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INSECTS: FRIENDS OR ENEMIES?

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Abstract

Insects are small creatures that are unavoidable by humans and other animals, their impacts in the universe are so numerous that they cannot be exhausted. This paper has its focus on these tiny but conspicuous creatures (insects), which most people see as enemies. It reveals some hidden facts about insects, and describes them as both friends and enemies. Insects at some stages of their life are involved in activities that are both friendly as well as harmful e.g. the honeybees which are beneficial to humans but tend to be harmful when aggressive. As a result of the benefits man gets from friendly insects, he conserves them so as to maximize profit. The status of insects as either friends or enemies has been a long case of controversy; this paper, however, makes new contributions towards this controversy. The war against insects started many years ago, but the insect pest management seems to be the best approach in controlling the harmful insects. Insects are highly indispensable in the ecosystem and cannot be totally exterminated rather they develop resistance to some of the measures used in controlling them.

Keywords: Insects, pest.

1.0 INTRODUCTION

Insects are arthropod animals of a large class (insecta) having a head, thorax and abdomen, six legs, two antennae, and one or two pairs of wings. Insects belong to the largest group of the phylum arthropoda in the animal kingdom containing up to 75% of the known species of the animals, (Hickman *et al*., 2008). Insects are by far the largest group of arthropods, whether measured in terms of numbers of species or number of individuals (Johnson, 2003). Insects are grouped with other animals sharing similar characteristics in the phylum Arthropoda but have some unique characteristics absent in other animals, (Pedigo and Rice, 2009). They range in size from less than 1mm to 20cm in length, the majority being less than 2.5cm long some of the largest insects live in the tropical areas, (Hickman *et al.*, 2008). Mader (2001) stated that insects are so numerous and so diverse that the study of this one group is a major specialty in biology called entomology.

Man has been interested mainly in two categories of insects: harmful and beneficial species. These two categories comprise only a few thousand of the millions of insect species. The beneficial species are seen as friends by humans while the harmful species are seen as enemies. Meanwhile, a vast group of insects are classified as neutral, which is rather a trivial term because these species are essential components of the world's ecosystems and thereby contribute to man's long term well being, (Vanlenteren and Overholt, 1994). This implies that some insects are beneficial and harmful as well such as grasshopper, termite, honeybees and many others. Jordan and Verma, (2010) opined that "compared with beneficial insects, injurious insects are very nunerous". For most people, insect is synonymous with the term "noxious organism" as they are being mentioned in books, magazines, movie and television shows as being harmful, cruel, and dangerous creatures, (Vanlenteren and Overholt, 1994).

In addition, Pedigo and Rice, (2009) posited that many people believe that all insects are bad (but that is a wrong perception) rather we might say that insects suffer from poor public relations. This view was expressed by Mertins, (1986) (as cited in Pedigo and Rice, 2009) in a review of insects and other arthropods that have been used as subject matter in moviemaking. Unfortunately, commercial films in countries such as the United States have portrayed insects mostly in an inaccurate, unflattering way, and this same medium serves to educate masses of impressionable young people. Apart from the movie theatre, parents also teach youngsters aversion of insects. Often times they scold them to throw away a caterpillar tucked in their hands or encourage them to step on a beetle running across the sidewalk. Unfounded admonitions such as "it will bite you, get rid of it" and "kill it before it gets away" serve to create attitudes of both fear and confrontation that are passed along from generation to generation. However, our country Nigeria is not an exception of insect aversion. Most Nigerians always discuss about insects from their negative characteristics paying less attention to their numerous benefits.

Furthermore, Pedigo and Rice, (2009) suggested that viewing other insects species as we do to butterflies might make us accept that the benefits of insects far outweigh the losses caused by them. Also, the key to this change in attitude is knowledge and understanding about insects and the important part insects play in the ecology of our planet. From past mistakes, it would seem that the most advantageous attitude should be to live in harmony as much as possible with all elements of nature, including insects. This paper answers the question "whether insects are our friends or enemies". It expresses the various ways insects are friends as well as enemies and concludes that the benefits of insects are greater than the harm they cause humans. It further supports the opinion of T. Eisner (in Pedigo and Rice, 2009) who opined that "bugs are not going to inherit the earth. They own it now, so we might as well make peace with the landlords". Therefore humans on their part should promote an attitude of harmony through insect pest management, the sensible approach to insect problems, (Pedigo and Rice, 2009).

