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**LATEST RESEARCH ON PLANTS WITHIN NO. 5782 - 5829 IN
ŞAHĪĤ AL-BUKHĀRIY**

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Abstract

The text of hadith, aside of considered as the second source for Islamic Jurisprudence, can be a reliable record for circumstances surrounding Prophet Muhammad and his companions, being a fraction of it is plants. The plants mentioned in the scripture depict an angle of their lifestyle in dealing with these natural sources. On the other hand, one shows curiosity about on what level the fraternity of researchers in this modern days treats these plants. In order to unveil the facts, this study embarks on textual analysis upon narrations within no. 5782 to no. 5825 culled from the Chapter of Clothing of ŞahĪĥ al-Bukhāriy. Three plants are identified to be mentioned within the chosen frame namely; saffron, al-wars and umbrella thorn acacia. This paper then conducts a bibliometric analysis which provides quantitative and qualitative assessments of each list of papers on each meant plant compiled by PubMed Central® (PMC). Saffron gains an impressive attention from scientists of Asia, Europe, Africa, North and South America, followed distantly by umbrella thorn acacia, whereas al-wars has been left in a poor light. This paper suggests an action of closing the gap of inequality, so that the less known plant gains deserved attention.

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Keywords: Research, PMC, ŞahĪĥ al-Bukhāriy, plants.



1. Introduction

Ṣaḥīḥ al-Bukhārīy, compiled by Muḥammad ibn Ismā'īl al-Bukhārīy (d. 256H / 870AD) has achieved the pinnacle of canonical status among Hadith scholars. The book which was arranged according to topics consists of 97 chapters as enumerated by a philologist, Muḥammad Fu'ād 'Abd al-Bāqī. It begins with the Chapter: The Advent of Revelation (Bad' al-Waḥy) and ends with the Chapter: Monotheism (al-Tawḥīd). Surplus, each chapter consists of approximately a dozen of topics or a lot more.

The frame chosen for this study is narrations of hadith within no. 5782 to hadith no. 5829 of the Ṣaḥīḥ, which is the first quarter part of The Chapter: Clothing (al-Libās). Precisely, the frame is from the Topic (1) The Statement of Allāh: Say (O Muḥammad): Who has forbidden the adornment with clothes given by Allāh which He has produced for His worshipers? to the Topic (25) The Wearing of silk clothes by men and what is allowed thereof. The Chapter: Clothing is placed the seventy seventh in the arranged list of the chapters of Ṣaḥīḥ al-Bukhārīy ('Abd al- Hādī, 1987), and consists of 103 topics.

In order to study the latest trends of papers pertaining to the plants mentioned in the text, the PubMed Central® (PMC) of the U.S. National Institutes of Health's National Library of Medicine (NIH/NLM) is deemed a reliable entity, for its reputation as a compiler for distinguished researches contributing to its particular concern. In fact, it is a free full-text archive of biomedical and life sciences journal literature (PMC: US National Library of Medicine, National Institute of Health, n.d.)

Prior to this study on trend of researches on plants mentioned in Muslim divine scripture, is a paper titled 'Kekerapan Penerbitan Di SCOPUS Mengenai Flora-flora Dalam Al-quran dan Al-hadith' (translated 'Frequency of Publication On Plants Mentioned in Al-quran and Al-hadith in SCOPUS Indexed) by Mohd Asmadi Yakob et al. The paper opts for the database of SCOPUS to study the frequency and trend of research on certain plants mentioned in the Holy Qur'an and Prophetic Hadith namely; date, olive, fig, pomegranate, Christ's thorn jujube and black cumin. The study concludes that sub-specialty divisions of science have a predominant presence in the research (Yakob et al., 2016)

1.1. Saffron and al-Wars, Two Fragrant Herbs

Among topics fall under the Chapter of Clothing is the one mentioning kinds of garments other than the permissible while performing divine pilgrimage (al-ḥajj and al-'umra). Prophet Muhammad pointed to a list of prohibited garments especially for men being among them are clothing touched by scented things by presenting saffron and al-wars as examples, as narrated by one of the companions of the Prophet 'AbduLlāh ibn 'Umar, as he said:

A man said: "O Allāh's Apostle. What type of clothes should a muḥrim (pilgrim in ritual devotion) wear?" Allāh's Messenger - Peace be upon him - replied: "Do not wear shirts, turbans, trousers, hooded garments or leather boots; but if someone cannot get sandals, then he can wear leather boots after cutting them short below the ankles. Do not wear clothes touched by (scented thing like the herbs) saffron or al-wars".

