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The Peculiarities of the Mention of Mosquitoes in the Qur'an from the Perspective of Tafsir Al-Azhar

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Abstract

Objective: This study aims to analyze the mention of mosquitoes in QS. Al-Baqarah verse 26 through Tafsir Al-Azhar by Buya Hamka, and explores the relevance of the symbolism to modern scientific knowledge. **Theoretical framework:** This study combines two approaches: classical interpretations, especially the Al-Azhar Interpretation, which interprets mosquitoes as a symbol of Allah's greatness, and scientific approaches that highlight biology, ecology, and the role of mosquitoes in public health. **Literature review:** The literature review includes Al-Azhar's interpretation of symbolism in the Qur'an as well as scientific literature on the biology and ecological role of mosquitoes, including their impact on health as a vector of disease. **Method:** Qualitative method is used with a literature study approach. Data were obtained from the analysis of the text of the Qur'an, Tafsir Al-Azhar, and related scientific literature. **Results:** The study found that Hamka views mosquitoes as a symbol of God's greatness and as a medium of spiritual education. Scientifically, mosquitoes have complex biological structures and play an important role in ecosystems and public health. **Implications:** This research connects revelation and science, enriching understanding of the role of God's creation, both from a spiritual and scientific perspective, and providing moral lessons about humility. **Novelty:** This research integrates the interpretation of the Qur'an with modern science, demonstrates the relevance between religious symbolism and scientific phenomena, and opens up new insights into understanding the relationship between revelation and human knowledge.

Keywords: mosquito, amtsal or parable, tafsir al-azhar, surah al-baqarah, hamka.

INTRODUCTION

The Qur'an, as the holy book of Muslims, not only functions as a guide for worship and morals, but also presents various cosmological images that invite humans to pay attention to the signs of Allah's greatness through His creatures. One of the Qur'an's approaches to conveying divine messages is the use of parables (amtsāl), which often involve minor elements in everyday life. In Surah Al-Baqarah verse 26, Allah explicitly mentions a mosquito as an example of a parable that should not be underestimated. The mention of this small creature provides a profound lesson about the vastness of God's knowledge, the wisdom in creation, and the challenge for humans to contemplate the smallest structure of life [1].

Buya Hamka's Tafsir Al-Azhar provides a distinctive perspective in understanding the verse. Hamka emphasized that the Qur'an deliberately mentions mosquitoes to show that the size or size of a creature is not a measure of glory or humiliation, but rather a lesson contained in the creation. Through a communicative and socially nuanced style of language, Hamka describes how a simple-looking mosquito actually has a very complex biological system, ranging from the ability to detect human body heat to the structure of its antenna and suction device. The existence of this small creature is a symbol that God's power encompasses all the details of life, even in creation that is often underestimated by humans [2].

In the context of the development of modern science, the study of mosquitoes is increasingly interesting because advances in biology, entomology, and epidemiology show how extraordinary the structure and life mechanisms of these small insects are. Thus, when the Qur'an mentions mosquitoes as a parable, it is not only a rhetorical symbol, but also an entrance to understanding the relationship between revelation and science. Combining classical-modern interpretations, such as Tafsir Al-Azhar, with today's scientific findings can enrich readers' understanding of theological and scientific meanings at the same time. Therefore, this research is important to examine more deeply how mosquitoes are positioned in the Qur'an as a symbol of the greatness of Allah, as well as how it is interpreted by Buya Hamka in Tafsir Al-Azhar [3].

From a research implication perspective, this study contributes to strengthening an integrative paradigm between Islamic exegesis and contemporary scientific knowledge. By analyzing the mention of mosquitoes through both tafsir and scientific lenses, the research demonstrates that Qur'anic parables are not merely theological metaphors detached from empirical reality, but meaningful signs that encourage reflection on the complexity of creation. This implication is significant for Qur'anic studies, as it challenges the dichotomy between religious knowledge and science, showing that classical interpretations can remain relevant and dialogical in the context of modern scientific developments. The study also implies that tafsir can function as a medium of scientific literacy, guiding readers to appreciate natural phenomena as part of divine signs rather than viewing science as contradictory to revelation [4].

In the educational context, the findings of this research have implications for Islamic pedagogy. Hamka's interpretation of mosquitoes as a symbol of humility and divine wisdom can be used as an effective teaching tool to cultivate critical thinking, spiritual awareness, and ethical reflection among students. The mosquito, despite its small size, represents the complexity of life and the limitations of human knowledge. This perspective encourages learners to adopt an attitude of intellectual humility, recognizing that scientific advancement should lead to deeper awareness of responsibility, ethics, and reverence for creation. Thus, this study supports the integration of tafsir-based values into science education, especially in Muslim societies [5].

Furthermore, the research has implications for contemporary religious discourse. In an era where religious texts are sometimes criticized as irrelevant to modern scientific understanding, this study shows that the Qur'an's use of parables remains meaningful and intellectually stimulating. The symbolic mention of mosquitoes highlights themes of public health, ecology, and biological interdependence, which are highly relevant today. This reinforces the idea that Qur'anic discourse can inspire moral reflection on human interaction with nature, environmental responsibility, and the ethical dimensions of scientific progress [5].

