

Etymological Review on Chemical and Pharmaceutical Substances of the Oriental Origin

¹Peyman Mikaili, ²Massoumeh Sharifi, ³Jalal Shayegh and ⁴Shadi Sarahroodi

¹Department of Pharmacology, School of Medicine, Urmia University of Medical Sciences, Urmia, Iran

²Islamic Azad University, Urmia branch, Urmia, Iran

³Department of Veterinary Medicine, Faculty of Agriculture and Veterinary, Shabestar Branch, Islamic Azad University, Shabestar, Iran

⁴Department of Physiology and Pharmacology, School of Medicine, Qom University of Medical Sciences, Qom, Iran

Abstract: The word of “alchemy” remembers the golden age of oriental flourishing of the chemical and medicinal sciences. In this paper, we have reviewed some of these words of oriental origin, including Arabic, Persian, Sanskrit, Hindi, Hebrew and Syriac. Some words have been passed through from one language to another. These borrowings are mentioned as a history of the words. These descriptions may be useful for full comprehension of the current meanings and the exact original meanings of the chemical names, especially for the students of related fields.

Key words: Arabic, chemicals, classical medicines, etymology, Islamic medicine, Persian, pharmacy

INTRODUCTION

Although the western, especially Greek and Roman sources (Riddle, 1985; Beck, 2005) for sciences have the core importance (Scarborough, 1978; Riddle, 1985; Collins, 2000), eastern sources for medicine and pharmacy are the precious legacy of human history (Singer, 1927; Izzo *et al.*, 2002; Jonas, 1999). Different people of oriental origin have shares in this common human treasure, including Chinese (Yang *et al.*, 2009), Hindustani (from Sanskrit and Hindi sources), Persian (Farsi, Pahlavi and Avesta sources) (Mousavizadeh and Ansari, 2005; Bekhradi, 2004) and Arabic (Ahmad *et al.*, 2006) and Hebrew sources. According to the best knowledge of us, there are no independent article in the literature merely dealt with these medicinal and pharmaceutical terms of oriental origin (Pavord, 2005). We have tried in this column to evaluate the currently used chemical and pharmaceutical terms in modern medical sciences, which are derived from different oriental sources and languages. The sources of following languages have been investigated: Akkadian or Acadian, Arabic, Avesta, French, Hebrew, Hindi, Latin, Persian, Portuguese, Sanskrit, Spanish, and Syriac

METHODOLOGY

In this study, we reviewed several sources for collecting data about the terminology used for describing the chemical and pharmaceutical substances of the Oriental origin (El-Gammal, 1997; Cupp, 1999; Givens

et al., 2006; Heilmeyer, 2007). Ultimately, we choose the valuable book of *Elsevier's Dictionary of Chemoetymology* (Senning, 2007); also, we reviewed some other sources mentioned in the bibliography of this book. All chemical and pharmaceutical substances mentioned in this book, of the Oriental origin were selected. After preparation the material, all scientific names were etymologically analyzed. For etymology of scientific names, we tried to use some standard sources for scientific nomenclature. For etymology of words from oriental languages, we used some valuable etymological sources of different world language families, including Semitic and Indo-European. The compound names have been divided to their components and then were etymologically analyzed.

Findings: After reviewing the selected sources, about 110 scientific terms of oriental origin were etymologically studied. The abbreviation for referred languages alphabetically are: Akk. Akkadian or Acadian, Ar. Arabic, Av. Avesta, Fr. French, Hebr. Hebrew, Hind. Hindi, L. Latin, Pers. Persian, Port. Portuguese, Skr. Sanskrit, Sp. Spanish, Syr. Syriac. The references used, are mentioned immediately in the end of the etymological descriptions.

- absinthe also as absinth; derived ultimately form L. *Absinthium*, from Gr. *apsinthion* wormwood; compare with the specific epithet of the species name *Artemisia absinthum* common wormwood (Senning, 2007); ultimately possibly from Pers. *aspand* and *sipand* (Klein, 1983).

