

Design Inspirations Derived from Botanical Plants: Insights from Jewellery Design

Hiranthi Pathirana
University of Moratuwa,
Sri Lanka
hiranthi.pathirana@gmail.com

Abstract

Learning to see and understand Nature comes only after a careful and enthusiastic search for her minute and apparently insignificant productions. Studies thus made when translated in terms of design principles, concepts and mathematics suggest endless ideas and unfolding of natural laws.

This paper looks at the principles of Nature's creations that can be used in the design of jewellery. It discusses about certain principles observed, recorded and put into studio experiments in design of neck chains inspired from parts of plants such as flowers and leaves. The plants were chosen from the neighborhood. Certain design principles were taken from Nature, carefully analyzed and applied in the design of neck chains. In the process, certain commonly known 'flower forms' were studied, in their plan forms, sections, and details to understand the principles of design. In the conclusion the observations on the characteristics of flowers and leaves were made into constructive design experiences that were carried through the design process into a unique set of neck ornaments.

Keywords: Jewellery design, Nature, Studio experiment, botanical plants

Introduction: Nature - Design relationship

Nature has been a popular source of inspiration and offers limitless unique forms to select. Inspiration for practically every element of design can be found in Nature from structures, shapes, forms, colours, textures, and materials through functions, emotions and processes. The evidence of the early jewellery lies with the human and Nature relationships in the countless interactions with Nature. The earliest jewellery created by Man is believed to have been more than 200,000 years ago. It has been accepted that the earliest primary forms of ornament worn on the human body were designs representing flowers, leaves and fruits, assembled together in strings and vines (Untracht, 1982). With the discovery of other durable materials such as metals, Man began to imitate Nature in a variety

of elements as depicted in jewellery. Evidence can be gathered even today where elements of Nature are transformed into unique jewellery forms with a clear sense of symbolism and narrative (Olver 2002). Jewellery designers around the world from past to the present have been fascinated by the boundless variety of sculptural forms, patterns and constructional elements. They have spent considerable amount of time handling, examining and drawing of Nature's elements to develop a more intimate relationship with the forms and gain a better understanding of how they look, feel and move.

Research objectives

The objective of the project discussed in this paper is to understand the principles of structures and forms that were applicable to the design of jewellery. In

the process, each element of Nature that were found were analyzed and put into studio practice to transform them into elegant and unique pieces of jewellery. The studies were carried out along the design process in which each unique element of flowers and leaves were subjected to a thorough study and conceptualized in terms of the design approach. They were then subjected to a development process where the principles learned were adapted to suit wearable jewellery. Creativity of the students emerged at this point of transformation. Further changes were made adapting to technical and fabrication methods suggested by the technical experts, particularly on casting number of multiple products from each design. This occurred due to the repeated elements of neck chains that were assembled with appropriate innovative linkages. As mentioned above, there were many lessons learned and finally the objectives were achieved resulting in unique jewellery pieces that emerged from the design process.

Hypothesis

The hypothesis of the research was that the principles of Nature's forms can be applied for the productive visual experiences of jewellery design. An experiment was carried out on the basis of analyzing the principles of forms & shapes of flower & leaf forms of neighborhood plants that were found in abundance.

Research methodology: A studio experiment

This research employed a studio experiment to test this hypothesis. The term 'studio' has a physical component, determining a particular space in which the design activity occurs. At the same time it indicates the activity of teaching design in the same space. (Salama & Wilkinson, 2007). Experiment is a process that is carried out in which the end result is not predicted that it relies on a hypothesis.

The exercise was carried out in the jewellery studio of the Department of Integrated design, University of

Moratuwa. In this studio experiment, the specimens were studied and analyzed in the studio with the guidance of the Lecturer. Parts of plants were dissected, photographed, scanned, enlarged, sketched and studied to gather information. Eight students took part in the exercise for a period of seven weeks. The students were gathered information, developed design, finalized designs phase I, finalized design phase II, and were involved in the production process and the selection of final products for presentation with panels and models.

