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Are Irrational Numbers (Like the Square Root of the Number Seven) Applicable to Genetic Sequences?

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Abstract

According to Quantum Perspective Model, this article researches whether there is a link between the square root of **seven** numbers and the genetic sequences. At first, the square root digits of the number seven after the comma are added respectively. Secondly, the resulting sum corresponds to the nucleotide bases, the results obtained in this way are expressed as nucleotide bases. (**A, T, C, G, and U**). (**A**) Adenine, (**T**) Thymine, (**C**) Cytosine, (**G**) Guanine, (**U**) **Uracil**. From this point of view, when the first four hundred and fifty digits of the square root of the number seven after the comma are calculated, the gene sequence is obtained as follows: [**GATTUAAGUTAATATTAUTAGTTTGATT**]. Thirdly, after researching this sequence at NCBI (National Biotechnology Information Center), the search result is similar to **bony fishes**, especially ***Danio rerio*** (zebrafish). Fourthly, the genetic codes of zebrafishes were found to be similar to human genetic codes. Lastly, some repetitions were detected exactly like this: as "**GAT**" and "**UTA**". In summary, the connection between these results and the square root of the seven in mathematical science and the genetic codes in biochemistry shed light on explaining irrational numbers.

Subject Areas

Biochemistry, Mathematics, Number Theory

Keywords

Quantum Perspective Model, Biochemistry, *Danio rerio*, *Danio aesculapii*, Timema, the Square Root of Seven and
NCBI (National Biotechnology Information Center)

1. Introduction and Calculation of the Square Root of Seven numbers

1.1. Introduction

The relationships between numbers and genetic codes are not only research with the square root of the number two [1] and but also researched with the square root of the number three [2] and the square root of the number five [3], too from the Quantum Perspective Model [4], this paper attempts to search the relationships between the square root of the number seven and the genetic codes.

1.2. Calculating the Square Root of Seven

The square root of seven =

2.645751311064590590501615753639260425710259183082450180368334459201068823;

2302836277603928864745436106150645783384974630957435298886272147844273905;

5588010772271715072972832389229968959486508726070097805420372382802371 59;

4110034193911600157852559630594574103515239680271640737379907404158151990440347431;

9453671399730597005051399692237545616097119027378154991633288287704000 65757;

0674651963497752083793818114613090876473786595624330579947981281632307054 [5].

2. Methods and Discussion

2.1. Methods

The chemical structures of bases include Carbon (**C**), Nitrogen (**N**), Oxygen (**O**), and Hydrogen (**H**). **Calculation of bases with chemical atoms** (See also **Table 1**) (Ölmez T, 2020) [6].

The atomic numbers of them: Carbon (**C**): 6, Nitrogen (**N**): 7, Oxygen (**O**): 8, Hydrogen (**H**): 1 (Wieser E M *et al.*, 2013) [7]. The chemical structures of bases (**A, T, C, G, and U**) are shown below (Ölmez T, 2020) [6].

Table 1. Representation of nucleotide bases (A, T, C, G and U) in chemical atoms.

ATOMS/NUCLEOTIDE BASES	*C* = 6	*H* = 1	*O* = 8	*N* = 7	*SUM*
ADENINE: $C_5H_5N_5$	5	5	-	5	70
THYMINE: $C_5H_6N_2O_2$	5	6	2	2	66
CYTOSINE: $C_4H_5N_3O_1$	4	5	1	3	58
GUANINE: $C_5H_5N_5O_1$	5	5	1	5	78
URACIL: $C_4H_4N_2O_2$	4	4	2	2	58

(**A**) Adenine: C5H5N5: **70**; (**T**) Thymine: C5H6N2O2: **66**, (**C**) Cytosine: C4H5N3O1: **58**, (**G**) Guanine: C5H5N5O1: **78**, and (**U**) Uracil: C4H4N2O2: **58** (Lodish H *et al*., 2018) [8].

2.2. Discussion

Every cell in our body contains genes, but only a certain subset of them is "turned on" or expressed in every cell. The amount of protein in each cell is controlled by a series of different processes. Now, if we analyze the genetic languages with the lowest level of *information processing*, it is the language of DNA and RNA with four nucleotide base alphabets and the language of proteins with twenty amino acid alphabets (Jonathan S, 2005) [9]. *Genetic information* is stored in DNA, the mobile messenger nucleic acid is transcribed into RNA and translated into amino acid sequences, which are then folded into proteins. Now, if we look at the ***Quantum Perspective Model*** starting from the amino acid class in the genetic code; The universal triplet has significant degeneration in genetic codes, with 64 codons (Penrose R *et al*., 2008) [10]. The reason it's called the QUANTUM PERSPECTIVE MODEL, which evokes quantum mechanics, implies that the universe is effectively computing not only at the most microscopic level but also at larger scales (Penrose R *et al*., 2008) [10].

