

## Parasites

John Chapman, MD, and Robert Bacigalupi, MD

DISEASE	ORGANISM	MODE OF TRANSMISSION	OTHER INFORMATION
<b>Parasite and others</b>			
Amebiasis cutis	Entamoeba histolytica	Fecal-oral route or sexually transmitted disease (STD)	Cutaneous lesions are a result from extension of amebic abscesses, except penile which are sexually transmitted
Granulomatous amebic encephalitis	Acanthamoeba genus Balamuthia mandrillaris	Fecal-oral route; ubiquitous	Occurs in immunocompromised patients; large pink nodules with suppuration and ulcers after organism disseminates
Leishmaniasis			
Cutaneous Leishmaniasis			
Old world	Leishmaniasis major L. aethiopia L. infantum L. tropica L. donovani	Sand fly: Phlebotomus genus	Leishmaniasis recidivans - soft red papules that appear after initial lesions heal. More common in urban type; apple-jelly color on diascopy
Rural/moist type Urban/dry type	L. mexicana L. braziliensis gyanensis L. b. braziliensis L. b. panamensis	Sand fly: Phlebotomus perniciosus Lutzomyia genus	Chiclero ulcer - chronic ulcer commonly on the ear
New world	L. braziliensis braziliensis L. b. panamensis	Sand fly: Lutzomyia genus	
Mucocutaneous leishmaniasis (Espundia)	L. braziliensis braziliensis L. b. panamensis	Sand fly: P. argentipes (India) P. perniciosus and P. ariasi (China, Africa, Near and Middle East, Mediterranean) L. longipalpis (Americas)	Kala-azar is the initial lesion Post-Kala-azar dermal leishmaniasis - occurs after treatment in African form
Visceral leishmaniasis (Kala-azar)	L. donovani donovani (India) L. d. infantum (China, Africa, Near and Middle East, Mediterranean) L. d. chagasi (Americas)	Sand fly: P. argentipes (India) P. perniciosus and P. ariasi (China, Africa, Near and Middle East, Mediterranean) L. longipalpis (Americas)	
Trypanosomiasis			
American trypanosomiasis (Chagas disease)	Trypanosoma cruzi	Reduviid bug (kissing bug, assassin bug)	Romana's sign; chagoma; Parinaud sign; Tx with nifurtimox May lead to megacolon, myocarditis, cardiac failure
African trypanosomiasis	T. brucei gambiense (West African) T. b. rhodesiense (East African)	Tsetse fly: Palpalis group (West African type) Glossina morsitans (East African type)	Winterbottom's sign - posterior cervical lymphadenopathy East African type is faster progressing
Toxoplasmosis	Toxoplasma gondii	Congenital infection or ingestion of cysts	Part of TORCH syndrome in newborns
Portuguese Man-of-War dermatitis	Physalia physalis P. urticulus	Envenomation of nematocysts on tentacles	Intense pain followed by linear lesions
Jelly fish dermatitis	Chironex fleckeri Carybdea marsupialis	Envenomation of nematocysts on tentacles	
Seabather's eruption	Linuche unguiculata Edwardstella lineata	Cnidarian larvae release toxin from nematocysts during pressure	Covered areas
Coral dermatitis	Milleporina order	Implantation of fragments after cuts by exoskeleton	
Sponge dermatitis	Poriferaphylum	Produce irritants such as halitoxin and okadaic toxin	
Sea urchin dermatitis	Diadema genus Echinothrix genus Tripneustes genus	Puncture wound with implementation of spines	
Seaweed dermatitis	Lyngbya majuscula gomont (alga)	Contact with organism	Covered areas
Protothecosis	Prototheca species (alga)	Contact with organism	Numerous septations
Dogger bank Itch	Alycyonium hirsutum (sea chervil)	Contact with organism	Found in the North sea between Scotland and Denmark
Schistosomiasis			
Cercarial dermatitis			
Freshwater swimmer's itch Saltwater marine dermatitis (Clam digger's itch)	Avian Schistosomes cercariae: Microbilharzia variglandis Schistosoma spindale	Cercarial burrow into skin	Found on exposed areas
Visceral schistosomiasis (Bilharziasis)	Schistosoma mansoni (Caribbean, S. America) S. haematobium (Middle East, Africa) S. japonicum (Southeast Asia)	cercaria burrow into skin cercaria mature in the aquatic snail	Cercaria mature in the aquatic snail; bladder cancer S. japonicum can cause Urticarial fever/Katayama fever
Cysticercosis	Taenia solium (pork tapeworm) larvae named Cysticercus cellulosae T. saginata (cattle tapeworm)	Ingestion of larva	Scolex has hooklets and two pairs of sucker caps
Sparganosis	Spirometra species	Direct application of a wound or ingestion of larvae infected undercooked meat	No solex
Echinococcosis (Hydatid disease)	Echinococcus granulosus	Fecal-oral	Host is dog; cysts often in lung and liver
Enterobiasis (Pinworm, Oxyuriasis)	Enterobius vermicularis	Ingestion of ova	Scotch tape test
Hookworm disease (Ground itch)	Ancylostoma duodenale Necator americanus	Penetration of skin by larvae	Dermatitis at site of infection
Nematode dermatitis	Ancylostoma caninum	Penetration of hair follicle by larvae	Widespread folliculitis
Cutaneous larva migrans (Creeping eruption)	Ancylostoma braziliense A. caninum	Penetration of skin by larvae	Loeffler syndrome - creeping eruption, patchy infiltrate of the lungs, eosinophilia
Gnathostomiasis (Larva migrans profundus)	Gnathostoma dolorosi G. spinigerum	Ingestion of cyst in raw fish	Intermittent migratory plaques that can last for years
Larva Currens (Perianal larva migrans)	Strongyloides stercoralis	Initially ingestion of larva then penetration of perianal skin during defecation (autoinfection)	Perianal petechia, purpura, and urticaria Thumbprint sign - periumbilical ecchymoses
Dracunculiasis	Dracunculus medinensis	Ingestion of larvae contaminated water	Extract worm gradually each day
Filariasis	Wuchereria bancrofti Brugia malayi Brugia timori	Culex, Aedes, and Anopheles mosquitoes	Treat co-infection of wolbachia with doxycycline
Loiasis	Loa loa	Mango fly: Chrysops dimidia C. silacea	Non-pitting edema called calabar or fugitive swelling
Onchocerciasis (River blindness)	Onchocerca volvulus	Black fly: Simulium genus	Erisipela de la costa - acute facial swelling and erythema Mal morado - urticarial eruption with hyperpigmentation Elephant, lizard, leopard skin variants Sowda - darkly pigmented plaque Mazzotti test reaction



