General

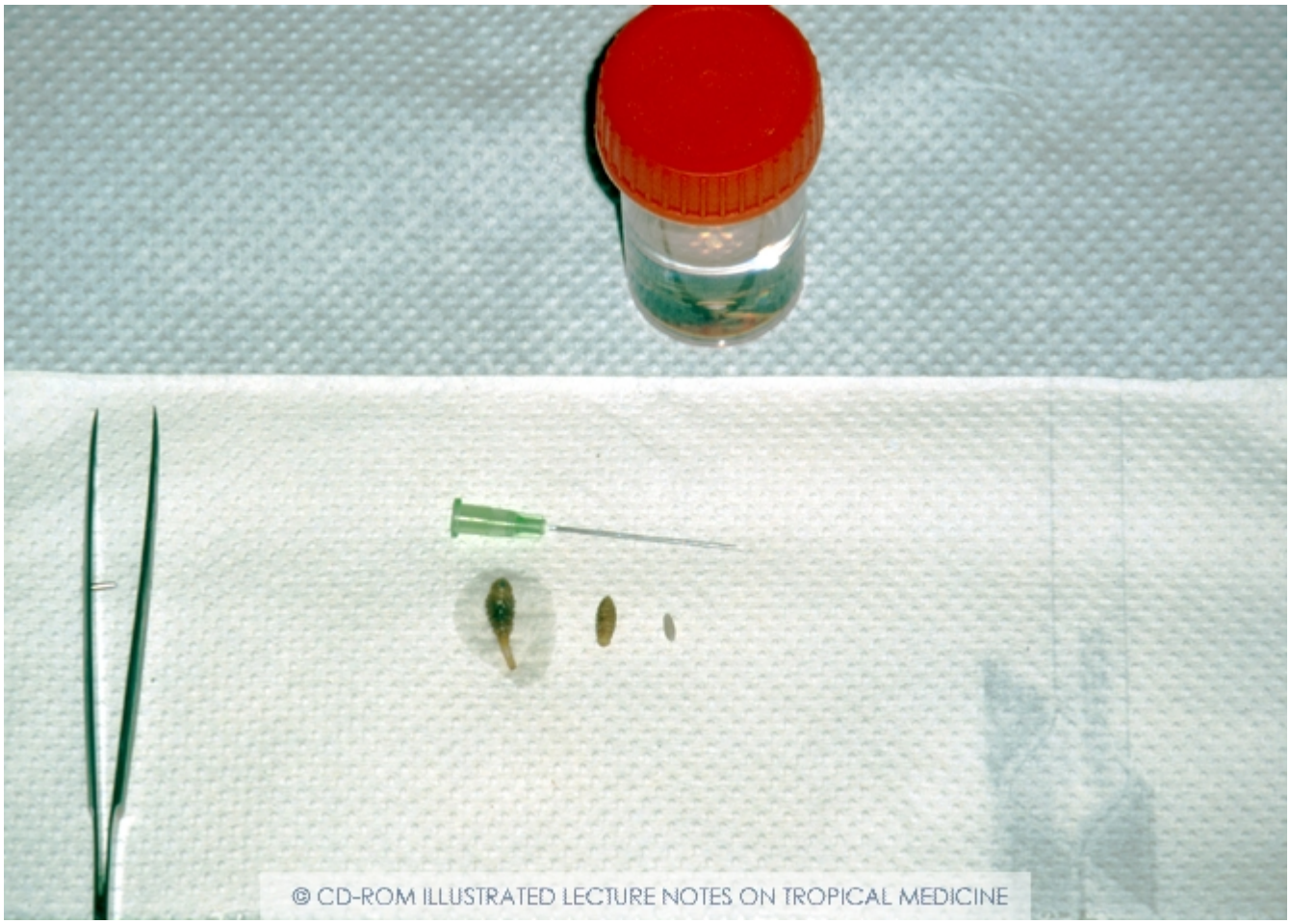
Myiasis is the invasion of the body by fly larvae. During this period, the larvae feed on live or dead tissues. Depending on the life cycle of the insect myiasis is obligatory or facultative. In obligatory myiasis, the larvae have to spend part of their life cycle on a living host. Examples are *Cordylobia anthropophaga, Dermatobia hominis, Cochliomyia hominivorax, Chrysomyia bezziana* and *Wohlfarthia* sp.

In facultative myiasis, the larvae are normally free-living, often on corpses, rotting meat, etc., but are sometimes found on living hosts (e.g. *Calliphora, Lucilia, Phormia* and *Sarcophaga* sp.) They can infect wounds and superficial ulcers. Clinically a distinction is drawn between cutaneous, urogenital, nasopharyngeal, ophthalmic and intestinal myiasis. Obligatory intestinal myiasis occurs only in animals, not in humans.

