

Research on Bionic Design of Packaging Forms for Snacks in Fishing Villages

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Abstract: This article aims to explore the bionic design of the packaging form of snacks in fishing village. Taking Quanzhou xunpu village as an example, through the in-depth understanding of the culture and natural environment of the fishing village, as well as the application of the principle of bionics, a snack package with bionic morphology is designed in line with the local characteristics of XunPu Village and the marine culture. The research combines the analysis of the morphological characteristics of marine organisms such as oysters, shells and fishes, and combines these characteristics with the traditional cultural background of the characteristic snacks of the fishing village to design a new type of packaging scheme that meets the requirements of aesthetics, functionality and sustainability. Through fieldwork research and internet data collection, and research and analysis were carried out. The final design solution is not only artistic and culturally expressive, but also considers the impact of packaging on the environment and enhances the market competitiveness of the product and consumer experience. Future research can further explore the application of bionic design in packaging and its potential in promoting sustainable development and cultural heritage.

Keywords: Packaging; Fishing Village Food; Bionic Design; Xunpu Village Culture.

1. Introduction

With the acceleration of globalisation and the increase of consumers' concern for health and environmental protection, packaging, as the first impression and protection level of commodities, is not only an accessory to the product, but also an important medium for conveying brand value and environmental protection concepts, and the design of food packaging has become more and more important. Especially in the field of traditional food such as fishing village snacks, the packaging not only needs to meet the functional requirements, but also fit the village cultural traditions and elements of marine characteristics. Combined with the concept of biomimetic design, by imitating the form, structure, colour, texture and function of nature, we can enhance the practicality, aesthetics and environmental friendliness of the packaging, and provide new ideas and methods for the development of the fishing village snacks industry.

Bionics is a new type of cross-category profession formed in the early twentieth century under the rapid development of life sciences and technological sciences. So far, although there is no uniform and clear definition of bionics, its connotation and extension are constantly changing with the deepening of bionic science research, enriching the research content and expanding the application fields, which are characterised by diversity, practice and time-varying nature. [1] The basic concepts of bionics, including Steele's concepts, traditional definitions, modern concepts, biologically related concepts, etc., and the basic principles of application, i.e., mimicking the forms, structures, functions and colours of plants and animals, provide different analytical perspectives for the study of aesthetics at different levels, and inspire the solution of technological problems faced by them.

Bionic design is an emerging discipline developed on the basis of bionics and design. Bionic design is an innovative design that simulates and draws on, or scientifically analyses and abstractly summarizes, the form, texture, structure, colour, function and other aspects of objects in nature.[2]Bionic

design can be classified according to its attributes: "Morphological bionics, functional bionics, structural bionics, colour bionics and textural bionics. Among them, morphological bionics is the most common and widespread. [3]Designers can imitate the form, structure and aesthetic principles of natural organisms to create, through simulation to achieve the protection, convenience and aesthetics of packaging. Therefore, the application of bionic design in food packaging can not only achieve the basic requirements of food packaging, but also meet the spiritual aesthetic needs of consumers.[4]

2. Status of Packaging of Snacks in Fishing Villages

2.1. Insufficient Brand Image Creation for the Packaging of Fishing Village Snacks

Compared with other industries, the brand awareness of local products in fishing villages is still relatively weak, and villagers do not attach enough importance to the brand, and there still exists the idea of "not seeking fame or profit, but only production", and brand building lacks continuity and systematicity. Due to the fishing village food production methods are more traditional, the product range is relatively single, the lack of obvious differentiation between brands, the competitiveness of the brand is weak, it is difficult to occupy the market share. The market channels of fishing village food brands are mainly concentrated in traditional bazaars and street shops, lacking diversified sales channels, making it difficult to meet the diversified needs of consumers. Most of the food producers in fishing villages are small farmers who lack the funds and resources needed for brand building, and it is difficult to achieve the expected results of brand publicity and promotion. The awareness of intellectual property protection of fishing village food is insufficient, and some brands have problems such as infringement and piracy, which can seriously damage brand image and consumer trust.

Therefore, in order to promote the development of Chinese

fishing village food brands, it is necessary to strengthen support and guidance in brand building, marketing and intellectual property protection, to promote the innovative development of brands and improve their market competitiveness.

2.2. The Packaging of Fishing Village Snacks is Simple and Monotonous

Fishing village food packaging design is more traditional, lack of innovation and personalisation, product packaging in a single form, it is difficult to attract the attention of consumers. Fishing village food packaging materials of poor quality, not durable, easy to break, cannot effectively protect the food, affecting food sales and brand image. Fishing village food packaging on the logo is not standardised, the label content is not comprehensive, cannot provide sufficient food information and cannot meet the requirements of relevant laws and regulations. The unreasonable design of food packaging in some fishing villages makes it easy for products to slide and squeeze, leading to deformation or damage of food products, which also affects consumers' trust in the products. Some fishing village food packaging design does not take into account environmental factors, excessive use of plastics and non-environmentally friendly materials, resulting in the generation of a large amount of packaging waste, which has a negative impact on the environment.

