The fly's genome gives some answers [1]

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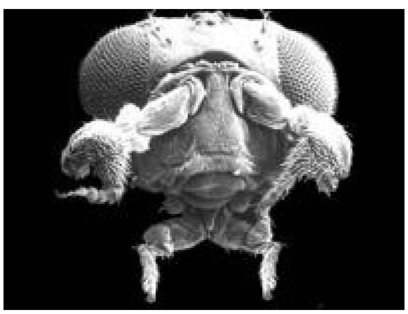

By Mónica I. Feliú Mójer / Special for El Nuevo Día endi.com [2] Before exterminating those annoying flies in your kitchen, flying over and eating those old bananas, maybe you would like to know that the fly is the most studied animal in modern biology. Crazy scientists –you are probably thinking- why are they wasting their time studying insects? The fly, actually a fruit fly (Drosophila melanogaster), is the most studied experimental model organism in biomedical sciences. The fruit fly has all the characteristics that make it an excellent model organism: is small (it measures only one eight of an inch), it reproduces in an average of 11 days; its genome sequence is known and its genes are not only easy to manipulate, but in most cases the effects of these mutations are easy to see. In spite of the obvious differences between you and a fruit fly, Homo sapiens and Drosophila melanogaster do resemble in what is important for science: genes. Fifty percent of the fly's 13,600 genes are similar to the human genes, which allow scientists to study mutations related to diseases like cancer and Alzheimer in the fly. There are thousands of documented mutations in Drosophila: flies with white, pink or purple eyes; short-winged flies, miniature wings or wingless flies; hairy flies and bald flies; flies with limbs in their head and eyes in their legs; amnesic flies and drunk flies, among many others. Although they sound like kafkian characters, the truth is that all of these mutant flies have helped scientists to learn about the function of many genes. The logic is simple: the best way to know a gene's function is observing what happens when it if defective or simply absent. The fruit fly has helped prove one of the basic paradigms of evolution: when nature finds a mechanism that works, it uses it over and over again. Using Drosophila melanogaster as an experimental model, scientists have understood that the fundamental genetic mechanisms that control embryonic development seem to be the same in all living organisms. One of the best examples of evolutionary conservation are homeobox genes. Homeobox genes are a group of genes involved in developmental control, segmentation and an embryo's body plan. This group of genes codifies certain proteins that indicate an embryo's cells where to form and place legs, hands, eyes, antennae, wings, head and other body parts. In 1995, Lewis, Nüsslein-Volhard and Wieschaus won the Nobel Prize in Physiology and Medicine, for their discoveries about the homeobox genes control over embryonic development, using Drosophila as an experimental model. Although homeobox genes were discovered in Drosophila, all the genes in this group are almost identical in all animal species, including humans. In fact, a lot of the genes studied by Lewis, Nüsslein-Volhard and Wieschaus have important roles in the human fetus development. It is thought that mutations in homeobox genes are responsible of most natural miscarriages and up to 40% of congenital malformations. An example of a condition caused by a homeobox gene mutation is polydactily – the presence of more than five fingers in a hand or more than five toes in a foot. So next time you see flies rounding your food, don't let them stand on them; it is true the stand on not-very hygienic places. However, considering the huge contributions Drosophila has made to science and medicine, maybe shooing them away is enough.
