parts, grand theriac in Yâdigâr of Ibn Sherif and Mücerrebname of Sheref al-Din Sabuncuoglu were mentioned. After sixth part, discussion and conclusion part takes place.

3. A Short History of Theriac

3.1. Mithridaticum, The Origin of Theriac:

The physicians all along have looked for an extensive way to refer to all the compound remedies, which were taken to treat all diseases, which arise for intrinsic or extrinsic causes. The poisons were in the first line among the extrinsic causes. The poisons and poisining have drawn attention of mankind ever since antiquities and the voluminous works on poisons and antidotes have been written. In antiquity, the poisining was a traditional weapon againist the enemies. Because of that, especially soverigns had to be act prudently against poisons and poisining. The foremost example of this condition was Mithridates VI Eupator (120–63 B.C.) king of Pontus in Asia Minor. While Mithridates VI was still a child, it was said that his mother poisoned his father, and he was witness of that attemption. Afterwards Mithridates became worried about being killed by poisining, so became obsessed with poisons. In order to protect himself he tried to develop a tolerance by taking small amounts of poisons daily as well as a mixture of antidotes.[7] He did experiments on criminals and slaves and studied systematically poisons in humans.[8] In addition Grout cites Aulus Gellius about experiments of Mithridates, "*Mithridates did also experimented with antidotes derived from the blood of Pontic ducks, which, says Pliny, suffered no harm, even though they were supposed to live on poisonous plants*".[9]

Mithridates also created a general antidote. In addition with that, as a result of his studies, he specified and indicated properties of medical plants belonged to 112 family, 330 genuses, 497 species, and 60 varieties from Pontic region[i]. It is said that the antidote called *mithridaticum* created by Mithridates VI consists of 54 drugs. But also Pliny has a skeptical approach about mithridaticum: "The Mithridatic antidote is composed of fifty-four ingredients, no two of them having the same weight, while of some is prescribed one sixtieth part of one denarius. Which of the gods, in the name of Truth, fixed these absurd proportions? No human brain could have been sharp enough. It is plainly a showy parade of the art, and a colossal boast of science".[10]

Vogt states that Galen cited the story of Mithridates VI as he intended to commit suicide after the defeat inflicted upon him by Pompey, he did not die from the poison.[11] According to Vogt, the recipe for this remedy was brought to Rome by the Emperor Pompey (103–29 B.C.) who demanded to protect themselves against poison.[11]

It is known that Galen has a respactable importance to come up to the present of mithridaticum and theriac formulations. In *De Antidotes I* and *De Antidotes II* of Galen, there are detailed informations about mithridaticum and theriac.[12] Furthermore Galen states that Andromachus (Ist century B.C.) the special physician of Emperor Nero created a mixture called 'galene' by adding and removing some matters of ingredients of mithridaticum (for example snake skin) states that the remedy called theriac, according to Galen, was created by Andromachus. According to Galen, mithridaticum consists of 41 components[ii], despite *galene* mixture of Andromachus consists of 55 components.[12,13] Both mithridaticum and galene was taken with water or wine orally, and also could be applied to skin or eye topically. It is known that, thereafter the word theriac was begun to use instead of galene. But in up to date sources, there is not any information when and how it happened.

It is known that theriac was derived from Greek therion, for wild beast especially venomous ones.[14] It was supposed that the only difference between theriac and mithridaticum was snake skin (or snake flesh). Terzioğlu indicates that mithridaticum recipe of Galen consists skink (a lizard from scincidae family), but theriac mixture never consists skink at all.[13] In addition, according to some sources, mithridaticum has less herbal compounds, does not consists snake flesh but consists lizard flesh, and also it is known that the quantity of opium of theriac mixture is more then mithridaticum indicates that mithridaticum consists of almost herbal compounds, it consists only skink and castoreum[iii] as animal compound.[12] Besides Galen states that he concentrates the ingredients on the best conditions for the water, wine and honey which make up the bulk of theriac.[11]

One version of mitridaticum was mentioned by Aulus Cornelius Celsus (ca 30 A.D.) in the fifth book of *De Medicina*. He refers Galen's De Antidotes II. And he gives the formula of mithridaticum.[2]

3.2.Theriac in Islamic Medicine:

It is seen that this theriac mixture created by Andromachus have passed to Islamic culture. Griffin and Tez cited that Paulus Aeginata (625–690 B.C.) was one of the person put on an act that theriac passed to Islamic culture.[12,15] Paulus Aeginata mentions both *mitridaticum* and *theriac*.[12] Once again according to Griffin, the books of Paulus Aeginata were used by Rhases (Muhammad ibn Zakariyā Rāzī, 854–930).[12] Paulus Aeginata suggested theriac including snake flesh against to venomous animals, fatal drugs, and scorpion bites.[16] Tez states that Yuhanna ibn Masawaih (died 857), Huneyn ibn Ishak (813–873), and Rhases mentioned theriac in their drug lists.[15] Pancaroğlu cited that Huneyn ibn Ishak translated *De Antidotes* of Galen during the translation movement in IXth century, and *Kitab al-Diryāq*, one of the leading Arabic sources about theriac, was collected from various different sources anonymously and ignoring historical aspects.[17] It is cited that also Maimonides (1135-1204) was informed both mitridaticum and theriac.[12]

Bîrûnî put emphasis on theriacs and gives information about various formulations of it. Bîrûnî says that about theriac:[18]

"*It (theriac) is effective against poisons. I do not know anything about basic drugs using to prepare this medicine. The known theriac is tiryâq al-fârûq. This theriac is known as mitridatus, and it is a reputed one. It is a mixture of drugs. Farûq means refreshing and something against poison. It is said that the indicator of a pure theriac is garlic. If a person had eaten garlic afterwards he/she has eaten tiryâq al-fârûq, the garlic odour would have taken away. Someones says that a perfect tiryâq al-fârûq taken in grape size removes garlic odour*."

