

# Water Breakdown during Photosynthesis and Transpiration in Plants as a Scientific Miracle in the Qur'an

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## ABSTRACT:

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This current study is an attempt for some scientific insights about verse 45 of *Sūrah al-Kahf*. In this verse, God said, “And present to them the example of the life of this world, like water which We send down from the sky, and the vegetation of the earth mingles with it and [then] it becomes broken, scattered by the winds”. In common interpretations, the pronoun in the statement “it becomes broken, scattered by the wind” has been directed to plants and not to water. However, in my new approach to interpreting this verse, the pronoun will refer to water, not plants, which is also linguistically acceptable. The purpose of this paper is to show that despite the common interpretation of this verse, an alternative interpretation can be provided that is both linguistically and scientifically plausible.

The results show that based on this new interpretation, it can be said that in this verse, the comparison of the scenario of life in relation to humans to the scenario of water in relation to plants is in good harmony with scientific findings about what happens to water in the plant. When water enters the plant, it can go through two pathways; transpiration or photosynthesis, in both of which a type of breakdown occurs in water. In the first pathway, i.e., transpiration, hydrogen bonds of water molecules are broken so that water is transformed from liquid to gas. In the second pathway, i.e., photosynthesis, the water molecules are broken into oxygen, protons, and electrons. The products resulted (water vapor and

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oxygen) are scattered by external winds. Protons and electrons contribute to the electrochemical potential driving ATP and NADPH formation, or in another words, they are scattered by internal wind. Therefore, it can be said that referring to the phenomena of water breakdown in the plants and then its dispersion, in the verse, is an accurate expression that is also confirmed by science.

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KEYWORDS: *Hashīm*, verse 45 of Surah al-Kahf, Water photolysis, Photosynthesis, Transpiration.

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## I. Introduction

Scientific interpretation approach of the Qur'an is situated between acceptance and rejection. Some scholars like al-Shāṭibī and Shaltūt who agree with scientific approach, believes that such approach gives pieces of evidence for the truth of Islam. It seems to be plausible that God supports his final Prophet Muḥammad (PBUH) with several miracles, which prove his message and prove that the Qur'an is the words of God. On the other hand, some scholars like al-Suyūṭī and al-Ghazālī are against the scientific interpretation of the Qur'an and believe that such approach might have a negative impact because the Qur'an is mainly a religious book for guidance, and it must not be implicated in such story. In the middle standing a moderate group like 'Abduh and al-Sha'rāwī that accept this approach in a very careful manner, only in case of scientific facts not being doubted theories (Shalaby 1985).

In the Qur'an, God Almighty has spoken about several natural phenomena, including rain and the growth of plants. It is stated in verse 45 of *Sūrah al-Kahf* (Q. 18:45):

وَ اضْرِبْ لَهُمْ مَثَلًا الْحَيَاةَ الدُّنْيَا كَمَا أَنْزَلْنَاهُ مِنَ السَّمَاءِ فَاخْتَلَطَ بِهِ نَبَاتُ الْأَرْضِ فَأَصْبَحَ هَشِيمًا تَذْرُوهُ الرِّيَّاحُ وَ كَانَ اللَّهُ عَلَى كُلِّ شَيْءٍ مُّقْتَدِرًا

And put forward to them the example of the life of this world: like the (rain) water which We sent down from towards the sky, then mingled with it the vegetation of the earth (to become fresh and green). But later on it became dry and broken into pieces which the winds scatter. And Allah is Possessor of Power and Authority regarding all things (Omar 2002).

In this verse, the life of the world is compared to water that falls from the sky and then mixes with the plants of the earth. So far, the meaning of the verse is apparent, but in the sentence *fā'aṣbaḥa hashīman tadhrūhu al-riyāḥ* (it becomes broken, scattered by winds) it is not clear what exactly is broken and scattered due to the use of the pronoun. Most of the commentators have referred back the pronoun in the verb *aṣbaḥa* to *nabāt al-arḍ* because they have not found anything else that can be broken except plants, of course after drying. Accordingly, the plants grow after water reaches them, and then by the end of their life cycle, they become dry, broken, and subsequently scattered by winds.

