THE EMBRYO DEVELOPMENT IN QURANIC VERSES

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SUMMARY

The aim of this paper is to answer two questions: is there a section in the Qur’ān that describes the human embryo development? Second, if such a case existed, could it be compared to the Greek theories of generation? The answer to both questions is affirmative. In the first part of this paper, we discuss some Quranic verses talking about the embryo development. We also outline how the terminology (nuṭfah, ‘alaqah, muḍghah) used for expressing the embryo development in these verses involves complex translation challenges. In the second part, we compare the Quranic verses to two Greek theories of generation. Finally, we highlight a little-known aspect of the Quranic text worthy of study.

Introduction

Considered as a source of knowledge, the Qur’ān (al-Qur’ān) is the holy book of Muslims. For them the Qur’ān contains the word of God revealed to his Prophet Muḥammad. Like any other book thought sacred, the Qur’ān tells the story and the customs of the Arab people at the time. Moreover, it provides account of some issues which have occupied human beings brain constantly, such as the bringing into existence of the universe and humankind origins. In this paper, we focus on some Quranic verses that narrate the story of creation and the process of generation. We will examine three terms

Key words: Qur’ān - Generation - Nutfah - ‘Alaqah - Mudghah
that describe the early stages of the embryo and illustrate their polysemic nature through the interpretation of the most famous medieval Muslim exegetes. We also will discuss how Avicenna uses the same terminology in his famous book *The Canon of Medicine* (al-Qanūn fi’l-Ṭibb). Finally, we will verify whether the generation process narrated in the Qur’an could be compared to the Greek theories of generation.

In *al-Mu’minūn* (The Believers), the 23rd surah of the Qur’an, God says:

> And indeed We created man out of an extract of clay (12). Thereafter We made him as *nuṭfah* in a safe lodging [womb of the woman] (13). Then We made the *nuṭfah* into *‘alaqah*, then We made the *‘alaqah* into *muḍghah*, then We made of that *muḍghah* bones, then We clothed the bones with flesh, and then We brought it forth as another creation. So blessed is God, the best of creators (14)!

The verses tell about the creation of humans by describing the generation process. First, they identify an initial phase, where man was created out of an extract of clay. Most of exegesis refers this phase to the creation of Adam of water and mud mixed together. But this is not the phase we point to analyze. The process that we will focus on consists of three stages:

1. *Nuṭfah*
2. *‘Alaqah*
3. *Muḍghah*

In the verses, the generation is described as a linear process of three defined stages. Starting with *nuṭfah*, it turns into *‘alaqah*, which becomes then a *muḍghah*. Now let’s go into the semantic analysis of each of the three terms.
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*Nutfah* (نطفة)

The word *nutfah* comes from the root *na-ṭa-fa*. In *Lisān al-‘Arab* the word has the following meanings:

1. Limpid water;
2. A little amount of water;
3. Man sexual discharge.

Given that in Arabic language the root of the words is their verb form, the first meaning of *nutfah* (limpid water) is connected to the verb *naṭafa*, which means ‘to trickle’ (yaqṭuru) or ‘to flow’ (yasīlu). According to the dictionary, the second meaning (a little amount of water) was common at the time when the Arabs were calling a small amount of water as *nutfah*. The word also means ‘male sexual fluid, i.e., sperm’ since the sperm is in little amount and liquid like water. The dictionary of *al-Munğid* gives almost the same meanings, adding another one:

4. Male and female sexual discharge or fluid.

This is a very interesting interpretation since it introduces woman’s contribution and interprets *nutfah* as both male and female sexual fluids. Considered *nutfah* as a sexual fluid, like a possible meaning, the Arabic dictionaries give two fundamental definitions: on the one hand, *nutfah* is ‘the sperm’. On the other hand, it is ‘male and female sexual fluids’.

