

Islam and science's perspectives on the endemic plant *Dillenia serrata* from South Sulawesi

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Abstract: One of Sulawesi's endemic plants, *Dillenia serrata*, has numerous uses in the culinary, furniture, and health sectors. Society frequently ignores the lack of knowledge on the use of endemic plants. This study aims to provide the public with information on the endemic plant, *D. serrata*, from an Islamic and scientific perspective, thus, it can be digested and used as effectively as possible in the future. The approach taken was qualitative, and it involved gathering a variety of pertinent facts and figures about the endemic Sulawesi *D. serrata* plant through library research. The findings of the studies show that there are several verses in QS Al-An'am verse 99, QS Ar-R'ad verse 4, QS Asy Syu'ara verse 7, and QS Al-An'am verse 141 that demonstrate differences as well as similarities in terms of shape and taste as well as related to the various advantages possessed by the *D. serrata* plant. In addition, it cautions scientists against breeding and conservation activities, one of which is sharing genetic information from these indigenous species.

Keywords: *Dillenia serrata*, endemic plant, indigenous species, Islam and science, plant conservation

Abstrak: Salah satu tanaman endemik Sulawesi, *Dillenia serrata*, memiliki banyak kegunaan dalam bidang kuliner, furnitur, dan kesehatan. Masyarakat seringkali mengabaikan akibat kurangnya pengetahuan mengenai pemanfaatan tanaman endemik. Tujuan dari penelitian ini adalah untuk memberikan informasi kepada masyarakat tentang tumbuhan endemik *D. serrata* dari sudut pandang Islam dan sains agar dapat dicerna dan dimanfaatkan seefektif mungkin di masa yang akan datang. Pendekatan yang digunakan adalah kualitatif, yaitu dengan mengumpulkan berbagai fakta dan gambaran terkait tanaman endemik Sulawesi *D. serrata* melalui penelitian kepustakaan. Temuan penelitian menunjukkan bahwa terdapat beberapa ayat dalam QS Al-An'am ayat 99, QS Ar-R'ad ayat 4, QS Asy Syu'ara ayat 7, dan QS Al-An'am ayat 141 yang menunjukkan perbedaan serta persamaan dari segi bentuk dan rasa serta terkait berbagai keunggulan yang dimiliki oleh tumbuhan *D. serrata*. Selain itu, juga memperingatkan para ilmuwan terhadap kegiatan pemuliaan dan konservasi, salah satunya dengan berbagi informasi genetik dari spesies asli tersebut.

Kata Kunci: *Dillenia serrata*, Islam dan sains, konservasi tumbuhan, spesies asli, tumbuhan endemik

Introduction

Due to its geographic location on the equator, Indonesia is an archipelagic nation with a variety of climates. The country is also recognized as one of the megabiodiversity countries (Kominfo, 2018) according to its abundance of plants and high level of plant endemism as a result of its location between two continents and two oceans (Abywijaya et al., 2014). There are endemic plant species among these, totaling 20,000 species, or around 40% of all flowering plant species (Kusmana & Hikmat, 2015).

Plant species that are endemic to a region are those that cannot be found elsewhere. Due to their increased susceptibility to environmental changes, endemic plants are more likely to go extinct. As a result, indigenous plants must be preserved within a preservation framework in order to prevent their extinction (Rinandio et al., 2022). *D. serrata*, often known as Dengen by the inhabitants of South Sulawesi, is one of the indigenous plants in Indonesia, particularly on Sulawesi Island (Illing et al., 2017).

Numerous passages in the Qur'an refer to plants, or flora as it is known in biology. The Qur'an uses the word al-nabat, which is translated as "flora," nine times and the word faakihah, which is translated as "fruit," eleven times (Zulfiakar, 2018). According to the Islamic perspective, the study of plants, or botany, explains how Allah SWT used his supernatural power to create plants and their life processes, as stated in QS Fusshilat verse 39 (Department of Religion of the Republic of Indonesia, 2012).

