

LITERATURE REVIEW OF PHYTOCHEMICAL PROPERTIES OF FIG (*FICUS CARICA L*) IN SURAH AT-TIN VERSE 1

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ABSTRACT

Allah provides information about the fig plant in Surah At-Tin verse 1. The fig plant is a special plant that is specifically mentioned in the Quran and is widely used for human health such as preventing hypertension, maintaining heart health, and treating diabetes. The fig plant is a plant that has many chemically active compounds that are useful in medicine. This study aims to interpret of the surah At-Tin verse 1 and identify the features of the fig plant from the perspective of plant phytochemicals. The results showed that Allah swore by the name of the fig plant in Surah At-Tin verse 1. This indicates that there are many blessings on the fig plant for human life. Phytochemical test results showed that the fig plant has chemical compounds that are beneficial to human health such as flavonoids, alkaloids, phenolics, terpenoids, and saponins. These compounds act as antioxidants, function in the detoxification of toxins, prevent cancer, regulate the stability of the body's metabolism, and scavenge radicals that enter the body. The fig plant has many benefits for human life. It is a proof of miraculous Quran perspective phytochemical of fruit because fig plants have chemical compounds that are good for human health.

Keywords: phytochemical, figs plant, Quran.

INTRODUCTION

Plants mentioned in the Quran such as olives and figs have many features such as economic value and chemical content in these plants (Bakoush et al., 2015; Gaaliche et al., 2017; Görgüç et al., 2021; Mendoza-Castillo et al., 2017). The fig plant is specifically mentioned in surah At Tin in verse 1 where Allah swears by the name of figs. This indicates that the fig plant has blessings for human life (Zulkarnain & Suprpto, 2022). Fig cultivation provides great benefits for people's welfare. Figs can be processed into products that are beneficial to health. Figs can be processed into cakes, ice cream, healthy food, and medicine (Gündeşli et al., 2021; Shamsi et al., 2020).

Many plants have a good impact on people's health (Walid et al., 2022). The specialty of fig plants in the world of medicine is an interesting thing to study. Figs have active chemical compounds that are often used for herbal medicine (Li et al., 2021; Shi et al., 2018; Wilding et al., 2018). Secondary metabolite compounds such as flavonoids, alkaloids, and phenolics are active substances in fig plants that are useful for medicine. Fig plants can treat cardiovascular disease, cancer, hypertension, respiratory disorders, and headaches. Secondary metabolites are bioactive compounds that function as antioxidants that can regenerate cells damaged by free radicals (Ghimire et al., 2020; Petruccelli et al., 2018; Salehi et al., 2021).

The potential of the fig plant to become the main ingredient in the medicine is enormous (Ghimire et al., 2020; Shamsi et al., 2020). This is because many people are moving into the world of herbs and Islamic medicine. Therefore, this research needs to analyze the phytochemical properties of the fig plant and provide information to the public about the benefits of the fig plant in the Quran.

METHODS

This research is library research. Data were collected from several references around 2015-2023 such as research journals and books that are appropriate to the research topic. This study uses secondary data related to the phytochemicals of figs and the Qur'an. The data will be analyzed with the results in the form of descriptive data. The first stage in this study was data collection, namely analyzing journals about the verses of At-Tin and fig plant phytochemical screening. The second stage is data reduction, which is carried out at this stage to select the data needed and correlate it with the research theme. The third stage is the presentation of data, the data will be presented using the existing theory. The fourth stage is concluding, at this stage conclusions are made based on the results of the analysis of the secondary data used.

RESULTS AND DISCUSSION

Interpretation of surah At-Tin

The Quran is a guide for humans in living this life (Husnaini et al., 2021; Meity Elvina, 2020; Tahreem Fatima & Aqsa Tasgheer, 2021). The Quran was revealed in a long process and followed human problems at that time. Surah in the Quran is grouped into two, namely the Quran which was revealed when the Prophet Muhammad was in the city of Mecca, and the surah which was revealed when the Prophet Muhammad was in the city of Medina (Aksoy, 2021; Wheeler, 2021; Zulkifli Yusoff, 2015). Surah At-Tin is one of the surah that came down

when the prophet Muhammad lived in the city of Mecca which is also called surah makki (Rofiq & Istiqomah, 2021; Rusdi & Omar, 2019).

Surah At-Tin has 8 verses. Some of the information conveyed to humans such as the creation of humans who have advantages in physical and spiritual form. Allah proves Allah's power by creating human beings in perfect condition and physical condition. Perfection is equipped with reason and passion that helps humans in making decisions to be safe in this world and the hereafter. Believers will live in heaven while unbelievers will live in hell.