4. Theriac formulations in the Canon of Avicenna

Avicenna (980–1037) gives uses of theriac and descriptions of various theriac formulas. According to him, theriac is good for intertinal obstruction of elder people, is used for frostbite as warmer, is used for harmful effects of some waters, is used against putrefaction caused by quartan malaria[iv], is used to return to normalcy of excessive purification (emetics, purgatives, exudatives) applied patients.[19]

Avicenna mentions three different tiryâq al fârûq formulations. Besides Avicenna mentions tiryâq al-fârûq is used for snake and scorpion bites, paralysis, epilepsy, leprosy, intertinal ulcers, liver and spleen illnesses, and also he indicates that the theriac formula of Andomachus is the best.[4] And also he indicates the dosage and application forms of tiryâk al-fârûq in different cases: "*In chronic cough, throcic pain, and pneumonia 500 mg of it mixed with honeyed water is given to patient consistently. If the patient has fever this dosage should be mixed with rosewater. If the patient has fever with chills, ague and vomitting this dosage should be mixed with water or 90 mg of tiryâk should be taken with 135 mg wine*".[4]

4.1.Tiryâq al-fârûq formulations in Canon of Avicenna

4.1.1.First formulation

The first tiryâk-ı fârûq formulation[4] is given in Table 1. According to Avicenna, the first formulation of tiryâk al-fârûq is prepared in this way: "*The soluble drugs should dissolve, dry drugs should be moisturized so they could draw water. After peeling of them (the herbs) and mixing them with honey, this mixture should be stored pots made from soil or lead or silver. But a little space should be separated because watered herbs move up. These herbs are 64 gr except honey and wine*".[4]

4.1.2.Second formulation:

The second tiryâq al-fârûq formulation[4] is given in Table 1.

Avicenna mentions how to prepare the second formula: "*These ingredients are mixed with about 6.45 kg honey. Saffron is pulverized and also myrrh, poppy and storax are pulverized separately. Nablus gum and galbanum are dissolved in balsam oil. In the same way, the vitriol is pulverized too. The rest of the drugs are pulverized and mixed with honey without foam. In this way a kind of paste is made. Afterwards this paste is stored in a soil pot and is used after four years. A dosage of 3.5 gr of it is taken with warm water when the stomach is empty*".[4]

4.1.3.Third formulation:

The third tiryâq al-fârûq formulation[4] is given in Table 1. Avicenna shortly describes the preparation of this formulation it as follows these ingredients are pulverized and mixed with honey and made a paste as said before.

4.2.The Ingredients of Compound Drugs in Tiryâq al-Fârûq in Canon

4.2.1.Viper tablets:

Avicenna says that every species of vipers was not suitable to make viper tablets.[16] The female vipers and skin thin ones have to be chosen. Avicenna describes the features of female vipers. “The male vipers have a characteristic feature as they have two fangs on both sides of their jaws. Avicenna continues; despite that the female vipers have only one fang. It has to avoid making cornified, striped, colourful and whitish ones. In that case, it has to not use the vipers, which live in swamps, canyons, riverbanks and seasides. And also the shaped leather ones are not appropriate for this purpose. In that case the vipers, which live in far from damp places, have to be caught. The slow ones should be caught but if a viper raises its head and moves fast, it should not be caught. When a viper got caught without delay its head and tail should be cut four fingers long”.[4] Also Avicenna mentions other viper species: “There are other good species of vipers such as bravely reacted ones, big eyed ones, and which have overhangs at the ends of the tails”. [4]

He describes how to prepare viper tablets as following: [4]

“After viper’s death, the internal organs especially gallbladder are removed very carefully, and the body is washed with salty water, and it is kept in this solution. If this is mixed with dill weed (*Anethum graveolens* L., *Apiaceae*) it means there is no difficulty. It has to cook until it separates from meat bones. Its bones are separated from flesh and its flesh is pounded in a muller mildly. The physicians advise whom is interested in this process to inhale balsam oil and to apply balsam oil their hands. When this mixture is pulverized it has to use in various compositions. But any mixture, which Andromachus does not mention, must not be added to it. Finally using this mixture, the small and smooth tablets are made, and dried in shade. Neither before nor after these tablets must not be exposed sunshine directly. Because the direct sun shine makes the tablets dry, so it damages the positive effects of viper flesh on snake bites and orally taken poisons”.

4.2.2.Sea onion tablets:

Avicenna describes the recipe of sea onion tablets as it follows: [4]

“The selected sea onions must be fresh, compact, and medium sized. They should not be covered with soil, but they should be covered with yeasts. Either the sea onions are parched in a hot pot, or roasted in oven till to be reduced to ash, or fried in bread pan properly. Afterwards soft parts of them should be pulverized, and mixed with fresh pea flour. Andromachus uses pea flour twice as much as sea onions. The other physicians use equal amounts of them. This mixture is formed to thin and small tablets. As a precaution, before this process, hands should be rubbed with rose oil. Finally, these tablets are kept as viper tablets”.