In terms of novelty and originality, this study offers a distinctive contribution by focusing specifically on the symbolism of mosquitoes in QS. Al-Baqarah verse 26 through the lens of Tafsir Al-Azhar while systematically relating it to modern scientific perspectives. Unlike previous studies that either concentrate solely on theological symbolism or purely on scientific explanations, this research bridges both domains in a balanced and dialogical

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manner. The originality lies in positioning Hamka's interpretation as a meeting point between classical Islamic thought and contemporary science, demonstrating its enduring relevance. By treating the mosquito not only as a rhetorical device but also as a scientifically meaningful sign, this study opens new avenues for interdisciplinary research that connects tafsir, natural sciences, and ethical reflection, enriching the broader discourse on the relationship between revelation and human knowledge [5].

LITERATURE REVIEW

The study of Qur'anic parables (amtsāl) has long occupied an important position in Islamic scholarship, as parables function as a communicative strategy to convey abstract theological truths through concrete and familiar imagery. Classical and modern Qur'anic exegetes have emphasized that parables are intended to stimulate reflection, deepen understanding, and challenge human arrogance by directing attention to seemingly insignificant aspects of creation. Within this tradition, the mention of small creatures in the Qur'an is understood as a deliberate rhetorical choice that highlights the comprehensiveness of divine knowledge and power [6].

One of the unique examples of Qur'anic parables is the mention of the mosquito in Surah Al-Baqarah verse 26. In the literature on tafsir, this verse is frequently discussed in relation to the divine wisdom behind using a small and often despised creature as a symbol. Scholars argue that the parable confronts human tendencies to judge value based on size, strength, or prestige, and instead redirects attention toward meaning, purpose, and moral lessons embedded in creation. The mosquito thus becomes a symbol that challenges anthropocentric perspectives and invites humility before divine creativity [6].

Within the corpus of modern Indonesian tafsir, Tafsir Al-Azhar by Buya Hamka occupies a distinctive position. Hamka's interpretative approach is characterized by its contextual sensitivity, communicative language, and engagement with social realities. His interpretation of the mosquito parable emphasizes that no creation of God is trivial or meaningless. According to Hamka, the Qur'an intentionally mentions the mosquito to demonstrate that divine wisdom is manifested even in creatures that humans often ignore or despise. This perspective reflects Hamka's broader methodological orientation, which seeks to make the Qur'an relevant to everyday human experience while preserving its theological depth [6].

The literature also indicates that Hamka's tafsir often resonates with scientific observations, even though it is not explicitly framed as a scientific interpretation. His reflections on the complexity of the mosquito's structure, behavior, and survival mechanisms illustrate an openness to scientific reasoning as a means of appreciating divine signs. This approach situates Tafsir Al-Azhar within a broader trend of modern tafsir that seeks harmony rather than conflict between revelation and scientific knowledge. On the scientific side, studies on mosquitoes emphasize their biological complexity, ecological roles, and impact on public health. Mosquitoes are recognized as creatures with highly specialized sensory systems, adaptive behaviors, and significant influence on ecosystems. Although they are often associated with disease transmission, scientific discourse also acknowledges their role in ecological balance. When viewed alongside Qur'anic symbolism, this scientific understanding reinforces the idea that even the smallest creatures carry profound significance [7].

Recent interdisciplinary discussions increasingly highlight the potential for dialogue between religious interpretation and science. Rather than positioning revelation and science as opposing domains, contemporary scholarship explores how scriptural symbolism can inspire ethical reflection on scientific knowledge. In this context, the mosquito serves as a meaningful intersection between tafsir and science, illustrating how Qur'anic parables can remain relevant in addressing modern intellectual and moral concerns. This literature review

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thus establishes a conceptual foundation for examining the mosquito as both a spiritual symbol and a scientifically significant creature within Qur'anic interpretation [7].

METHODOLOGY

This study employs a qualitative research design using a library research approach to examine the meaning and significance of the parable of mosquitoes in QS Al-Baqarah verse 26 as interpreted in Tafsir Al-Azhar by Buya Hamka. A qualitative method is considered appropriate because the research focuses on interpreting texts, symbols, and meanings rather than measuring variables or testing hypotheses. This approach allows for an in-depth exploration of Qur'anic symbolism and its relevance to both theological understanding and contemporary scientific perspectives.

The primary data sources of this research consist of the Qur'anic text, specifically QS Al-Baqarah verse 26, and Buya Hamka's Tafsir Al-Azhar. These primary texts provide the foundational interpretive framework for analyzing the symbolic meaning of mosquitoes within the Qur'anic discourse. Secondary data sources include academic journal articles, theses, and scientific literature related to the biological characteristics, ecological roles, and public health implications of mosquitoes. These secondary sources are used to contextualize the Qur'anic interpretation within contemporary scientific knowledge and to enrich the interdisciplinary analysis.

Data collection was conducted through documentation study. This process involved systematic reading, careful examination, and detailed note-taking of relevant sections from the primary and secondary sources. Particular attention was given to passages that discuss the concept of parables (amtsāl), Hamka's interpretive methodology, and descriptions of mosquito biology and behavior. This method ensured that the collected data were comprehensive and directly related to the research objectives.

