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Palindromes in Tamil literature

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Abstract

Palindrome is one of the decorative aspect of the poetry. This is a creative and aesthetic talent of a poet. Tamil is the only Language which has poetry in Palindromic pattern in the yearly 7th Century. Word Palindrome, Line Palindrome, Hymn Palindrome, Number Palindrome are some of the varieties of Palindromes. Hymn Palindrome in Tamil is called as “Maalai Maatru”. Thirugnana Sambandhar a poet of 7th Century, had composed not only one Hymn But 11 couplets. It is really an achievement in the field of Poetic World. Tamil

Literature has also poetry with Palindromic Numbers. The “ThiruEzhukootrirukkai “ composed by many Tamil Poets 1) Thirugnana Sambandhar 2) Nakkirar 3) Arnagiri Naathar 4) Thiru Mangai Aalwar shows this Palindromic number Pattern. Arichalur Inscriptions of Erode shows Palindromic pattern in the field of Music, which belongs to 2nd Century. Raagas, Swara patterns are also coined in the Palindromic pattern in Music.

Keywords: Yathi, Chaplets, Maalai Maatru, Chitrakavi, Thiru Ezukootrirukkai, Seerkaazhi, Arichalur Inscriptions, Raagaas, Swaraas, Genetics

Introduction: Arts and Poetry

There are 64 Arts mentioned in ancient Literature. Arts play an important role in promoting culture and progress in life. The fine arts appeal to the sense of beauty in us. They are music, poetry, painting, drawing, sculpture, and Architecture. Writing poetry or Composing a Composition is one of the fine arts. A poetry is a beautiful imagination of a poet. Its soulful words combine to form a wonderful work. The technical aspects of a poem are its Edugai - Repetition of Second Letter, Monai - Repetition of First Letter, Sandam- same sound syllables occurring in each word of the line or whole poem. Yamaham- same word is used in different meaning. Manipravaalam - employment of 2 or more languages. Yathi Pattern – adding or deleting phrases in a regular manner to give meaning, which gives beauty to the whole poem. They are the decorative aspects of the poem.. These creative aspects are meant for entertainment and aesthetic appreciation. One such aspect is Palindrome. We rarely observe Palindromic Words, simple Palindromic sentences in other languages of the world. But Tamil is the only Language which has poem, poetry in Palindrome. In 7th century Tamil literature, in Thirugnana Sambandhar’s Thevaram, Palindrome is seen in multiple Lines. Palindrome is not only seen as one poem but in the form of a whole Padhigam that is 10 or 11 Hymns in total.

Palindrome

The word Palindrome originally comes from the Greek language. It is made up of two words. The first word being Palin which translates to mean again. The second being Dromos translates to mean direction or way. The Palindrome when read Backwards will have the same pattern, layout, appearance, sound and meaning. For the use of Palindrome in English language, Ben Jonson was the first person who introduced the idea wayback in 17th Century. What is a Palindrome? A word or a line, verse, number, sentence etc., reading the same forward and backward. For example Madam, Malayalam, Racecar, in words and 11, 121, 131 etc., in numbers. Some Palindromic sentences are

1. Madam I’m Adam
2. Poor Dan is in a Droop.

The varieties of palindrome

1. The word Unit Palindrome

The word Unit Palindrome is one where the word or Sentence is read backwards in terms of the words and letters. The words Noon, Civic, Radar, Level, are examples of words which falls into this category. There are also sentences which might be classified as a word Unit Palindrome such as “ Fall Leaves after Leaves Fall “, “Queen are you Happy You are Queen”.

2. One Line Palindrome

The One Line Palindrome is one in which a sentence is read backwards in terms of the letters-example “was it a car or a cat I saw”

3. Number Palindrome

In this the Numbers can be read from either side. We will get the same number by reading it on both sides. The Palindromic Number is a number that is the number when written forward or backward gives the same number. For example 11, 33, 44, 101, 121, and so on.

4. Palindromic sequences

They are sequences made up of Nucleic Acids within double helix of DNA or RNA.

In Bio-Chemistry a region of DNA in which the sequence of Nucleotides is identical with an inverted sequence in the complementary strand GAATTC is a Palindrome of

CTTAAG.

Palindrome in latin

Sator arepo tenet opera rotas

This is the very first palindrome that was recorded and it is thought that it comes from around 70 AD. This is written in Latin whilst it is not entirely grammatically correct it is certainly for fun.

