

The balsam of Maṭariyya: an exploration of a medieval panacea¹

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Introduction

Aromatic resins collected from trees have been employed since the earliest times in perfumes and incense, the treatment of wounds, and the preparation of a wide range of medicaments.² The widespread belief in the medicinal and other qualities of resins such as myrrh, frankincense and storax, coupled with the difficulties involved in collecting and transporting them from their places of origin in Arabia and the Levant meant that these, and other, tree resins were highly valued in the pre-modern world.³ Perhaps the most sought after of all these tree resins was balsam (Greek *βάλσαμον*; Latin *balsamum*; Arabic *balasān*). Discussing the use of the product in Egypt the surgeon and embalmer Thomas Greenhill (d. 1740) remarks:

There is no medicine more generally us'd by the *Egyptians* than the *True Balsam*, which they esteem as a kind of Panacea for all Diseases, both external and internal, curing therewith diverse sorts of Wounds, as also the bitings of venomous Creatures. They use it moreover as a Preservative against the Plague, and to drive away Agues or Fevers that proceed from Putrefaction.⁴

That balsam was so highly esteemed in medicine is amply demonstrated by earlier written sources; it appears regularly in the works of authors from the third century BCE through to the eighteenth century CE. The first part of this article reviews the evidence for the identification of the 'balsams' discussed in these sources and presents a preliminary analysis of the medical literature relating to balsam during this long period. This diachronic survey concentrates upon establishing the main areas of treatment in which balsam was employed.

Balsam maintained high commercial value from the first century CE through to the medieval period. Pliny the Elder (d. 79 CE) claims that a pint of the oil could sell for as much as 1,000 *denarii*, and balsam wood was traded for six *denarii* per roman pound.⁵ The Egyptian chronicler Ibn Iyās (d. c. 1523) claims that balsam fetched as much as its weight in gold.⁶ What is difficult to account for, however, is why balsam should have been much more expensive than other

¹ The research for this article has been funded by grants from the Wingate Foundation and the Barakat Trust. I would like to thank Dr Emilie Savage-Smith and Dr Jos Van Lent for their help in the preparation of this article.

² For instance, see T. Bardinet, *Les Papyrus médicaux de l'Égypte pharaonique: traduction intégrale et commentaire* (Paris: Librairie Arthème Fayard, 1995), *passim*; R. Harrison, *Healing herbs of the Bible* (Leiden: E. J. Brill, 1966), 43, 45–6; J. Zarins, 'Mesopotamia and frankincense: the early evidence', in *Profumi d'Arabia. Atti del convegno*, ed. A. Avanzini (Rome: 'L'Erma' di Bretschneider, 1997), 251–72; D. Potts, *The Arabian Gulf in antiquity*, 2 vols. (Oxford: Oxford University Press, 1990), i, 349; ii, 9–10, 149.

³ G. Majno, *The healing hand: man and wound in antiquity* (Cambridge, MA: Harvard University Press, 1975), 208–19; N. Groom, *Frankincense and myrrh* (London: Longman, 1981).

⁴ T. Greenhill, *Nekrokedeia or the art of embalming* (London, 1705), 210.

⁵ Pliny, *Natural history* xii.54.111, 123. See also comments in H. Cotton and W. Eck, 'Ein Staatsmonopol und seiner Folgen: Plinius, "Naturalis historia", 12, 123 und der Preis für Balsam', *Rheinische Museum für Philologie*, 140, 1997, 153–61.

⁶ Ibn Iyās, *Abū al-Barakat Muḥammad b. Aḥmad al-Hanafī, Die Chronik des Ibn Ijās*, ed. M. Mustafa, M. Sobernheim and P. Kahle, 5 vols. (Wiesbaden: Franz Steiner Verlag, 1960–74), iv, 149.

aromatic tree resins from the Middle East. It should be noted from the outset that resins such as frankincense and myrrh probably appear even more regularly in the medical literature surveyed below. In the second part of this article I argue that the exceptional status accorded in medieval medical practice to balsam, and specifically the balsam from Maṭariyya in Egypt, can only be understood when seen in a wider historical context. This contextual appreciation encompasses both the use of balsam in a range of important ritual functions and the role played by the legends associated with the gardens of Maṭariyya in forming the perception of the product in the medieval period.

Identification of the balsam tree

The words ‘balsam’ and ‘balm’ have long carried rather nebulous connotations relating to the properties of particular substances to soothe or heal.⁷ The words have been incorporated into the hackneyed vocabulary of modern advertising, while the application of grandiose labels such as ‘balm of Gilead’ to cheap commercial medicines was a common practice in the nineteenth century.⁸ In the following discussion, however, I propose a more precise definition. Biologists and pharmacognosists use the term ‘balsam’ to refer to a form of oleo-resin or oleo-gum resin; that is, a mixture of resin and volatile oils.⁹ Oleo-resins are contained in the schizogenous or schizolysigenous ducts of the plant and, in many cases, these liquids are pathological (i.e. only forming when the tree is injured). Balsams are distinguished from other oleo-resins by the high proportion of balsamic acids, such as benzoic or cinnamic acid.¹⁰ Examples of this group include myrrh (*Commiphora molmol* Engl.), frankincense (an appellation covering a variety of resins from the genus *Boswellia*), and balsam of Peru (*Myroxylon pereirae* [Royle] Klotzsch). Balsams are strongly aromatic, and the volatile oils which produce the smell also possess an antiseptic action. The antiseptic and anti-inflammatory qualities of aromatic tree resins such as myrrh and balsam of Peru have been demonstrated in laboratory tests.¹¹ Oleo-resins have other medical applications; for instance, myrrh has been employed as a stimulant, expectorant, anti-spasmodic and carminative.¹²

⁷ For instance, an example of a ‘boulme’ for the treatment of wounds is described in a sixteenth-century English text. See E. MacGill, ‘An example of a primary source: *This Booke of Sovereigne Medicines*’, in *Prospecting for drugs in ancient and medieval European texts: a scientific approach*, ed. B. Holland (Amsterdam: Harwood Academic Publishers, 1996), 52–3. Balm of Gilead is mentioned as a ‘cure’ for love-sickness in the work of the Spanish poet, Judah al-Ḥarizi (d. 1235). See ed. and trans. V. Reichert, *The Tahkemoni of Judah al-Ḥarizi* (Jerusalem: Raphael Haim Cohen, 1965–73), II, 339–44.

⁸ For instance, an anonymous pamphlet now in the Bodleian library printed in Derby in c.1810 is entitled *To the weak, the relaxed and debilitated, Solomon’s cordial balm of Gilead is an invaluable restorative*.

⁹ G. Trease and W. Evans, *Pharmacognosy*, 10th ed. (London: Ballière Tindall, 1972), 156–7; T. Wallis, *Textbook of pharmacognosy*, 4th ed. (London: J. and A. Churchill, 1960), 500.

¹⁰ Trease and Evans, *Pharmacognosy*, 156–7.

¹¹ Majno, *Healing hand*, 217–18; R. Rao, Z. Khan and A. Shah, ‘Toxicity studies in mice of *Commiphora molmol* oleo-gum-resin’, *Journal of Ethnopharmacology*, 76, 2001, 151 and references. A detailed chemical analysis of myrrh is given in D. Martinez, K. Lohs and J. Janzen, *Weihrauch und Myrrh. Kulturgeschichte und wirtschaftliche Bedeutung. Botanik. Chemie. Medizin* (Stuttgart: Wissenschaftliche Verlagsgesellschaft, 1989), 169–80.

¹² R. Wren, *Potter’s new cyclopaedia of botanical drugs and preparations*, revised E. Williamson and F. Evans (Saffron Walden: C. W. Daniel, 1988), 198; Rao *et al.*, ‘Toxicity’, 151; M. Tariq *et al.*, ‘Anti-inflammatory activity of *Commiphora molmol*’, *Agents and Actions*, 17, 1986, 381–2. See also comments by M. Postlethwayt in the translated edition of J. Savary des Bruslons, *The universal dictionary of trade and commerce*, 2 vols., 3rd ed., unpaginated text (London, 1766), I, ‘balsam’. He notes that balm of Mekka may be used for pains in the stomach, colic, weakness of the lungs and low appetite.

Recent experiments have found that extracts taken from the branches of *Commiphora opobalsamum* reduced heart rate and lowered blood pressure.¹³

The range of beneficial properties possessed by oleo-resins helps to explain why they came to be so valued by physicians of the pre-modern period.¹⁴ As with other medicinal products derived from plants, considerable scholarly effort was expended during the antique and medieval periods in differentiating the physical and pharmacological characteristics of each type of tree and the resin it produced. In books of simples and other medical texts, the word ‘balsam’ is not used in a generic sense, but rather to describe the product of a specific species of tree (fig. 1). Early references to the balsam tree appear in the work of Theophrastus (d. 285 BCE),¹⁵ but the first detailed description of the plant, and the products derived from it, appear in *De materia medica* by Dioscorides Pedanius (fl. 1st CE).¹⁶ His account forms the basis of virtually all subsequent descriptions of the balsam tree.¹⁷ Dioscorides states that it is found only in Palestine and Egypt. The tree is described as a small shrub, with long, pale leaves similar in appearance to rue, and growing up to the height of a pyracanthus (illustrations of the plant indicate a height of c. 1.5–2m). The flowers are star-shaped and white. The trunk and slender branches are covered with a two-layered bark, red on the exterior and green on the interior. The berries are yellow to dark red and form in small clusters. The water-soluble oleo-resin, collected by scoring into the bark is the famous balsam ‘oil’ (*opobalsamum*). A single tree might produce six or seven *congii* (approximately 35–40 pints) of the oil each year. Accounts of the extraction of the oleo-resin indicate that a liquid of lesser quality was derived from the berries of the plant (*carpobalsamum*), and a third type was made by boiling down the branches (*xylobalsamum*).¹⁸ Other products were made from the ash of the burnt wood (*lachobalsamum*).¹⁹ The finest oil is described as pale yellow in colour, smooth in texture, aromatic, with an astringent quality. In some sources the smell is likened to either citron or cardamom.²⁰

¹³ A.-S. Abdul-Ghani and R. Amin, ‘Effect of aqueous extract of *Commiphora opobalsamum* on blood pressure and heart rate in rats’, *Journal of Ethnopharmacology*, 57, 1997, 219–22.