Although, there is another possibility in the meaning of the phrase that the pronoun refers back to water instead of plants, since scientific findings show that water is also capable of breaking. In this case, the meaning of the verse is that immediately after entering the plant, water becomes broken and the winds disperse it. This meaning seems to be consistent with scientific findings about the process that water goes through inside the plant, i.e., transpiration and photosynthesis.

It should be noted that both of these interpretations have their strengths and weaknesses, which will be examined in this study, according to the linguistic and contextual evidences. In this paper, I intend to investigate the semantic possibilities of the verse and explain the scientific phenomena related to it in details. Finally, I will evaluate the degree of harmony of the verse with new scientific findings. For this purpose, I will answer the following questions:

1. What pieces of evidence support the second interpretive possibility?  
In other words, can the second meaning be accepted as a valid interpretation of the verse?
2. Do scientific findings about water entering the plant and the process of photosynthesis agree with what is described in the verse?
3. What are the similarities between the scenario of life of the world relative to human being and the scenario of water relative to plant?

## 2. Lexical and interpretative investigation

In the verse Q.18:45, God likened the life of this world to water that descends from the sky.

وَاضْرِبْ لَهُم مَّثَلًا الْحَيَاةَ الدُّنْيَا كَمَا أَنْزَلْنَاهُ مِنَ السَّمَاءِ

And put forward to them the example of the life of this world:  
like the (rain) water which We sent down from towards the sky.

The commentators have mentioned several reasons for this simile. Just as water does not stay in a constant form, the world is not stable for anyone. Furthermore, if water is in adequate quantity, it will be beneficial, but if it is too much, it will become harmful and destructive. The life of this world (compared to the life of the hereafter) is the same, if it is sufficient, it will be advantageous, but if it is excessive, it will become harmful and adverse (al-Tha‘labī 2001: 6:173; al-Qurṭubī 2014: 10:413).

In the next sentence of the verse, God says:

فَاخْتَلَطَ بِهِ نَبَاتُ الْأَرْضِ

then mingled with it the vegetation of the earth [to become fresh and green].

Commentators have stated two possibilities to interpret this sentence:

1. The plants mix with each other and intertwine, because of their growth and reproduction.
2. The plants mix with the water (al-Zamakhsharī 1986: 2:725; al-Rāzī 1999: 21:467; al-Qurṭubī 2014: 10:413; al-Māwardī 2010: 3:310).

Al-Ālūsī (1994: 8:271) said that although there is no problem in terms of Arabic grammar that the letter *bā’* comes before any of the two sides that are mixed together, what is common in the language is that the letter *bā’* comes before the side that has a larger size. That is, here it should have come before *nabāt al-arḍ*, which is generally larger than water mixed with it, not before the pronoun *hu* that refers to water. Therefore, the first meaning, that is, mixing plants together, is more appropriate, unless it is said that the letter *bā’* came before it to exaggerate the abundance of water. However, some commentators considered the second meaning more appropriate because they did not think it is necessary for the letter *bā’* to come before the larger side (al-Rāzī 1999: 21:467; al-Zamakhsharī 1986: 2:725).

In the next sentence, it is mentioned that:

فَأَصْبَحَ هَشِيمًا تَذْرُوهُ الرِّيحُ

But later on it became dry and broken into pieces which the winds scatter.

The word *hashīm* comes from the root HSHM that means to break hollow and dry things (al-Khalīl 1982: 3:405; al-Azhārī 2001: 6:60; Ibn Manẓūr 1993: 12:611). Al-Rāghib (1993: 842) said that *hashīm* means breaking something weak like a plant. Ibn Fāris (1969: 6:54) said that this root means breaking dry and non-dry things. Ibn Manẓūr (1993, 12:611), after stating several phrases in which *hashīm* was used, said that *hashīm* is applied to break anything. Therefore, this word has the capability to mean breaking something other than dry plants.

The question raised here is what the pronoun in the verb *aṣḥaba* refers back to, or in other words, what is changed into *hashīm* (broken). Most of commentators referred back the pronoun of the verb *aṣḥaba* to *nabāt al-arḍ* (plants) and they interpreted the verse in such a way that water descends from the sky, reaches the plants, then the plants are broken, and the wind scatters them (al-Rāzī 1999: 21:467; al-Zamakhsharī 1986: 2:725; al-Ālūsī 1994: 8:271). What supports this interpretation is the proximity of *nabāt al-arḍ* to the verb *aṣḥaba* because the pronoun usually refers to the closest word before it, but there are also indications that weaken this interpretation.