4.2.3.Stavesacre tablets:

Avicenna describes the recipe of stavesacre tablets as it follows: [4]

The following drugs are pulverized. 27 grams of Myrtle stool (*Myrtus communis* L., *Myrtaceae*), Gummi tragacanthae, Arabian costus roots (*Costus arabicus* L., *Zingiberaceae*), Melissa (*Melissa officinalis* L., *Labiatae*), Asrabacca (*Asarum europoeum* L., *Aristolochiaceae*), Cardamon (*Amomum cardamomum* Willd., *Zingiberaceae*), Mastic tree (*Pistacia lentiscus* L., *Anacardiaceae*), Bachelor button (*Centaurea cyanus* L., *Compositae*), Ox-eye daisy (*Leucanthemum* L., *Compositae*); 108 grams of Aloe (*Aloë vera* (L.) Burm.f., *Xanthorrhoeaceae*); 72 grams of Spikenard (*Nardostachys jatamansi* (D.Don) DC., *Caprifoliaceae*), Cinnamon leaves (*Laurus cinnamomum* L., *Lauraceae*); 49.5 grams of Saffron (*Crocus sativus* L., *Iridaceae*)

After pulverization process all of them are mixed with old fragnant wine (sweet basil wine) and this mixture is turned into a kind of pasta. Afterwards it is formed into tablets, and dried in the shade, and protected like viper tablets.

4.2.3.1. The other recipe for stavesacre tablets:

Avicenna describes the other recipe of stavesacre tablets as it follows: [4]

The following drugs are pulverized. 81 grams of Myrtle wood, Gummi tragacanthae, Arabian costus roots, Asrabacca, Melissa, Cardamon, Mastic tree gum, Ox-eye daisy, Bachelor buton; 54 grams of Saffron, Spikenard, Cinnamon leaves; 63 grams of Aloe.

After pulverization process this mixture is formed into tablets as in previously said recipes, and dried in the shade, and protected like viper tablets.

4.2.3.2. Another recipe for stavesacre tablets:

Avicenna gives another recipe for stavesacre tablets a sit follows: [4]

27 grams of Myrtle root peels, Asrabacca, Spikenard, Melissa, Chinese cinnamon (*Cinnamomum cassia* Blume, *Lauraceae*), Common germander (*Teucrium chamaedrys* L., *Labiatae*), Mastic tree, Saffron; 54 grams of Watercress (*Nasturtium officinale* R. Br., *Brassicaceae*), *Delphinium saniculaefolium* Boiss., *Ranunculaceae*; 90 grams of Bachelor buton; 108 grams of Cinnamon, Cardamon, Aloe.

All of these drugs are pulverized properly, mixed with pure wine, and this mixture is turned into a kind of pasta, is formed into tablets as in previously said recipes.

5. Tiryâq al-Fârûq (Grand Theriac) in Yâdigâr of Ibn Sherif:

It is known that Ibn Sherif wrote Yâdigâr by utilizing Avicenna and Ibn Baitar. But it is controversial when he wrote and who he dedicated this book. But it was written about the first half of the XVth century. Yâdigâr mentions hygiene, symptomatology, pharmacology and treatment. The ingredients of tiryâq al-fârûq in Yâdigâr[5] are given in the Table 1.

Ibn Sherif mentions the indications of tiryâq al-fârûq as follows:[5]

“The bites of big and other snakes, scorpions and a spider called ‘bö’, mad dog bites, melancholic diseases (black bile connected diseases), leprosy, epilepsy, paralysis, apoplexy, phlegmatic hemiplegy, facial palsy, anxiety, phlegmatic or melancholic heart diseases, dyspnea, phlegmatic patients, aphony, phlegmatic vertigo, dropsy, spitting blood by coughing, phlegmatic gripes, intestinal infections, melancholic and phlegmatic intestinal ulcers and pains, kidney and urinary bladder pains, bladder stones.” And also he says it is good for malfunction of liver and spleen, chills, and shivering. It is diuretic and it helps the ejection of dead baby from uterus. It removes evil winds in liver, swellings of liver and spleen, ulcers in spleen”.[5]

Ibn Sherif gives some information about the preparation of tiryâq al-fârûq:[5]

“Opopanax, poppy, acacia, extract of salsify, oriental sweetgum, and gum ammoniacum plant are pulverized in wine. And also elder tree oil pounded in a little wine. All the other ingredients are rubbed with wine-elder tree oil mixtures. After this process, the first made compound (pulverized in wine) is mixed with thickened honey. Afterwards all the blends are mixed with each other. This mixture is kept in silver or chine pot in six months in barley”.

5.1. The Ingredients and Preparation of Compound Drugs in Tiryâq al-Fârûq in Yâdigâr:

5.1.1. Aqrâs al-unsuli (Sea onion tablets):

Ibn Sherif describes the sea onion tablets preparation as it follows:[5]

Sea onion is coated with pasta and baked rather good like bread in tandour. After it is cooled, it is peeled off and pestled until the ointment consistency. Afterwards common vetch is added twice the weight of sea onion paste. This mixture is pestled until it becomes flour. At the end, after almond oil is added, it is formed into tablets.

5.1.2. Aqrâs al-enduruhûrûn:

This compound is one of the important ingredients of the tiryâq. The recipe of it is described as following:[5]

The ingredients are Spiny broom (If this can not be found instead of it the following herbs can be used; 6 misqâls[v] asrabacca, 6 misqâls azhir al-makkah[vi] and 12 misqâls lamb's quarters [24 misqâls cinnamon can be used instead of lamb's quarters if it can not be found]; 24 misqâls of Clustered cardamoms, Corn chamomile; 12 misqâls of Saffron; 6 misqâls of Madder, Cassia tree, Mastic tree.

All of these ingredients are pestled and mixed with a kind of fragnant wine. Afterwards the person, who would prepare it, greases his/her own hands with balsam of mecca and makes little tablets from this mixture. These tablets are saved and dried in the shade.

