

# Insects Effecting by Annoyance to Peoples Relating to the Public Health Concerns

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## Abstract

On earth, insects are by far the most diverse group of organisms found on almost all land surfaces and throughout the ocean, this is why they are among the most familiar creatures coming in human's contact. So, larger the numbers of insects, there is greater the possibility of severe annoyance to human. The objective of this guideline is to help homeowners for identifying and understanding some of the insects visiting in and around homes for annoyance to peoples that may be applicable to many areas where humans coexist with these vectors inflicting considerable discomfort merely by their presence and normal activities, even when they produce no serious physical harm. In addition to disease transmission, arthropods can cause direct annoyance or injuries to man wherein bites, stings and allergic reactions are three major categories of annoyance caused by certain insects. Arthropods also affect man by disturbing him through blood sucking, parasitism, venoms and irritants. The sound of a single mosquito buzzing around the head while somebodies are trying to sleep is annoying. Standing peoples in open environment with gnats buzzing around face can be really disturbing concern. Also, finding cockroaches or other insects or parts of insects in our food is disturbing. Some insects cause general frustrations by annoyance through their presence, buzzing, foul odours, infesting and excretions on foods, biting, entering the eyes, ears and nose, laying eggs on skin, hair and feathers, applying venom by biting or stinging, setae or hairs, larvae invasion on body, leaving caustic body fluids or irritants when crushed, causing allergies, can be poisonous if swallowed, making their homes on or in the body, injuring the host, and transmitting disease organisms or creating unsanitary conditions. Other examples of annoyance caused by insects are flies that surround and land on man, predaceous wasps which land on exposed food at picnic points, and insects such as chironomid midges, mosquitoes and black flies that splatter on automobile windshields. Overall, fallouts of this article suggest that Integrated Vector Management (IVM) is a sustainable approach to manage insects that combines biological, cultural, physical and chemical tools in a way that minimizes economic, health and environmental risks. The aim of IVM is to eliminate or reduce potentially harmful pesticide use by using a combination of control methods that would reduce the vector to an acceptable level. All the vector control methods should be socially acceptable, environmentally safe and economically practicable.

## Keywords

Annoyance, Poisonous, Buzzing, Foul Odour, Body Fluids, Excretion

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## 1. Introduction

The high populations of various insect species, especially common in the summer or after rainy seasons, may adversely affect human health because of the transmission of contagious and parasitic diseases and the induction of insect

allergies. Their nuisance, however, is always present where they are available in reasonable numbers. The insects included here in the article are those, which in one way or another, have a direct effect upon or within humans. Many of these utilize the blood of man as a primary source of food and others feed on humans in lieu of other vertebrate hosts which serve important role equally well. Other species do not

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suck blood, but spread germs as they crawl about on peoples, and their food and dishes. They may also be a severe annoyance to man by their presence and activities. Many other forms attack man only in self-defense, some bite, while others sting when disturbed. Nonindigenous vectors that arrive, establish and spread in new areas have fomented epidemics of human diseases such as malaria, yellow fever, typhus and plague. Although some vagile vectors, such as adults of black flies, biting midges, and tsetse flies, have dispersed into new habitats by flight or wind, human-aided transport are responsible for the arrival and spread of most invasive vectors, such as anthropophilic fleas, lice, kissing bugs and mosquitoes. From the past to the present, successive waves of invasion of the vector mosquitoes *Aedes aegypti*, *Culex pipiens* complex and most recently *Aedes albopictus* have been facilitated by worldwide ship transport. Aircraft have been comparatively unimportant for the transport of mosquito invaders. Mosquito species that occupy transportable container habitats, such as water-holding automobile tires have been especially successful as recent invaders. Propagule pressure, previous success and adaptations to human habits appear to favor successful invasions by these vectors (Lounibos, 2002; Sarwar, 2015 a; 2015 b).

In addition to diseases transmission, insects can cause direct injuries to man. Bites, stings and allergic reactions are three major categories of injuries caused by insects. Insects also affect humans by annoying and disturbing them. The sound of a single mosquito buzzing around someone head while are trying to sleep is annoying and gnats buzzing around face can be disturbing. Also, presence and finding cockroaches or other insects or body parts of insects in food is disturbing. The problems of arthropod injury and the exaggerated fear of arthropods can even result in psychiatric problems (Michalina and Jezierski, 2014).