An indication is that in this interpretation, it is said that immediately after the water reaches the plant, it becomes broken. In other words, several steps have been omitted in between, which include the growth and greening of plants, the completion of their life cycle, the drying of the plants to the extent that they become broken, and winds disperse them.

Even if it can be accepted that the removal of these few steps does not contradict the eloquence of the speech, but the use of the conjunction *fā'*, which implies a short time interval, before the verb *aṣḥaba* is problematic. Because the time interval between the stage when the water reaches the plant, it goes through its life cycle and dries up to the point that it becomes *hashīm*, is generally not a short time. Another indication is obtained from the next sentence, *tadhrūhu al-riyāḥ*. It is clear that many plants, due to their size and weight, cannot be easily broken and scattered by winds, after drying. For example, some plant species particularly sequoia species can live for around 3,200 years (Nathan &

Demetry 1995). These trees have a huge weight that would be difficult to undergo scattering by winds.

Therefore, we should either accept that the meaning of *nabāt al-ard*, despite its apparent generality, points only to certain species of delicate plants that have an extremely short life cycle or consider the second possibility in the meaning of the verse, which is the reference of the pronoun to water instead of plants.

According to what has been said, it seems that the commentators have referred back the pronoun to plants since they did not see anything in the verse that can be broken except plants. While new scientific findings show that water breaks down and decomposes after entering plants in the process of photosynthesis, so the possibility of referring the pronoun to water cannot be ruled out. In this case, the meaning of the verse is that God compares the worldly life to water that descends from the sky. This water mixes with plants; that is, it enters the plants and then it breaks down and becomes scattered. In this way, the integrity of the simile is more preserved because the simile begins with water and then what happens to it, not to plants, is described.

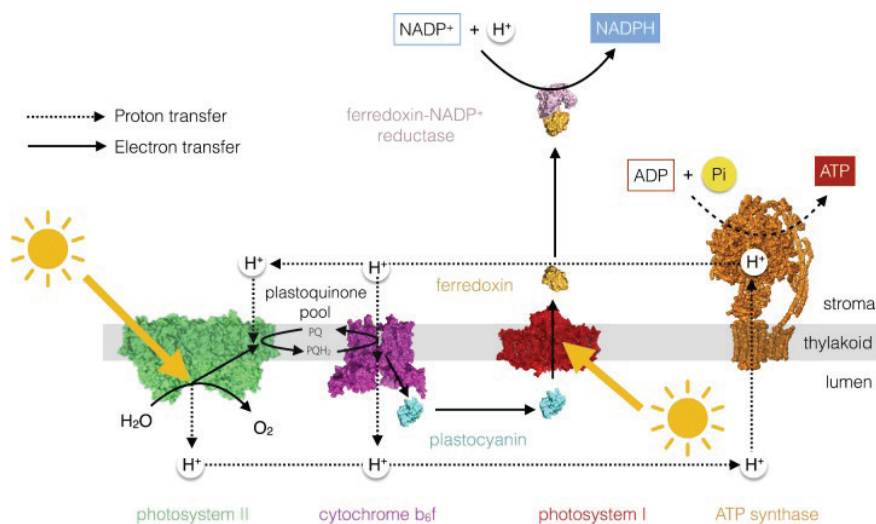
Now, after it became clear that the second interpretation for the verse is a worthy and acceptable interpretation, we will examine the scientific findings regarding the process that water goes through after entering the plants.

### 3. *Scientific Investigation*

#### 3.1. *Photosynthesis*

The oxygen we breathe and the food we eat on the planet Earth are the products of photosynthesis. Around two hundred billion of tones of  $\text{CO}_2$  converts into organic compounds every year and around one hundred and forty billion of tones of oxygen released into the atmosphere via photosynthesis. Oxygenic photosynthesis is responsible for the conversion of water and carbon dioxide to organic compounds such as carbohydrates and oxygen. Photosynthesis as a biological process consists of two different reactions: light and dark reactions. In light reactions, water undergoes photolysis and this process resulted in splitting water using light into oxygen, protons and electrons (Figure 1),

and in dark reactions, protons and electrons are used in reduction of carbon dioxide into carbohydrate (Johnson 2016).