John Chapman, MD, is a PGY2 dermatology resident at Tulane Medical Center.



Robert Bacigalupi, MD, is a PGY2 dermatology resident at Tulane Medical Center.

## Parasites (continued)

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DISEASE	ORGANISM	MODE OF TRANSMISSION	OTHER INFORMATION
Trichinosis	<i>Trichinella spiralis</i>	Ingestion of cysts in undercooked pork	Eyelid edema; diagnosis confirmed by muscle biopsy
Creeping myiasis	<i>Gasterophilus nasalis</i> <i>G. intestinalis</i>	Fly larvae infestation	
Furuncular myiasis	<i>Dermatobia hominis</i> (botfly) <i>Callitroga americana</i> <i>Hypoderma lineatum</i> (cattle grub) <i>Cuterebra cuniculi</i> (rabbit botfly) <i>Wohlfahrtia vigil</i>	Fly larvae infestation	
Tungiasis	<i>Tunga penetrans</i>	Sand flea: <i>Tunga penetrans</i> burrows into the skin	
Dirofilariasis	<i>Dirofilaria immitis</i> <i>D. repens</i>	<i>Culex</i> , <i>Aedes</i> , and <i>Anopheles</i> mosquitoes	"heartworms" in dogs
<b>Bacteria</b>			
<b>Bartonella</b>			
Oroya Fever/ Verruga peruana (Carion's disease)	<i>Bartonella bacilliformis</i>	Sand fly: <i>Lutzomyia verrucarum</i>	Verruga peruana - chronic form; co-infection with salmonella increases mortality
Cat Scratch disease	<i>B. henselae</i>	Flea bite: <i>Afipia felis</i> cat scratch/bite	Oculoglandular syndrome of Parinaud
Bacillary Angiomatosis	<i>B. henselae</i> <i>B. quintana</i>	Body louse: <i>Pediculus humanus corporis</i> cat scratch/bite	Associated with AIDS
Trench fever	<i>B. quintana</i>	Body louse: <i>Pediculus humanus corporis</i>	No skin lesions
<b>Borrelia</b>			
Acrodermatitis chronica atropicans	<i>Borrelia afzelii</i>	<i>Ixodes ricinus</i>	Chronic form of Lyme disease
Lyme Disease	<i>B. burgdorferi</i> <i>B. garinii</i> <i>B. afzelii</i>	<i>Ixodes dammini</i> <i>I. pacificus</i> <i>I. scapularis</i> <i>Amblyomma americanum</i>	Erythema migrans
Southern tick associated rash illness	<i>B. lonestari</i>	<i>Amblyomma americanum</i>	
Tick paralysis	Toxin related	<i>Dermacentor</i> genus	
Tick-borne relapsing fever	<i>B. duttonii</i> <i>B. hermsii</i> <i>B. turicata</i>	<i>Ornithodoros moubata</i>	
Louse-borne relapsing fever	<i>B. recurrentis</i>	Body louse: <i>Pediculus humanus corporis</i>	
<b>Rickettsia</b>			
Rocky Mountain Spotted Fever	<i>Rickettsia rickettsii</i>	<i>Dermacentor variabilis</i> <i>D. andersoni</i> <i>Amblyomma americanum</i> <i>Rhipicephalus sanguineus</i>	Centripetal rash
Endemic typhus (Murine typhus)	<i>R. typhi</i> (formerly <i>R. mooseri</i> )	Rat flea: <i>Xenopsylla cheopis</i> Cat flea: <i>Ctenocephaloides felis</i> Scrub mite:	
