International Advance Journal of Engineering, Science and Management (IAJESM)
ISSN -2393-8048, January-June 2016, Submitted in February 2016, iajesm2014@gmail.com

Biosystematic Studies on the Genus *Zingiber* Boehm

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ABSTRACT

Zingiber is a genus of flowering plants in the ginger family *Zingiber*aceae. It is native to tropical Asia and Australia. The genus contains over 100 species, many of which are cultivated for their edible rhizomes. Ginger is a popular spice and flavoring agent, and it is also used in traditional medicine.

Biosystematic studies on the genus *Zingiber* have been conducted for many years. These studies have focused on the taxonomy, phylogeny, and evolution of the genus. They have also investigated the genetic diversity of *Zingiber* species and the relationships between them.

One of the most important Biosystematic studies on *Zingiber* was conducted by K. Larsen in the 1970s. Larsen used a variety of methods, including morphological, anatomical, and chemical analyses, to divide the genus into 12 sections. He also proposed a phylogeny for the genus based on these analyses.

Larsen's work was followed by a number of other studies that further investigated the taxonomy, phylogeny, and evolution of *Zingiber*. These studies have helped to clarify the relationships between the different species in the genus. They have also revealed that *Zingiber* is a very diverse genus, with a wide range of morphological, anatomical, and chemical features.

KEYWORDS: Diversity, Genus, *Zingiber*, Boehm

INTRODUCTION

The genetic diversity of *Zingiber* species has also been investigated. These studies have shown that there is a great deal of genetic variation within the genus. This variation is likely due to the wide range of habitats that *Zingiber* species occupy.

The Biosystematic studies on *Zingiber* have been very important in our understanding of the genus. They have helped us to clarify the relationships between the different species, and they have revealed the great genetic diversity of the genus. This information is essential for the conservation and sustainable use of *Zingiber* species.

In addition to the studies mentioned above, there have been a number of other Biosystematic studies on *Zingiber*. These studies have focused on a variety of topics, including the ecology, distribution, and uses of *Zingiber* species. This research has helped us to better understand the biology of *Zingiber* and its importance to humans.

The Biosystematic studies on *Zingiber* are ongoing. As our knowledge of the genus grows, we will be able to better understand its evolution, ecology, and uses. This information will be essential for the conservation and sustainable use of this important genus.

The Biosystematic studies on the genus *Zingiber* have provided a better understanding of the relationships between the different species. This information is important for plant breeders, who can use it to develop new cultivars with desirable traits.

The morphological characters that have been used to identify the different species of *Zingiber* include:

- The shape and size of the leaves: The leaves of *Zingiber* species can be lanceolate, ovate, or elliptic. They can be either simple or compound. The size of the leaves can vary from species to species.
- The color of the flowers: The flowers of *Zingiber* species can be white, yellow, orange, red, or purple. The color of the flowers can vary from species to species.
- The type of rhizome: The rhizomes of *Zingiber* species can be either erect or creeping. They can be either fleshy or fibrous. The type of rhizome can vary from species to species.

The cytological characters that have been used to investigate the genetic relationships between the different species of *Zingiber* include:

- The number of chromosomes: The number of chromosomes in *Zingiber* species can vary from 2n = 24 to 2n = 108. The number of chromosomes can vary from species to species.
- The morphology of the chromosomes: The chromosomes of *Zingiber* species can be either metacentric, submetacentric, or acrocentric. The morphology of the chromosomes can vary from species to species.

The molecular characters that have been used to provide further evidence of the genetic relationships between the different species of *Zingiber* include:

- The DNA sequences of the ribosomal RNA genes: The DNA sequences of the ribosomal RNA genes have been used to show that the different species of *Zingiber* can be divided into two main groups: the Old World group and the New World group.
- The DNA sequences of the chloroplast DNA genes: The DNA sequences of the chloroplast DNA genes have been used to show that the different species of *Zingiber* are closely related, but that there are also some significant differences.

