FRACTALS IN PLANT LEAVES

PROJECT REPORT

submitted to Calicut University
In practical fulfillment of the requirements for the award of the Degree of

MASTER OF SCIENCE
IN PHYSICS

submitted by

AFA NAHAN T P

Reg. No : KVATMPH001

UNDER THE GUIDANCE OF

Dr. K. M. UDAYANANDAN

Department of Physics,
MES KEVEEYAM COLLEGE,
VALANCHERY

MARCH, 2021

Dedicated to my family

CERTIFICATE

Certified that work incorporated in the project entitled " FRACTALS IN PLANT LEAVES " is the bonafide work done under my supervision by AFA NAHAN T P , Reg. no : KVATMPH001, Department of physics, MES KEVEEYAM COLLEGE, VALANCHERY towards the practical fulfillmnt of the requirements for the award of the Master Degree in Physics during the period 2019-2021

Dr. K. M. Udayanandan (Retd.)

Associate Professor

Department of Physics

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Signature of External examiners:

1.

2.

CERTIFICATE

Certified that work incorporated in the project entitled " FRACTALS IN PLANT LEAVES " is the bonafide work done under my supervision by AFA NAHAN T P , Reg. no : KVATMPH001 , Department of physics, MES KEVEEYAM COLLEGE, VALANCHERY towards the practical fulfillment of the requirements for the award of the Master Degree in Physics during the period 2019-2021

Mr. SURESH V. C.

Head of the Department

MES KEVEEYAM COLLEGE, VALANCHERY

DECLARATION

It is declared that the work presented in this project is based on the work done under the guidance of Dr. K. M. UDAYANANDAN (Retd.), Department of Physics, Nehru Arts and Science College, Kanhangad and has not been included in any other project submitted previously for the award of any M. Sc degree either to this university or to any other university/institution.

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May, 2021.

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AFA NAHAN T P

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Preface

The project titled, 'Fractals in plant leaves', is to find the fractal dimension of thirty-one species of plant leaves collected from various plants which including fruit-bearing plants such as Manilkara zapota, Mangifera indica, etc..., flowering plants like Lantana camara, Hibiscus, etc..., and medicinal plants such as Azadirachta indica, Ficus microcarpa, etc..., present in our nature using the box-counting method. This project aims to check and compare the fractal dimensions of different types of leaves that consist of different shapes and variations. It also finds the relationship between fractal dimension and distinct factors connected to this structure. It also attempts to prove the fact that mathematics is an integral part of our nature. It also checks whether the leaves can be distinguished using their fractal dimension.