5.1.3.Aqrâs al-af'i (Viper tablets):

"Aqrâs al-af'i" means viper flesh briefly. Ibn Sherif tells us which viper is suitable for tiryâq and how it is prepared.[5] He says female viper is more convenient to make tiryâq. But this female viper has should have four poison fangs, her colour should be reddish grizzle, and also the viper should be young and healthy. He says that the signs of its youth and health are its speed and to remove its head while creeping. After the viper get caught, immediately it must be killed without suffering inflicted, should not be left thirsty, and should not get sick. It should be cut from its head and tail four fingers inside. Afterwards its abdomen is cleaved and cleaned. Once skinned, it is washed in salty water then distilled water. Then it is cooked in sealed pottery or tinned copper cauldron until its flesh is separated from the bones. Afterwards it is filtered and the flesh is pounded in a stone muller. A bread is made from leaven, then this bread is pulverized. The pulverulent bread is added to cooked viper flesh as ¼ of it, and this mixture is pounded and kneaded properly. If it is dry, the water viper cooked in is added drop by drop. The little tablets are made from this pasta with viper flesh as 1 misqâl extent. These tablets are dried in shade by spinning until they release all their humidity. Afterwards they are saved in a ceramic pot.

6. Theriacs in Mucerrebname of Sheref al-Din Sabuncuoglu:

Ottoman physician Sheref al-Din Sabuncuoglu (1385 – after 1468) is mostly known his work named Cerrâhiyye al-Hânie. But Mucerrebname is one of his important works. According to Bayat, he wrote this book in 1468, when he was 83 years old, and he classified medicines as usage types in 17 titles such as dragees, ointments, syrups, pulverized ones, enemas, pastes, cataplasms.[20] And he explains how to use them in which condition. In Islamic medical tradition classification used to be made from head to feet. On the contrary the classification of Sabuncuoglu was begun from the most used ones.[21] According to Şar and Suveren, in his work, Sabuncuoglu put in order the effects and usage extent of theriac one by one, he registered positive and negative changes of patients during treatment, he regulated the dosage of theriac on patients and also stated efficient amount of theriacs experimentally.[21] He also mentions different theriac versions.[21] Even Sabuncuoglu had made an experiment by using theriac on himself and recorded the consequences as follows:[6]

"… one day an ophiuchus came to me. He prided himself on that he had a very poisonous viper. I had eaten this theriac before and I said him "bring your viper". He got his viper and I made middle finger of my left hand bitten by it. Afterwards I made syrup with this theriac and applied theriac where viper bit. During the effection span of poison there had not been any changes neither in my finger nor to my body…"

6.1.Tiryâq al-Fârûq (Grand Theriac) in Mucerrebname:

Sheref al-Din Sabuncuoglu mentions this theriac is used instead of tiryâq al-fârûq. In this formulation Sheref al-Din Sabuncuoglu did not give any information about the quantity of ingredients. The ingredients of this mixture[6] are given in Table 1. He says it is used for psychological and neurological diseases as strengthening and heart-reinforcing, digestive system, joints, spleen and kidney diseases, and poisonings.[6]

7. DISCUSSION AND CONCLUSION

As seen in the Table 1, in the grand theriac formulations have ingredients from different sources such as herbal, animal and mineral. But mithridaticum has no mineral ingredient. Although Griffin and Terzioğlu mentions the presence of skink, lizard skin, and castoreum in mithridaticum as animal-derived drug, despite that according to our source, mithridaticum includes only castoreum.[12]

As seen in the table, in theriac formulations the fresh viper meat is used only in theriaca from the French Pharmacopoeia (45.888 gr) and tiryâq al-fârûq in Mucerrebnâme.[3] In other theriac formulations (from the Canon and Yâdigâr) the viper meat is used as processed viper tablets. In Avicenna's Canon, the viper tablets are used in 108 grams, but in the Yâdigâr they are used in 115.45 grams.[4,5]

It is very difficult to compare whole ingredients one by one. But it should be necessary to put emphasis on some points such as the drugs take place in only one theriac type, and the drugs take place in whole theriacs. Asafoetida, cat thyme, citronella grass, elder tree oil, elder tree seeds, lesser bindweed, nape, nutmeg tree, oil of vitriol, oriental sweetgum fruits, rocambole, salsify, silk tree, turpentine tree gum, and white mustard take place only in tiryâq al-fârûq in Yâdigâr.[5] In the same way, cassia tree leaves, cherry tree, Egyptian lupin balm, hypocist, pepper cress seeds, sealing wax, sweet trefoil, sweet vernal grass, water lilly root, and white lilly take place only in first formulation of tiryâq al-fârûq in Canon of Avicenna.[4] In this way it can be mentioned for other formulations. The other important output is the ingredients take place all the theriac formulations. Common cinnamon tree peel, myrrh, and poppy are situated in all theriac formulations.

The sea onion tablets or fresh sea onion are used except mithridaticum and tiryâq al-fârûq in Mucerreb-nâme. But in third formulation of Avicenna it is seen that both sea onion extract and fresh sea onion are existed.[6]

As mineral ingredient, soil of Lemnos Island is in only grand theriac in French Pharmacopeia and Yâdigâr.[5]

Also it is seen that wine and/or honey are used as connective medium for the ingredients. In Avicenna's formulations, the wine and honey even do not take a place directly; he mentions them as connective medium in preparation.

The common and different properties of theriac formulations mentioned in this paper can be increased. In this study, it tried to expose the differences and similarities of varied theriac formulations. It is certain that although even if they are different, theriac formulations are reflection of the desire to find the panacea for all diseases. Even in different region, culture or time physicians try to find this wonder drug by mixing so many ingredients.

