

Housefly (*Musca domestica*): A possible Mechanical Vector in the Transmission of Coronavirus Disease

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Abstract

Housefly is one of the most important health pests in the world. This species can mechanically transmit a large number of bacterial, viral, and parasitic pathogens. Coronavirus is one of the largest and most important family of viruses among humans and animals. Coronavirus disease 2019 (COVID-19), the new Coronavirus, which can cause mild, moderate, severe symptoms and death in patients. Unfortunately, Coronavirus disease is spreading rapidly in the world, And there is no comprehensive information on the routes of transmission of this disease. Mechanical transmission through insects, can be one of the possible methods of transmission of the coronavirus, Houseflies can mechanically transmit coronavirus between humans and animals. There is no definitive cure for COVID-19, although vaccination is the best way to control this disease, but until the vaccine is fully and effectively discovered, the most effective method is to eliminate and reduce the routes of transmission of coronavirus disease. Insect removal and control methods (environmental improvement, mechanical and chemical methods can be one of the effective methods in interrupting the epidemiological cycle of coronavirus transmission.

Keywords: Housefly. Transmission. Coronavirus. Control

Introduction

The house fly, *Musca domestica* (Diptera: Muscidae), is the most important and abundant species of flies in the world(1). This species has a high adaptability to the environment and is found in abundance in various rural and urban communities among humans and animal populations [1,2].

M. domestica is mainly present in human habitats, Food distribution centers, hospitals, toilets along the way, dirty places and poor sanitation, slaughterhouses, livestock, stables, and animal shelters [1, 3-5].

Therefore, the presence of risk factors such as type of behavior, high flying power, rapid movement, high olfactory and visual power in domestic flies, could suggest that *M. domestica* may be a potential vector of many pathogens (bacterial / viral / parasitic). [6,7], Houseflies can sit on the surfaces of contaminated objects and food then transmit a variety of pathogens with using different parts of the body (legs, wings, mouth parts, abdomen, hair on the surface of the body). [5,8].

Studies have shown that houseflies can directly / indirectly cause diseases such typhoid, polio, tuberculosis, cholera, salmonellosis, dysentery, diarrhea, anthrax, Rota virus, viral hepatitis, poliomyelitis, and etc. [9]

Coronaviruses are in the family Coronaviridae, they are enveloped viruses with a positive-sense single-stranded RNA genome. Coronaviruses are among the largest RNA viruses (26-32 kbp) and can cause disease in mammals and birds [10,11].

The first report of coronavirus was reported in the chickens with acute respiratory distress, in the North America, In the late 1920 [12]. Then the first human coronavirus was identified in 1960 in the United Kingdom and United State [13-15]. Other coronaviruses were similarly identified and isolated in later years [16]. In late 2019, a new strain of coronavirus was discovered in Wuhan, China (Covid-19), and it quickly became a pandemic in all countries

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of the world, which can cause mild symptoms such as a simple cold to acute respiratory symptoms [17]. This disease can be transmitted through respiratory secretions, contact and touch infected surfaces (hands, eyes, mouth) and other unknown routes (under study). The coronavirus can stay on different surfaces for a long time (several hours to several days) [18].

The behavioural and nutritional characteristics of houseflies, as well as the long-term stability of the coronavirus, allow the insect to transmit the virus mechanically [19,20].

Discussion and Conclusion

Due to the fact that Covid-19 disease is spreading rapidly and there are many concerns about the unknown routes of transmission of the virus, which is an important and priority issue for the World Health Organization [17]. Therefore, special attention and study should be done on the routes of transmission and spread of this disease, so that with the correct and accurate knowledge of the routes of transmission of the disease, the necessary measures can be taken to reduce and control this disease. Some insects such as flies and cockroaches, according to the characteristics of the behavior and biology, as well as contact with human lives, can be potential mechanical vectors of pathogens, especially coronavirus. Although transmission of the coronavirus by different species of insects is being studied by scientists, the transmission of the virus by blood-sucking insects has not been reported or confirmed [21].

Disease and since there is no definitive cure for the disease and the only way to prevent it is to get an effective vaccine. For this reason, methods in the case of some insects, such as flies, as mechanical vector, methods of control and removal of vector, including mechanical and physical methods: (placing nets on doors and windows, Ventilators), improving the environment :(correct garbage collection, preventing the accumulation of waste Human and animal), chemical methods: (spraying surfaces and space), etc are effective in controlling coronavirus disease.

Conflict of interest

None declared.

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