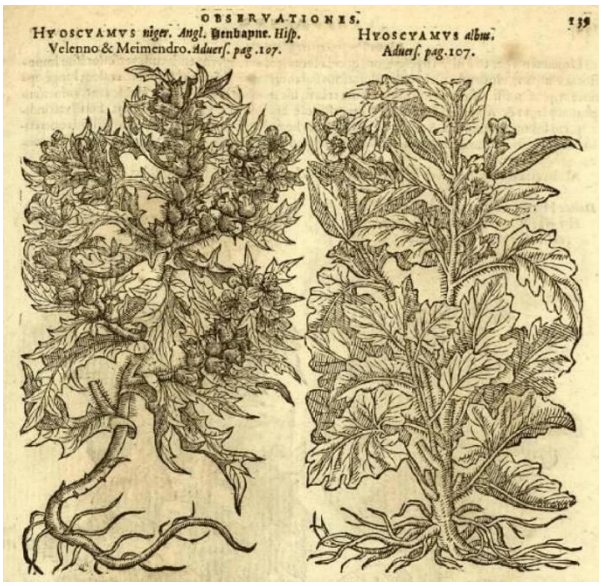
Herbal Medicaments for Dental and Periodontal Problems: An Analysis



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INTRODUCTION

Throughout history, humans have suffered from the same dental problems. At the time, as now, dental issues were treated with medicaments or with surgery, although prior to the discovery of microbes the logic behind treatment choices was different. How effective these remedies were is the question I have set out to answer using modern medical studies and my own dental knowledge gained from 18 years in the field.

In this paper I have analyzed and attached 135 recipes for dental medicaments from 1550 BCE to the late 16th century CE authored in Europe, the Near East, and North Africa to get an overall picture of the most common types of treatment and the most popular ingredients. I have included an appendix listing each recipe by type, culture and time of origin, and ingredients. I have opted to exclude treatments that were not applied directly to the head/neck and those which are obviously magical in nature. My previous paper covered surgical treatments so they will not be addressed here.

PROBLEMS TO SOLVE

Humans have been treating the same dental issues throughout our history. Those are, broadly, the following:

- Toothache
- Loose teeth/periodontal bone loss
- Gingival ulcers/inflammation
- Cavities/caries
- Worn teeth
- Misaligned teeth
- Dental abscess

The period sources also discuss dislocated jaws, inflammation of the uvula and tonsils, ulcers on the tongue, etc. I have excluded these and focused only on treatments for the teeth and gums. I also excluded recipes where the ingredients are difficult to precisely identify.

Teeth recovered from the Roman Forum

TYPES OF REMEDIES

Medicaments came in several different major forms: filling placed in a cavitated tooth, mouthwash/rinse, poultice or ointment applied extraorally, poultice or ointment applied intraorally, dentifrice, masticatory (substance to be chewed), and fumigant (where a substance is burned, and the smoke is directed into the mouth). Of the 135 recipes I analyzed, they broke down this way:

- Filling x8
- Mouthwash x39
- Extraoral poultice x10
- Intraoral poultice x35
- Dentifrice x22
- Masticatory x9
- Fumigatory x12

Some intraoral poultices were used to cure tooth pain or inflamed gums, and others were applied to teeth which needed to be extracted in order to intentionally cause bone loss (periodontal disease) which would loosen the tooth prior to extraction.

In the 135 recipes, there are 194 different ingredients. Many ingredients only show up once or twice, but a handful are common ingredients which show up frequently across time and cultures. Those common ingredients are listed below, and for each ingredient I have included at least one period source and a modern source discussing their attributes. After this I discuss the effects on the oral cavity. Most of these ingredients have not been studied specifically in dental applications so in those cases I have combined the modern scientific information with my knowledge of dental healthcare from working in dentistry for 18 years.

ANALYSIS OF THE ACTION OF THE TOP INGREDIENTS

Note: I have attempted to edit the modern scientific literature for readability but have elected to leave in more information to support my conclusions.

VINEGAR

General Observation: Vinegar and wine specifically were described as carriers for other ingredients; unsurprisingly, they are some of the most common ingredients in dental treatments, especially in mouthwashes. Guy de Chauliac explained Galen and Avicenna regarding vinegar:

“Galen said among the medicines for toothache, the resolutives and the repercussives should be very potent, and their major component usually has been very strong vinegar. They would be of little use if the vinegar injures the teeth; but the vinegar loses its

vehemence when it is properly mixed with other substances. Avicenna said that the cooling effects of vinegar can easily be tempered without losing its penetrating and incisive qualities, when used for treating cool matter. But there is no better treatment for warm matter. Galen agreed. Archigenes, cited by Galen, placed vinegar at the top of his list for treating toothache, using it warm and mixed with galls." (11)

Dioscorides states:

"Acetum cools and is astringent. It is good for the stomach and to encourage an appetite. It staunches excessive bloody discharges, either taken as a drink or sat in as a bath. It is good boiled together with meat for discharges of the bowels. It is fit for bleeding wounds, and applied with unwashed wool or sponges keeps inflammation away. It represses the vulva and perineum that have fallen down, and broken bleeding gums. It is also good for gangrenous ulceration, erysipelas [streptococcal skin infection], shingles [herpes], psoriasis, lichen [skin disease with red pustules], and pterygium [membrane on eye] mixed with some other medicine from those that are suitable. Continuously applied with hot cloths it stops eating ulcers and gangrenous ulceration of the cheeks. Applied with hot cloths and sulphur it helps gout, and rubbed on it takes away bruises. With rosaceum and unwashed wool (or a sponge) it is good for burning fevers of the head. Inhaled as a steam it helps those with difficult hearing, or noises and hissings of the ears. Dropped in the ears it kills worms." (6)

Clinical Applications: In the modern era we know that vinegar is acidic enough to demineralize tooth enamel which weakens it and can, over time, completely dissolve the tooth structure. In this case it is, as they believed in period, strong enough to penetrate the tooth structure; however, we now know that that is bad for dental health.

From *Taccuino Sanitatis*

WINE

Dioscorides:

"Generally, all unmixed and simple wine (hard by nature) is warming, easily digested and good for the stomach. It encourages the appetite, is nourishing, induces sleep, and causes a good colour. Taken liberally as a drink it helps [antidote] those who have taken hemlock, coriander, pharmicum [?poison], ixia, meconium, lithargyrum, smilax, aconitum or mushrooms; as well as for snakebites and the strikes of all that by striking or biting kill by cold or overturn the stomach. It is effective for long-lasting windiness, anxiety from hypochondrium [nervous gastric disorder], distension and hiccups of the stomach, and excessive discharges of the bowels and intestines. It is good for sweating and those who faint from it, especially the white, old, sweet-smelling wines. The old sweet wines (applied with lana succida [underneath wool]) are more useful for disorders of the bladder and kidneys, as well as for wounds and inflammation. They are usefully

applied with hot cloths for malignancies and eating, running ulcers. Those without seawater (hard and white) are fitting for use in times of health." (6)

Clinical Applications: Wine is also acidic, slightly less so than most vinegar. It would have the same negative effects on tooth structure.