¹⁴ For differing views concerning the evaluation of the medical properties of herbal substances in the pre-modern texts, see: J. Riddle, ‘The medicines of Greco-Roman Antiquity as a source for medicines today’, in ed. B. Holland, *Prospecting for drugs in ancient and medieval European texts: a scientific approach* (Amsterdam: Harwood Academic Publishers, 1996), 7–17; P. Prioireschi et al., ‘A quantitative assessment of ancient therapeutics: poppy and pain in the Hippocratic corpus’, *Medical Hypotheses*, 51, 1998, 325–51.

¹⁵ Theophrastus, *Enquiry into plants* ix.6.1.

¹⁶ Dioscorides, *De materia medica* i.19 (according to: ed. M. Wellmann, *Pedanii Dioscurides Anazarbos. De materia medica libra quinque* (Berlin: Weidemann, 1906–14).

¹⁷ For the transmission and interpretation of Dioscorides’ writings in the European and Arab worlds, see: J. Stannard, ‘Medieval herbals and their development’, *Clio Medica*, 9, 1974, 23–33; and *idem*, ‘Dioscorides and Renaissance *Materia Medica*’, *Analecta Medico-Historica 1: Materia Medica in the XVI Century* (Oxford, 1966), 1–21 (both reprinted in J. Stannard, *Herbs and herbalism in the Middle Ages and Renaissance*, eds. K. Stannard and R. Kay, (Variorum Collected Studies Series, Aldershot: Variorum, 1999)); J. Riddle, *Dioscorides on pharmacy and medicine* (Austin: University of Texas Press, 1985); M. Collins, *Medieval herbals: the illustrative traditions*, The British Library Studies in Medieval Culture (London: British Museum, 2000), 31–114; M. Sadek, *The Arabic Materia Medica of Dioscorides* (St Jean-Chrysostome, Quebec: Éditions du Sphinx, 1985).

¹⁸ *Xylobalsamum* is also used to describe the branches themselves. Bundles of branches were also sold in Cairo or exported to Europe. See Savary des Bruslons, *Dictionary*, ‘balsam’.

¹⁹ F. Fabri, *Evagatorium in Terrae Sanctae, Arabiae et Egypti peregrinationem*, ed. C. Hassler, 3 vols. (Bibliothek des Literarischen Vereins in Stuttgart 2–4, Stuttgart: Gedruckt auf Kosten des Literarischen Vereins, 1843–49), iii, 15.

²⁰ For instance, P. Pomet, *Histoire générale des drogues* (Paris, 1694), 276 (citron); P. Belon du Mans, *Observations du plusieurs singularitez et choses mémorables trouuées en Grece, Asie, Iudée, Égypte, Arabie et autres pays estranges* (Paris, 1554), 111 (cardamom).

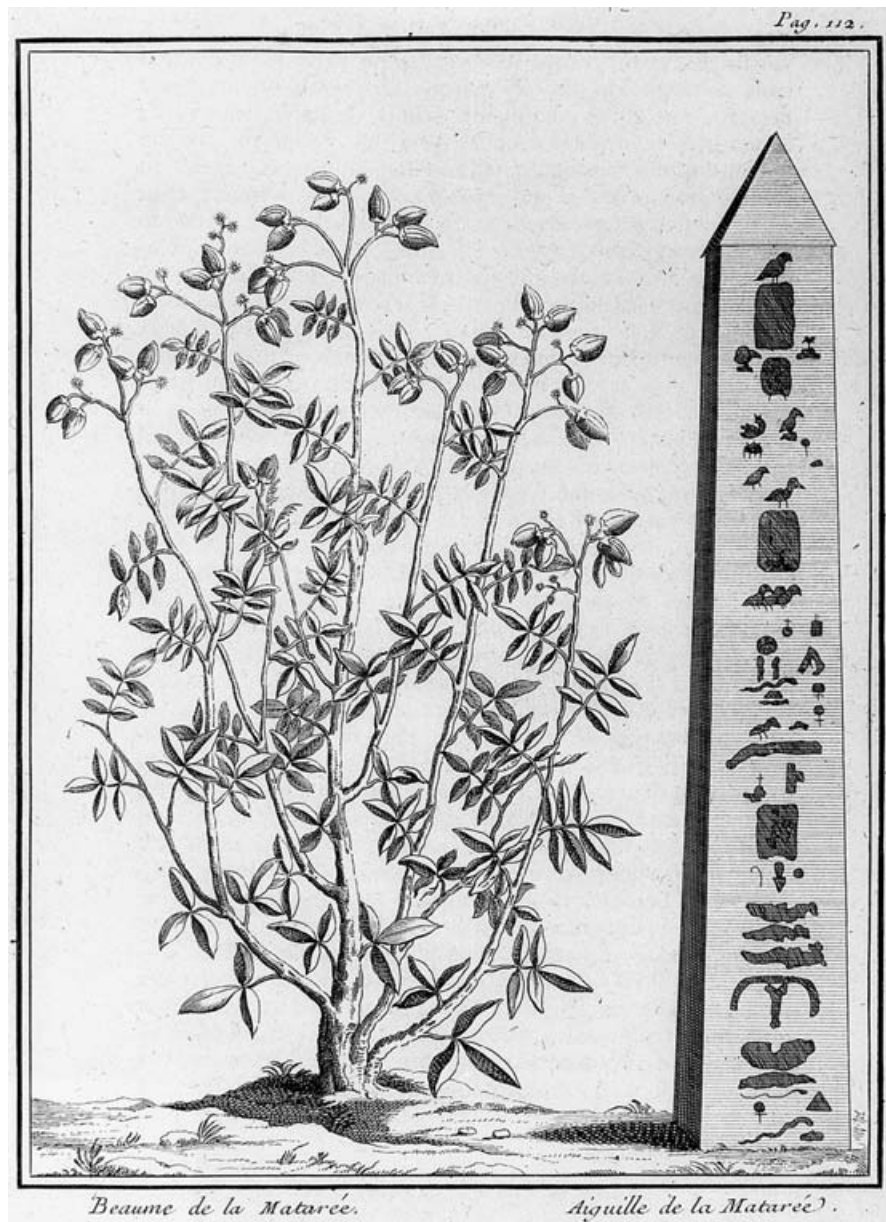


FIG. 1. Illustration of a balsam tree and the obelisk at 'Ayn Shams (Heliopolis). From B. de Maillet, *Description de l'Égypte contenant plusieurs remarques curieuses sur la géographie ancienne et moderne de ce païs* (Paris, 1735). Reproduced by permission of the Syndics of Cambridge University Library.

Attempts have been made to match the descriptions found in biblical, antique and medieval sources with an extant species. The closest correlate appears to be a tree of the Burseraceae family, *Commiphora opobalsamum* [L.] Engl. (synonyms: *Commiphora boranensis* Vollesen, *Commiphora gileadensis* [L.] C. Chr., *Balsamendron gileadensis* Kth. resin, and *Amyris gileadensis* L.,

and colloquially as ‘balm/balsam of Mekka’).²¹ This species, like others of the Burseraceae family such as *Commiphora molmol* and *Boswellia sacra*, is found in semi-arid bushland, rocky hills and sand dunes. It flourishes from sea level to an altitude of 750m. The natural range is south as far as Kenya and north to the Red Sea hills of Sudan and the Hijaz. It is also attested in India.²² An aromatic and virtually colourless oleo-resin is collected from the tree, and travellers of the nineteenth and twentieth centuries report that the resin was available in the markets of the Hijaz and Cairo.²³

The physical appearance and other characteristics of *Commiphora opobalsamum* appear to correspond well with the written descriptions and illustrations of the balsam tree found in antique and medieval sources, but this identification presents some problems. First, *Commiphora opobalsamum* grows considerably taller (between 4m and 6m) than Dioscorides’ balsam tree. Second, the exudate of the former does not possess the fine odour attributed to balsam oil. Indeed, while the balsam was employed extensively in perfume and incense during the antique and medieval periods,²⁴ the smell of balm of Mekka when heated has been likened to ‘burning India rubber’.²⁵ The other difficulty with the identification is geographical. There is broad consensus in sources prior to the eighteenth century that the trees which produced balsam were cultivated in only two locations: the Jordan valley and Dead Sea area (at least up to the end of the fourth century CE²⁶) and, later, in Egypt.²⁷ This designation is not without complications, however. Flavius Josephus (d. after 100 CE) relates that the first balsam trees in Palestine were brought as a gift from Sheba to Solomon (the Old Testament account in I Kings 10.10 makes no specific mention of this)²⁸ and, while this story is probably fanciful, it does contain an element of truth; the trees were native of neither Palestine nor northern Egypt.²⁹

The Arabian peninsula or north-east Africa are certainly candidates for the original home of the plant, but Arabic sources of the thirteenth century onwards make a clear distinction between balsam (*balasān*) from Maṭariyya in Egypt and the oleo-resins derived from the trees of Arabia and elsewhere around the Red Sea coast. A tree found in Arabia—known as *bashām*—produced a similar ‘oil’, but this product was accorded little value in commerce

²¹ K. Vollesen, ‘Burseraceae’, in *Flora of Ethiopia 3: Pittosporaceae to Araliceae*, eds. I. Hedberg and S. Edwards (Addis Ababa and Uppsala, 1989), 475–7; J. Gillett, *Burseraceae* (Flora of East Africa, Rotterdam: Balkema, 1991), 84–6. And see comments in H. and A. Moldenke, *Plants of the Bible* (New Series in Plant Sciences, 28, Waltham, MA: Chronica Botanica, 1952), 84–6; D. Vesey-Fitzgerald, ‘Vegetation of the Red Sea coast south of Jeddah, Saudi Arabia’, *Journal of Ecology*, 43, 1955, 485–6. Additional synonyms are given in Groom, *Frankincense*, 126–30.

