

HARUM SUNDAL MALAM (*POLIANTHES TUBEROSA*) AS AN INSPIRATION ON BATIK DESIGN: AN ETHNOMATHEMATICAL STUDY

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Abstract: *Bunga Harum Sundal Malam* or its scientific name *Polianthes Tuberosa* is an incredibly unique plant in Malay society. This flower has a seductive aroma of fragrant night flower with everlasting scent and is often used in wedding ceremonies in Indonesia, India, and Hawaii. It has an aromatherapy property that can reduce stress and have a healing effect. The uniqueness of this flower has given an inspiration to the batik designer to design on batik. This paper discusses ethnomathematical studies on *Bunga Harum Sundal Malam* as an inspiration of batik design. Triangulation method of observation, interview and analysis of motifs were used. The result showed that the geometrical elements of “bunga harum sundal malam” or *Polianthes Tuberosa* are circle, rectangle, and half circle. The flower motifs were arranged in tessellation. Further research can be developed to study other arrangements of the flower.

Keywords: *bunga harum sundal malam (Polianthes Tuberosa)*, batik design (using wax and dye to create dots widely arranged in stunning patterns and design), ethnomathematical study (exploring cultural diversity in Mathematics).

Introduction

Bunga Harum Sundal Malam in Malay Name or Bunga Sedap Malam in Indonesian name or so called as 'Ratkirani' In Indian name Or *Polianthes Tuberosa* in Mexican dialect is a unique flower from Mexico. The flower subsequently conquered to Morocco, Egypt, and China then in 17th century it was exported to Europe from India. it extremely became a famous ingredient for various perfumes and was extremely popular at French Court. Bunga Harum Sundal Malam or *Polianthes Tuberosa* in white color symbolized innocence, peace, and purity. The symbolism leads to the use of it in wedding ceremonies.

This flower is a multi-faceted scent married by tinges of sweet honey and ambrosial white blooms. Feminine in its character, it releases a narcotic stream of elements that can have green and earthy accents of almond like aspects. for more than four hundred years bunga harum sundal malam or *Polianthes Tuberosa* has been a secret seducer giving passion and fire to thousands of perfumes. A symbol of dangerous love and voluptuousness to the Victorians, the tuberosa rich and heady fragrance is similar to gardenia.

In Malaysia the problems faced by batik entrepreneurs is that it is less popular among young people. This is due to several factors. One of the factor is its unattractive pattern and boring color, that does not suit the taste of young people. Thus, as a solution to these problems, batik entrepreneurs are looking for a new innovation in sparking the interest of young people in the latest batik design.

As a result of this, a designer in UiTM Kelantan has come to an inspiration of a new design made of a viral flower called Bunga Harum Sundal Malam or *Polianthes Tuberosa* that has once been popular in a Malay movie entitled 'Pontianak Harum Sundal Malam' which revealed the famous actress, Maya Karin. The uniqueness of Bunga Harum Sundal Malam or *Polianthes Tuberosa* caught the attention of the designer to apply it on batik design and analyze it through the lens of ethnomathematics to capture the secret of its beauty, everlasting fragrance, symbolism, and the philosophy of the geometrical petals of bunga harum sundal malam or *Polianthes Tuberosa*.

Literature Review

Batik, originated from Javanese word, meaning 'painted' uses a wax resist dyeing process to produce colorful textile. Developed from the Island of Java, the motifs on batik design created by the designer's observation are inspired by elements of nature such as floral, fauna and geometrical shapes. Floral patterns are common in batik decorating textiles with curves, colors, and loose lines. Sacred in Hindu Buddhist belief systems the lotus blossom of ten appears in batik textiles. Often flowers that are frequent favorites include Frangipani, Hibiscus and Lilies. Frequent research has been done on flowers as the motifs of batik design. One of them is a study of batik blocks by Adiguru Mahadi Deraman in Tumpat, Kelantan where the findings of batik blocks produced are various motifs such as geometric, abstract, fauna and flora (Che Rahim Husin, 2023).

In Terengganu Nik Farhana Zubir (2021) conducted a study on Terengganu sarong batik with climbing floral design. The study revealed that climbing flower designs were used as the framing border and the upper and lower edge part. Distinct types of tropical flowers were developed by the batik makers and represent the batik sarong identity. In Pahang Shahrolnizam Ramli (2018), conducted research on the production process of batik painting based on the idea generation, activity, expression, representation, creativity and aesthetics in the production of

painted batik, kiambang flower or shrimp pin flower motifs are used. In Indonesia Sri Wiratina (2023), conducted a study and found seven types of flowers to be the favorite motifs of batik creation. They are Roses, Jasmine Flowers, Kenanga Flowers, Cempaka Flowers, Kemuning Flowers and Polianthes Tuberosa.

