Toxocara canis – canine roundworm

Occurence - cosmopolitan nematode, present in the small intestine, especially in young dogs, wolves and foxes. Man is paratenic host.

Pathogenicity:

In the initial period of intense invasion of the larvae: -high fever, -enlarged liver, -abdominal pain, -nausea and vomiting, -inflammatory lesions in the lungs, -signs of focal lesions in the brain and eye,

Later: the temperature returns to normal, there may be headache, vertigo, recurrent respiratory infections, inflammation of the lymph nodes. Detection: -serological tests, -CT, USG, -sometimes biopsy.



Acarina

Developmental stages: -larva (three pairs of legs) -nymph (proto-, deuto- and tritonymph) -adult (4 pairs of legs)

dioecioussexual dimorphism

Harmful effects on human health:

-direct parasitism,
-reservoir and transmitter of pathogenic microorganisms and parasites,
-a cause of allergic reactions,

Argas reflexus

Occurence- species widespread in western, central and southern Europe.

It attacks mostly domestic pigeons (also mammals).

Medical importance: -itching and swelling after penetration into the skin, -in susceptible individuals- toxicosis and even systemic reactions, -reservoir of viruses, rickettsiae, bacteria and protozoa,

Detection: -cracks in the walls of the old towers, pigeons nests,

Ixodes ricinus

Occurence- widespread in Europe, North and West Africa, and Asia Minor, common in Poland.

Tick penetrates skin with chelicerae and hypostome.

It secretes a high number of fast-hardening saliva, forming a tubular sheath which provides tick attachment.

The second type of saliva contains substances that dissolve the host tissue and prevent blood clotting.

Medical importance: -reservoir of following diseases: tick-borne encephalitis, borreliosis, tularemia, brucellosis, listeriosis, piroplasmosis and Q fever

Detection & fighting: remove immediately after finding, disinfect the place of tick's attachment



Lyme disease (borreliosis) Symptoms

Early Signs and Symptoms (3 to 30 days after tick bite)

- Fever, chills, headache, fatigue, muscle and joint aches, and swollen lymph nodes

- Erythema migrans (EM) rash:

- Occurs in approximately 70 to 80 percent of infected persons
- Begins at the site of a tick bite after a delay of 3 to 30 days (average is about 7 days)
- Expands gradually over a period of days reaching up to 12 inches or more (30 cm) across
- May feel warm to the touch but is rarely itchy or painful
- Sometimes clears as it enlarges, resulting in a target or "bull's-eye" appearance
- May appear on any area of the body

Later Signs and Symptoms (days to months after tick bite)

- Severe headaches and neck stiffness
- Additional EM rashes on other areas of the body
- Arthritis with severe joint pain and swelling, particularly the knees and other large joints.
- Facial or Bell's palsy (loss of muscle tone or droop on one or both sides of the face)
- Intermittent pain in tendons, muscles, joints, and bones
- Heart palpitations or an irregular heart beat
- Episodes of dizziness or shortness of breath
- Inflammation of the brain and spinal cord
- Nerve pain
- Shooting pains, numbress, or tingling in the hands or feet
- Problems with short-term memory

	lick-borne encephalitis	адех огнск-ронне списернания
Faza I I stage	gorączka do 38°C fever up to 38°C cephalgia, arthralgia nudności, wymioty nausea, vomiting nieżyt górnych dróg oddechowych upper airways infection	przebieg łagodny mild course
		objawy grypopodobne influenza-like signs atonia pęcherza moczowego atonia of the urinary bladder
Remisja Remission	przebieg bezobjawowy asymptomatic course	
	gorączka do 40°C fever up to 40°C zaburzenia świadomości, śpiączka unawareness, coma zmiana nastroju, tendencje samobójcze changing mood, suicidal tendency depresja depression drżenia zmiarowe intention tremor oczopląs, podwójne widzenie, światłowstręt nystagmus, diplopia, photophobia bóle głowy, zawroty głowy headache, vertigo niedosłuch hypoacusia wymioty vomiting obniżenie ciśnienia tętniczego arterial hypotension	przebieg ciężki severe course
Faza II II stage		meningoencephalitis (>40%) meningitis (>40%) meningoencephalo- myelitis lub meningo- myelitis (ok. 10%)
	porażenie nerwów czaszkowych (głó cranial nerve paralysis (mostly VII) niedowłady wiotkie, asymetryczne ko mięśni (głównie pasa barkowego), a flaccid and asymetric paresis of extri with muscular atrophy (mostly acror	wnie VII) pńczyn z zaniknięciem tonia emities nial), atonia

Flaviviridae

Dermacentor reticulatus

Occurence: West, Central and East Europe, Middle Asia Habitats: grasslands, pastures, mixed forests, and woodland

Medical importance: -reservoir of following diseases: tularemia, Q fever, anaplasmosis, babesiosis

Detection & fighting: As in *Ixodes* ticks

Sarcoptes scabiei

Occurence: cosmopolitan species, accompanied by larger communities of people with lower level of hygiene.

Skin parasite of human- makes tunnels in the epidermis.

Medical importance:

-scabies are mainly localized on the hands between the fingers, on the wrists, elbows, around the abdomen, chest and genitals. In children, changes may occur throughout the body.

Detection:

- microscopic examination of skin scrapings

Detection:

Squeezed out the contents of the sebaceous ducts flooded with 4% NaOH or KOH solution and studied under a microscope for the presence of *Demodex*

Skin scrapings viewed under a microscope in a mixture of 20% KOH

SSSB – Standardized Skin Surface Biopsy



Transmission occurs primarily during person-to-person, skin-to-skin contact.



Demodex folliculorum

Occurence: cosmopolitan species, occurs in all human races

It lives in hair follicles mainly of the face and feeds on sebum. The development lasts 2 - 3 weeks.