From *De Re Metallica*

Alum *(Potassium Aluminum Sulfate)*

Dioscorides:

"Moist [alum] that is most transparent must be chosen — milky, even, and juicy throughout, and furthermore without stones and giving out a smell of fire. It is warming, astringent, and purges away those things that darken the eyesight and consume the flesh on the eyelids, and all other abnormal fleshy growths. They regard the scissile as more effective than the round. They are burnt and roasted like chalcitis [calcium carbonate]. With vinegar or honey they restrain creeping ulcers, stop bloody discharges, close moist gums, and they strengthen loose teeth. They are good with honey for

apthae [aptylia — absence of saliva], and with juice of polygonum [knotgrass] for pustules and rheumatic discharges in the ears. They are good with brassica leaves (or boiled with honey) for leprosy; and are applied with hot cloths and water for itches, rotten nails, pterygium [membrane on eye], and chilblains. With vinegar sediment (rubbed on with the same amount of burnt galls [oak galls]) they are good for eating ulcers. They are used with twice as much salt for gangrenous ulceration, and smeared on with ervum and moist pitch they wear off dandruff. Rubbed on with water it is a remedy for nits, lice and burns. They are smeared on for oedema and bad smells in the armpits and groins. Allom from Melos (laid at the mouth of the womb before sexual intercourse) also prevents conception and it is an abortifacient. It is expedient for abnormal growths on the gums, as well as for the uvula, tonsils, and the mouth, and is smeared on with honey for the ears and genitals." (6)

Technical analysis: National Institutes of Health:

*"*Alum *(AL) is one of the astringent herbal medicines that features a strong ability to dry dampness. Upon external use, it has the effects of detoxifying and killing worms in addition to an antipruritic effects. Upon internal use, it has a hemostatic effect and can check diarrhea and dispel windphlegm. … Burnt* Alum *(BAL) heals wounds, has a hemostatic effect, and resolves putridity, curing… nosebleeds, gum bleeding, and nasal putridity. Generally, AL is used internally, and BAL is used externally… AL belongs to the group of astringent medicines and is a refined crystal processed from alunite , which has antibiotic, anti-trichomonas, and astriction effects. Most of time, it is used externally only because it is highly stimulative if taken internally, except for cases of lead colic. Clinically, AL can be used both internally and externally, but it has always been burned before external use. (19)*

Clinical Applications: Astringent medicaments shrink inflamed tissues, stop bleeding, and have an antimicrobial effect. These actions would temporarily counteract some of the most common oral issues including gingivitis/periodontal disease which is chronic

inflammation of the gums and periodontal bone; however it would not cure most issues. It does need to be used in small amounts as it can cause irritation, burns, and respiratory issues. The most common injury from aluminum sulfate is local tissue irritation; therefore, dosage and/or combination with other ingredients would be important to make sure that damage was minimized, except in cases where it was applied to teeth that needed to be extracted because irritation of the periodontal tissues was the intention in those cases.

From a 9th century translation of *De Materia Medica*

Galbanum *(Ferula spp.)*

Dioscorides:

"Smeared on the tooth or put into a cavity it soothes toothaches, and it seems to be good for frequent painful urination. It is dissolved in pills with bitter almonds and water (or rue, or honey and water, or warm bread, or else with meconium, or burned brass, or liquid myrica gale). If you want to purify it put it into warm water. When melted the filth from it will swim on top and you can separate it as follows. Tie the galbanum in a clean thin linen cloth, hang it in a brass pot or ceramic jar so that the bundle does not touch the bottom of the jar. Plug it closed and pour boiling water over it, for this way the best

will be melted (as through a strainer) but the woody stuff will remain in the linen cloth." (6)

Gerard:
"The seed doth heate, and attenuate or make thinne: it is a remedie against cold fits of an aue, by procuring sweat, being mixed with oyle, and the body anointed therewith." (10)

Technical Evaluation: Modern studies on the effects of galbanum have been difficult to find. The Physician's Desk Reference for Herbal Medicine states:

"Internally, Galbanum is used for digestive disorders and flatulence; externally, it is used in the treatment of wounds. Health risks or side effects following the proper administration of designated therapeutic dosages are not recorded." (16)

Clinical Applications: Galbanum is the resin of the *Ferula gummosa* plant. As an expectorant it could help treat tooth pain caused by sinus pressure. It could also help heal damage to the gums although in the case of periodontal disease the effects would be minor and temporary.

From Gerard

Henbane *(Hyoscyamus niger)*

Dioscorides:

"It is effective mixed with other poultices made to stop pain. The leaves (made into little balls) are good to use in all medications — mixed with polenta or else applied by themselves. The fresh leaves (smeared on) are the most soothing of pain for all difficulties. A decoction of three or four (taken as a drink with wine) cures fevers called epialae [sudden]. Boiled like vegetables and a tryblium [plateful] eaten, they cause a mean disturbance of the senses. They say if anyone gives a suppository with it to someone that has an ulcer in the perineum that it has the same effect. The root (boiled with vinegar) is a mouth rinse for toothache." (6)

Gerard:

"Henbane causeth drowsinesse, and mitigateth all kinde of paine: it is good against hot and sharp distillations of the eyes and other parts… To wash the feet in the decoction of Henbane causeth sleepe; and also the often melling to the floures. The leaves, seed, and juice taken inwardly cause an unquiet sleep like unto the sleepe of drunkennesse, which continueth long, and is deadly to the party… The root boiled with vinegre, and the same holden hot in the mouth, easeth the pain of the teeth. Te seed is used by Mountibank tooth-rawers which run about the country, to cause worms come forth of the teeth, by burning it in a chafing dish of coles, the party holding his mouth over the fume thereof: but some crafty companions to gain mony convey small lute-strings into the water, persuading the patient, that those small creepers came out of his mouth or other parts which he intended to ease." (10)

Technical Evaluation: National Institutes of Health:

"Black henbane has been traditionally used as anti-inflammatory drug and it is validated chemically and biologically. The methanolic extraction of BH seeds has shown acute and chronic analgesic and anti-inflammatory effects in animal models… As it is

hypnotic, the pulse rate remains unchanged on therapeutic doses… Scopolamine induces CNS depression, leading to drowsiness, amnesia and fatigue. Following to scopolamine administration, especially in large dose, a short stage of excitement and delirium with giddiness, uncertain movements, difficult and indistinct speech present and lead to sleep. The sleep usually is lasting 5-8 hours. Scopolamine also usually induces dry throat and thirst… It is applied as a premedication for anesthesia for bronchial secretions reduction and blocking bradycardia accompanied by some anesthetic drugs." (1)

Clinical Applications: Henbane (most often black henbane) was included in a lot of dental remedies, most frequently in fumigants. It was burned and the patient held their mouth open over the smoke to allow it to reach the effected tooth. It has legitimate therapeutic uses but also it was likely used due to the fact that the seeds can look like tiny worms, which makes it effective (according to period theory) at countering tooth worms. The anti-inflammatory effects would temporarily improve gum health and the analgesic effects would improve tooth and gum pain. Overdose of black henbane causes about 48 hours of physical symptoms and hallucinations, paranoia, and/or unconsciousness. Death is rare.

Honey

Dioscorides:

"It is cleansing, opens pores, and draws out fluids. As a result it is good for all rotten and hollow ulcers when infused. Boiled and applied it heals flesh that stands separated, and it cures lichen [skin disease with red pustules] boiled with liquid allom and applied; as well as noise in the ears and their pains, dropped in lukewarm with salt dug up or mined sea shells pounded into small pieces… It heals inflammations around the throat and tonsils, and tonsillitis, either rubbed on or gargled." (6)

Technical Evaluation: National Institutes of Health:

“ The ingredients of honey have been reported to exert antioxidant, antimicrobial, anti-inflammatory, antiproliferative, anticancer, and antimetastatic effects. Many evidences suggest the use of honey in the control and treatment of wounds, diabetes mellitus, cancer, asthma, and also cardiovascular, neurological, and gastrointestinal diseases… According to modern scientific literature, honey may be useful and

has protective effects for the treatment of various disease conditions such as diabetes mellitus, respiratory, gastrointestinal, cardiovascular, and nervous systems, even it is useful in cancer treatment because many types of antioxidant are present in honey. “ (5)

Medicine being made from honey, from an Arabic translation of *De Materia Medica*

In the dental context:

“Dental caries is a classic biofilm-induced disease that causes the destruction of mineralised tooth tissue. Cariogenic bacteria are required but not sufficient to cause dental caries because the formation of cariogenic biofilms is dependent on the host diet.

