

P5. MANAGEMENT OF INSECTICIDE RESISTANCE: ADANA MODEL

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Many diseases in the world have been transmitted to humans by insects. Chemical substances that are used against pests or insect vectors in agricultural production and public health are called pesticide. Insecticides are chemical substances or a group of substances used to kill Insects which are classified within pesticides forming the class of Insecta including any biological stage of insects (larva, pupa, adult). Insecticides are classified according to their effective biological stage (adulticide, larvicide), or entry to the insect's bodies such as stomach insecticides, contact insecticides, respiratory insecticides.

The majority of insecticides used in public health are used against mosquitoes, houseflies, phlebotomes, cockroaches, ticks and so on. Particularly mosquito species are insect vectors that are responsible for mainly Malaria and many other diseases such as Filariasis, Dengue fever, viral encephalitides. Malaria has been eradicated in our country. However, according to WHO (World Health Organization) malaria report (2013) there were an estimated of 207 million cases of malaria between 2008 and 2012 and an estimated of 627.000 deaths occur in sub-Saharan Africa. Yet, houseflies can transmit many pathogens (about 60) to humans and animals. Diseases carried by houseflies include Cholera, Typhoid, Trachoma, Diarrhoea, Meningitis, Dysentery, Hepatitis, Poliomyelitis, food poisoning, Salmonella, Tuberculosis. Phlebotomy is a Leishmania vector which is one of our countries main problems. Cockroaches also become insect vectors by wandering in dirty areas and by carrying various microbes to human foods. Ticks are vectors of Crimean-Congo Hemorrhagic fever disease. Flea bites can cause both the Plague and Typhoid. Due to these reasons mentioned above fight against insects is very important. In 1900s, when billions of people died because of typhus epidemic which is caused by pediculus, in 1939 DDT (Dikloro Difenil Trikloroethan) was discovered. DDT was begun to use for insect control worldwide. In spite of being used for insect control, DDT is harmful for other living things and causes extinction of some species; in 1970 it was forbidden to use DDT. Besides DDT, other organic chlorinated, carbamated and organic phosphoric insecticides were developed and were/are used for public health and agriculture. In recent years, the uses of these insecticides in public health were retracted and instead synthetic piretroits were begun to use and are still being used.

Tolerance or resistance is mentioned in the case of an insecticide or group of insecticides have not affected some individuals of the sensitive insect population. Individual, behavioral, structural, physiological and cross resistance can develop in harmful insects as a result of the widespread and irresponsible using of pesticides. DDT and pyrethroid resistance comes first in this type of resistance. Resistance is developed by the use of DDT for many years against insects and this resistance was first time detected in *Musca domestica* of houseflies. Voltage - sensitive sodium channel gene (*Vssc*) mutations in the houseflies nerve cells membrane cause this resistance. This resistance developing against DDT has also developed as a cross- resistance against pyrethroids. This resistance is known as *kdr* (knock-down resistance) since Pyrethroid group of insecticides has a destructive effect. This presentation is about the formation and mechanism of action of *kdr* resistance.

Keywords: Insecticide, *kdr* resistance, synthetic pyrethroides