- alchemy derived from Ar. *al-kīmīyā* alchemy, the prefix particle of *al-* is the definite article in Ar. language; Ar. word ultimately from Gr. *chemēiā* chemistry, the final etymology is unclear. Some suggest it is from Gr. *chēmós* juice, from Gr. *chéin* to pour (Senning, 2007). Some authors derived it from Gr. *Chēmīā* Blackland, hence Egypt (Klein, 1983).
- alcohol derived from Ar. *al-kuhul* powder, referring to the alchemistic procedure of reducing samples, through several purification steps, to a powder, the supposedly pure essence of the substance in question; thus alcohol is the essence (or spirit) of wine; the same word, spelled *koḥl*, is used for powdered antimony as a cosmetic preparation (Klein, 1983).
- aldebaranium a name unsuccessfully suggested for ytterbium (Yb), after the double star Aldebaran, from Ar. *al-dabaran* Aldebaran, from Ar. *dabara* to follow, and suffix *-ium* (Senning, 2007).
- alizarin C₁₄H₈O₄, ultimately derived from Ar. *al-asara* madder root, and suffix *-in(e)* (Senning, 2007).
- alkali derived from Ar. *al-qilī* charred ashes of the saltwort, the roasted (Klein, 1983).
- alkannin C₁₆H₁₆O₅, derived from the genus name *Alkanna* (herbs), ultimately from Ar. *al-hinna* henna, and suffix *-in(e)* (Senning, 2007).
- alli derived from the genus name *Allium* garlic, from L. *allium* garlic, ultimately probably from Skr. *aluka* edible root of the aroid plant *Amorphophallus campanulatus* (Senning, 2007).
- aloin C₂₁H₂₂O₉, derived from aloe, ultimately from Skr. *agaru* agalloch, and suffix *-in(e)* (Senning, 2007).
- amber (C₁₀H₁₆O)_n, ultimately derived from Ar. *anbar* ambergris (Partridge, 1966).
- anandamide C₂₂H₃₇NO₂, derived from Skr. *ananda* bliss and amide, referring to this compound's psychopharmacological properties (Senning, 2007).
- aniline C₆H₇N, derived from Ar. *al-nīl* indigo plant, ultimately from Skr. *nīla* dark blue, referring to the fact that aniline was first obtained by degradation of indigo (Partridge, 1966).
- antara derived either from Gr. *ant(i)-* and Gr. *arada* line, row or from Skr. *antara* the other (Senning, 2007).
- antimony derived from L. *antimonium* antimony (Sb), ultimately from Ar. *ithmid* antimony, probably borrowed from Gr. *stimmi*, variation of *stibi* whence L. *stibium* adopted in Chemistry, compare Sb symbole (Partridge, 1966).
- arabinose C₅H₁₀O₅, ultimately derived from gum arabic and suffix *-ose* (Senning, 2007).
- arsenic As, derived from Gr. *arsenikón* yellow orpiment, ultimately from Syr. *zarnig* yellow orpiment, compare Av. *zaranya* gold (Partridge, 1966).
- atidane C₁₉H₃₁N, derived from atis plant (*Aconitum heterophyllum* Wall.), from Hind. *atis* atis plant, and suffix *-an(e)* (Senning, 2007).
- atis(o) derived from atis plant (*Aconitum heterophyllum* Wall.), from Hind. *atis* atis plant (Senning, 2007).
- azadirachtin C₃₅H₄₄O₁₆, derived from the genus name *Azadirachta* (neem tree), from Pers. *azad dirakht* neem tree, literally free or noble tree, and suffix *-in(e)* (Senning, 2007).
- azafrin C₂₇H₃₈O₄, derived from Sp. *azafranillo* safflower, ultimately from Ar. *alzafaran* saffron, and suffix *-in(e)* (Senning, 2007).
- azurite Cu₃(CO₃)₂(OH)₂, derived from L. *azura* ultramarine, via Ar. *al-lazaward*, from Pers. *lājward*, ultimately after the town of Lajward, Turkestan, and suffix *-ite*, referring to this mineral's blue color (Klein, 1983).
- behenic acid C₂₂H₄₄O₂, derived from ben or behen, from Ar. *ban* seeds of any species of the genus *Moringa* (Senning, 2007).
- benzoin a resin, derived from Fr. *benzoin* an odoriferous resin, ultimately from Ar. *lubān jāwī* Javanese incense (Klein, 1983).
- berb(er) derived from L. *berberis* barberry, from Ar. *barbari* barberry (Partridge, 1966).
- berbamine C₃₇H₄₀N₂O₆, derived (with contraction) from the genus name *Berberis* (barberry), from Medieval L. *barbaris* barberry, from Ar. *barbaris* barberry, and *amine* (Senning, 2007).
- bishaconitine C₃₆H₅₁NO₁₁, coined by contraction of bikh (*Aconitum spicatum* Stapf.), derived from Hind. *bikh* poison, *aconit-*, and suffix *-in(e)* (Senning, 2007).
- borax (tincal) Na₂B₄O₇·10H₂O, from Ar. *baúraq* also *bóraq*, ultimately derived from Pers. *būrah* borax, soda, literally white (Klein, 1983).
- bronze (Cu,Sn), ultimately derived from Pers. *birinj* bronze (Partridge, 1966); according to another assumption from L. *aes brundisium* metal from Brundisium, now Brindisi, Italy (Senning, 2007).
- bungarotoxin derived from the genus name *Bungarus* (krait), ultimately from Skr. *bhrugara* krait, and toxin (Senning, 2007).
- coffea ultimately derived from Ar. *qahwa* coffee, from *Kaffa* or *Kāfa* a district in southwestern part of Ethiopia (Klein, 1983).
- carmin ultimately derived from Ar. *qirmiz* kermes and L. *minium* cinnabar (Partridge, 1966).
- carthamin also known as carthamic acid, C₄₃H₄₂O₂₂, derived from the genus name *Carthamus* (safflower), ultimately from Ar. *qartam* safflower, and suffix *-in(e)* (Senning, 2007).
- cassic acid also known as rhein, C₁₅H₈O₆, derived from the genus name *Cassia* (herbs, shrubs, trees), ultimately from Hebr. *qēzīiā*^h cassia (Klein, 1983).
- cathinone C₉H₁₁NO, derived from the genus name *Catha* (khat), from Ar. *qat* khat, and suffix *-in(e)*, and suffix *-one* (Senning, 2007).

