

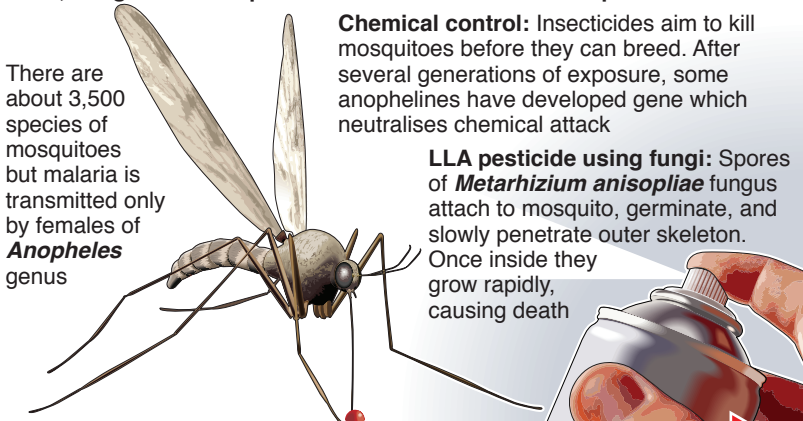
Evolutionary idea to fight malaria

Repeated exposure to an insecticide leads to the evolution of insecticide-resistant mosquitoes. Late-life-acting (LLA) pesticides – which only kill older, dangerous mosquitoes – could lead to evolution-proof insecticides

There are about 3,500 species of mosquitoes but malaria is transmitted only by females of *Anopheles* genus

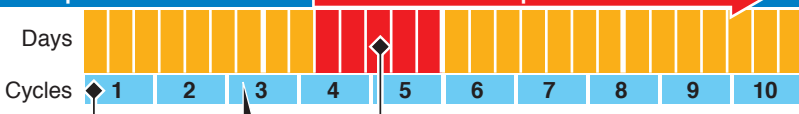
Chemical control: Insecticides aim to kill mosquitoes before they can breed. After several generations of exposure, some anophelines have developed gene which neutralises chemical attack

LLA pesticide using fungi: Spores of *Metarhizium anisopliae* fungus attach to mosquito, germinate, and slowly penetrate outer skeleton. Once inside they grow rapidly, causing death



Lifespan: 2-4 weeks

Period when mosquito is infectious



Gonotrophic cycle:

Egg production and laying takes 2-4 days

Parasitic infection: Plasmodium parasite

takes 10–14 days to develop to stage when it can be transmitted from mosquito to human

LLA pesticide: Only lethal to mosquitoes after 2 or more gonotrophic cycles. Progeny do not develop resistance – infectious bites cut by 95%