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Art and Expression

ART + COMMUNITY

SCIENCE



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ENTOMOLOGICAL ART

Engaging Science and Community

a chapter by

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Introduction

Entomology is a branch of science that specifically dealing with insects. Insects are dominant group of animals on Earth today among other terrestrial animals. They are well adapted to any kind of habitat and thus can be found everywhere (Triplehorn & Johnson, 2005). Insects and humans have had a long-standing and close relationship. Some people see insects as nuisance, rather than as beneficial creatures and serve many ecosystem services. We will continue to rely on and be inspired by insects because of their diversity, abundance, ecological benefits, and cultural links (Leather, 2015; Duffus et al., 2021).

Everyone is familiar with insects, and insect imagery generates a wide spectrum of emotional reactions, whether you like it or not, it depends on your past experiences (Klein & Brosius, 2022). It is not easy to quantify the insect roles, but it can be looked in various perspectives. Therefore, in this short review, we want to examine the importance of insects by focusing on their existence potential and influential in engaging science and community.

Entomological Art & Science

Science and art share many similarities, either directly or indirectly. Many scientists and artists worked together to share their viewpoint of insects both scientifically and aesthetically. A few centuries ago, it was usual for an artist to be an expert of insects as well (Dicke, 2004). A growing number of people are using their artistic talents to help spread the word about issues relating to environmental health. The capacity of art to arouse feelings while fostering conversation may be a potent instrument for conveying the significance of insects and other fauna, for example,

by understanding their impact to the environment (Klein & Brosius, 2022).

Human Invention and Innovation

It is not surprising that insects can provide engineers and architects with ideas for new designs, particularly in the context of the current sustainability movement. Engineers are particularly interested in social insects in this field of biomimetics because they have figured out the fundamental functional problems involved with sociality during evolution (Holbrook et al., 2010).

Other than that, honeycomb structures that are characterized by their lightweight and porous structures able to maximise space in an energy-efficient and have been progressively incorporated into human-made designs (Zhang et al., 2015). The technology of micro-drones and airless tyres has been inspired by dragonflies and bees (Leather, 2015). Six-legged robots with electronic command systems have been created using insect nervous systems as models (Tüzün, et al., 2015).

To enhance the sound of the xylophone, some people boil crickets in water infused with certain roots, which is then used to wash the instrument (van Huis, 2022). Others, use insects as bait for fishing and to catch birds (van Huis, 2022). Fly fishing lures have been modelled after insects, and many angling activities coincide with the annual appearance of mayflies or stoneflies. Thus, insects have influenced, directly or indirectly, and inspired the invention of fly fishing (Suter & Cormier, 2015).

Entomophagy and Traditional Medicine

According to Ramos-Elorduy (1997), entomophagy is a tradition that is learnt and passed down from one generation to the next, making it a significant part of cultural legacy that has influenced the formation of belief systems. Particularly in terms of culinary traditions, this effect is noticeable. Around the world, at least 1681 species of insects from 14 different orders are consumed in 102 different nations (Ramos-Elorduy, 2005; Leather, 2015).

Insects are consumed as a delicacy, nutritious food, snack, and seasoning by people, particularly in rural areas (Chung et al., 2002). For instance, in sub-Saharan Africa; grasshoppers, locust, and crickets are commonly available, affordable, cheap, and delicious source of protein. Few methods in preparing the insects including barbecued, sun-dried, fried, and boiled before being eaten with a variety of dishes.

Various insects are consumed not only for the nutritional purposes but also to cure diseases like diabetes, jaundice, high blood pressure and stomach diseases. Edible insects are high in calcium, iron, phosphate, protein, vitamins, minerals and amino acids (Chung et al., 2002; Tüzün, et al., 2015; Leather, 2015; van Huis, 2022; Borges, et al., 2022).

Entomological Art & Community Influence

Most artists produced insect art in various themes. Among the themes are habitat destruction or climate change, pollution, human population, decline of pollinators, invasive species, insects as a food source, insects and religion, insects in native cultures and the impact of insects on history (Dicke, 2000; Klein and Brosius, 2022). Due to the beauty of their forms and colours, insects are frequently utilised as symbols for the transience of life and transcendence of the soul (Dicke, 2004). Following are few other aspects that we want to discuss further.

Painting, Sculpture and Design

Artists have portrayed insects in two-dimensional and three-dimensional works since the

13th century. Classical paintings, sketches, artefacts, and etchings are example of two-dimensional works that make up most of the art works (Leather, 2015; Klein & Brosius, 2022). However, some artists used insects to create sculptures; carved in stone or represented in other three-dimensional works, either dead or alive. An etching of a cave cricket from 30,000 years ago is thought to be the earliest example of insects in art (Duffus et al., 2021).

Jan Fabre, the Belgian artist has fascinated with the colour of elytra of buprestid beetles and has employed this beetle in many of his art works (Dicke, 2004). In addition, numerous old coins, and stamps from around the world also have insect illustrations (Tüzün, et al., 2015). Some of the accessories are designed and inspired by the insects. For example, coleopteran-shaped earrings and necklaces that date to the Palaeolithic ages have been discovered. Due to aesthetical values of insects, items like household furniture, clothes, ornaments, and jewellery; have motifs of insect (Tüzün, et al., 2015; Suter & Cormier, 2015).