(al-Bukhārīy, 2000; al-Naysābūrīy, 2000)

The hadith is mentioned in three topics within the chosen text of Chapter of Clothing; the first is a narration no. 5803 under the Topic of Hooded Garments, the second is no. 5805 under the Topic of

Trousers and the third is no. 5806 under the Topic of Turbans. While the hadith relating to prohibition of wearing in pilgrimage above mentions both herbs; in another topic relating to general code for masculinity, there is a hadith mentions the herb 'saffron' instead of al-wars narrated by the companion `Anas as he said:

“The Prophet (pbuh) dissuaded man to apply saffron on his body”.

(al-Bukhāriy, 2000; al-Naysābūriy, 2000)

The hadith above is under the Topic of Prohibition For Man Regarding Applying Saffron on His Body which bears no. 5846. The two narrations denote that both saffron and al-wars were known as fragrant herbs with a difference that the former is undesirable for men's consumption on their external body parts (al-`Asqalāniy, 1988), including wearing garments of dyed with it.

As referred to Royal Botanic Gardens Kew (2013), saffron bears its binominal nomenclature 'Crocus sativus'. It is native to Greece and introduced to Czechoslovakia, Iran, Italy, Morocco, Pakistan, Spain, Turkey, West Himalaya (Royal Botanic Gardens Kewscience, 2017). While al-wars is identified in the fraternity of Science as *Flemingia grahamiana*, and is not known to has a name in English for, even the botanist Burkill (1966) introduces it with its Arabic name while points to its binomial nomenclature in order to differentiate it from other species of the genus *Flemingia*.

Based on the chosen sample of researches published from 2014 to 2019 on saffron (*Crocus sativus*), the study finds a total of 468 papers as compiled by the PubMed.gov (2019) of U.S. National Library of Medicine. This study then focuses on the latest ten papers to find out their country of origin and their specific field of concern. The latest paper is a collaborative attainment of Turkey, Mauritius, Slovakia and Hungary on pharmacy (Zengin et al., 2019). While the second is from India on food chemistry (Khilare et al., 2019), and the third is from Iran on cellular biochemistry (Moradzadeh, Kalari, & Avan, 2019). Prior to them is the fourth from Austria and Greece on phytochemical analysis (Pittaneuer, Rados, & Tsarbopoulos, 2019), then the fifth from Italy and Brazil on medicine (Li Puma et al., 2019). The remained five papers which preceded them are originated from European countries and China on different sub-specialty divisions of medicine (Tóth et al., 2019; Colapietro, Mancini, & D'Alessandro, 2019; Yuan, Deng, & Wang, 2018; Christodoulou et al., 2018; Wang et al., 2018).

In fact, the top exporter for saffron is Iran, following with Afghanistan, France and Portugal. While the top importers are Spain, Italy, the United Arab Emirates, the United States and Argentina as reported by Product Complexity Index (PCI) (as quoted in OEC, n.d.). Hereby, among contributing countries for the meant ten cutting-edge papers; Iran represents the top providing countries, while Italy represents the top importing countries.

On the other hand, regarding al-wars, a medieval Muslim botanist, `Abū Ḥanīfat al-Dīnawariy `Aḥmad ibn Dāwūd, once articulated that he receives no information about the plant grows outside of Arab territories. He added that al-wars trees have been cultivated and harvested in Arab lands precisely Yemen and not brought from the wild (as quoted in Ibn Qayyim al-Jawziyya, 2008). Notwithstanding, as recorded by Royal Botanic Gardens Kewscience (2017), al-wars trees nowadays can be found distributed in its wide native blanket of Africa, South and Central China, Guinea, India, Myanmar, Thailand, Vietnam and Yemen. It is known among contemporary Arabs that Yemen, precisely the district of Yafa sustained to be a provider for al-wars to other Arab countries (Alamree.net, 2010) before it becomes a

conflict-ridden state. For a surprise, within a list of researches published from 2014 to 2019 on al-wars as compiled by PubMed.gov (2014), there is a sole paper from Kenya relating to natural products (Gumula et al., 2014).

