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Revealing Patterns of the Universe and the Science Behind Beauty of Flowers Through Fibonacci sequence and Quasicrystals

K R Zala[1*] and Mansi I. Bhati[2]

[1]Department of Floriculture and Landscape Architecture, ASPEE College of Horticulture and Forestry , Navsari Agricultural University, Navsari, Gujarat, India.

[2]Department of Floriculture and Landscaping, College of Horticulture and Forestry, Punjab Agricultural University, Ludhiana, Punjab, India.

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Abstract

Everything arranged in nature considering from tiniest of atoms to mightiest of galaxies look random to us that we could hardly believe in any patterns interlinked between them. Every structure in the universe follows a specific pattern, a pattern which is still unknown by developed science. Many scientists in the past have tried to figure out that very pattern and have come up with different results with their supporting theories. There are numbers involved in this, right from our genome to formation of galaxies it follows a specific set of numbers which were discovered by an Italian scientist Leonardo da Pisa. And they are called as Fibonacci numbers. This Fibonacci number is directly linked with the golden ratio which makes everything look in shape. The following paper is aimed at figuring out the patterns of the objects and mathematics behind beauty of flowers and different living things.

Introduction

Why are flowers beautiful? Is everything in nature randomly arranged or is there any method to its madness? These are the questions which come in our minds at least once. We live in the world where we think there’s no pattern in the natural objects and hardly notice any repeated form.

An Italian scientist named Leonardo da Pisa in 1202 (also known as Fibonacci) discovered a sequence in which the sum of the previous two numbers in the sequence thus 1, 1, 2, 3, 5, 8, 13, and this sequence appear macroscopically, which is present at the cellular or sub-cellular levels of life forms. These numbers are called as Fibonacci numbers.

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Microtubules, cell wall and mechanical stress are involved in this coordination of development. Liquids crystals are common in plants with both cellulose and microtubules forming liquid crystalline phases under certain circumstances and DNA itself can generate liquid crystal phases.

What are quasicrystals?

Quasicrystals were first reported in 1984, in this case forbidden icosahedral symmetry from aluminum manganese alloys. There are cellular and sub-cellular Fibonacci fractals in plants, but we don't know what form they take. Quasicrystals are aperiodic formations with forbidden non-crystallographic symmetry. So it can demonstrate a mechanism by which the golden ratio might be introduced into biological systems.

Why flowers look beautiful?

Quasicrystals are common throughout the biological universe and they play a vital role in in animals and plant consciousness. It signifies that golden ratio is present in the stratum of consciousness in life forms.

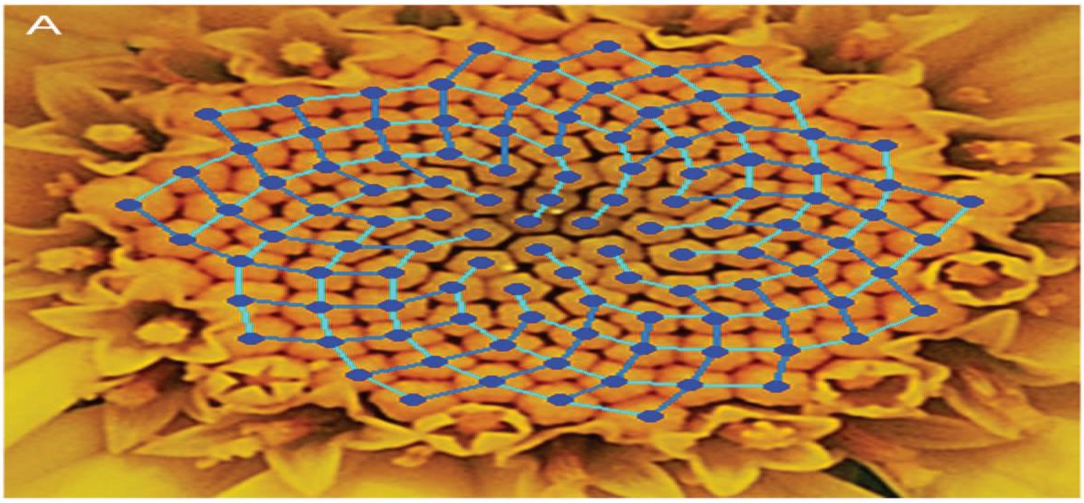
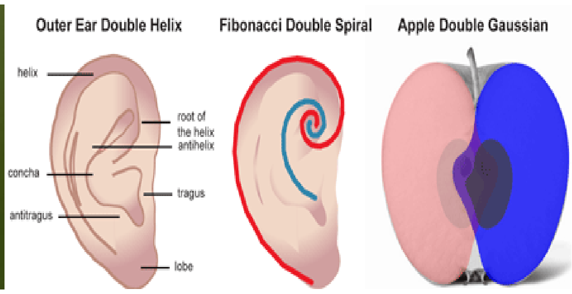


Figure: A flower showing Fibonacci organization. Spirals of florets are in groups of both 13 (green) and 21 (blue) which are consecutive Fibonacci sequence numbers.

