



Cultural Entomology

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Abstract

Insects – which represent the largest and most diverse class of animal, and constitute the subject of entomology – can be encountered in almost every part and area of daily life. Insects are found in almost every livable location on earth, and comprise numerous species that are harmful and beneficial to humans. Just as there are numerous species of insects that cause damage to agricultural and residential areas, harm humans, spoil foods, and damage human tools and items; there also many species of insect that provide valuable products (honey, pollen, royal jelly, silk, etc.) and serve as a source of knowledge and inspiration for humans (in literature, poetry, novels, films, music, cartoons, folklore, handicrafts, jewelry, etc.). Furthermore, in many forensic cases, insects found in and on a corpse allow the determination of the time and location of death, as well as the post-mortem interval (Forensic Entomology). These contributions of insects to human societies, which constitute the subject of cultural entomology, reflect the indispensable role they assume in human culture. For this reason, it is important for humans to see insects as more than just harmful and frightening animals, and to realize that they constitute an important part of both nature and daily life, while also learning to live together with them.

Keywords: Insect, Human, Cultural Entomology.

INTRODUCTION

Entomology is the branch of science that investigates the lives of insects and the various aspects of their relationships with their environment (from Greek; entomon: insect + logy: science). Insects are the richest group of the animal kingdom and we confront these animals, which are the subject of entomology, on a daily basis. Insects, which live practically everywhere on the planet, have both beneficial and harmful characteristics for mankind. While they can cause damage to humans themselves, and their various products and food in agricultural areas and living environments, there are also insects whose products we use (honey, bee pollen, bee bread, bee venom, royal jelly) and those we use as a source of inspiration (literature, poetry, novels, films, music, animated films, folklore, handcrafts, jewellery). In addition, in many criminal cases, the time of death, and place of death can be detected by investigating the insects around, in and on the corpse (Forensic Entomology).

Insects in culture, religion and symbolism

For millennia, insects have occupied a significant role in human culture. Earrings and necklaces, in the shape of coleopteran, have been found that are known to date to the Palaeolithic ages. In shamanist cultures, coleopteran were used in the making of ornaments, with their bright colours and spectacular mandibles (hornets). Insects have been illustrated on ancient coins and on thousands of stamps worldwide. Mummification, a complex process that aims to preserve the corpse until resurrection, takes its inspiration from holometabolous development, the pupa stage, of the of the insect.

Insects also play an important role in many religions. Insects have been worshipped in various ways since prehistoric times. In shamanism, it is believed that during the trance state there is direct contact with the realm of the gods and souls. These innumerable souls are generally thought of as having animal shapes, and among these insects are significant. According to shamanist beliefs, the bright, metallic colours of the coleoptera, used in rituals and ornamentation, symbolise the bright sky, and the mandibles symbolise ascension. According to the Toba people of Sumatra, a large coleoptera (dung beetle) has brought a great lump of matter from the sky to form the earth. According to the Taoist belief, the purpose of which is to achieve material or spiritual immortality, the dung beetle makes dung into a ball from which life emerges as an effect of the unscattered work of spiritual concentration. Insects can be found in Islam too. The names of some insects are cited in the hadiths and suras of the Quran: the Bee Sura, Ant Sura.

Since ancient times, certain symbols are used in conveying enigmatic messages, calling on the help of supernatural powers and making use of them. In mythology, it is believed that insects are representatives of the gods, created to convey messages, and they frequently have a symbolic duty in human spirit. The cicada and some other insects, especially the dung beetle, symbolise resurrection, resurgence and an immortal life. Ancient Egyptians believe that the dung scarab (*Scarabaeus sacer*) is the symbol of Ra, the God of Sun and have used it as a talisman, as the royal cartouche. The dung scarab carrying the sun disk on its back, representing the cycle of the Sun as a ball of fire, and the seeds it took from the Sirius star, represents the Solar System with its planets. According to the belief, the ball, in which the scarabs put their eggs and which they created pushing and rolling, gives life to the planets in the system. In ancient

Egypt, the mummies have on their chests the heart-shaped scarab talisman, which symbolises reincarnation having the meaning “survive immortally”. This symbol has also been an early period Christian symbol representing resurrection. Phoenicians have recognised the dung beetle as their good fortune talismans, which they have symbolised as four-winged.

Just as the dung beetle, butterflies, ants and bees have been used as symbols.

Butterflies are also used to represent dead souls or souls in purgatory and life after death. The Greek Goddess Psyche, who represents the soul, has been illustrated with butterfly wings. Social insects such as ants, termites and some bees symbolise cooperation and hard work. In the United States of America, the honeybee symbolises virtue.

As well as being symbols of good fortune, there are also insects that are seen as a symbol of bad luck, such as flies. Flies, which are associated with dirt, symbolise evil, plague, pain, disease, death and dirtiness of everything.