1.1 Major Insect orders

Insects are divided into nine (9) major orders as represented in the table below (Raven *et al.*, 2011).

Table 1: Major Insect orders

Orders	Typical examples	Key characteristics	Approximate no of named species
Coleoptera	Beetles	Two pairs of wings, the front one hard, protecting the rear one, heavily armored skeleton; biting and chewing mouthparts. Complete metamorphosis. It is the most diverse.	350,000
Diptera	Flies, Mosquitoes	Front flying wings transparent; hind wings reduced to knobby balancing organs called halters. Sucking, piercing, or lapping mouthparts; some bite people and other mammals. Complete metamorphosis.	120,000
Lepidoptera	Butterflies, Moths	Two pairs of broad, scaly, flying wings; often brightly colored. Hairy body; tube like, sucking mouthparts. Complete metamorphosis.	120,000
Hymenoptera	Bees, wasps, ants	Two pairs of transparent flying wings mobile head and well-developed compound eyes; often possess stingers; chewing and sucking mouth parts; many social. Complete metamorphosis.	100,000
Hemiptera and Homoptera	True bugs, bed bugs, leafhoppers, aphids, cicadas	Wingless with two pairs of wings; piercing and sucking mouthparts, with which some draw blood, some feed on plants. Simple metamorphosis	60,000
Orthoptera	Grasshoppers, crickets	Wingless or with two pairs of wings; among the largest insects; biting and chewing mouthparts in adults. Third pair of legs modified for jumping. Simple metamorphosis.	20,000
Odonata	Dragonflies	Two pairs of transparent flying wings that cannot fold back; large long and slender body, chewing mouthparts. Simple metamorphosis.	5,000
Isoptera	Termites	Two pairs of wings, but some stages are wingless; chewing mouthparts, simple metamorphosis. Social organizations; labor divided among several body types; some are among the few types of animals able to digest wood. Complete metamorphosis.	2,000
Siphanoptera	Fleas	Wingless, flattened body with jumping legs; piercing and sucking mouth parts small; known for irritating bites. Complete metamorphosis.	1,200

Source: Raven *et al*, (2011)

1.2 Success of Insects

According to Eisner and Wilson, (1977), as cited in (Pedigo and Rice, 2009) stated that "insects all but own the land" which means that they live in almost habitable place on earth. The characteristics that accounted for insects tremendous diversity and numbers includes their; exoskeleton, small size, flight, great reproductive potential, metamorphosis and adaptability, (Meyer, 2009).

2.0 BENEFICIAL EFFECTS OF INSECTS

Most insects, play a very positive role in nature while only a minimal fraction of insect species – less than 0.01% – possibly cause problems to humans, (VanLenteren and Overholt, 1994). Few of the numerous benefits of insects are discussed below.

2.1 Insect Products

Insects can benefit humans by providing products desired for human consumption, a primary source, or by interacting with elements of our environment to yield benefits, an intermediate resource; probably the most valued primary resources insects provide today are: honey, silk, bees-wax, their bodies for human consumption and experimentation, (Pedigo and Rice, 2009). Other vital product of insects includes propolis, royal jelly (bee milk) and gut.

2.1.1 Honey

Moran, (2012), described honey as the main source of energy for bees. Worker bees collect nectar from plants and carry it back to the hive in a special pouch on their gut called a crop, before passing it to the house bees. These bees add enzymes and place the nectar near the entrance of the hive, fanning it with air to dry it out, creating sticky sweet honey. The bees then store the honey in cells of the honeycomb and cover it over with wax to keep it fresh for the winter. The strongest colonies can store up to four times as much honey as they actually need and it is this spare honey that

beekeepers harvest and market. Honey is used as a food source and as a medicine. In the world wars, honey was used to treat the wounds of soldiers and to fight infection before penicillin was discovered. Today, it has even been used to preserve parts of human eyes for transplants. This is all due to honey's antiseptic properties. More so, Ezra, (2010) emphatically stated that honey is medicine, money, delicious and nutritious. It is more than just a food. Today, beekeeping for honey production is a profitable agricultural enterprise in many countries and an important foreign exchange earner for those that export honey and bee wax. It is used in cosmetic industry, as industrial raw materials, as animal feeds, and as brewing ingredients (Akunne, 2011). Honey is used in many ways by man also as the chief source of natural sweet in preparing candies, cakes, bread and so on. It forms a very important food for patients of diabetes or for persons undergoing very strenuous physical exertion, (Jordan and Verma, 2010).