2.3. Unreasonable Packaging Structure of Fishing Village Snacks

Over-expansion or over-complexity of food packaging space structure and failure to consider the use of safety and practicality of the food packaging modelling structure of the two existing unreasonable situation. The first situation is a certain degree of over-packaging, is an obvious waste of resources, we need to design from the complicated structure of the complexity of the misunderstanding out, as far as possible to achieve simplicity and clarity. Another situation is to pay attention to the use of safety and practicality. It is important to have a certain sense of design in packaging, but if we call the random addition of useless packaging structure a sense of design, it will only add to the snake's footsteps. Design only in-depth understanding of the needs of the consumer public can be closer to life.

3. Application of Bionic Design Concepts in Packaging of Fishing Village Snacks

3.1. Morphological Bionics

Morphological biomimicry is an innovative design that imitates and draws on the premise of the designer's full knowledge of the external morphological characteristics of living creatures, so that the consumer's visual perception of the corresponding natural associations and imaginations, and to stimulate the consumer's aesthetic experience and emotional needs. In food packaging design, morphology biomimicry can guide how to design packaging that has both excellent protective properties and meets the aesthetic needs of consumers. By learning and imitating the whole or partial forms of organisms in nature, designers can develop new packaging styles and improve the functionality and market competitiveness of packaging.

In the packaging design of the snacks in the xunpu fishing

village, we firstly choose the creatures whose overall form and local outline are similar to the food. The snacks are mainly fried, including oyster omelette, seaweed omelette, fried fish and so on, and the packaging form needs to express the local characteristics, therefore, we integrate the characteristic architecture of the village, oyster-shell alcove, with the elements of the marine culture, and select the oyster shell form and the fish form; and then, the form of the selected creatures are used to simulate and re-design their appearance characteristics. The oyster and fish forms are simplified, processed, summarised and combined with the characteristics of the fishing village snacks themselves; finally, the form of the packaging of the fishing village snacks is the same as some of the characteristics of the selected marine organisms, so as to achieve the perfect fusion of food packaging and bionic design.

3.2. Structural Bionics



Figure 1. Oyster Bionic Packaging

The basic idea of structural bionics is to learn its structural features from living organisms in nature, such as bones, shells, fibre structures, etc. These structures have been optimised through a long evolutionary process to provide specific functions and performances, and according to the objectives and concepts of product design, the principles of natural constructions are applied to design the products in order to endow them with vitality and natural aesthetics. Bionic thinking in snack packaging design can be inspired by the shell or scale structure of marine organisms to design packaging with good sealing and durability. Imitating the opening and closing structure of oysters for biomimetic packaging design, as in Figure 1, oyster fry into the package is like fresh oyster meat, "restore" the appearance of the food itself, as if to let the consumer feel the site salvage, on-site production, sale of the freshness of the sense of experience. Oyster-type snack packaging structure of the short front and long back, easy to pick up food, dipping sauce; imitation of

sea fish in the middle and back half of the structure of the bionic packaging design as shown in Figure 2, the fish in the middle of the structure of the cross-section of the wider, designed to open and close the shape of the placement of fried food snacks, the tail of the fish structure simplified to deal with, easy for consumers to pick up and eat, to a certain extent, to add to the packaging of the aesthetic interest. Bionic design is usually able to reduce the amount of material used while maintaining sufficient strength and stability. This is beneficial for reducing the overall cost and environmental burden of packaging. The skeletal structure of marine organisms or the arrangement of plant fibres can be used as inspiration to design lightweight and compact packaging structures.

