

Cutaneous Larva Migrans and Myiasis

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General

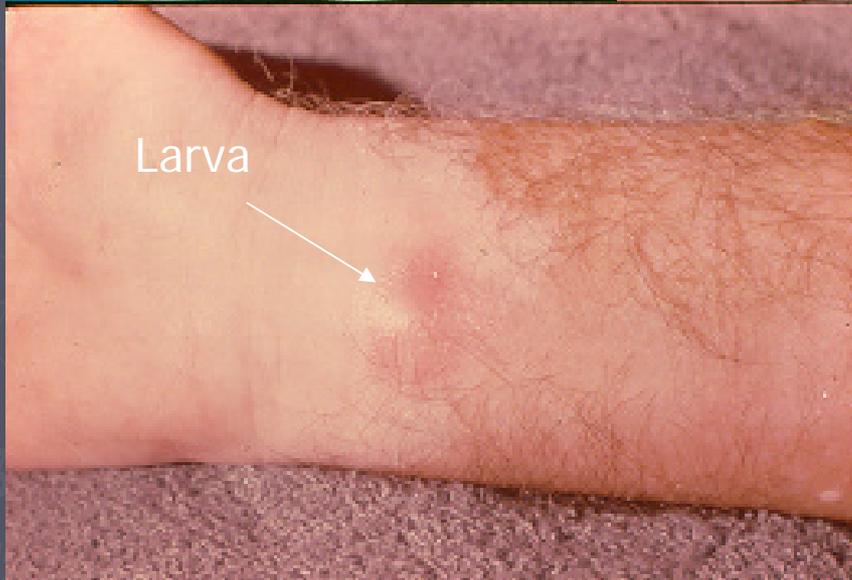
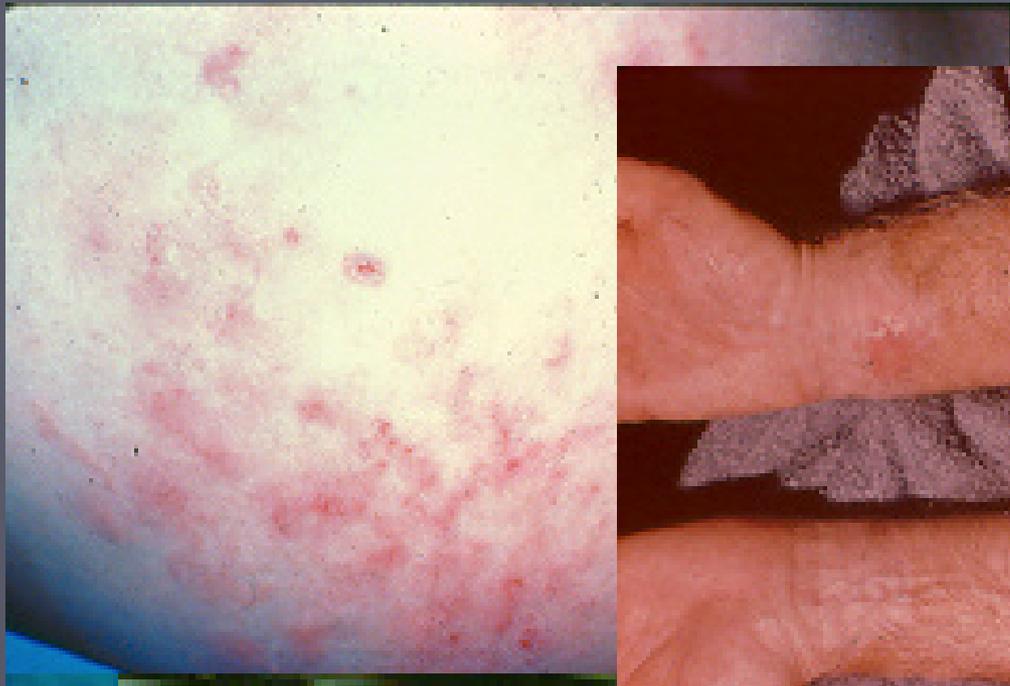
- ▶ Cutaneous Larva Migrans (Creeping Eruption) is a cutaneous eruption resulting from exposure of the skin to infective filariform larvae of non-human hookworms and Strongyloides.
- ▶ Occurs in most warm humid tropical and subtropical areas (eg South USA along the coasts, coasts of West, South and East Africa, South-East Asia, India, Malaysia, Sri Lanka and Thailand)