Cordylobia anthropophaga



Myiasis, infestation with the larva of a fly (*Cordylobia anthropophaga*). Copyright ITM



Myiasis, Dermatobia hominis and Cordylobia anthropophaga. Copyright ITM

Cordylobia anthropophaga (tumbu fly, ver de Cayor) is a thick brown fly limited to tropical Africa. The larvae are obligate parasites, among others of dogs and humans. The female lays her 100-300 eggs on shaded, polluted ground or on dirty or inadequately washed sheets or clothes with some traces of sweat or urine still on it, laid out on the ground in the shade to dry. The females never lay their eggs on clothing that has been hung up in direct sunlight and also never directly on the skin. The larvae that emerge from the eggs penetrate the epidermis as far as the subcutaneous fatty tissue and develop there for 8 to 12 days. They then crawl out of the skin and fall to the ground where they undergo pupation in 24 hours. The pupae develop into adult flies in 10 to 20 days. The larvae rapidly penetrate the skin without causing any pain. In the first few days, an itchy, painful papule appears which

develops over the course of a week into a painful furuncle in the centre of which two black dots (respiratory canals) are visible. The lesions may be few or numerous. The larvae can be pressed out of the skin if their respiration is prevented by coating the lesion with vaseline. One way to avoid infection is to iron bed linen and clothes on both sides.

Dermatobia hominis

Dermatobia hominis (ver macaque) occurs in scrubland and woody lowland regions of Latin America. This large (15 mm) blue-grey fly has a remarkable life cycle. During their short life (8-9 days) adult females seize various bloodsucking insects. They then attach 6-30 eggs to the body of these arthropods, which include *Psorophora* mosquitoes and stable flies (*Stomoxys calcitrans*). Cattle flies (*Haematobia irritans* and *H. exigua*) can also act as transport hosts. In some cattle breeding districts they constitute a real plague. The larva of *Dermatobia hominis* develops in the egg. When the transport insect sucks blood the larva feels the higher temperature and breaks out of the egg and drops onto the skin or fur.

Subsequently the *Dermatobia* larva penetrates the skin relatively rapidly. The larvae cause rather large cutaneous lesions, often painful and pruritic, few in number and frequently solitary and localised on the head. Development is slow, up to 12 weeks (up to 18 weeks has been reported). Fluid is formed constantly, consisting of the excreta of the larvae, but there is rarely superinfection. If this occurs, cellulitis and lymphangitis can follow. Frequently, the larvae have to be removed surgically (the final size of the larvae is 18-25 mm). A non-invasive technique of removing larvae is based on topical application of Vaseline to cut off their oxygen supply butthis does not work very well. Fresh bacon can also be tried, the white part of the raw bacon is laid on the wound for some hours until the larva has attached itself. The bacon should then be lifted up and the larva can be grasped and removed with a rapid movement.



Myiasis; *Dermatobia hominis;* infestation with fly larva; photo Dr Van den Enden, copyright ITM

Prevention of *Dermatobia hominis* infections is difficult. The transport host *Haematobia irritans* ("horn fly") principally bites cattle and can be successfully combated by "ear tags" containing a PVC matrix with pyrethroids. They can also bite humans. When these insects form a local plague, they can be controlled in a "low-tech" fashion since *Haematobia irritans* and *H. exigua* obligatorily lay their eggs on fresh cow dung. When this is broken up mechanically, the larvae die. A shepherd with a rake can diminish a local plague and limit the exposure of humans and animals.

Screw worms

Cochliomyia hominivorax ("New World screw worm"; syn. *Callitroga hominivorax*) is a fly that occurs in Latin America and the Caribbean. It belongs to the Calliphoridae ("blow flies"). It was first described in 1858 by Dr Coquerel, a French army doctor in Cayenne, French Guyana. Many of the prisoners in the penal colony of Devil's Island had infections in the nose

and sinuses. The insect lays its eggs on all types of wounds. The larvae bore deep in the tissues with serious consequences, such as mutilation or even death. Although the species name translates as “man eater”, the insect preferentially plagues cattle. The name “screw worm” refers to the somewhat screw-like appearance of the larvae. They have mouth hooks in order to attach themselves firmly. Treatment consists of the mechanical removal of the intact larvae, standard wound care and tetanus prophylaxis. Antibiotics are usually necessary to combat superinfection.

Chrysomyia bezziana (“Old World screw worm”) strongly resembles *Cochliomyia hominivorax*, but does not lay its eggs on wounds. When larvae invade natural openings (vagina, nose, eyes, mouth), they can cause very painful and serious lesions. The larvae complete their development in humans in 5-6 days, after which they crawl out of the tissues and fall to the ground to pupate. *Chrysomyia megalocephala* is a facultative parasite of humans.



Myiasis. Adult *Chrysomyia bezziana,* dorsal view. Copyright ITM

Tabanids

Stinging flies that belong to the tabanids (*Haematopota, Chrysops, Tabanus*) can be mechanical vectors for anthrax and tularaemia ("rabbit fever"). This last infectious disease is caused by *Francisella tularensis.*