The Role of Insects in Mechanical Transmission of Human Parasites

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Dear Editor,

Arthropods are probably the most successful animals and are found worldwide in every type of habitat. In the absence of a suitable vector, the life cycle of a parasite will be disrupted, and the parasite may die. By understanding the mechanism of parasite transmission and vector involvement, public health personnel can design and organize more efficient control programs against a particular parasite. Feeding on a diseased host does not ensure parasite transmission in arthropods or the survival and development of the parasites after ingestion in mechanical transmission, arthropods transport parasites on their body parts such as setae; these parasites are collected when the arthropods feed on dead animals or excrement. In biological transmission, parasites either multiply or develop (or undergo both multiplication and development) inside arthropods.

Flies act as vectors for a number of pathogens (Figure 1). The transmission of pathogens by adult flies occurs in the following ways: 1) mechanical dislodgement from the exoskeleton used for adherence to vertical surfaces, 2) fecal deposition, and 3) regurgitation of incompletely digested food. Insects infect humans directly or indirectly.

Various mites and worms invade human tissues. Allergies can be caused by the bites of bees, body lice, chiggers, and ticks. Some flies are called mechanical carriers because they transmit parasites from a diseased animal to a healthy person. Fleas carry disease after ingesting plague organisms concerned with sanitation and public health as causative agents of gastrointestinal diseases in people based on synanthropy, endophily, communicative behavior, and strong attraction to filth and human food. Cockroaches are among the most notorious pests seen in any premises. They contaminate food with their droppings containing bacteria that can cause food poisoning, and they transmit bacteria, fungi, and other pathogenic microorganisms in infested areas.

The nocturnal and filthy habits of cockroaches make them ideal carriers of various pathogenic microorganisms. They are tropical insects, and numerous pathogenic bacteria such as Salmonellasp., Shigellaspp., and Klebsiellapneumoniae have been isolated from them. In addition, some parasites and fungi have been found on the external surfaces as well as internal parts of the body of cockroaches. A previous study has shown that exposure to cockroach antigens may play an important role in asthma-related health problems.

Filth flies are potential mechanical vectors because pathogens can be transferred from their contaminated bodies to our food, eyes, nose, mouth, and open wounds.

Myiasis is the invasion of the tissues or organs of humans or animals by fly larvae that may feed on the host's living or dead tissue or on food ingested by the host. The hosts may be asymptomatic or may exhibit minor to severe symptoms, and some hosts may even die. Cockroaches and filth flies have been known to be the transport hosts of Toxoplasma gondii. Insects such as dung beetles (Onthophagusspp.) are one of the most important foods for Norway rats, roof rats, and field mice; however, the role of dung beetles as the carriers of coccidian oocysts is not well known.

Locating and eliminating the breeding places of pests is an important first step in pest control. In addition to drug therapy, the control or eradication of housesflies should be attempted to prevent transmission of intestinal parasites in the community. Cockroaches are an important reservoir for infectious pathogens; therefore, control of cockroaches will substantially minimize the spread of infectious diseases in our environment. Integrated pest control programs should involve control...
measures for a variety of pests such as flies, cockroaches, fleas, bedbugs, ants, and rodents. Early identification of the presence of these pests is important to avoid large infestations.

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References