A sugar-rich diet promotes the assembly of extracellular matrix polymeric substances and enhances the accumulation of acidogenic and acid-tolerant microbiota. An accumulation of bacteria producing organic acids results in a local decrease of pH value and, thus, causes the demineralisation of the dental hard tissue. The demineralisation process starts with damage to enamel and dentine, but this process can be reversed by the uptake of calcium, phosphate and fluoride. Repeated demineralisation over a prolonged period leads to the formation of dental caries… Honey is a super-saturated solution of sugars (up to 80% of the product's total composition) enriched with other minor components, including amino acids, peptides, proteins/enzymes, acids, lactones, minerals and polyphenols… Furthermore, Streptococcus mutans *is more resistant to honey types, with minimal bactericidal concentrations being in the range of 25% to 50% (w/v). In another study, non-manuka honey inhibited the bacterial growth of* S. mutans *at concentrations of between 12.5% and 25%. On the other hand, no inhibition of bacterial growth of* S. mutans *was documented at non-manuka honey concentrations of 5%, 10%, 20% and 40% (v/v).* S. mutans*, a notably acidic-tolerant bacterium, is the most common bacterium associated with dental caries. As mentioned above, honey is able to inhibit the bacterial growth of* S. mutans *only at very high concentrations… It is well known that dietary sugars, particularly sucrose, contribute significantly to the progression of dental caries and the demineralisation process and promote the formation of oral biofilm. The composition of honey and its acidity seem to have a favourable effect on the cariogenic process. In fact, sucrose or its individual monosaccharide units (glucose and fructose) selectively promote acidogenic and acid-tolerating bacterial species, including* S. mutans*.*

Acidic solutions that come into contact with teeth can cause dental erosion. Any solution with a pH value lower than 5.5, a critical value for dental enamel, may cause dental erosion. The acidity of honey is due to the presence of organic acids, particularly gluconic acid. Gluconic acid, accumulating to a concentration of between 8.6 and 60 mM, is the most abundant acid in honey and the major determinant of its acidity (pH 3.4–4.5). The erosive effect of honey has been investigated in two studies. Hablutzel et al. (2018) tested three different types of honey, including manuka honey, for their

erosive effect. All honeys, even after dilution with saliva, exhibited a pH value below 5.8. Despite the low pH of these honeys, no erosive activity on the enamel surface was detected. This is in agreement with Grobler and co-workers, who showed that honey, despite its low pH, does not cause erosion after 30 min in contact with teeth.

Demineralisation is the process that plays a first and key role in dental caries development. Demineralisation begins at the atomic level at the crystal surface inside the enamel or dentine and can continue unless halted, with the endpoint being cavitation. In fact, many cycles of demineralisation and remineralisation continue in the mouth as long as there are cariogenic bacteria, fermentable carbohydrates and saliva present. Due to honey's composition, it is likely that honey may take part in and stimulate the demineralisation process. Interestingly, several studies have reported a low demineralisation effect. Comparison in vitro evaluations of enamel demineralisation depth by five sweeteners (sucrose, fructose, palm sugar, sucralose and honey) clearly showed that artificial (sucralose) and natural (honey) sweeteners have a lower cariogenic potential than sucrose. The results of previous studies have also shown that honey exhibits a lower demineralisation effect compared to fructose and glucose, even lower than that of sucrose. On the other hand, natural honey is able to remineralise the enamel surface in vitro, as shown in two recent studies… An important factor in the management of dental caries is the reduction and/or elimination of cariogenic bacteria in both planktonic and biofilm-embedded states. Although the application of systemic antibiotics early in the prevention or treatment of dental caries showed some potential efficacy, their usage has been gradually reduced in recent decades. Antimicrobials such as chlorhexidine, iodine, ozone, quaternary ammonium salts and antimicrobial peptides, as well as natural products (e.g., essential oils), are already used in clinical settings for managing the development of carious lesions.

The promising antibacterial and antibiofilm activity of honey and its constituents and results from a recent systematic review have promoted its use in the management of dental caries However, the findings from laboratory studies investigating the antibacterial activity of honey may not be directly translated into clinical studies related

to dental caries… From a clinical point of view, honey is an attractive and effective therapeutic agent recommended primarily for topical application in diverse clinical disciplines, including dermatology, ophthalmology and stomatology. The most beneficial property of honey is antibacterial/antibiofilm activity, which also represents its most studied biological effect… Although honey has been shown to reduce the bacterial content of dental plaque, its clinical efficacy is less potent than that of conventional mouthwash containing chlorhexidine. One of the major drawbacks of most clinical studies is the quality of honey and the absence of laboratory testing of the honey used. Therefore, the quality of honey and its antibacterial and antibiofilm activity need to be determined before pre-clinical and clinical trials are conducted. The antibacterial, and particularly antibiofilm, effect of honey is an important factor in determining honey's clinical efficacy in the prevention of dental caries through the eradication of viable bacteria within dental plaque biofilm." (18)

Clinical Applications: Modern studies are inconclusive on the dental use of honey. It has anti-microbial and anti-inflammatory properties and inhibits the formation of biofilm (which is essential to the proliferation of cavity-causing bacteria) but it is also acidic and very high in simple sugars which feed the cavity-causing bacteria. The NIH notes that the high variation between types of honey makes controlled clinical trials difficult. In period, physicians would have noticed the shorter-term positive effects of honey (anti-inflammatory) but not understood the longer-term effects on tooth structure. It may also have been included in order to make intraoral treatments more palatable.

From Gerard

Mastic *(Pistacia lentiscus)*

Dioscorides:

"It is a remedy against gangrenous sores and is diuretic, and it settles unstable teeth that are washed with it. The green sprigs are rubbed on the teeth (instead of reed toothpicks) to clean them. An astringent oil is made from the fruit which is suitable for things which need an astringent… Taken as a drink it is good for vomiting of blood and for an old cough. It is good for the stomach, causing belching. It is mixed with tooth powders and ointments for the face making it clearer. It prevents the eyelashes from falling out and thickens them, and when chewed it causes sweet breath and strengthens the gums." (6)

Gerard:

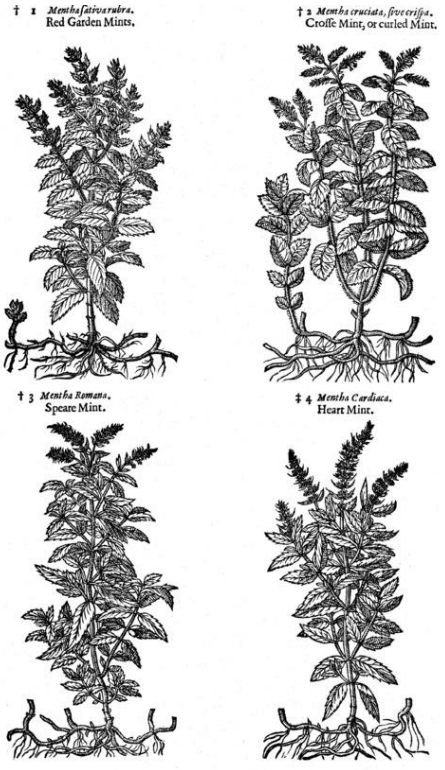
"It prevaileth much against ulcers and wounds, being put into digestives and healing unguents. It draweth flegme forth of the head gently and without trouble." (10)

Technical Evaluation: *Nutrients*:

"…the existing data suggest that Chios mastic [mastic grown on the island of Chios in the Aegean Sea] possesses anti-inflammatory and anti-oxidative properties which could be utilized in the treatment of multiple disorders. Given the emerging antimicrobial resistance trends, the establishment of mastic's antibacterial efficacy could support its introduction as adjunct therapy in the management of various infectious diseases… Another point that should be underlined is that, to date, no significant adverse effects associated with human consumption of mastic have been reported.