Scrub typhus of Southeast Asia	<i>Orientia tsutsugamushi</i> (formerly <i>R. tsutsugamushi</i> )	<i>Leptotrombidium</i> ( <i>Trombicula</i> ) <i>akamushi</i> <i>L. deliense</i>	
Rickettsial Pox	<i>R. akari</i>	House mouse mite: <i>Liponyssoides sanguineus</i> (formerly <i>Allodermanyssus sanguineus</i> )	Varicella-like lesion; Negative Weil-Felix test
Epidemic typhus	<i>R. prowazekii</i>	Body louse: <i>Pediculus humanus corporis</i>	Brill-Zinsser disease - relapse of epidemic typhus
Babesiosis	<i>Babesia microti</i>	<i>Ixodes scapularis</i> <i>I. dammini</i>	Maltese cross
Tularemia	<i>Francisella tularensis</i>	<i>Dermacentor andersoni</i> , <i>Dermacentor variabilis</i> , deer fly, and black fly, carcasses	Hosts are rabbits; Ulceroglandular form most common
<b>Ehrlichiosis</b>			
Human monocytic ehrlichiosis	<i>Ehrlichia chaffeensis</i>	<i>Dermacentor variabilis</i> <i>Amblyomma americanum</i>	Morulae: intracytoplasmic microcolonies
Human granulocytic ehrlichiosis	<i>Anaplasma phagocytophilum</i> (formerly <i>Ehrlichia phagocytophilum</i> )	<i>Ixodes scapularis</i> <i>I. pacificus</i> <i>Dermacentor variabilis</i>	
Bubonic Plague	<i>Yersinia pestis</i>	Rat flea: <i>Xenopsylla cheopis</i>	
<b>Malaria</b>			
	<i>Plasmodium falciparum</i> <i>P. vivax</i> <i>P. ovale</i>	<i>Anopheles</i> mosquitoes	
Cutaneous Anthrax	<i>Bacillus anthracis</i>	Carcasses of sheep, cows, goats, horses	Use dactron or rayon swabs for cultures Two toxins - edema and lethal toxin
Brucellosis	<i>Brucella</i> species <i>Erysipelothrix insidiosa</i>	Ingestion of unpasteurized goat dairy	Gram-negative rod
Erysipeloid	<i>E. rhusiopathiae</i>	Many animals, commonly pigs	
Q Fever	<i>Coxiella burnetii</i>	Exposure to infected livestock	Can be cause of blood-culture negative endocarditis
Glanders	<i>Pseudomonas mallei</i>	Inoculation	
Typhoid fever	<i>Salmonella typhi</i>	Ingestion	Rose spots
<b>Virus</b>			
<b>Flavivirus family</b>			
Yellow fever	Yellow fever virus	<i>Aedes aegypti</i>	
Dengue fever	Dengue virus	<i>Aedes aegypti</i>	Hemorrhagic and break-bone fever
West Nile fever	West Nile virus	<i>Culex</i> mosquito	
Sandfly fever (Phlebotomus fever, Pappataci fever)	Phlebotomus (Bunyaviridae family)	<i>Phlebotomus papatasi</i>	
Equine encephalitis	Alphavirus (Togaviridae family)	<i>Culiseta</i> mosquito	
<b>Poxvirus family</b>			
Orf (Ecthyma contagiosum)	Orf virus	Sheep and goats	
Milkers' nodule	Paravaccinia virus	Cows	

References: Bologna JL, Jorizzo JL, Rapini RP. *Dermatology*. 2<sup>nd</sup> ed. Spain, Mosby-Elsevier; 2009.

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