

Opium in ninth century Baghdad

In this article, Selma Tibi outlines the knowledge and therapeutic uses of opium and various species of poppy in Baghdad (a leading medical centre during the ninth century AD), as seen in key works by six outstanding physicians

Much of what we now know about the medicinal value of opium was already known in antiquity. Produced in Egypt, particularly in Thebes, opium was exported all over the Mediterranean world as *opium thebaicum* and used medicinally by the ancient Egyptians, and in Hellenistic and Roman times. With the spread of Islam in the seventh century, opium was introduced into India and, much later, in the 13th century, into China, where it was first used as a medicine.

GREEKS AND ROMANS

The benefits and dangers of opium were recorded by many Greek and Roman medical authors such as Hippocrates, Dioscorides, Celsus, Galen and Paul of Aegina. They knew, as we do, that nearly all parts of the white poppy, *Papaver somniferum* L., are pharmacologically active, particularly the unripe capsules, from which the juice or latex, opium, is extracted. The word opium is from the Latin for poppy juice and from the Greek word, *opion*, meaning juice

of a plant. The Greek word *diacodion* means “the drug from the poppy capsule”. In Arabic, the word for opium, taken either immediately from Greek, or through the Persian word *abyun*, is *afyun*, while poppy is called *kbasbkhash* — “that which rattles” referring, presumably, to seeds in a dry capsule.

Knowledge of the Graeco-Roman use of opium passed to ninth century Baghdad physicians mainly through translations of the works of Dioscorides and Galen. Dioscorides, from Anazarbus in south-east Turkey, was the first to write detailed accounts of the therapeutic uses of opium. He acquired his name, Greek for “the dendrologist of God”, from his interest in nature; he spent 40 years collecting information on over 1,000 plants, animals and minerals and recorded this in the five books of ‘*De materia medica*’, which became one of the most influential of medical writings, forming a database of pharmacy for genera-

tions after him. Strangely enough, the shield in the centre of the Royal Pharmaceutical Society’s coat of arms, which is supported on the left by the 11th century Islamic physician Ibn Sina (Avicenna) and on the right by Galen, does not feature Dioscorides at all.

Way ahead of his times, Dioscorides arranged drugs according to their physiological effect on the body. Herbs, for instance, are recorded in different books depending on their actions. Book IV, ‘Herbs and roots’, has separate entries for the different species of poppy. ‘*De materia medica*’ of Dioscorides was first translated from Greek into Arabic in the ninth century and became the foundation for Islamic pharmacology. The only translation into English was made by John Goodyer in the 17th century.

Two Arabic manuscripts of *De materia medica* are held at the Bodleian Library in Oxford. One is a 12th century, complete and unillustrated copy and the other is a 13th-century, illustrated copy which is incomplete but does contain the book on herbs and roots. The latter was bought by Sir William Osler (Regius Professor of Medicine at Oxford) in 1912 via the British con-

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sul in Shiraz from a reluctant but needy Persian for the grand sum of £25 plus tuppence ha'penny for postage. Much to his disgust, the consul noted that the halo on Dioscorides at the beginning of the manuscript had been changed by a pious former owner (as being idolatrous) to a turban.

Galen, who lived in the second century AD, was of even greater influence in the Islamic medical world. According to Ibn Zuhri, the renowned 12th-century Andalusian physician, "Jalinus [Galen] was unquestionably the master of the science of medicine". Like Dioscorides, Galen was a Greek living in a Roman world and though he wrote in Greek, the titles of his books are generally referred to by their Latin names. Born and educated at Pergamum in Asia Minor, Galen went to Rome, where he excelled as a physician. His most famous patient was Marcus Aurelius (161–80 AD), for whom Galen prepared a daily dose of theriac (literally antidote). Theriac was made up of many drugs and aromatics, including opium. According to Galen, it cured everything from snakebites to epilepsy but, for Marcus Aurelius, he adjusted the opium content depending on whether the Roman emperor wished to feel good or simply wanted a good night's sleep. Like Dioscorides, Galen described the effect of opium as cooling because of the potentially fatal loss of innate heat and sensitivity.