**Figure 1.** The photosynthetic electron and protein transfer chain. The linear electron transfer pathway from water to NADP<sup>+</sup> to form NADPH results in the formation of a proton gradient across the thylakoid membrane that is used by the ATP synthase enzyme to make ATP (Johnson 2016).

### 3.2. Water Photolysis

Oxidation of a very stable molecule like water to form molecular oxygen is a very difficult process. The oxygen evolving complex (OEC) is the only catalytic site in biology that can split water. This complex has identical structure and function (Su et al. 2011) in cyanobacteria, algae and all higher plants; however, some discriminant features have been reported between cyanobacteria and higher plants (Retegan & Pantazis 2017). Electrons liberated from water molecules during photolysis quench chlorophyll molecules in PSII and subsequently transfer across series of protein molecules ending by reduction of NADP<sup>+</sup> to form NADPH. Staying of protons inside the plant leads to the synthesis of ATP (Figure 1). The molecules NADPH and ATP are used in the reduction of carbon dioxide gas to form glucose molecule in the dark reaction.

### 3.3. Water Breakdown Output by Plant

The electromagnetic energy of sunlight is captured by the chlorophyll in photosynthesis and stored in macronutrients such as carbohydrates, fats, and protein (Rapf & Vaida 2016). Glucose molecule is considered to be ubiquitous origin of energy for all organisms in the globe and is necessary to fuel aerobic and anaerobic cellular respiration (Hantzidiamantis & Lappin 2022). Enough energy that makes large complex organisms viable can be obtained only from reactions with molecular oxygen (Hedges et al. 2004). It has been reported that the two main mechanisms involved in the origins of life were likely to be Redox and proton gradients, initiating the necessary energy flux to drive metabolism and growth (Lane et al. 2010; Lane & Martin 2012). Accordingly, the life's limits have been extended to not only include pH, temperature, salinity, pressure, and radiation gradients but also include the possible energetic and nutrient limits of life (Hoehler & Jørgensen 2013; LaRowe & Amend 2015; Jones et al. 2018).

Thus, water has an indispensable job to provide the living organisms by oxygen and glucose as products of its breakdown. Perhaps it can be said that this is why God has said in the verse Q. 21:30<sup>1</sup>, “And We have made from water every living thing”. In support of this perspective, there are two pieces of evidence; firstly, the lexical meaning of the preposition in “from water” that Allah used in the verse and He did not use “by water”. In case of “from water”, it means that living things originated from water (products of water breakdown) not water molecules directly. As one can say, we made paper from wood, which means paper originated from wood and not wood directly. Accordingly, if it was said “by water”, it would mean that water molecules were directly used. It seems that this approach is confirmed by verses Q. 78:14-15 that says, “And We sent down from the laden clouds water, raining heavily, so that We may produce therewith corn and vegetation”.<sup>2</sup> In this case, the preposition *bā'*, not *min*, was used because water as a liquid is necessary for the germination process.

Secondly, although water has a crucial importance for organisms, removal of water from the biological material in a process called lyophilization resulted in long survival in the preservation process. It has been reported that during lyophilization of *Escherichia coli*, residual

1. وَجَعَلْنَا مِنَ الْمَاءِ كُلَّ شَيْءٍ حَيٍّ (الانبياء)

2. وَأَنْزَلْنَا مِنَ الْمُعْصِرَاتِ مَاءً نَّحْيَا بِهِ حَبًّا وَنَبَاتًا (النبا/14-15)



moisture contents ranging from approximately 0 to 20% showed that low residual moisture content produced higher survival rate in cells stored under vacuum or nitrogen (Nei et al. 1966). Although water is an end-product of the respiration process, it is essential that cell should have an adequate water content for respiration to proceed. Some plant material can remain alive with a very low water content such as dormant seeds that continued in respiration at a very low rate in and that when all respiration ceased the seed was no longer viable (Stiles 1956). Thus, respiration process and consumption of glucose and oxygen (products of water breakdown) to get energy is considered to be the determining factor for viability more than water molecules itself. In other words, the determining factor for viability is water but indirect (via products of its breakdown by plant); therefore, Allah mentioned “from water”.