2.1.2 Silk

The true silk is the secretion of the caterpillars of silkworm moth (*Bombyx mori*). Silk is a secretion in the form of fine threads, produced by caterpillars in preparing cocoons for their pupae. Long sac-like silk-glands, which are in fact modified salivary glands, secrete a thick pasty substance which is passed out through a pair of fine ducts that open on the lower lip. This secretion is spun by the caterpillar into fine threads which harden on exposure to air to form fairly strong and pliable silk-strands. The caterpillar larva prepares silk filaments several thousand metres in length at the rate of 15.00cm per minute, (Jordan and Verma, 2010). The market value of silk supports the argument that the silkworm is one of our most significant insect species and is truly a valued resource. Alebiosu, (2011), stated that the culturing of silkworm with mulberry leaves for the production of silk is very new in Nigeria. So for it to be done profitably as in other countries, some basic studies must be carried out to obtain a sustainable silkworm rearing technology. The study carried out revealed that mulberry sericulture is practicable in Nigeria. To buttress more, Mckinney and Eicher, (2009), stated that the Yoruba (a large ethnic group in Nigeria) use native silk that they call "sanyan" from the Anaphe moth as one of their most prized fibre resources .

2.1.3 Gut

Another economic value of the silkworm is the preparation of gut used for surgical and fishing purposes. For preparing the gut, the intestines of silkworm are extracted, made into strings, dried, treated and packed. This industry has good prospects and is growing in Italy, Spain, Fermosa, Japan and India, (Jordan and Verma, 2010).

2.1.4 Bees wax

The worker bees secrete wax from glands situated in the abdomen. The secretion is exuded between the segments on the underside of the abdomen and scales of wax can be noticed as a result of hardening of this secretion. These scales are detached from the body by the setae of tarsi and passed onwards to the mouth, wherein they are chewed and made plastic to be used in building the comb walls. A large quantity is utilized in pressing comb foundations and returned to the bees hive wherever artificial methods of rearing are carried out. Bee wax is used in cosmetics and pharmaceutical industry; in making candles, lubricant for sewing thread (by shoemakers) and industrial use, (Akunne, 2011). Several thousand mounds bees wax are used in shaving creams, cold creams, polishes, castings of models, carbon paper, crayons, electrical and other products, (Jordan and Verma, 2010).

2.1.5 Lac

This is a raw material from lac scale insects *(Laccifer lacca)* used in making shellac and the colouring of other scale insects for making red and purple dyes. It is mostly produced in India, from where the world receives some 40 million pounds annually. Lac is an important ingredient of many items including floor polishes, shoe polishes, insulators, various sealants, printing inks and varnish.

2.1.6 Dyes

Many species of scale insects provide dyes that are used in many products, including cosmetics, and for colouring cakes, medicines, and beverages. Cochineal is a bright red pigment that is gained from the bodies of a scale insect, *Coccus cacti*, which lives on cactus plants. Cochineal, red dye derived from the dried bodies of female scale insects, *Dactylopius coccus*, (native to America) were used as a dye source by the Aztecs. The natural dyes gained from insects flourished because the synthetic ones were found to be carcinogenic. Tannin is a dye that is gained from insect galls and is used in the tanning of hides and in the production of permanent durable inks.

2.1.7 Propolis

Bee propolis is used by bees to seal open spaces and cracks. It is made up of tree sap collected from conifers, pines, flowers, and small buds, along with small amounts of bee saliva. Both humans and bees enjoy the benefits of bee propolis. It is often prescribed as a natural remedy or traditional medicine. Some proven bee propolis benefits includes: use as topical cream; it can be applied to small wounds; used in treating sores in the mouth and sore throat, used in treating second degree burns, helps in reducing inflammation, used as mouth wash and it also reduces infection after surgery. Recent research revealed that propolis is able to stimulate the immune system, increases the effects of penicillin and other antibiotics. In veterinary research, propolis is found to improve milk-fed calves' weight gain and reduce diarrhoea. Nowadays, it is being investigated as a possible treatment for cancer, bowel problems and reducing blood pressure, (Uno, 2011).