Etiology - CLM

- ▶ Hookworms - CLM
 - *Ankylostoma caninum* (dog)
 - *Ankylostoma braziliense* (dog, cat) – most common
 - *Urcinaria stenocephala* (European dogs)
 - *Bunostoma phlebotomun* (cattle)
- ▶ Strongyloides – CLM
 - *S pyoncyonis* (raccoon)
 - *S myoptami* (nutrea)
 - ? *Pelodara*
- ▶ *Gnathostoma spinergium* (dog, cat)
- ▶ Others
 - Loa Loa (Calabar swelling)
 - *Fasciola hepatic* (ectopic migration)

Clinical - CLM

- ▶ There is no protective immunity from a prior infection
- ▶ Larvae generally wander under the skin for months before they eventually die
- ▶ Symptoms start immediately after penetration of the skin
- ▶ Generally there is an erythematous papule at the entry site which often becomes a vesicle
- ▶ The larvae generally move a few mm – cm's per day leaving tunnels that become dry and crusted
- ▶ The track can be linear but also twists and turns
- ▶ Causes intense pruritus and may become secondarily infected
- ▶ Generally there is little flare surrounding the indurated track
- ▶ *Strongyloides pyocyonis* and *myoptami* clinically present as described. *Strongyloides stercoralis* causes tracks that are less defined, have a red flare, move more rapidly (10 cm per hour) and persist for only a few hours. This is not called CLM but larva currens.





Treatment

Drug	Adult dosage	Pediatric dosage
Albendazole (drug of choice)	400 mg daily X 3 days	400 mg daily X 3 days
Ivermectin (drug of choice)	200 ug / kg daily X 1-2 days	200 ug / kg daily X 1-2 days
Thiabendazole (alternate)	Topically (generally daily for 5 days)	Topically (generally daily for 5 days)

Medical Letter, August 2004, Drugs for Parasitic Infections.

Adverse Reactions

Albendazole	Occasional: diarrhea, abdominal pain Rare: leukopenia, alopecia, increased serum transaminase levels
Ivermectin	Occasional: eczematous skin rash, conjunctivitis Rare: hypotension
Thiabendazole	Frequent: Nausea, vomiting, vertigo Occasional: Leudopenia, crystalluria, rash, hallucinations, olfactory disturbance, erythema multiforme, Steven's Johnson syndrome Rare: Shock, tinnitus, intrahepatic cholestasis, convulsions, angioneurotic edema

Myiasis



Myiasis

Family	Subfamily	Genus and Species	Other Names		
Calliphoridae	Calliphorinae	Metallic group			
		<i>Chrysomya bezziana</i>	Old world screw worm		
		<i>Callitroga hominivorax</i>	New world screw worm		
		<i>Lucilia</i> spp	Green bottles		
		<i>Calliphora</i>	Blue bottles		
		Non – metallic group			
		<i>Auchmeromyia luteola</i>	Congo floor maggot		
		<i>Cordylobia anthropophaga</i>	Tumbu or mango fly		
		Sarcophaginae	Sarcophaginae	<i>Wohlfahrtia</i> spp	Flesh fly
				<i>Sarcophaga</i>	Flesh fly
Oestridae		<i>Dermatobia hominis</i>	Human bot fly		
		<i>Hypoderma</i> spp	Larva migrans		
		<i>Gastrophilus</i> spp	Larva migrans		

General - Myiasis

- ▶ Myiasis is caused when fly larvae invade living tissues or when they are harbored in the intestine or bladder

Myiasis

- ▶ There are 3 categories of myiasis producing flies
 - Obligatory – Larvae must develop in living tissues
 - Facultative – Larvae usually develop on carrion but can invade wounds
 - Accidental – Larvae or eggs are accidentally ingested and are not killed in the intestine

Myiasis

- ▶ Maggots may attack 3 parts of the body
 - Cutaneous tissues – invade sores, wounds, burrow in the skin, suck blood
 - Body cavities – nose, mouth, ears, orbit, anus, vagina
 - Gastrointestinal lumen – fly eggs / larvae pass through the stomach and bowel and emerge in the stool

Myiasis – Nose and Ears

- Nasal and ear myiasis is caused by *Chrysomyia*, *Oestrus*, *Rhinoestrus*, and *Callitroga* flies. The flies lay eggs in the the nasal cavity particularly where there is chronic nasal discharge. The larvae burrow into tissues even to the nasal bone within a few hours. Symptoms include tickling, sneezing, pain and nasal obstruction followed by a purulent fetid odor and discharge. Can lead to local destruction of bone and cartilage, and even migrate to the brain. Mortality with *Callitroga hominivorax* is 8%. Treatment is with a few drops of 15% chloroform in light vegetable oil which causes them to emerge where they can be removed. Control – large scale release of male flies sterilized by gamma radiation.