Table 1. Alphabetical List of Ingredients of Grand Theriacs

English	Latin	Mithridaticum (gr.)	Theriaca in 1837 French Pharm. (gros[vii])	Tiryâq al-Fârûq in Canon [1st formulation] (gr.)	Tiryâq al-Fârûq in Canon [2nd formulation (gr.)	Tiryâq al-Fârûq in Canon [3rd formulation] (gr.)	Tiryâq al-Fârûq in Yâdigâr (misqâl)	Tiryâq al-Fârûq in Mucerrebname
Agaric, Fungus laricis	*Laricifomes officinalis* Kotl. & Pouzar, *Fomitopsidaceae*	-	12	-	-	-	12	-
Aloe	*Aloë vera* L., *Liliaceae*	-	-	-	-	27	-	-
Anise, Sweet cumin	*Pimpinella anisum* L., *Apiaceae*	12	4	-	18	-	4	-
Apple of earth (Round aristoloch) root	*Aristolochia rotunda* L., *Aristolochiaceae*	-	12	-	-	-	2	(+)
Arabian costus (Kust-root) root	*Costus arabicus* L., *Costaceae*	-	6	-	-	27	6	(+)
Arnut (Earth chestnut, Pig-nut, Tuberous caraway) seeds	*Bunium bulbocastanum* L., *Apiaceae*	-	12	-	-	-	-	-
Asafoetida, or asafetida plant	*Ferula assa-foetida* L., *Apiaceae*	-	-	-	-	-	4	-
Asrabacca (Cabaret, Wild nard, Halette) root	*Asarum europaeum* L., *Aristolochiaceae*	-	12	-	-	-	-	-
Bald-money (Meu, Spignel, Bear root) root	*Meum athamanticum* Jacq., *Apiaceae*	-	4	-	-	-	-	-

Balm of Gilead (Mecca)	Carpobalsamum	-	4	54	49.5	-	2	(+)
Balsam of Mecca	*Commiphora opobalsamum* (L.) Eng ., *Burseraceae*	25	12	-	-	-	-	-
Balsam of Mecca seeds	*Commiphora opobalsamum* (L.) Eng ., *Burseraceae*	-	-	18	-	-	-	-
Bishop's weed, Amee	*Ammi majus* L., *Apiaceae*	-	4	-	-	-	-	-
Bitter vetch (Ervil) seeds	*Ervum ervilia* L., *Leguminosae*	-	36	-	-	-	-	-
Black cumin extract	*Nigella sativa* L., *Ranunculaceae*	-	-	-	18	-	-	-
Black cumin seeds	*Nigella sativa* L., *Ranunculaceae*	-	-	18	18	-	-	-
Black hyacinth	*Hyacinthus orientalis* L., *Asparagaceae*	-	-	27	-	-	-	-
Black pepper plant	*Piper nigrum* L., *Piperaceae*	-	6	108	108	18	24	(+)
Breadcrumbs	*Perenniporia medulla panis* (Jacq.) Fr., *Polyporaceae*	-	12	-	-	-	-	-
Bulrush (Pool-rush)	*Scirpus lacustris* L. *Cyperaceae*	-	-	-	18	27	-	-
Cabaret (Wild nard)	*Asarum europaeum* L., *Aristolochiaceae*	-	-	18	-	18	-	-
Camel's hay, Scenanth, Geranium grass	*Andropogon schoenanthus* L., *Poaceae*	-	6	-	-	-	6	-
Candy carrot, Cretan carrot	*Athamanta cretensis* L., *Apiaceae*	24.66 (seeds)	12	-	1 pinch	-	4	-
Cardamon	*Amomum cardamomum* Willd., *Zingiberaceae*	8	4	18	-	18	-	-
Cassia tree (Chinese cinnamon tree) peel	*Laurus cassia* (L.) J. Presl., *Lauraceae*	20.66	1 ance	-	27	27	6	(+)
Cassia tree leaves	*Laurus cassia* (L.) J. Presl., *Lauraceae*	-	-	18	-	-	-	-
Castor, the bitter exudate from the castor sacs of mature beavers	Castoreum	24	12	9	9	-	2	-
Cat thyme	*Teucrium polium* L., *Lamiaceae*	-	-	-	-	-	6	-
Cat thyme (Marum-germander) luminaries	*Teucrium polium* L., *Lamiaceae*	-	12	-	-	-	-	-
Catmint (Catnip)	*Nepeta cataria* L., *Lamiaceae*	-	-	-	18	-	-	-
Celery (Marsh parsley) seeds	*Apium graveolens* L., *Apiaceae*	-	-	18	18	18	4	(+)
Celtic spikenard (Celtic valerian)	*Valeriana celtica* L., *Caprifoliaceae*	-	-	18	27	-	-	-
Celtic spikenard (Celtic valerian) root	*Valeriana celtica* L., *Caprifoliaceae*	-	8	-	-	18	4	-
Centaury, Earth-gall, Feverwort	*Erythraea centaurium* (L.) Pers., *Gentianaceae*	-	12	9	-	-	2	(+)
Cherry tree	*Prunus cerasus* L., *Rosaceae*	-	-	27	-	-	-	-
Chinese rhubarb, Turkish rhubarb, Indian rhubarb	*Rheum palmatum* L., *Polygonaceae*	-	-	-	-	-	6	-
Chinese tamarix	*Tamarix chinensis* Lour., *Tamaricaceae*	-	-	-	27	-	-	-
Chios turpentine	*Pistacia terebinthus* (L.) var *Chia Anacardiaceae*	24.66	6	-	-	-	-	-
Cinquefoil (Five finger grass, Five leaf) root	*Potentilla reptans* L., *Rosaceae*	-	6	27	27	27	6	-
Citronella grass	*Andropogon nardus* L., *Poaceae*	-	-	-	-	-	6	-
Clove tree	*Eugenia caryophyllata* Thunb., *Myrtaceae*	-	-	-	-	-	-	(+)
Clustered cardamoms	*Amomum racemosum* Lam., *Zingiberaceae*	-	8	-	-	-	4	-
Common calamint (Cat-mint) luminaries	*Melissa calamintha* L., *Lamiaceae*	-	6	27	27	27	-	-
Common caper bush	*Capparis spinosa* L. *Capparaceae*	-	-	-	-	-	-	(+)