## 2. Threats by Insect Vectors

Here are mentioned some of the biggest threats imposed by insect vectors directly and indirectly faced by mankind today:-

### 2.1. Blood Sucking Insects

Certain blood sucking insects of man are so closely adapted that they cannot live on another host, while other blood sucking types use human as a temporary host visiting a person only in response to the need for food. The remainder of the insect's time like mosquitoes is spent in resting, digesting the blood meal and producing eggs. However, some blood sucking insects prefer livestock or other vertebrates as a source of food, but will use man when an opportunity exists. The infested persons often become aware of the

problem only after severe itching begins to occur over much of the hairy region of their body parts. Normally, with few exceptions, all stages of insect vectors suck blood or lymph and cause intense irritation followed by skin discoloration. The secondary infection may follow the incessant scratching. Blood sucking or biting flies inject salivary fluids into host causing excessive bleeding, itching and in some cases local swelling and a characteristic hum is produced by the moving wings as the female comes in for a blood meal. The black fly is a vicious biter and its mouthparts are minute blades which pierce the host skin, there by potent venom in the salivary fluid causes bleeding, irritation, localized swelling and more severe symptoms on occasion. The hungry flies attack any exposed skin on the body and sand flies, black gnats or ceratopogonids flies produce a very painful bite particularly on the hands, face, ears, around the eyes and in the edges of the hair. The bites may be followed by swelling, prolonged itching and blisters which soon change to persistent open lesions, while secondary infection is always a danger because of the necessity for scratching. The adults of horn flies are blood feeders, but have not been implicated in disease transmission to man (Hallem et al., 2004; Lehane, 2005).

### 2.2. Odorous Insects

The familiar ants (Formicidae), are social insects and among the most abundant animals on earth, and they are also extremely diverse. They often nest in the soil, but many also live in rotting wood or in trees, while some invade homes to search for food and water, and mainly are generalists scavenging on different things. Ants are typically a nuisance problem in or around the home, where they get into food stuffs. Some species, like fire ants (*Solenopsis invicta*), have a painful sting, while others produce foul chemicals. The odorous house ant (*Tapinoma sessile*) is a typical household ant which can be seen looking for water or food. They and the Argentine ant (*Linepitheme humile*) are similar in many ways, but odorous house ants have a distinct smell when crushed. Several groups of bugs have scent glands that produce strong defensive odors. The bed bug is a blood sucking insect and has defensive scent glands which emit a foul smelling substance when the bug is disturbed. Stink bugs (Pentatomidae) as their name implies, have scent glands that produce a distinct smell when disturbed. The brown marmorated stink bug (*Halyomorpha halys*) is common in homes, especially during the winter where they may hibernate in attics, sheds, barns, which is not dangerous, but an annoyance and their smell can be difficult to tolerate. Many true bugs possess glands that synthesize and release repugnatorial substances. For example, a large infestation of bed bugs can be detected by a characteristic odor (Dolling, 1991).

### 2.3. Biting Insects

Insects bite to feed, probe, taste, or defend themselves which include mosquitoes, biting midges, sandflies, black flies, horse flies, stable flies. Most penetrations of human skin are made by mouthparts that are developed for ingesting blood, tissue and tissue fluids of animals or plants. These insect's bites usually result in the injecting of salivary fluids or regurgitating of digestive tract products into the man or animal. Some biting insects can also produce skin injuries and each individual's reaction to insect bites can be very different. Most mandibulate insects are not strong enough to pierce human skin with their mouthparts and their bite is usually little more than a pinch, serving primarily as a defensive behavior (ground beetles and ants). Even fire ants (*Solenopsis* spp.), whose painful bite is well known, lack the ability to penetrate skin. In fact, their bite is actually caused by a sting at the other end of the body. All of the insects that can pierce human skin have mouthparts that are especially adapted for piercing, cutting, or burrowing. These include Diptera (mosquitoes, black flies, horse flies, deer flies, stable flies, sand flies and various biting midges) and Hemiptera, (bed bugs, assassin bugs, water bugs). Other bugs are predators, piercing prey and often having digestive saliva which helps to liquefy the prey's body contents and these species can often give a painful bite. The bites of bed bugs (*Cimex lectularius*) (Cimicidae) cause annoyance and can lead to psychosis and feelings of uncleanness, but the related bat bugs (*Cimex adjunctus*) can sometimes bite humans. Within Phthiraptera (sucking lice) and Siphonaptera (fleas) most of these insect are hematophagous as they feed on blood. Their mouthparts are designed either to cut the skin or induce bleeding (horse flies and stable flies) or to pierce far enough under the skin to reach capillary blood (mosquitoes, bugs, fleas). Salivary enzymes and other compounds such as anti-coagulants, anesthetics and vasodilators also may be injected by the mouthparts during feeding. The localized reaction to an insect bite (pain, swelling, redness) is usually a physiological (inflammatory) response to these injected compounds. Adults of stable fly are vicious biters of humans, especially just before a storm, the flies approach quietly and the first indication of their presence is a sharp and stinging pain. They frequently attack the back of the neck, hand, ankles, or other exposed skin. The horse fly is also called the green eye, gadfly or breeze fly that bites with broad, blade-like stylets. These slice the skin or hide and an anticoagulant salivary fluid is injected into the wound. Prolonged bleeding, persisting long after the fly has fed and departed, often occurs. Snipe fly is another insect which lands very quietly on the back of the neck or other exposed skin and inflicts a very painful bite (Foil and Hogsette, 1994; Chubareva and Petrova; 2007; Schurink et