- champacol $C_{15}H_{26}O$, derived from champac (*Michelia champaca*), from Skr. *campaka* champac, of Dravidian origin, and suffix *-ol* (Senning, 2007).
- chavi©) derived from the genus name *Chavica* (peppers). Etymology is unclear. Some authors suggest it is from Skr. *cavika* a pepper. It is perhaps named after a botanist (Partridge, 1966).
- chavibetol $C_{10}H_{12}O_2$, derived (with contraction) from the species name *Chavica betle* betel pepper, from Skr. *cavika* a pepper and Port. *betle* betel, ultimately from Tamil *verrilai* Piper betle, and suffix *-ol* (Senning, 2007).
- cinnabar also known as cinnabarite, paragite, HgS, from L. *cinnabāris*, from Gr. *kinnábari*, ultimately derived from Pers. *shangarf* red lead, cinnabar (Klein, 1983).
- cinnamic acid $C_9H_8O_2$, derived from cinnamon, L. *cinnamomum*, derived from Gr. *kinnamwmon*, used by Theophrastus (Gledhill, 2008), ultimately from Hebr. *qinnānōn* cinnamon (Klein, 1983).
- cubebin $C_{20}H_{20}O_6$, derived from the specific epithet of the species name *Piper cubeba* (cubeb tailed pepper), from Ar. *kubabah* cubeb, and suffix *-in(e)* (Senning, 2007).
- cum(o) derived from cumin (*Cuminum cyminum*), ultimately from Hebr. *kammōn* cumin (Klein, 1983).
- curcumin $C_{21}H_{20}O_6$, derived from the genus name *Curcuma* turmeric, ultimately from Ar. *kúrkum* saffron, crocus (Klein, 1983).
- cymene $C_{10}H_{14}$, derived from the specific epithet of the species name *Cuminum cyminum* cumin, from Gr. *kāmínōn* cumin, ultimately from Hebr. *kammōn* cumin (Klein, 1983), and suffix *-ene*.
- daturine also known as duboisine, hyoscyamine, $C_{17}H_{23}NO_3$, derived from the genus name *Datura* jimsonweed, from Hind. *datura* jimsonweed, and suffix *-in(e)* (Senning, 2007).
- dhurrin $C_{14}H_{17}NO_7$, derived from dhurra (durra, *Sorghum bicolor*), from Ar. *dhurrah* durra, *Sorghum bicolor*, and suffix *-in(e)* (Senning, 2007).
- dvi derived from Skr. *dvi* two (Partridge, 1966).
- eka derived from Skr. *ēkas* one (Partridge, 1966).
- electrum (Au,Ag), ultimately derived from Gr. *élector* beaming sun, ultimately from Skr. *ulkā* fiery phenomenon in the sky, meteor (Klein, 1983).
- elemol $C_{15}H_{26}O$, derived from Manila elemi (oil of Canarium trees), from Ar. *al-lami* elemi, and suffix *-ol* (Senning, 2007).
- elixir derived from Ar. *al-iksīr* elixir, from Gr. *xēron* desiccating powder, dry medicinal substance (Klein, 1983).
- emerald $A_{13}Be_2Si_6O_{18}$, ultimately derived from Gr. *smáragdos* emerald, akin to Hebr. *bāreqef* emerald (Klein, 1983).
- fagarine $C_{13}H_{11}NO_3$, derived from the genus name *Fagara* (zanthoxylum), from Ar. *fagara* zanthoxylum, and suffix *-in(e)* (Senning, 2007).