Fig Plant

The fig plant is a plant that grows in tropical and subtropical regions and has a relatively long life. This type of plant can be cultivated on a large scale because it can adapt to various conditions (Ravichandra & Paarakh, 2011; Vora & Vora, 2017). The parts of the fig plant that are often used are the fruit and leaves. Figs can be eaten directly in fresh or dry form. Commodity figs have good economic value because they can be sold fresh or processed. Figs are rich in minerals, fiber, vitamins, iron, calcium, and potassium. The leaves, roots, and fruit are often used in traditional herbal medicine (Arvaniti et al., 2019; Gillani et al., 2018; Zulkarnain, 2022). Based on the research results, some of the nutritional content in figs are vitamin A, vitamin C, vitamin E, calcium, antioxidants, magnesium, and potassium. The fig plant belongs to the plant species with the kingdom Plantae, division Magnoliophyta, class Magnoliopsida, order Rosales, family Moraceae, genus ficus, species ficus carica L. The fig plant like in figure.1 (Mawa et al., 2013; Rahmasita et al., 2021).



Figure 1. Fig plants

Fig plants also contain phenolic compounds and flavonoids (Farhan Al-Halbosi et al., 2020; Hssaini et al., 2022; Mawa et al., 2013; Nishad & Ahmed, 2019; Rahmasita et al., 2021; Veberic et al., 2008). These compounds help maintain human health such as preventing cancer, counteracting free radicals, preventing blood vessel disease, and maintaining healthy nerves (Cosme et al., 2020; Ghasemzadeh & Ghasemzadeh, 2011; Karak, 2019; M. Akram, 2011; Panche et al., 2016). The use of figs has long been carried out by the Arabs to treat various types of diseases. Several studies have shown that figs can be used as antioxidants, anti-cancer, and anti-tumor (Shahrajabian et al., 2021; Suttisansanee et al., 2021). In addition, the fig plant can cure cardiovascular, respiratory, antispasmodic, and anti-inflammatory diseases (Abe, 2020; Bougiouklis et al., 2020; Bouyahya et al., 2016; Fajar & Mulyani, 2020; Mawa et al., 2013; Shahrajabian et al., 2021; Suttisansanee et al., 2021).

The various benefits of figs for human health show the greatness of Allah through the Quran. Islam teaches its people to keep trying to find healing, not to stay silent without making an effort to get healthy again. Positive energy from a sense of optimism is very influential in dealing with sick exams. This can speed up the healing process. Maximum effort and surrender to Allah's provision is the attitude of a Muslim in facing a sickness test (Ahsan et al., 2012; Akhmad, 2017; Rahman, 2015).

The Messenger of Allah is an example for Muslims in maintaining health such as maintaining food that enters the body, fasting, and being close to Allah. Health has a tremendous impact on carrying out daily activities. There are many suggestions in Islam to stay healthy because Allah is more pleased with healthy Muslims than sick ones. As Allah says in surah Al-Baqarah verse 222:

“Indeed, Allah loves those who repent and loves those who purify themselves.”

In the letter, we can know that Allah likes humans who purify themselves physically and spiritually. Outwardly humans can maintain physical health in the form of a good diet and regular exercise, while inwardly they form of maintain mental, heart, and psychological health (Ahsan et al., 2012; Chamsi-Pasha & Chamsi-Pasha, 2021; Saad Najam et al., 2019).

Phytochemical of Fig

Phytochemicals are secondary metabolites that have certain bioactivities and are beneficial to humans (Antonio et al., 2018; Kennedy & Wightman, 2011; Mangwani et al., 2020; Mera et al., 2019). Metabolite compounds are produced by plants for defense and adaptation to the environment. When plants are attacked by animals and microorganisms, the plants produce secondary metabolites which are toxic or antimicrobial for defense. Component

of secondary metabolite in fig fruit extracted in water and ethanol then analysed by color test using some reagents such as magnesium metal, potassium iodide, hydrochloric acid, sulfuric acid, nitric acid, and bismuth (III) nitrate. There are several useful secondary metabolite compounds in fig plants, namely flavonoids, alkaloids, and phenols (Arvaniti et al., 2019; Gündeşli et al., 2021; Nishad & Ahmed, 2019; Ravichandra & Paarakh, 2011; Salehi et al., 2021). The chemical structure of flavonoids, alkaloids, and phenolics are shown in figure.2.