As a matter of fact, the interpretation of a complex text such as the Qur’an must take account of *al-tafsīr*, one of the so-called Quranic sciences. The *tafsīr* is a huge exegetical Islamic tradition that has commented and interpreted the Qur’an over the centuries and besides, it has consolidated its orthodox interpretation in exegesis volumes. The most important exegetes or scholars (mufassirūn) in the Islamic tradition are al-Ṭabarī (838-923), al-Qurṭubī (1214-1273) and Ibn Kaṭīr (1301-1373).
According to al-Ṭabarî, *nuṭfah* is the male sexual fluid that is the sperm. Similarly, al-Qurṭūbī states that “it’s the sperm. Man’s sperm is called *nuṭfah* for being in little amount”. While for Ibn Kaṭīr *nuṭfah* is “the water gushing forth that comes from the loins of man, i.e., his back, and the ribs of woman, i.e., the bones of her chest, between the clavicle and the breast”. So both the first and the second commentators agree that *nuṭfah* is the male sexual discharge (the sperm). While for Ibn Kaṭīr’s the term refers to the ‘water’ (sexual fluid) of both sexes. He also explains that this liquid comes from man’s loins while for woman it comes from her chest.

None of the three quoted commentators talks about any kind of union between male and female sexual fluids. Nevertheless, a recent scholar, Ibn ‘Ashūr (1879-1973), makes exactly this consideration. First of all, for Ibn ‘Ashūr the word *extract* (sulālah), in “We created man from an extract of clay” (Qur’an 23:12), means both male and female sexual fluids that are extracted from their blood. And the word *clay* (ṭīn) alludes to the earth or the soil which is the main source of food for humankind. So “extract of clay” means that man and woman sexual fluids come out from blood and represent the origin of the generating act. Furthermore, Ibn ‘Ashūr makes a very interesting consideration regarding the *nuṭfah*. On the one side, *nuṭfah* could be interpreted as man’s sexual fluid mixed and combined with female’s one within woman’s womb. He illustrates that this mixed sexual discharge is one of the early stages of the embryo. On the other side, Ibn ‘Ashūr agrees that man’s penile fluid could be called *nuṭfah* because it becomes trickled (yaqṭuru) in woman’s womb during the sexual intercourse and this is one of the meanings of the verb (naṭafa) as we mentioned before.

To sum up, we can say that the term *nuṭfah* has several meanings. It is limpid water or small quantities of fluid. For many commentators, it is male sexual fluids. For others, *nuṭfah* is either the male and female sexual fluids. We also found that according to one of the
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scholars, it is man’s sexual fluid mixed with female’s one. This is a very interesting interpretation that has an echo in this Quranic verse:

\[\text{Verily, We have created man from nutfah amshāḡ}^{17}\]

Amshāḡ\(^{18}\) derives from the root \(ma\)-sha-ḡa and means ‘to mix’\(^{18}\). It may be singular and plural form\(^{19}\). In the verse, \(nutfah\) amshāḡ could mean ‘mixed semen’ or ‘sexual discharge of man and women’. Ibn ʿAshūr restates that if \(amshāḡ\) in this verse is singular, so \(nutfah\) amshāḡ means ‘mixed semen’. But if it is plural, then it alludes to the numerous elements that exist into the \(nutfah\)\(^{20}\).

There is a contribution regarding this debate in Avicenna’s \textit{Canon of Medicine}. In the chapter of the reproductive system, precisely in the 21st art, the author outlines the embryo genesis (tawallud al-ḡanīn). After the conception, Avicenna illustrates that the embryo goes through this process:

When the sperm (al-maniyy) reaches woman womb, first, it becomes frothy (zabadiyyah) for the generative force. In fact, the froth originates when the formative transforms the components that the sperm contains into minerals, which remain within it [...]. Once the sperm gets stable and frothy, the foam goes deeper blowing up the heart [...]. After that, the sexual fluid of the woman reaches the sperm, thereby a membrane forms. This membrane remains free. Later, it will be attached to the uterine veins to get nutrients [...] and the embryo (al-ḡanīn) gets nutrients through this membrane as long as it is slender\(^{22}\).