Demodex is transmitted with the dust, through direct contact with an infected person, by applying the same cosmetic utensils, towels and clothes.

Medical importance:

Usually infestation is asymptomatic, but human mite may act as a carrier of bacteria and fungi and be responsible for the development of skin lesions (i.e. seborrhoeic diseases).

Demodex may cause ocular demodecosis (redness of the conjunctiva and eyelids, itching, loss of eyelashes).

Insecta

sexual reproduction, sexual dimorphism, rarely hermaphroditism or parthenogenesis

<u>Incomplete metamorphosis,</u> <u>hemimetabolism</u> - the type of metamorphosis, during which there is no pupa stage

Insects undergoing incomplete metamorphosis:

- ➤ orthoptera
- ≻ lice
- ➤ weighty
- ➤ bugs
- ➤ grasshopper
- \succ cockroaches
- ➤ crickets

Complete metamorphosis, holometabolism - the type of metamorphosis in which occurs the pupa stage.

Insects undergoing complete metamorphosis :

- ➤ dipterans
- ≻ bees
- ➤ beetles
- ➢ butterflies

Parasites found only in winged insects but their wings were more or less reduced.

Pediculus humanus

Occurence- external parasite of man, cosmopolitan; consists of two subspecies: clothes and head louse

Medical importance: -scratching leads to injuries of the skin and secondary bacterial infections, allergic symptoms may occur

-clothes lice lives in the folds of clothes and at the seams of underwear;
-it is a vector of epidemic typhus and rickettsiae



Pthirus pubis



Pthirus pubis

Medical importance: They are transmitted through sexual contact, through the bedding and clothing.

Pubic lice irritate the skin, the bite sites appear as blue red spots. If they locate on the eyelashes and eyebrows it may lead to the inflammation of the conjunctiva.

Detection: -lices and their eggs in the hairy parts of body,

Cimex lectularius – bed bug

Occurence- mainly in countries with temperate climate, also in subtropical zone,



Cimex lectularius

Bedbug is a night-time parasite; main host is human (it can also drink the blood of other animals),
lives about 14 months,

Medical importance: Stings cause local changes in the skin, often a general allergic reactions.

Detection:

Insects, eggs and moults may be in cracks in the floors, the moldings, often in joints of furniture, etc., on the walls noticeable brown spots and a characteristic fecal odor in the room (the smell of fragrant glands bugs).

Anopheles macullipennis

Occurence- cosmopolitan species

Life cycle takes place in clean, standing water with plenty of plants that produce oxygen.

It lasts 4 weeks in temperature >10°C

Medical importance: vector of *Plasmodium sp*.

Detecting and fighting: -larvae under surface of the water, -chemical control of insects, -combating larvae with biopreparats

Culex pipiens

Occurence- widespread in Europe, Asia, Africa and North America, common in Poland.



Culex pipiens

Medical importance: -saliva causes itching; mosquito may carry ornithosis and neurotropic viruses of domestic and wild birds to domestic animals and humans

Detecting and fighting:

-personal protection against mosquitoes,
-elimination of mosquito breeding sites by draining the land,
-water purification,

Glossina sp.

Occurence: tropical and subtropical Africa They feed on the blood of humans and animals

Medical importance:

Vector of *Trypanosoma sp.*; African sleeping sickness

Rhodnius prolixus

Occurence: South and Central America, one of the kissing bugs

Rhodnius bugs belong to the family *Reduviidae*; they are obligate blood feeders.

Bugs undergo incomplete metamorphosis.

Medical importance: vector of Trypanosoma cruzi (Chagas' disease)

Musca domestica – house fly

Occurence- cosmopolitan and synanthropic species



Medical importance: -invasion of living tissue or organs by larvae-**myiasis**; -adult flies are vectors of: *Vibrio cholerae*, tuberculosis, dysentery bacilli, amebic desentery and eggs of nematodes,

Fighting:

-adequate sanitary and hygienic conditions,

- -food preservation,
- -isecticides and pyrethroids,

Lucilia sericata

Occurence- cosmopolitan species, common in temperate climate.



Lucilia sericata

Medical importance- feeds on dead tissue; accidentally parasitizes in the wounds, causing human and animal myiasis. Can be transmitter of different pathogens: protozoa cysts, eggs of intestinal parasites and bacteria.

Fighting: -like house flies, -securing wounds with bandages,

Stomoxys calcitrans – stable fly

Occurence- cosmopolitan and synanthropic species

It is similar to the house fly. Reproduces by lying eggs in the manure. Armed with a proboscis. Stings are painful, and bite-site created inflammation and itching.

Medical importance: -stings are very painful, -they may carry tularemia bacillus, *Mycobacterium leprosy*, polio virus, *Trypanosoma equiperdum*

Detection: -larvae and pupae in the fertilizer, -imago in buildings,

Fighting: -good hygienic conditions in livestocks,

Pulex irritans – human flea

Occurence- cosmopolitan species

Medical importance:

-may transmit rickettsiae, endemic typhus, tularemia bacilli, *Yersinia pestis*; -they are intermediate hosts for tapeworms *Dipylidium caninum*, *Hymenolepsis nana* and *H. diminuta*.

Detection: -characteristic spots of the stool on the bed, -red, itchy dots on the skin,

Fighting: -the use of repellents, destroying all developmental forms,

Pulex irritans

Adults feed on blood of man or domestic animals.

Larvae live in cracks of walls, floors and feed on food scraps.



Ctenocephalides canis – dogs flea

Occurence- parasite of cats and dogs, sometimes attacks man.

Medical importance: -irritate the skin causing itching, -intermediate host of *Dipilidium caninum*,