Myiasis - Eye

- Eye myiasis or ophthalmomyiasis may be external caused by *Oestrus* and *Wohlfahrtia* spp causing conjunctivitis only.
- Internal ophthalmomyiasis is caused by *Dermatobia*, *Oestrus*, *Gasterophilus* and *Hypoderma*. *Oestrus* mainly causes conjunctivitis. The female fly strikes the eye and instantaneously deposits eggs. Larvae develop which cause conjunctivitis or invade the eye and can be incredibly destructive.

Myiasis – Anus and Vagina

- Myiasis of the Anus and Vagina is caused mainly by *Wohlfahrtia*. Eggs are laid around the anus and vagina of adults and children in poor hygienic conditions particularly where there is soiling or sores. Large numbers of maggots can develop in a few hours.

Myiasis - Wound

- Wound myiasis is caused by both obligatory and facultative flies including *Calliphora*, *Lucilia*, *Phormia*, *Musca*, *Fannia*, *Wohlfahrtia*, *Chrysomyia*, and *Callitroga*. The larvae of these flies live in moist folds of skin and enter sores and wounds. In some instances these maggots are used to debride wounds of dead material where antibiotics and surgery are impractical.

Myiasis - Urogenital

- Urogenital Myiasis is rare and caused by larvae infecting the vagina or vulva area penetrating the urethra and entering the bladder. Most of these infections are caused by *Psychoda*, *Musca*, *Calliphora* and *Sarcophaga*.

Myiasis - Gastrointestinal

- Gastrointestinal lumen –Eggs and sometimes larvae are deposited on food and occasionally survive the transit through the stomach. They then develop in the folds of the mucous membranes causing pain, vomiting, diarrhea and occasionally ulcers. This infestation may persist for months. Occasionally larvae may be seen in feces or vomitus. The usual flies associated with intestinal myiasis are *Musca*, *Fannia*, *Chrysomya*, *Calliphora*, and *Lucilia*. Covering of food is preventive. Treatment with purgatives will aid elimination and Ivermectin is occasionally worth a trial.

Etiology - Myiasis

▶ Cutaneous

- Blood suckers – Congo Floor Maggot *Auchmeromyia luteola*
- Subcutaneous
 - ▶ *Cordylobia anthropophaga* (Africa) – Tumbu, Putsi, Ver Du Cayor fly
 - ▶ *Dermatobia hominis* (South America) – Macaque, Berne, El Torsalo, Beefworm, Human Bot fly
- Creeping Eruption or Dermal Myiasis – *Gastrophilus*, *Hypoderma*, *Gnathostoma spinergium*

Auchmeromyia luteola – Congo floor maggot

- ▶ Widely distributed in tropical Africa from sea level to 2250 m in both dry and wet climates
- ▶ Orange buff colored blowfly
- ▶ Human feces are it's most important food source
- ▶ The larva generally feeds on sleeping host
- ▶ Bite is painless. No other infections are transmitted by it's bite.
- ▶ Sleeping on a raised bed prevents attacks.
- ▶ Spraying the house with residual insecticides help eliminate infestation

Cordylobia anthropophaga

- ▶ Cordylobia anthropophaga in sub-saharan Africa and S Spain
- ▶ Also called Tumbu, Putsi fly or Ver du cayor
- ▶ A large yellow brown fly
- ▶ Eggs are laid on sandy ground contaminated with feces and urine or washed clothing. Larvae emerge and invade subcutaneous tissues and develop over 8-12 days. They emerge fall to the ground pupate and hatch as adults in 10-20 days.
- ▶ Most commonly involves the back, head and neck
- ▶ Most common in children

Cordylobia anthropophaga

▶ Lesion

- Starts as a papule which can be pruritic
- Serous exudate is common
- Lymphadenopathy is occasionally seen
- Can see fever and malaise
- Resembles an abscess
- Respiratory spicule is seen but retracts when touched

▶ Diagnosis

- Little pain vs a boil
- Spiracles present
- Cover with vaseline, glycerin or oil – diagnostic bubbles