In this quotation, Avicenna uses the word \textit{maniyy}\(^{23}\) to express the sperm. He explains that once the \textit{maniyy} is within the womb of woman, it becomes frothy by the act of the generative force. The embryo
gets surrounded with a membrane through which it gets nutrients. A few paragraphs later, Avicenna points out the duration of this phase and reaffirms the way the formed or the generated (al-muṣawwarah) gets fed:

The foam takes from 6 to 7 days during which the generated (al-muṣawwarah) advances in the nuṭfah without taking anything from the uterus.

This quotation is very fundamental since the author uses the word nuṭfah where we would expect maniyy or at the least zabadiyyah. From his discourse we deduce that nuṭfah is not used here as sperm25. Obviously, it has a broader meaning. However, it is not clear enough what it could be exactly. To verify this vagueness we quote here the Latin translation of Avicenna’s text by Gerard of Cremona (XII sec.):

et spatium quidem spume est vj. dierum aut vij. & in his diebus format informativa in embryone non petendo aliquid ex matrice26.

In the Latin text, the term nuṭfah is rendered as embryone (embryo). This confirms the idea that we have just proposed: nuṭfah is not just the sperm, but mixed semen or (as Gerard says) embryo. Indeed, it is a kind of a developed entity created by the formative or generative force. According to Avicenna, after six or seven days this complex entity goes through an advanced stage. This is why we think that Avicenna’s consideration for nuṭfah coincides with our point of view. We should say that even the translators of the Quranic text give more than a possible interpretation for the nuṭfah. In the Italian translation of the Qur’an by Bausani the word is rendered as ‘a drop of sperm’: “ne facemmo una goccia di sperma in ricettacolo sicuro27”. In the English interpretation of the Qur’an of al-Hilālī the Quranic verse is translated this way: “We made him as nuṭfah (mixed drops
of the male and female sexual discharge)". Al-Hilālī considers the *nuṭfah* as mixed semen. Not only, but in another English translation the word results as ‘sperm-drop, i.e., zygote’.

At this point we should report the work of Aḥmad Shawqī Ibrāhīm, a famous Egyptian physician and scientist who wrote many works that aim to illustrate the correspondence between some passages of the Qur’an and the modern theories of generation. Shawqī claims that only in the 17th Century scientists got to know that reproduction requires a sperm which fertilizes an ovum instead of the menstrual blood’s hypothesis which was thought before. According to him, this truth has already existed in many Quranic verses and in the Hadith.

It is not our aim to verify the idea carried out by Shawqī. What is important to us is his interpretation of *nuṭfah* as mixed semen, i.e., zygote. This interpretation has not always worked out, despite that it is present in Avicenna.

To conclude the analysis of the first term, we claim that in this Quranic verse *nuṭfah* means a drop of water or fluid substance, precisely seminal fluid. Precisely, it is the mixed semen that comes out from the union between male and female sexual fluids.

ʻ*Alaqah* (عَلَاَّقَة)

The second phase is the transformation of the *nuṭfah* into ʻ*alaqah*: “We made the *nuṭfah* into ʻ*alaqah*” (Qur’an 23:14). ʻ*Alaqah* comes from the root ‘*a-la qa* which means ‘to cling’, ‘to attach’ and ‘to suck’. The aforementioned dictionaries report the following meanings of ʻ*alaqah* as a noun:

1. Bright blood;
2. Coagulated blood;
3. Leech.

It is ‘blood’, precisely ‘coagulated blood’. This interpretation is confirmed by the commentators of the Qur’an. For Ibn Kafīr ʻ*alqah*
is “a red piece of blood, like an elongated clot.” Al-Ṭabarî also affirms that it is ‘a clot’. Moreover, both the scholars agreed that ‘alaqah is the second phase of the embryo. The Canon of Avicenna gives a description of this phase slightly different:

According to Avicenna, the change process goes through these stages:

1. Al-maniyy transforms into froth (which advances within the nutfah as seen before).
2. A drop of blood appears in the peritoneum (al-ṣifāq);
3. Al-maniyy changes into ‘alaqah.