Common caraway	*Carum carvi* L., *Apiaceae*	-	-	18	-	-	4	-
Common cinnamon leaves	*Laurus cinnamomum* L., *Lauraceae*	-	-	-	18	-	-	-
Common cinnamon tree peel	*Laurus cinnamomum* L., *Lauraceae*	29	12	54	49.5	54	12 or 24	(+)
Common European viper	*Vipera berus* L., *Viperidae*	-	12	-	-	-	-	(+)
Common germander	*Teucrium chamaedrys* L., *Lamiaceae*	-	-	27	18	54	-	-
Common germander (Ground oak)	*Teucrium chamaedrys* L., *Lamiaceae*	-	-	18	-	18	-	-
Common germander (Ground oak) luminaries	*Teucrium chamaedrys* L., *Lamiaceae*	-	4	54	-	-	4	-
Common hemp	*Cannabis sativa* L., *Cannabaceae*	-	-	27	-	27	-	-
Common lavander	*Lavandula officinalis* Chaix, *Lamiaceae*	-	-	27	-	27	-	-
Common rose (French rose)	*Rosa gallica* L., *Rosaceae*	16 (dried)	12	54	49.5	54 (dried)	12	-
Common valerian (All-heal, Cat's valerian) root	*Valeriana officinalis* L., *Caprifoliaceae*	-	4	-	-	-	4	-
Common white horehound luminaries	*Marrubium vulgare* L., *Lamiaceae*	-	6	-	-	-	6	-
Cone pepper	*Capsicum conicum* Lam., *Solanaceae*	-	-	27	27	108	-	-
Cornelian cherry (Cornel tree)	*Cornus mascula* L., *Cornaceae*	-	-	-	18	18	-	-
Darnel, Poison darnel, Cockle	*Lolium temulentum* L., *Poaceae*	20.66	-	-	-	-	-	-
Dittany of Crete	*Origanum dictamnus* L., *Lamiaceae*	-	6	-	-	-	6	-
Egyptian lupin balm	*Lupinus termis* Forssk., *Leguminosae*	-	-	27	-	-	-	-
Elder tree (Boon tree) oil	*Sambucus nigra* L., *Adoxaceae*	-	-	-	-	-	12	-
Elder tree (Boon tree) seeds	*Sambucus nigra* L., *Adoxaceae*	-	-	-	-	-	4	-
Euphorbium gum-plant	*Euphorbia resinifera* O.Berg *Euphorbiaceae*	-	-	-	-	-	-	(+)
Extract of acacia	Acacioe verus[viii]	8	4	-	-	-	-	-
Extract of glycyrrhiza	Glycyrrhiza[ix]	-	12	54	-	-	12	-
Extract of hypocist	*Cytinus hypocistis* (L.) L., *Cytinaceae*	24	4	-	-	-	-	-
Fennel	*Foeniculum dulce* Mill., *Apiaceae*	-	4	-	18	-	4	-
Fennel seeds	*Foeniculum dulce* Mill., *Apiaceae*	-	-	18	-	-	4	-
Ferrous sulfate	Sulfas ferrosus	-	4	-	-	-	-	-
French hartwort	*Seseli tortuosum* L., *Apiaceae*	-	4	-	-	-	-	-
French lavender	*Lavandula stoechas* L., *Lamiaceae*	-	6	-	-	-	6	-
Galbanum[x]	Galbanum	24.66	12	9	9	-	-	-
Gallic nard	*Valeriana italica* Lam., *Caprifoliaceae*	16	-	-	-	-	-	-
Garden petunia	*Petunia hybrida* Vilm., *Solanaceae*	-	-	-	9	-	-	-
Gas plant (White dittany, Candle plant, Fraxinella) balsam	*Dictamnus albus* L., *Rutaceae*	-	-	-	-	27	-	-
German iris, Blue flower de Luce, Flowering flag	*Iris germanica* L., *Iridaceae*	-	-	-	-	54 (root)	12	-
Ginger root	*Zingiber officinale* Roscoe, *Zingiberaceae*	29	6	27 (dried)	27 gr (dried)	-	6	-
Gum ammoniacum plant	*Dorema ammoniacum* D.Don., *Apiaceae*	-	-	-	-	-	2	-
Gum arabic, Acacia gum	Gummi arabicum	8	4	18	-	-	4	-
Henbane, Hen-bell, Hyoscyamus	*Hyoscyamus niger* L., *Solanaceae*	-	-	-	9	-	-	(+)
Henna plant, Egyptian privet, Alcanna	*Lawsonia spinosa* L., *Lythraceae*	-	-	-	-	-	-	(+)