- fustin $C_{15}H_{12}O_6$, derived from fustet (*Rhus cotinus* L.), ultimately from Ar. *fústaq*, *fústuq* fustet, from Pers. *pistah* and suffix *-in(e)* (Klein, 1983).
- galangin $C_{15}H_{10}O_5$, derived from galanga root (*Alpinia officinarum* Hance), ultimately from Ar. *khalanjān* galanga root and suffix *-in(e)* (Senning, 2007).
- gelsemine $C_{20}H_{22}N_2O_2$, derived from the genus name *Gelsemium* jessamine, ultimately from Ar. *yāsamīn* jessamine, and suffix *-in(e)* (Senning, 2007).
- guaran also known as guar gum, derived from guar (*Cyamopsis tetragonaloba* (L.) Taub.), from Hind. *guar*, and suffix *-an* (Senning, 2007).
- gypsum $CaSO_4 \cdot 2H_2O$, ultimately derived from Gr. *gúpsos* chalk, gypsum, of Semitic origin, compare Akk. *gašsu*, akin to Ar. *jibs* plaster, mortar (Klein, 1983).
- harm(al) derived from harmal (*Peganum harmala*), from Ar. *harmalah* harmal (Senning, 2007).
- hashish derived from Ar. *hashīsh* dried grass, hemp (Partridge, 1966).
- jasmo derived from the genus name *Jasminum* jessamine, ultimately from Pers. *yasmin*, *yasman* jessamine (Partridge, 1966).
- jasper SiO_2 , derived from Gr. *íaspis* jasper, from Hebr. *jāshpeh* jasper, compare Ar. *yashb* (Partridge, 1966).
- kermesic acid $C_{16}H_{10}O_8$, derived from kermes, ultimately from Ar. *qirmiz* vivid red (Partridge, 1966).
- kermesite Sb_2S_3O , ultimately derived from Ar. *qirmiz* vivid red and suffix *-ite*, referring to this mineral's red color (Senning, 2007).
- khellin $C_{14}H_{12}O_5$, derived from khellah, from Ar. *akhillah* toothpick plant, *Ammi visnaga* Lam. and suffix *-in(e)* (Senning, 2007).
- lacc(a) derived from Modern L. *lacca* lac, ultimately from Skr. *lākṣā* lac (Partridge, 1966).
- lazulite also known as blue spar, klaprothite, $(Mg,Fe)A_2(PO_4)_2(OH)_2$, derived from Ar. *āzūl* sky and suffix *-lite*, referring to this mineral's blue color (Klein, 1983).
- lime CaO , ultimately derived from Skr. *layate* he clings, he sticks (Partridge, 1966).
- magainin derived from Hebr. *maghen* shield, and suffix *-in(e)*; referring to these polypeptides antimicrobial properties (Senning, 2007).
- mannose $C_6H_{12}O_6$, derived from manna, from Hebr. *mān* gift, and suffix *-ose* (Klein, 1983).
- massicotite also known as massicot, PbO , derived from Ital. *marzacotta* potter's glaze, ultimately from Ar. *sabb qubti* Egyptian alum, i.e. iron and/or aluminum sulfate, and suffix *-ite* (Senning, 2007).
- meteloidine $C_{13}H_{21}NO_4$, derived from the specific epithet of the species name *Datura meteloides* DC. (Jimson weed, sacred datura), from Modern L. *meteloides* resembling *Datura metel*, garden