2.1.8 Royal Jelly (Bee Milk)

Moran, (2012) stated that honey provides bees with energy as earlier stated but it is important for bees to have a source of protein to feed growing larvae. Pollen contains protein so young nurse bees eat it to help them grow. The royal jelly causes a larva that feeds on it to develop into a queen rather than a worker, increasing its lifespan from 6 weeks to an average of 3-4 years, so it's not surprising some people believe it can benefit our health. Humans harvest the large amounts of royal jelly that can be found in the queen's chamber and use it in various cosmetic products such as hand cream, and shampoo. The effect that royal jelly has on us is not fully understood but some studies have shown evidence for it doing all kinds of things, from giving us more energy and getting rid of wrinkles to helping fight cancer.

2.2 Role of Insects in Pollination

For humans, pollination is by far the most useful activity that insects carry out. Pollination is the process by which pollen is transferred in the reproduction of plants, thereby enabling fertilization and sexual reproduction. The most important crop pollinators are bees, of both social and solitary species, although visitors to flowers also include small beetles, butterflies and a variety of flies, (Microsoft Encarta, 2009). Losey and Vaughan, (2006) stated that the value of crop production from pollination by native insects (not just the bees) is $ 3,000,000,000. Examples of bee pollinated plants are clover, Lemon balm, Toadflax, and Willow. Because insects help flowering plants to cross-pollinate, some insects are critical to agriculture. Most flowering plants require an animal to do the transportation. While other animals are included as pollinators, the majority of pollination is done by insects. Because insects usually receive benefit for the pollination in the form of energy rich nectar; it is a grand example of mutualism. The various flower traits (and combinations thereof) that differentially attract one type of pollinator or another are known as pollination syndromes. These arose through complex plant-animal adaptations. Pollinators find flowers through bright colorations, including ultraviolet, and attractant pheromones. Ants sometimes pollinate flowers (Burnie and Tschinkel, 2009). As the Worker Honeybee fly from flower to flower, worker honeybees collect pollen grains and pack them onto their hind legs in special hair-fringed pockets known as pollen baskets.

2.3 Role of Insects in Weed Control

Populations of weeds are often controlled or held in balance by insects. Sometimes insects are introduced from another country to control weed plants. A South American moth, *Cactoblastis cactorum,* was introduced into Australia to control a cactus that was ruining the range land of cattle. Many insects have been introduced into the United States to help control alligator weed, which clogs streams and lakes.

2.4 Insects as Food

Ifie and Emeruwa (2011) stated that insects have played an important part in the history of human nutrition in Africa, Australia, Asia and America. As long as protein-energy malnutrition prevails in developing countries, the search for low cost, nutritious and easy to prepare locally available complementary foods will continue (Dunkel and Berenbaum, 2000). There are over 1,400 recorded edible insects (FAO, 2008) and according to DeFoliart, (2002), indigenous population in many Third World countries where animal protein is scarce use 30 species of insects or more. As long as protein-energy malnutrition prevails in developing countries, the search for low cost, nutritious and easy to prepare locally available complementary foods will continue (Solomon *et al*., 2008). In addition, global climate change and increasing food insecurity in many parts of the developing world may put insects regularly on the menu. Most edible insects are cheap, available and can provide a good source of protein and minerals needed to complement cereal based foods consumed in the developing countries. The larva of *Oryctes Monoceros* is one of the insects commonly consumed in the Niger Delta regions of Nigeria. It is commonly consumed raw, boiled smoked or fried. They are fried in their own oil and salted for snacks either alone or with a boiled carbohydrate food (Ifie and Emeruwa, 2011).

Pedigo and Rice, (2009) observed that Europeans and their descendants are the only major group of people not consuming insects in an appreciable amount. This may be surprising when considering that the Greeks and Romans, who laid the foundations of modern European culture, ate a wide variety of insects and reared some as specialty foods. Among the edible insects, termites and grasshoppers are probably the most widely consumed, with caloric value sometimes exceeding 500 calories per 100 insect grams. Since it is impossible to entirely eliminate pest insects from the human food chain, insects are present in many foods, especially grains. Food safety laws in many countries do not prohibit insect parts in food but rather limit the quantity. Curran, (2012) stated that insects are sold in cans in stores in Africa, the Goliath beetle, a type of scarab, is pursued with zeal among the roots of the banana tree.