²² The present northern range of *Commiphora opobalsamum* in Arabia is in the foothills between Jeddah and Yanbu. See D. Vesey-Fitzgerald, ‘Vegetation of the Red Sea coast north of Jeddah, Saudi Arabia’, *Journal of Ecology*, 45, 1957, 552.

²³ For instance, Ali Bey Abbasi, *The travels of Ali Bey Abbasi in Morocco, Cyprus, Egypt, Arabia, Syria and Turkey between the years 1803 and 1807*, 2 vols. (London: Longman, Hurst, Rees, Orme and Brown, 1816), 1: 112; M. Meyerhof, ‘Der Bazar der Drogen und Wohlgeruche in Kairo’, *Sonderabdruck aus Archiv für Wirtschaftsforschung im Orient*, 3/4, 1918, 198, no. 297.

²⁴ P. Faure, *Parfums et aromates de l’antiquité* (Nouvelles Études Historiques, Paris: Librairie Arthème Fayard, 1987), 240, 246–7; J.-P. Albert, *Odeurs sainteté. La mythologie Chrétienne des aromatiques* (Recherches d’Histoire et des Science Sociales, Paris: Éditions de l’École des Hautes Études en Sciences Sociales, 1990), *passim*.

²⁵ Groom, *Frankincense*, 127. See also I. Löw, *Die Flora den Juden*, 4 vols. (Vienna and Leipzig: R. Löwit Verlag, 1924–34), 1, 300; P. Crone, *Meccan trade and the rise of Islam* (Princeton, NJ: Princeton University Press, 1987), 65.

²⁶ P. Donceel-Voûte, ‘Traces of fragrance along the Dead Sea’, *Parfums d’Orient. Res Orientales*, 11, 1998, 94.

²⁷ G. Post, *Flora of Syria, Palestine and Sinai*, 2nd ed. revised by John Dinsmore (Beirut: American University in Beirut Press, 1932–33), 1, 284.

²⁸ Josephus, *Jewish Antiquities* VIII.174.6.6.

²⁹ It is now found on the Red Sea coast of Egypt. See L. Boulous, *Flora of Egypt. Volume Two: Geraniaceae–Boraginaceae* (Cairo: Al Hadra Publishing, 2000), 68–9.

and was not believed to possess any of the medicinal properties attributed to balsam.³⁰ A plausible solution is that the balsam trees in Egypt and Palestine constituted a cultivated strain of the wild *Commiphora opobalsamum* rather than a separate species. Given that the balsam trees in the plantations of Judea and Egypt had been kept apart from the wild trees from the third century BCE (and perhaps as early as the eighth century BCE if the account of Josephus is to be credited), it would not be surprising if the former evolved distinct characteristics relating to the diminutive dimensions of the tree and the refined scent of the oil. Some evidence can be brought forward to support this view. Already in the third century BCE Theophrastus claims that balsam is unknown in the wild.³¹ Al-Birūnī (d. 1048), citing an earlier author al-Khuṭaybī, writes that the balsam trees do not produce seeds and are propagated by means of cuttings.³² The geographer and physician ‘Abd al-Laṭīf al-Baghdādī (d. 1231) voices the opinion that the Egyptian plants are a sterile hybrid of a wild tree (*al-bashām*) found in the southern Arabian deserts.³³

The designation by medieval sources of the trees in Maṭariyya, and earlier in the plantations of En-Gedi and Jericho, as a distinct and highly-valued category within the larger group of resin-producing Middle Eastern plants should not be understood, however, simply as the end result of a process of careful accumulation of scientific observation in a manner equivalent to the methods practised by modern botanists. While some of the authors discussed in this article made detailed observations based on first-hand knowledge, it would be unwise to discount the impact of received wisdom upon the thinking of the medieval physician or traveller.

Balsam in medicine

It is beyond the scope of the present article to deal with the issue of the precise mechanisms by which knowledge concerning balsam was transferred from antique sources through to the Islamic world and the medieval West,³⁴ but a few observations may help to place the material discussed in the following sections into a general historical context. It has already been noted that the description given by Dioscorides formed the basis of almost all of the later accounts of the balsam tree and the ‘oils’ derived from it. Not only was the work of the Greek author translated in its entirety into Arabic and Latin during the medieval period, but extracts were also lifted and placed into other compendia. For example, the section concerned with balsam in Ibn al-Bayṭār’s (d. 1248) *Kitāb al-jāmi’ li-mufrādat al-adwīya wa’l-aghḍīya* comprises Dioscorides’ account in its entirety, supplemented by comments drawn from

³⁰ For instance, see a discussion of this issue in al-Ghāfiqī, *The abridged version of ‘the book of simple drugs’ of Ahmad ibn Muhammad al-Ghāfiqī Abu’l-Farag (Barhebraeus)*, Egypt University, ed. and trans. M. Meyerhof and G. Sobhy (Faculty of Medicine Publication 4, 5 fascs., Cairo: Al-’Ettemad Printing House, 1932–40), II, 244–5 (Arabic text: 58–9). Also Ibn al-Bayṭār, ‘Abd Allāh b. Aḥmad, *Kitāb al-jāmi’ li-mufrādat al-adwīya wa’l-aghḍīya*, 4 vols. (Bulaq 1291/1874), I, 109. In the eighteenth century it is claimed that ‘balm of Mekka’ (presumably, the same as *bashām*) could be used in the treatment of venereal disease. See translator’s additions in P. Pomet, *A compleat history of druggs* (London: R. Bonwicke et al., 1712), 205–6.

³¹ Theophrastus, *Enquiry* VI.6.4.

³² Muhammad ibn Aḥmad al-Birūnī, *Al-Biruni’s book of pharmacy and medicine*, ed. and trans. H. Saïd (Karachi: Hamdard Academy, 1973), I, 73.

³³ ‘Abd al-Laṭīf b. Yūsuf al-Baghdādī, *Kitāb al-ifāda wa’l-i’tibār*, ed. A. Sabūnū (Damascus, 1983), 24. Trans. in *The eastern key*, ed. K. Zand, J. and I. Vidan (London: George Allen and Unwin, 1964), 45. He writes that the ‘oily balsam [tree]’ (*al-balsām al-duhnī*) [i.e. the cultivated version] does not bear fruit (*lā yuthmiru*).

³⁴ See discussion in M. Milwright, ‘Balsam in the mediaeval Mediterranean: a case study of commodity and information exchange’, *Journal of Mediterranean Archaeology*, 14/1, 2001, 3–23.

other Greek and Arabic sources.³⁵ In other cases, such as Matthaeus Platearius' (d. 1160) book of simples only sections of the original description of balsam are repeated.³⁶ European anthologies of the thirteenth century and later quote antique authorities including Pliny and Dioscorides as well as earlier medieval sources such as the *Tables of Salerno*, Constantine the African (d. c. 1087) and Platearius.³⁷

Several medieval European travellers to Egypt give an account of the methods by which a purchaser could ascertain whether the balsam offered in the market place had been adulterated by using tests including dropping tiny quantities of the substance into a bowl of milk or water (the genuine article would disperse evenly over the surface of the liquid).³⁸ Again, this test has its origins in *De materia medica*. A similar situation is encountered in the transmission of knowledge concerning the use of balsam in compound treatments. The translation, repetition and elaboration of recipes found in the works of earlier authorities is well attested in the writings of Arab and medieval European physicians. Examples of textual transmission can be found in the discussion of theriacs and ophthalmological treatments (see below).

An examination of the medical literature of the antique and medieval periods reveals the important role played by balsam in the preparation of numerous medicaments. The applications of balsam were not confined to the treatment of one illness or group of illnesses, but the available information can be rationalized into a series of categories relating to different forms of treatment. Although other uses are identified, balsam is most consistently reported in the treatment of wounds, in ophthalmology, and as an antidote, calorifacient, effluent, deobstruent and analgesic.

Some of the qualities ascribed to balsam seem to have originated in observable characteristics of the balsam trees, and of tree resins in general. First, the volatile oils in balsam gave off a powerful and pleasant smell. Second, the oleo-resin exuded from cuts made in the bark of the tree. Third, the exudate of the balsam tree, like other tree resins, was not affected by natural processes of decay. Guido Majno, in his discussion of myrrh, assesses the significance of these factors in the use of aromatic resins in antiquity.³⁹ He suggests that the pleasant odour of such oleo-resins could mask the smell of putrefaction. That the resin collected in, and thus 'healed' the cuts made into the bark of the trees, may have encouraged the idea that it would have the same effect on human wounds. The apparently unchanging nature of balsam might also serve to place a wound in a condition of stasis. References to the treatment of wounds with balsam (*zori*) from Gilead are attested in the Old Testament,⁴⁰

³⁵ Ibn al-Bayṭār, *Mufrāda*, i, 107–9.