- thornapple, from metel nut, from Ar. *jouz mathal* metel nut, and suffix *-idin(e)* (Senning, 2007).
- nacrite $A_{12}Si_2O_5(OH)_4$, derived from Fr. *nacre* mother-of-pearl, ultimately from Ar. *naqqārah* bowl, and suffix *-ite* (Partridge, 1966).
 - naphtha derived from Gr. *náphtha* naphtha, ultimately from Pers. *neft* naphtha (Klein, 1983).
 - naringin $C_{27}H_{32}O_{14}$, ultimately derived from Skr. *nāraṅga* orange tree, *Citrus*, Tamil *naṅu* fragrant, and suffix *-in(e)* (Senning, 2007).
 - nimbi derived from Skr. *nimba* neem tree, *Azadirachta indica* A. Juss (Senning, 2007).
 - nupharidine $C_{15}H_{23}NO_2$, derived from the genus name *Nuphar* water lilies, ultimately from Skr. *nilotpala* nenuphar, formed from Skr. *nila* dark blue and Skr. *utpala* nenuphar blossom, and suffix *-idin(e)* (Senning, 2007).
 - opal $SiO_2 \cdot nH_2O$, ultimately derived from Skr. *upala* (precious) stone (Partridge, 1966).
 - oryza ultimately derived from Gr. *óryza* rice of non-Indo-European origin, akin to Skr. *vr̥his* rice (Partridge, 1966).
 - peridot also known as chrysolite, olivine, $(Fe,Mg)_2SiO_4$, derived from Old Fr. *peridot* peridot, literally unclear or from Ar. *faridat* gem (Senning, 2007).
 - piper(o) derived from the genus name *Piper* peppers, from L. *piper* pepper, ultimately from Skr. *pippalī* long pepper (Partridge, 1966).
 - realgar As_4S_4 , derived from Ar. *rahj al-ghār* powder of the mine (Senning, 2007).
 - saccharum derived from L. *saccharum* sugar, ultimately from Skr. *śárkarā* sugar (Partridge, 1966).
 - safflorite $CoAs_2$, derived from Germ. *Safflor* dyer's saffron, ultimately from Ar. *zafaran* saffron, and suffix *-ite*; referring to the use of this mineral in the manufacture of Germ. *Saflor* zaffer, cobalt blue.
 - safranal $C_{10}H_{14}O$, derived from Germ. *Safran* saffron, ultimately from Ar. *zafaran* saffron, and suffix *-al* (Senning, 2007).
 - sandarac As_4S_4 , derived from Gr. *sandarákē* realgar, probably akin to Skr. *candana* sandalwood (Partridge, 1966).
 - santalol $C_{15}H_{24}O$, derived from the genus name *Santalum* sandalwood, from Medieval L. *sandalum*, *santalum* sandalwood, ultimately from Ar. *śandal* sandalwood, and suffix *-ol* (Senning, 2007), From Pers. *chandal*, from Skr. *chandan*.
 - sapphire Al_2O_3 , ultimately derived from Hebr. *sappīr* sapphire, lapis lazuli (Klein, 1983).
 - sarafotoxin derived from Hebr. *saraf* a biblical poisonous snake, possibly *Atractaspis engaddensis* and toxin (Senning, 2007).
 - sarpag derived from Hind. *sarpagandha* Indian snakeroot, *Rauwolfia serpentina* (Senning, 2007).
 - sennoside $C_{42}H_{38}O_{20}$, derived from senna (*Cassia*), from Ar. *sana* senna, and suffix *-ose*, and suffix *-ide*.