▶ Treatment

- Cover with oil
- Pop out like a pimple

Cordylobia anthropophaga

► Prevention

- All clothing and towels should be ironed on both sides
- Drip dry clothing hung indoors with the windows closed to prevent contact with flies

Dermatobia hominis

- ▶ Widely distributed in Central and South America
- ▶ Attacks a wide range of host including livestock
- ▶ Bluish gray fly
- ▶ Fly lays eggs on other insects particularly mosquitoes. These eggs hitchhike to the host on these other insect's bellies. On feeling warmth rapidly hatch and penetrate the skin (5-10 minutes). Larvae develop in 6-12 weeks, drop from the skin to the ground, pupate and hatch as adults.
- ▶ Lesion
 - Develop into a small nodule with a central pore (air hole)
 - Can be multiple
 - Inflamed swelling of 2-3 cm
 - Spiracles can be seen from the air hole
 - Exudate of seropurulent fluid and dark feces of the larva
 - Painful and pruritic
 - Do not suppurate due to bacteristatic action the gut of the larva

Dermatobia hominis

▶ Diagnosis

- Characteristic spiracles and fecal stained serous exudate

▶ Treatment

- Occasionally can be removed like *Cordylobia anthropophaga*
- Generally requires surgical removal
- Care must be taken not to leave portions of the larvae in the wound

▶ Complications

- Loss of eye
- Fatal cerebral myiasis in children - rare

▶ Control

- Insecticides
- Sterilizing male insects with radiation

Gastrophilus and Hypoderma– Creeping Eruption

- ▶ Common parasites of horses (Gastrophilus) and cattle (Hypoderma ovis and lineatum)
- ▶ Eggs are deposited on hair or grasses. The larvae hatch (eg 1 week in Hypoderma) and penetrate the skin on contact.
- ▶ Larvae do not develop beyond the instar stage
- ▶ Cause swelling and a creeping eruption in the lower dermis
- ▶ Hypoderma penetrates deeper than Gastrophilus and has been reported to invade the nervous system

Clinical Features

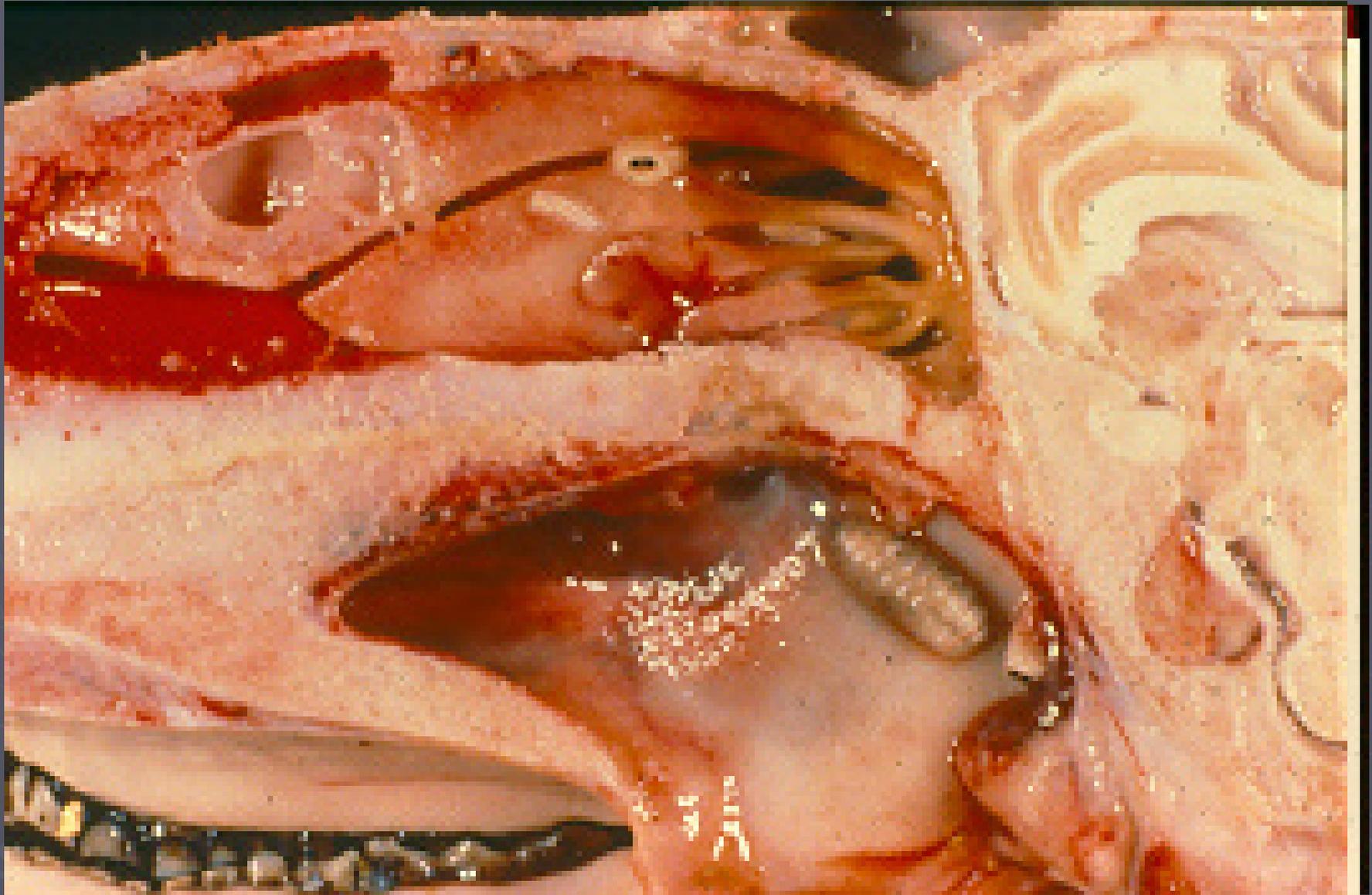
- ▶ Tunnels of *Gastrophilus* mimic CLM
- ▶ Pruritus
- ▶ Hypoderma produce deeper swellings that resemble an abscess
- ▶ Migrate for considerable distances
- ▶ *Hypoderma ovis* has been associated with CNS invasion