Data analysis was carried out through several interrelated analytical techniques. First, content analysis was used to identify key concepts, themes, and symbolic elements within QS Al-Baqarah verse 26 and Tafsir Al-Azhar. This step focused on extracting Hamka's views on the theological and moral significance of mosquitoes as a Qur'anic parable. Second, thematic analysis was applied to group recurring ideas and patterns, such as the notions of divine wisdom, humility, and the educational function of small creatures in the Qur'an. This thematic grouping enabled a structured understanding of how meaning is constructed within the tafsir.

In addition, analytical description was employed to connect the interpretive findings with modern scientific perspectives on mosquitoes. Rather than attempting to prove scientific facts through scripture, this stage aimed to explore conceptual relevance and resonance between Qur'anic symbolism and scientific understanding. The analysis emphasizes how the complexity of mosquito biology, as discussed in scientific literature, aligns with Hamka's portrayal of mosquitoes as evidence of divine greatness. Finally, the integration of interpretive and scientific insights allowed the construction of a comprehensive and coherent explanation of the peculiarities of mosquitoes from the perspective of tafsir. By combining textual interpretation with thematic and descriptive analysis, this methodology supports a holistic understanding of the Qur'anic parable and highlights its continued relevance in bridging religious insight and modern scientific awareness.

RESULTS AND DISCUSSION

Biography of Buya Hamka

Buya Hamka is an Indonesian scholar, writer, scholar, and national figure who was born in Maninjau, West Sumatra, on February 17, 1908. His full name is Haji Abdul Malik Karim Amrullah. He grew up in a strong religious environment; his father, Sheikh Abdul Karim Amrullah, was a pioneer of the Islamic reform movement in Minangkabau. Hamka pursued

non-formal education through halaqah and knowledge assemblies, but later became known as a productive self-taught intellectual [8]. Throughout his life, he produced monumental works in various fields, such as *Tafsir Al-Azhar*, *Modern Sufism*, *Philosophy of Life*, to literary works. In 1977, he was awarded the title of Doctor Honoris Causa by Universiti Kebangsaan Malaysia for his contributions to Islamic thought and Malay culture. His personality made Hamka an important figure in the intellectual treasures of Islam of the archipelago, whose views are still referred to in the study of interpretation to this day [9].

In *Tafsir Al-Azhar*, Buya Hamka made many methodological and substantive contributions to the understanding of Qur'anic verses. The interpretation is classified as tafsir *bil-ra'yi* with patterns *Adab al-Ijtima'i*, which is an approach that emphasizes the moral, social, and humanitarian relevance of the Qur'anic verses to modern life [10]. One of the objects of his study is small creatures, including mosquitoes, which the Qur'an uses as a parable to arouse the human intellect. Mosquitoes that far exceed the human population and have complex biological structures are called Allah in QS. Al-Baqarah verse 26 as an example that no creature of the slightest is created without a purpose [11].

Buya Hamka emphasized that the mention of mosquitoes in the verse is a form of intellectual challenge for humans: Allah shows that even small creatures contain signs of His greatness. Believers will learn from the creation of the tiny organism, while the unbelievers question why God would make a parable with something trivial [12]. Hamka explained that the attitude of underestimating small creations shows the inability of humans to understand the wisdom of God, because in mosquitoes, there are more delicate nervous systems, respiratory apparatus, reproductive mechanisms, and adaptability than humans can design. Thus, Hamka's interpretation of QS. Al-Baqarah verse 26 not only affirms the theological message of the greatness of Allah, but is also in line with the perspective of modern science, which shows that mosquitoes are organisms with extraordinary biological and ecological details [13].

Tafsir Al-Azhar

Tafsir Al-Azhar is an important work of a great Indonesian scholar. Initially, this tafsir came from a collection of Hamka's lectures in 1959–1960, and was later named *Al-Azhar* by Shaykh Mahmud Syalthuth [14]. This interpretation uses the *tahlīlī*, that is, interpreting the verses of the Qur'an in the order of the mushaf, starting from Surah Al-Fātihah to Surah An-Nās. In terms of its type, *Tafsir Al-Azhar* includes the category of interpretation *bil-ma'tsūr* At once *Bi Al-Ra'yi*, while the pattern of interpretation is characterized by *adab ijtimā'i*. Hamka himself is a great figure who is widely known, not only as a scholar but also as an influential writer and thinker. Throughout his life, he wrote many works that are still studied today and made great contributions to the development of science. In his interpretation, he also highlights the small creatures such as mosquitoes mentioned in the Qur'an, revealing the peculiarities and wisdom behind their creation as well as their relevance to modern science [15].

Verses and Translations

The text of the Qur'an verse used in this article is Surah al-Baqarah verse 26 which reads:

اِنَّ اللّٰهَ لَا يَسْتَحْيٖٓ اَنْ يَّضْرِبَ مَثَلًا مَّا بَعُوْضَةً فَمَا فَوْقَهَاۗ فَاَمَّا الَّذِيْنَ اٰمَنُوْا فَيَعْلَمُوْنَ اَنَّهُ الْحَقُّ مِنْ رَّبِّهِمْۚ وَاَمَّا الَّذِيْنَ كَفَرُوْا فَيَقُوْلُوْنَ مَاذَآ اَرَادَ اللّٰهُ بِهٰذَا مَثَلًاۘ يُضِلُّ بِهٖ كَثِيْرًا وَّيَهْدِيْ بِهٖ كَثِيْرًاۗ وَمَا يُضِلُّ بِهٖٓ اِلَّا الْفٰسِقِيْنَۙ

"Indeed, Allah does not hesitate to make the parable of a mosquito or something smaller than that. As for the believers, they know that it is the truth of their Lord. But the disbelievers said, "What does Allah mean by this parable?" With that (parable) many people He has misled. With that, too, many people were instructed by Him. However, He does not lead anyone astray with it, except the wicked," (Qur'an Al-Baqarah 2:26).