A member of the Dilleniaceae family, *D. serrata* is an endemic plant found only in Sulawesi, particularly in the provinces of South Sulawesi and Central Sulawesi. These plants typically resemble

shrubs or trees, and the fruit they produce has a tart flavor. even though the public finds it less appealing due to the taste. However, *D. serrata* offers a number of advantages, including the ability to treat a number of ailments like fever, wounds, inflammation, canker sores, and blood-vomiting. *D. serrata* is frequently added to a variety of processed food items, including jam, chips, and desserts. Additionally, it is employed in the production of furniture items and other items (Wibawa & Lugrayasa, 2021).

Due to the indigenous nature of the *D. serrata* plant, it has a wide range of therapeutic properties and advantages. It turns out that many people in the neighborhood are still unaware of the benefits of these plants and frequently misuse them. In order to teach and educate the public about the endemic plant, *D. serrata*, from an Islamic and scientific standpoint, this literature-based research was conducted. This will enable it to be processed and used as effectively as possible in the future.

Materials and Methods

The Sulawesi endemic *D. serrata* plant was studied utilizing a qualitative methodology based on library research, which involved gathering a variety of pertinent facts, data from Nash, books and other scientific studies from journals. Additionally, the textual analysis of the literature was used for data analysis in this study by textually examining various literature and research pertinent to the endemic *D. serrata* plant in Sulawesi (Zed, 2014).

Result and Discussion

A. Islamic Perspective on *Dillenia serrata* Endemic to Sulawesi

In the Al-Qur'an it is implicitly explained about endemic plants as follows:

1. QS Al-An'am/6: 99

وَهُوَ الَّذِي أَنْزَلَ مِنَ السَّمَاءِ مَاءً فَأَخْرَجْنَا بِهِ نَبَاتَ كُلِّ شَيْءٍ فَأَخْرَجْنَا مِنْهُ خَضِرًا نُخْرَجُ مِنْهُ حَبًّا مُمْتَرًا كَبَابًا وَمِنَ النَّخْلِ مِنْ طَلْعِهَا قِنْوَانٌ دَانِيَةٌ وَجَنَّاتٍ مِنْ أَعْنَابٍ وَالزَّيْتُونَ وَالرُّمَّانَ مُشْتَبِهًا وَغَيْرَ مُتَشَابِهٍ انظُرُوا إِلَى ثَمَرِهِ إِذَا أَثْمَرَ وَيَنْعِهِ إِنَّ فِي ذَلِكَ لَآيَاتٍ لِقَوْمٍ يُؤْمِنُونَ

Meaning:

“And He is the One Who sends down rain from the sky—causing all kinds of plants to grow—producing green stalks from which We bring forth clustered grain. And from palm trees come clusters of dates hanging within reach. “There are” also gardens of grapevines, olives, and pomegranates, similar ‘in shape’ but dissimilar ‘in taste’. Look at their fruit as it yields and ripens! Indeed, in these are signs for people who believe” (QS Al-An'am/6: 99).

Based on the interpretation of al-Misbah written by Quraish Shihab, he explains that the verse above is one proof of Allah's power in creating what is around humans, namely in the form of various kinds of plants that Allah grows on the face of the earth by sending rain, so that from the rain plants grow. The green color is caused by the chlorophyll content in the leaves, from this plant Allah produces fruit that has a similar shape but different uses, taste and aroma. In addition, this paragraph also explains the important role of rainwater in growing plants as the only clean water for the soil. In this verse, four types of fruit are mentioned sequentially, namely dates, grapes, olives and pomegranates, each of which has different features and benefits, this can be attributed to the different contents of each fruit. The four fruits that have been discussed are examples of additional fruits that God made, each with unique advantages. Allah underlines at the conclusion of the passage that those who believe in Him are the only ones who benefit from the manifestations of His power; else, the information gained would be useless (Shihab, 2010). Meanwhile, according to Al-Qurthubi's interpretation, the words *musytabihan*, which implies similar, and *wa gaira mutasyabih*, which means dissimilarity in terms of taste, mean different things. This is caused by a plant called *Dillenia serrata*, whose fruit resembles an orange (Al-Hifnawi, 2010).