1.2. Umbrella Thorn Acacia, The Plant Mentioned In The Story Of Migration

Umbrella thorn acacia is synonymous to natural view of the desert of Arabian Peninsula. The plant even mentioned in several hadiths, being one of them is compiled in the pertaining Chapter al-Libās which was narrated by ‘Ā`isha, a wife of the Prophet. The hadith is a lengthy text being the beginning of it is:

Some Muslim men emigrated to Abyssinia whereupon `Abū Bakr also prepared himself for the emigration, but the Prophet said (to him): "Wait, for I hope that Allāh will allow me also to emigrate." `Abū Bakr said: "Let my father and mother be sacrificed for you. Do you hope that (emigration)?" The Prophet said: "Yes." So `Abū Bakr waited to accompany the Prophet and fed two pack camels he had on the leaves of umbrella thorn acacia tree regularly for four months....

(al-Bukhāriy, 2000)

This hadith mentions the usage of leaves of umbrella thorn acacia as a fodder for the pack camels. In the fraternity of Science, its binomial nomenclature is *Acacia tortilis* as revealed by the Ministry of Climate Change and Environment, United Arab Emirates (n.d). In fact, in the foremost English translation for Ṣaḥīḥ al-Bukhāriy by Khan (1997) the plant mentioned in this hadith is left in transliterated form ‘As-samur’, which possibly makes it unknown for most English readers. Umbrella thorn acacia is a native plant to Saudi Arabia, United Arab Emirates, Iran and Africa specifically, Nile basin countries, eastern and southern parts of the continent, and is considered exotic to other parts of Africa and South Asia (Orwa, Mutua, & Kindt, 2009).

Regarding umbrella thorn acacia, there are 23 papers published on it from 2014 to 2019 as compiled by PubMed.gov (2018). Israel has a significant presence in the latest researches on the species; where the three first papers are from the state. The first is a collaboration with Kenya and Germany on environmental science (Winters et al., 2018), the second is with the United States of America on desert study (Rodger, Greenbaum, & Silver, 2018) and the third is with Vietnam on environmental science (Tran et al., 2018) respectively. Then the fourth paper is from Ethiopia on veterinary (Gebu, Tekle, & Belay, 2018), whereas the fifth is from Egypt on food technology (Embaby, Swailam, & Rayan, 2018). The remaining four papers are from Saudi Arabia on pharmacy and biology, being the eighth and ninth are collaborative with South Africa and Sudan respectively (Alajmi et al., 2017; Al-Hammad & Al-Ammari, 2017; Adgaba et al., 2017; Alam et al., 2017). While the tenth is a paper from India delving in biological macromolecules (Lakhera & Kumar, 2017).

Table 01. Latest researches on the plants; saffron, al-wars, umbrella thorn acacia, dated from 2014 – 2019 (data collection finished on 25 Jan 2019)

Plant	Total of Papers	Year of the latest 10 publications	Country	Field
Saffron (Crocus Sativus)	468	5 Feb 2019 30 Jan 2019 15 Jan 2019 15 Jan 2019 12 Jan 2019 Jan 2019 2018 2018 2018 2018	Turkey, Mauritius, Slovakia & Hungary India Iran Austria & Greece Italy & Brazil Hungary Italy China Greece & UK China	1 st – Pharmacy 2 nd – Food Chemistry 3 rd – Cellular Biochemistry 4 th – Phytochemical Analysis 5 th – Medicine 6 th – Psychiatry 7 th – Medicinal Chemistry 8 th – Medicine 9 th – Pharmacy 10 th – Molecular Medicine
al-Wars (Flemingia Grahamiana)	1	2014	Kenya	Natural products
Umbrella Thorn Acacia (Acacia Tortilis)	23	2018 2018 2018 2018 2017 2017 2017 2017 2017	Israel, Kenya & Germany Israel & USA Israel & Vietnam Ethiopia Egypt Saudi Arabia Saudi Arabia Saudi Arabia & South Africa Saudi Arabia & Sudan India	1 st – Environmental Science 2 nd – Dessert Research 3 rd – Environmental Science 4 th – Veterinary 5 th - Food Technology 6 th – Pharmacy 7 th – Biology 8 th – Biology 9 th – Pharmacy 10 th – Biological Macromolecules