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Asbab an-nuzul

In Qs. Al-Baqarah verse 26 discusses the matter of mosquitoes, and this verse has azbab an-nuzul, which is in the verse that discusses mosquitoes in Surah Al-Baqarah verse 26. The background of the descent of the verse is about the hypocrites who criticized at the time of the revelation of Al Baqarah, verses 17 and 19. The hypocrite said, "Is it possible for the Most High and Exalted God to make such a parable?" (HR. Ibn Jarir). While the opinion of Al-Wahidi asbab an-nuzul is taken from the narration (Ibn Abbas from Murrah al-Hamdani from Ibn Mas'ud from several companions) because the hypocrites say "Allah is exalted and exalted than just such a parable" [16]. What is meant by the word "make such a parable" is the denial of the hypocrites with the parable mentioned by Allah in the following two verses:

مَثَلُهُمْ كَمَثَلِ الَّذِي اسْتَوْقَدَ نَارًا

Meaning: Their parable is like a person who lights a fire.

أَوْ كَصَيِّبٍ مِّنَ السَّمَاءِ

Meaning: Or, like (the person who is struck) a heavy rain from the sky.

Thus, asbāb an-nuzūl surah Al-Baqarah verse 26 is Allah's answer to the denial that has been made by the hypocrites of the parable mentioned by Allah in Surah Al-Baqarah verses 17 and 19.

The Peculiarities of Mosquitoes Perspective of Tafsir Al-Azhar

In Tafsir Al-Azhar, Hamka emphasized that the mention of mosquitoes in QS. Al-Baqarah verse 26 is not meaningless. Allah chose mosquitoes as an example to show that even very small creatures have privileges and wisdom that can be the subject of human reflection. Hamka explained that humans often underestimate small creatures, even though mosquitoes have a very complex, orderly life structure, and show the perfection of God's creation. By displaying mosquitoes as a parable, Allah reminds us that wisdom can be found in the slightest thing for those who are willing to think [17].

Hamka also highlighted that mosquitoes have extraordinary life skills. It is small in size, but capable of carrying out complex biological functions: it can detect the heat of the human body, has a regular reproductive system, and can fly with fast and consistent movement patterns [18]. This shows that even creatures as small as mosquitoes were created with perfection unmatched by humans. According to Hamka, the mention of mosquitoes in the Qur'an also teaches humility; Humans do not deserve to be arrogant if only mosquito-like creatures have a body system that is the secret of Allah's greatness [19].

Furthermore, Hamka interpreted that mosquitoes are also a symbol for humans who are reluctant to take lessons. Those who reject the truth of revelation will still consider this parable worthless, whereas for believers, the mention of mosquitoes actually emphasizes that every creation of God contains signs of His power. Thus, the peculiarity of mosquitoes from the perspective of Tafsir Al-Azhar lies not only in their biological character but also in the symbolic value that contains theological, moral, and spiritual messages for humans [20].

Which is found in QS Al-Baqarah, verse 26, which reads:

"Indeed, Allah does not hesitate to make the parable of a mosquito or something smaller than it..."

In *Tafsir Al-Azhar*, Buya Hamka gives some important explanations about why Allah chose mosquitoes as an example in his parable, as follows:

God shows His greatness through very small creatures

According to Hamka, God chose mosquitoes to teach that His greatness is not only seen in large creatures such as mountains, sky, or seas, but also in small creatures that are often

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underestimated. Hamka wrote that, The mosquito's small and delicate structure, its ability to fly, its precision of movement, its ability to suck blood, its complex body system all show signs of God's power that humans cannot imitate [21].

Hamka emphasized that even creatures as small as mosquitoes have a very detailed and amazing arrangement, clear evidence that Allah's creation is full of wisdom.

Responding to the ridicule of the disbelievers of the parable of the Qur'an

Hamka explained that the infidels of the Quraish mocked the Prophet because they considered the use of mosquitoes as a metaphor too low. Hamka said that the ridicule showed their ignorance about the meaning of the parable and the arrogance of those who refused to learn from small things [22].

According to Hamka, Allah deliberately used mosquitoes to destroy their arrogance. The humble will see wisdom, while the arrogant will understand nothing.

Mosquitoes as a symbol of testing: small creatures that can defeat humans

Hamka also described that mosquitoes are not only small, but also a threat to humans. For example, it can spread diseases, bite without being difficult to detect, and can defeat humans even though their bodies are very small.

According to Hamka, this is a subtle form of insinuation from Allah that human arrogance can be defeated by creatures as small as mosquitoes [23].

Moral message: Learn from little creatures

Buya Hamka concluded that believers will be more confident and submissive when they see miracles in small creatures, and while disbelievers are increasingly lost because they refuse to learn lessons.