### *3.4. Transpiration and Its Correlation with Photosynthesis*

During the life cycle of plants, individuals continuously absorb and lose water. Most of the water lost by the plant takes place from leaves in the form of water vapor as the CO<sub>2</sub> absorption from the atmosphere needed for photosynthesis. Within the plant's lifetime, the amount of water lost by the plant through leaf surfaces may be equal to 100 times of the fresh weight of the plant. This phenomenon of water loss is called transpiration. About three-quarters of vaporized water at the global land surface and one-eighth of that vaporized over the entire globe are resulted from transpiration in higher plants accounts (Caemmerer and Baker 2007).

During the transpiration process, the energy needed to separate molecules from the liquid phase into the gas phase at constant temperature is called latent heat. The heat of vaporization for water at 25°C is the highest value known for any liquid. The vast majority of this energy is used in the breakdown of hydrogen bonds between water molecules. This high value of latent heat of vaporization of water acts as a cooling system that enables plants to cool themselves via evaporating water from sun heated leaf surfaces. Transpiration is considered to be a key element for temperature regulation in plants (Wang et al. 2007). Land plants are suffering from desiccation that can be affected by the large surface area of leaves and inevitable opening stomata for CO<sub>2</sub> uptake. Therefore, there is a clear conflict between the need for CO<sub>2</sub> for photosynthetic assimilation and the need for water conservation (Clements 1934). There is a much-debated question whether transpiration

is beneficial or harmful to the plants. Some scientists reported that transpiration is almost harmful with essentially no helpful impact to the plant physiology (Curtis 1926). Others appear to accept that the detrimental effects of transpiration exceed any of the benefits that may be obtained from the process (Miller 1931). Transpiration is considered to be less helpful than it is harmful to the plant suggesting that plants could adjust themselves to control transpiration (Maximov 1929). Plants do not have membranes that are both permeable to  $\text{CO}_2$  and impermeable to water. Transpiration is an inevitable consequence of photosynthesis (Caemmerer and Baker 2007). Therefore, plants suffer to control transpiration because it is affected by several factors including light (Kinoshita et al. 2001; Sothorn et al. 2002), carbon dioxide (Hashimoto et al. 2006; Teng et al. 2006; Young et al. 2006), and humidity (Assmann et al. 2000; Yoshida et al. 2002; Xie et al. 2006). Accordingly, the term water use efficiency (WUE) has been widely used by botanists and it is determined as the amount of assimilated carbon as a biomass or grain obtained per unit of water used by the crop (Hatfield & Dold 2019). To improve water use efficiency some plants like crassulacean acid metabolism (CAM) plants developed a specific mechanism for concentrating  $\text{CO}_2$  at the site of Ribulose 1, 5-bisphosphate carboxylase/oxygenase (Rubisco) which catalyzes the assimilation of  $\text{CO}_2$  into organic matter. Therefore, the CAM plants lose 50 to 100g of water for every gram of  $\text{CO}_2$  gained, plants with  $\text{C}_4$  carbon fixation pathway lose 250 to 300g and plants with  $\text{C}_3$  carbon fixation pathway lose 400 to 500g (Taiz & Zeiger 2006).

#### *4. Comparative Investigation*

##### *4.1. The Similarity Aspect in the Simile*

Water has been sent down from the sky and mingled with the normally growing land plant, then water has two pathways in the plant body. The first is a low-cost pathway in which water undergoes breakdown of its hydrogen bonds during transpiration and the plant chooses this pathway as a less benefits and sometimes harmful pathway. The second is a high-cost pathway in which water undergoes photolysis during photosynthesis and the plant chooses it as a fruitful pathway. In this pathway, the plant uses water efficiently to produce not only carbohydrates but also liberate oxygen to the ambient atmosphere.

On the other hand, life (real life after the age of puberty) has two pathways for human beings. The first is a low-cost pathway selected by humans who prefer pursuing desires as temporary pleasures. In this pathway, they are egotistic ones who are harming themselves and not benefiting others, like transpiring plants that are dissipating water. The second is a high-cost pathway chosen by those who exploit their life very efficiently by following God's rules. In this pathway, they are generous ones who not only benefit themselves but also go beyond and benefit others, like the photosynthesizing plants whose organic compounds they produce are consumed by almost all living organisms as a source of energy.