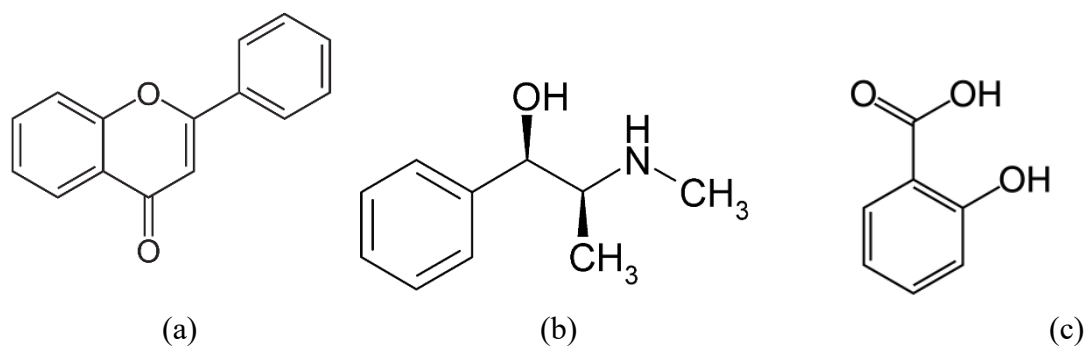


Figure 2. Chemical structure of flavonoid (a), alkaloid (b), and phenolic (c)

Flavonoid compounds are secondary metabolites that are important in pharmacology because they can function as antioxidants, anti-microbial, anti-cytotoxic, anti-inflammatory, anti-cancer, and anti-diabetic (Agati et al., 2012, 2020; Ahn-Jarvis et al., 2019; Ciumărnean et al., 2020; Slika et al., 2022). Flavonoid compounds consist of several types, namely flavones, flavonols, flavanols, chalcones, flavanones, and ansotianidone (Fardoun et al., 2020; Lim & A.G. Koffas, 2010; Maaliki et al., 2019). These compounds are often found in plants in the leaves, fruit, stems, and roots. The presence of flavonoid compounds in plants influences the color, flower, aroma, and taste of the seeds (Safeena & Kalinga, 2020).

Flavonoids, alkaloids, and phenols are classified as secondary metabolites that function as antioxidants because they can capture free radicals. The compound has a hydroxyl group which will give one electron to the unpaired electron in the free radical. This can cause free radicals to be unreactive and harmless to health. In general, in plants, flavonoid compounds bind to glycosides, where the molecules that bind to sugars are called glycans, while the molecules that bind to non-sugars are called aglycones (Abrankó & Szilvássy, 2014; Cuyckens et al., 2001; Ilyasov et al., 2020). The aglycones of flavonoid compounds are polyphenols, so they have phenol-like properties. The interaction of flavonoid compounds against free radicals can be seen in Figure 3.

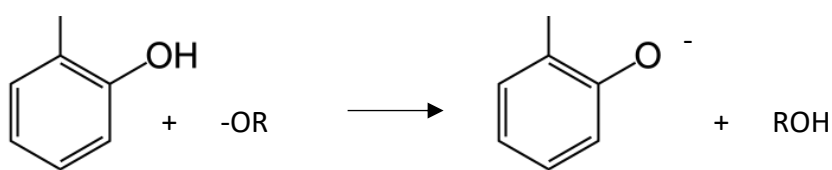


Figure 3. Interaction of flavonoid against

Every day we can be exposed to free radicals and toxins that are harmful to human health. Free radicals can damage components in cells so they harm human health. Increasing pollution from the outside will increase the risk of free radicals entering the human body (Abrankó & Szilvássy, 2014; Ilyasov et al., 2020). Pollution that is often encountered in everyday life is cigarette smoke, vehicle exhaust, and air pollution. In addition to pollution, food factors also contribute to entering free radicals in the human body. The presence of flavonoids can neutralize incoming free radicals so that human health is maintained (Lalhminglui & Jagetia, 2018; Pal & Dubey, 2013; Yashin et al., 2017).

Alkaloid compounds are toxic compounds produced by plants for defense against insects and herbivores. Alkaloid compounds provide good benefits for humans because they can function as anti-diarrhea, anti-malarial, anti-diabetic, and antimicrobial. Most of the alkaloid compounds come from plants and can be found in roots, leaves, seeds, bark, and twigs (Dotto & Abihudi, 2021; Hasanuzzaman et al., 2018; Khan et al., 2019). The utilization of plants containing alkaloids requires the right concentration in medicine to avoid bad effects on the body. Phenolic compounds are secondary metabolites that have hydroxyl functional groups that are useful for humans, such as antioxidants, anticarcinogenic and antimicrobial (Olas, 2018; Roleira et al., 2015; Zeb, 2020).