3. Calculation of the Square Root of Seven Numbers and Genetic Codes

The first four hundred and fifty digits of the square root of seven after the comma are here:

2.64575131106459059050161575363926042571025918308245018036833445920106882 3;

2302836277603928864745436106150645783384974630957435298886272147844273905;

5588010772271715072972832389229968959486508726070097805420372382802371 59;

4110034193911600157852559630594574103515239680271640737379907404158151990440347431;

9453671399730597005051399692237545616097119027378154991633288287704000657 57;

0674651963497752083793818114613090876473786595624330579947981281632307054 [5].

At first, the first group of the square root numbers of seven after comma was taken. For example, 6, 4, 5, 7, 5, 1, 3, 1, 1, 0, 6, 4, 5, 9, 0, 5, 9, 0, 5, 0, 1, …and so on. Secondly, all decimal numbers are subjected to the addition process, respectively. (6+4+5+7+5+1+3+1+1+0+6+4+5+9+0+5+9+0+5+0+1 = **77**). The sum of the first group of the root square numbers of seven after comma is "**77**". Just like as in (**G**) Guanine: 78 (See also **Table 1**).

The **first** group of the root square numbers of seven after comma:

6+4+5+7+5+1+3+1+1+0+6+4+5+9+0+5+9+0+5+0+1 = 77 (**G**) Guanine: **78**
The **second** group of the root square numbers of seven after comma:
6+1+5+7+5+3+6+3+9+2+6+0+4+2+5+7 = 70 (**A**) Adenine: **70**
The **third** group of the root square numbers of seven after comma:
1+0+2+5+9+1+8+3+0+8+2+4+5+0+1+8+0+3+6 = 66 (**T**) Thymine: **66**
The **fourth** group of the root square numbers of seven after comma:
8+3+3+4+4+5+9+2+0+1+0+6+8+8+2+3 = 66 (**T**) Thymine: **66**
The **fifth** group of the root square numbers of seven after comma:
2+3+0+2+8+3+6+2+7+7+6+0+3+9 = 58 (**U**) Uracil: **58**
The **sixth** group of the root square numbers of seven after comma:
2+8+8+6+4+7+4+5+4+3+6+1+0+6+1+5 = 70 (**A**) Adenine: **70**
The **seventh** group of the root square numbers of seven after comma:
0+6+4+5+7+8+3+3+8+4+9+7+4 = 68 (**A**) Adenine: **70**
The **eighth** group of the root square numbers of seven after comma:
6+3+0+9+5+7+4+3+5+2+9+8+8 = 69 (**A**) Adenine: **70**
The ni**nth** group of the square numbers of seven after comma:
8+6+2+7+2+1+4+7+8+4+4+2+7+3+9+0+5 = 79 (**G**) Guanine: **78**
The t**enth** group of the root square numbers of seven after comma:
5+5+8+8+0+1+0+7+7+2+2+7+1+7 = 60 (**U**) Uracil: **58**
The **eleventh** group of the root square numbers of seven after comma:
1+5+0+7+2+9+7+2+8+3+2+3+8+9 = 66 (**T**) Thymine: **66**
The **twelfth** group of the root square numbers of seven after comma:
2+2+9+9+6+8+9+5+9+4+8 = 71 (**A**) Adenine: **70**
The **thirteenth** group of the root square numbers of seven after comma:
6+5+0+8+7+2+6+0+7+0+0+9+7+8+0+5 = 70 (**A**) Adenine: **70**
The **fourteenth** group of the root square numbers of seven after comma:
4+2+0+3+7+2+3+8+2+8+0+2+3+7+1+5+9 = 66 (**T**) Thymine:**66**
The **fifteenth** group of the root square numbers of seven after comma:
4+1+1+0+0+3+4+1+9+3+9+1+1+6+0+0+1+5+7+8+5+2 = 71 (**A**) Adenine: **70**
The **sixteenth** group of the root square numbers of seven after comma:
5+5+9+6+3+0+5+9+4+5+7+4+1+0+3 = 66 (**T**) Thymine: **66**
The **seventh** group of the root square numbers of seven after comma:
5+1+5+2+3+9+6+8+0+2+7+1+6+4+0+7 = 66 (**T**) Thymine: **66**
The **eighteenth** group of the root square numbers of seven after comma:
3+7+3+7+9+9+0+7+4+0+4+1+5+8+1 = 68 (**A**) Adenine: **70**
The **nineteenth** group of the root square numbers of seven after comma:
5+1+9+9+0+4+4+0+3+4+7+4+3+1 = 58(**U**) Uracil: **58**
The **twentieth** group of the root square numbers of seven after comma:
9+4+5+3+6+7+1+3+9+9+7+3 = 66 (**T**) Thymine: **66**
The **twenty-first** group of the root square numbers of seven after comma:
0+5+9+7+0+0+5+0+5+1+3+9+9+6+9+2 = 70 (**A**) Adenine: **70**
The **twenty-second** group of the root square numbers of seven after comma:
2+3+7+5+4+5+6+1+6+0+9+7+1+1+9+0+2+7+3 = 78 (**G**) Guanine: **78**
The **twenty-third**group of the root square numbers of seven after comma:

7+8+1+5+4+9+9+1+6+3+3+2+8 = 66 (**T**) Thymine: **66**

The **twenty-fourth** group of the root square numbers of seven after comma:

8+2+8+7+7+0+4+0+0+0+6+5+7+5+7 = 66 (**T**) Thymine: **66**

The **twenty-fifth** group of the root square numbers of seven after comma:

0+6+7+4+6+5+1+9+6+3+4+9+7 = 67 (**T**) Thymine: **66**

The **twenty-sixth** group of the root square numbers of seven after comma:

7+5+2+0+8+3+7+9+3+8+1+8+1+1+4+6+1+3 = 77 (**G**) Guanine: **78**

The **twenty-seventh** group of the root square numbers of seven after comma:

0+9+0+8+7+6+4+7+3+7+8+6+5 = 70 (**A**) Adenine: **70**

The **twenty-eighth** group of the root square numbers of seven after comma:

9+5+6+2+4+3+3+0+5+7+9+9+4 = 66 (**T**) Thymine: **66**

The **twenty-ninth** group of the root square numbers of seven after comma:

7+9+8+1+2+8+1+6+3+2+3+0+7+0+5+4 = 66 (**T**) Thymine: **66**

This sequence can be shown as [**GATTUAAGUTAATATTAUTAGTTTGATT**]. Let me try to explain this sequence with the "**Quantum Perspective Model**". For example, The **first** group of the square root of seven after comma is equal to Guanine (**G**): 77 with the lack of one "1" Hydrogen bond (**H:1**) (Remember, See Table 1; Guanine (**G**): 78). This result may mean the sequence of the square root of seven in groups [**GATTUAAGUTAATATTAUTAGTTTGATT**]. The **fifteenth** group of the square root of seven after the comma is regarded as Adenine (A) with one more Hydrogen bond (**H:1**); Adenine: 71. (Remember, See Table 1; (**A**) Adenine:70) (Because the **deviations** in the calculation of the square root of seven numbers can be derived from the Cytosine (**C**)—Guanine (**G**) Hydrogen bonds because of Cytosine (**C**)—Guanine (**G**) pairs with by *three* hydrogen bonds. Adenine (A) pairs with Thymine (T) by *two* hydrogen bonds [6]. The reason for the lack/more of hydrogen bonds: **Hydrogen bonding** is a very versatile attraction (Ölmez T, 2020) [6]. Hydrogen bonds are relatively *weak and easily broken* by increasing hardness (Farrell R E, 2010) [11].

4. Results

After searching the square root of the number seven with the National Biotechnology Information Center (NCBI) databases [12], some conceptual relationships with **bony fishes** can ultimately be found. Types of **bony fishes** are based on ***Danio rerio*** (zebrafish) (See Figure 1). Types of other living creatures are eudicots, walking sticks, ***Danio aesculapii***, flies beetles, moths, butterflies, lice, bivalves, roaches, hawks and eagles, caddisflies, ***Timema tahoe***, ***Timema bartmani*** and carnivores. Another interesting result of NCBI is ***Timema shepardi***, an animal that has not engaged in sexual reproduction for many years and has the longest known asexual period [11] (See Figure 2).