For Hamka, the parable with the mosquito is an exercise in humility and a reminder that the knowledge of Allah is unlimited [24].

Science's Perspective on Mosquitoes

From a scientific point of view, mosquitoes are invertebrate organisms that have significant biological, ecological, and evolutionary complexity, so they cannot be viewed as simple entities. Edward O. Wilson emphasized that mosquitoes have an important role in maintaining trophic structure and biodiversity balance because they are vital components in the food chain in various ecosystems, especially waters [25].

Mosquitoes are insects of the order *Diptera*, which includes about 35 genera with more than 2,700 species, among which are *Anopheles*, *Culex*, *Aedes*, and *Culiseta*. The insect has a slender body, two scaly wings, as well as six feet long, with a size that is usually no more than 15 mm. The uniqueness of its feeding behavior lies in the difference between males and females: male mosquitoes consume only plant nectar, while female mosquitoes suck human or animal blood as a source of protein for egg formation. Without blood intake, female mosquitoes cannot produce eggs and can die before laying eggs [26].

Female mosquitoes have a long proboscis that functions to penetrate the skin of mammals, birds, or even reptiles and amphibians to obtain blood. However, some genera, such as *Toxorhynchites*, do not suck blood at all because their larvae become predators of other mosquito larvae. In their life cycle, mosquitoes go through four stages of development, namely eggs, larvae, pupae, and adults, with the length of each stage being influenced by temperature and species type. Basically, both male and female mosquitoes still rely on nectar as their main food, while blood for female mosquitoes is a special biological need to ensure optimal egg development [27].

Mosquitoes are made up of various species with different biological and behavioral characteristics. Aedes aegypti is the main vector of dengue hemorrhagic fever, characterized

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by a black body with a white stripe pattern on the thorax and legs. This species is anthropophilic, bites more humans, is active in the domestic environment, and lays eggs in clean water. Aedes albopictus, known as the Asian Tiger Mosquito, has a more pronounced white stripe on the dorsal part of its body [28]. This species is active during the day, opportunistic in selecting hosts, and has the potential to transmit various arboviruses such as dengue, chikungunya, Zika, and encephalitis. Culex fatigans, or *Culex quinquefasciatus*, is a species that is commonly found in settlements, actively bites at night, and breeds in waters containing organic matter. These mosquitoes are vectors of lymphatic filariasis. Anopheles, including *Anopheles quadrimaculatus*, is the main vector of malaria; its morphological features include a typical body position when perched and palpi that are almost the size of a proboscis. This species usually lays its eggs in fresh waters and bites at night [29].

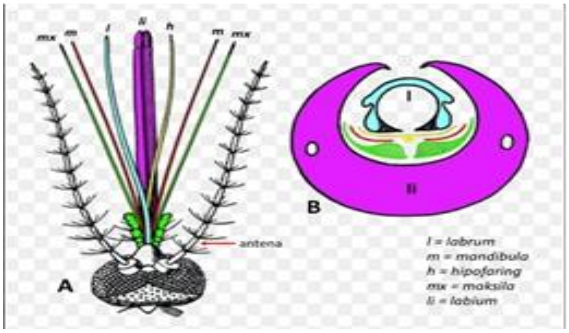

Figure 1. Mosquito Head

Biological Complexity

Mosquitoes are not just small insects, but have a very complex body architecture:

a. Oral Structure (Proboscis) – 6 Needles (3 Pairs)

The female mosquito proboscis consists of six fine needles that function differently:

Mandibular (2 pieces) – penetrates the skin

Shape:

a) Shaped like an elongated thin needle, located on the left and right sides.
b) This structure is sleek, very smooth, and quite flexible.
c) Not jagged, but very sharp at the edges.

Function:

a) Penetrates the surface of the skin for the first time.
b) It becomes a "stabilizer" when other needles go deeper.
c) Helps to divide tissues smoothly so that the suction process is faster and has minimal resistance.

Maksila (2 pieces) – serrated to tear tissue.

Shape:

a) It is long, needle-shaped like a mandible, but has serrations (small serrations) at the edges.
b) These serrations are microscopic, resembling a micro-saw blade.

Function:

a) Tears off skin tissue slowly.

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b) The serrations allow the stylus to move forward like a saw, allowing deeper penetration.

c) Facilitates the formation of "inlets" for other stylets, especially the labrum and hypopharynx.

d) It gives a "stinging" sensation to humans, but is partially suppressed by the anesthetic effect of saliva.

Labrum (1 piece) – drains blood.

Shape:

a) Long, capillary pipe-like structures that curve slightly.

b) It is located in the middle and forms a suction tube (food channel).

c) The tip can detect the location of blood vessels through chemical receptors.

Function:

a) Becomes the main channel for sucking blood.

b) When the proboscis enters, the labrum opens slightly so that a food canal is formed where blood flows to the mosquito's body.

c) The labrum also has chemoreceptors to detect heat, CO_2, and blood chemical compounds so that mosquitoes can "search" for capillaries.

Hypopharynx (1 piece) – channeling saliva (contains anticoagulants & anesthetics).

Shape:

a) The needles are thin, like long threads, very fine.

b) Not completely rigid, being adjacent to the labrum in the middle of the proboscis.