Insects and their products from which we benefit

Insects and their products play an important role in our lives. Bees, which we use themselves as well as their products, are important in human health. The honey, pollen from bees and royal jelly is an important and healthy nutritional source, due to the many substances they contain. For people who must not consume fats, honey, which is rich in proteins and amino acids, but contains no fats, may be used. In addition, honey is the most suitable food source for increasing blood sugar levels and thus a very good source of energy. Moreover, honey has many beneficial effects, such as killing microbes, treating fatigue, and strengthening the immune system. Bee pollen, another product from bees, can be used as a meat substitute and its medical nutritional value is so powerful that no other food can equal it. Royal jelly is commercially produced and used in many countries for dietary and cosmetic purposes due to its repairing and healing characteristics. Similarly, bee venom is used in treating rheumatoid diseases. Using honeybee products, (royal jelly, pollen, bee bread, honey, venom, and propolis) as preparations, in various amounts and compositions, for the treatment of human diseases is called Apitherapy. In China and in Eastern European countries there are Apitherapy centres where human diseases are treated using bee products.

The silkworm, another insect of which we use their product, has an important role. Their silk fibres are used in the manufacture of textiles, house articles, parachutes and surgery filaments. This gummy fluid is secreted as filaments from the silkworms' structural glands, or spinnerets, which are ducts on the lower lip of the worm. This filament solidifies and hardens when in contact with the air. The silkworm weaves a cocoon around itself, the outer part loose and tangled, and the inner part is tighter and regular. The filaments in the silkworm's cocoon are opened and made into silk balls, using a special method. Then, these fine filaments are made into more resistant silk strands through a process called twisting, which in turn is used for weaving fabric.

Although insects do not generally form part of the human diet across the world, they are one of the alternative food sources, and their consumption is steadily increasing. In some regions of the world, insects are not thought of as an alternative but were once one of the most commonly consumed foods in ancient times. Insects,

having a high nutritional value, are important for human health, as they contain abundant amounts of protein, minerals, vitamins, calcium, iron and phosphate, as well as a minimal amount of fat. The amount of protein in grasshoppers is three times higher than that found in chicken. Dried insects are relatively rich in unsaturated fats when compared with uncooked meat and fish.

Insects are also used as food colorants. The dyestuff carmine, which is used in everyday products, such as textiles, cosmetics and food, is obtained from the insect *Dactylopius coccus* (Cochineal). This dyestuff is used to obtain many shades of red. This red colour comes from the carminic acid, which the Cochineal synthesises to keep other insects away from the cactus. Carminic acid is a natural colorant particularly used in the meat products sector in Turkey. It is used in the food sector in fruit preparations, meat products (salami, sausage, sucuk (Turkish sausage)), fish products (surimi, roe pate), beverages (with or without alcohol, cocktail syrups, apple wine, mineral waters, functional beverages), candies (aromatised candies, Turkish delight, jelly tots), milk products (yoghurts with red fruits), bakery products (cakes, biscuits, pastries), jams, ice cream and sauces. Another areas of use are in the cosmetics, pharmacology and textile industries. In the cosmetic sector, it is used in lipsticks, nail gloss, face powder, and blushers; in the pharmacology sector, it is used in syrups and pills; and in the textile sector, it is used in natural products.

Insects used as a source of inspiration

The physiologies, movements and lives of insects are sources of inspiration for us. Insects are right in our lives with articles and technological equipment which we use all the time and prefer due to their aesthetics. On items of household furniture, clothes and ornaments, insects are being used as motifs (such as dragonfly shaped necklaces, caterpillar shaped hairpins, ladybug shaped articles, bee shaped lamps, butterfly shaped children's costumes). In jewellery design, bees, ladybirds, butterflies, dragonflies and flies are used as images and symbols. Metallic coloured insects of the Buprestidae family are known as jewel insects and are collected to be used in ornaments and textiles. Dragonfly, butterfly, caterpillar, ladybird and bee-shaped plastic toys are being manufactured. Many children's articles such as watches, backpacks are insect shaped.

In technology too the physiologies and morphologies of insects have led to useful inventions. In the Artificial Intelligence Laboratory of MIT, six-legged robots with electronic command systems have been developed, using the dispersed nervous system of insects as models. 'Bugs', small bugging devices, which do not attract attention, are inspired from the small structures of insects. Similarly, vehicles such as helicopters have been inspired by the dragonfly which is colloquially known as the helicopter bug.

Insects in literature, arts and music

Insects have long been used as sources of inspiration for literature, arts and music. Insects are the subject of many novels, tales, poems, sayings and idioms. They have been given important roles in children's literature, such as the Ant and the Grasshopper and The Little Caterpillar. They have been the subjects of novels, such as *The Beetle* (Richard Marsh), *Boxer Beetle* (Ned Beaman). In Turkish, insects are frequently used in sayings such as “Anlayana sivrisinek saz, anlamayana davul zurna az (For he who understands, the mosquito is music, for he who does not understand, drums and shrill pipes are insufficient)” and “Çanakta balın olsun Bağdat'tan sinek gelir (Keep a jar of honey and you will

attract a fly from Baghdad)” and in idioms such as “Dilini eşek arası soksun (Has a hornet stung your tongue)”, “Sinek avlamak (Hunting the flies)”, “Sinekkaydı tıraş (a close shave)”. Similarly, they have been used in films and titles such as Beetlejuice, Killer bees and in animations AntZ and The Ant Bully.