Literature review

Even though there were many studies related to Nature inspired design strategies such as sustainable product development, Bio-mimicry, Cradle to Cradle and Eco-design, it was found that none were directly related to the topic. Especially considering the deriving of the inspiration none was found available. Nevertheless, here is some literature that discusses the relationships that exist between Art and Nature. Among them Comaraswamy stands out. In fact, he explains about the imaginative capacities of the Sinhalese artists in creating Nature based motives during Kandy era. (Coomaraswamy, 1956)

According to Coomaswamy, in the past, Nature was observed by the artists and the ideas were applied into practice using their own imaginations. As a result many of the motives that existed during the Kandy era resulted from the personal experiences of the artist. The generations of practice of drawing the natural interpretations were a personal experience for the designer each time the objects were made. These practices were followed from generation to generation of practice displaying the skills and traditions of teachings of the East. (Coomaraswamy, 1956) As he says, "...the love of Nature in its infinite beauty and the oriental craftsman, to decorate his handwork, with the form of the well known birds, flowers and beasts, with which he is most intimate or which have most appealed to his

imagination in to creations of rhythmic ornament”..(Coomaraswamy,1969:54)

According to De Silva (2009), graphical interpretations of Nature are made in to paintings, utensils and jewellery expressing the imagination and crafting skills of the Kandyan designer. For example, he has clearly shown derivation of natural principles of Nature in design using various graphical compositions in arts & crafts. Sharr et al, (1970) explains about the creative gold and silver smithing techniques of jewellery, and the methods indicating in making customize metal crafts of jewellery. The study presents a wider range of techniques narrowed down to more frequently used, versatile techniques. She emphasizes the importance of having worked out design solutions in a framework, with materials, technical skills, and available tools, in which good designs develop. Rose and Cirino (1980) give details about the jewellery design and derive inspiration for design, starting from drawing techniques. The careful and enthusiastic search for details in Nature and the interpretations of such examples are taken from the world of insects, animals, and bird life. The contents are divided to two sections based on manufacturing principles and the design principles. In manufacturing principles, discussions lead to methods and materials used for jewellery making. It also deals with design principles derived from Nature and methods and practical applications conducted for students. Two outstanding examples taken from Albrecht Durer from Germany, and William Hogarth from England are presented in the discussion, both of whom served as apprentices in goldsmith shops. It is mentioned that to the untrained mind, they are limited or hidden but the process of deriving ideas begin by studying from different points of views. Studies thus made when translated in terms of design principles suggest endless ideas that unfold Natures’ laws for creating

jewellery. In the process, a collection of bud forms are presented with lines of beautiful contours and learning outcomes indicating exquisite proportion and detail. In this study, the inexhaustible stimulations that occur in jewellery design is tested and carefully and systematically laid out as student exercises. The exercises chosen for each stage of work possess delicate and extremely fine relations, of space areas, with examples set forth with principles of sequence, balance, rhythm in a fine manner.

Experimental design activity

Results and findings generated from the design process were collected through at each stage of the design process. The process included design development, inspiration, sketching, brainstorming, sample making and the fabrication process. In all these, Sterling silver was used as the design base metal. Casting was used to make multiple forms from a single master piece. Hand techniques using pliers were also used to assemble the individual pieces. Limitations were set selecting only the flowers and leaves from the neighborhood plants found in abundance.

Design experiment 01: ‘Girapala’ flower (Commelina clavata)

Characteristic ‘Girapala’ flower is identified for neck chain design due to the following qualities. ‘Girapala’ flower bears a certain characteristic with its connected petals, and central calyx. As indicated in the diagrams, one is able to identify the simplest forms made with wire in arranged compositions. Initially, many graphical interpretations were made and the most suitable were selected for the product design as shown in the diagrams below. Appropriate technology was used as simple wire technique for form making. The end result was a light-weight, flexible flower chain that carried on the neck beautifully. Main components in wire & sheet form were the chain links & main sheet form with blue gems and wire forms.



Fig. 01: Commelina clavata
Source: Author

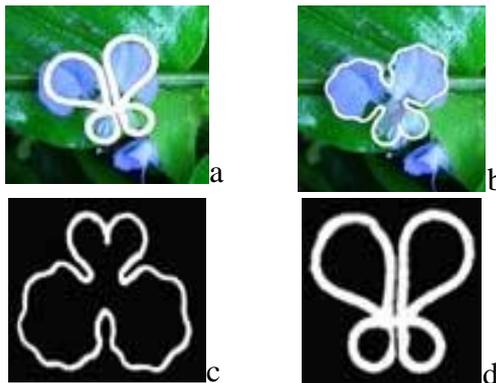


Fig 02: a,b,c,d Graphical interpretations
Source: Author



Fig. 03: Design details
Source: Author

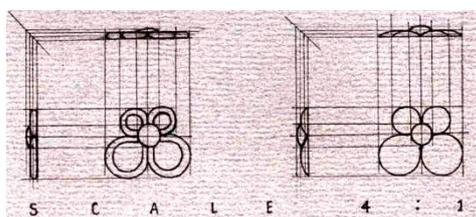


Fig. 04: Three dimensional form in design
in plan & section
Source: Author



Fig. 05: Final design with 'polished' and
'matt' surfaces.
Source: Author



Fig.06: Neck chain on a model
Source: Author

Design experiment 02 - 'Nika' (Vitex negundo) flower: its form and shape

Nika flower, by nature contains a significant tongue like petal, in its form. It gives a prominent characteristic feature,

making it an easily connected element in a neck chain. This is identified as a feature in one of the neck chains, made of twisted shapes of the flower. Simple round links were made connecting the tongue like petal that was made into a neck chain.