Bunga Harum Sundal Malam or its scientific name *Polianthes Tuberosa* is a unique plant in Malay Society. This flower originated from Central America. Bunga Harum Sundal Malam or *Polianthes Tuberosa* has around fifteen species under the genus of *Polianthes*'s, but twelve species are distributed from Mexico. Only *Polianthes Tuberosa* are commercially grown, and all the others are growing wild (Mandal,2018). It has a height of about three meters and is included in the group of herbaceous plants and belongs to Amaryllidaceae or Agavaceae family, which is a type of clumping tree, which is categorized as a Lily just like Amaryllis and Spider lily or Daffodil. Its leaves are shiny green with yellowish flowers of various shapes. The strong and fragrant aroma of this flower usually appears at night and attracts many people to explore the secret of its existence.

In addition to the seductive aroma of fragrant night flowers they have a variety of uses. According to Sotyati (2016), the smell of this flower can increase passion and is often used in wedding ceremonies in several countries like Indonesia, India, and Hawaii. This flower has a long-lasting fragrance even if it is cut from the tree. This makes the flower a popular choice for special occasions and is used in luxury hotels and private hospitals. Another specialty of this flower is that its scent has an aromatherapy property that can reduce stress and have healing effect. The use of bunga harum sundal malam has been commercialized in India to create a romantic mood especially for newlyweds. In India there are also tips where unmarried girls are forbidden to smell the fragrance at night because it is feared that it will stimulate their sexual activity. In India, this flower is known as 'Ratkirani' or mistress of the night flower that is believed to stimulate the chakra energy that can make a person to have a psychic power. The oil from the essence of this flower can be filtered through the extraction process with a ridiculously small amount obtained. However, the demand is extremely high in the international market, and it is not the same as the fake perfume that is sold.

The uniqueness of bunga harum sundal malam inspired batik designer to illustrate it on batik design. Few studies have proven that this flower is a keen interest among Indonesian designers. In Indonesia Sri Wiratina (2023), conducted a study and found seven types of flowers to be the favorite motifs of batik creation. They are Roses, Jasmine Flowers, Kenanga Flowers, Cempaka Flowers, Kemuning Flowers, and Bunga Sedap Malam (*Polianthes Tuberosa*). Yuri Inang Prihatina (2011) had done a study on how Bunga Sedap Malam or *Polianthes Tuberosa* is chosen as the motif of weaving. This is due to the fact Bangil, a city of East Java is famous for its embroidery. Arida Nur Indrasari (2016) studied the Lorok Batik Home Industry at East Java and found that Bunga Sedap Malam or *Polianthes Tuberosa* is chosen as the additional motif of batik design because of the flower itself symbolizes the concept of helping each other in all situations.

Mega Novita, Murti Dewanto, Bambang Arus Herlambang (2023) found that Bunga Harum Sundal Malam or *Polianthes Tuberosa* is chosen as the motif on Batik Tulis at Desa Poplang, Semarang, Indonesia. Bunga Sedap Malam or *Polianthes Tuberosa* is being chosen because it stands for peace, innocence, and purity. The floral design of bunga harum sundal malam or *Polianthes Tuberosa* can be analyzed through the lens of ethnomathematics, a branch of study that discusses the mathematical ideas of the local community in their culture. Ethnomathematics

is a qualitative explorative study employing triangulation method to collect data consisting of observation, analysis, and interview. It explains the floral and phenomena of natural environment in each of the cultures (Ambrosio,2016). The term ‘ethno’ describes all the ingredients that make up the cultural identity of a group language, code, values, jargon, beliefs, food, dress, habits, and physical traits. The word ‘mathematics is expresses broad views of mathematics including ciphering, classifying, ordering. inferring and modeling (Ambrosio,2001).

The elements of ethnomathematics in analyzing Bunga Harum Sundal Malam or *Polianthes Tuberosa* are the geometrical shapes of petals which can be identified by their character. The flower petals shapes are different from round to oval, ovate and obovate at the top of the petals from notched to fimbriate. Petals remodified leaves that surround the reproductive parts of flowers. They are often brightly colored or unusually shaped to attract pollinators.