CONCLUSION

The Quran is a source of knowledge that provides a lot of information about an event. The truth of the Quran as a revelation from Allah can be proven by modern science. The content of phytochemical compounds in figs is proof of God's power and compassion for humans. Allah created the fig plant full of human health benefits because the fig plant has phytochemical compounds such as flavonoids, alkaloids, and phenols.

REFERENCES

- Abe, T. (2020). Fig (*Ficus carica* L.) leaf tea suppresses allergy by acceleration disassembly of IgE-receptor complexes. *Bioscience, Biotechnology and Biochemistry*, 84(5).
 Lantanida Journal, 11(2): 192-203

<https://doi.org/10.1080/09168451.2020.1722608>

- Abrankó, L., & Szilvássy, B. (2014). Mass spectrometric profiling of flavonoid glycoconjugates possessing isomeric aglycones. *Journal of Mass Spectrometry*, 50(1). <https://doi.org/10.1002/jms.3474>
- Agati, G., Azzarello, E., Pollastri, S., & Tattini, M. (2012). Flavonoids as antioxidants in plants: Location and functional significance. In *Plant Science* (Vol. 196). <https://doi.org/10.1016/j.plantsci.2012.07.014>
- Agati, G., Brunetti, C., Fini, A., Gori, A., Guidi, L., Landi, M., Sebastiani, F., & Tattini, M. (2020). Are flavonoids effective antioxidants in plants? Twenty years of our investigation. In *Antioxidants* (Vol. 9, Issue 11). <https://doi.org/10.3390/antiox9111098>
- Ahn-Jarvis, J. H., Parihar, A., & Doseff, A. I. (2019). Dietary flavonoids for immunoregulation and cancer: Food design for targeting disease. In *Antioxidants* (Vol. 8, Issue 7). <https://doi.org/10.3390/antiox8070202>
- Ahsan, A., Khan, M., & Siddiqui, R. N. (2012). The healing power of prayer in Islam. *Indian Journal of Positive Psychology*, 3(2).
- Akhmad, S. A. (2017). The Role of Prayer in Islam for Treatment (Healing); Potency and Problem. *Jurnal Kedokteran Dan Kesehatan Indonesia*, 8(2). <https://doi.org/10.20885/jkki.vol8.iss2.art1>
- Aksoy, S. (2021). The significance of content and style and in determining Meccan-Medinan sūrahs: The case of Sūrah al-Insān. *Darulfunun Ilahiyat*, 29(1). <https://doi.org/10.26650/di.2018.29.1.0102>
- Antonio, A. S., Wiedemann, L. S. M., & Veiga Junior, V. F. (2018). The genus: Capsicum: a phytochemical review of bioactive secondary metabolites. In *RSC Advances* (Vol. 8, Issue 45). <https://doi.org/10.1039/c8ra02067a>
- Arvaniti, O. S., Samaras, Y., Gatidou, G., Thomaidis, N. S., & Stasinakis, A. S. (2019). Review on fresh and dried figs: Chemical analysis and occurrence of phytochemical compounds, antioxidant capacity and health effects. In *Food Research International* (Vol. 119). <https://doi.org/10.1016/j.foodres.2019.01.055>
- Bakoush, S. M. M., Yaacob, W. A., Adam, J., & Ibrahim, N. (2015). Phytochemical properties and cytotoxicity evaluation of the aqueous extracts from *Rafflesia cantleyi*. *AIP Conference Proceedings*, 1678. <https://doi.org/10.1063/1.4931236>
- Bougiouklis, J. N., Karachaliou, Z., Tsakos, J., Kalkanis, P., Michalakos, A., & Moustakas, N. (2020). Seasonal variation of macro-and micro-nutrients in leaves of fig (*Ficus carica* L.) under mediterranean conditions. *Agronomy Research*, 18(4). <https://doi.org/10.15159/AR.20.201>
- Bouyahya, A., Bensaid, M., Bakri, Y., & Dakka, N. (2016). Phytochemistry and Ethnopharmacology of *Ficus carica*. *International Journal of Biochemistry Research & Review*, 14(1), 1–12. <https://doi.org/10.9734/ijbcr/2016/29029>
- Chamsi-Pasha, M., & Chamsi-Pasha, H. (2021). A review of the literature on the health benefits of salat (Islamic prayer). In *Medical Journal of Malaysia* (Vol. 76, Issue 1). *Lantanida Journal*, 11(2): 192-203