Palindrome in Tamil

In Tamil, a 7th century composer and poet Thiru Gnana Sambandhar had composed 11 couplets (a Padhigam) which consists of 11 hymns of 2 lines each. The whole 11 couplets is in the form of Palindrome. It is an achievement in the field of poetic world. Composing one single line or song is very challenging. But our 7th century Tamil poet Sambandhar had composed 11 couplets in Palindromic effect.

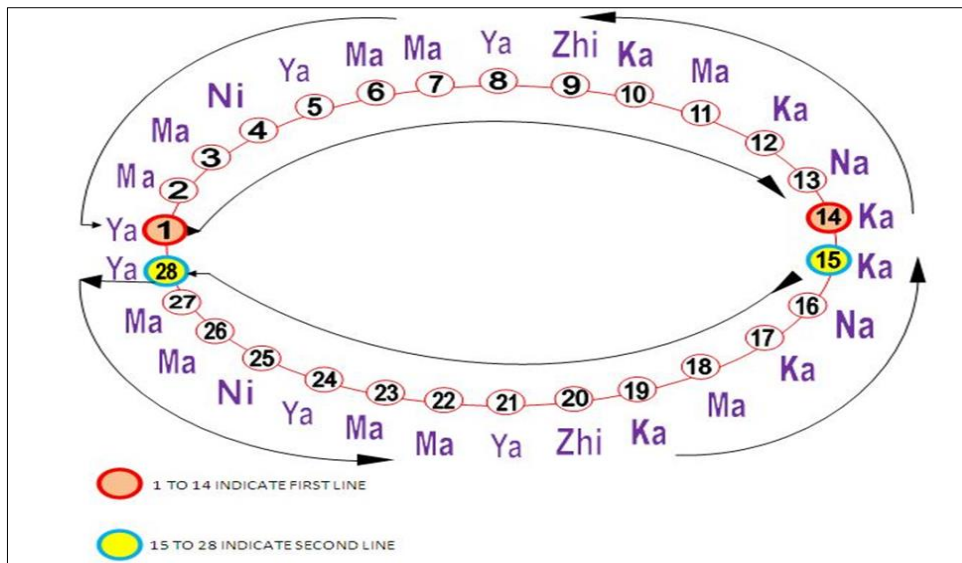


Fig 1: Structure of Palindrome

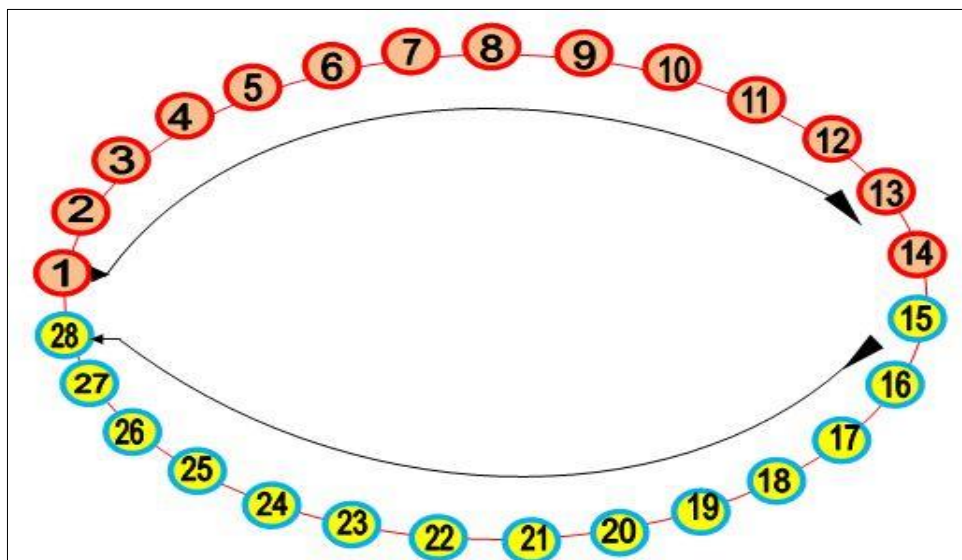


Fig 2: Chaplets

The Palindromic hymn of Thirugnanasambandhar

1. YaMaMaNi YaMaMa YaZhiKaMa KaNaKa
KaNaKaMa KaZhaYa MaMaYaNi MaMaYa
2. YaKaYaZhi KaYaKa TaYaRaRa TaYaYa YaYaTa Ra
RaYaTa KaYa KaZhi YaKaYa