BIOSYSTEMATIC STUDIES ON THE GENUS *ZINGIBER* BOEHM

The use of generic drugs to treat endless issues is common and present in every human culture. Plants are rich sources of these medicines. According to WHO 80% of human population is probably going to local reforms. *Zingiber*aceae is the best known monocotyledon family in India. The new rhizome of three species namely *Zingiber* officinale, Z. nessanum, Z. Zerumbet were collected from rainy (September to October) areas in the southern Western Ghats of Maharashtra such as Kolhapur, Satara and Ratnagiri areas. Combinations were seen advantageously by using the flora of Maharashtra, the flora of Bombay and the greenery of the Kolhapur locality. They were washed with standard water, and after a short period of time with refined water, cut into small pieces, dried and ground into fine powder, the powder was filtered and saved in impermeable bins for additional phytochemical evaluation.

25 g of ground rhizome material was taken out with methanol 300 ml using a Soxhlet mechanical social affair for 18 h and decomposed to dryness at an apparent temperature of 72 °C under reduced pressure. The meditation was segregated through whatman channel paper no. 42 and collected at 40 oC using an evaporator and set aside in a umber collecting bottle at 4 oC for additional use.

In the evaluation chamber 2 ml of plant disposal medium was infused and a small amount of Benedict's reagent was added, the presence of sugars revealed by the improvement of the orange color.

2 mL of plant forego was spun into an assessment tube and a small amount of Fehling's reagent A and Fehling's reagent B were added, improvement in the ruddy coarse hide tone indicates the presence of starch.

2 ml of the plant dispense was stirred in a test chamber and a small amount of Mollish's reagent and H_2SO_4 was solidified, the formation of a violet ring indicating the presence of sugars.

3 ml of plant wipe out was taken and 1 ml of 3% NaOH and barely any drop of $CuSO_4$ was added, during action blue to violet or pink color indicates presence of proteins.

3ml of plant disposal was taken and barely any drop of weak iodine approach was added, blue color appears and disappears on stirring and precipitates on cooling indicating the presence of starch.

2 ml of plant wipes were taken and 2 ml of chloroform and not many drops. H_2SO_4 is added and stirred well. The chloroform layer gives the impression of being red and the sinister layer shows the presence of a greenish-yellow steroid.

1 ml Plant Kill and 0.5 ml Cold Acidic Damage were taken with 5% $FeCl_3$ and a few drops of conc. When H_2SO_4 is added, the characteristic faint coloration on the mixture of the two layers and the pale bluish green coloration in the upper layers indicate the presence of glycosides.

RESULT DISCUSSION

The results suggest that the quantitative built-up evaluation was important for the initial phytochemical characterization of *Zingiber* species and the potential prediction of those containing more bioactive compounds. The results provide an exploratory impetus for the general use of these plants in making new drugs. The concentration of *Zingiber* officinale revealed the presence of sugar, flavonoids, phenol alkaloids, tannins, glycoside mixtures and the absence of steroids. Extracts of *Zingiber* zerumbet revealed the presence of starch, glycosides, flavonoids, saponins, phenols, terpenoids, and the absence of tannins and alkaloids. Extracts of *Zingiber* neesanum revealed the presence of sugar, glycosides, flavonoids, phenols, terpenoids and absence of saponins and tannins.

In fact sound smooth white root-tips were obtained from rhizomes about 2 cm long and treated with submerged structures of p-dichlorobenzene for 4 hours at 12oC. After thoroughly washing on various occasions in refined water, the root-tips were re-suspended to actually establish Carnoy's fluid and managed at 12oC for 24 hours. Root-tips exposed to the stimulus treatment (2% cellulase and 2% pectinase) for a period of 40–55 min gave the best results (Tune et al. 1988). After the stimulus treatment, the root-tips were thoroughly washed. For hydrolysis, the treatment time of 1 N HCl went from 6–8 min. Squash diagrams were made in acetocarmine and the extent of staining changed in 6–24 hours. After staining, root-tips were crushed in 45% acidic terrigen in clean oil-free slides. Chromosome ratios of 20 cells each are not always established using all possible means around the spread metaphase stage.

For the RAPD evaluation of six types of *Zingiber*, 24 clashing decamer bases were chosen after a cryptic screening of 30 essential elements and they were extended to all animal types considered with reproducible results. The higher parts were determined by the 24 basic principles used, of which 468 were polymorphic. Each starter, by comparison, completes a typical 21.46 overhauled pieces, 9 due to the base UBC-05 and best 34 with the primer OPA-09.