2. QS Ar-R'ad/13: 4

وَفِي الْأَرْضِ قِطْعٌ مُتَجَارِتٌ وَجَنَّاتٌ مِنْ أَعْنَابٍ وَزَرْعٌ وَنَخِيلٌ صِنَوَانٌ وَغَيْرُ صِنَوَانٍ يُسْقَى بِمَاءٍ وَاجِدٍ وَنُفِصِلُ بَعْضَهَا عَلَى بَعْضٍ فِي الْأُكُلِ إِنَّ فِي ذَلِكَ لَآيَاتٍ لِقَوْمٍ يَعْقِلُونَ

Meaning:

“And on the earth there are ‘different’ neighbouring tracts, gardens of grapevines, ‘various’ crops, palm trees—some stemming from the same root, others standing alone. They are all irrigated with the same water, yet We make some taste better than others. Surely in this are signs for those who understand” (QS Ar-R’ad/13: 4).

A portion of the verse ba'dhaha 'ala ba'din fil ukuli, which refers to favoring one plant over another, is found in QS Ar-Rad verse 4. According to Jalalain's reading of the poem, it can be interpreted as ukuli and ukli, which signifies that some things have a sweet flavor and some things have a sour taste (Al-Mahalli, 2008). This has a connection to the tart *D. serrata* fruit. Meanwhile, according to Al-Qurthubi's interpretation, the words musytabihan, which implies similar, and wa gaira mutasyabih, which means dissimilarity in terms of taste, mean different things. This is caused by a plant called *D. serrata*, whose fruit resembles an orange (Al-Hifnawi, 2010).

3. QS Luqman/31: 10

خَلَقَ السَّمَوَاتِ بِغَيْرِ عَمَدٍ تَرَوْنَهَا وَالْأَرْضِ رَوَاسِي أَنْ تُمِيدَ بِكُمْ وَبَثَّ فِيهَا مِنْ كُلِّ دَابَّةٍ وَأَنْزَلْنَا مِنَ السَّمَاءِ مَاءً فَأَنْبَتْنَا فِيهَا مِنْ كُلِّ زَوْجٍ كَرِيمٍ

Meaning:

“He created the heavens without pillars—as you can see—and placed firm mountains upon the earth so it does not shake with you, and scattered throughout it all types of creatures. And We send down rain from the sky, causing every type of fine plant to grow on earth” (QS Luqman/31: 10).

All of the many plant species that God created on earth serve a variety of purposes. According to Fathul Qadir's reading, the verse is وَأَنْزَلْنَا مِنَ السَّمَاءِ مَاءً فَأَنْبَتْنَا فِيهَا مِنْ كُلِّ زَوْجٍ كَرِيمٍ that when God delivers rain, He also uses it to develop a variety of beneficial plants. The word كَرِيمٍ (good) is used to describe it because of its beauty and numerous advantages (Asy-Syaukani, 2012).

There is a need to protect endemic plants like *D. serrata* since they have many advantages. These plants are used by the local population as medicine for fruit, leaves, bark, and wood. Several studies have demonstrated the activity of the components from this plant's bark that have the antioxidant ability to be turned into herbal remedies and are able to trap free radicals (Sabandar et al., 2020). The dengen fruit also includes flavonoids, which have been shown in studies to have antioxidant, antiviral, antibacterial, and anticancer properties (Illing et al., 2017). This plant can be utilized for furniture and other household items in addition to being used as medicine (Wibawa et al., 2021).

4. QS Asy Syu'ara/26: 7

أَوَلَمْ يَرَوْا إِلَى الْأَرْضِ كَمْ أَنْبَتْنَا فِيهَا مِنْ كُلِّ زَوْجٍ كَرِيمٍ

Meaning:

“Have they failed to look at the earth, ‘to see’ how many types of fine plants We have caused to grow in it?” (QS Asy Syu'ara/26: 7).

In His Word, Allah explains that plant diversity is beneficial as a source of food, energy, and medicine and is crucial to the existence of all life on Earth in QS Asy Syu'ara verse 7. According to this verse from the Hidayatul Insan bi Tafsiril Qur'an, only Allah, the Almighty, has the power to cause plants to grow and has various advantages that can be used by mankind as food and medicine.