Source: PubMed.gov, 2019, PubMed.gov, 2018 & PubMed.gov, 2014

2. Problem Statement

Regularly, the text of hadith is meant for finalising decrees as it is a second source for Islamic Jurisprudence after the Holy Quran. Meanwhile, the surroundings the contemporaneous people of Prophet Muḥammad were accustomed to are portrayed in poor light, being plants they used to utilise in their daily life were credibly a part of their ambience. Actually, many types of plants mentioned in the scripture are known to the people of this modern days, whereas some are unknown even among average Arabs, let alone among non-Arabs. Unpleasantly, some types of plants in the translated scripture are left in transliterated form without pointing to their particular species. Belying the different concerns applied to the plants, they are all from the Mother Nature deserve to be identified and treated properly.

3. Research Questions

1. What is the plants mentioned within narrations no. 5782 to no. 5829 in Ṣaḥīḥ al-Bukhāriy?
2. What is the trend of research regarding the plants mentioned within narrations no. 5782 to no. 5829 in Ṣaḥīḥ al-Bukhāriy, based on archive of PMC dated 2014 to 2019?

4. Purpose of the Study

1. To identify the plants mentioned within narrations no. 5782 to no. 5829 in Ṣaḥīḥ al-Bukhāriy.
2. To realise the trend of research regarding the plants mentioned within narrations no. 5782 to no. 5829 in Ṣaḥīḥ al-Bukhāriy

5. Research Methods

Initially, this study relies on content analysis on narrations within no. 5782 to no. 5829 in Ṣaḥīḥ al-Bukhāriy to trace plants mentioned in the text. In addition, other classical and contemporary sources which assist the study are referred to grasp information pertaining to the plants. In delving into its further discourse, the study conducts a bibliometric analysis of researches dated 2014 to 2019 compiled by the PubMed of U.S. National Library of Medicine. The analysis provides quantitative and qualitative assessments on a database of the meant plants within the chosen publication period. Quintessentially, this study focuses on the types of plants mentioned within the culled text of hadith and identifies them as; saffron, al-wars and umbrella thorn acacia. Surplus, the binomial nomenclature of each plant or species is identified. Within the frame, through the quantitative approach, the number of papers attained pertaining to each species is recorded and compared, then the latest ten papers are shortlisted. The qualitative portion of this study focuses on trends of the shortlisted papers on each plant regarding contributing countries and their specific fields of concern.

6. Findings

This study finds three types of plants are mentioned within narrations no. 5782 to no. 5829 in Ṣaḥīḥ al-Bukhāriy namely; saffron, al-wars and umbrella thorn acacia. As stated in these hadiths inside the frame chosen, saffron and al-wars were utilised as fragrant herbs, whereas leaves of umbrella thorn acacia were consumed as fodder. Upon unveiling the trend of researches which resembles the need and consciousness of this modern days worldwide to these types of plant, this study discovers a vivid difference in terms of concerns the researchers give to the plant. Saffron gains impressive attention and followed by umbrella thorn acacia distantly, whereas the concern on al-wars is acutely scarce.

Notably, saffron is not only represented by the highest number of papers among the three plants, a litany of the researches attained on the plant is seemingly sustaining until 2019 which exudes the proliferation concern. Meanwhile the latest paper on umbrella thorn acacia is dated 2018, and the only paper published on al-wars is dated 2014 respectively. The papers attained for the plants cover various sub-specialty divisions of science as recorded in Table 01.

The involving countries in the researches represent the continents; Asia, Europe, Africa, North and South America. Seemingly, the existence of the plants in their surrounding, livelihood and culture is a strong backbone to the researches achieved, so that the commendable efforts cater at the first place to the local need.

7. Conclusion

The trend of researches attained exudes the atmosphere of national innovation driven irrespective of being achieved by sole country or being attained in collaborative of many countries. However, this study suggests an action of filling the visible gap of concerns in research pertaining to three plants. Al-Wars which is growing in the less developed countries and was once cultivated commercially in the now conflict-ridden state; is likely not the less invaluable one.