Insects have also been used in the works of renowned painters and sculptures. In Carnac, the giant red granite scarab sculpture, called the Great Sphinx (God), looks east to greet the sun.

Insects have inspired musicians. Sounds made by bees, grasshoppers, cicadas, have been used as musical effects. Similarly, they have been the subject of songs such as “Arım Balım Peteğim (My Bee, My Honey, My Honeycomb)”, “Flight of the Bumblebee”, “Kovaladıkça kaçan ateş böceği misin? (Are you the firefly that flies away when chased?)”. Not only song names, but also names of renown musical bands in Turkey involve insects such as Beyaz kelebekler (White Butterflies), Uğur böcekleri (Ladybirds). The iconic band, The Beatles, have derived their name from the words, beetle and beat.

Insects in the forensic sciences

In many criminal cases, time of death, place and time of death can be determined by investigating the insects that are around, on or in the corpse. In this field of Forensic Entomology, insects are very important in determining the place and time of death and whether the corpse was moved to a different place. Considering the development of insects around the corpse, toxicology analyses can be made; the place and time of death and whether the place or position of the corpse was changed after death can also be detected. In particular, the eggs, larvae, nymphs and adults of holometabolous insects have a primary role in identifying the time of death. The appearance of the Coleoptera and Lepidoptera order of insects provides information in estimating the time of a death that occurred long ago. Many murders have been solved as a result of Forensic Entomology.

Insects in psychology: Entomophobia

In psychology, Entomophobia, which is defined as a phobia of one or more class of insects, or other insect-like Arthropods, is known as insectophobia or the fear of insects or worms.

This is caused by a specific characteristic: the fear, or an emotional response, in the form of anxiety or a panic attack. The fear of bees (Apiphobia), fear of insect stings (Cnidophobia), the fear of termites (Isopterophobia), the fear of ants (Myctophobia) and fear of lice (Phthiriophobia) are among the phobias manifested in many individuals.

Harmful insects

Besides their numerous benefits, there are also insects that cause serious damage to human health, living spaces and objects. Humanity has been in a continuous struggle to prevent such damage. Insects, harmful to health, cause many diseases and allergies by stinging, biting or sucking. Medications and creams, to minimise reaction, are produced for ailments caused by stinging, biting or sucking. Besides the impact on human health, insects also cause untold damage to agricultural crops, moths damage our clothes, and woodworm our furniture. The crops in the fields are protected from undesirable insects with the use of insecticides. . Naphthalene or similar substances are used to protect our clothes and furniture.

CONCLUSION AND DISCUSSION

Insects can be found virtually everywhere in the world and have aspects that are both beneficial and harmful for humanity. There are insects that damage agriculture, living spaces, humans themselves, as well as food and possession, but there are insects whose products we use and which are sources of inspiration. In addition, insects can make a valuable contribution to the solving of criminal cases. The presence and development of insects around, in and on the corpse, means that the time and place of death can be detected. All these show that insects are indispensable tools in human culture and form the basis of cultural entomology. Thus, man has to be made aware of the role insects play and, rather than merely considering them to be harmful, disgusting or frightening, must learn to live with them.

REFERENCES

- [1] Kökdener M. & Karapazarlıoğlu E., 2013. Forensic entomology. Düzce Üniversitesi Sağlık Bilimleri Enstitüsü Dergisi, 3(2): 24-28.
- [2] Saruhan İ., Tuncer C. 2010. Cultural Entomology. Anatolian Journal Agricultural Science, 25(1): 21-27.
- [3] Veliöğlu H., Yılmaz İ., Veliöğlu D.S. 2006. Carmine from natural dyes used in food. Turkey 9. Food Congress, p347-350.
- [4] Yücel B. 2004. Apitherapy; The importance of bee products on human health. Ege University Agricultural Practices and Research Center, Farmers Brochure, 56. Beetles as religious symbols. www.insects.org/ced1/beetles_rel_sy m.html
- [5] How to obtain silk. www.nkfu.com/ipek-nasil-elde-ediliripekcilik-hakkinda-bilgi/
- [6] Insects as an alternative food source. www.bilgiustam.com/alternatif-besinkaynagi-olarak-bocekler/
- [7] Scarab -The Magical Beetle of Egypt. <http://www.crossroad.to/articles2/2002/carl-teichrib/11scarab.htm>
- [8] The scarab symbol. www.astroset.com/bireysel_gelisim/s embol/s31.htm
- [9] What are the bee products. www.eziraat.net/ari-urunlerini.html