³⁶ Matthaeus Platearius, *Le livre des simple médecines d'après le manuscrit français 12322 de la Bibliothèque Nationale de Paris*, ed. Ghislaine Malandin (Paris: Éditions Ozalid et Textes Cardinaux, 1986), p. 222 (and see illustration on p. 223).

³⁷ For instance, see the entries on balsam in: Bartholomaeus Anglicus (fl. early 13th), *De proprietatibus rerum* xvii.18 (in ed. M. Seymour et al., *On the properties of things. John Trevisa's translation of Bartholomaeus Anglicus De proprietatibus rerum. A critical text*, 2 vols [Oxford: Oxford University Press, 1975], ii, 916–17); *The herbal of Rufinus*, ed. L. Thorndike (Chicago: University of Chicago Press, 1946), 50–52 (composed c. 1287–1300).

³⁸ For instance, Fabri, *Evagatorium*, iii, 17. And see discussion in Riddle, *Dioscorides*, 75–7.

³⁹ Majno, *Healing hand*, 208–19.

⁴⁰ Jeremiah 8.22: 'I am wounded at the sight of my people's wound. I go like a mourner, overcome with horror. Is there no balm in Gilead, no physician there?' Jeremiah 46.11: 'Go up to Gilead and fetch balm, o virgin people of Egypt. You have tried many remedies, all in vain; no skin shall grow over your wounds'. See also comments on references to balsam in biblical and talmudic literature in *Encyclopaedia Judaica* (Jerusalem, 1971), iv, 142–43; Löw, *Flora*, i, 299–304; J. Preuss, *Biblical and Talmudic medicine*, trans. and ed. F. Rosner (New York: Hebrew Publishing Company, 1978), 238.

and it is also connected with the treatment of wounds⁴¹ and skin blemishes⁴² in antique and Arabic texts. ‘Balm of Mekka’ is sometimes recommended in texts of the seventeenth and eighteenth centuries as a substance which can help to bind a wound together, avoiding the formation of a scar.⁴³

The Greek writer Pausanias (fl. 2nd CE) relates a curious story about trees in Arabia, which provides a link between balsam and the treatment of snake venom. He states:

Those vipers in Arabia that nest around the balsam trees (πάσσαμα), have I know, the following peculiarities. The balsams are about as big as a myrtle bush, and their leaves like those of the herb marjoram. The vipers of Arabia lodge in certain numbers, larger or smaller, under each tree. For the balsam juice is the food they like most, and moreover they are fond of the shade of the bushes... And even if a man should have the misfortune to be bitten by the vipers, though the wound is like the cut of knife, nevertheless there is no fear from poison. For as the vipers feed on the most fragrant perfumes, their poison is mitigated and less deadly.⁴⁴

Whether this anecdote enjoyed a wide currency in the antique world is unclear, but there is evidence that balsam was valued as an antidote from an early date. Dioscorides states that balsam could be used against snake bites.⁴⁵ The later writers al-Ṭabarī (fl. 9th) and al-Rāzī (Rhages, d. c. 925) both voice the opinion that balsam was efficacious in the case of scorpion stings (sing. *ladgh al-aqrab*).⁴⁶ Similar claims are made by the Byzantine physician Simeonis Seth (fl. 11th).⁴⁷ Moses b. Maymūn (Maimonides, d. 1204) includes balsam in an antidote to poison.⁴⁸ Al-Birūnī mentions balsam as a treatment for hemlock poisoning, while the ninth-century writer Ibn Wahshiyya employs the oleo-resin in the preparation of both poisons and in medicines for the ingestion of plants such as spurge.⁴⁹

Balsam was also incorporated into complicated compound medicines.⁵⁰ Cornelius Celsus (fl. 1st CE) gives the recipe of the famous theriac Mithridatium, said to have been taken daily by Mithridates, king of Pontus (d. 163 BCE) as a protection against poison. This recipe includes a number of resins including storax, frankincense, turpentine, myrrh and *opobalsamum*, as well as herbs, perfumed products and spices. The ingredients were crushed, combined with honey and formed into tablets.⁵¹ Nero’s physician, Andromachus, is said to

⁴¹ For instance, al-Birūnī, *Pharmacy*, 1: 75.

⁴² Dioscorides, *De materia medica* 1.19, describes the use of balsam to remove boils. Ibn al-Bayṭār, *Mufrāda*, 1, 109, states that burnt balsam wood mixed with vinegar (*al-khall*) can be rubbed on the skin to remove warts (sing. *al-thu’lūl*). See also S. Rubin, *Medieval English medicine* (Newton Abbott: David and Charles, 1974), 125.

⁴³ Translator’s notes in Savary des Bruslons, *Universal dictionary*, 1: ‘balsam’. See also M. Charas, *The royal pharmacopoea galenical and chymical* (London: John Starkey and Moses Pitt, 1678), II. 3 ‘Balsomes’ (213–19).

⁴⁴ Pausanias, *Description of Greece* IX. 28.3–4.

⁴⁵ Dioscorides, *De materia medica* 1. 19.

⁴⁶ Al-Ṭabarī, ‘Alī b. Sahl Rabbān, *Firdausu’l-hikmat or paradise of wisdom*, ed. M. Siddiqi (Berlin, 1928), 403; al-Rāzī cited in Ibn al-Bayṭār, *Mufrāda*, 1, 109.

⁴⁷ Simeonis Seth, *Syntagma per elementorum ordinem, de alimentorum facultate* (Basle, 1561), 20.

⁴⁸ Maimonides, *Treatise on poisons, hemorrhoids and cohabitation. Maimonides’ medical writing*, trans. F. Rosner (Haifa: Maimonides Research Institute, 1984), 51.

⁴⁹ Ibn Wahshiyya, Muḥammad b. ‘Alī, *Medieval Arabic toxicology: the book of poisons of Ibn Wahshiyya and its relation to early Indian and Greek texts*, trans. and ed. M. Levey (American Philosophical Society Transactions, New Series 56 viii, Philadelphia: American Philosophical Society, 1966), 55, 58, 69, 71, 79, 88, 102, 108.

⁵⁰ For a general discussion of the transmission of theriacs, see G. Watson, *Theriac and mithridatium. A study of therapeutics* (London: Wellcome Historical Medical Library, 1966).

⁵¹ Celsus, *De medicina* v. 23. Variant forms of Mithridatium are given in Galen, *De Antidotis* II. 1–4 (according to ed. C. Kühn, *Claudii Galeni opera omnia* [Medicorum graecorum opera quae exstant, Leipzig, 1821–33], xiv, 108–29). See also Watson, *Theriac*, 5–6.

have refined Mithridatium through the subtraction of some components and the addition of others, most notably dried flesh of viper. This theriac, named Galene (γαλήνη), included balsam among the sixty-four ingredients which were ground up, heated and left to mature for five years or more.⁵² Another frequently cited antique recipe involved making tablets ('troches of hedycharum') from the products of perfumed plants including *xylobalsamum* and *opobalsamum*.⁵³

Compound recipes of this type are ubiquitous in Arabic and Western texts of the medieval period. For instance, antique theriacs and later variants are to be found in the works of Ibn Sīnā (Avicenna, d. 1037)⁵⁴ and Ibn Ruṣhd (Averroes, d. 1198).⁵⁵ The former's medical writing became well known in the medieval West through the translations of Gerard of Cremona (d. 1187). The preparation of types of Mithridatium and Galene became a major industry in many cities of medieval and early modern Europe. Of these 'treacles' (a word which, like the Old French *triacle*, is a corruption of theriac), the most famous was Venice Treacle, an electuary mixed with honey and made into tablets. It was said to be based upon the recipe of the Galene of Andromachus. The treacle was first made in the city perhaps as early as the twelfth century and remained popular until the eighteenth as a theriac and panacea.⁵⁶ Balsam (probably most often *carpobalsamum*⁵⁷) is usually listed as one of the many ingredients. Other towns such as Montpellier and Orléans produced similar treacles, although sources of the seventeenth and eighteenth century claim that frauds were common and, in many cases, little care was taken over the ingredients used in the recipe. In particular, it is noted that *opobalsamum*, *carpobalsamum*, and *xylobalsamum* were all extremely difficult, if not impossible, to obtain.⁵⁸ Oil of nutmeg, balsam of Mekka, and balsam of Peru are suggested as alternatives to the balsam of Maṭariyya in the making of treacles.⁵⁹

The Egyptian historian, al-'Umarī (d. 1347), claims that the Mamluk sultan distributed balsam from the gardens of Maṭariyya 'to the castles of Syria, and to hospitals for the treatment of those suffering from illnesses of cold [humour] (*li-mu'āljat al-mabrūdīn*)'.⁶⁰ While it is not apparent whether the supplies sent to the castles of Syria were meant for a medical purpose (such as the treatment of wounded soldiers) or some other function,⁶¹ the reference to 'illnesses of cold' indicates that balsam was employed as a calorifacient. According to the

⁵² Galen, *De theriaca ad pisonem* VI–VII (Kühn ed., XIV, 233). For translations, see *Claudio Galeno. De theriaca ad pisonem*, ed. and trans. E. Cotteri (Biblioteca della 'Rivista di Storia della Scienze Mediche et Naturali', 8, Florence, 1959), 120–26; Watson, *Theriac*, 45–9.

⁵³ Galen, *De theriaca ad pampophilinum* (Kühn ed., XIV, 306). See also comments in Charas, *Pharmacopoea*, Part 2, book 1, chapter 20 (179–80). Dioscorides (*De materia medica* II 91) describes the use of *xylobalsamum* in a recipe for scented goose or pork fat.