The tree species of plants were once utilised by the bygone community which was contemporaneous with Prophet Muhammad for certain benefits. According to the pertaining hadiths which mention plants within their text; saffron and al-wars were utilised in perfumery, whereas umbrella thorn acacia used as a fodder to camels. In this modern days, the fraternity of Science is capable to keep the plants in benefiting order. To be precise, the plants are not merely considered to be industry-ready. Apart from that is to be conserved and friendly treated for environmental sustainability.

References

- ‘Abd al-Hādī, A. M. (1987). *Turuq takhrīj hadīth RasūliLlāh ṣallā alLāh ‘alayh wa sallam* [Methods of ascription for hadith of Allah’s Messenger peace be upon him]. Cairo: Dār al-‘I’tisām.
- Adgaba, N., Alghamdi, A., Sammoud, R., Shenkute, A., Tadesse, Y., Ansari, M. J., ... & Hepburn, C. (2017). Determining spatio-temporal distribution of bee forage species of Al-Baha region based on ground inventorying supported with GIS applications and Remote Sensed Satellite Image analysis. *Saudi journal of biological*, 24(5), 1038-1044. Retrieved from <https://www.sciencedirect.com/science/article/pii/S1319562X17300098>
- Alajmi, M. F., Alam, P., Alqasoumi, S. I., Siddiqui, N. A., Basudan, O. A., Hussain, A., ...& Khan, A. A. (2017). Comparative anticancer and antimicrobial activity of aerial parts of *Acacia salicina*, *Acacia laeta*, *Acacia hamulosa* and *Acacia tortilis* grown in Saudi Arabia. *Saudi Pharmaceutical Journal*, 25(8), 1248 - 1252 Retrieved from <https://www.sciencedirect.com/science/article/pii/S1319016417301664>
- Alam, P., Alajmi, M. F., Arbab, A. H., Parvez, M. K., Siddiqui, N. A., Alqasoumi, S. I., ...& Basudan, O. A. (2017). Comparative study of antioxidant activity and validated RP-HPTLC analysis of rutin in the leaves of different *Acacia* species grown in Saudi Arabia. *Saudi Pharmaceutical Journal*, 25(5), 715-723. Retrieved from <https://www.sciencedirect.com/science/article/pii/S1319016416301153>
- Alamree.net (2010). al-Zirā’at fi Yāfa’ [The agriculture in Yafa]. (2010, September 17). Retrieved from http://alamree.net/yafa_zeraah.html
- Al-‘Asqalāniy, `A. ‘A. (1988). *Fath al-Bārī Sharḥ Ṣaḥīḥ al-Bukhāriy* [The unfolding blessed by The Creator as a commentary for Ṣaḥīḥ al-Bukhāriy]. Ed. al-Khaṭīb, M. Cairo: Dār al-Rayyān lī al-Turāth.
- Al-Bukhāriy, M. `I. (2000). ‘al-Ṣaḥīḥ’ [The sound hadiths]. *Mawsū’at al-Ḥadīth al-Sharīf: al-Kutub al-Sitta* [Encyclopedia of prophetic hadith of the Six Authentic Books]. Ed. `Āl al-Shaykh, Ṣ. ‘A. ‘A. Riyadh: Darussalam.