3. TaVa MuVa TaSaKa ZhiNaTaNi YaMaMa MaMaYaNi
TaNaZhi KaSaTaVa MuVaTa
4. NiVaYaYa KaYaZhi KaVaVaNo VaRa Me MeRaVaNo
VaVaKa ZhiYaKaYa YaVaNi
5. YaKaLaMe YaKaZhi YaMeTaVi TaYaVi ViYaTaVi

- TaMeYa ZhiKaYaMe LaKaYa
6. MeLePoKa MeTeZhi KaLaLeKa LaNaYe YeNaLaKa LeLaKa ZheTeMeKa PeLeMe
 7. NiYe MaNi YeYaMa TaVeZhiKa NiTaNe NeTaNiKa ZhiVeTa MaYaYeNi MaYaNi
 8. NeNaVaRaViZha YaSaiZhiYe VeKadaLeRya LaUZhiKaKaZhiULaAri LeDagaVe YeZhisaiYaZhavi RaVaNaNe
 9. KaLeMeLe KaNiKa ZhiKaLeMa LeMePu PuMeLeMa LeKaZhi KaaNiKeLe MeLeKa
 10. VeRiUMeNava KaZhiyoYe YenaiNiNemada LokaraTe TerakaLeDamaNe ninaiYeYe YozhiKaVana MeuriVe
 11. Ne rakaZha mita YasazhiTa YenaniYenani LayuzhiKa KazhiuLanina YeninaYe TazhisaYatami zhakaraNe.
- In this the Hymns 8, 10 & 11 has short vowels instead of long vowels.

These hymns were sung at Seerkaazhi the birth place of Sambandhar. It has 11 couplets. Each Couplet has 2 Lines. Each Line is constructed with 14 Letters. Except 8, 10, 11 all the couplets are coined with long vowels. In the rest instead of one long vowels 2 Short Vowels are used. It is really amazing that the whole Padhigam is in Palindrome. This padhigam shows Sambandhar's extraordinary power of composing.

The song is called "MAALAI MAATTRU". Maalai is garland (Chaplets). Chaplet is a string of beads for counting in Prayers. Normally it is worn around the neck. This will be in the form of a circle, a circular ornament. This circle of beads has no end, if we start from one place after counting we will be reaching the same place that is to the (Starting point) again.

In the Tamil Palindrome hymn of Thirugnana Sambandhar, the first song of this hymn is analysed. [For clear understanding each letters are numbered]

Ya¹ Ma² Ma³ Ni⁴ Ya⁵ Ma⁶ Ma⁷ Ya⁸ Zhi⁹ Ka¹⁰ Ma¹¹ Ka¹² Na¹³ Ka¹⁴

Ka¹⁵ Na¹⁶ Ka¹⁷ Ma¹⁸ Ka¹⁹ Zhi²⁰ Ya²¹ Ma²² Ma²³ Ya²⁴ Ni²⁵ Ma²⁶ Ma²⁷ Ya²⁸

Normally if we read from 1 to 28, (ascending order) we get the whole song. As it is a Palindromic Song even if we read from 28 to 1, (discending order) we get the same whole song. According to Sambandhar "MAALAI MAATTRU" is one where A full circle is formed when counting from 1 to 28 and the same way in the reverse order i.e. 28 to 1. Hence Sambandhar has given the name MAALAI MAATTRU".

The first palindromic song of Sambandar is constructed with 14 letters. From the below sum and figure we can view the palindromic pattern of the song. The numbers 1-14 form the first line. The numbers 14-1 form the second line

First line (1-14)

Ya Ma Ma Ni Ya Ma Ma Ya Zhi Ka
 1 2 3 4 5 6 7 8 9 10
 Ma Ka Na Ka
 11 12 13 14

Second line (14-1) reverse order of the above first line

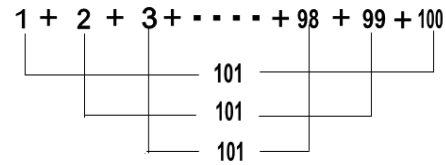
Ka Na Ka Ma Ka Zhi Ya Ma Ma Ya Ni
 14 13 12 11 10 9 8 7 6 5 4
 Ma Ma Ya
 3 2 1

It is interesting to note that there is another Palindromic pattern is seen inside the above Palindromic song i.e. the