Thus, when we look at a flower or work of art displaying golden ratio-based morphology there may be **a resonance with the stratum of our consciousness** itself which leads us to regard the flower or work of art as beautiful.

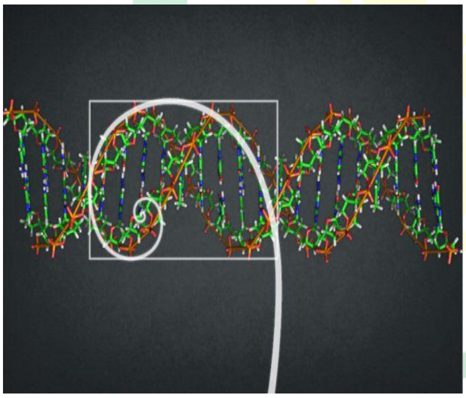
Quasisexual selection and Aesthetic selection:

The figure shows the orchid has developed to look like a female wasp **ornamentation** that is **attractive to the opposite sex**, leading to the male wasp to try to mate with it and thus the orchid is pollinated



DNA molecules

Fibonacci numbers can be seen even in the microscopic world. The DNA molecule measures 34 angstroms long by 21 angstroms wide for each full cycle of its double helix spiral. These numbers, 34 and 21, are numbers in the Fibonacci series, and their ratio 1.6190476 closely approximates Phi, 1.6180339



DNA double helical structure **Veins and veinlets following fibonacci sequence**

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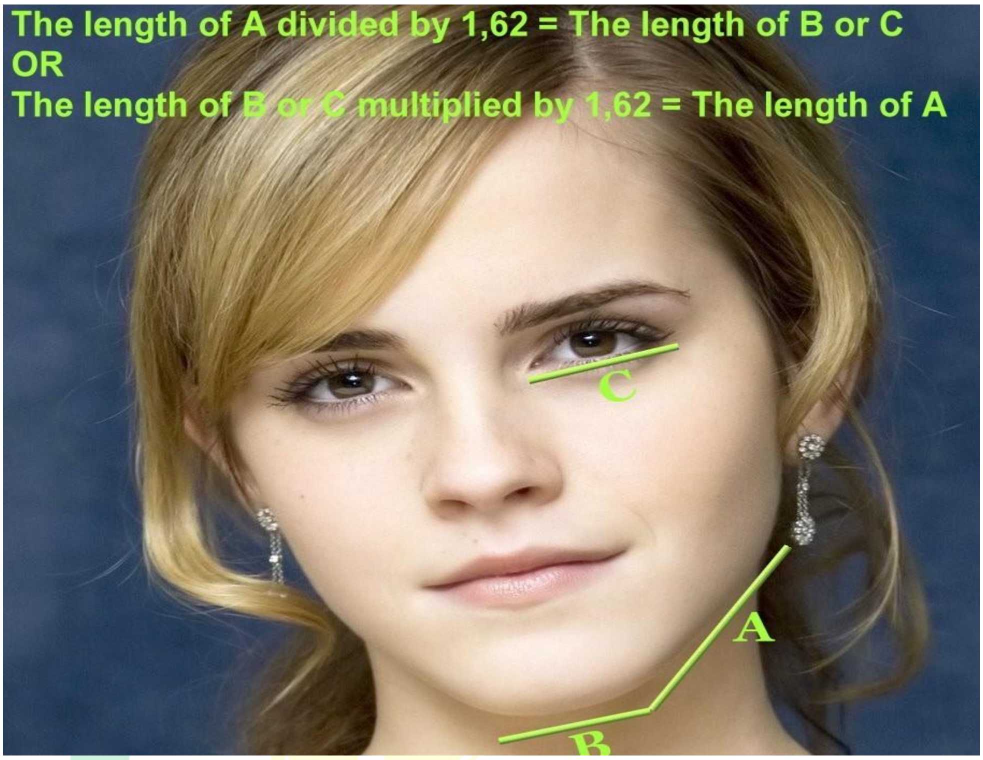
Figures showing golden ratio followed in the forms of natural objects

Rose Petals

Fibonacci spiral observed in Pineapple, banana and cauliflower.



The facial symmetry of famous Harry potter actress Emma Watson which follows the golden ratio.

Conclusion:

The resonance of Fibonacci- and golden ratio-based structures is what that makes life forms so beautiful at the sub cellular levels. Also these numbers resonate with the nervous system of the living beings.

Plants right from the beginning are using flowers constructed using Fibonacci sequences and the golden ratio to carry out pollination by attracting pollinators. It is also seen in the sexual selection of animals where structures such as a peacock's tail or a lion's mane are being used to attract mates.

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