Avicenna differentiates ‘alaqah from the drop of blood. As a result one might wonder what happens exactly to the embryo at this stage, from Avicenna’s point of view. We find the answer in the following passage:

So in the third phase the blood penetrates all the parts of the nutfah which becomes ‘alaqah. But ‘alaqah is not just a drop of blood. To better understand what it means let’s consider the word ‘ulūq which is mentioned in the last quotation. In The Canon Avicenna uses the
word ʻulūq when he talks about the conception. In fact, this word is another derived form of the root ʻa-la-qa. Consequently, one might think that both ʻalaqah and ʻulūq allude to the conception act. Probably, this is what Gerard of Cremona had thought when he translated the last quotation. Reading the Latin translation we note that both of the words are translated into the same word:

& recipiunt dispositiones conversionem spermatis ad conceptionem⁹⁹;

This is the quotation, where ʻalaqah is translated in Latin as conceptio.

deinde post vi. Dies alios. & sunt xv. a conceptione penetrat sanguineitas in toto, & fit [illud unde creatur]¹⁰

In the above excerpt, ʻulūq is also rendered as conceptio. So we are in front of a misleading interpretation. This perhaps is due to the fact that both words have the same root. It is not possible to think that ʻalaqah is the ‘conception’, if one considers, as Avicenna does, that the nutfah contains already mixed semen; furthermore, the embryo has been already figured. It remains then to define what ʻalaqah represents for Avicenna. Given the brevity of the argued quotation, we can imagine that the drop of blood, which was formed at the ninth day, starts to spread throughout the nutfah, until the latter gets filled totally with blood then becomes coagulated blood. In order to summarize Avicenna’s point of view we can say that the author distinguishes the following three phases:

1. The formation of the nutfah – seminal fluid (which takes almost six or seven day);
2. The appearance of a drop of blood accompanied with the first features and lines (at the ninth day);
3. Total transformation of the nutfah into ʻalaqah - coagulated blood (at the fifteenth day).
For this term al-Hilālī and Bausani give similar translation. The first renders ‘alāqaḥ as ‘clot’ and/or a piece of a thick coagulated blood. Also Bausani translates it as ‘grumo di sangue’ (blood clot). Anyway, this was the idea widely held at the time; in other words the embryo was thought like blood clot during its earliest stages. However, another broader interpretation of this word can be possible. As seen before, leech is one of the meanings of ‘alāqaḥ in Arabic. So we propose that the word ‘alāqaḥ should not be understood literally but metaphorically. Thereby, the word could be interpreted as leech or as something similar. In fact, in this phase the nutfah clings to mother’s uterine wall and begins to get nutrients from it. In this sense it is like a leech that attaches to (ta’laqau) something and sucks substances from the bloodstream. And this is what the verb ‘alāqa means. It is not accident that Ibn Kaṭīr describes ‘alāqaḥ as a clot of blood similar to a rectangular leech. So our point is to interpret ‘alāqaḥ as ‘clingy clot-like leech’ since this second phase begins when the nutfah attaches to the uterine wall to suck nutrients from mother’s bloodstream. After the analysis we propose that ‘alāqaḥ in the Quranic verse is related to the blood, which means that it is fluid. Precisely, it is semifluid for being in condensed state. Compared to the first phase, the substance has undergone change. It is not water any more, but blood. It also has had a change of state. The substance is not fluid, but something denser. In other words, it becomes coagulated.

Muḍghah

After the ‘alāqaḥ the embryo continues to develop and turns into muḍghah through the third stage: “We made the ‘alāqaḥ muḍghah” (Qur’an 23:14). Muḍghah is noun and derives from the root ma-ḍa-gh-a which means ‘to chew’ and ‘to masticate’. The aforementioned dictionaries give this meaning for the word:

1. The amount of something that mouth can hold.
This term does not give rise to a great debate. The scholars are of a similar opinion. Ibn Kathir presumes that mudghah is like a piece of flesh that has no shape or features. Al-Qurtubi says that “it’s a mouthful of flesh”. On the other side, mudghah for Avicenna is similar to a piece of flesh, where some shapes and features start to appear and three organs (the heart, the liver and the brain) are almost complete. This phase is different because its substance has defined limits and with the first organs almost formed. It looks like a piece of flesh, not liquid anymore neither solid. The mudghah seems like a tender mass or a group of aggregate elements. It is interesting to quote Shawqi’s point of view concerning this phase. He argues that medieval commentators have considered mudghah as a chewed lamp of flesh; but “this could be correct in form and not in substance”. Shawqi reiterates that the commentators could be right when they described mudgha as a piece of flesh, if they only considered its external shape. But it would be completely inaccurate, if they pointed its consistency, since the muscle cells (the flesh) appear after the bones have grown.