Overall, Chios mastic gathers many favorable properties that could justify its therapeutic use for a variety of human diseases… There is, therefore, need for further clinical research in order to assess the therapeutic potential of mastic in different disorders and to unravel its complex mechanism of action." (20)

Clinical Applications: Mastic is the resin of the *Pistacia lentiscus* plant. It has properties which could make it a good choice for oral problems but clinical studies are minimal.



From Gerard

Mint *(Mentha spp.)*

Dioscorides:

"Hedyosmus is a well-known little herb that is warming, astringent, and drying. As a result the juice of it (taken as a drink with vinegar) stops blood, kills roundworms, and encourages lust [aphrodisiac]. Two or three little sprigs (taken in a drink with the juice of a sour pomegranate) soothe hiccups, vomiting, and bile. Applied with polenta it dissolves suppurations. Applied to the forehead it eases headaches… Rubbed on, it makes a rough tongue smooth… Finally, it is good for the stomach and fit for sauce. It is also called mentha; the Romans call it menta, some, nepeta, the Egyptians, tis, others call it pherthumerthrumonthu, perxo, or macetho." (6)

Gerard:

"of Cat-mint… It is a present helpe for them tat be bursten inwardly by means of some fall received from an high place, and that are very much bruised, if the juice be given with wine or meade…. Of Horse-mint… The savor or smell of the water Mint rejoyceth the heart of man… There is no use hereof in phytsick whilst we have with us the garden Mint, which is sweeter and more agreeing to mans nature. " (10)

Technical Evaluation: *Molecules*:

*"Among medicinal plants, mint (*Mentha *species) exhibits multiple health beneficial properties…* Mentha *species are widely used in savory dishes, food, beverages, and confectionary products… However, numerous preclinical works have been performed, underlining the antioxidant, antibacterial, antifungal, anti-yeast, antiviral, and anticancer activity. Indeed,* Mentha *species, and especially essential oils, are used to reduce microbial load, suggesting a strong bactericidal, virucidal, and fungicidal activity." (22)*

Clinical Applications : Mint species are anti-microbial and as such can theoretically reduce the incidence of dental caries and periodontal disease. The anti-yeast properties would help treat thrush. Most of the recipes I analyzed include heating the ingredients which would counteract the possible negative side effects.

Myrrh *(Commiphora myrrha)*

Dioscorides:

"It is warming, rheum-closing, sleep-inducing, retaining, drying and astringent. It soothes and opens the closed vulva, and it expels the menstrual flow and birth speedily applied with wormwood, a dilution of lupins or juice from rue. The amount of a bean is taken like a catapotium [pill], against a long-enduring cough, asthma, pains of the side and chest, looseness of the bowels and dysentery. It dissolves chills (in acute fevers, especially recurrent paroxysmic ones) the amount of a bean taken in a drink with pepper and water two hours before the fit. Put under the tongue and melted it helps both sharpness

of the arteries and hoarseness of the voice. It kills worms and is chewed for stinking breath. For sores on the armpits it is rubbed on with liquid alum. Used as a mouthwash with wine and oil it strengthens teeth and gums." (6)

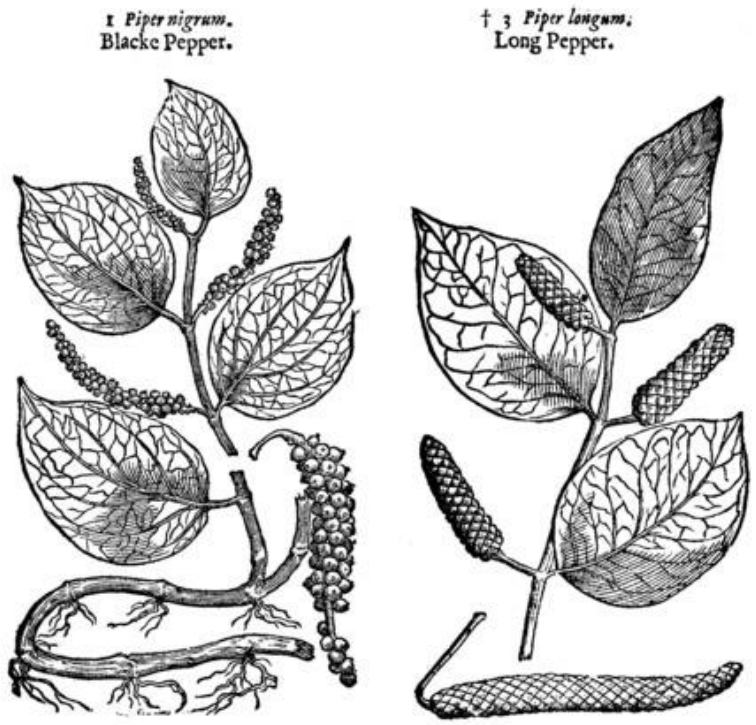
Technical Evaluation: National Institutes of Health:

"Aqueous resin inhibited the growth of Enterococcus faecalis [a bacteria that lives in the human digestive tract and is commonly found in infected teeth] *in the tooth cavity; this activity was equated with 2% chlorhexidine, a standard drug… Myrrh emulsion has shown good antioxidant potential and guards against hepatic oxidative damage and immunotoxicity… Biological activity of myrrh on viruses and bacteria has been reported in literatures. Empirical evidences have shown that myrrh extracts possess effects on virus by virtue of which these extracts possess antibacterial and antiviral activities on different virus strains. In a particular study, bactericidal, fungicidal, and anti-viral activities of myrrh essential oil extracts suggested their potential in inhibiting the growth of bacteria and virus strains… Studies on PE myrrh extract using diffusion test showed antimicrobial potential on* C. albicans*,* Streptococcus pyogenes*, and* Staphylococcus aureus*. The extract of EtOH showed potent action against the strains tested. However, greater activity was observed against* C. albicans *and* S. aureus *(9 mm zone of inhibition, 20 mg /mL); this further establishes the therapeutic effect of myrrh for curing infectious diseases such as gingivitis pharyngitis, phyorrhoea, and sinusitis … These extracts have been reported to be applied as a substitute medication in the management of nerve pain. In addition, some isolate such as furanocudesma-1, 3-diene and lindestrene present in myrrh were reported to relief pain by acting on nerves and body joints. These compounds bring about their effects by suppression of the molecule prostaglandin and hinder the inward movement of sodium current thereby ameliorating the feeling of pain…*

Myrrh from Commiphora have been reported as having activity on sore throat and chest infection. It acts by subduing inflammatory responses associated with it. Extract of C. myrrh and its essential oil have been reported to be used as expectorants, essential for the management of respiratory diseases like chest infection and any ailment associated

to it. Similarly, in myrrh the activity of aromatic gum resin has been reported infection in the chest. The resin employs the anti-inflammation and cytotoxic mechanism on bacteria or fungi infection responsible for the chest ailment… Headaches associated with nasal congestion have been treated with myrrh indicating its analgesic effect ." (3)

Clinical Applications: Myrrh is the resin of the *Commiphora myrrha* plant. It has been shown to have numerous health benefits that improve upper respiratory and gingival health. Since some tooth pain is the result of sinus pressure, myrrh could have a positive effect on that type of toothache. Of all the ingredients I analyzed, it has the most direct effects on diseases of the head and oral cavity. In large, daily doses over time it can cause some damage to the kidneys but short-term use (up to 8 weeks) has no negative effects.