Diagnosis

- ▶ Gastrophilus larvae can be identified by putting a small amount of clear mineral oil over a lesion. The larvae can then be identified by the black transverse bands of spines on the body.

Treatment

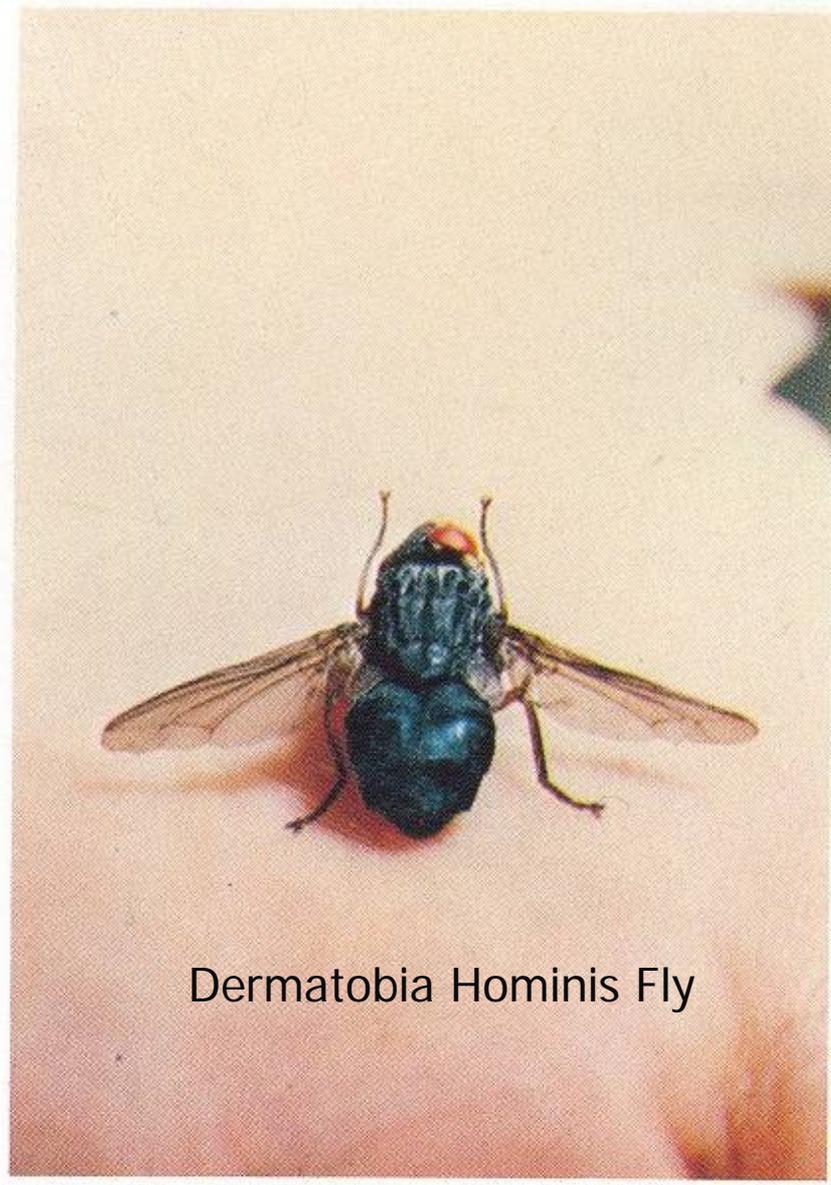
- ▶ Gastrophilus larvae – needle
- ▶ Hypoderma – cruciform incision