al., 2011; Taylor et al., 2012).

### 2.4. Stinging Insects

Stings from the insects are frequently the result of defensive action and some arthropods affect man by injecting insect toxins through stingers, fangs, modified front legs, or spines. Usually, insect's injection of poison is in defense or to kill prey and man is envenomed by arthropods in defense of themselves and their nest or eggs. Stings often are the result of individuals walking barefoot, in stocking feet, or because they use their hand to move the object where the insect is hiding. Also, stings occur when individuals put on clothing or footwear without first shaking the item to make sure that it is free of unwanted insects. Chinese needle ants (*Pachycondyla chinensis*) are distinctly black and elongate, and typically live in decaying logs where they feed on termites. They may enter homes and have a painful sting used to kill termites. Red imported fire ants (*Solenopsis invicta*) are red with a brown abdomen and have 10-segmented antennae and they usually construct mounds in disturbed areas. These ants are famous for their stings, which are painful at first, but then produce an itchy pustule. Honey bee insect also called the hive bee, is the most common problem of man when bee stings are involved. Bumble bees are large hairy bees, whose venom could cause serious problems to a previously sensitized person. Paper nest wasps are reddish brown with small darker markings on the abdomen, these insects also called Polisties wasps, are quick and violent with their stinging in response to any disturbance. These build one layer nests out of paper they make from chewed up wood. Bald faced hornet is a larger and more robust wasp, essentially it is black with a few yellow markings on the head, thorax and end of the abdomen, may also sting. Mud daubers are found responsible for the irritation and can affect man by injecting toxins through stingers (Mullen and Durden, 2002).

### 2.5. Venom Insects

Insect's venom is rapid-acting and frequently associated with considerable pain. Many insects sting and bite intensely and have developed poisoning mechanisms to use in self-defense or in paralyzing their prey. Stings of bees and wasps may be serious or even highly fatal to peoples due to their allergic venoms. Most peoples experience an intense local reaction that subsides after several hours and heals within a few days. But, for other peoples a single sting may elicit anaphylactic shock, which is a life-threatening allergic reaction caused by hypersensitivity to insect protein or any other venom component. Anaphylaxis is characterized by rapid loss of blood pressure, fainting and respiratory difficulty. If the patient does not receive prompt medical attention, unconsciousness and death may occur within minutes. Emergency treatment of

anaphylactic shock usually consists of deep subcutaneous or intramuscular injections of a cardiac stimulant in an effort to counteract the physiological reaction, increase heart rate and stabilize blood pressure. A number of caterpillars have poisonous hairs or spines on the body, the hairs or spine tips are easily detached and can penetrate the fingers when the insect is caught. The spine tips contain a poison which reacts locally when the tip is penetrated in the skin. Reactions include immediate pain, whitening of the flesh and numbness lasting for a few hours to several days (Valentine, 1995).

## 2.6. Urticating Insects

An urticating reaction can be induced by nearly any component of an insect's body, but hairs, scales, exuviae and fecal products are the most common culprits. The larvae of certain flannel moths (Megalopygidae) and slug caterpillars (Limacodidae) do not have a stinger, but they also inflict a sharp, stinging pain upon human's contact. These insects have specialized urticating hairs that inject a painful chemical when touched. The sensation, like that of a stinging nettle, is an intense localized pain that gradually fades after several hours. Saddleback caterpillars (*Sibine stimulea*) are probably the most conspicuous of the stinging caterpillars. Other insects that cause skin urtication to humans include the puss moth caterpillars, and these larvae have urticating hairs rather like those of the stinging nettle plant. The cantharidin present in the blood of blister beetles can cause painful blistering of the skin when the beetle is crushed on the skin surface. Other caterpillars have a dense covering of long, soft hairs on the entire body and these hairs detach easily if the larva is handled. Also, at pupation, the hairs are shed and may be used in building a pupation chamber. Strong winds blow the loose hairs about causing irritation to the eyes, nose, throat and skin (Jonathan et al., 2004).

