

## INSECTS AND DISEASE

Of the incredible variety of insects inhabiting the earth, most of them are harmless to man. Unfortunately, a few insects are responsible for the spread of diseases, some of which are potentially fatal. Others inflict untold misery by their irritating bites.

It is important for any traveller to know the basic facts about medically important insects and try, as best as possible, to avoid being bitten by using insect repellents, bed nets and sprays as appropriate. It can take just one bite from an infected insect to result in illness and death a few days later. Ignorance is definitely not bliss.

### MOSQUITOES

Mosquitoes are found nearly everywhere in the world. They are equipped with a needle-like mouthpart, the proboscis, to suck up their food. Male mosquitoes only feed on plant juices but the females must suck blood. Several species feed exclusively on human blood and consequently become VECTORS of disease, transmitting disease organisms from one person to another in their quest for blood meals.

In the tropics, mosquitoes transmit malaria, certain types of filariasis, yellow fever, dengue fever and some strains of viral encephalitis. Many mosquito species bite at night, such as the *Anopheles* genus, which spreads malaria, but the day-biting *Aedes* is responsible for spreading the yellow fever virus. In Asia, the Far East and Africa, some filarial worms are transmitted by mosquitoes. All along the East African coastal region, *Culex* and *Anopheles* mosquitoes carry the *Wucheraria bancrofti* worms from one infected person to another. The worms settle in the tissues of infected persons who may develop symptoms such as scrotal swelling in men and eventually, elephantiasis. Short-term travellers are not usually at risk though, because so many bites are needed to pass on the disease.

### BLACKFLIES

These small biting flies breed in water, especially fast-flowing rivers and streams, and are the only vectors of river blindness (onchocerciasis) in sub-Saharan Africa. Their method of biting differs from mosquitoes because they tear and rasp the skin with their mouthparts, creating a pool of blood which they can then suck up. The microscopic larvae of the *Onchocerca* worms live in human skin and are picked up from an infected person by the biting flies. The tiny worms develop in the blackfly and migrate back to the mouthparts from where they can infect a new person. The infection is commonest in West and Central Africa, where the most serious symptom of the disease is blindness.

### TSETSE AND TABANID FLIES

Tsetse flies only occur in sub-Saharan Africa where they are the vectors of human and animal trypanosomiasis. The human disease is known as sleeping sickness. The adult Tsetse fly is a bit larger than a housefly and is recognized by its scissor-like wings and its

long, forward-pointing proboscis. Typically the flies are attracted to dark, moving objects, making them quite a pest on safaris in some African parks. The chronic form of sleeping sickness occurs in West Africa and the patient can waste away over a period of many years before death occurs. The East African species of trypanosomiasis is very rare nowadays with limited distribution but is potentially much more virulent than the West African type. It maintains a reservoir of infection in wild animals, mainly antelope-type species.

The day-biting *Chrysops* is a Tabanid fly about the same size as a tsetse fly. In the forested regions of central Africa its bite can infect a person with a filarial worm called *Loa loa*, which migrates through the tissues under the skin, and may even cross the eye. An infected person experiences intense itching and swellings (Calabar swellings).

### SANDFLIES AND MIDGES

Sandflies are tiny, hairy flies with tent-like wings, which prefer semi-arid regions, breeding in leaf litter, termite mounds and other moist microhabitats. They bite visitors to such areas, such as boys herding cattle, and transmit a disease called leishmaniasis. The visceral type, otherwise known as kala azar, invades the spleen and over a period of time leads to death if untreated. The cutaneous form develops as a defined and often disfiguring sore on the skin. Treatment of both types involves at least 20 days of daily injections. Leishmaniasis occurs in Africa and South America.

Midges constitute a biting nuisance in many parts of the world, usually in the warmer season. They can bite in swarms, especially targeting the face, thus ruining many a camping trip, tiny though they are. Some species of midge can also transmit some fairly harmless species of filarial worms in both Africa and South America.

### FLEAS

Flea bites are some of the most irritating of all. Although there is a “human flea”, humans can also be bitten by cat, dog and rat fleas, among others. The rat flea carries the deadly plague bacteria, *Yersinia pestis*. Outbreaks of plague still occur today, mainly in crowded slum conditions where rats, fleas and man share the same habitat. Fleas can also transmit murine typhus, which usually leads to rashes and fever. Accidental swallowing of dog or cat fleas can result in certain tapeworm infections, including the dog tapeworm. This is especially so if young children fondle their pets too closely.

The jigger flea, *Tunga*, is famous for the localised itching it causes. The female burrows into the skin from where she lays her eggs. During this process she swells up and remains embedded in her host after death. “Jiggers” are still common in the rural tropics where people rarely wear shoes, exposing their toes to the fleas.

## LICE

Of the three types of human lice only body lice can transmit disease, whereas head lice and pubic lice cause misery from their itchy bites. Body lice proliferate in famine and war situations, where people are unlikely to wash or change their clothes frequently. Street children are often plagued by body lice, which live in the seams of clothing, only leaving the cloth to have a blood meal on the host. Body lice act as vectors of epidemic typhus and Trench fever, which are not transmitted to man by the bite of the louse but through the louse faeces.

## BEDBUGS AND OTHER BUGS

Bedbugs are familiar to schoolchildren and students who reside in dormitories where furniture and mattresses have not been changed for a long time. These flat, secretive insects live in cracks of furniture and seams of mattresses, crawling out at night to feed on the blood of their sleeping victims. Fortunately, they do not transmit disease, but they bite persistently, sometimes to the extent of causing anaemia.

Reduvid bugs belong to the same order of insects as bedbugs and in South America, transmit Chagas disease, another type of trypanosomiasis, through their infected faeces.

## OTHER FLIES

Some flies belonging to the same class of insects as houseflies, are called myiasis flies. The Tumbu or Mango fly likes to lay its eggs in clothing left out to dry on the grass and if the clothes are not ironed, each egg hatches into a larva, which burrows into the skin and forms a boil. The developing larva eventually emerges but not before causing pain and irritation. More rarely, some fly larvae suck blood (the Congo floor maggot) while others feed on deeper tissues, especially if they find a wound or soft skin through which they can burrow.

Note that biting mites and ticks are also vectors of some viruses and bacteria, but they are NOT insects, being related to spiders.