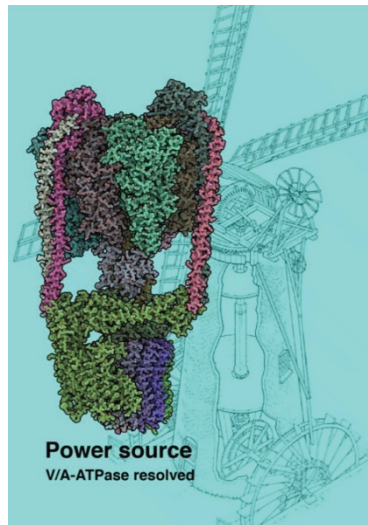
It is noteworthy that transpiration inevitably takes place in the plant; therefore, it has been widely distributed in the literatures the term describing it as a "necessary evil". However, the plant must control the balance between transpiration and photosynthesis carefully. It is the same for the general human beings who are not impeccable. They commit sins to achieve temporary pleasure that is not beneficial but harmful for them.<sup>1</sup>

#### *4.2. Scattered by Winds*

In continuation with the verse under investigation, the phrase "Scattered by winds" in common interpretation means the plant itself after breakdown is scattered by winds. However, in our new approach it means that the final products of water breakdown are scattered by winds. There are three final products of this process: water vapor, oxygen, and protons. Water vapor and oxygen are scattered by external winds from plant to the ambient atmosphere everywhere. However, protons remain inside the plant and released into the lumen of the thylakoid, not directly into the stromal compartment. As a result of electron transport, the stroma becomes more alkaline, and the lumen becomes more acidic. Protons are eventually transferred from the lumen

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1. In the same context, Abū Hurayrah said: "The Messenger of Allah (PBUH) said; 'By the one in Whose Hand my soul is! If you did not commit sins, Allah would replace you with people who would commit sins and seek forgiveness from Allah; and Allah will certainly forgive them'" (Muslim n.d.). Of course, this is not a license for committing sins rather than showing the road of hope for forgiveness from Allah. In accordance with this context, it is thus said in Q. 6:54, "Prescribed your Lord upon Himself the Mercy, that he who does among you evil in ignorance then repents from after it and reforms, then, indeed He (is) Oft-Forgiving, Most Merciful."

to the stroma via translocation through ATP synthase. The release of protons during water oxidation resulted in electrochemical potential driving ATP formation. The complicated structure of ATP synthase as a unique molecular machine (Figure 2) which resembles a turbine or a water mill, driven by the flow of protons rather than water (Zhou & Sazanov 2019). This comprises a positively charged electric current, in contrast to our electric motors, which use a negative current of electrons (Zhang 2015). Like the wind turbines, ATP synthases are natural “ion turbines”, each made up of a stator and a rotor that turns turbines that generate electricity, driven by a flow of ion to generate the cell’s energy supply of ATP (Preiss et al., 2010).



**Figure 2.** Structure of the *Thermus thermophilus* V/A-type ATP synthase. Each protein subunit is of different color. The background shows wind-powered water pump (Zhou & Sazanov 2019).

#### 4.3. Time Span of Water Breakdown by Plant

One more evidence in the verse under investigation that confirms that water is the intended word for breakdown is the conjunction *fā'* before the two verbs *ikhtalaṭa* (mingles) and *aṣbaḥa* (becomes). The conjunction *fā'*, which connects the two sentences, indicates that the verbs of the two sentences have occurred in order and with a short interval (Ibn Manzūr 1993). The shortness of this time interval is more compatible

