

Mechanical Transmission of Parasites by Cockroaches' Collected from Urban Environment of Lahore, Pakistan

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Abstract : Cockroaches are termed as medically important pests because of their wide distribution in human habitation including houses, hospitals, food industries and kitchens. They may harbor multiple drug resistant pathogenic bacteria and protozoan parasites on their external surfaces, disseminate on human food and cause serious diseases and allergies to human. Hence, they are regarded as mechanical vector in human habitation due to their nocturnal activity and nutritional behavior. Viable eggs and dormant cysts of parasites can hitch a ride on cockroaches. Ova and cysts of parasitic organism may settle into the crevices and cracks between thorax and head. There are so many fissures and clefts and crannies on a cockroach which provide site for these organisms. This study aimed with identifying role of cockroaches in mechanically transmitting and disseminating gastrointestinal parasites in two environmental settings; hospitals and houses in urban area of Lahore. Totally, 250 adult cockroaches were collected from houses and hospitals by sticky traps and food baited traps and screened for parasitic load. All cockroaches were captured during their feeding time in natural habitat. Direct wet smear, 1% lugols iodine and modified acid-fast bacilli staining were used to identify the parasites from the body surfaces of cockroaches. Among human habitation two common species of cockroaches were collected i.e. *P. americana* and *B. germanica*. The results showed that 112 (46.8%) cockroaches harbored at least one human intestinal parasite on their body surfaces. The cockroaches from hospital environment harboured more parasites than houses. 47 (33.57%) cockroaches from houses and 65 (59.09%) from hospitals were infected with parasitic organisms. Of these, 76 (67.85%) were parasitic protozoans and 36(32.15%) were pathogenic and non-pathogenic intestinal parasites. *P. americana* harboured more parasites as compared to *B. germanica* in both environment. Most common human intestinal parasites found on cockroaches include ova of *Ascaris lumbricoides* (giant roundworm), *Trichuris trichura* (whipworm), *Anchylostoma deodunale* (hookworm), *Enterobius vermicularis* (pinworm), *Taenia* spp. and *Strongyloides stercoralis* (threadworm). The cysts of protozoans' parasites including *Balantidium coli*, *Entomoeba hystolitica*, *C. parvum*, *Isopora belli*, *Giardia duodenalis* and *C. cayetenensis* were isolated and identified from cockroaches. Both experimental sites were significantly different in carriage of parasitic load on cockroaches. Difference in the hygienic condition of the environments, including human excrement disposal, variable habitat interacted, indoor and outdoor species, may account for the observed variation in the parasitic carriage rate of cockroaches among different experimental site. Thus a finding of this study is that Cockroaches are uniformly distributed in human habitation and act as a mechanical vector of pathogenic parasites that cause common illness such as diarrhea and bowel disorders. This fact contributes to epidemiological chain therefore control of cockroaches will significantly lessen the prevalence of illness in human. Effective control strategies will reduce the public health burden of the gastro-intestinal parasites in the developing countries.

Keywords : cockroaches, health risks, hospitals, houses, parasites, protozoans, transmission

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