Methodology

The research aims to identify bunga harum sundal malam or *Polianthes Tuberosa* as an inspiration of batik design, hence qualitative study was chosen. A lecturer from the faculty of art and design was chosen. The data collection was through observation of the petals of bunga harum sundal malam or *Polianthes Tuberosa*. It was followed by an interview session with the designer. The input obtained was then analyzed to understand the geometrical characteristics of bunga harum sundal malam or *Polianthes Tuberosa* and the philosophy of the design.

Findings and Discussion

The objective of this study is to identify Bunga Harum Sundal Malam or *Polianthes Tuberosa* as an inspiration for batik design. Hence qualitative study method is used. Data analysis gathered from the triangulation method of observation and analysis of Bunga Harum Sundal Malam that has been illustrated into batik design. Then an interview session was held to gather in-depth information about the design.



Figure 1: The Original Shape of Bunga Harum Sundal Malam (*Polianthes Tuberosa*)

Bunga Harum Sundal Malam or *Polianthes Tuberosa* is a Tuberous Perennial with elongated spikes of white waxy funnel shaped flowers from late summer to fall. It has a height of about three meters and is included in the group of herbaceous and belongs to Amaryllidaceae or Agavaceae family.

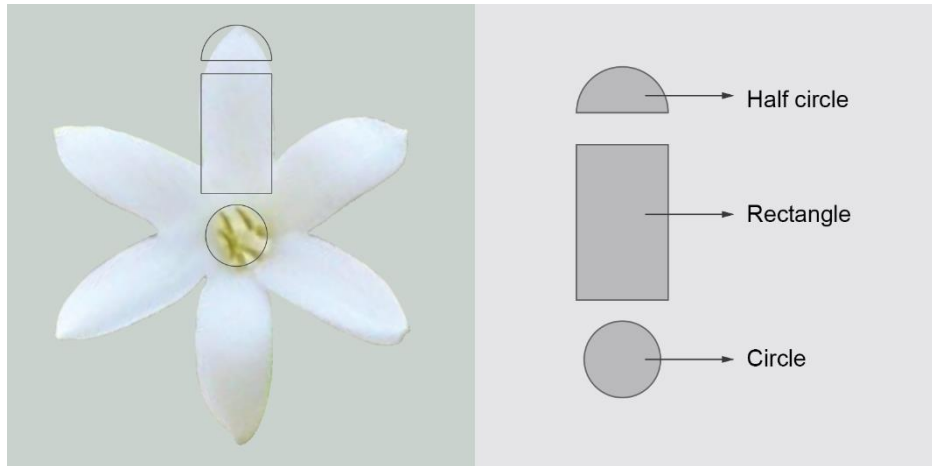


Figure 2: The Segmented Geometrical Shape of Bunga Harum Sundal Malam or *Polianthes Tuberosa* Petals

Bunga Harum Sundal Malam or *Polianthes Tuberosa* has six petals with three segmented shapes of semi-circle, rectangle, and circle. A semi-circle is half a circle, a flat 2-dimensional shape a semi-circle has two sides on one curved side and one flat. The rectangle is characterized by a quadrilateral with four right angles. Thus, all the angles in a rectangle are equal. Moreover, the opposite sides of a rectangle are parallel and equal, and diagonals bisect each other. A circle is a shape that consists of points in a two-dimensional plane, equidistant from a given point.

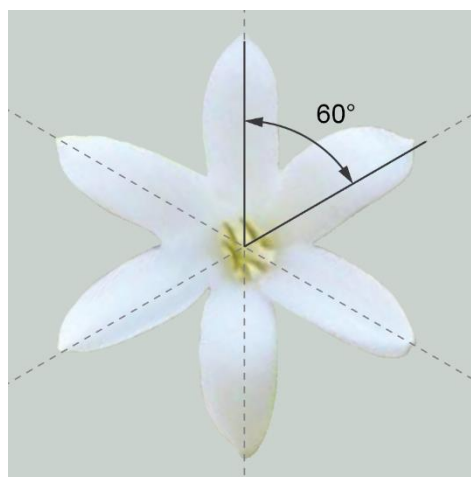


Figure 3: The Formation of Six Petals of Bunga Harum Sundal Malam or *Polianthes Tuberosa*

The formation of the six petals of Bunga Harum Sundal malam or *Polianthes Tuberosa* is through clockwise rotation with an angle of 60 degrees.