## 2.7. Medical Disorders

Insects are potentially dangerous to humans due to their high numbers and the negative results of their activities to the economic damage and medical disorders caused by a few of them. Dermatologic symptoms due to insect are addressed as lesions, sores, or wounds, but not as bites. However, calling them bites presupposes their origin and validates the patient's conviction. Physical contact with arthropod body parts, hemolymph, poisonous spines and defensive secretions can cause contact dermatitis and local irritation. Conjunctivitis can be caused by beetles in the family Staphylinidae that swarm in large numbers and accidentally enter eyes. Once trapped in the eye, they release defensive secretions that cause intense burning and sometimes temporary blindness. This highlights the need for multidisciplinary studies involving dermatologists and medical entomologists to

recruit test subjects paired with psychiatrists and psychologists to provide the mental health components (Bewley et al., 2012, Sarwar, 2015 c).

## 2.8. Irritants and Allergens Insects

Allergic reactions are caused by both the bites and stings of arthropods. Additionally, arthropod parts (live or dead) and their body fluids can cause allergic reactions. Skin and eye irritation, respiratory inflammation and various types of chronic allergies may be caused by insects and related arthropods. Allergies to household dust, for example, can often be traced to dander from fleas (Siphonaptera), cockroaches (Blattodea), or house dust mites (*Dermatophagoides* spp.). The larvae of the brown tail moth (*Euproctis chrysorrhoea*) have hairs that cause an irritating rash on the skin of many peoples. The insect German cockroach (*Blattella germanica*) can leave feces in pantries and high densities may produce allergens that contribute to respiratory difficulties, like asthma. They are also considered dirty and may track disease microorganisms into our homes and onto our food. Blister beetles neither bite nor sting, instead, as the common name indicates, they may cause large watery blisters on the skin. Such blisters are due to a chemical irritant in the blood of the beetle which is liberated and rubbed into the skin when the beetle is crushed. When held alive, drops of an amber or colorless liquid are seen forming at the joints of the legs. Each small drop can cause a blister if it comes into contact with the skin. Allergic reactions are extremely variable in different peoples ranging from very mild to severe reactions. Highly sensitive persons should be prepared to deal with their problems in case they are bitten, stung, or exposed to other arthropod allergens. Human's exposure to sensitizing antigens usually occurs in one of four ways inhalation of airborne particles, ingestion with foods, dermal contact, or unintentional injection (as by rubbing the eyes). Immunological responses of the human's body vary, but sneezing, watery eyes, a runny nose, or skin rashes are common manifestations. Chronic asthma, allergic rhinitis and eczema are frequently aggravated by exposure to arthropod antigens. The prognosis for treatment of arboallergies is not very promising and one option, immunotherapy, involves successive exposures to increasing concentrations of the offending allergen in an effort to desensitize the immune system. This approach may provide some relief for some patients, but the only sure cure is complete avoidance of exposure to the allergens (Eldridge and Edman, 2000; Service, 2012).

## 2.9. Insect Invasions of Human

Of all the arthropods, only the larvae of certain flies (Diptera) are adapted to invade and consume the tissues of a vertebrate

host. An infestation by any of these flies is known as myiasis. In certain localities, this type of parasitism is most common among domestic animals (particularly sheep, cattle and horses), but it can also be a problem among the poor and elderly of the human population where it is usually associated with neglect and unsanitary conditions. Some of these flies breed in carrion or manure and others live in spoiled food. Eggs or larvae may be ingested and survive in the vertebrate's intestinal tract, or larvae may crawl into the bowel through the anus. The screwworm fly (*Cochliomyia hominivorax*) lays its eggs in open and festering wounds. Screwworms are endemic in few areas that are pest of sheep and cattle, and the larvae feed on the injured tissues and prevent healing. The larvae of bot flies and warble flies also attack man and obligate myiasis occurs when the human bot fly attacks peoples. The eggs are found mainly deposited on the skin by the females fly or they may be carried to the human by a female mosquito. Larvae bore into the skin soon after hatching and settle down to feed in one location. Accidental myiasis is a general term which includes all the others flies larvae which invade humans. Myiasis of the digestive tract most often follows the ingestion of eggs or very young maggots in or on raw, partially decomposed fruits and vegetables, or when infected soil is carried to the mouth or nose by dirty fingers. Maggots of house fly, blow fly and flesh fly are most often involved. Cutaneous myiasis occurs most often when a wound or infection is untreated and the discharge attracts the females fly wherein the screwworm fly maggot is the most common invader in this category. Creeping dermal myiasis is usually due to larvae of bots or warbles moving about under the skin. The eggs are deposited on exposed human skin and the newly hatched larvae burrow inside without being felt (Yeates et al., 1996).