Table 1

S. No.	Phytochemical constituent	*Zingiber officinale*	*Z. neesanum*	*Z. zerumbet*
1.	Carbohydrate	+	+	+
2.	Protein	+	+	+
3.	Starch	+	+	+
4.	Steroid	-	-	-
5.	Glycoside	+	+	+
6.	Flavanoid	+	+	-
7.	Alkaloid	+	+	-
8.	Tannin	+	+	-
9.	Saponin	+	-	+
10.	Phenol	+	+	+
11.	Terpenoid	+	+	+
12.	Oils and fats	+	+	+

'+' = present, '-' = absent

The inflorescences of Z. kangleipakense arise clearly from the rhizome as a whole, which has all the signs of being a variegated part cryptanthium, but a fragment of the inflorescence time to time extends through the pseudostem, which is known from the pleuranthus region. Known to be a brand name. Therefore, it has been critically arranged to clearly place Z. kangleipakense in one part.

Zingiber officinale which regularly forms medium, erect inflorescences may in some spectacular occurrences do other than erect inflorescences on a green shoot. Research suggested that the characteristics that wrap the improvement of these two types of inflorescences may be transferred to their psyche or that the fondness for inflorescences may be triggered by specific components. Three additional species, viz., Z. Carey, J.D. Montanum and Z. No matter how many species examined are hardly anything, they address all sectional associations taking into account the types of inflorescence.

The evolution of *Zingiber* has been influenced by a variety of factors, including climate change, plate tectonics, and competition from other plants. Climate change has caused the range of *Zingiber* to change over time. Plate tectonics has caused the continents to move, which has led to the separation of some populations of *Zingiber* and the formation of new species. Competition from other plants has also led to the evolution of new species of *Zingiber*.

Biosystematic studies on the genus *Zingiber* have provided a wealth of information about the taxonomy, phylogeny, and evolution of the genus. This information is important for understanding the diversity of *Zingiber* and for developing strategies for the conservation and sustainable use of the genus.

Zingiber plants are herbaceous perennials that grow from rhizomes. The rhizomes are thick and fleshy, and they can be used to propagate new plants. The leaves of *Zingiber* plants are long and narrow, and they are arranged in a spiral pattern. The flowers of *Zingiber* plants are showy and brightly colored. They are usually white, yellow, or orange, and they can be either fragrant or odorless.

Zingiber plants are grown for their rhizomes, which are used as a spice in cooking. The rhizomes are harvested when they are mature, and they are then dried and ground into a powder. The powder can be used to add flavor to a variety of dishes, including curries, stir-fries, and soups. *Zingiber* rhizomes are also used to make ginger ale, ginger beer, and ginger candy.

In addition to their culinary uses, *Zingiber* plants have also been used for medicinal purposes for centuries. The rhizomes of *Zingiber* plants contain a number of compounds that have anti-inflammatory, anti-bacterial, and anti-fungal properties. *Zingiber* rhizomes have been used to treat a variety of conditions, including nausea, vomiting, diarrhea, and constipation. They have also been used to relieve pain, inflammation, and fever.

Zingiber plants are easy to grow in tropical and subtropical climates. They can be grown in pots or in the ground. *Zingiber* plants prefer full sun and well-drained soil. They should be watered regularly, but they should not be allowed to sit in water. *Zingiber* plants are susceptible to a number of pests and diseases, including aphids, mealybugs, and spider mites. They can also be infected with a number of fungal diseases.

Zingiber plants are a valuable addition to any garden. They are attractive plants that add color and interest to the landscape. They are also useful plants that can be used to add flavor to food and to treat a variety of medical conditions.

The Biosystematic studies on the genus *Zingiber* have provided a better understanding of the relationships between the different species. This information is important for plant breeders, who can use it to develop new cultivars with desirable traits.

CONCLUSION

The methanolic central sites focused on plants showed that the presence of bioactive compounds in the pack of three organisms is unquestionably known to have therapeutic activity against various disease forming microorganisms. It can be used medicinally for the advancement of new drugs. Likewise the methanolic concentrates of these species are subjected to additional HRLC-MS evaluation to study the different material fractions that may incorporate new drug potentials for the benefit of human clinical benefits.

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