- Al-Hammad, B. A., & Al-Ammari, B. (2017). Seed viability of five wild Saudi Arabian species by germination and X-ray tests. *Saudi journal of biological sciences*, 24(6), 1424 –1429. Retrieved from <https://www.sciencedirect.com/science/article/pii/S1319562X17301183>
- Al-Naysābūriy, M. H. (2000). ‘al-Ṣaḥīḥ’ [The sound hadiths]. *Mawsū‘at al-Ḥadīth al-Sharīf: al-Kutub al-Sitta* [Encyclopedia of prophetic hadith of the Six Authentic Books] . Ed. `Āl al-Shaykh, Ṣ ‘A. ‘A. Riyadh: Darussalam.
- Burkhill, I. H. (1966). *A dictionary of the economic products of the Malay Peninsula*. Kuala Lumpur: Ministry of Agriculture and Co-operatives, Malaysia.
- Christodoulou, E., Grafakou, M. E., Skaltsa, E., Kadoglou N., Kostomitsopoulos, N., & Valsami, G. (2018). Preparation, chemical characterization and determination of crocetin's pharmacokinetics after oral and intravenous administration of saffron (*Crocus sativus* L.) aqueous extract to C57/BL6J mice. *The journal of pharmacy and pharmacology*, 71(5), 753-764. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/30575029>
- Colapietro, A., Mancini, A., & D’Alessandro A. M. (2019). Crocetin and crocin from saffron in cancer chemotherapy and chemoprevention. *Anti-cancer agents in medicinal chemistry*, 19(1), 38 –47. Retrieved from: <https://www.ncbi.nlm.nih.gov/pubmed/30599111>
- Embaby, H. E., Swailam, H. M., & Rayan, A. M. (2018). Preparation and physicochemical properties of protein concentrate and isolate produced from *Acacia tortilis* (Forssk.) Hayne ssp. *Raddiana*. *Journal of food science and technology*, 55(2), 489 – 495. Retrieved from <https://link.springer.com/article/10.1007/s13197-017-2957-1>
- Gebru, G., Tekle, D., & Belay, S. (2018). Effect of supplementation of indigenous browse tree pods on weight gain and carcass parameters of Abergelle rams. *Tropical animal health and production*, 50(3), 659 – 664. Retrieved from: <https://link.springer.com/article/10.1007/s11250-017-1483-5>
- Gumula, I., Alao, J. P., Ndiege, I. O., Sunnerhagen, P., Yenesew, A., & Erdélyi, M. (2014). Flemingins G-O, cytotoxic and antioxidant constituents of the leaves of *Flemingia grahamiana*. *Journal of Natural Products*, 77(9), 2060 – 2067. Retrieved from <https://pubs.acs.org/action/doSearch?AllField=flemingia+grahamiana&type=within&publication=40026036>
- Khan, M. M. (1997). *The Translation of the meanings of Sahih Al-Bukhari: Arabic – English*. Riyadh: Darussalam.
- Khilare, V., Tiknaik, A., Prakash, B., Balasaheb, B., Korhale, G., Nalage, D., ... & Khedkar, G. (2019). Multiple tests on saffron find new adulterant materials and reveal that Ist grade saffron is rare in the market. *Food chemistry*, 272, 635-642. Retrieved from <https://www.sciencedirect.com/science/article/pii/S0308814618314924>
- Lakhera, A. K., & Kumar, V. (2017). Monosaccharide composition of acidic gum exudates from Indian *Acacia tortilis* ssp. *raddiana* (Savi) Brenan. *International journal of macromolecules*. 94(Part A). pp. 45 – pp. 50. <https://www.sciencedirect.com/science/article/pii/S0141813016307607>
- Li Puma, S., Landini, L., Marcedo, S. J. Jr., Seravalli, V, Marone, I. M., ... & De Logu, F. (2019). TRPA1 mediates the antinociceptive properties of the constituent of *Crocus sativus* L., safranal. *Journal of cellular and molecular medicine*, 23(3), 1976-1986. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/30636360>
- Ministry of Climate Change and Environment, United Arab Emirates/Shajar al-samur [Umbrella thorn acacia trees]. (n.d.). Retrieved from: file:///C:/Users/User/Downloads/Acacia_info_ARA.pdf
- Moradzadeh, M., Kalari, M. R, & Avan, A. (2019). The antileukemic effects of saffron (*Crocus sativus* L.) and its related molecular targets: A mini review. *Journal of cellular biochemistry*, 120(4), 4732 –4738. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/30644127>
- Orwa, C., Mutua, A., Kindt, R., Jamnadass, R., & Anthony, S. (2009). (Forssk.) Hayne: Fabaceae – Mimosoideae/*Acacia tortilis*. Retrieved from http://www.worldagroforestry.org/treedb/AFTPDFS/Acacia_tortilis.PDF
- Pittenauer, E, Rados, E. Tsarbopoulos, A., & Allmaier, G. (2019). In-depth analysis of crocetin ester glycosides from dried/processed stigmas of *Crocus sativus* L. by HPLC-ESI-MSn (n = 2, 3). *Phytochemical Analysis: PCA*, 30(3), 346 –356. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/30644146>