⁵⁴ *Avicennae arabum medicorum principis, canon medicinae*. Trans. Gerard of Cremona with annotations by I. Costeo and I. Mongio (Venice, 1608), IV. 1.1 (II, 265–83).

⁵⁵ G. Anawati, 'La traité d'Averroes sur la thériaque et ses antécédents Grecs et Arabes', *Quaderni di Studi Arabi* 5–6, 1987–88, 36–8.

⁵⁶ Watson, *Theriac*, 103–05. Venice Treacle could be used in the treatment of virtually every ailment with the notable exception of plague.

⁵⁷ Savary des Bruslons, *Dictionary*, 'balsam'. Of *carpobalsamum*, he states that it is employed exclusively in Venice Treacle and that 'it has not other use in physic'.

⁵⁸ Pomet, *Druggs*, II, 204–05 (who notes that the balsam which is sold in Cairo is often balsam of Peru prepared with spirit of wine or distilled oil); Charas, *Pharmacopoea*, Part 2, Book 1, 143.

⁵⁹ Charas, *Pharmacopoea*, Part 2, Book 1, 138–9, 143; Savary des Bruslons, *Dictionary*, 'balsam'; Watson, *Theriac*, 143–4 (citing the *Pharmacopoeia* of the Royal College of Physicians for 1746).

⁶⁰ Al-'Umarī, Ibn Faḍl Allāh, *Masālik al-absār*, ed. Ayman Sayyid (Textes Arabes et Études Islamiques, 23, Cairo: Institut Français d'Archéologie Orientale, 1985), 68.

⁶¹ Al-'Umarī may also be alluding to the use of balsam in the manufacture of incendiary devices. See C. Cahen, 'Une traité d'armurerie composé pour Saladin', *Bulletin d'Études Orientales*, 12, 1947–48: 122, 145.

Galenic system of classification, balsam was recognized as a substance with heating and drying qualities.⁶² Dioscorides claims that balsam was one of the most powerful heating agents, while in later sources it is described as a heating and drying element of the second degree.⁶³ Balsam could both warm organs afflicted by an excess of cold humour and expel moisture. Compound recipes including balsam are recommended in Syriac and Byzantine medical texts for warming internal organs and for fighting inflammations caused by an excess of cold.⁶⁴ Ibn al-Bayṭār writes that the head should be covered with a cloth soaked in a mixture of balsam and oil of lily (*duhn al-zanbaq*) in cases of stroke (*al-sakta*) caused by coldness of the brain. Burnt balsam wood mixed with honey can be taken to warm the stomach and remove excess humidity.⁶⁵ Al-Birūnī describes the preparation of a cerecloth impregnated with balsam and rose oil for use against coldness of the uterus and stangury.⁶⁶ Al-Kindī (d. c. 873) employs the substance in a clyster (*ḥuqna*) for, among other things, warming the kidneys and increasing sexual potency.⁶⁷ Ibn Sīnā indicates that balsam can be used both as an astringent and as a calorifacient.⁶⁸ It was not just the oil which might be used in this context as a heating agent; the bark was sold to druggists to be used for this purpose,⁶⁹ and Ibn Riḍwān (d. 1067) recommends the burning of sticks and leaves of balsam when the air is cold.⁷⁰

Diseases of cold humour are also associated in Galenic medicine with the build-up of vapours within the body. Physicians recommended various simples and recipes which would act as effluents. Balsam was regarded as particularly beneficial in such treatments and also in opening blockages. Dioscorides notes that balsam functions as a diuretic, and that it provokes menstruation and can be used to expel a dead foetus.⁷¹ Ibn al-Jazzār (d. 979–80) categorizes balsam as one of the oils which causes the evacuation of vapours collected in the organs and the warming of cold parts of the body.⁷² Other sources describe

⁶² For a discussion of the theoretical basis of Galenic pharmacology, see O. Temkin, *Galenism. Rise and decline of a medical philosophy* (Cornell Publications in the History of Science, Ithaca and London: Cornell University Press, 1973), 112–14.

⁶³ Dioscorides, *De materia medica* i. 19; Ibn al-Bayṭār, *Mufrāda*, i, 108 (citing Galen); al-Ghāfiqī, *Simple drugs*, ii, 244. Platearius (*Livre*, 222) claims balsam is a heating and drying element of the third degree.

⁶⁴ E. Wallis Budge, ed. and trans., *Syrian anatomy, pathology and therapeutics or 'book of medicines'*, 2 vols. (London and New York: Oxford University Press, 1913), xv. 11 (trans. ii, 374–5); Alexander of Tralles, *Oeuvres médicales d'Alexandre de Tralles. Le dernier auteur classique dans grands médecins grecs de l'antiquité*, trans. Félix Brunet (Médecine et Thérapeutique Byzantine, 4 vols., Paris: Librairie Orientaliste Paul Geuthner, 1933–37), vii.18–19.

⁶⁵ Ibn al-Bayṭār, *Mufrāda*, i, 109 (citing Ibn Abī al-Ash'ath and al-Taymī respectively). See also Budge, *Syrian anatomy*, iii, 37 (ii, 64) for a cerecloth impregnated with balsam.

⁶⁶ Al-Birūnī, *Pharmacy*, i, 75.

⁶⁷ Al-Kindī, Abū Yūsuf Ya'qūb b. Ishāq, *The medical formulary or Aqrabadhin of al-Kindi*, trans. and ed. M. Levey (Madison: University of Wisconsin Press, 1966), 146.

⁶⁸ Ibn Sīnā, Husayn b. 'Abd Allāh, *De generatione et corruptione* ii. 2.57 (see *Avicenna latinus. Liber tertius naturalium*, ed. S. Van Riet [Éditions Critiques. Académie Royale de Belgique, Louvain-la-Neuve and Leiden: E. Peeters and E. J. Brill, 1987], 87); Ibn Sīnā, *Poème de la médecine*, ed. H. Jahier and A. Noureddine (Paris: Société d'Édition 'Les Belles Lettres', 1956), 79–80.

⁶⁹ Al-Khutaibī cited in al-Birūnī, *Pharmacy*, i, 74.

⁷⁰ Ibn Riḍwān, Abū Hasan 'Alī, *Medieval Islamic medicine. Ibn Riḍwān's treatise, on the prevention of bodily ills in Egypt*, trans. and ed. M. Dols and A. Gamal (Berkeley and Los Angeles: University of California Press, 1984), 133 (Arabic text: 27). For balsam as a medicinal perfume, see also Paul of Aegina, *Seven books* vii 21–2 (in trans. and ed. F. Adams, *The seven books of Paulus Aegineta*, 3 vols. [London: Sydenham Society, 1844–47], iii, 598–600).

⁷¹ Dioscorides, *De materia medica* i. 19. See also Budge, *Syrian anatomy*, xv 11 (ii, 374–5); Ibn Sīnā, *Canon* ii 2.84; Constantine the African, *Liber de gradibus simplicium in Opera* (Basel, 1536), 357.

⁷² Ibn al-Jazzār, *Ibn al-Jazzār on sexual diseases and their treatment. A critical edition of Zād al-musāfir wa-qūt al-hādir. Provisions for the traveller and nourishment for the sedentary, Book 6*, trans. and ed. G. Bos (The Sir Henry Wellcome Asian Series, London: Wellcome Institute, 1997), 218, 303.

the use of the substance to alleviate the symptoms of colic and to promote good digestion.⁷³ The retention of menstrual blood was believed to be the cause of hysteria in women, and Prosper Alpin (d. 1617) describes a clyster containing balsam which could be used in these circumstances.⁷⁴ Ibn Ridwān writes that balsam can be used to break up bladder stones (sing. *al-ḥaṣā*) and to encourage urination.⁷⁵

The fifteenth-century traveller to Egypt, Felix Fabri, reports a story that a drop of balsam placed in the eye would conserve it in its current state indefinitely.⁷⁶ Legends of this sort are frequently encountered in the descriptions of the gardens of Maṭariyya, but it is the case that balsam was extensively employed in ophthalmology. Galen specifies *opobalsamum* in the preparation of several collyria,⁷⁷ and Alexander of Tralles (d. 603) describes a collyrium containing balsam to be used against ulceration of the eye.⁷⁸ A Syriac medical text recommends smearing a mixture of wolf's gall, opopanax, peppercorns, olive oil, oil of balsam, tincture of aniseed, cadmin and honey on the eyelids in cases of dimness of sight.⁷⁹ Balsam oil is also an ingredient in a number of ophthalmological remedies by 'Alī ibn 'Isā (Jesu Haly, d. 1010).⁸⁰ Ḥunayn ibn Ishāq (d. 877) gives the recipe, probably derived from Paul of Aegina (d. 641), for a collyrium composed of galls, juice of fennel, honey, gum of ferula persica, asfoetida, scapwort, balsam oil (*duhn al-balaṣān*), pepper and rock salt used in the treatment of dim sight and cataracts (sing. *mā*).⁸¹ This text was subsequently translated into Latin by Constantine the African.⁸² The efficacy of balsam oil in the alleviation of cataracts is also noted later by Ibn al-Bayṭār.⁸³

Balsam appears in treatments for a range of other illnesses. It is often recommended in cases of persistent cough, pneumonia, asthma, and other forms of breathing difficulty.⁸⁴ A draught of balsam infused with rue and dill

⁷³ Budge, *Syrian anatomy*, III 30 (II, 51–2); al-Birūnī, *Pharmacy*, I, 75; Prosper Alpin, *Histoire naturelle de l'Égypte par Prosper Alpin, 1581–1584*, trans. and ed. R. de Fenoyl and S. Sauneron (Collection des Voyageurs en Égypte, 20, Cairo: Institut Français d'Archéologie Orientale, 1979), 191–2.