Fig. 07: a, b 'Nika', flower in detail
Source: Author



Fig. 08: The twisted forms of 'Nika' flower
Source: Author



Fig. 09: Silver models before assembling
Source: Author



Fig. 10: Final necklace
Source: Author

Design experiment 03: Flower form of 'Kudalu' (Impatiens balsamina)

'Kudalu' (Impatiens balsamina) makes an interesting inter twined, formation that is easily made in to an interlaced throatlet. Two solid petals were made, as fixed elements and wire forms were connected with plier work. The primary forms were made by casting the master mould.

Design experiment 04: Detailed design element from 'Coffea arabica'

In this particular exercise, the cross sections of the flower form were taken as generators in design. Flower of 'Coffea arabica' plant makes an interesting, simple cross section that can be connected with less number of solder points, completed with handcrafting skills. Flowers are made slightly bent on its reverse side that sits well on the neck. Wire forms are made into a flat connected neck chain.



Fig. 11: 'Kudalu' Flower
Source: Author

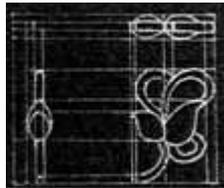


Fig. 12: Working drawing
Source: Author



Fig. 13: Final design
Source: Author



Fig. 14: a,b Coffea Arabica flower

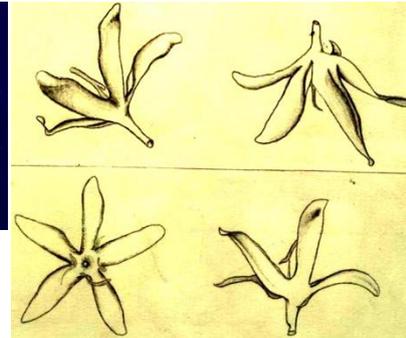
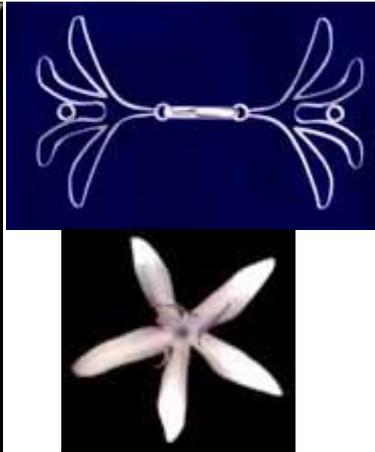


Fig. 15: Student's sketches

Fig. 16: Cross sectional form as giving the most interesting visual effects in design made with wire.

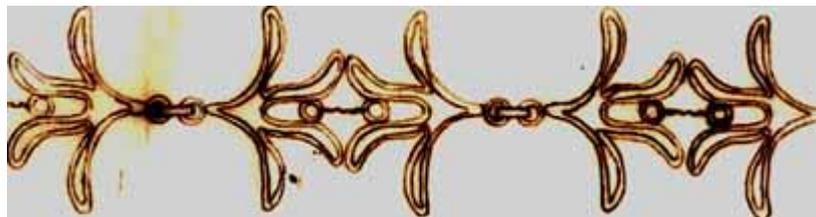


Fig. 17: Connected forms giving an interlaced effect in a neck chain, made with simple wire work, enhanced with gems.

Design experiment 05: The motions recorded in flowers made into neck chain.

The opening of petals of flowers, from the bud formations was recorded in 'Watusudda' (*Ervetamia divaricata*). Half opened 'Watusudda', was taken for a neck chain made into a long chain, flowers placed at long intervals to suit best in its composition, making use of a long chain with small links.



Fig. 18: Sequences of flower opening in 'Watusudda' flower.



Fig. 20: Long flower chain



Fig. 21: A three unit flowers



Fig. 22 Model.