- Ciumărnean, L., Milaciu, M. V., Runcan, O., Vesa, S. C., Răchisan, A. L., Negrean, V., Perné, M. G., Donca, V. I., Alexescu, T. G., Para, I., & Dogaru, G. (2020). The effects of flavonoids in cardiovascular diseases. In *Molecules* (Vol. 25, Issue 18). <https://doi.org/10.3390/molecules25184320>
- Cosme, P., Rodríguez, A. B., Espino, J., & Garrido, M. (2020). Plant phenolics: Bioavailability as a key determinant of their potential health-promoting applications. In *Antioxidants* (Vol. 9, Issue 12). <https://doi.org/10.3390/antiox9121263>
- Cuyckens, F., Rozenberg, R., De Hoffmann, E., & Claeys, M. (2001). Structure characterization of flavonoid O-diglycosides by positive and negative nano-electrospray ionization ion trap mass spectrometry. *Journal of Mass Spectrometry*, 36(11). <https://doi.org/10.1002/jms.224>
- Dotto, J. M., & Abihudi, S. A. (2021). Nutraceutical value of Carica papaya: A review. *Scientific African*, 13. <https://doi.org/10.1016/j.sciaf.2021.e00933>
- Fajar, W., & Mulyani, T. (2020). Review artikel : etnofarmakologi tanaman tin (ficus carica l.) (kajian tafsir ilmi tentang buah tin dalam al-qur'an). *Jurnal Farmagazine*, 7(1), 58. <https://doi.org/10.47653/farm.v7i1.156>
- Fardoun, M. M., Maaliki, D., Halabi, N., Iratni, R., Bitto, A., Baydoun, E., & Eid, A. H. (2020). Flavonoids in adipose tissue inflammation and atherosclerosis: One arrow, two targets. In *Clinical Science* (Vol. 134, Issue 12). <https://doi.org/10.1042/CS20200356>
- Farhan Al-Halbosi, M. M., Hasan, Z. Y. M., Mohammad, F. I., & Abdulhameed, B. A. (2020). Biological activities of iraqi fig (Ficus carica) crude ethanolic and total flavonoids extracts. *Iraqi Journal of Science*, 61(7). <https://doi.org/10.24996/ij.s.2020.61.7.9>
- Gaaliche, B., Ladhari, A., de Medeiros, A. G., Ben Mimoun, M., & Hajlaoui, M. R. (2017). Relationship between phytochemical profiles and phytotoxic properties of Tunisian fig leaf cultivars. *South African Journal of Botany*, 112. <https://doi.org/10.1016/j.sajb.2017.06.015>
- Ghasemzadeh, A., & Ghasemzadeh, N. (2011). Flavonoids and phenolic acids: Role and biochemical activity in plants and human. In *Journal of Medicinal Plant Research* (Vol. 5, Issue 31). <https://doi.org/10.5897/JMPR11.1404>
- Ghimire, P., Pandey, S., Shrestha, A. C., & Chandra Shrestha, A. (2020). A comprehensive review on phytochemical, pharmacognostical properties and pharmacological activities of Ficus lacor L. (Moraceae). ~ 96 ~ *International Journal of Herbal Medicine*, 8(5).
- Gillani, M., Iftikhar, H., Pasha, I., & Lodhi, A. (2018). Development and characterisation of fig (Ficus carica) leaves tea with special reference to hypoglycemic effect. *Pakistan Journal of Scientific and Industrial Research Series B: Biological Sciences*, 61(2). <https://doi.org/10.52763/pjsir.biol.sci.61.2.2018.78.83>
- Görgüç, A., Gençdağ, E., Okuroğlu, F., Yılmaz, F. M., Bıyık, H. H., Öztürk Köse, S., & Ersus, S. (2021). Single and combined decontamination effects of power-ultrasound, peroxyacetic acid and sodium chloride sanitizing treatments on Escherichia coli, Bacillus cereus and Penicillium expansum inoculated dried figs. *LWT*, 140. <https://doi.org/10.1016/j.lwt.2020.110844>