5. QS Al-An'am/6:141

Dillenia serrata, an endemic plant found only in Sulawesi, is one example of a plant with several advantages. According to what Allah stated in QS Al-An'am/6: 141:

وَهُوَ الَّذِي أَنْشَأَ جَنَّاتٍ مَعْرُوشَاتٍ وَغَيْرَ مَعْرُوشَاتٍ وَالنَّخْلَ وَالزَّرْعَ مُخْتَلِفًا أَكْلُهُ وَالزَّيْتُونَ وَالرُّمَانَ مُتَشَابِهًا وَغَيْرَ مُتَشَابِهٍ كُلُوا مِنْ ثَمَرِهِ إِذَا أَثْمَرَ وَآتُوا حَقَّهُ يَوْمَ حَصَادِهِ وَلَا تُسْرِفُوا إِنَّهُ لَا يُحِبُّ الْمُسْرِفِينَ ١٤١

Meaning:

"He is the One Who produces gardens—both cultivated and wild¹—and palm trees, crops of different flavours, olives, and pomegranates—similar 'in shape', but dissimilar 'in taste'. Eat of the fruit they bear and pay the dues at harvest, but do not waste. Surely He does not like the wasteful" (QS Al-An'am/6: 141).

In his explanation of Al-Misbah, Shihab claimed that QS Al-An'am/6: 141 describes the creation of many species of plants that bear fruits with different sizes, hues, flavors, and fragrances, including palm trees, olives, and pomegranates. Even though it is watered with the same water and grows on the ground. There is a command to pay zakat from the fruits of certain plants in addition to the yield from these plants being edible. Do not, however, consume these fruits in excess as this might be harmful to your health, put you in risk, and lessen the rights of the poor. Allah doesn't command His slaves to refrain from going overboard (Shihab, 2011). Additionally, according to a scientific interpretation, the verse clarifies the variations in flavor that can be found in different kinds of fruits. This variation is solely due to the metabolite content, which is produced through each plant's DNA and gives the fruit its own characteristics and distinct flavor (Kementerian Agama RI, 2011).

B. Science perspective on *Dillenia serrata* Endemic to Sulawesi

From a scientific standpoint, endemic plants require special attention, and this focus includes carrying out conservation activities that can both enhance the amount of these endemic plants and avoid their extinction (Samedi, 2015). Due to environmental degradation, there may be a loss of endemic plants in the development region as a result of the issue of large-scale nickel mine development on Sulawesi Island, which is the habitat of the endemic plant *D. serrata* (Ginting, 2019). A series of DNA barcoding studies are being conducted as one of the attempts and methods to protect the endangered plant *D. serrata*.

Conservation and DNA barcoding-based research are closely related. This is due to the fact that the DNA barcoding approach can assist in monitoring diverse species of endemic or threatened plants and animals so they can be safeguarded. This is accomplished by supplying genetic information about endemic plants discovered in accordance with the DNA barcoding principle, which entails identifying species through brief DNA sequences known as "barcodes." These findings will be contrasted with genetic information for diverse plant species that has been gathered on the Genbank website by earlier researchers. In this situation, DNA barcoding can offer more comprehensive information on different kinds of indigenous plants found all over the world (Sheth & Thaker, 2017).

A study explaining that the *D. serrata* plant is found in Luwu Regency, which consists of three different locations in Luwu, was extracted and amplified using molecular markers, and carried out sequencing to obtain genetic data from the *D. serrata* plant, which was conducted by Authors and team (Mutiarra, 2022; Rahman, 2022).

Conclusion

Based on the discussion that has been done, it can be said that the *D. serrata* plant has an endemic status, is different in stature and taste from other plants, and has many advantages. Its fruit is edible for both human and animal survival, and regardless of what it contains, can treat a variety of diseases. Due to the benefits these indigenous plants offer, efforts must be made to ensure their maintenance and prevention of extinction. This can be done by breeding these plants or by supplying genetic information about them through DNA barcoding.

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