⁷⁴ Prosper Alpin, *La Médecine des Égyptiens par Prosper Alpin, 1581–1584*, ed. R. de Fenoyl (Collection des Voyageurs en Égypte, 21, Cairo: Institut Français d'Archéologie Orientale, 1980), 314. This interpretation of hysteria derives from Galen.

⁷⁵ Ibn Ridwān, Abū Hasan 'Alī, *Kitāb al-kifāya fi'l-tibb*, ed. Salmān Qatāya (Baghdad: Maktabat al-Wataniyya, 1981), 81. The same claims are made in Platearius, *Livre*, 222.

⁷⁶ Fabri, *Evagatorium*, III, 17.

⁷⁷ Galen, *De compositione medicamentorum* II.IV 7 (Kühn ed., XII, 781–85, 787–88). See also H. Nielsen, *Ancient ophthalmological agents* (Acta Historica Scientiarum Naturalium et Medicinalium, 31, Odense: Odense University Press, 1974), 17.

⁷⁸ Alexander of Tralles, *Oeuvres* II 3 (III, 23–4).

⁷⁹ Budge, *Syrian anatomy*, V 6 (II, 95). *The leechbook of bald* (composed c. 900–950) recommends a mixture of balsam, honey, seawater, rainwater and wine to be smeared on the eyes in cases of cataract. See Rubin, *English medicine*, 121.

⁸⁰ 'Alī ibn 'Isā al-Kaḥḥāl, *Memorandum book of a tenth-century oculist for the use of modern ophthalmologists*, trans. and ed. C. Wood (Chicago: University of Chicago Press, 1936), 181–3. See also M. Levey, *Early Arabic pharmacology* (Leiden: E. J. Brill, 1973), 128.

⁸¹ Hunayn ibn Ishāq, *The book of the ten treatises on the eye ascribed to Hunayn ibn Is-Hāq (809–877 A.D.)*, ed. and trans. M. Meyerhof (Cairo: The Government Press, 1928), 121–2 and notes (Arabic text: 189). According to Meyerhof, the relevant passage is in Paul of Aegina, *Seven Books* I 22 (I, 421).

⁸² Constantine the African, *Der 'Liber de oculis' des Constantine Africanus*, ed. D. Haefeli-Till (Zürcher Medizingeschichtliche Abhandlungen, Neue Reihe, 121, Zurich: Juris Druck und Verlag, 1977), XII.13 (p.92).

⁸³ Ibn al-Bayṭār, *Mufrāda*, I, 109 (citing Ibn Abī Ash'ath).

⁸⁴ For instance, Dioscorides, *De materia medica*, I 19; al-Birūnī, *Pharmacy*, I, 75; Ibn al-Bayṭār, *Mufrāda*, I, 109 (citing Ibn 'Amrān); Budge, *Syrian anatomy*, XIII 7 (II, 262, 277). Balsam appears in a compound fumigant for clearing catarrh (see Paul of Aegina, *Seven books* VII 22). According to the *Leechbook of Bald*, a letter sent by Elias, patriarch of Jerusalem to king Alfred of Wessex recommends balsam in cases of chest infections. See Rubin, *English medicine*, 61, 125; L. Voigts, 'Anglo-Saxon plant remedies and the Anglo-Saxons', *Isis*, 70, 1979, 260.

is suggested as a treatment for hardness of the liver in a Syriac medical text.⁸⁵ Balsam appears in compound medicines used in the relief of paralysis, lethargy, spasms, convulsions and vertigo.⁸⁶ It functions as an analgesic in cases of back pain, headache, toothache and earache.⁸⁷ Benvenutus Grassus (fl. 13th) includes balsam in a purge for the brain and stomach to be used prior to the application of a plaster over an infected eye.⁸⁸ Prosper Alpin writes that balsam is good for lowering fevers,⁸⁹ removing obstructions, and reducing tumours. He also describes draughts containing the substance which were drunk in Egypt as a preventive medicine against plague.⁹⁰

The balsam of Maṭariyya

Central to any discussion of the use and perception of balsam in the medieval period is the question of the provenance of the ‘oils’ and other related commodities. As already noted, many authors of the medieval period sought to differentiate between the balsam from the gardens of Maṭariyya in Egypt and the products derived from similar trees in Arabia, known in Arabic as *bashām*. I have suggested that the trees in Maṭariyya were a cultivated strain of the wild Arabian tree, but the far greater value of the former oleo-resin was not merely the result of the more refined scent. ‘True’ balsam from the Egyptian site was believed to possess a much wider range of medicinal properties than *bashām*, even though the two products probably differed little in their chemical composition. The distinction found in medieval texts becomes more explicable when one considers the rich historical associations surrounding the balsam trees in Maṭariyya. This plantation, located approximately five miles north of Cairo, was famous throughout the medieval period for two inter-related reasons: first, for the valuable crop gathered annually from the balsam trees; and second, for the legends concerning the visit of the Holy Family.

Although nothing now survives of the balsam plantation or the associated structures, the numerous written descriptions provided by Arabic and Western writers from the twelfth to the eighteenth century allow one to reconstruct the basic topography of the site, and the changes through time.⁹¹ The plantation was located within a fertile area north of Cairo and near the Za‘farān canal, a subsidiary of the city’s main canal, al-Khalīj. At Maṭariyya itself, a perimeter wall enclosed an area of about seven *fiddān* (approximately three hectares)⁹² that was planted with both balsam and fig trees. Also contained in this space were a chapel, a well, a cistern or fountain, and a holy tree (probably a sycamore). The accounts of Maṭariyya provided by medieval pilgrims and travellers differ in aspects of detail, but the main elements of the story derive

⁸⁵ Budge, *Syrian anatomy*, xvi 5 (ii, 417). Balsam is also recommended by Jean de Saint Amand (fl. 13th–14th) for strengthening the liver. See ed. J. Pagel, *Die Areolae des Johannes de Sancto Amando* (Berlin: Georg Reimer, 1896), 54.

⁸⁶ For instance, Ibn Riḍwān, *Kifāya*, 81; al-Birūnī, *Pharmacy*, i, 75; Ibn al-Bayṭār, *Mufrāda*, i, 109; Budge, *Syrian anatomy*, iii 30 (ii, 51–2); Constantine the African, *Liber*, 356.

⁸⁷ For instance, al-Birūnī, *Pharmacy*, i, 75; Budge, *Syrian anatomy*, vii 2 (ii, 111–14); Alexander of Tralles, *Oeuvres* iii 1 (iii, 54–5); Platearius, *Livre*, 222.

⁸⁸ Benvenutus Grassus, *The wonderful art of the eye. A critical edition of the Middle English translation of his De probatissima arte oculorum*, ed. L. M. Aldredge (Medieval Texts and Studies, 19, East Lansing: Michigan State University Press, 1996), i, 815.

⁸⁹ An interesting assertion given that balsam is commonly described as a calorifacient.

⁹⁰ Alpin, *Histoire*, 191–2; *Médecine*, 322–3.

⁹¹ There is not space here to provide a detailed discussion of the topography and history of Maṭariyya. For a summary of the many accounts of the gardens of Maṭariyya through the medieval period, see M. Jullien, *L’arbre de la vierge à Matarieh*, 4th ed. (Cairo: Imprimerie Nationale, 1904); U. Zanetti, ‘Matarieh, la Sainte Famille et les baumiers’, *Analecta Bollandiana*, 111, 1983, 21–68. See also D. Behrens-Abouseif, ‘The north-eastern extension of Cairo under the Mamluks’, *Annales Islamologiques*, 27, 1981, 158–60 and pl. X.

⁹² According to ‘Abd al-Laṭīf al-Baghdādī, *Ifāda*, 23; *Eastern Key*, 41.

from Coptic traditions. The earliest surviving account is given by Zacharie of Sakhā, writing at the end of the seventh century.⁹³ In a larger text giving the itinerary of the Holy Family during their sojourn in Egypt, he claims that they stopped at Maṭariyya near to the ancient town of ‘Ayn Shams (Heliopolis). According to his account, the infant Christ took Joseph’s staff, broke it into pieces, and placed the pieces in the ground. Christ then put his hand on the ground to create a spring of water. The water caused the sections of the staff to come into leaf and to give off a fine perfume. Zacharie identifies this event as the beginning of the balsam plantation of Maṭariyya. That Joseph’s staff was said to have come from around Jericho provides a link to the earlier balsam plantations of Judea.⁹⁴ The author also notes that the balsam of Judea was used for the anointing of kings, priests and the utensils of the Temple in Jerusalem.⁹⁵ In some later accounts of this legend, the water source is venerated as the place where the Virgin washed the clothes of Christ but, importantly, the well at Maṭariyya becomes inextricably linked with the cultivation of balsam; medieval travellers and other writers are agreed that only the water from this source could sustain the trees.