Function:

a) Channeling saliva into the skin through the salivary canal.

b) This saliva contains:

1. Anticoagulants: prevent blood from clots, so that the flow remains smooth.
2. Mild anesthetic: reduces pain so that the bite feels insignificant.
3. Vasodilator enzymes: dilate capillaries to make blood easier to take.

c) The role of the hypopharynx is very important because, without saliva, mosquitoes have difficulty sucking blood [30].

This structure allows mosquitoes to draw blood without making large holes and without being quickly noticed by the host. In the context of morphology and physiology, James A. Downes shows that the mosquito proboscis is composed of six microscopic elements that work synergistically in the process of penetration and suction, accompanied by a very high wing oscillation ability, reflecting the sophistication of the insect's biological adaptation [31].

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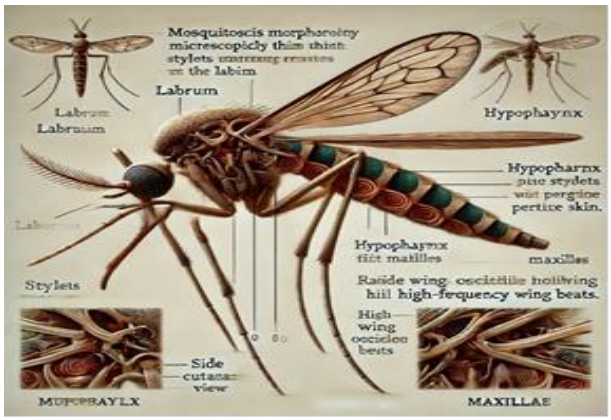

Figure 2. The Structure of the Mosquito Proboscis

The Structure of the Mosquito Proboscis: Six Microscopic Elements

The mosquito's proboscis is a very complex structure, composed of six microscopic needles (stylets) that work synergistically when piercing the skin and sucking blood.

The six components:

a. Labrum

1). The main needle at the top serves as a conduit for sucking blood.

2). It has chemoreceptors to detect capillaries.

b. Mandibula (pair)

1). Two blades are thin like a small saw.

2). It plays a role in cutting and opening the way through the epidermis.

c. Maksila (Pair)

1). It has a serrated tip that makes it easier to penetrate the tissue.

2). Helps push the fascicle deeper into the tissue.

d. Hypopharyngeal

1). The needle that channels saliva.

2). Saliva contains anticoagulants, mild anesthetics, and digestive enzymes.

All of these stylettes are inside the labium (outer sheath) that bends when the mosquito starts piercing the skin.

Penetration Mechanism: How Mosquitoes Pierce the Skin

Downes explains that the piercing process is not a straight movement, but:

a. Sawing-like movement

The mandible and maxillary move up and down alternately, creating a subtle incision in the skin.

b. Capillary navigation

The labrum uses chemical sensors to search for blood vessels.

c. Saliva flow

1). The hypopharynx injects saliva that:

2). prevent freezing,

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3). reduces pain,

4). makes blood drawing more efficient.

d. Blood sucking

Blood enters through the labrum using a cibarial pump and a pharyngeal pump in the mosquito's head.

1. Physiology of Wing Motion: High-Frequency Oscillations

In addition to the proboscis, Downes emphasized the ability of wing oscillation (wing beat frequency):

a. The range is 250–600 Hz, depending on the species.

b. The movement of the wings is so rapid that it affects:

1). Flying maneuvers,

2). Stability when perching,

3). Production of a typical buzzing sound.

These oscillations are created by asynchronous flight muscles—muscles that can contract many times with just one nerve signal, a unique adaptation of small-winged insects.

Sensory System

a. Antenna: has sensilla to detect CO_2, body heat, lactic acid, and skin odor.

Shape:

1). The mosquito antennae are long, thin, segmented (usually 15–17 segments).

2). The surface of the antenna is covered by microscopic structures called sensilla (sensory hairs).

3). In male mosquitoes, the antennae are denser and hairier (plumose), used primarily to detect the sound of female wings.

4). In female mosquitoes, the antennae are slimmer and less hairy (pilose), more functional to detect chemical signals from the host [32].

Function:

Antennae are sensory organs that are essential for obtaining chemical and physical information from the environment.

1. Detecting CO_2

a) The antenna has chemoreceptors that are sensitive to carbon dioxide.

b) When humans exhale, CO_2 levels rise in the air → mosquitoes follow a CO_2 gradient towards their source.

2. Detecting body heat

a) The antenna has thermoreceptors that can distinguish very small temperature changes.

b) This helps mosquitoes know the location of the body or warmer blood vessels.

3. Detecting lactic acid

a) Lactic acid from human sweat is a strong signal for mosquitoes.

b) Sensilla specifically recognizes the concentration of lactic acid in human skin.

4. Detects skin odor (volatile compounds)

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a) Compounds such as ammonia, octanol, and carboxylic acid are the "aromas" of the human body that are detected by olfactory sensilla.

1. Compound eyes: provide broad-spectrum vision, including polarized light.

Shape:

a) The mosquito's eyes are round and enlarged on both sides of the head.

b) It consists of thousands of small visual units called ommatidia (about 800–1,500 ommatidia, depending on the species).

c) Each ommatidium has its own lens, so the mosquito's eyes provide mosaic vision.

d) The compound eyes of mosquitoes are also sensitive to polarizing light [33].