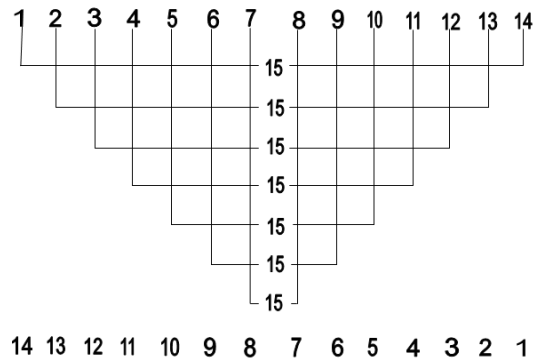
reverse order of first line becomes the second Line

According to one maths fact

"If you add up all the numbers between 1 to 100 consecutively then the total that you will reach is 5050"



The same fact is followed below to get 15 as a total for 1 to 14 numbers.



The fact used in the above is $n+1-n = \text{Expected number}$

$n + 1 - n = \text{Expected number}$

- 14+1=15-14 = 1
- 13+2=15-13 = 2
- 12+3=15-12 = 3
- 11+4=15-11 = 4
- 10+5=15-10 = 5
- 9+6=15-9 = 6
- 8+7=15-8 = 7
- 7+8=15-7 = 8
- 6+9=15-6 = 9
- 5+10=15-5 = 10
- 4+11=15-4 = 11
- 3+12=15-3 = 12
- 2+13=15-2 = 13
- 1+14=15-1 = 14

So we can come to a conclusion that the reverse order of the letters in the 1st line becomes the 2nd line. This is perfectly in a mathematical calculation. Sambandar of 7th century is the only person in the Tamil poetic filed to compose this type of songs He has composed not only one song but 11 songs in form of couplets which is also a Palindromic Number.

Number palindromes

Tamil Literature has also poems with Palondromic Numbers. With this number inside the Poem conveys a figure or diagram or Art. So it is called Chitra Kavi (Chitram is Art). A Palindromic Number is a number that is the same when written Forwards or Backwards. Some Palindromic Numbers are 11, 22, 33, 44, 101, 111, 121 etc.

In Tamil there is a poetic format called Thiru Ezhukootrirukkai which shows Palindromic Numbers from 1(one) to 7(seven) constructed in increasing and Decreasing Order to form pallindromic number paterns. This Palindromic Numbers are observed in Thiru Ezhukootrirukkai of Tamil Literature.This numbers can be read from right to left or left to right makes the same.

This Thiru Ezhukootrirukkai is composed by many poets like Thirugnana Sambandhar, Nakkirar, ArunagiriNadhar, and Thirumangai Aalwar. But Thirugnana Sambandhar is the first person to compose in this format who belongs to 7th Century.

Palindromic numbers in Thirugnana Sambandhar’s hymn

Sambandhar composed this Thiru Ezhukootrirukkai with 47 lines. In this we observe 6 rows of Palindromic number. This hymn praises Lord Shiva of Seerkaazhi.

The song starts as follows

Ooru vaayinai maa naangaarath
Theeriyal baayoru vin**mudal** boodhalam
Onedriya Irusudar Umbarkal Piravum

In the above song the numbers one, two are constructed as Oru, Ondru, mudal and Iru in Tamil words.

21 12
 321 123
 4321 1234
 54321 12345
 654321 123456
 7654321 1234567

First Row - 21 12 is a palindromic number
 Second Row 321 123
 Third Row 4321 1234
 Fourth Row 54321 12345
 Fifth Row 654321 123456
 Sixth Row 7654321 1234567

Like this All six rows shows palindromic numbers which can be read in both ways.

Palindromic numbers in Nakkirar’s poem

Nakkirar composed Thiru Ezhukootrirukkai in 55 lines. This praises Lord Shiva of Madurai. In this we Observe 7 rows of Palindromic Numbers.

The song starts as follows.

Orudambu Eiriru Aayinai **onedrupurinth**
Thonri Neerithal Konrai Soodinai
Moovilaich Choolam yendrinai
 Sudarunj chenni Mimisai
Irukote torumathi

The Palindromic patterns of Nakrirar

1-2 1
 1 2 3 2 1
 1 2 3 4 3 2 1
 1 2 3 4 5 4 3 2 1
 1 2 3 4 5 6 5 4 3 2 1
 1 2 3 4 5 6 7 6 5 4 3 2 1
 1 2 3 4 5 6 7 6 5 4 3 2 1

First Row 1-2-1
 Second Row 1 2 3 2 1
 Third Row 1 2 3 4 3 2 1
 Fourth Row 1 2 3 4 5 4 3 2 1
 Fifth Row 1 2 3 4 5 6 5 4 3 2 1
 Sixth Row 1 2 3 4 5 6 7 6 5 4 3 2 1
 Seventh Row 1 2 3 4 5 6 7 6 5 4 3 2 1. Last two rows are repeated

All rows shows palindromic numbers which can be read in both ways.