BAGHDAD IN THE NINTH CENTURY

The Arabs played an important role in preserving Greek knowledge. They studied and translated many of the Greek medical works, then built on them with their own observations. The ninth century (the third, in the Muslim calendar) was a particularly significant one in the Islamic world. It was the golden age of the Abbasid caliphate (of Harun al-Rashid fame), an age not only of power but also of learning and progress. The capital, Baghdad, though only 50 years old, was at its peak and had become a centre of academic activity. Caliphs sent scholars to distant places in search of manuscripts; according to the historian R. A. Nicholson: "In quest of knowledge men travelled over three continents and returned home, like bees laden with honey, to impart the precious stores, which they had accumulated to crowds of eager disciples." As a result, many Greek and Roman codices that would otherwise have been lost were copied, translated and preserved. Owing in part to Muslim tolerance of other religions, the translators were mainly Syriac-speaking Christians, who were of the elite class before the arrival of Islam and therefore knew the languages necessary. The translators of Greek works into Arabic were not interested in Greek literature, so no close contact was established between the Arab mind and Greek drama, poetry or history (influence in this field remained Persian). It was Greek medicine, mathematics and allied sciences, and philosophy that fascinated the Arabs most. Philosophy (from

which the Arabic word *falsafa* is derived) was new to them and Aristotle was their "first teacher". In medicine, Galen was quoted most, but when it came to pharmacy and botany, Dioscorides took precedence.

OPIUM AND POPPY IN SELECTED WORKS

A number of well known physicians, who either originated from Baghdad or went there to practise, flourished in the ninth century and were authors of important medical and scientific treatises. Medical figures of the time were not only polymaths, but also excelled in all that they knew. Their livelihood and their lives were at the mercy of the ruling caliph, yet they still managed to produce a vast amount of work not only on medicine but also on a variety of subjects such as philosophy, mathematics, logic, music and astronomy. Kindi, for example, wrote the earliest known description of how the frequency with which various letters of the alphabet appear in a text can be used to decipher codes.



Illustration of a poppy from a 13th century Arabic manuscript of a translation of Dioscorides's *De materia medica*

Six of the most important figures were, in chronological order: Yaqub ibn Ishaq al-Kindi, Sabur ibn Sahl, Hunayn ibn Ishaq, Ali ibn Sahl Rabban al-Tabari, Thabit ibn Qurra and Muhammad ibn Zakariyya al-Razi. Kindi and Razi (so called after the place of his birth, Rayy, near Tehran) were Muslims, while Thabit (from Harran in Mesopotamia) was a Sabian — a star worshipper. Sabur (from Khuzistan), Hunayn (from al-Hira) and Tabari (from Tabaristan) were Christians, although Tabari converted to Islam at the age of 70.

By the ninth century, the number of simple and compound remedies known to the Arabs had risen from that recorded in Greek works, and medical formularies or *agrabadhin* were compiled according to the type of medicament, a form of arrangement for an *agrabadhin* favoured in early Islamic

medicine. Kindi's medical formulary is one of the earliest written in Arabic. Each recipe has a title, usually specifying the ailments it is intended to treat, followed by a list of ingredients and their weights, a brief method of preparation and, sometimes, the dosage. Most of the recipes end with the following, or a similar invocation: "Beneficial, God willing." Kindi's recipes that include opium or poppy are mainly for ocular complaints such as cataracts and ophthalmia.

Like Kindi's, the much larger medical formulary of Sabur, which continued to be used by hospitals and pharmacies until the 12th century, is arranged according to the type of medication in chapters with curious names such as "theriacs and electuaries" and "divine remedies". Unlike Kindi, however, Sabur gives full instructions on preparation: the ingredients are gathered, pounded and sieved (sometimes through a silk cloth), then kneaded in honey. Other vehicles include wine that has been boiled until two thirds of it has evaporated (*muthallath* wine). In one recipe, Sabur stipulates that the medicine should be used six months after its preparation and that it would be fatal if used before. There are about 300 substances that occur in Sabur's opium and opium poppy recipes, some of them quite bizarre. One remedy for angina includes dog's excrement while another, for miscarriage, requires a hyena that is "lame, female, alive and old, with its front and back legs tied together". Oddly enough, the hyena features in remedies by a number of sources, including Dioscorides, and is still used by African witch doctors. Sabur's 400 opium or poppy recipes are for a range of remedies, including those that are "good for old age" and one which, if given to a healthy person, "will protect him from all pains and diseases". Interestingly, the recipe with the most opium is "useful for stupidity and lethargy, and sharpens the brain", while a recipe called "Food for sorrows", which contains henbane as well as opium, is, not surprisingly, used for depression.