Function:

1. Wide-angle vision

a) With thousands of ommatidia, mosquitoes have a very wide viewing angle → almost 360°.

b) It helps detect fast movements from afar.

2. Seeing polarizing light

a) Mosquitoes can see the polarization pattern of light reflected from the environment.

b) Used for navigation, especially when flying at dusk or night.

3. Detecting motion

a) Compound eyes are very sensitive to changes in movement → making it easier to avoid threats.

4. Help find a host

a) Although their vision is not as sharp as that of humans, mosquitoes are able:

b) Detects dark-light contrast.

c) Seeing the Shadow of the Human Body.

d) Being aware of moving objects, including walking humans.

c. Internal Organs

a) The digestive tract is lined with a peritrophic membrane capable of filtering pathogens.

b) A reproductive system capable of producing hundreds of eggs after a single meal of blood.

Ecological Complexity

According to biologist Edward O. Wilson, mosquitoes have important ecological roles, including:

a. Vital Parts of the Food Chain

Mosquito larvae & pupae live in the water and become food for small fish, dragonfly larvae, and other aquatic microinvertebrates [34].

Adult mosquitoes become food for birds, bats, spiders, and dragonflies.

Without mosquitoes, many species of small predators would lose their high-energy source of nutrients.

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b. Nutrient Cycle Drivers

Mosquito larvae:

1). Eating microorganisms & detritus,

2). Helps decompose organic matter,

3). Maintaining the water quality of microhabitats.

1. Evolutionary Complexity

Mosquitoes have evolved for more than 100 million years. Its evolutionary peculiarities:

a. Activity at a certain hour (crepuscular) to avoid predators.

b. Adaptations live in > 3,500 species, each of which is adapted to its habitat.

c. The ability evolved so quickly that it became the driver of the evolution of the pathogens that lived with it (affirmed by Thomas W. Scott) [35].

The picture you see also shows the life cycle and its role in aquatic ecosystems, and above that are 3 biological, ecological, and evolutionary explanations [36].

In addition, one of the interesting aspects of mosquito biology is its vision system, which is made up of thousands of small optical units that work simultaneously. In the study of insect anatomy, the mosquito eye occupies a central role due to its complex functions in the processes of orientation, host search, and spatial navigation. And the discussion of mosquito eyes opens up insights into how very small organisms can have efficient and adaptive visual abilities [37]. Here's the explanation:

Figure 3. Mosquito Eyes: Compound Eyes

Mosquito eyes include compound eyes, which are eyes made up of thousands of small units called ommatidia. Each ommatidium works like a miniature lens that captures a small portion of the field of view. When these thousands of ommatidia work together, the mosquitoes acquire a single visual image. The average mosquito has 2,000–3,000 ommatidia per eye, depending on the species [38].

Functions of compound eyes in mosquitoes:

Detecting Motion Very Quickly

The compound eye does not produce sharp images like humans, but is very sensitive to small movements, so mosquitoes can:

a) Avoiding human blows

b) Tracking the host's movements

c) Navigating while flying

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Wide-Angle Vision

Because the ommatidia are spread out like a dome, mosquitoes have an angle of view of up to 360° without having to move their heads.

1. Viewing in Low Light Conditions

Species such as *Anopheles* and *Culex* are active at dusk/night. The compound eye is able to collect more light so that mosquitoes can see in dim conditions.

2. Detecting Specific Colors

Some studies show mosquitoes can see color:

a) Black & red: very attractive to mosquitoes

b) Blue & orange: quite interesting

c) Green & white: less attractive

Dark colors absorb heat → mosquitoes detect them more easily.

3. Light-Based Navigation

Mosquitoes use light patterns to:

a) Fly straight

b) Maintaining altitude

c) Looking for a place to rest or mate.

How Ommatidia works. Each ommatidium consists of:

1. The corneal lens → captures light
2. Crystalline → directing light
3. Photoreceptor cells (retinula cells) → translate light into signals
4. Rhabdom → light-sensitive structures
5. The optic nerve → sends signals to the brain

Mosquitoes do not see details, but a mosaic image is enough to:

1. Approaching the host
2. Avoiding predators
3. Landing with precision

Interesting facts about Mosquitoes

1. Male mosquitoes have larger eyes and are "hairy" to detect the vibrations of female wings.
2. Some species have polarized light vision capabilities for navigation.
3. Their eyes respond very quickly to about 10× faster than the human eye.
4. Mosquito food is nectar, not blood. So biologically, Nectar is the main food of mosquitoes, and blood is not a staple food, but *an additional nutrient for laying eggs*. Meanwhile, blood is only needed by female mosquitoes to produce eggs, not to survive [39].
5. Mosquitoes, particularly species such as *Aedes aegypti*, tend to be more attracted to individuals with blood type O. However, this preference can vary depending on the mosquito species as well as other physiological and chemical factors of the body [40].

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4. Mosquito sensors in detecting and sucking work through a series of sensory mechanisms that help them find their host through smell, heat, CO_2, and light, and suck up blood precisely using sensors found in the proboscis. Thus, the process of detecting and taking blood (feeding) is two stages that are interrelated, and both depend on the sensory ability of mosquitoes [41].