5. Conclusions

At first, the result of this research can be summarized as the expression of root

Danio rerio genome assembly, chromosome: 8	Danio rerio	42.1	235	100%	0.98	100.00%	55941223	LR812045.1
Danio rerio genome assembly, chromosome: 8	Danio rerio	42.1	237	85%	0.98	100.00%	51589891	LR812601.1
Danio rerio strain Nadia (NA) genome assembly, chromosome: 8	Danio rerio	42.1	271	85%	0.98	100.00%	53615831	LR812576.1
Danio rerio strain Cooch Behar (CB) genome assembly, chromosome: 8	Danio rerio	42.1	241	85%	0.98	100.00%	53882377	LR812551.1
Diploptera punctata clone 19Y milk protein mRNA, partial cds	Diploptera pun...	42.1	42.1	89%	0.98	96.00%	649	AY448005.1
Accipiter gentilis genome assembly, chromosome: 17	Accipiter gentilis	40.1	108	100%	3.9	100.00%	31036983	OV839378.1
Limnephilus rhombicus genome assembly, chromosome: 22	Limnephilus rh...	40.1	345	100%	3.9	100.00%	46446577	OV815292.1
Macaria notata genome assembly, chromosome: 27	Macaria notata	40.1	72.4	85%	3.9	95.83%	9005937	OV656751.1
Brassicogethes aeneus genome assembly, chromosome: 4	Brassicogethe...	40.1	736	100%	3.9	100.00%	61642216	OV121135.1
Sphingobacterium sp. SRCM116780 chromosome, complete genome	Sphingobacteri...	40.1	40.1	71%	3.9	100.00%	4282846	CP090446.1
Meles meles genome assembly, chromosome: 13	Meles meles	40.1	74.3	85%	3.9	100.00%	87850455	OV277454.1
Notodonta ziczac genome assembly, chromosome: 4	Notodonta ziczac	40.1	40.1	71%	3.9	100.00%	14050355	OU974041.1
Calonectria ilicicola strain GDYJ169 chromosome 10	Calonectria ilic...	40.1	110	85%	3.9	95.83%	4267126	CP085834.1
Rhizophagus irregularis strain A1 chromosome 4	Rhizophagus ir...	40.1	176	82%	3.9	100.00%	6036189	CP080923.1
Rhizophagus irregularis strain C2 chromosome 4	Rhizophagus ir...	40.1	142	82%	3.9	100.00%	6439466	CP080888.1
Rhizophagus irregularis strain B3 chromosome 4	Rhizophagus ir...	40.1	142	82%	3.9	100.00%	5903266	CP080856.1
Melinaea marsaeus rileyi genome assembly, chromosome: 13	Melinaea mars...	40.1	406	89%	3.9	100.00%	25081093	OU911094.1
Synanthedon vespiformis genome assembly, chromosome: 3	Synanthedon v...	40.1	40.1	71%	3.9	100.00%	12113659	OU906948.1
Lasiommata megera genome assembly, chromosome: 14	Lasiommata m...	40.1	205	96%	3.9	100.00%	17193394	OV743321.1

Figure 1. The NCBI (National Center for Biotechnology Information) result for nucleotide sequence "**GATTUAAGUTAATATTAUTAGTTTGATT**" [13].
(https://blast.ncbi.nlm.nih.gov/Blast.cgi?PROGRAM=blastn&PAGE_TYPE=BlastSearch&LINK_LOC=blasthome)