In most cases, artists usually use a single insect in their art works, while others use several insect motifs (Dicke, 2004). Among insect orders that mostly appeared in entomological art works are Lepidoptera (eg : butterflies), Diptera (eg : flies), Hymenoptera (eg : ants), Coleoptera (eg : beetles) and Odonata (eg : dragonflies) (Dicke, 2004; Klein & Brosius, 2022). These orders are chosen probably because they are commonly found everywhere and form cohabitation with human.

Textiles and Cosmetics

Insects provide us with honey, beeswax, silk, and other products of commercial value. The silk has a commercial value of \$200 million to \$500 million annually (Triplehorn & Johnson, 2005). Due to silk's distinctive lustre, cosiness, and warmth, which make it a highly sought-after fabric, silk production and trading began in China and eventually spread to Eurasia (Padaki et al., 2015). This highly demand has resulted in cultural exchanges while trading the silk (Li, 2020).

Various bee products have been used as ingredients in cosmetics and for skin care. Among the products are lipsticks, nail gloss, face powder, and blushers (Tüzün, et al., 2015). The bee products that are utilised in medicine and cosmetic manufacturing include honey, propolis, bee pollen, bee bread, beeswax, and bee venom. Each bee product differs from the others in terms of the active ingredients it contains, making each one useful for a specific skin treatment (Kurek-Górecka et al., 2020).

Religion, Traditional Beliefs and Mythology

The connection between insect, for example butterfly, and the internal soul has established since 3000 BC Egypt. Butterflies were said to be the philosophy of rebirth (Duffus et al., 2021). Flies represented brevity, while dragonflies represented the soul and endless life in the Hereafter. (Dicke, 2000). In traditional agricultural practices in Nepal, farmers have spiritual festivals that is done specifically to help control pest species (Gurung, 2003). Among other common belief, for example in Nepal, parents reinforce the traditional belief by telling their kids not to sleep in the grass while they are supposed to be gathering feed for cattle because the risk of having harmful earwigs burrow into their ears, in which later, could penetrating the brain (Gurung, 2003).

A locust plague is viewed as both a catastrophe and a punishment by God. Whereas the arrival of mole cricket indicates the impending death of a family member or close relative and is considered a bad omen. It may also indicate that there is no food in the house (van Huis, 2022). This intricate relationship between people and insects have shaped traditional beliefs and folklore with cultural ceremonies and other traditional activities (Duffus et al., 2021).

Mass Media and Insect-inspired Metaphors

Insect morphology has influenced different types of media, such as books, comics, novels, literature, photography, and films which have used insects as both inspiration for heroes and/or antagonists in equal proportion. This idea is inspired by the special skills that insects possess, such as flight, stinging, secretion production, and meta-

morphosis (Tüzün, et al., 2015; Suter & Cormier, 2015; Duffus et al., 2021). For example, some movies that are related to insects; *The Swarm* (1978), *The Fly* (1986), *Mosquito* (1995), *Infested* (2002) and others (Leather, 2015).

Although metal and punk music play on emotions of dread and disgust, they also make references to insects for their beauty (like butterflies and moths) and other good attributes (Coelho, 2000). Even sounds produced by bees, grasshoppers, cicadas, have been used as musical effects (Tüzün, et al., 2015). Music has a weaker visual impact than film, which may lessen the impact of frightful pictures. Without the visual cues offered by movies and other visual arts, this medium enables the viewer to experience a range of insect-inspired metaphors—both positive and negative—in their own way (Leather, 2015; Duffus et al., 2021).

Art Therapy

Even they are not the expert on insects, people from all cultures have always enjoyed collecting insect specimens especially butterflies, which have aesthetic appeal to many of them (Takada, 2013; Suter & Cormier, 2015; Duffus et al., 2021). The problems associated to climate change and socioeconomic challenges can be greatly improved by good urban design and planning. Nowadays, the goal of urban planners around the world is to replace the lack of parks, gardens, and other green spaces in cities with nature in a variety of methods (Lehmann, 2021). Rewilding urban areas has emerged as an alternative approach to reintroduce butterflies and other insects (Lehmann, 2021). Users of these urban places report psychological advantages from increased butterfly species diversity in urban green spaces, including reduced stress, depression, and anxiety. (Fuller et al., 2007; Cox et al., 2017).

Conclusion

Entomology and art are an ideal combination by looking at various perspectives towards shaping a community. The engagement between these two elements is tighten by addressing the functions of insects in many aspects as mentioned above. Insects have a significant economic and

social impact on humanity (Leather, 2015). Our experience influences the way we view insects. A hate of insects might develop because of having unpleasant experiences with them (Shiple & Bixler, 2017), which in turn decreases interest in learning about insects. Positive experiences, however, can significantly lessen the perception of risk posed by insects and foster good perception toward their significance value and contributions (Duffus et al., 2021). It is undeniable that modernisation has caused changes in tradition, culture, and upbringing of the local communities (Chung et al., 2002). Therefore, it is important to integrate science and art for sustainable development of a community.

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