Pepper *(Piper nigrum, Piper longum)*

Both long pepper and black pepper were used, and it isn't always clear which plant was being recommended in a given recipe. The bioactive compounds in both are very similar

so they may be largely interchangeable in a medicinal context. Dioscorides discusses them both in one entry.

Dioscorides:

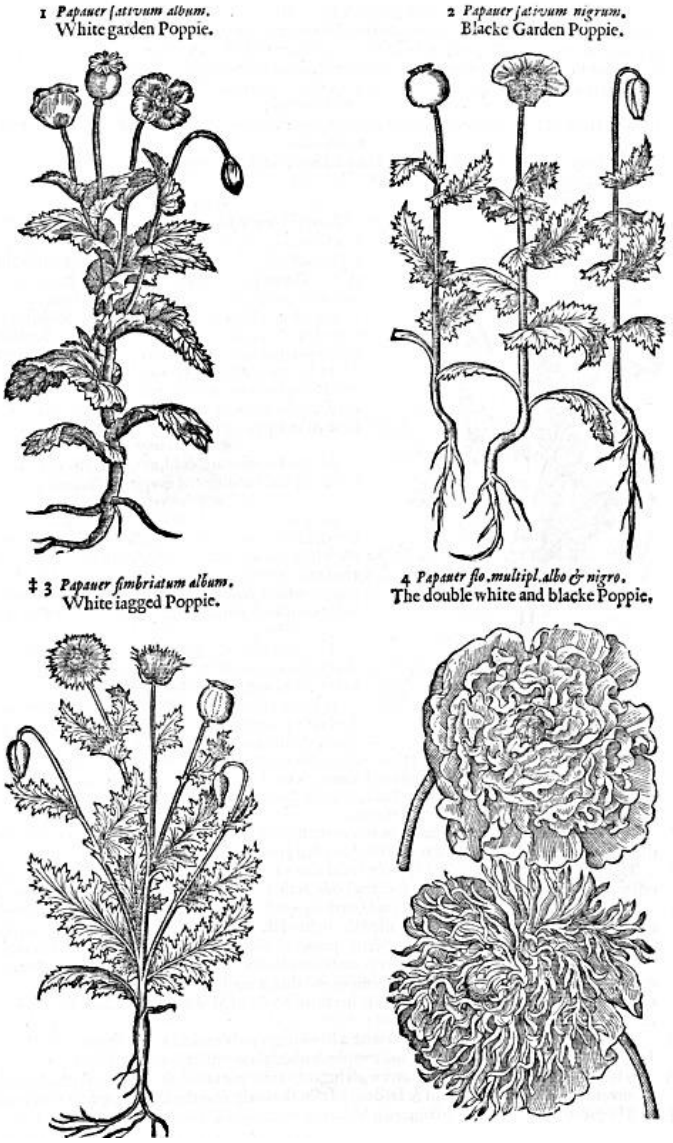
"All pepper in general is warming, urinary, digestive, attracting and dissolving, and cleans away things that darken the pupils… It is good rubbed on with honey for tonsillitis, and dissolves griping taken as a drink with tender leaves of laurel. Chewed with adenoid passae [lozenges] it draws mucus out of the head. Mixed in sauces it eases pain, is healing, and encourages appetite. Taken with pitch it dissolves scrofulous tumours [glandular swelling], and with nitre [saltpetre] it cleans away vitiligines [type of leprosy]. It is roasted in a new ceramic jar over coals — being shaken about similar to lens [lentils]. The root of it is not ginger (as some have supposed) as we will show a little later. Yet the root of pepper is similar to costus — warming the taste and causing spittle. Rubbed on with vinegar it humbles the spleen, and chewed with stavesacre it extracts mucus." (6)

Gerard:
"All Pepper heateth, provoketh urine, digesteth, draweth, disperseth, and clenseth the dimness of the sight as Dioscorides noteth." (10)

Technical Evaluation: Journal of Acupuncture and Meridian Studies:

" P. longum *has demonstrated remarkable effects against numerous diseases and conditions, including cancer, inflammation, depression, diabetes, obesity, and hepatotoxicity. The plant markedly improves microbial infections, cardiac disease, and protects against the effects of radiation. The specific effects of the plant make it more useful for animals and human beings. Furthermore, the plant appears to be nontoxic, as no deaths have been reported with the use of high doses of the plant extracts." (21)*

Clinical Applications: Like many of the ingredients on this list, pepper has properties which would improve oral health in the short term but would not definitively cure any issues.



Poppy ***(Popaver somniferum)***

Many species of poppy have bioactive compounds. It is not always clear which species is being called for in a recipe but many of them mention that it relieves pain and/or causes drowsiness which suggests that they are referring to *Popaver somniferum*, the opium poppy, in those cases. Dioscorides breaks the Popaver genus into several groups with different aspects, I have quoted the section including *Popaver somniferum*.

Dioscorides:

“There is a third — more wild, more medicinal and longer than these, with a head somewhat long — and they are all cooling. The leaves and heads (boiled in water and applied with hot cloths) cause sleep. A decoction is taken as a drink against lack of sleep. The heads (pounded into small pieces and mixed into poultices with polenta) are good for inflammation and erysipela [streptococcal skin infection]. It is necessary for those who beat them when they are green to make them into tablets, dry them for storage, and then use them. The heads are boiled alone in water until half, and then boiled again with honey until the dullness is thickened, make a licking medicine soothing for coughs, dripping fluids in the throat, and abdominal afflictions. It becomes more effective if juice of hypocistis and acacia are mixed with it. The seed of the black poppy (pounded into small pieces) is given to drink with wine for excessive discharges of the bowels, and women's excessive discharges. It is applied with water on the forehead and temples for those who cannot sleep, but the liquid itself (taken) is more cooling, thickening, and drying. A little of it (taken with as much as a grain of ervum) is a pain-easer, a sleep-causer, and a digester, helping coughs and abdominal cavity afflictions. Taken as a drink too often it hurts (making men lethargic) and it kills. It is helpful for aches, sprinkled on with rosaceum; and for pain in the ears dropped in them with oil of almonds, saffron, and myrrh.” (6)

Gerard:

“It mitigateth all kinde of paines: but it leaveth behind it oftentimes a mischief worse than the disease itself, and that hard to be cured, as dead palsie and such like.” (10)

Technical Evaluation: Oxidative Medicine and Cellular Longevity:

“The type of phytochemical and its content mainly depend on the part used and solvent applied for the extraction, as it was discussed in the previous sections. Also, intraspecific

variation occurs, for example, due to different locations, growth stage, and conditions. This is extremely important for standardization or to choose those plants with strong enough potency to be applied to obtain functional ingredients… Among these studies, P. somniferum *seed extracts, containing alkaloids and phenolic compounds, among other components, have shown the highest antimicrobial activity for the methanol extract against* Staphylococcus aureus *[a normal part of the human microbiome which can cause opportunistic infections in the upper respiratory tract] and* Aspergillus *species, whereas the aqueous and ethanolic extracts against root rot fungi at 5%." (4)*

Clinical Applications: Poppies vary widely in their concentration of bioactive compounds**,** but all have some anti-microbial effect. The opium poppy is the natural source of morphine, a powerful analgesic that is highly addictive and dangerous in high doses, depressing the central nervous system. Many period authors warn against using it except when pain is extreme due to the difficulty in determining safe dosage.