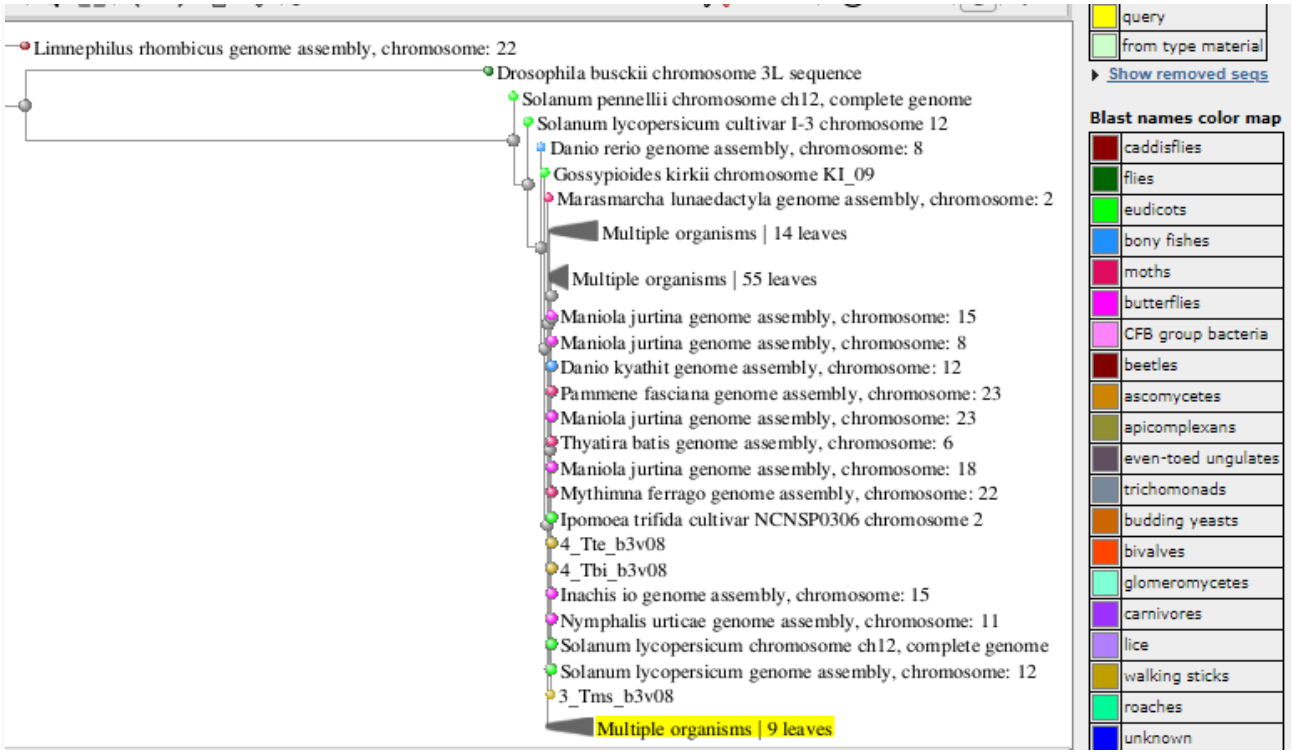

Figure 2. The NCBI (National Center for Biotechnology Information) result blast tree view widget for "**GATTUAAGUTAATATTAUTAGTTTGATT**" nucleotide sequence [14].
(https://www.ncbi.nlm.nih.gov/blast/treeview/treeView.cgi?request=page&blastRID=32WBVGR8016&queryID=lcl|Query_51663&entrezLim=&ex=&exl=&exh=&ns=100)

seven numbers after commas by genetic codes. Secondly, digits after the comma were thought to be an indicator of genetic codes. As a common feature of Bio-

chemistry and Mathematical sciences, NCBI blasts are obtained [12]. Because these results include both bony fishes and especially ***Danio Rerio*** (zebrafish) (See **Figure 1**), some genetic stem cells have also been studied in zebrafish (*Danio rerio*) in studies with functional macrophages (Takahashi K, 2001) [15]. Zebrafish not only have muscarinic in their nervous system but also, receptor isoforms not previously identified in other species are present in zebrafish (Nuckels R J, 2006) [16] and (Abrams P *et al*. 2006) [17]. Although there are no specific subtypes of muscarinic acetylcholine receptors, detected in the zebrafish retina. An enzyme was studied in the developing zebrafish brain and retina. But more work may be needed to confirm the studies and experiment with zebrafish (Nuckels R J, 2006).

In biology-related experiments and gene sequencing, it is an excellent favorite example [18]. The common feature of pi numbers [4] and Euler numbers [19] [20] along with the square of the speed of light is that the NCBI results are bony fish [21] [22]. Let alone this result, NCBI result for CAAT Box also consists of **bony fishes**, too [6]. Thirdly, the genetic codes of the square root of two [1] and the genetic codes of the square root of three consist of the same NCBI blast results as the same as bony fishes [2]. Fourthly, although there is no periodic sequence of irrational numbers, in this paper a periodic sequence is obtained in terms of genetic sequences, just as in "**GAT**" and "**UTA**". Remember, this sequence can be shown as [**GATTUAAGUTAATATTAUTAGTTTGATT**]. Finally, the results of calculating the square root of seven numbers with genetic codes can be expressed by chemical formulas of nucleotide bases. It is stated by Steward that life is between genes and Mathematics (Stewart I, 1999) [23]. Indeed, the relationships between *Mathematics* and *Genetics* have been described by a molecular-genetic alphabet matrix. According to the quantum perspective model, just like this matrix, is it possible to define the square root of the number seven as genetic sequences? (Petoukhov S V, 2011) [24].

Conflicts of Interest

The author declares no conflicts of interest.

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