It is worth writing a few words about Hunayn, who was a particularly interesting character. The son of a pharmacist, Hunayn, known in the Latin world as Johannitus, was fluent in Greek, Syriac and Arabic and became the most able and prolific of the translators. Besides making translations, Hunayn wrote a number of original works on medicine and other subjects. Word of Hunayn's knowledge and expertise inevitably reached the ears of the caliph who summoned him and made him chief of physicians at his court. Knowing that Hunayn had been to Byzantium, and uncertain of his true allegiance, the caliph decided to put him to the test. He asked Hunayn to concoct a poison to kill an enemy but Hunayn flatly refused, saying he had only learnt how to prepare cures, and that such a request went against both his profession and his religion. As a result, he was imprisoned but continued to study, apparently unperturbed by his surroundings. The caliph, impressed by Hunayn's conviction and

learning, released him and had him reinstated. Later, however, Hunayn fell out of favour again and was publicly flogged. Worse still, like Kindi before him, he had his library confiscated. At the loss of a library that had taken him a lifetime to build up, Hunayn is said to have either died of sorrow or to have poisoned himself.

Hunayn's 'Ten treatises on the eye' is the oldest existing systematic textbook of ophthalmology. It is a large tome, one of the most important medical texts of the Islamic Golden Age. In the eighth century, the Persian physician, Hunayn ibn Ishaq, described the 'horned poppy' (Papaver somniferum) as a 'strong narcotic' and 'one of the most powerful of all narcotics'. He referred to it as 'the plant that has a horned seed' (Razi). The Rev. & Prof. John H. M. J. Flanagan, who is sceptical about the use of narcotics, gives the following passage: "With regard to drugs of the seventh category, that is narcotics, they should be used when the pain is so acute that the patient's life is in danger, particularly when the pain is sharp and comes with corrosion and ulcers. It is necessary to be cautious in the use of these drugs because they weaken eyesight and could possibly damage it. For this reason, one should be careful and avoid them except in cases of extreme urgency. When needed, such drugs should be used sparingly and for a short period, until the pain subsides. When this happens, one should use ocular remedies that have a warming effect, such as the one prepared with cinnamon. These [narcotic] drugs are opium, juice of mandrake and the like."

The tenth treatise contains 45 compound remedies by Greek authors; they are mainly for collyria, involving opium or horned poppy, or both, used to treat ophthalmia, ulcers and pain in the eye. Four recipes are for *kubl*, a compound ocular remedy ground to a fine powder and applied to the eyelids with a probe (*al-kubl* is the origin of the word alcohol — it came to mean essence and spirit obtained by distillation). Hunayn says little about preparation but, occasionally, gives instructions on how to use the medicine, for example, mixed with egg white, woman's milk or water, then applied.

Tabari's most famous work, *Firdaws al-bikma* ('The paradise of wisdom'), is a compendium that includes the anatomy of the human body, its diseases and their treatment. Opium and poppy feature in 46 recipes with titles such as "The great therapy", "Caesar's recipe", "God's gift" and "Mithriditus" (an antidote named after Mithridates VI, king of Pontus, who gave himself immunity to poisons by gradually taking increased doses to the extent that when he was defeated by Pompey, he was unable to commit suicide by poison and had resort to the sword). Some of Tabari's recipes show superstitious belief. For example, some are used for epileptic fits that occur monthly at half-moon, or for people under a spell, for the evil eye, or for evil spirits. Tabari also had a recipe for weight gain in women (fatness in women was, and probably still is, considered highly desirable by Arab males).

The *Kitab al-dbakhira* (Book of treasure) attributed to Thabit (famous mainly as a

mathematician) is a small compendium of diseases and their treatment for use by general practitioners. It has some 60 references to opium or poppy, many of which are not recipes, but contain interesting information such as "opium can eradicate hair from the face and the body" or "eating poppy with syrup of rose-water and syrup of grapes is useful for colds". For head lice, Thabit rec-



Papaver somniferum

ommends a paste of horned poppy and borax. Although they appear under the general heading, "Treatment for hangover", there are two recipes that would seem to precipitate rather than treat the effects of intoxication. In addition to opium, one of them includes black henbane and the other, henbane and mandrake. Perhaps, like many of us, Thabit regarded intoxication as therapeutic in certain circumstances (just as we might take the hair of the dog today).