Hyacinth	*Hyacinthus* L., *Liliaceae*	-	-	27	18	-	-	(+)
Hypocist	*Cytinus hypocistis* (L.) L., *Cytinaceae*	-	-	18	-	-	-	-
Illyrian iris	*Iris illyrica* Tom. Ex Vis, *Iridaceae*	8	-	-	-	-	-	-
Indian aloe tree, Calambac tree	*Aloexylum agallochum* Lour., *Thymelaeaceae*	-	12	-	-	-	-	-
Indian malabathrum, a kind of Cassia tree	*Laurus malabathrum* Wall., *Lauraceae*	24 (leaves)	6	-	-	-	-	-
Iris (Florentine iris, Orris-root plant) root	*Iris florentina* L., *Iridaceae*	-	-	-	49.5	-	-	-
Iris (Florentine iris, Orris-root plant) root	*Iris florentina* L., *Iridaceae*	-	12	-	-	-	-	-
Jewish ointment		-	-	9	9	-	-	-
Lesser bindweed, Corn bind, Corn lily	*Convolvulus arvensis* L., *Convolvulaceae*	-	-	-	-	-	2	-
Liquid honey	Liquentia mella	-	-	-	-	-	10 ritil[xi]	-
Liquorice plant	*Glycyrrhiza glabra* L., *Leguminosae*	-	-	-	49.5	-	-	-
Long pepper	*Piper longum* L., *Piperaceae*	20.66	24	-	-	-	6	(+)
Macedonian parsley	*Athamanta macedonica* (L.) Spreng. *Apiaceae*	-	6	-	-	-	-	-
Mastic tree	*Pistacia lentiscus* L., *Anacardiaceae*	-	-	-	-	2	-	-
Mineral pitch	Asphaltum	-	12	-	-	-	-	-
Mountain mint	*Cyclotrichium niveum* (Boiss.) Manden. & Scheng., *Lamiaceae*	-	-	27	-	27	-	-
Mountain parsley	*Athamanta oreoselinum* L., *Apiaceae*	-	-	27	27	27	6	-
Myrrh	*Commiphora myrrha* (Nees) Engl., *Burseraceae*	24	8	27	27	27	6	(+)
Nablus gum		-	-	-	27	-	-	-
Nape, Naphew, Winter rape	*Brassica napus* L., *Brassicaceae*	-	-	-	-	-	12	-
Nutmeg tree	*Myristica fragrans* Houtt., *Myristicaceae*	-	-	-	-	-	4[xii]	-
Old fragnant wine		-	-	7 lt.	-	-	-	-
Oil of vitriol		-	-	-	-	-	4	-
Olibanum[xiii]	Olibanum	24	6	18	-	-	6	(+)
Opopanax[xiv]	Opopanax	24	12	9	9	-	2	-
Oriental sweetgum, Turkish sweetgum fruits	*Liquidambar orientalis* Mill., *Altingiaceae*	-	-	-	-	-	4	-
Parsley, Garden parsley	*Petroselinum crispum* (Mill.) Fuss, *Apiaceae*	17	-	-	-	-	-	-
Pellitory of Spain, Alexander's foot, Costmary	*Anacyclus pyrethrum* (L.) Lag., *Compositae*	1.66	-	-	-	-	-	(+)
Penny-cress (Mithridate mustard, Wild cress) seeds	*Thlaspi arvense* L., *Brassicaceae*	-	12	-	-	-	-	-
Pennyroyal luminaries	*Mentha pulegium* L., *Lamiaceae*	-	4	-	-	-	-	-
Pepper cress seeds	*Lepidium campestre* (L.) R.Br., *Brassicaceae*	-	-	18	-	-	-	-
Perfoliate, St. John's wort	*Hypericum perforatum* L., *Hypericaceae*	8	4	-	-	-	4	-
Poppy, Opium poppy	*Papaver somniferum* L., *Papaveraceae*	17	24	108	108	54	24	(+)
Rhapontic (Pie rhubarb, Garden rhubarb) root	*Rheum raponticum* L., *Polygonaceae*	28	6	-	-	-	-	-
Rocambole, Sand leek, Spanish garlic	*Allium scorodoprasum* L., *Amaryllidaceae*	-	-	-	-	-	12	-
Roman laurel (Sweet-bay) seed	*Laurus nobilis* L., *Lauraceae*	-	-	-	-	-	-	(+)