Palindromic numbers in Arunagiri Nadhar’s poem

Arunagirinadhar composed Thiru Ezhukootrirukkai in 29 lines. This praises Lord Muruga of Thiru Eragam. In this we observe 6 rows of Palindromic Numbers.

This Song starts as follows.

Oreuru vakiya thaarahap piramath
thoruvahaith thottrath **thirumara** peythi
onedraa yonri yiruvarir thoonri **moovaa** thaayinai

Palindromic pattern of Arunagirinathar

1
 1 2 1
 1 2 3 2 1
 1 2 3 4 3 2 1
 1 2 3 4 5 4 3 2 1
 1 2 3 4 5 6 5 4 3 2 1
 1 2 3 4 5 6 7 6 5 4 3 2 1

Palindromic numbers in the above structure

First Row 1 2 1
 Second Row 1 2 3 2 1
 Third Row 1 2 3 4 3 2 1
 Fourth Row 1 2 3 4 5 4 3 2 1
 Fifth Row 1 2 3 4 5 6 5 4 3 2 1
 Sixth Row 1 2 3 4 5 6 7 6 5 4 3 2 1

All six rows shows palindromic numbers which can be read in both ways.

Palindromic patterns in Thirumangai Alwar’s Thiruezhukootrirukkai

Thirumangai Alwar composed ThiruEzhukootrirukkai in 46 lines. This songs are in praise of Lord Vishnu. In this hymn we observe 6 Rows of Palindromic numbers. These numbers can be read on either side. We will get the same number while reading from left to right or right to left.

This starts as follows.

Oru Perunidhi **Irumalar** thavisil 1-2-1
Oru murai ayanai Yeendranai **Orumurai**
Iru sudar meedhini liyanga **mummadhi**
 ilangai **irukaal** valaiya **oru** silai 1-2-3-2-1

1 2 1
 1 2 3 2 1
 1 2 3 4 3 2 1
 1 2 3 4 5 4 3 2 1
 1 2 3 4 5 6 5 4 3 2 1
 1 2 3 4 5 6 7 6 5 4 3 2 1

The Palindromic Numbers seen in the above structures are 121, 12321, 1234321, 123454321, 12345654321, 1234567654321.

First Row 1 2 1
 Second Row 1 2 3 2 1
 Third Row 1 2 3 4 3 2 1
 Fourth Row 1 2 3 4 5 4 3 2 1
 Fifth Row 1 2 3 4 5 6 5 4 3 2 1
 Sixth Row 1 2 3 4 5 6 7 6 5 4 3 2 1

All six rows shows palindromic numbers which can be read in both ways.

Palindrome in inscriptions

Jathis are the words or letters used in dance and in turn they are played in percussion instruments. Arichalur is a place

seen in Northern Tamilnadu (In Kongu district). Now it is in Erode district. At Arichalur there is a natural cave called "Paandiyar Kuzhi" in Aandipparai of Nagamalai. On the floor of the cave there are three Tamil Inscriptions. They are in combination of "Vattaezhuththu and Brahmi". Archiological department says that the Inscriptions belongs to 4th century. Whereas Dr. AN.Perumal in his book "Tamilar Issai Varalaaru" confirms and reiterates that it belongs to 2nd century. (Tamilar Issai Book page no 343).

The Inscription has three parts.

First part of Inscription. 29- 2

Ta	Tai	Taa	Tai	Ta
Tai	Taa	Te	Taa	Tai
Taa	Te	Tai	Te	Taa
Tai	Taa	Te	Taa	Tai
Ta	Tai	Taa	Tai	Ta

The above table said is a Jathi Patterns or Sollukattu used in Percussion instruments. They are constructed in such a way like a square. They can be read from left to right, right to left, top to bottom, or bottom to top to form a Palindromic Pattern. In all the ways it depicts the same.

Second part of the Inscription. 29- 3

Tai	Ta	Tai	Ta	Tai
Ta	Tai	Ta	Tai	Ta
Tai	Ta	Tai	Ta	Tai
Ta	Tai	Ta	Tai	Ta
Tai	Ta	Tai	Ta	Tai

This Inscription also depicts Palindromic Pattern. They can be read from left to right, right to left, top to bottom, or bottom to top to form a Palindromic Pattern. In all the ways it depicts the same.