with the breakdown of water than the plant because regarding plant, there are evergreen and perennial plants whose life cycle is too long and requires long interval depending on the plant species. On the other hand, the consumed time in the pathways for the water breakdown in the plant either photosynthesis or transpiration is very short relative to the whole plant life. Regarding the time for photosynthesis process, plant cells synthesize the sugar glucose via photosynthesis in around 30 seconds. More interestingly, a stable 3-carbon precursor of glucose has been formed after the exposure of spinach leaves to a flash of light by only five seconds. But this short time is required for the whole process of photosynthesis. Specifically, if we consider the time required only for water photolysis during photosynthesis, it will be shorter. It has been reported that the lifetime of photosystem II (PS II) is only half an hour under normal light conditions (Vass 2012). The turnover time of the OEC is  $\approx 2$  ms, and that of the whole PS II is  $\approx 10$  ms (Vinyard & Brudvig 2017). It performs more than 105 reaction cycles before it must be replaced. More recently, it has been reported that photosystem II (PSII) performs the solar-driven oxidation of water used to fuel oxygenic photosynthesis. The active site of water oxidation is the oxygen-evolving complex (OEC), a  $\text{Mn}_4\text{CaO}_5$  cluster. PSII requires degradation of key subunits and reassembly of the OEC as frequently as every 20 to 40 min (Vinyard et al. 2019).

In case of transpiration on a sunny warm dry day, a leaf will exchange up to 100% of its water in a single hour (Taiz & Zeiger 2006). These times ( $\approx 2$  milliseconds or 1 hour) are very short in relation to the life cycle of each plant, just like the life of this world, in relation to the hereafter life for the human being, is very short and running fast.<sup>1</sup>

In the next verse (Q. 18:46), a comparison is mentioned that makes the discussion more elucidated. It is stated that “The wealth and the sons are the adornment of the life of this world; and the righteous deeds of a lasting character are better in the sight of your Nourisher-Sustainer for rewards and better as a hope for the future”.<sup>2</sup>

In this verse, wealth and children are compared with lasting righteous deeds, just like the two pathways mentioned in the previous verse for water in the plant; First, the pleasant temporary pathway of water

1. To emphasize this meaning about life, in verses Q. 23:112-113 Allah mentioned that “(Allah) said, ‘What number of years did you stay on earth?’ They said, ‘We stayed a day or part of a day. Ask those who keep account.’”

2. أَمْالٌ وَأَبْنَاءٌ زِينَةُ الْحَيَاةِ الدُّنْيَا وَالصَّالِحَاتُ خَيْرٌ عِنْدَ رَبِّكَ ثَوَابًا وَخَيْرٌ أَمَلًا (الكهف/46)

during transpiration, and second, the arduous pathway of water during photosynthesis, which results in the release of oxygen, and providing life for the plant itself and other organisms.

## 10. Conclusion

In this study, new insights have been given for verse 45 of *Sūrah al-Kahf*. In this verse, God presents a simile in which the worldly life is compared with water that sends down from the sky, and mixes with the plants. Then, according to the common interpretation, the dried plant breaks and the wind scatters it, although this interpretation has weak points that raise the possibility of a new interpretation for the verse. In this new approach, which was shown to be lexically and grammatically authentic, after the water descends and enters the plant, it is the water that breaks, not the plant.

As explained in detail, this interpretation seems to be in perfect harmony with new scientific findings about the process that water goes through inside the plant. When water enters the plant, it encounters two pathways; transpiration and photosynthesis, in both of which a kind of breakdown occurs for water. In the transpiration pathway, hydrogen bonds of water molecules are broken so that water is transformed from liquid to gas. In the photosynthesis pathway, the water molecules are broken down into oxygen, protons, and electrons. The resulted products from both pathways (water vapor and oxygen) are scattered by external winds. Protons and electrons contribute to the electrochemical potential driving ATP and NADPH formation, or in other words, it is scattered by internal wind. These two energy-rich molecules drive the reduction  $\text{CO}_2$  into glucose during dark reaction. Therefore, water breakdown by plant provides life for all organisms on the planet.

Thus, it can be said that Allah presented the scenario of worldly life relative to human being like the scenario of water relative to the plant in this verse. The life of this world has two pathways for human beings: wise pathway in which humans exploit their life efficiently (like plants during photosynthesis) not only for themselves but also for others and the unwise pathway (like plants during transpiration) in which humans do not exploit their life properly and can harm themselves and others.

This new interpretation can introduce clear evidence to prove that these words are impossible to have been written by human beings. It is impossible for a non-specialist to talk about water breakdown by plants,

14 centuries ago, and this would be his own talk. More than 14 centuries ago, the Qur'an has been sent down by Allah to support his final prophet Muḥammad (PBUH). Because it is the final book, it provides people continuously by some signs that support their faith. Each generation discovers and understands the miracles in the Qur'an according to the level of their accumulative knowledge.

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