- Gündeşli, M. A., Kafkas, N. E., Güney, M., & Ercişli, S. (2021). Determination of phytochemicals from fresh fruits of fig (*Ficus carica* L.) at different maturity stages. *Acta Scientiarum Polonorum, Hortorum Cultus*, 20(2). <https://doi.org/10.24326/asphc.2021.2.8>
- Hasanuzzaman, M., Islam, W., & Islam, M. (2018). Phytochemical screening of *Syzygium cumini* (L.) extracts in different solvents. *Journal of Bio-Science*, 24. <https://doi.org/10.3329/jbs.v24i0.37483>
- Hssaini, L., Razouk, R., & Bouslihim, Y. (2022). Rapid Prediction of Fig Phenolic Acids and Flavonoids Using Mid-Infrared Spectroscopy Combined With Partial Least Square Regression. *Frontiers in Plant Science*, 13. <https://doi.org/10.3389/fpls.2022.782159>
- Husnaini, M., Al-Hidabi, D. A. Y., Kartika, B., Victorynie, I., & Mukhtasor, A. S. (2021). Quranic Multiple Intelligences and its Implementation in Educational Institutions. *International Journal of Asian Education*, 2(3). <https://doi.org/10.46966/ijae.v2i3.232>
- Ilyasov, I., Beloborodov, V., Antonov, D., Dubrovskaya, A., Terekhov, R., Zhevlakova, A., Saydasheva, A., Evteev, V., & Selivanova, I. (2020). Flavonoids with glutathione antioxidant synergy: Influence of free radicals inflow. *Antioxidants*, 9(8). <https://doi.org/10.3390/antiox9080695>
- Karak, P. (2019). Biological activities of flavonoids: an overview. *International Journal of Pharmaceutical Sciences and Research*, 10(4).
- Kennedy, D. O., & Wightman, E. L. (2011). Herbal extracts and phytochemicals: Plant secondary metabolites and the enhancement of human brain function. In *Advances in Nutrition* (Vol. 2, Issue 1). <https://doi.org/10.3945/an.110.000117>
- Khan, W., Subhan, S., Shams, D. F., Afridi, S. G., Ullah, R., Shahat, A. A., & Alqahtani, A. S. (2019). Antioxidant Potential, Phytochemicals Composition, and Metal Contents of *Datura alba*. *BioMed Research International*, 2019. <https://doi.org/10.1155/2019/2403718>
- Lalhmingshui, K., & Jagetia, G. C. (2018). Evaluation of the free-radical scavenging and antioxidant activities of Chilauni, *Schima wallichii* Korth in vitro. *Future Science OA*, 4(2). <https://doi.org/10.4155/fsoa-2017-0086>
- Li, Z., Yang, Y., Liu, M., Zhang, C., Shao, J., Hou, X., Tian, J., & Cui, Q. (2021). A comprehensive review on phytochemistry, bioactivities, toxicity studies, and clinical studies on *Ficus carica* Linn. leaves. In *Biomedicine and Pharmacotherapy* (Vol. 137). <https://doi.org/10.1016/j.biopha.2021.111393>
- Lim, C.-G., & A.G. Koffas, M. (2010). Bioavailability and Recent Advances in the Bioactivity of Flavonoid and Stilbene Compounds. *Current Organic Chemistry*, 14(16). <https://doi.org/10.2174/138527210792927654>
- M. Akram. (2011). Flavonoids and phenolic acids: Role and biochemical activity in plants and human. *Journal of Medicinal Plants Research*, 5(32). <https://doi.org/10.5897/jmpr11.363>
- Maaliki, D., Shaito, A. A., Pintus, G., El-Yazbi, A., & Eid, A. H. (2019). Flavonoids in hypertension: a brief review of the underlying mechanisms. In *Current Opinion in Pharmacology* (Vol. 45). <https://doi.org/10.1016/j.coph.2019.04.014>
- Mangwani, N., Singh, P. K., & Kumar, V. (2020). Medicinal plants: Adjunct treatment to Lantanida *Journal*, 11(2): 192-203