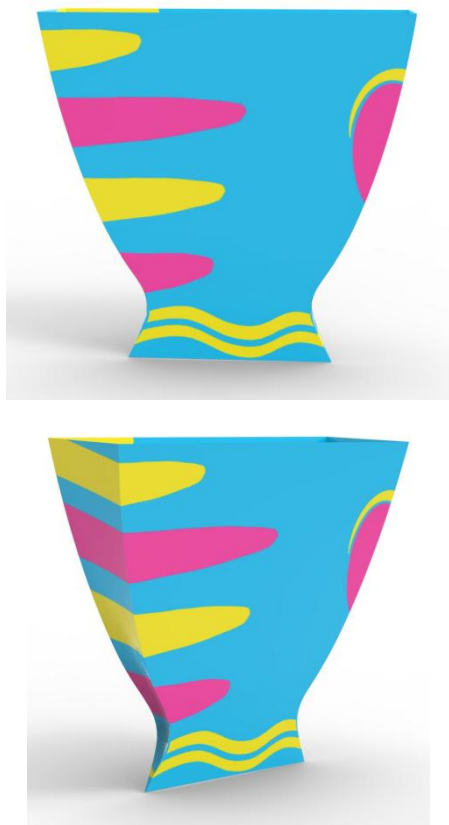


Figure 2. Fish Bionic Packaging

3.3. Colour Bionics

Colour Bionics is an innovative design concept that draws inspiration from colour combinations, colour distributions and colour functions in nature and applies them to packaging design in order to create a more natural, harmonious and appealing colour scheme. Colour is not only a visual stimulus, but also a tool that can trigger consumers' visual imaginations and associations, effectively conveying the product's information and value. Especially in the field of food packaging, the use of colour bionics not only highlights the aesthetics of the packaging, but also enhances the appetite of the food, making consumers more likely to want to buy such food. The colours of the xunpu fishing village snack packaging are taken from the village's maritime culture, with blue as the main colour, representing the sea around the xunpu fishing village and the seawater that feeds the raw materials for the snacks; supplemented by fuchsia and yellow, with fuchsia and yellow taken from the hairpin on the head of the xunpu woman; Hairpin surround belongs to Quanzhou xunpu intangible cultural heritage, is a brand representative of xunpu

fishing village, a significant feature, the overall colour of the package using bionic colours "blue, purple red, yellow", these colours from nature, not only so that the packaging design incorporates the concept of colour bionic also promotes the characteristics of the local colour culture.

4. The Significance of Bionic Design in the Packaging of Fishing Village Snacks

4.1. Building a Brand Image for Fishing Villages

Combining the bionic design concept and the cultural heritage of the fishing village, we have innovated the food packaging design, breaking the traditional cultural and creative design paradigm and introducing new technology, new thinking and new connotation. We used sea oysters and sea fish as prototypes for bionic extraction and simplification of form, structure and colour, through which we created a unique xunpu village food brand image. In this design series, we have designed various types of bionic food packaging, including packaging for deep-processed seafood, unprocessed seafood and seafood street snacks, forming a complete and iteratively upgradable packaging design chain. Through these designs, we not only regulate the village catering and food vending industry, but also effectively integrate multiple resources to help local villagers better sell their speciality foods. This innovative design approach is not only to beautify food packaging, but also to convey the unique charm and richness of local culture through packaging, thus strengthening the brand's sense of local identity and cultural heritage, and injecting new vitality and opportunities into the marketing and development of fishing village food.

4.2. Promoting Sustainable Development of Fishing Villages

The incorporation of bionic design concepts brings many innovative possibilities to the packaging of Fishing Village Snacks, by drawing inspiration from nature to design powerful, environmentally sustainable food packaging. The design of the XunPu Fishing Village Snacks packaging takes the environment into account. It draws on the structure of plant seeds or other biodegradable materials so that the packaging can decompose quickly after use, thus reducing environmental pollution and responding to the strategy of sustainable development. By designing the food packaging with the characteristics of xunpu village through the concept of bionics, it can effectively enhance the influence of the region on tourism culture. This kind of packaging not only demonstrates the unique local fishery culture, but also promotes the organic integration of fishery, culture and tourism industry, and shapes the unique image of xunpu village. Such initiatives help to promote rural revitalisation, attract more tourists and investment, and contribute to the sustainable development of the local economy. These designs not only enhance the attractiveness of the products, but also make a positive contribution to the environment and society.

5. Conclusion

This paper on the study of bionic design for packaging forms of snacks in fishing villages discusses in depth how to enhance the packaging image and attractiveness of snack products by combining the cultural characteristics of local

fishing villages with the concept of bionic design. Bionic design is not only a visual innovation, but also a process of establishing connection and interaction between products and nature. By adopting natural elements such as sea oysters, sea fish and hairpin flowers, we have designed a packaging form that can interact with consumers emotionally, further enhancing the deep integration of snack packaging with fishing village culture.

In our research, we found that the bionic design concept can not only enhance the market competitiveness of products, but also promote the development of local economy and the cultural heritage of villages. This kind of design is not only a form of packaging, but also a kind of respect and expression of nature, culture and consumers' emotions. Through these efforts, we believe we can make a positive contribution to the promotion of fishing village snacks and rural revitalisation, and do our part to protect and pass on local culture. In the future, we will continue our in-depth research and practice to explore more design concepts that meet the development of the times and market demand, and bring more innovation and value to the packaging form of fishing village snacks.

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