- PMC: US National Library of Medicine, National Institute of Health. (n.d.). *PMC*. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/>
- PubMed.gov/Format: Abstract. (2014). Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/?term=Flemingia+grahamiana>
- PubMed.gov/Search results. (2018). Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/?term=Acacia+tortilis>
- PubMed.gov/Search results. (2019). Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/?term=Crocus+sativus>
- Ibn Qayyim al-Jawziyya, M. (2008). *al-Ṭibb al-nabawiy* [The prophetic medicine]. Ed. `Ibrāhīm, S. Cairo: Dār al-Ḥadīth.
- Rodger, Y. S., Greenbaum, G., & Silver, M. (2018). Detecting hierarchical levels of connectivity in a population of *Acacia tortilis* at the northern edge of the species' global distribution: Combining classical population genetics and network analyses. *Plos One*, *13*(4). Retrieved from <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0194901>
- Royal Botanic Gardens Kew/Crocus sativus, saffron. (2013, June 24). Retrieved from <http://images.kew.org/crocus-sativus-saffron/print/10660804.html>
- Royal Botanic Gardens Kewscience/Crocus sativus L. (2017). Retrieved from <http://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:436688-1#sources>
- Royal Botanic Gardens Kewscience/Flemingia Grahamiana. (2017). Retrieved from <http://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:495259-1>
- OEC/Saffron. (n.d.) Retrieved from URL: <https://atlas.media.mit.edu/en/profile/hs92/091020/>
- Tóth, B. Hegyi, P., Lantos, T., Szakács, Z., Kerémi, B. Varga, G., ... & Csupor, D. (2019). The efficacy of saffron in the treatment of mild to moderate depression: A meta-analysis. *Planta medica*, *85*(1), 24-31. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/30036891>
- Tran, T. H., Gati, E. M., & Eshel, A. (2018). Germination, physiological and biochemical responses of acacia seedlings (*Acacia raddiana* and *Acacia tortilis*) to petroleum contaminated soils. *Environmental pollution*, *234*, 642-655. Retrieved from <https://www.sciencedirect.com/science/article/pii/S0269749117337752#!>
- Wang, C., Cai, X., Hu, W., Li, Z., Kong, F., & Chen, X. (2018). Investigation of the neuroprotective effects of crocin via antioxidant activities in HT22 cells and in mice with Alzheimer's disease. *International journal of molecular medicine*, *43*(2), 956-966. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/30569175>
- Winters, G., Otieno, D., Cohen, S., Bogner, C., Ragowloski, G., & Paudel, I. (2018). Tree growth and water-use in hyper-arid *Acacia* occurs during the hottest and driest season. *Oecologia*, *188*, 695 – 705. Retrieved from: <https://link.springer.com/article/10.1007/s00442-018-4250-z>
- Yakob, M. A., Mohd Yusoff, M. Y. @ Z., Abd Razzak, M @ M, Ahmad, K. & Fauzi, N., Awang, K., ... & Mustafa, M. R. (2016). Kekerapan Penerbitan Di SCOPUS Mengenai Flora-flora Dalam Al-quran dan Al-hadith [Frequency of publication on plants mentioned in Al-quran and Al-hadith in SCOPUS indexed]. *Journal of contemporary Islamic studies*, Ed. Ab Manan, S. K. 2(1). 123 –142. Shah Alam: Academy of Contemporary Islamic Studies, Universiti Teknologi MARA.
- Yuan, Y., Deng, Y., & Wang, J. (2018). A rapid site-specific PCR based one-tube authentication method for saffron in crude drugs and processed herbal medicines. *Electrophoresis*. Retrieved from: <https://www.ncbi.nlm.nih.gov/pubmed/30575987>
- Zengin, G., Aumeeruddy, M. Z., Diuzheva, A., Jekő, J., Cziáky, Z., Yıldızıtugay, A., ... & Mahomoodally, M. F. (2019). A comprehensive appraisal on *Crocus chrysanthus* (Herb.) Herb. flower extracts with HPLC-MS/MS profiles, antioxidant and enzyme inhibitory properties. *Journal of pharmaceutical and biomedical analysis*, *164*, 581-589. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/30466026>