Pyrethrum *(Multiple spp.)*

Dioscorides:

"*It draws out phlegm; as a result boiled with vinegar and used as a mouthwash it helps toothache. Chewed, it expels phlegm; and rubbed on with oil it produces sweats, is helpful for long-lasting chills, and is excellent for chilled or paralytic parts of the body." (6)*

Gerard:
"Pyrethrum taken with honey is good against all cold diseases of the braine. The root chewed in the mouth draweth forth great store of rheume, slime, and filthy waterish humors, and easeth the paine of the teeth… If it be boyled in vinegar, and kept warme in the mouth it hath the same effect." (10)

Technical Evaluation: Molecules:

“The extracts of different parts of A. pyrethrum (L) showed a significant analgesic effect against pain caused by acetic acid... Regarding the wound healing activity, the macroscopic examination of wounds revealed a better evolution, with a substantial diminution in the wound diameter of treated animals with different extracts compared to both positive and negative controls. The healing effects of plant extracts could be attributed to their antibacterial effects, which ensure the protection of damaged tissues and the wound microenvironment from bacteria. Furthermore, the healing effects might also be due to the anti-inflammatory activity of plant extracts that manage immune cell accumulation at the wound site.” (14)

Clinical Applications: Pyrethrum is a perennial flowering plant. It is anti-microbial, analgesic, and improves wound healing.

Evaporating sea water, from *De Re Metallica*

Salt

Dioscorides:

"These salts all have similar properties — useful as an astringent, and to clean and dissolve, as well as repress, reduce the intensity of symptoms, and form scabs — only differing slightly… Warm packs are made from them in little bags to ease pain, and rubbed on by the fire with oil and vinegar (until the person sweats) they lessen itching. In the same way (rubbed on with honey and vinegar) they lessen lichen [skin disease with red pustules], parasitical skin diseases, leprosy, and a synanchic [abscessed] throat. For the tonsils and adenoids they are roasted with honey, and for spreading ulcers, apthas [small ulcers], and moisture of the gums they are applied burnt with polenta… As an antidote for drinking the juice of poppy or eating mushrooms it is taken as a drink with vinegar and honey." (6)

Technical Evaluation: National Institutes of Health:

"The main application salt in Iranian medical resources includes usage in latif supplier, solvent, dryer, laxative of phlegm and melancholy, slimy moisture body repellent, opening obstruction of liver and spleen, aid in digestion, beneficial for seeds and corruption of foods, appetizing, cold foods reformer and improving the flavor of foods. On the other hand, the major benefits of salt according to modern medicine resources are; aiding the balance of electrolytes and fluids, carry nutrients into cells, regulation of acid-base balance, support transfer of nerve impulses, regulate blood pressure, and secretion of gastric acid." (16)

Clinical Applications: In the modern dental context, saltwater is often recommended as a mouth rinse as it is anti-microbial and soothing to inflamed gum tissue. In period salt was often recommended as an ingredient in mouth rinses. It was also a common ingredient in dentifrices; the crystalline structure makes it very abrasive which helps clean the teeth and remove stains but it also wears away tooth enamel over time. In the short term it would help remove calculus and sooth the gums but in the long-term it could eventually wear away the enamel entirely, exposing the softer middle portion of the tooth (dentin).

CONCLUSIONS

The most commonly used ingredients in historical dental medicaments all have scientifically proven health benefits; however, these treatments would mostly have been good for short-term symptom relief and slowing the progression of dental caries and periodontal disease, and/or promoting healing of ulcers or wounds in the mouth. Gingival pain caused by bacterial, fungal, or viral infections could be improved by the anti-microbial ingredients, but the infection might not be entirely eradicated. Tooth pain caused by sinus pressure/infections could be improved by the antimicrobial action of many ingredients. Some ingredients have an analgesic effect which would improve patient comfort. Physically removing dental calculus (as prescribed by Albucasis and others) is necessary to prevent the progression of periodontal disease which is the most common cause of chronic gingival pain. Physically removing carious dental structure and filling the cavity with an inert substance such as gold (first documented in Europe in the late 15th century) stops the progression of caries. While these treatments were prescribed in period I have been unable to find any information about how common they were and who would have had access. That would require access to large numbers of skulls, specifically analyzing them for evidence of treatment.

BIBLIOGRAPHY

1. Alizadeh, A., Moshiri, M., Alizadeh, J., & Balali-Mood, M. (2014, September). *Black Henbane and its toxicity - A Descriptive Review*. Avicenna journal of phytomedicine. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4224707/
2. Anderson, T. (2004). Dental treatment in Medieval England. *British Dental Journal*, *197*(7), 419–425. https://doi.org/10.1038/sj.bdj.4811723
3. Batiha, G. E.-S., Wasef, L., Teibo, J. O., Shaheen, H. M., Zakariya, A. M., Akinfe, O. A., Teibo, T. K. A., Al-Kuraishy, H. M., Al-Garbee, A. I., Alexiou, A., & Papadakis, M. (2023, March). *Commiphora myrrh: A phytochemical and pharmacological update*. Naunyn-Schmiedeberg's archives of pharmacology. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9672555/
4. Butnariu, M., Quispe, C., Herrera-Bravo, J., Pentea, M., Sărac, I., Küşümler, A. S., Özçelik, B., Painuli, S., Semwal, P., Imran, M., Gondal, T. A., Emamzadeh-Yazdi, S., Lapava, N., Yousaf, Z., Kumar, M., Eid, A. H., Al-Dhaheri, Y., Suleria, H. a. R., Del Mar Contreras, M., . . . Cho, W. C. (2022). Papaver Plants: Current Insights on Phytochemical and Nutritional Composition Along with Biotechnological Applications. *Oxidative Medicine and Cellular Longevity*, *2022*, 1–23. https://doi.org/10.1155/2022/2041769
5. Deglovic, J., Majtánová, N., & Majtán, J. (2022). Antibacterial and antibiofilm effect of honey in the prevention of dental caries: a recent perspective. *Foods*, *11*(17), 2670. https://doi.org/10.3390/foods11172670
6. Dioscorides Pedanius, of Anazarbos. (1934). *The Greek Herbal of Dioscorides*, Oxford : Printed by J. Johnson for the author, at the University Press
7. Eustachius, B., Chernin, D. A., & Shklar, G. (1999). *Bartholomaeus Eustachius: A little treatise on the teeth: The first authoritative book on dentistry (1563)*. Canton: Science History Publications.
8. Forshaw, R. J. (2009a, April 25). *Dental Health and disease in Ancient Egypt*. Nature News. https://www.nature.com/articles/sj.bdj.2009.309

9. Forshaw, R. J. (2009, May 9). *The practice of dentistry in ancient Egypt*. Nature News. https://www.nature.com/articles/sj.bdj.2009.355

10. Gerard, J., Johnson, T., Ollivander, H., & Thomas, H. (2009). *Gerard's herbal: Selections from the 1633 enlarged and amended edition*. Velluminous.

11. Guerini, V. (1967). *A history of dentistry: From the most ancient times until the end of the eighteenth century: (Philadelfia and New York 1909)*. Liberac.

