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Short Communication

Isolation of *Salmonella* and *Shigella* species from house flies (*Musca domestica* l.) in Uturu, Nigeria

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***Salmonella* and *Shigella* species were isolated from House flies (*Musca domestica* L.) from various sampling sites using selective media. Out of 34 pooled samples *Shigella* species were isolated in all (100%) of the samples while *Salmonella* species were isolated in 21 (61.7%) of the samples. The flies pooled from the refuse dump sites had higher load of these organisms. The infection rate of flies with *Shigella* species observed in this study is very high and calls for proper mechanical control of flies, environment sanitation and use of insecticides where applicable.**

Key words: *Salmonella* species, *Shigella* species, house flies, Uturu, disease transmission.

INTRODUCTION

The association of Muscoid flies as mechanical vectors of pathogens of gastrointestinal illness has been documented in various parts of the world (Greenberg, 1973; Banjo et al., 2005). *Salmonella* species and other pathogens have been reported from both synanthropic and hemisynanthropic flies in Nigeria (Dipeolu, 1977; Adeyemi and Dipeolu, 1984) and Malaysia (Suleiman et al., 2000). Besides annoying animals and people, house flies are responsible for spreading diseases from animals to man and from animal to animal (Mian et al., 2002). House flies can transmit viruses such as polioviruses, coxsackie viruses infectious hepatitis, numerous bacterial diseases but mainly enteric ones such as bacillary dysentery (*Shigella*), cholera, typhoid and paratyphoid (*Salmonella),* anthrax and a variety of cocci. Some may also be vectors of protozoan parasites like amoebic dysenteries (*Entamoeba, Giardia*) and eggs of a variety of tapeworms (Service, 1980).

Salmonellas are well established as one of the most important causes of food borne illness worldwide and transmission is usually by the faecal-oral route (Adams and Moss, 1995). Since birds, rodents, insects and infected food handlers can contaminate foods directly or indirectly, potential food vehicles for *Salmonella* are numerous. *Shigella* species, which are generally regarded as rather fragile organisms and do not survive well outside their natural habitat, which is the gut of humans and other primates (Cheesbrough, 2000). They have not attracted the attention other food pathogens have.

This paper reports the influence of house flies, *Musca domestica* L., in the dissemination of infections especially those caused by *Salmonella* and *Shigella* species in Abia state University, Uturu Community.

MATERIALS AND METHODS

Collection of samples (flies)

Adult muscoid flies were collected from a refuse dump site in Eke Okigwe market, a two storey apartment, eating places in the food village of Abia State University (ABSU) and a resident building at Uturu. Fly collection was done on warm sunny days with temperature between 28- 38°C allowing for ample fly activity. The collector wore protective clothing's. Mango wastes were used to attract flies in the two storey building apartment and resident building at Uturu. All fly collection was carried out by using a standard collecting sweeps net provided with a heavy duty arial bag. Aiming at the swarming flies one or two quick sweeps were made to collect a good number of flies. The bag containing flies were closed with rubber bands prior to removing it from the ring assembly. The entire net bag with flies was transferred to a clean polyethyelene bag. Samples were transported to the laboratory within 30-45 min of their collection.

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Table 1. Frequency of sampling and isolation of *Salmonella* and *Shigella* species from the various study sites.

Sampling site	No of time sampled	No of times *Shigella* sp. was isolated	No of times *Salmonella* sp. Was isolated
Refused dump site	10	10	6
Eating places in ABSU	8	8	6
Two storey building apartment	8	8	6
Bungalow apartment in Uturu	8	8	5
Total	34	34	21

Isolation and Identification of *Salmonella* and *Shigella* species

The samples brought to the laboratory were put into sterile Petri dishes with the aid of needles and tweezers. The flies were then pooled (17-50) flies per pool and transferred to a sterile disposable Petri dish. Exactly 3ml peptone water (oxoid) was added. The flies were ground to an emulsion in the broth using a sterile hockey stick. The preparation was allowed to stand for 30mins to 1h. Subsequently 2-3 drops of the preparation of the fly emulsion were inoculated on to Deoxycholate citrate agar (DCA) (oxoid) plates previously prepared according to manufacturers' instructions. The plates were incubated for 24-48h at 37^{o}c and observation made. Isolates were identified based on their colonial appearance on DCA, Gram stain, motility test, urease, oxidase, citrate and indole tests (Cheesbrough, 2000).

RESULTS AND DISCUSSION

Salmonella and *Shigella* species were isolated from the house flies from the various sampling sites used for the study (Table 1). The flies pooled from the refuse dump site had higher load of these organisms than other sampling sites. Out of 34 pooled samples, *Shigella* species were isolated in all (100) of the samples while *Salmonella* species were isolated in 21 (61.7%) of the samples.

Flies are known to be mechanical vectors of pathogens that cause disease (Nichols, 2005). Although, whether these organisms were carried externally or internally was not investigated in this study. Other studies have shown that infection of flies by *Salmonella* could be external as well as internal. Sulaiman et al. (2000) isolated a variety of pathogenic organisms from the gut of flies including *M. domestica.* The findings of this study indicate that *M. domestica* can transmit *Salmonella* and *Shigella* species showing that dirty environments can easily attract flies which subsequently deposit pathogenic organisms on food and water. This may result to food borne infections among people in such environment.

The fact that *Shigella* species were isolated from all the pooled samples is enough cause for worry since houseflies are easily found in local eating houses patronised by low income earners. This explains why environmental cleanliness and proper refuse disposal is necessary to discourage flies from hovering around the environment. Foods borne infections are major causes of illness and death world wide (WHO, 2002; Rosek et al., 2003). Moreso, flies also transmit species such as *campylobacter* (Hald et al., 2004; Nichols, 2005) and *Escherichia coli* (Iwasa et al., 1999).

The flies pooled from refuse dump sites in this study had higher load of the pathogens confirming the fact that refuse dumps propagate disease causing agents. It is clear that housefly *Musca domestica* pose a possible health risk to communities in proximity to population of flies. Good environmental sanitation practices and measures must be adopted to control house flies.

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