Before going further in our analysis, it is appropriate to focus on some details of the Quranic verse under discussion. In the text, there are two coordinating conjunctions: thumma and fa. Both mean ‘and’ or ‘then’ and are used for expressing two events which are one after another but in different way. Thumma coordinates two actions that are separated by a certain distance of time. Meanwhile, it expresses consequence and result. Fa coordinates two things or events that are connected and follow one after the other; moreover, they have common characteristics. In “Then (thumma) We made the nutfah into ‘alaqah” (Qur’an 23:13) the use of thumma is suitable since there is a distance of time, space and different function between nutfah and ‘alaqah. Nutfah takes time before turning into ‘alaqah. They are also located in different places. Actually, the nutfah originates in the uterine tube and only some days later it reaches the
womb and clings to the uterine wall then becomes ‘alāqah. While fa is used to coordinate ‘alāqah and mudghah in “Then (fa) We made the ‘alāqah mudghah” (Qur’an 23:13) since they represent two consecutive phases. Both the two entities are part of a linear sequence and share common characteristics: they are semisolid substance, able to get nutrients.

Going back to the analysis of the third term, we propose that in these Quranic verses mudghah means “soft mass”. Accordingly, the state has changed again. Now it is an aggregated matter that is not solid but compact. It is no more blood but perfect mass with clear borders. Nevertheless, it is not solid. But it will be followed by a solid state. In other words, bones grow then muscular tissue (flesh) begins to grow around. The following table summarizes the entire process of embryogenesis, which we read in the verse:

<table>
<thead>
<tr>
<th>Qur’an</th>
<th>1) Nuṭfah</th>
<th>2) ‘Alaqah</th>
<th>3) Mudghah</th>
<th>4) Bones–flesh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substance</td>
<td>Water (seminal fluid)</td>
<td>Blood (coagulated)</td>
<td>Soft mass</td>
<td>Bones–flesh</td>
</tr>
<tr>
<td>State</td>
<td>Fluid</td>
<td>Semifluid</td>
<td>Aggregated</td>
<td>Solid</td>
</tr>
</tbody>
</table>

**The Greek theories of the embryo before the revelation of Qur’an**

It is strangely enough to find such a sophisticated theory in the Qur’an. Moreover, it is surprising to see how Avicenna, as we demonstrated before, had to make little modifications to reconcile what we read in the Qur’an to the Greek theories of embryogenesis process. At this point one might wonder if it is possible to compare the Quranic theory of generation to the ones we read in the Greek texts. This is what we will do in this paragraph. Regarding the ancient Greek medicine, we will take into consideration two theories:

a. The single-seed theory (the vase theory)

b. The double seed-theory (the bisexual seed theory)
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The first theory held that the procreative force exists in male’s semen which is active and warm. Thereby, the role of the woman is similar to the moist vase which receives passively the seed and gives it nutrients during the early stages. Aristotle was the first to advocate and amplify the success of this theory which dates back to pre-Socratic physiologists. According to the second theory, the procreative force exists in both male and female seeds (the double-semen theory). The embryo comes out from two mixed-seeds. Each one has physical characteristics that can be transmitted to descendants. Besides, each of them carries within male and female characteristics (the bisexual-seed theory). This theory is present in one of the texts of the Hippocratic Corpus, known as *De natura pueri*, also in the *De Semine* of Galen. Here we can distinguish two camps: the first is represented by Aristotle (philosopher), the second one is represented by Galen and physicians. In fact, during the Islamic Golden Age the Greek medical texts were well known to the Arabs. They also translated the *De natura pueri* into Arabic. Not only that, but the Arabic version had a wide circulation. In this text we read a particular description of the embryo development that coincides largely with the Quranic one. According to the Hippocratic author, the embryo development goes through these phases: first, two seeds (both fertile) mingle in the woman womb; second, the fluid coagulates; third, a membrane forms (delimitation of the mass) and the embryo clings to the uterus and gets nutrients through a protrusion; fourth, the fluid turns into blood. Finally, the latter becomes flesh. In the following table we summarize this process and compare it to the one which is described in the abovementioned Quranic verses:

<table>
<thead>
<tr>
<th><em>De natura pueri</em></th>
<th>Substance</th>
<th>State</th>
<th>1) Mingled semen</th>
<th>2) Condensed semen</th>
<th>3) A (thick and defined) membrane comes out</th>
<th>4) Blood -flesh -bones</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Substance</strong></td>
<td><strong>State</strong></td>
<td><strong>1)</strong> Fluid</td>
<td><strong>2)</strong> Semifluid</td>
<td><strong>3)</strong> Semifluid (with external borders)</td>
<td><strong>4)</strong> Solid</td>
<td></td>
</tr>
<tr>
<td><strong>State</strong></td>
<td><strong>1)</strong> Fluid</td>
<td><strong>2)</strong> Semifluid</td>
<td><strong>3)</strong> Semifluid (with external borders)</td>
<td><strong>4)</strong> Solid</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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As we notice the Greek text and the Quranic verses have things in common. In both texts the first phase is characterized by a fluid state in which two seeds are mingled forming the embryo. In the second phase, the fluid is condensed. In the third phase, a defined boundary surrounds the condensed fluid, which means that the substance is distinguished from the rest. Finally, the substance is perfectly consolidated and ready for becoming flesh.

On the other hand, there are some differences. First, the Greek text refers to the blood only in the fourth phase, while in the Quranic verses the blood appears in the second one. Second, according to the Greek text, flesh grows out before bones. In spite of these differences, the fact remains that the Greek text and the Quranic verses we highlighted above fall into the same general framework. These small differences do not alter the main discourse.

**Conclusions**

Now let’s record the questions which we tried to answer in this paper. The first one was whether the Qur’an talks about the development of the embryo. The answer is affirmative. There are different verses that tell about the embryogenesis in short but meaningful words. The verses that we examined distinguish four phases through which we can follow a gradual change of substance and state. Regarding the substance, the mixed semen that comes out from the mingle of male and female seeds (nuṭfah) transforms first into blood (‘alaqah), then into an aggregated mass (muḍgha), then into bones and flesh. As regards the state of the substance, it changes from fluid into dense fluid, then into aggregated substance and finally, it assumes a solid state.
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The second question that we answered was whether it was possible to make a comparison between these Quranic verses and the ancient Greek medical texts that talk about the theory of generation. We also gave a positive answer to this question. Particular attention was paid to the *De natura pueri*, a text from the *Hippocratic Corpus*. We demonstrated that (except for few differences) the text gives similar description of the embryo early phases. Moreover, one of the fundamental common ideas between the Quranic verses and the *De natura* is that they tell about mixed semen (seminal fluid) which comes out from the union between male and female seeds.

No doubt that the Greek medical texts belong to a so far era which is more ancient than the one in which the Qur’an was revealed. Almost a millennium separates the first Greek medical texts and the Quranic one. It is tempting to say that there is a relationship of dependency of the second text on the first one. This is a simple hypothesis that opens the field to further detailed study; however, it remains difficult to go along. But the fact that we wanted to highlight is that the Qur’an contains between its pages deep and surprising glimpses which are waiting to be discovered.

BIBLIOGRAPHY AND NOTES

1. The introduction is written by ELSAKAAN & LONGO. Pp. 923-932 are written by ELSAKAAN. Pp. 932-935. According to the Islamic traditions, the revelation of the Qur’an began in 610 when Prophet Muḥammad was 40 years old.

2. Religious scholars (‘ulamā’), whose role was to study the Qur’an and the Islamic texts, used to compare the Quranic verses with science in order to approve the correspondence between Islam and scientific facts besides the inimitableness of the Qur’an. In this paper we don’t follow these approaches.