12. Guy, Nicose, E.D. (2007). *The Major surgery of Guy de Chauliac: Surgeon and master in medicine of the University of Montpelier*. Philadelphia: Xlibris Corporation.

13. Hildegard, Saint & Throop, Priscilla, 1946-, (translator.) & Jacobsen, Mary Elder, (illustrator.) (1998). *Hildegard von Bingen's Physica : the complete English translation of her classic work on health and healing*. Healing Arts Press, Rochester, Vt

14. Jawhari, F. Z., Moussaoui, A. E., Bourhia, M., Imtara, H., Mechchate, H., Es-Safi, I., Ullah, R., Ezzeldin, E., Mostafa, G. a. E., Grafov, A., Ibenmoussa, S., Bousta, D., & Bari, A. (2020). Anacyclus pyrethrum (L): Chemical Composition, Analgesic, Anti-Inflammatory, and Wound Healing Properties. *Molecules*, *25*(22), 5469. https://doi.org/10.3390/molecules25225469

15. Khodadoust, K. (2013). *Dental and oral diseases in Medieval Persia, lessons from Hedayat Akhawayni*. PubMed Central (PMC). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3885147/

16. Mokhtari, M., & Vahid, H. (2016, May). *Salt and its role in health and disease prevention from the perspectives of Iranian Medicine and Modern Medicine*. Iranian journal of medical sciences. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5103567/#:~:text=On%20the%20other%20hand%2C%20the,and%20secretion%20of%20gastric%20acid.

17. *PDR for Herbal Medicines*. (2007). . Thomson.

18. Samarghandian, S., Farkhondeh, T., & Samini, F. (2017). *Honey and health: A review of recent clinical research*. Pharmacognosy research. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5424551/#:~:text=Traditionally%2C%20honey%20is%20used%20in,used%20as%20a%20nutritious%20supplement.

19. Seo, H.-S. (2012, June). *An experimental study of the anti-oxidant and the anti-inflammatory effects of alum and burnt alum*. Journal of pharmacopuncture. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4331937/#:~:text=Alum%20(AL)%20is%20one%20of,check%20diarrhea%20and%20dispel%20windphlegm.

20. Σουλαϊδόπουλος, Σ., Tsiogka, A., Chrysochoou, C., Lazarou, E., Aznaouridis, K., Doundoulakis, I., Tyrovola, D., Tousoulis, D., Tsioufis, K., Vlachopoulos, C., & Lazaros, G. (2022). Overview of Chios Mastic Gum (Pistacia lentiscus) Effects on Human Health. *Nutrients*, *14*(3), 590. https://doi.org/10.3390/nu14030590

21. Suresh Kumar, & popular, A. remedies have become. (2011, June 24). *Overview for various aspects of the health benefits of Piper Longum Linn. fruit*. Journal of Acupuncture and Meridian Studies. https://www.sciencedirect.com/science/article/pii/S2005290111600204?via%3Dihub

22. Tafrihi, M., Imran, M., Tufail, T., Gondal, T. A., Caruso, G., Sharma, S., Sharma, R., Atanassova, M., Atanassov, L., Fokou, P. V. T., & Pezzani, R. (2021). The wonderful activities of the genus Mentha: not only antioxidant properties. *Molecules*, *26*(4), 1118. https://doi.org/10.3390/molecules26041118

23. Tagonline. (2020, December 9). *Alum Environmental and toxicological information*. Affinity Chemical. https://www.affinitychemical.com/alum-environmental-and-toxicological-information/#:~:text=Alum's%20toxicity%20to%20humans,%2C%20nausea%2C%20and%20respiratory%20irritations.

24. Trotula, & Green, M. H. (2001). *The Trotula: A medieval compendium of women's medicine*. Philadelphia: Univ. of Pennsylvania.

25. Vigo, G. D., & Godin, N. (1520). *Practica copiosa in arte chirurgica ..* Venetiis.

GLOSSARY OF DENTAL TERMS

Calculus – dental tartar. It is formed when biofilm (plaque) on the teeth mineralizes and hardens due to minerals in the saliva. It is the primary cause of gingivitis and periodontitis.

Caries – tooth decay, caused directly by acid and indirectly by bacteria which ingest sugars and secrete acid

Cariogenic – causing caries

Dentifrice – a paste or powder for cleaning the teeth

Dentin – the moderately hard, semi-porous middle layer of teeth

Enamel – the hard outer layer of teeth

Extraoral – outside the mouth

Gingiva – gum tissue

Gingivitis – the first stage of periodontal disease characterized by inflamed gums which bleed easily

Intraoral – inside the mouth

Periodontal – around the tooth

Periodontal disease/periodontitis - inflammation and infection of the gums and the bone that supports the teeth. It is caused by bacterial build up on the teeth which hardens into calculus which then induces chronic inflammation of the tissues. Symptoms include bad breath, loose teeth and bleeding, swollen gums. Bone loss caused by periodontitis is irreversible and is a leading cause of tooth loss in adults.

Pulp – the inner layer of teeth including the nerves and blood supply

TABLE OF RECIPES ANALYZED

CULTURE	INGREDIENTS	TYPE OF MEDICAMENT	APPROXIMATE DATE	SOURCE
Egyptian	wheat seeds ochre	intraoral poultice	3000 BCE	Guerini
Egyptian	honey malachite terebinth resin	intraoral poultice	3000 BCE	Guerini
Egyptian	terebinth resin cumin carob	intraoral poultice	3000 BCE	Guerini
Egyptian	grain dough honey oil	intraoral poultice	1000 BCE	Guerini
Egyptian	fennel dough anest honey incense	mouth wash	1000 BCE	Guerini
Egyptian	palm fruit green lead honey	dentifrice	1000 BCE	Guerini
Egyptian	cumin incense onion	intraoral poultice	1000 BCE	Guerini
Egyptian	incense verdigris green lead	intraoral poultice	1000 BCE	Guerini
Greek	dill anise myrrh wine	mouth wash	100 BCE	Guerini
Greek	castoreum pepper	mouth wash	100 BCE	Guerini
Greek	alum	intraoral poultice	100 BCE	Guerini
Greek	alum myrtle	intraoral poultice	100 BCE	Guerini

Greek	red nitre peach kernel resin	intraoral poultice	100 BCE	Guerini
Roman	alum frankincense cannelle cypress	intraoral poultice	100 CE	Guerini
Roman	acorn castoreum cinnamon poppy mandrake pepper	mouth wash	100 CE	Guerini
Roman	cypress iris	extraoral poultice	100 CE	Guerini
Roman	white poplar wine deer antler vinegar figs wine honey	mouth wash	100 CE	Guerini
Roman	pomegranate gall nut pine bark vermillion	intraoral poultice	100 CE	Guerini
Roman	rose leaf gall nut myrrh	dentifrice	100 CE	Guerini
Roman	panax	mouth wash	100 CE	Guerini
Roman	plantain	masticatory	100 CE	Guerini
Roman	Verbena officinalis	masticatory	100 CE	Guerini
Roman	snail shell myrrh	dentifrice	100 CE	Guerini
Roman	cypress	mouth wash	100 CE	Guerini
Roman	hyoscyamus	intraoral poultice	100 CE	Guerini
Roman	purslane	dentifrice	100 CE	Guerini
Roman	wax onion seed	fumigant	100 CE	Guerini
Roman	wine	mouth wash	100 CE	Guerini