THE MOST IMPORTANT WRITER

The sixth and by far the most important medical writer in ninth century Baghdad was Razi, known to Europeans as Rhazes. Physician, philosopher and alchemist, he spent most of his life studying. Razi's output was phenomenal, the largest of his medical works being *Kitab al-hawi fi al-tibb* ('The comprehensive book of medicine'). In it, Razi, who did not know Greek, quotes Hippocrates in the middle of the first millennium BC and a range of Hellenic authors between the first and the seventh centuries AD, Galen being his preferred choice. The *Hawi* is, therefore, an invaluable source of earlier work as well as a unique record of the medical knowledge at the time, including remedies that were used or at least tested. Translated into Latin in the 13th century under the title 'Continens', the *Hawi* was repeatedly printed in Europe in the 15th and 16th centuries. The medical science of Razi had a major influence on the development of European medicine. Some of his sayings, which have strong parallels with modern trends in medicine, are worth noting:

- "The physician, even though he has his doubts, must always make the patient believe that he will recover, for the state of the body is linked to the state of the mind"

- "If the physician is able to treat with nutrients, not medication, then he has succeeded. If, however, he must use medication, then it should be simple remedies and not compound ones"
- "With a learned physician and an obedient patient, illness does not linger long"

A medical encyclopedia of 23 volumes, two of them further divided into two lengthy parts, the *Hawi* deals with diseases from the head and progresses systematically through the rest of the body. It is a collection of medical notes that Razi made for himself throughout his life from all he had read (quoting each source), to which he added personal observations. These notes were put together after Razi's death by doctors who had been his pupils.

Razi held strong views on the role of a physician and did not believe it included that of a pharmacist. Introducing his discourse on pharmacy, he states that he includes it in his work despite the fact that "knowledge of medicines and the ability to distinguish the good from the bad and the pure from the adulterated are not necessarily obligatory for a physician". As a result, there is no separate section on compound remedies and, for a text this size, there are relatively few recipes. Both opium and poppy, however, are mentioned frequently and are discussed at length in Volume XX ('On simple drugs'), where the entries on opium and poppy in Dioscorides's *Materia medica* are reproduced. Volumes with more than 20 citations of opium, poppy or horned poppy in descending order are: 'Intestines', 'The eye', 'Ear, nose and teeth', 'Sleep and wakefulness', 'Kidneys and urinary tract', 'Evacuation and fattening', 'Piles and gout', 'Lungs', 'The head', and 'The uterus and pregnancy'.

Razi evidently considered opium and poppy particularly effective for diseases of the intestines and the eyes. He recommended opium orally for diarrhoea and for intestinal ulcers; opium suppositories for tenesmus; opium suppositories (attached to a thread, held at night and pulled out when necessary) for colic; poppy seed enemas for intestinal ulcers and a poppy drink at all times for what he called "a loathsome type of diarrhoea", possibly referring to ulcerative colitis or severe dysentery. Opium was also recommended by Razi to stop the loss of blood in pregnancy, heavy periods and haemorrhoids. An ointment for anal fissures, described by him as "very remarkable", consists only of camphor to which opium is added when the pain is severe. Opium combined with colchicum occurs in oral recipes for "gout and the joints". Colchicum has been used to treat gout since the second millennium BC and its active constituent, colchicine, still used today. Gout was known and described by ancient Greek physicians under various names that appear to have been applied to gout and rheumatism alike; this might explain Razi's reference to "gout and the joints".

Poppy taken with kidneys of skink, brains and eggs of birds, or cockerel testicles was the Viagra of the day, though which of

the ingredients was the aphrodisiac is anyone's guess. Tabari's version, which reads more like a gourmet dish, was made with onions, garlic and male birds' brains.

Opium or poppy appear in topical preparations for inflamed male and female external genitalia. Razi, however, struck lucky and cured a swelling in his right testicle simply with emetics! In the volume on leprosy and scabies, Razi curiously includes treatment for whitlow (a paste of opium in vinegar) which he declares to be the best.

Towards the end of his days, Razi suffered from cataracts and went blind but refused treatment, saying that at his age it would be too painful and that in any case he had seen enough of the world.

CONCLUSIONS

From the mass of material encountered in the six works discussed, it appears that Baghdad physicians in the ninth century used opium for a variety of ailments in every part of the body. Also used, but to a lesser extent, were various species of poppy, which included the horned poppy and a variety of wild poppy. Recipes by the earlier authors, particularly by Sabur and Tabari, have far more ingredients and were often used for a wide variety of disparate complaints. Recipes by the later authors, in particular by Thabit and Razi, are short, to the point and say little about preparation, weights or dosage. The invocations to God invariably given by Kindi and Sabur are absent from recipes by the later authors.