Fig 3: Inscription of Arichalur

Palindrome in Karnatic music

Palindromic Swaraas: Palindromic Swaraas are seen in Abyasa Gaana (Musical forms for Training) in Karnatic music. They are seen Sarali Varisai, Janta Varisai and Alankaaram and so on. All these lines can be read from left to right or both ways forms the same.

- First Sarali**
S R G M P D N S S N D P M G R S
- First Janta Varisai**
SS RR GG MM PP DD NN SS SS NN DD PP MM GG RR SS
- Eka Thaala Alankaaram (Chatusra Jati)**
SRGM RGMP GMPD MPDN PDNS
SNDP NDPM DPMG PMGR MGRS
- Thisra Jati Eka Taalam**
SRG RGM GMP MPD PDN DNS
SND NDP DPM PMG MGR GRS
- Agatha, Prathiagatha Gamaka Swaraas**
SR RG GM MP PD DN NS
SN ND DP PM MG GR RS

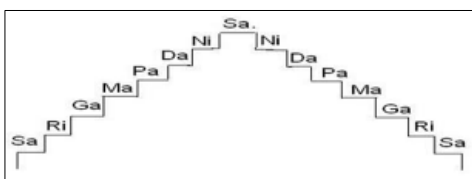


Fig 4: Arohanam

Fig 5: Avarohanam

Palindrome in Ragaas

All the 72 Melakartha Ragaas are in Palindromic paterns. They have the same Swaraas of Arohana and Avarohana. All 72 mela ragaas acquire the same pattern of swaraas both in Arohana and Avarohana.

Example

- Kanahaangi - S R1 G0 M1 P D1 N0 S S N0 D1 P M1 G0 R1 S
- HanumaThodi - S R1 G1 M1 P D1 N1 S S N1 D1 P M1 G1 R1 S
- Mayaa Malava Gowlai - S R1 G2 M1 P D1 N2 S S N2 D1 P M1 G2 R1 S
- Kalyaani - S1 R2 G2 M2 P D2 N2 S S N2 D2 P M2 G2 R2 S

Palindrome in genetics

A gene is the basic physical and functional unit of heredity and a sequence of Nucleotides in DNA. DNA is de-oxy Ribo Nucleic acid. The information in DNA is stored as a code made up of four chemical bases.

1. Adenine (A)
2. Guanine (G)
3. Cytosine (C)
4. Thymine (T)

These above Nucleobases in the Nuclie acid of DNA are represented by the letters G-C-A-T. DNA is a double helix structure which means that these are two strands of DNA. These are the Palindromic sequences made up of Nucleic acid within double helix of DNA. In genetics a region of DNA in which the sequence of Nuclotides are identical with an inverted sequence in the complimentary strand. GAATTC is a Palindrome of CTTAAG.

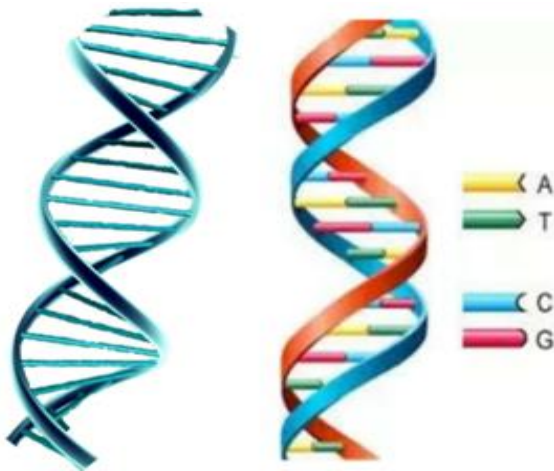


Fig 6: Structure of DNA

Conclusion

Palindromes shows the extra-ordinary Brilliance of the Poet and it also shows his new Creative skill and intelligent work in the poetic world. One of the main reason that Palindromes are used in written works is because they give the author a chance to make a more creative piece of writing which is also much more entertaining to read. The Palindromes may also be used in written works to play the part of a Brain teaser Exercise, both for the author and for the reader. The brilliant architectural nature of the Palindrmic song is amazing which adds a colourful feather to the crown of Thirugnana Sambandar, a great Tamil poet, musician of 7th century. Till now we are not able to find this type of poem or song in any language in this world.

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