For example, mayflies are thought to be the single most important dietary component of trout, and the skilled angler would not expect good fishing without these insects. In other instances, insects, are reared for sale as fish bait and pet food and some, including crickets and locusts are collected during mass outbreaks for swine and poultry feed in some countries (Pedigo and Rice, 2009). The grasshopper is eaten by some people either roasted or fried; their eggs, nymphs and adults provide food for several predatory insects, spiders, fish, frogs, reptiles, birds and mammals. The Greeks ground the locusts with mortars and made flour of them and used as floor food, (Jordan and Verma, 2010).

2.5 Insects (Dermestids) for Cleaning Skeletons

Carpet beetles are small insects that will feed on almost anything organic, including cereals, carpets, and dried insects in collections. Museum technicians take advantage of this fact, and utilise established colonies of dermestids to clean skeletons of mammals.

2.6 Insects as Scavengers

Pedigo and Rice (2009) stated that scavenging is another benefit of insects to humans. Insects in feeding, on dead animals and plant tissues, often carry out the first stage of decomposition by predisposing matter for enhanced decay and ultimate breakdown by micro organisms. Some prominent examples of insect decomposers are termites that breakdown woods, springtails that assist in the decomposition of dead leaves and carrion beetles and many fly maggots that feed on dead animals. The beetles which are scavengers feed on dead animals and fallen trees and thereby recycle biological materials into forms found useful by other organisms. These insects and others are responsible for much of the process by which topsoil is created. More so, economic losses avoided every year by burial of plant matters by dung beetles are $ 380,000,000, (Losey and Vaughan, 2006).

2.7 Insects as Experimental Animals

Insects play important roles in biological research. Insects used as experimental animals have been indispensable in such fields as genetics, toxicology, and neurobiology (Pedigo and Rice, 2009). For example, because of insects' small size, short generation time and high fecundity, the common fruit fly, *Drosophila melanogaster* is a model organism for studies in the genetics of higher eukaryotes. Also, *Drosophila melanogaster* has been an essential part of studies into principles like genetic linkage, interactions between genes, chromosomal genetics, development, behaviour, and evolution. Because genetics systems are well conserved among eukaryotes, understanding basic cellular process like DNA replication or transcription in fruit flies can help to understand those processes in other eukaryotes, including humans (Pierce, 2006). In applied ecology, scientists have relied on the presence and absence of certain insect species as indicators of pollution. This is possible with insects like immature mayflies which are particularly sensitive to chemical changes in water. Also large cockroaches when used as experimental animals demand little care and maintenance, (Pedigo and Rice, 2009).

2.8 Role of Insects in Medicine

Insects are also used in medicine, for example fly larvae (maggots) were formerly used to treat wounds to prevent or stop gangrene, as they would only consume dead flesh. This treatment is finding modern usage in some hospitals. Recently insects have also gained attention as potential sources of drugs and other medicinal substances, (Dossey, 2010). Honey bee venom is extracted for the production of anti-venom therapy and is being investigated as a treatment for several serious diseases of the muscles, connective tissue, and immune system, including multiple sclerosis and arthritis (Microsoft Encarta, 2009). Native Americans of the south-western United States sometimes eat honeypot ants as a sweet treat or a form of medicine, (Burnie and Tschinkel, 2009). Ezra, (2010) stated that honey can be mixed with some plant products in treating patients suffering from weakness of erection of penis, stomach problem, gastroenteritis (burning sensation), cough and cold, night blindness, yellow fever, catarrh, nose bleeding, low sperm count, anemia, boil, quick ejaculation, overflowing menstruation, epilepsy, malaria, typhoid, chest pain, hypertension, and ulcer.

2.9 Insects as Promoters of Soil fertility

Insects are extremely numerous and their carcasses contribute to organic matter content of soils while the burrowing activity improves the physical properties of the soil as well as aeration. All these facilitate rejuvenation and healthy growth of plant roots and plants generally, (Emosairue, 2007).