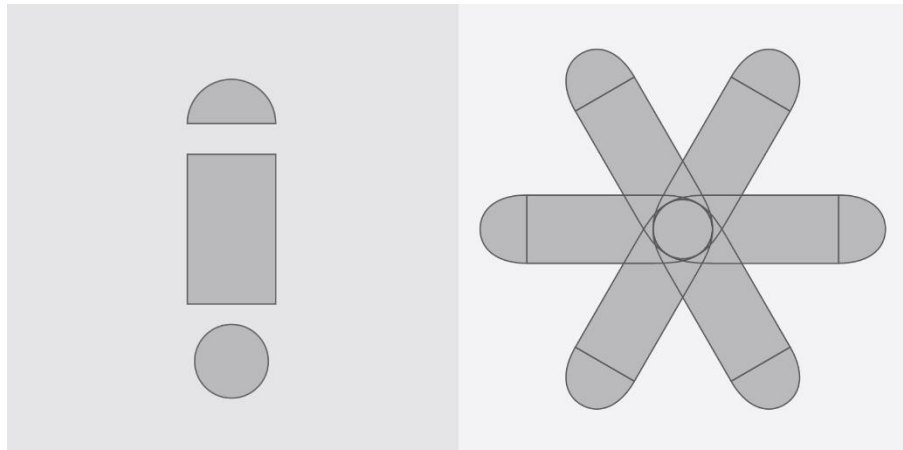


Figure 4: The Geometrical Design of *Polianthes Tuberosa*

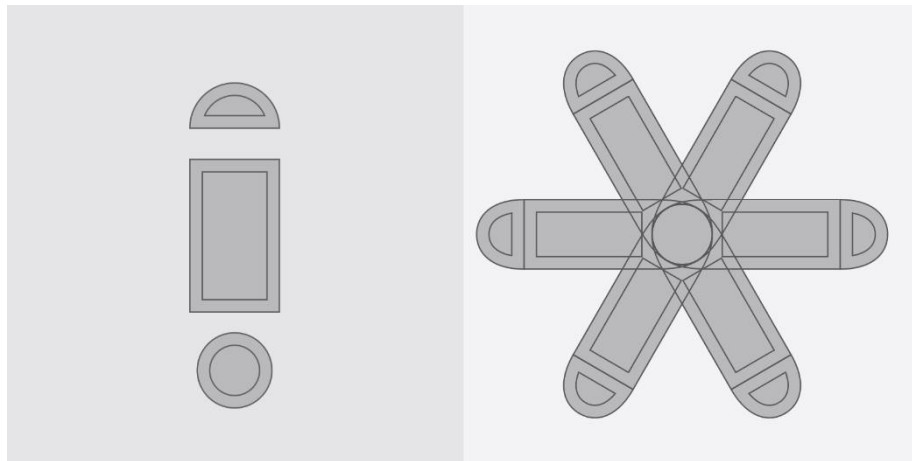


Figure 5: The Geometrical Design of *Polianthes Tuberosa*

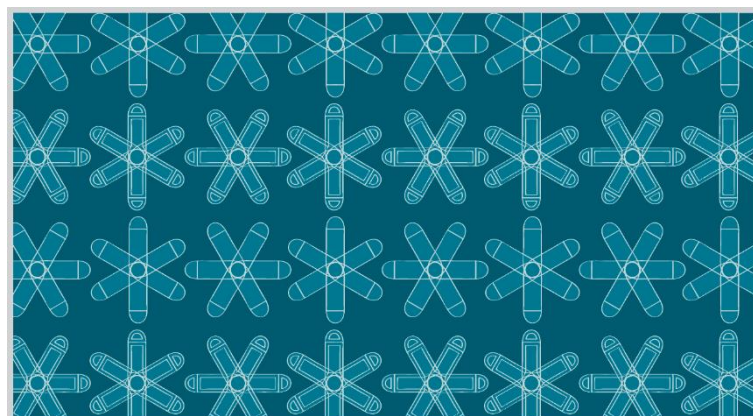


Figure 5: The Arrangements of *Polianthes Tuberosa* in Tessellation

Conclusion

Bunga harum sundal malam or *Polianthes Tuberosa* has its own uniqueness that attracts designers to illustrate it on batik design. Its properties can be studied, and it is found that it has three segmented areas of semi-circle, rectangle, and circle. The formation of six petals is through clockwise rotation with an angle of 45 degrees. Further research can be done to discover the implementation of bunga harum sundal malam on batik design as a batik cop..

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