As early as the tenth century there appears to have been common consent that Maṭariyya was the only source of ‘true’ balsam; the geographer Ibn Ḥawqal writes, ‘and in ‘Ayn Shams [i.e. Maṭariyya] are grown the trees called *balsām* from which is taken the oil of balsam (*duhn al-balāsān*), and it is not known in any place other than here’.⁹⁶ This claim is substantiated by other Arabic sources including al-Birūnī, Ibn Sīnā and al-Idrīsī (d. c. 1165),⁹⁷ and a host of Europeans who visited the site between the twelfth and the eighteenth centuries. During this period, the sultans of Egypt sought to exploit the symbolic value of Maṭariyya and the precious trees. The annual collection of the balsam in the Coptic month of Barmahāt was an event attended by the sultan or, in his absence, the keeper of the royal treasury (*khazindār*), as well as other members of the court and visiting dignitaries.⁹⁸

The Ayyubid and early Mamluk periods appear to have been the high point in the productivity of the garden. The later fifteenth and sixteenth centuries witnessed a lack of sustained investment in Maṭariyya leading to a decline in the number of healthy trees. The worst damage to the garden occurred during the reign of the sultan al-Nāṣir Muḥammad ibn Qayṭbāy

⁹³ The relevant section of the text is translated and discussed in Zanetti, ‘Matarieh’, 23–7.

⁹⁴ For archaeological and historical evidence relating to the cultivation and processing of balsam near Jericho and En-Gedi before and after the Roman conquest of Judea, see Donceel-Voûte, ‘Traces’, 106–17; J. Patrich and B. Arubas, ‘A juglet containing balsam oil(?) from a cave near Qumran’, *Israel Exploration Journal*, 39, 1989, 43–59; T. Gnoli, ‘La produzione del balsamo nell’oasi di Engaddi (Israele). Su alcuni nuovi documenti dal deserto di Guida’, in *Profumi d’Arabia. Atti del convegno*, ed. A. Avanzini (Rome: L’Erma’ di Bretschneider, 1997), 413–29. Further literary sources can be found in G. Wissowa, ed., *Paulys Real-Encyclopädie der classischen Altertumswissenschaft* (Stuttgart: J. B. Metzscherscher Verlag, 1896), 2.2: cols. 2836–9.

⁹⁵ This claim appears to be only partially correct. Balsam was only used occasionally for rituals such as royal anointings. See L. Ginzberg, *The legends of the Jews*, trans. H. Szold et al., 8th ed. (Washington, D.C.: The Jewish Publications Society of America, 1982–83), III, 179–81; VI, 72. Also ed. I. Epstein, *The Babylonian Talmud* (London: The Soncino Press, 1935–59), *Seder Nezikin. Horayoth* 11b (p. 84).

⁹⁶ Ibn Ḥawqal, Muḥammad Abū al-Qāsim, *Viae et regna, descriptio dittonis moslemicae*, ed. M. de Goeje (Bibliotheca Geographorum Arabicorum, 2, Leiden: E. J. Brill, 1873), 106.

⁹⁷ Al-Birūnī, *Pharmacy*, 1: 73; Ibn Sīnā, *Canon* II.2.84; al-Idrīsī, Abū ‘Abd Allāh, *Opus geographorum, sive liber ad eorum delectationem qui terras peregrare studeant*, ed. A. Bombaci et al. (Naples and Rome, 1971–84), 326.

⁹⁸ Behrens-Abouseif, ‘Extension’, 160; Ibn Iyās, *Chronik* IV, 149. Citing Ibn Samajūn, ‘Abd al-Laṭīf al-Baghdādī (*Ifāda*, 24; *Eastern Key*, 41, 45) writes that the oil was extracted during the rising of Sirius (*al-Shu‘arī*) in the month of Shubāt (February).

(r. 1496–98),⁹⁹ and by the turn of the century there were no living balsam trees. Possibly at the prompting of foreign emissaries, sultan al-Ghawrī (r. 1501–16) ordered that new trees be found to replenish the garden. According to Ibn Iyās, agents of the sultan found specimens in the Hijaz and these were planted in Maṭariyya. The new stock flourished after having been watered from the well on the site.¹⁰⁰ Ibn Iyās praises the sultan's actions, but the revival was relatively short-lived. Although the Ottoman governors of Egypt in the sixteenth and early seventeenth centuries made similar attempts to restock the plantation, these efforts too met with only limited success.¹⁰¹ By the time of the visit of John Sandys in 1610 only one tree remained, and this perished following an inundation of the Nile five years later.¹⁰²

The interest shown by European travellers of the medieval period in the plantations of Maṭariyya derives in part from the association with the life of the Holy Family, but it also relates to extensive use of balsam in medicine and alchemy,¹⁰³ and for a variety of ritual functions. This last dimension of balsam is of considerable importance to understanding why it was esteemed above other oleo-resins available during the medieval period. The account of Maṭariyya given by Zacharie of Sakhā mentions that balsam was employed in the Coptic Church as one of the ingredients of myron (chrism), the oil of consecration. Myron/chrism was employed in baptism, the anointing of priests, and the consecration of churches, altars and icons.¹⁰⁴ It is not clear when the Copts first used balsam in this way or at what stage the other Churches of the Middle East and Europe adopted the oleo-resin from Maṭariyya in their own liturgical oils, but the practice appears to have been widespread from an early date. For instance, recipes for myron can be traced back to the eighth century in Greek manuscripts.¹⁰⁵ In the eastern Churches the recipes for myron become increasingly complex over time with the addition of further ingredients and associated rituals around the making of the holy oil.¹⁰⁶ Balsam also appears to have been important in Christian Europe for the practice of embalming.¹⁰⁷

⁹⁹ Arnold von Harff, *The pilgrimage of Arnold von Harff*, ed. and trans. M. Letts (Hakluyt Society 2nd series, no. 94, London: 1946), 104–05. The author describes how a rival to the sultan pulled up the balsam trees and broke the waterwheels used to irrigate the garden. He concludes '...as I was told, as indeed I saw with my own eyes, that no balsam would grow there for ten years'.

¹⁰⁰ Ibn Iyās, *Chronik* iv, 149. See also C. Petry, *Protectors or Praetorians? The last Mamluk sultans and Egypt's waning as a great power* (New York: State University of New York Press, 1994), 119; D. Behrens-Abouseif, 'Gardens in Islamic Egypt', *Der Islam* 69/2, 1992, 308–9.

¹⁰¹ For instance, Jean Palerne reports that in 1575–76 the Pasha of Egypt sent to Mekka for balsam trees to be planted in Maṭariyya. By the time of the visit of Hans von Lichtenstein in 1587 only two trees remained. See *Voyage en Égypte de Jean Palerne, Forésien, 1581*, ed. S. Sauneron (Collection des Voyageurs Occidentaux en Égypte, 2, Cairo: 1971), 98; H. von Lichtenstein in ed. S. Sauneron, *Voyages en Égypte pendant les années 1587–1588*, trans. U. Castel and N. Sauneron (Collection des Voyageurs Occidentaux en Égypte, 6, Cairo: 1972), 11.

¹⁰² J. Sandys, *Relation of a voyage begun in Anno Domini 1610* (London, 1615), 127; C. Niebuhr, *Voyage en Arabie et en d'autres pays* (Amsterdam: S. J. Baalde, 1776–80), i, 98.

¹⁰³ For instance, see ed. D. Pingree, *Picatrix: the Latin version of Ghayat al-hakim* (Studies of the Warburg Institute, 39, London: Warburg Institute, 1986), *passim*.

¹⁰⁴ For a general discussion of holy oils, see 'Chrism' in ed. E. Livingstone and F. Cross, *The Oxford dictionary of the Christian Church*, 3rd ed. (Oxford: Oxford University Press, 1997), 332; S. Brock, *The Holy Spirit in the Syrian baptismal tradition* (The Syrian Churches Series, 9, Poona, 1979); ed. M. Dudley and G. Rowell, *The oil of gladness. Anointing in the Christian tradition* (London, 1993). For the anointing of icons in the Coptic Church, see H. E. White, *The Metropolitan Museum of Art expedition. The monasteries of Wadi'n-Natrun. Part III: the architecture and archaeology*, ed. W. Hauser (New York: Metropolitan Museum, 1933), 69, n. 5.

¹⁰⁵ P. Menevisoglou, *Το Άγιον Μύρον εν τη ορθόδοξω ανατολικη εκκλησία* (The Holy Myron in the Eastern Orthodox Church), ed. P. Christou (Analecta Vlatadon, 14, Thessaloniki, 1972), 33–4 (citing Codex Barberini Greek 336 in the Vatican).

¹⁰⁶ Menevisoglou, *Holy Myron*, 33–40; A. Butler, *The ancient Coptic churches of Egypt* (reprinted London: Oxford University Press, 1970), ii, 332–3.

¹⁰⁷ E. Atchley, *A history of the use of incense in divine worship* (Alcuin Club Collections, 13, London: Longman and Green, 1909), 100–07; Greenhill, *Nekrokedeia*, 211. The miraculous ability of a mixture of balsam and myrrh to maintain the body despite illness or death is also described in fiction. See *The chronicle of the Cid*, trans. R. Southey (London, 1808), 330–35.