3.0 HARMFUL EFFECTS OF INSECTS

3.1 Transmission of diseases

Insects bring about harmful effects by destroying tissues of their hosts, e.g larvae of a fly *Dermatobia* burrow under the skin and cause cutaneous myiasis. *Dermatophilus*,a flea destroys tissues below the skin and causes sores. The larvae of a fly *Gastrophilus* enter the stomach of horses and cause inflectional myiasis. Some insects transmit disease producing bacteria and protozoans. The insect which carries the disease organisms from one host to another is called vector. A summary of insects that causes disease as outlined by (Ubachukwu, 2009) is given below;

- Order Dictyoptera (Cockroaches and Mantids): Cockroaches spoil food and are intermediate hosts of some helminthes of humans.
- Order Hemiptera (Bugs, Bed bugs): These give irritating bites. Cone-nose bugs transmit Chagas disease.
- Order Pthiraptera (Anoplura and Mallophaga) (Lice): they cause irritation and skin infections and are vectors of typhus, trench fever and louse-borne relapsing fever.
- Order Coleoptera (Beetles): invasion of alimentary canal and intermediate hosts of helminthes of man. Larvae can cause urticaria
- Order Lepidoptera (Butterflies and moths): Caterpillars found in alimentary canal. Caterpillar hairs cause urticaria. Moths attack eyes of cattle and suck blood.
- Order Hymenoptera (Wasps, Bees, and Ants): they give venomous stings and bites.
- Order Diptera (Flies, Mosquitoes, and Gnats): Different types of biting flies cause irritation. They transmit diseases e.g. malaria, dengue, yellow fever, filariasis, leshmaniasis, trypanosomiasis, etc. They cause tissue invasion called myiasis.
- Order Siphanoptera (Fleas including Jigger or Chigoe flea): They cause direct irritation, transmission of plague.

3.2 Household pest

Pests in households flourished with the storage of dried organic material in houses, such as grains, flour, dried dog food. Some common insect pests in households include:

Carpet Beetles: these tiny insects are quite destructive in the larval stage on nearly anything organic. Heavily infested food should be discarded. Lightly infested food may be frozen for a few days and then used. Pantries shelves should be vacuumed and cleared thoroughly. They also infest carpets.

Pantry Moths: there are several kinds of moths that appear in pantries to feed on all kinds of stored foods, the Indian meal Moth perhaps being the most common. They may be controlled to some extent by using sticky trap boxes that contain pheromones as attractants.

Silverfish: these insects are wingless, primitive types that live in areas of moderate humidity and darkness. They are a particular threat to paper products, and the glue used in book and magazine production. Silverfish are able to extract nutrients from the cellulose fibers in paper products.

Cockroaches: there are thousands of cockroach species in the world, but only a handful are pests. Control measures commonly involve sprays or dusts.

Termites: this group of insects is the least commonly seen of all the household pests. They infest wood and must rely on protozoa and bacteria in their guts to break down the cellulose of the wood. Recent studies indicate that termite digestion produces large quantities of methane gas as (flatulence), which, because of the large numbers of termites affects world ecosystems.

Bedbugs: Though not very common in many countries currently, in earlier decades, these blood-suckers were an annoying problem, and would also be found in the seats of trains, trolley cars and theaters.

Carpenter Ants: the Black Carpenter Ant, *Camponotus pennosvlvanicus,*is a problem in many households. They originate from large nests in dead or dying trees, and then enter houses to start secondary nests, usually in walls. Sometimes home owners are alerted to their presence by the sight of small piles of sawdust. Blockage of entry places and the use of baits will usually control these large pests.

Cloth Moths: adults of this species do not feed, but damage to clothes is caused by the larvae, which avoid light and live inside silken cases or webs. Wool, hair, fur and feathers are eaten. Dry cleaning kills the larvae, and storage in airtight boxes or bags will protect clothes.

3.4 Injurious to domestic animals

Domestic animals are often seriously injured by insects. Many of them live more or less as parasites either externally, such as fleas, lice, bugs, mosquitoes, and others or internally such as larvae of botflies in sheep. The bird lice feeding upon feathers of chicken cause irritation and loss of flesh. The blood-sucking horn-fly is a serious pest to cattle. The grubs of ox warble-fly cut holes in the skin of cattle, thus causing damaging of hide and flesh. The larvae of horse botfly sometimes cause serious disturbances of stomach.

CONCLUSION

Over the years humans refer to insects as outright enemies and pass the same notion to the subsequent generations just because of the few numbers that are harmful. This review has indeed revealed many benefits of insects as well as their harmful effects and concludes thus; insects are more of friends than enemies. This is because their friendly attributes in the ecosystem so far outweighs their little harmful effects. All the biotic components of the ecosystem in one way or the other depend on insects for survival. We should also change our mind set about insects because their existence cannot be totally truncated, rather we have to coexist with them.

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