Round rush (flowers)	*Juncus effusus* L., *Juncaceae*	24.66	-	-	-	-	-	-
Safflower, Bastard saffron, False saffron, African saffron	*Carthamus tinctorius* L., *Compositae*	-	-	-	-	-	-	(+)
Saffron, Crocus	*Crocus sativus* L., *Iridaceae*	29	8	27	27	27	6	-
Sagapenum[xv]	Sagapenum	8	12	-	-	-	-	-
Salsify or Wid salsify	*Tragopogon crocifolius* L., *Compositae*	-	-	-	-	-	4	-
Saxifrage, Rockfoil	*Saxifraga cymbalaria* L., *Saxifragaceae*	20.66	-	-	-	-	-	-
Sea onion extract	*Scilla maritima* L., *Asparagaceae*	-	-	-	-	18	-	-
Sea onion, Medicinal squill	*Scilla maritima* L., *Asparagaceae*	-	12	216	-	216	-	-
Sea onion tablets		-	-	-	126	-	48	-
Sealing wax (made from Mastic tree)		-	-	18	-	-	-	-
Shepherd's-purse	*Capsella bursa-pastoris* (L.) Medik., *Brassicaceae*	25	-	-	-	-	-	-
Silk tree, Bastard tamarind	*Acacia julibrissin* (Durazz.) Willd., *Leguminosae*	-	-	-	-	-	4	-
Soil of Lemnos Island	Terra lemnia	-	4	-	-	-	4	-
Spanish wine	Vinum hispanicum	-	Q.S.[xvi]	-	-	-	-	-
Spikenard, Nard	*Nardostachys jatamansi* (D.Don) DC., *Caprifoliaceae*	25	-	-	-	27	-	-
St. John's wort (Perfoliate)	*Hypericum perforatum* L., *Hypericaceae*	-	-	-	27	-	-	-
Stavesacre tablets	*Delphinium staphisagria* L., *Ranunculaceae*	-	-	108	108	108	-	-
Storax, Oriental sweetgum, Turkish sweetgum	*Liquidambar orientalis* Mill. *Altingiaceae*	21	-	-	-	-	-	-
Styrax tree (Officinal storax)	*Styrax officinale* L., *Styracaceae*	-	12	-	-	-	-	-
Sweet aromatic wine		-	-	-	-	-	4[xvii]	-
Sweet flag (Sweet sedge) root	*Acorus calamus* L., *Acoraceae*	20	6	-	-	-	4	-
Sweet lemon tree peel	*Citrus limonum* Risso, *Rutaceae*	-	6	-	-	-	-	-
Sweet trefoil	*Trigonella caerulea* (L.) Ser., *Leguminosae*	-	-	27	-	-	-	-
Sweet vernal grass	*Anthoxanthum odoratum* L., *Poaceae*	-	-	54	-	-	-	-
Tamarix	*Tamarix articulata* Vahl., *Tamaricaceae*	-	-	27	9	27	-	-
Turpentine (Terebinth) tree gum	*Pistacia terebinthus* L., *Anacardiaceae*	-	-	-	-	-	6	-
Vinegar with honey		-	-	9	9	-	-	-
Viper tablets		-	-	108	108	108	24	-
Water germander luminaries	*Teucrium scordium* L., *Lamiaceae*	-	12	-	-	-	-	-
Water grass	*Nasturtium officinale* R.Br., *Brassicaceae*	-	-	27	-	27	-	-
Water lilly root	*Nymphaea alba* L., *Nymphaeaceae*	-	-	54	-	-	-	-
Water mint (Fish mint)	*Mentha aquatica* L., *Lamiaceae*	-	-	-	9	-	-	-
White common mushroom	*Agaricus campestris* L., *Agaricaceae*	-	-	54	49.5	54	-	-
White honey	Mel album	-	5250[xviii]	-	-	-	-	-
White lily (Madonna lily)	*Lilium candidum* L., *Liliaceae*	-	-	18	-	-	-	-
White mustard, Salad mustard	*Sinapis alba* L., *Brassicaceae*	-	-	-	-	-	4	-
White pepper	*Piper nigrum decorticatum* L., *Piperaceae*	-	6	27	-	-	6	-
White watercress (and its latex)	*Rorippa nasturtium-aquaticum* (L.) Hayek. *Brassicaceae*	-	-	-	18	-	-	-

Wild celery	*Apium montanum* Kunth, *Apiaceae*	-	-	-	18	-	-	-
Wild garlic	*Allium xiphopetalum* Aitch. & Black, *Amaryllidaceae*	-	-	-	49.5	-	-	-
Wild tulip seeds	*Tulipa lutea* Freyn, *Liliaceae*	-	-	54	49.5	54	-	-
Xylobalsamum[xix]	Xylobalsamum	-	1	-	-	54	-	-
Yellow flowered gentian extract	*Gentiana lutea* L., *Gentianaceae*	-	-	18	18	-	-	-
Yellow flowered gentian root	*Gentiana lutea* L., *Gentianaceae*	16	4	-	-	-	4	(+)
Yellow violet (roasted)	*Viola pubescens* Ait., *Violaceae*	-	-	-	18	-	-	-

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Notes:

[i] Pontic region is a historical Greek designation for a region on the southern coast of the Black Sea, located in modern-day northeastern Anatolia, Turkey.
[ii] According to Vogt, Galen's recipe of theriac consists of 42 ingredients.
[iii] A peculiar bitter orange-brown substance, with strong, penetrating odor, found in two sacs between the anus and external genitals of the beaver.
[iv] According to Griffin, Galen mentions theriac usage against malarial fever.
[v] 1 shar'î (related to Shari'a) misqâl is 4.009 gr; 1 traditional misqâl is 4.8105 gr
[vi] This herb can not be translated.
[vii] A traditional French weight unit equal to about 3.824 gr.
[viii] It is not defined. It is supposed to be Acacia vera Willd., Leguminosae, but it is not a certain information.
[ix] The species of glycyrrhiza is not defined.
[x] A gum resin exuding from the stems of certain Asiatic umbelliferous plants, mostly species of Ferula.
[xi] 1 ritil is 416 gr.
[xii] It can be used instead of Myrrh.
[xiii] An aromatic resin obtained from trees of the genus Boswellia, particularly Boswellia sacra, B. carteri, B. thurifera, B. frereana, and B. bhaw-dajiana (Burseraceae).
[xiv] A gum resin obtained from the root of Opopanax chironium (All heal).
[xv] It is not known from what plant this is procured though it is probably from some species of Ferrula. It is imported from Aleppo Alexandria and Smyrna in masses agglutinated together of a yellow or dark brown colour and tenacious consistence. It has a smell similar to assafoetida but more feeble and a hot nauseous and bitterish taste medicinally it is antispasmodic and deobstruent.
[xvi] Quantum satis is a Latin term meaning the amount which is needed.
[xii] Ritil of Bagdad (1 ritil of Bagdad is 412 gr).
[xiii] It is not given the measurement.
[xix] The dried twigs or fragrant wood of balm of Gilead (Balsam of Mecca).