 - sesamin $C_{20}H_{18}O_6$, derived from sesame (*Fagara*), ultimately from Ar. *simsim* sesame, from Akk. *shamashshamu* and suffix *-in(e)* (Klein, 1983).
 - soda $Na_2CO_3 \cdot 10H_2O$, derived from Medieval L. *soda* barilla, ultimately maybe from Ar. *suwwad* barilla (Senning, 2007).
 - sophor(a) derived from the genus name *Sophora* (trees, shrubs), ultimately from Ar. *sufayrā* Sophora.
 - spinasterol $C_{29}H_{48}O$, derived from the genus name *Spinacia* (spinach), ultimately from Pers. *isfanāk* spinach, and sterol (Senning, 2007).
 - steel ultimately derived from Skr. *stakati* he resists; compare Av. *staxra* firm, strong (Partridge, 1966).
 - sucrose $C_{12}H_{22}O_{11}$, derived from Fr. *sucre* sugar, ultimately from Skr. *sarkara* sugar, and suffix *-ose*.
 - sugar ultimately derived from Skr. *sarkara* sugar (Partridge, 1966).
 - talc also known as talcum, steatite, soapstone, $Mg_3Si_4O_{10}(OH)_2$, ultimately derived from Ar. *talq* talc (Partridge, 1966).
 - taraxasterol $C_{30}H_{50}O$, derived from the genus name *Taraxacum* (perennial herbs), from Ar. *tarakhshaqun* wild chicory, and sterol.
 - tartar $C_4H_5KO_6$, ultimately derived, via Medieval L. *tartarum* tartar, Medieval Gr. *tártaron* tartar, and Ar. *durdhia* lees, from Pers. *durd* lees (Partridge, 1966).
 - trehalose $C_{12}H_{22}O_{11}$, derived from *trehala* (edible pupal covering of the beetle *Larinus maculatus*), ultimately from Pers. *tighāl* trehala, and suffix *-ose*.
 - trona $Na_3(HCO_3)(CO_3) \cdot 2H_2O$, derived from Ar. *tron* aphaeretic form of natrun, from Ar. *natrun* natron (Senning, 2007).
 - turanose $C_{12}H_{22}O_{11}$, derived from Pers. *Tūrān* Turkestan, and suffix *-ose*; referring to this sugar's occurrence in a manna found in Turkestan.
 - uscharin $C_{31}H_{41}NO_8S$, derived from *uschari*, a native African word for the arrow poison obtained from the African plant rubberbush, apple of Sodom (*Calotropis procera*), ultimately probably from Ar. *usher* rubberbush, apple of Sodom, *Calotropis procera*, and suffix *-in(e)* (Senning, 2007).
 - usnic acid $C_{18}H_{16}O_7$, derived from the genus name *Usnea* mosses, from Ar. *ushnah* moss.
 - vasicine $C_{11}H_{12}N_2O$, derived from the specific epithet of the species name *Adhatoda vasica* Nees Malabar nut, from Skr. *vasika*, *vasaka* Malabar nut, from Skr. *vasayati* it perfumes, it makes fragrant, and suffix *-in(e)* (Senning, 2007).
 - zero ultimately derived from Ar. *sifr* empty, zero (Partridge, 1966).
 - zingiber derived from the genus name *Zingiber* ginger, from L. *zingiber*, *gingiber* ginger, ultimately from Skr. *siṅgi-vera* antler-shaped (Partridge, 1966).
 - zircon derived from Ital. *giargone* zircon ($(Zr,Hf)SiO_4$), from Ar. *zargun* gold color (Senning, 2007).