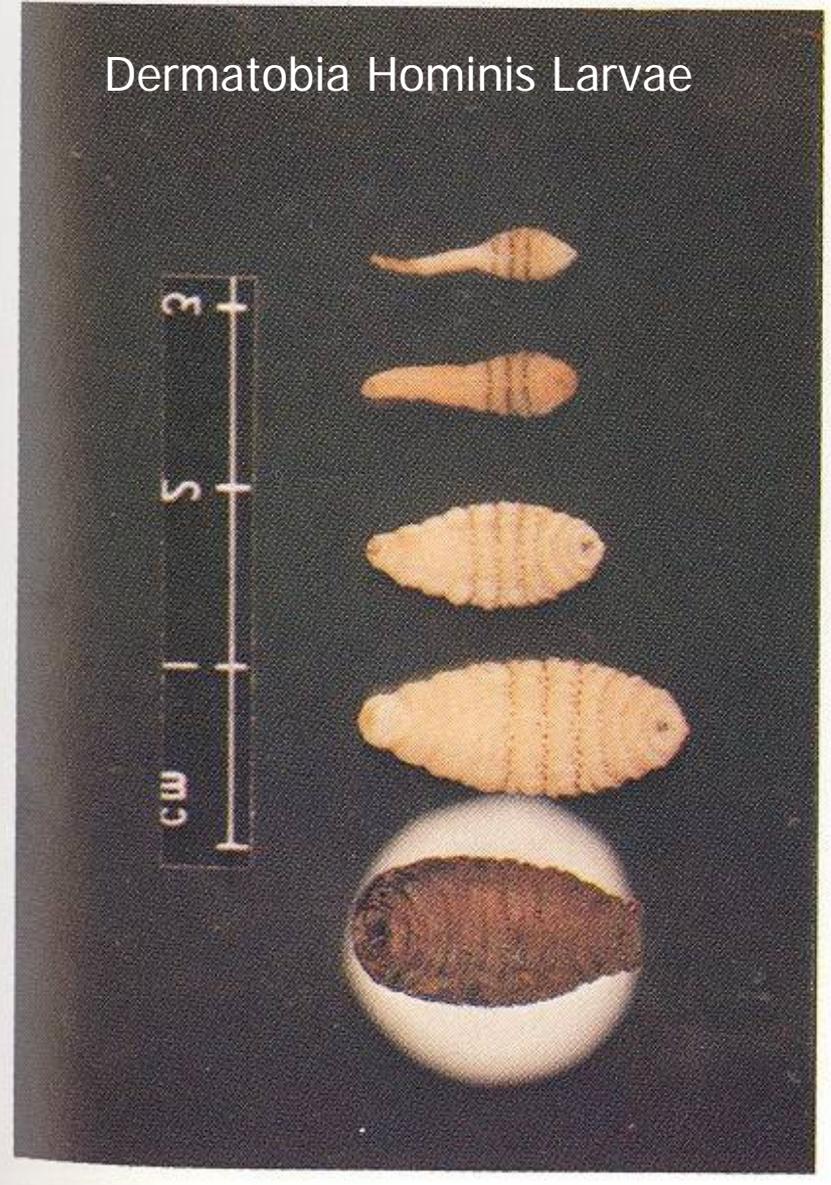
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Dermatobia Hominis Fly



Dermatobia Hominis Larvae