3. The verses in English are cited from AL-HILALI, Taqi-ud-Din, Mohammad, *Translation of the Meaning of the Nobel Qur’an*. K.S.A., King Fahd Complex, Madinah, [No date], pp. 455-456 (23:12-14).


6. Ibid.


11. Actually, the comment of Ibn Kaṯīr is the reflection of a very important Quranic verse that says: “So let man see from what he is created (5) He is created from water gushing forth (6) Proceeding from between the backbone and the ribs (7)” Qur’an (86: 5-7).


13. Ibid.

14. Ibid.


16. Actually, the prevailing interpretation is the first one, supported by a Hadith (though its reference is weak) in which the Prophet Muḥammad gives his men this advice: “Choose the best for your nufah and marry compatible women”. AL-QAZWİNĪ, Ibn Māğah, *Sunann Ibn Māğah*. Ch. of Marriage, vol. III, book 9, hadith no. 1986. Hadith narrated by ʻĀ’isha and its reference is weak. The hadith is available on http://sunnah.com/urn/1320450 (Last access 20/10/2015 at 15.30).

17. The verses in English are cited from AL-HILALI, *Translation*, ref. note 3, p. 803 (76: 2).

18. In the specialized terminology of modern biology *amshāğ* indicates the spermatozoa and the ovum.

19. There is a linguistic debate about this word. For more information see IBN MANZÜR, *Lisān*, ref. note 4, vol. III, *Mashağa*.

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22. Avicenna’s quotations are translated from Arabic into English by Nesma Elsakaan.
23. Avicenna uses the same word when he talks about woman sexual fluids. However, in *Lisān al-ʻarab* maniyy means only the sperm.
25. In the excerpt which is cited in note 21, Avicenna uses the word maniyy to express the sperm.
31. Ivi, pp. 48-49.
32. There is more than one Quranic verse that talks about this stage. Besides, in the verse that we cited ‘alaqah is singular, while in the following one it is plural: “Read! In the name of your Lord Who has created (all that exists), He has created man from ‘alaqah” Qur’an (96:1). According to the Islamic tradition, this is the first verse revealed to Prophet Muḥammad. The verse is the first of the 96th sura of *al-ʻAlaq* (The Clot).
34. IBN KAṮĪR, *Tafsīr*… ref. note 10, p. 466.
35. AL-ṬABARĪ, *Ḡāmi’*… ref. note 8, p. 21.
37. Ibid.
38. Ibid.
40. Ivi p. 921, lines 61-63.
41. AL-ṬABARĪ, *Ḡāmi’*… ref. note 8, p. 21.
42. Unlike Avicenna, Shawqi thinks that ‘alaqah is the embryo’s second phase. “The cells of the nutfāh begin to divide […]. After that it attaches and penetrates the uterine wall. Thus it becomes ‘alaqah which takes nutrients from mother’s bloodstream” (The quotation is translated by Nesma Elsakaan). See SHAWQĪ, *Aṭwār*… ref. note 20, p. 56. Furthermore, he states that ‘alaqah may allude to the spermatozoa, which is similar to the leech in both form and
movement. So the word ‘alaqah could be allegorical. But we don’t agree with him as the spermatozoa already transformed and got mixed with female semen to form the nutfah.

43. IBN KATĪR, Tafsīr… ref. note 10, p. 466.
44. IBN MANZŪR, Lisān… ref. note 4, vol. III, maḍagha.
45. Ibid.
46. AL-QURTUBĪ, al-Ğāmi‘… ref. note 9, p. 313.
47. IBN SĪNĀ, al-Qanūn, ref. note 21, p. 757.
49. GERARD of Cremona translates mudgha into Latin as sodalitas, perhaps in reference to its nature no more fluid and liquid as the one of ‘alaqa. Cfr. AVICENNA, The Canon… ref. note 26, p. 921, lines 29-31.
50. SHAWQĪ, Aṭwār… ref. note 20, p. 56.
51. Ibid.
52. IBN MANZŪR, Lisān… ref. note 4, vol. I, tumma.
57. GIORGIANNI F., La traduzione… ref. note 56, p. 73.

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