CONCLUSION

Reviewing the results of this study reveals that a great deal of important chemical and pharmaceutical terms are of oriental, especially Arabic, Persian and Hindi sources. Of these terms 63 references directly or indirectly made to Arabic language, Persian language 14 references, Hindi language 14 references, Sanskrit language 31 references, Hebrew language 10 references, and a single reference made to Syriac language. The authors believe that the exact amount of scientific terms of oriental origin are far many from the terms mentioned here as a small sample (Klepser and Klepser, 1999). The diversity of terms show that oriental sources have an important role in enrichment of human sciences.

REFERENCES

- Ahmad, I., A. Farrukh and O. Mohammad, 2006. Modern Phytomedicine: Turning Medicinal Plants into Drugs. Wiley-VCH, Verlag.
- Beck, L.Y., 2005. De materia medica by Pedanius Dioscorides. Hildesheim. Olm-Weidmann, Germany.
- Bekhradi, R., 2004. New herbal therapy. Kashan: Motarjem Publication;
- Collins, M., 2000. Medieval herbs. The British Library and University of Toronto Press.
- Cupp, M.J., 1999. Herbal remedies: Adverse effects and drug interactions. Am. Fam. Physician., 59: 1239-1245.
- El-Gammal, S.Y., 1997. The relation between Greek and Islamic *materia medica*. Bull. Indian Inst. Hist. Med. Hyderabad, 27(1): 39-46.
- Givens, J.A., K. Reeds and A. Touwaide, 2006. Visualizing Medieval Medicine and Natural History, 1200-1550.
- Gledhill, D., 2008. The Names of Plants. Cambridge University Press, Cambridge.
- Heilmeyer, M., 2007. Ancient Herbs. Frances Lincoln Limited.
- Izzo, A.A., F. Borrelli and R. Capasso, 2002. Herbal medicine: The dangers of drug interaction. Trends Pharmacol Sci., 23: 358-391.
- Jonas, W.B., 1999. Complementary and alternative medicine and the NIH. Clin. Dermatol., 17: 99-103.
- Klein, D., 1983. A Comprehensive Etymological Dictionary of the Hebrew Language.
- Klepser, T.B. and M.E. Klepser, 1999. Unsafe and potentially safe herbal therapies. Am. J. Health Syst. Pharm., 56: 125-138.
- Mousavizadeh, K. and H. Ansari, 2005. Complementary and alternative medicine and medical education. Jahad Daneshgahi J., 7: 329-336.
- Partridge, E., 1966. Origins: A short etymological dictionary of Modern English. Routledge.
- Pavord, A., 2005. The Naming of Names, the Search for Order in the World of Plants. Bloomsbury, London.
- Riddle, M.J., 1985. Dioscorides on Pharmacy and Medicine. University of Texas Press, Austin.
- Scarborough, J., 1978. Theophrastus on herbals and herbal remedies. J. History Biol., 11: 353-385.
- Senning, A., 2007. Elsevier's Dictionary of Chemoetymology. Elsevier B.V.
- Singer, C., 1927. The herbal in antiquity and its transmission to later ages. J. Hellenic Stud., 47: 1-52.
- Yang, A.W., G. Allan, C.G. Li and C.C. Xue, 2009. Effective application of knowledge management in evidence-based Chinese medicine: A case study. Evidence Based Complement. Alter. Nat. Med., 6: 393-398.