Terminology Opium, according to Razi, is the juice of the "black poppy" and, according to Tabari, it is extracted from the juice of poppy leaves. The combining of "heat-producing" drugs such as castoreum and cinnamon with opium make it safer to use. The use of the term *khashkhash* is not altogether clear. In theory it denotes the genus, poppy, of which two specific varieties are identified and used, *mamitha*, the horned poppy, and *narkiwa*, a wild variety. *Khashkhash* is sometimes qualified as *abyad* (white), *aswad* (black) or *barri* (wild), but when unqualified it seems to refer to the opium poppy.

Of the poppy varieties that are specifically mentioned, the black and the white poppies, along with their seeds, feature most. What was meant by black poppy is uncertain. Botanically, there is no such colour, so this may have been a reference to poppies with dark red flowers, or to the seeds. The relative potency of opium, poppy varieties and poppy parts were graded in the following order, going from weak to strong: unripe poppy, poppy seeds, poppy husks, black poppy and, the most potent, opium. As

regards formulation, poppy was made into a drink, a syrup or a confection, powdered, roasted, fried or inhaled as a vapour.

Uses of opium and poppy There is no clear distinction between the functions of opium, poppy, wild poppy or the horned poppy. In general, however, opium was undoubtedly the drug of choice for pain or severe pain, and poppy was often prescribed for coughs and colds, while horned poppy featured in many ocular remedies. Razi even declares that "horned poppy maintains the health of the eye".

The medicaments take various forms and include: potions; pills, tablets (round or triangular, taken as they are, or stored and mixed with a drink when needed) and

when the body was scratched. Treatment of overdose included: drinking water with honey or absinth with vinegar; taking cinnamon (*the* antidote for opium poisoning) or chicken broth and salt; sternutators, emetics, strong acid enemas, smelling putrid matter and soaking in hot water to alleviate itching. Razi states that, from experience, he found the best treatment of opium poisoning was a potion prepared with a *mithqal* (4.46g) of asafoetida in two *uqiyyas* (67.7g) of pure, strong wine.

A modern perspective Plants and other substances available to practitioners 1,000 years ago differed from area to area and from those of today, so we cannot always be certain of what was meant by names and terms transcribed in books through the centuries. Consequently, we do not know precisely what was used or practised by the physicians. However, bearing this in mind, a brief comparison of the use of opium as seen in the six works with the use of its active components today, allows us to judge whether these physicians were rational users of the opiate. It must be remembered that Razi and the other physicians made the observations they did without the help of modern methods.

The use of opium recommended by the six authors for moderate and severe pain matches, in general, the oral use of codeine, dihydrocodeine and morphine today, although they are not used topically now as some of the opium recipes were by Baghdad physicians. Different varieties and forms of poppy were recommended for coughs, as are codeine and its weaker derivative, pholcodine, now. Both opium and poppy were recommended or intestinal disorders, especially diarrhoea, and codeine is prescribed for acute diarrhoea today. On the other hand, opiates are not used nowadays for eye problems, gout, insomnia, to increase sexual desire or to eradicate head lice.

The delicate red flower that we tend to associate with wheat fields and cornflowers on a balmy summer's day belongs to a family of plants that has served us well through the ages, so much so that Britain's first commercial crop of opium poppies was harvested at 20 secret locations in August 2002. The poppy and its product, opium, have killed pain, induced sleep, improved vision, counteracted gut complaints and treated depression. These vital attributes and many more were noted by Baghdad physicians in the ninth century and, though well aware that opium was a potentially toxic drug, they considered its therapeutic usefulness outweighed its dangers, and recommended its use extensively, but with caution.

lozenges (placed under the tongue overnight), ocular remedies (applied with a probe or in the form of collyria), pastes, dressings and compresses, suppositories, snuffs, decoctions poured on the head for headaches, fumigants and preparations shaped like apples and sniffed. Instructions, however, on how to prepare or use these products are not always provided. All six authors used saffron, gum arabic and myrrh in the recipes. Evidently considered to be of therapeutic value, saffron is the substance that occurs most frequently, although less so towards the end of the century. Starch, which hardly features in recipes by the earlier physicians and is not mentioned by Razi, is the excipient used most by Thabit in the middle of the century.

Dose and overdose The weight of ingredients and doses are not always given, but in a number of oral recipes where they are, the percentage of opium per recipe varies roughly between 2 and 13 per cent, and the weight of opium taken per dose, depending on the patient, is between 0.03 and 0.42g. The dangers associated with opium were generally known, and various figures were given for the lethal dose, ranging from 3.125 to 6.25g. The main symptoms of overdose were given as: dizziness, hiccups, dimmed vision, choking, body chills, severe convulsions, deep sleep and the smell of opium