- tuberculosis chemotherapy to prevent hepatic damage. In *Journal of Ayurveda and Integrative Medicine* (Vol. 11, Issue 4). <https://doi.org/10.1016/j.jaim.2019.02.004>
- Mawa, S., Husain, K., & Jantan, I. (2013). *Ficus carica* L. (Moraceae): Phytochemistry, traditional uses and biological activities. In *Evidence-based Complementary and Alternative Medicine* (Vol. 2013). <https://doi.org/10.1155/2013/974256>
- Meity Elvina. (2020). Integrative medicine through islamic perspective in respecting pandemic covid-19. *International Journal of Islamic and Complementary Medicine*, 1(1). <https://doi.org/10.55116/ijim.v1i1.7>
- Mendoza-Castillo, V. M., Vargas-Canales, J. M., Calderón-Zavala, G., Mendoza-Castillo, M. D. C., & Santacruz-Varela, A. (2017). Intensive production systems of fig (*Ficus carica* L.) under greenhouse conditions. *Experimental Agriculture*, 53(3). <https://doi.org/10.1017/S0014479716000405>
- Mera, I. F. G., Falconí, D. E. G., & Córdova, V. M. (2019). Secondary metabolites in plants: Main classes, phytochemical analysis and pharmacological activities. In *Bionatura* (Vol. 4, Issue 4). <https://doi.org/10.21931/RB/2019.04.04.11>
- Nishad, R., & Ahmed, T. (2019). *Comparative Analysis of Antifungal Activity of Total Phenolics from Different Date Palm Cultivars Against Five Phyto Pathogenic Fungi*. <https://doi.org/10.5339/qfarc.2016.eesp2666>
- Olas, B. (2018). Berry phenolic antioxidants - implications for human health? In *Frontiers in Pharmacology* (Vol. 9, Issue MAR). <https://doi.org/10.3389/fphar.2018.00078>
- Pal, D., & Dubey, P. (2013). Flavonoids: A powerful and abundant source of antioxidants. In *International Journal of Pharmacy and Pharmaceutical Sciences* (Vol. 5, Issue 3).
- Panche, A. N., Diwan, A. D., & Chandra, S. R. (2016). Flavonoids: An overview. In *Journal of Nutritional Science* (Vol. 5). <https://doi.org/10.1017/jns.2016.41>
- Petrucelli, R., Ieri, F., Ciaccheri, L., & Bonetti, A. (2018). Polyphenolic profiling and chemometric analysis of leaves from Italian *Ficus carica* L. Varieties. Polyphenol compounds in common fig. *European Journal of Horticultural Science*, 83(2). <https://doi.org/10.17660/eJHS.2018/83.2.5>
- Rahman, M. T. (2015). Health and healing in Islam: Links and gaps with (post)modern practices. In *Bangladesh Journal of Medical Science* (Vol. 14, Issue 2). <https://doi.org/10.3329/bjms.v14i2.21808>
- Rahmasita, R., Nuryanti, S., & Supriadi, S. (2021). Analysis of Flavonoid Levels in Tin (*Ficus carica* Linn) Fruit. *Jurnal Akademika Kimia*, 10(1), 32–35. <https://doi.org/10.22487/j24775185.2021.v10.i1.pp32-35>
- Ravichandra, V. D., & Paarakh, P. M. (2011). Pharmacognostic and phytochemical investigation on leaves of *Ficus hispida*. *International Journal of Pharmacy and Pharmaceutical Sciences*, 3(2).
- Rofiq, M. A., & Istiqomah, N. (2021). The Existence of al-Aql in Quran and Its Articulation with the Text of Revelation in Islamic Law Interpretation. *International Conference on Law, Technology, Spirituality and Society (ICOLESS)*, 1.