The twelfth-century pilgrim Saewulf's account of the tomb of the Patriarchs at Hebron, provides evidence that in the Middle East balsam also had a long history in the anointing of the corpses of holy men and women.¹⁰⁸

In medieval Europe it was commonly considered that anointing with chrism conferred upon the monarch an inviolate spiritual authority.¹⁰⁹ Balsam, being one of the principal ingredients of chrism, thus became an essential component of royal ceremonies across the courts of Europe. This placed the rulers of Europe in the difficult position of having to rely upon a Muslim power for their supplies of the precious balsam.¹¹⁰ The significance of the sultan's control over the gardens of Maṭariyya was not lost on Egyptian writers; al-'umarī notes with evident satisfaction that the rulers of Byzantium, Ethiopia and Europe had 'to vie with one another' in order to obtain their supplies from the sultan.¹¹¹ The sultans made full use of balsam in diplomatic exchanges. Containers of the oleo-resin were included in gifts sent by Ayyubid and Mamluk rulers to Charles VII of France, Lorenzo de' Medici, the kings of Aragon, and the doges of Venice among others.¹¹² Other less favoured groups, such as the representatives of the eastern Churches, had to buy their balsam from the sultan's treasury.¹¹³

The most conspicuous modes of distribution of balsam were those of redistribution and diplomatic exchange, but documentary sources also attest to the trade in Egyptian balsam in the Middle East and the Mediterranean region during the Byzantine and Islamic periods.¹¹⁴ There are references to balsam in Italian trade manuals of the fourteenth century,¹¹⁵ while the oft-repeated methods for detecting whether balsam is genuine or unadulterated found in the writings of European travellers probably indicate that various grades of the 'oil' were available for purchase in the markets of Cairo and other cities.¹¹⁶ The presence of containers of balsam in the personal effects of Frankish nobles in the kingdom of Jerusalem also supports the idea of some degree of commercial distribution in the Middle East.¹¹⁷

¹⁰⁸ Saewulf trans. in ed. J. Wilkinson, J. Hill and W. Ryan, *Jerusalem pilgrimage, 1099–1185* (London: The Hakluyt Society, 1988), 110.

¹⁰⁹ E. Kantorowicz, *The King's two bodies. A study in medieval political philosophy* (Princeton, N.J.: Princeton University Press, 1957), *passim*; J. Nelson, *Politics and ritual in early medieval Europe* (London and Ronceverte: Hambledon Press, 1986), chapter 11. The anointing ritual could also be performed with the lesser oil of catechumens.

¹¹⁰ See discussion in Milwright, 'Balsam'.

¹¹¹ 'Umarī, *Masālik*, 68.

¹¹² Matthieu de Coussy cited in C. Davillier, *Les origines de la porcelaine en Europe* (Paris, 1882), 9–10; J. Wansbrough, 'A Mamluk commercial treaty concluded with the republic of Florence 894/1489', in ed. S. Stern, *Documents from Islamic chanceries* (Oriental Studies, 3, Oxford: Bruno Cassirer, 1965), 40; A. Atiya, *Egypt and Aragon: embassies and diplomatic correspondence between 1300 and 1330 A.D.* (Abhandlungen für die Kunde des Morgenlandes, 23.7, Leipzig: F. A. Brockhaus, 1938), 28–32; L. Mas Latrie, *Histoire de l'île de Chypre*, 3 vols. (Paris, 1852–61), III, 481–3. Gifts of balsam were also made by Ottoman sultans and viziers in the sixteenth century. See J. Raby, 'Terra Lemnia and the potteries of the Golden Horn: an antique revival under Ottoman auspices', *Byzantinische Forschungen*, 21, 1995, 316–17.

¹¹³ L. Villecourt, 'Une manuscrit arabe sur le Saint Chrême dans l'Église copte II', *Revue d'Histoire Ecclésiastique*, 18, 1992, 6.

¹¹⁴ M. Mango, 'Byzantine maritime trade with the East (4th–7th centuries)', *Aram*, 8, 1996, 148; Atchley, *Incense*, 141; W. Heyd, *Histoire du commerce du Levant au Moyen Âge*. Trans. M. Reynaud (1885–86 reprinted Leipzig: Harrassowitz, 1923), II, 575–80.

¹¹⁵ F. Balducci Pegolotti, *Pratica della mercatura*, ed. A. Evans (Cambridge, MA: The Medieval Academy of America, 1936), 124, 414. According to the account of Pignol Zucchelo in 1347, balsam wood was sold at 1 *ḍinār* per 10 pounds. See E. Ashtor, *Histoire des prix et des salaires dans l'Orient médiévale* (Paris: SEVPEN, 1969), 338.

¹¹⁶ For instance, Fabri, *Evagatorium*, III, 17.

¹¹⁷ A.-M. Chazaud, 'Inventaire et comptes de la succession d'Eudes, comté de Nevers (Acre, 1266)', *Mémoires de la Société Nationale des Antiquaires de France*, 32, sér. 4, t.2, 1871, 192, 201. Balsam was probably available for sale in Palestine in earlier periods, although Willibald's account of smuggling a container of the 'oil' through customs at Tyre in 726 may indicate that its export was either restricted or heavily taxed. See Voigts, 'Plant remedies', 260.

Conclusion

There are several factors to be considered when assessing the high status (and commercial value) of balsam in the medieval period. The wide historical and geographical focus of this article means that the following comments only touch upon some of the larger issues, and cannot hope to address the complexities of practice and received knowledge in any one locality or period. The analysis of the medical literature presented above indicates the pre-eminent position occupied by the works of Greek authors—particularly Dioscorides and Galen—in the formation of a body of knowledge concerning the identification and active properties of balsam in the Islamic world and medieval Europe. This is not to suggest that there were no innovations (for instance, in the employment of balsam for the treatment of plague) during the medieval period, but the importance of the transmission of information from the Greek tradition should be emphasized. This notion of chains of authority can be seen also in the representation of the balsam gardens of Maṭariyya in medieval literature. A survey of the descriptions provided by European travellers between the twelfth and the sixteenth centuries reveals that, despite differences in detail, they all rely upon the same basic corpus of oral and written history. Thus, it is commonly asserted that: Maṭariyya is the sole source of ‘true’ balsam and the trees can only be sustained using water from the well; the Holy Family visited the garden; the trees originally came from the plantations in ancient Judea and, in some accounts, were originally a gift from the Queen of Sheba to Solomon. Most writers were aware of the use of balsam in the preparation of chrism and related oils for royal anointing ceremonies in Europe.

Given the limited area under cultivation, the balsam of Maṭariyya was always a scarce commodity. The demand for balsam in Europe from the twelfth century must have been further fuelled by the great increase in the production and dispersal of both medical manuscripts and travellers’ accounts of the Middle East. It is perhaps no accident that around this time the collection of the annual harvest from Maṭariyya was elevated to the status of a state occasion in the calendar of the sultan’s court in Egypt. Such ceremonies were designed to highlight the sultan’s ability to manipulate the supply of this precious, and symbolically-loaded, substance within his own realm and abroad.¹¹⁸ During the Ayyubid and Mamluk periods some proportion of the annual product from Maṭariyya was made available for sale either directly from the treasury or on the open market (presumably, mainly the cheaper *carpobalsamum* and *xylobalsamum*), but it seems unlikely that it would have been sufficient to satisfy the demand. The available evidence concerning the trade of balsam in the Mediterranean during the fourteenth century suggests that the overall volume was very small, and remained economically insignificant when seen in relation to other luxury products such as pepper or ginger.¹¹⁹

The limited supply and the high cost are of considerable importance to the interpretation of the discussion of balsam in medical literature of the medieval period. As already noted, the Egyptian sultan sent supplies of balsam to medical and military institutions in his empire, and broadly comparable processes of non-commercial redistribution were probably operated by royal courts

¹¹⁸ An interesting comparison can be made with the revival by the Ottoman sultans of the practice of collecting clay, ‘terra lemnia’, from the Greek island of Lemnos. Like balsam, the medicinal properties of Lemnian clay were lauded by writers of the antique period. See Raby, ‘Terra Lemnia’.

¹¹⁹ Milwright, ‘Balsam’, 10. It is also striking that, despite the frequent mentions of drugs and perfumes, there appears to be no mention of balsam in the Geniza archive. See S. Goitein, *A Mediterranean society. The Jewish community of the world as portrayed in the documents of the Cairo Geniza*, 6 vols. (Berkeley: University of California Press, 1967–88).

or the Catholic Church in medieval Europe.¹²⁰ In Europe any state- or church-sponsored redistribution would have been principally directed towards the supply of balsam for liturgical purposes, although physicians and scholars may have enjoyed some access through such channels. That authors specified the use of balsam in a wide variety of treatments does not mean that those who made use of the texts would have been able to obtain the quantities they required. The existence of a genre devoted to the identification of substitute drugs (in which substitutes for balsam are mentioned) is perhaps an indication that the ubiquity of balsam in the literature was not necessarily reflected in contemporary medical practice in either the Islamic world or Europe.¹²¹ Further, it is likely that there existed a trade in alternative oleo-resins from Arabia and elsewhere prior to the decline in the number of trees in Maṭariyya in the late fifteenth and sixteenth centuries.¹²² Nevertheless, there remained a consensus that Maṭariyya was the sole source of 'true' balsam. The analysis presented here illustrates the important roles played by factors including location, political history, popular legends and the accumulation of received wisdom in forming the perception of a single product.

¹²⁰ For instance, large containers apparently still containing balsam were located in the Vatican in the early twentieth century. See H. Grisar, *Die römische Kapelle Sancta Sanctorum und ihrer Schatz: Meine Entdeckungen und Studien in der Palastkapelle der mittelalterlichen Päpste* (Freiburg: Herdesche Verlagshandlung, 1908), 89–97.

¹²¹ For instance, see M. Levey, *Substitute drugs in early Arabic medicine with special reference to the texts of Māsarjawāh, al-Rāzī, and Pythagoras* (Veröffentlichungen der Internationalen Gesellschaft für Geschichte der Pharmazie. Neue Folge, 37, Stuttgart: Wissenschaftliche Verlagsgesellschaft MBH, 1971), *passim*. It is difficult to evaluate the practical value of these texts in this context because balsam is itself given in some lists as a substitute for other, less expensive, products.

¹²² In 1575 the Catholic Church authorized the use of balsam of Peru as an alternative to the balsam from Maṭariyya in the churches of South America. See Heyd, *Histoire*, II, 580.