Analysis

The mention of mosquitoes in QS Al-Baqarah verse 26 represents a profound Qur'anic strategy in conveying theological and moral messages through seemingly insignificant elements of creation. Based on the data analyzed in this study, the mosquito functions not merely as a rhetorical device but as a meaningful symbol that challenges human perceptions of value, power, and knowledge. Through Tafsir Al-Azhar, Buya Hamka interprets this parable as a deliberate reminder that divine wisdom cannot be measured by size or human preference, but by purpose and meaning embedded within creation.

Hamka's interpretation emphasizes that the Qur'an intentionally selects objects familiar to daily human experience to provoke reflection and humility. The mosquito, often viewed as trivial or disturbing, is portrayed as evidence of the vastness of God's creative power. Hamka highlights that this small creature possesses an intricate biological system that surpasses human comprehension, thereby reinforcing the Qur'anic message that no creation of God is without wisdom. This interpretation aligns with Hamka's broader exegetical approach, which connects scriptural meaning with social awareness and rational reflection, making the Qur'an accessible and relevant to modern readers.

From an analytical perspective, the study reveals that Hamka's reading of the mosquito parable carries an educational and ethical dimension. The parable serves as spiritual pedagogy, training believers to reflect deeply and avoid arrogance. The Qur'an, according to this interpretation, does not hesitate to use minor creatures as teaching tools, thereby dismantling hierarchical assumptions that associate greatness only with the grand or powerful. This ethical message becomes particularly significant in contemporary contexts where technological advancement may foster intellectual pride and the illusion of human dominance over nature.

The analysis also demonstrates that the symbolic meaning of mosquitoes in Tafsir Al-Azhar resonates strongly with modern scientific understanding. Scientific knowledge reveals mosquitoes as biologically complex organisms with sophisticated sensory systems and ecological roles. Although Hamka did not frame his interpretation as scientific exegesis, his reflections on the complexity of mosquitoes show a convergence between Qur'anic symbolism and scientific observation. This convergence does not imply that the Qur'an functions as a scientific textbook, but rather that its parables remain open to intellectual engagement across disciplines. Furthermore, the study shows that the mention of mosquitoes encourages reflection on human responsibility toward creation. By drawing attention to a creature often associated with harm or annoyance, the Qur'an invites believers to reconsider their relationship with nature. Hamka's interpretation suggests that even creatures perceived negatively play a role within the divine order. This understanding fosters an ethical outlook that emphasizes balance, awareness, and respect for all forms of life, rather than utilitarian or exploitative attitudes.

In a broader analytical framework, the mosquito parable illustrates the Qur'an's dialogical nature. It speaks to believers and skeptics alike, challenging those who mock religious symbolism while guiding the faithful toward deeper understanding. Hamka interprets this verse as a test of faith and intellect, where acceptance of the parable reflects spiritual maturity, while rejection indicates arrogance. This dynamic highlights the Qur'an's function as both guidance and moral critique. Overall, the analysis confirms that the mention of mosquitoes in QS Al-Baqarah verse 26, as interpreted through Tafsir Al-Azhar, embodies a multidimensional message encompassing theology, ethics, education, and intellectual reflection. The parable remains relevant in contemporary discourse, offering insights into

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humility, the limits of human knowledge, and the harmony between revelation and rational inquiry. Through Hamka's interpretation, the mosquito emerges not as a trivial creature, but as a powerful symbol of divine wisdom and moral instruction embedded within the Qur'anic worldview.

CONCLUSION

This study shows that the mention of mosquitoes in QS. Al-Baqarah verse 26 has a very deep meaning, both from a theological and scientific point of view. In Tafsir Al-Azhar, Buya Hamka explains that Allah deliberately chose a creature as small as a mosquito as a parable to affirm that His greatness and power are not only seen in something big, but also in the smallest details of life that are often underestimated by humans. This parable is at once an intellectual and spiritual test: the believer sees wisdom and truth, while the arrogant person rejects it. Hamka also highlighted that mosquitoes are proof of the accuracy of Allah's creation. These small creatures have a very complex body structure, high adaptability, and a life system that humans cannot match. Thus, the parable of the mosquito teaches humility, moral awareness, and recognition of the breadth of God's knowledge. From the perspective of modern science, mosquitoes have been shown to have an important role in ecosystems, complex biological structures, and living mechanisms that show a very high level of adaptation. In addition, as a vector of disease, mosquitoes have a great influence on global health dynamics, proving that even small creatures can have a significant impact on human life. Overall, this study confirms that the mention of mosquitoes in the Qur'an is not only a rhetorical symbol but also contains a scientific message that is relevant to the findings of modern knowledge. Revelation and science complement each other, showing that every creation, no matter how small, has wisdom, functions, and lessons for man to better recognize the greatness of God.

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Author's Contributions

Amru Farkhan Salim conceptualized the study, conducted textual analysis of the Qur'an and Tafsir Al-Azhar, and drafted the manuscript. Yeti Dahliana and Muhammad Ndow contributed to the literature review, thematic analysis, and integration of scientific perspectives. Both authors collaboratively reviewed, revised, and approved the final version of the article.

Conflicts of Interest

The authors declare no conflicts of interest in relation to this study. The research was conducted independently without financial support, institutional pressure, or personal relationships that could potentially influence the research process, interpretation of findings, or presentation of the results.

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