- Roleira, F. M. F., Tavares-Da-Silva, E. J., Varela, C. L., Costa, S. C., Silva, T., Garrido, J., & Borges, F. (2015). Plant derived and dietary phenolic antioxidants: Anticancer properties. In *Food Chemistry* (Vol. 183). <https://doi.org/10.1016/j.foodchem.2015.03.039>
- Rusdi, M., & Omar, M. A. (2019). Contribution of Animals and Plants in Prospering Lives According to Al-Quran Sumbangan Haiwan Dan Tumbuh-Tumbuhan Dalam Mensejahterakan Kehidupan Menurut Al-Quran. *Journal of Techno Social*, 11(1).
- Saad Najam, K., Sannam Khan, R., Waheed, A., & Hassan, R. (2019). Impact of Islamic practices on the mental health of Muslims Introduction and Background. *International Dental & Medical Journal of Advanced Research* •, 5(July).
- Safeena, M., & Kalinga, J. (2020). Qualitative and quantitative screening of secondary metabolites in selected medicinal plants of Sri Lanka. ~ 94 ~ *Journal of Medicinal Plants Studies*, 8(5).
- Salehi, B., Prakash Mishra, A., Nigam, M., Karazhan, N., Shukla, I., Kiełtyka-Dadasiewicz, A., Sawicka, B., Głowacka, A., Abu-Darwish, M. S., Hussein Tarawneh, A., Gadetskaya, A. V., Cabral, C., Salgueiro, L., Victoriano, M., Martorell, M., Docea, A. O., Abdolshahi, A., Calina, D., & Sharifi-Rad, J. (2021). Ficus plants: State of the art from a phytochemical, pharmacological, and toxicological perspective. In *Phytotherapy Research* (Vol. 35, Issue 3). <https://doi.org/10.1002/ptr.6884>
- Shahrajabian, M. H., Sun, W., & Cheng, Q. (2021). A review of chemical constituents, traditional and modern pharmacology of fig (*Ficus carica* L.), a super fruit with medical astonishing characteristics. *Polish Journal of Agronomy*, 44.
- Shamsi, Y., Ansari, S., Nikhat, S., & Professor, A. (2020). Ficus carica l.: a panacea of nutritional and medicinal benefits. *CELLMED*, 10(1).
- Shi, Y., Mon, A. M., Fu, Y., Zhang, Y., Wang, C., Yang, X., & Wang, Y. (2018). The genus Ficus (Moraceae) used in diet: Its plant diversity, distribution, traditional uses and ethnopharmacological importance. In *Journal of Ethnopharmacology* (Vol. 226). <https://doi.org/10.1016/j.jep.2018.07.027>
- Slika, H., Mansour, H., Wehbe, N., Nasser, S. A., Iratni, R., Nasrallah, G., Shaito, A., Ghaddar, T., Kobeissy, F., & Eid, A. H. (2022). Therapeutic potential of flavonoids in cancer: ROS-mediated mechanisms. In *Biomedicine and Pharmacotherapy* (Vol. 146). <https://doi.org/10.1016/j.biopha.2021.112442>
- Suttisansanee, U., Pitchakarn, P., Ting, P., Inthachai, W., Thiyajai, P., Rodthayoy, D., Karinchai, J., Chanatarasuan, B., Nuchuchua, O., & Temviriyankul, P. (2021). Health-promoting bioactivity and in vivo genotoxicity evaluation of a hemiepiphyte fig, *Ficus dubia*. *Food Science and Nutrition*, 9(4). <https://doi.org/10.1002/fsn3.2205>
- Tahreem Fatima, & Aqsa Tasgheer. (2021). Psychological Nurturing of Adolescents through Prophetic Stories of Quran. *International Research Journal on Islamic Studies (IRJIS)*, 3(02). <https://doi.org/10.54262/irjis.03.02.e03>
- Veberic, R., Colaric, M., & Stampar, F. (2008). Phenolic acids and flavonoids of fig fruit (*Ficus carica* L.) in the northern Mediterranean region. *Food Chemistry*, 106(1). <https://doi.org/10.1016/j.foodchem.2007.05.061>

- Vora, D. J. D., & Vora, D. D. (2017). Biochemical, Organoleptic Assessment of Fig (*Ficus Carica*). *IOSR Journal of Biotechnology and Biochemistry*, 03(02). <https://doi.org/10.9790/264x-030295104>
- Walid, A., Winarni, E. W., Yanti, F. A., Firdaus, M. L., Suherman, S., & Zulkarnain, Z. (2022). Ethnoscience-Based Module: Biodiversity Materials in Lembak Tribe. *JTK (Jurnal Tadris Kimiya)*, 7(2), 300–308. <https://doi.org/10.15575/jtk.v7i2.19955>
- Wheeler, B. (2021). Quran as scripture in classical muslim scholarship. *Religions*, 12(11). <https://doi.org/10.3390/rel12111013>
- Wilding, J., Fernando, K., Milne, N., Evans, M., Ali, A., Bain, S., Hicks, D., James, J., Newland-Jones, P., Patel, D., & Viljoen, A. (2018). SGLT2 Inhibitors in Type 2 Diabetes Management: Key Evidence and Implications for Clinical Practice. In *Diabetes Therapy* (Vol. 9, Issue 5). <https://doi.org/10.1007/s13300-018-0471-8>
- Yashin, A., Yashin, Y., Xia, X., & Nemzer, B. (2017). Antioxidant activity of spices and their impact on human health: A review. In *Antioxidants* (Vol. 6, Issue 3). <https://doi.org/10.3390/antiox6030070>
- Zeb, A. (2020). Concept, mechanism, and applications of phenolic antioxidants in foods. In *Journal of Food Biochemistry* (Vol. 44, Issue 9). <https://doi.org/10.1111/jfbc.13394>
- Zulkarnain. (2022). Perilaku senyawa flavonoid tanaman tin (*Ficus Carica* L) dalam Al-Qur'an. *Jurnal Edukasia Multikultura*, 4(2).
- Zulkarnain, & Suprpto. (2022). Chemical compounds of honey in the qur'an. *Lantanida Journal*, 10(2).
- Zulkifli Yusoff. (2015). Makki dan Madani serta Beberapa Diskusi Tentangnya. *Jurnal Usuluddin*, 2(2).