	sorrel			
Roman	vinegar alum cedar gum	intraoral poultice	100 CE	Guerini
Roman	radish	dentifrice	100 CE	Guerini
Roman	barley vinegar honey salt	dentifrice	100 CE	Guerini
Roman	deer antler mastic sal ammoniac	dentifrice	100 CE	Guerini
Roman	vinegar hyoscyamus	mouth wash	100 CE	Guerini
Roman	salt alum wine	intraoral poultice	100 CE	Guerini
Roman	black veratrum honey	fumigant	100 CE	Guerini
Roman	figs spikenard honey	dentifrice	100 CE	Guerini
Roman	beet root cumin myrrh cucumber human milk	extraoral poultice	100 CE	Guerini
Persian	willow bark oxime plantago psyllium vinegar	mouth wash	800-900 CE	Khodadoust
Persian	oil of willow mastic	intraoral poultice	800-900 CE	Khodadoust
Persian Persian	vinegar salt Muscari comosum	mouth wash mouth wash	800-900 CE 800-900 CE	Khodadoust Khodadoust
	tar			
Persian	citrullus colocynthis vinegar	mouth wash	800-900 CE	Khodadoust
Persian	Ruscus aculeatus	mouth wash	800-900 CE	Khodadoust

	pine wood garlic vinegar			
Persian	pyrethrum caper bush vinegar	mouth wash	800-900 CE	Khodadoust
Persian	black henbane Styrax officinale	intraoral poultice	800-900 CE	Khodadoust
Persian	salt meerschaum (white clay) Ghozareh chini cumin	dentifrice	800-900 CE	Khodadoust
Persian	bergamot clove Valerian celtica vinegar Aquilaria malaccensis	intraoral poultice	800-900 CE	Khodadoust
Persian	lime oil oak apple alum	intraoral poultice	800-900 CE	Khodadoust
Persian	vinegar	mouth wash	800-900 CE	Khodadoust
German	wormwood ironweed wine sugar	mouth wash	1100 CE	von Bingen
German	aloe myrrh	fumigant	1100 CE	von Bingen
English English	alum honey wine Vebascum thapsus pomegranate pyrethrum ginger	intraoral poultice intraoral poultice	1200 CE 1200 CE	Anderson Anderson
English	marshmallow plant	intraoral poultice	1200 CE	Anderson
English	henbane leek	intraoral poultice	1200 CE	Anderson
English	ivy honeysuckle betony	intraoral poultice	1200 CE	Anderson

	round birthwort thornapple holly leaf			
English	pyrethrum	intraoral poultice	1200 CE	Anderson
English	sheep suet Eryngium maritinum	intraoral poultice	1200 CE	Anderson
English	Inula helenium	dentifrice	1200 CE	Anderson
English	sage salt	dentifrice	1200 CE	Anderson
English	rosemary sage honeysuckle common mallow honey alum	mouth wash	1200 CE	Anderson
English	wine rosemary frankincense honey	mouth wash	1200 CE	Anderson
English	sage salt vinegar	intraoral poultice	1200 CE	Anderson
English	plantain vinegar rose water	mouth wash	1200 CE	Anderson
English	black nightshade goat milk blackberry vinegar	fumigant	1200 CE	Anderson
English	birch mint wine	mouth wash	1200 CE	Anderson
English	marjoram oregano	masticatory	1200 CE	Anderson
English	mint pyrethrum	intraoral poultice	1200 CE	Anderson
English	hyssop cinnamon spikenard cubeb	mouth wash	1200 CE	Anderson

English	pepper	dentifrice	1200 CE	Anderson
English	purselane Solanum dulcamara vinegar	masticatory	1200 CE	Anderson
English	mastic clay iron oxide Solanum dulcamara	extraoral poultice	1200 CE	Anderson
English	mentha	extraoral poultice	1200 CE	Anderson
English	rose	fumigant	1200 CE	Anderson
English	henbane leek	fumigant	1200 CE	Anderson
English	purselane Solanum dulcamara vinegar	masticatory	1200 CE	Anderson
English	mastic clay iron oxide Calamus draco	extraoral poultice	1200 CE	Anderson
English	mint	intraoral poultice	1200 CE	Anderson
English	henbane Popaver somniferum	intraoral poultice	1200 CE	Anderson
English	galbanum myrrh Popaver somniferum	fumigant	1200 CE	Anderson
English	galbanum ivy oak gall ginger vinegar	intraoral poultice	1200 CE	Anderson
English	sage nettle Piper nigrum	intraoral poultice	1200 CE	Anderson
English	henbane	fumigant	1200 CE	Anderson
English	henbane marjoram	fumigant	1200 CE	Anderson
English	mint wine	mouth wash	1200 CE	Anderson
English	honey salt	intraoral poultice	1200 CE	Anderson

	Styrax officinale			
English	incense clove	fumigant	1200 CE	Anderson
English	Delphinium staphisagria mastic galbanum	masticatory	1200 CE	Anderson
English	ginger Piper nigrum pyrethrum costmary	dentifrice	1200 CE	Anderson
English	alum salt columbine Verbena officinalis marjoram mint	intraoral poultice	1200 CE	Anderson
English	cinnamon mastic marjoram mint saltpetre	dentifrice	1200 CE	Anderson
English	myrrh agrimony Verbena officinalis oak gall frankincense	dentifrice	1200 CE	Anderson
Italian	walnut salt wine	dentifrice	1200 CE	Trotula
Italian	wine galengal ginger frankincense alum sugar	mouth wash	1200 Ce	Trotula
Italian	cinnamon clove spikenard mastic frankincense	intraoral poultice	1200 CE	Trotula

	wheat wormwood crabfoot date pits olives			
Italian	pumice salt cinnamon clove honey	dentifrice	1200 CE	Trotula
Italian	marble date pits white natron red tile salt pumice	dentifrice	1200 CE	Trotula
Italian	fennel lovage parsley	masticatory	1200 CE	Trotula
Italian	quicklime sulfur orpiment gourd pepper vinegar mullein root cinnamon rose water	intraoral poultice	1200 CE	Trotula
Italian	bay laurel musk	mouth wash	1200 CE	Trotula
French	vinegar rose water plantain camphor	mouth wash	1360 CE	de Chauliac
French	rose oil myrrh onfacium mastic raisins Popaver somniferum	mouth wash	1360 CE	de Chauliac
French	rose oil	mouth wash	1360 CE	de Chauliac

	mastic wine hyssop calamint			
French	raisins figs flax seed fenugreek	mouth wash	1360 CE	de Chauliac
French	rose oil camomile aneth	mouth wash	1360 CE	de Chauliac
French	ben spikenard	mouth wash	1360 CE	de Chauliac
French	cumin bay laurel rue seed galbanum serapinum	mouth wash	1360 CE	de Chauliac
French	salt alum gall ash	intraoral poultice	1360 CE	de Chauliac
French	parietory mercury salt alum oregano iris pepper pyrethrum costus mustard sesali hyssop mint deer antler cinnamon	intraoral poultice	1360 CE	de Chauliac
French	wine mint saffron calamint pepper	mouth wash	1400 CE	Guerini

	pyrethrum			
French	gall-musk souchet mastic myrrh sulfur camphor wax sal ammoniac asafetida	fumigant	1400 CE	Guerini
French	squid bone seashell porcelain pumice deer antler niter alum salt sulfur iris root aristolochia reed ash	dentifrice	1400 CE	Guerini
French	sal ammoniac salt alum	mouth wash	1400 CE	Guerini
Italian	vinegar acqua vitae rosemary sage chamomile clove nutmeg mandrake	mouth wash	1520 CE	da Vigo