Fig. 19: Casted elements before assembling

Design experiment 06 -
Characteristic colour & form of flowers

Characteristic colour & form of 'Sepalika' (*Nyctanthes arbor-trstis*) flower is taken for neck chain design. Particularly the drooping, twisted form of flowers are made into wax model and made in to multiples. These multiples are made with red coral stalk to represent the colour contrast in its composition. This is identified as 'Sepalika' necklace.



Fig 23: Sepalika flower

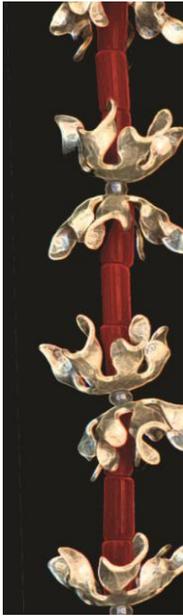


Fig. 24: Silver petals & red corals



Fig. 25: Final design

Design experiment 07: Undupiyali' neck chain

Undupiyali' (Desmodium triflorum) the light grass found in our gardens is taken as the inspiration in design. The changing motions of its petals and variety of different sizes are composed into a flexible chain. Single loops and double loops were used to connect the leaf forms.



Fig 26: Rustling effect of the leaves, as one compound, with inter connected chain links

Design experiment 08: Tridax neck chain

The characteristic base form of Tridax flower has been taken in design of this particular neck chain. Interesting deep

base of the Tridax, flower is made into a granulated bead, with connecting the petals.



Fig 27: a,b Tridax flower



Fig 28: Granulated bead & wire forms



Fig 29: Flower Neck chain, as final product



Fig 30: Neck chain on a Model

Conclusions

The design exercise was carried out as a studio experiment which allowed teaching and learning process to happen in a more open and flexible manner. Within the first six hours of the first day of the studio work, information was gathered and recorded. By doing this, students learned quick methods of observing and recording the information gathered. The most important lessons were learned from the session of 'brain storming' in which every option was considered thrashing out ideas so that every possibility was considered to reach their full potential in the design process. It was important to open up the mind to ensure that the designs were not only based on simplistic ideas that they looked beyond the initial ideas to find solutions that were more interesting, sophisticated or subtle. As a result, one idea was developed as a catalyst for many other ideas to develop. In the end of the design development process many ideas were gathered from a single source of

inspiration. Only the best options were selected for further development without considering too many abstractions of the original form. Therefore these eight experiments made with understanding the forms of the flowers, was an attempt to identify nature's forms, chosen in their best possible ways, to suit the need of adornment. Eight flowers and leaf forms offered such limitless possibilities to new creations for jewellery that students learned with much enthusiasm. This occurred mainly because every sample carried excitement and a challenge in their fabrication process. The final designs that were selected and chosen for the study presented eight principles that can be used in design for further development. Each flower, in its characteristic form, brings certain unique design element to neck chains making it, a continuation of the jewellery tradition, transformed into contemporary usage.

Acknowledgements

The author gratefully acknowledges the contributions of the BDES Jewellery students of the batch 2006/2007 at the Department of Architecture, University of Moratuwa, in this experiment.

References

- Augustus F. R. & Cirino A, (1980) *Jewellery making & design*. Dover pub Inc.
- Choate Sharr and Cecil De Ma Bonnie, (1970) *Creative gold and silversmithing*. New York: Crown publishers Inc.
- Coomaraswamy A.K, (1969) *Introduction to Indian art*. Delhi : Munshiram Manoharlal, Oriental publishers
- Coomaraswamy A.K, (1956) *Medieval Sinhalese Art*. 2nded. 333 sixth avenue, New York 14,N.Y : Pantheon books,Inc.
- Coomaraswamy A K, (1956) *Transformation of Nature in Art*. 180 Varick street, New York, NY : Dover publications
- De Silva Nimal, (2009) *Sinhala chitraya saha mostara sampradaya.*, No 09, Gothami rd, Colombo 08: Padmapani publishers
- Fitch Janet, 1992. *The Arts and Crafts of jewellery*. Michelin house, 81 Fulham Rd, London SW3 6RB; Reed consumer books Ltd
- Mc Creight Tim, (1998) *Jewellery*. 35 Bedford Row, London : A& C Black publishers Ltd
- Oppi Untracht, (1982) *Jewellery concepts and technology*. Garden City, New York: Doubleday & Company,Inc
- Pathirana D.S.H, (2010) *Concepts, principles and methodologies used in traditional Sinhalese jewellery*' unpublished PhD thesis, University of Moratuwa,
- Salama A.M & Wilkinson N, (2007) *Design studio Pedagogy: Horizons for the future*. Gateshead, United Kingdom: The Urban international Press