### 2.10. Transmission of Diseases

Annoying attacks by bloodsucking insects may not result in transmission of disease pathogens, but as discussed earlier, they can cause allergic reactions and associations between arthropods and peoples. For the most part, insects are regarded as annoying vectors because like mosquitoes and other bloodsucking arthropods they bite, or because like flies and cockroaches, they contaminate food. Researchers do not understand the role of microorganisms and other parasites in diseases until after the middle of the previous century; it took even longer to discover the role of certain arthropods as vectors of disease pathogens. Eggs of *Ascaris lumbricoides* regurgitated by *Musca vicina* or *M. domestica* within 2 hours after ingestion continued to develop normally. The larvae of both *A. lumbricoides* and hookworms are viable when regurgitated up to 8 hours post-ingestion to infect the host. Fleas can transmit plague (though uncommon) and tapeworms which are transmitted when a flea is swallowed

(which may occur while vectors groom themselves). They readily bite humans and may be involved in the transmission of various diseases such as bubonic plague. Bed bug is a blood sucking insect, the bugs nearly always defecate immediately after feeding and may transmit chagas disease to the person. The most common effects of mosquitoes on peoples are irritation and swelling from the bites, and annoyance from their persistence presence in trying to bite and transmission of universally important diseases like malaria and dengue (Lawson et al., 1996; Sarwar, 2014 a; 2014 b; 2014 c; 2014 d).

## 3. Insect Vectors Control Strategies

Successful integrated vector management strategies consist of site preparation, monitoring the vector population, problem analysis and selection of appropriate control methods. Identify the insect vector to that somebody is dealing with; learn the life cycle of the vector and what is the susceptible stage to which apply the best control measures. Learn about the host or living conditions of the vector, are there alternate host vertebrates and does the insect vector prefer dry conditions or warm weather. Determine the extent of the problem, is the infestation serious enough to cause significant damage of host and are control measures cost-effective. Determine which control measures are the most effective, and consider biological control, less toxic and environmentally safe pesticides and applicator safety. Learn the proper use of pesticide application equipment and avoid insect pest over exposure to pesticides, which may reduce effectiveness and create resistance. The database uses may include more information on insect life cycles and describe additional nonchemical vector control methods (Mikulak et al., 2012; Sarwar et al., 2014; Mughal et al., 2015; Sarwar et al., 2015).

## 4. Chemical Control

Insecticides can be a part of the integrated vector management system if other methods are not sufficient for vector control. When pesticides are necessary, pest control administrator should use the least toxic pesticide that can control the insects successfully. New pesticides include more environmentally safe materials, and measure and use only the recommended amount of pesticide necessary to cover the targeted area (Sarwar, 2015 d; 2015 e; 2015 f; 2015 g; 2015 h; 2015 i; 2015 j; 2015 k).

## 5. Conclusion

This article shows the huge global problems of insect

harassment and describes most important information on this topic. Insects are vectors of many contagious and parasitic diseases and also cause allergies. Infestation of blood-sucking Diptera can have detrimental effects on welfare and behavior, daily activity, health and productivity of human by causing chronic irritation and pain through biting, though humans use various vector control and protective strategies to protect themselves against insects attack. Furthermore, the most important is that economic losses in livestock production caused by flies are estimated in millions dollar because insects decrease in milk production or weight gains by dairy cattle significantly. This is an important from an economic point of view, that there are also huge financial cost spent on repellents and insecticides to protect ourselves against insect outbreaks. However, there are questions concerning the effectiveness and applicability of all of these methods used to control insects, because many of these repellents applied to body are usually only of short-term effectiveness and also the application of them is sometimes problematic. The main problem to be solved is to find methods which might be more effective to protect humans and animals from insect harassment in different conditions under variable localities.

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