



Disease	Causative pathogen	Clinical phenotypes	Relevant ticks	Continent(s)
Lyme disease	<i>Borrelia burgdorferi</i> sensu lato complex, especially <i>B. burgdorferi</i> sensu stricto, <i>B. afzelii</i> , <i>B. garinii</i>	Erythema migrans; Acrodermatitis atrophicans; Arthritis; Carditis; Neuroborreliosis / CNS diseases	Mainly <i>Ixodes ricinus</i> in Europe; also <i>I. persulcatus</i> , <i>I. hexagonus</i> , and other regional <i>Ixodes</i> vectors	North America; Europe; Asia
Tick-borne relapsing fever	Tick-borne relapsing fever <i>Borrelia</i> spp., including <i>B. duttonii</i> , <i>B. hispanica</i> , and <i>B. persica</i>	Recurrent febrile illness; systemic infection; neurologic involvement (rare)	<i>Ornithodoros</i> spp. soft ticks	Africa; Europe; Asia; North America; Central America
<i>Borrelia miyamotoi</i> disease	<i>Borrelia miyamotoi</i>	Nonspecific febrile illness; meningoencephalitis reported, especially in immunocompromised patients	<i>Ixodes ricinus</i> and other regional <i>Ixodes</i> spp.	North America; Europe; Asia
Human granulocytic anaplasmosis	<i>Anaplasma phagocytophilum</i>	Febrile systemic illness; cytopenias; occasional severe disease	<i>Ixodes ricinus</i> ; <i>I. scapularis</i> ; <i>I. pacificus</i>	North America; Europe; Asia
Human monocytic ehrlichiosis	<i>Ehrlichia chaffeensis</i>	Febrile systemic illness; CNS disease can occur, including meningitis and meningoencephalitis	<i>Amblyomma americanum</i> ; <i>Ixodes ricinus</i> reported in Europe	North America; Europe
Mediterranean spotted fever	<i>Rickettsia conorii</i> subsp. <i>conorii</i>	Fever; rash, eschar; vasculitic spotted fever syndrome	<i>Rhipicephalus sanguineus</i>	Europe; Africa; Asia
Indian tick typhus	<i>Rickettsia conorii</i> subsp. <i>indica</i>	Febrile rash illness; vasculitic spotted fever syndrome	<i>Rhipicephalus sanguineus</i>	Asia
Israeli spotted fever	<i>Rickettsia conorii</i> subsp. <i>israelensis</i>	Febrile rash illness; severe spotted fever syndrome may occur	<i>Rhipicephalus sanguineus</i>	Asia; Europe
Astrakhan fever	<i>Rickettsia conorii</i> subsp. <i>caspi</i>	Febrile rash illness; spotted fever phenotype	<i>Rhipicephalus sanguineus</i>	Europe; Asia
Rocky Mountain spotted fever	<i>Rickettsia rickettsii</i>	Severe febrile vasculitic illness; rash; multi-organ involvement; CNS disease may occur	<i>D. variabilis</i> ; <i>D. andersoni</i>	North America; Central America
African tick-bite fever	<i>Rickettsia africae</i>	Fever; inoculation eschar(s); regional lymphadenitis; rash may occur	<i>Amblyomma</i> spp.	Africa
<i>Rickettsia aeschlimannii</i> infection	<i>Rickettsia aeschlimannii</i>	Mediterranean spotted fever-like illness; fever; rash; eschar	<i>Amblyomma</i> spp.; <i>Dermacentor</i> spp.	Europe; Africa; Asia
Far Eastern spotted fever	<i>Rickettsia heilongjiangensis</i>	Febrile rash illness; spotted fever phenotype	<i>Dermacentor</i> spp.; <i>Haemaphysalis</i> spp.	Asia
Queensland tick typhus	<i>Rickettsia australis</i>	Febrile rash illness; eschar may occur	<i>Ixodes</i> spp.	Australia
<i>Rickettsia helvetica</i> infection	<i>Rickettsia helvetica</i>	Fever; headache; rash; invasive disease (rare)	<i>Dermacentor reticulatus</i> (?) <i>Ixodes ricinus</i>	Europe; Asia
Flinders Island spotted fever	<i>Rickettsia honei</i>	Febrile rash illness; spotted fever phenotype	<i>Bothriocroton hydrosauri</i>	Australia
Japanese spotted fever	<i>Rickettsia japonica</i> <i>Rickettsia japonica</i>	Febrile rash illness; eschar; spotted fever phenotype	<i>Dermacentor taiwanensis</i> <i>Dermacentor taiwanensis</i>	Asia Asia
<i>Rickettsia massiliae</i> infection	<i>Rickettsia massiliae</i>	Mediterranean spotted fever-like illness	<i>Rhipicephalus</i> ticks (regional variation); <i>A. sylvaticum</i>	Europe
<i>Rickettsia monacensis</i> infection	<i>Rickettsia monacensis</i>	Fever; rash; spotted fever phenotype	<i>Ixodid</i> ticks; <i>A. dissimile</i>	Europe
Pacific Coast tick fever	<i>Rickettsia philipii</i>	Eschar-associated febrile illness; rash may occur	<i>Dermacentor occidentalis</i>	North America
Siberian tick typhus / lymphangitis-associated rickettsiosis	<i>Rickettsia sibirica</i> subsp. <i>sibirica</i> and subsp. <i>mongolitimonae</i>	Febrile rash illness; eschar; lymphangitis in some cases	<i>Dermacentor nuttalli</i> ; <i>Dermacentor marginatus</i>	Asia; Europe
TIBOLA / DEBONEL / SENLAT	<i>Rickettsia slovac</i> or <i>Rickettsia raoultii</i>	Scalp eschar; neck lymphadenopathy; localized skin and lymph node syndrome	<i>Dermacentor marginatus</i> ; other <i>Dermacentor</i> spp.; <i>Amblyomma testudinarium</i> reported for <i>R. raoultii</i>	Europe; Asia
<i>Rickettsia tamurae</i> infection	<i>Rickettsia tamurae</i>	Local skin inflammation; regional inflammation at bite site	<i>Amblyomma testudinarium</i>	Asia
Babesiosis	<i>Babesia microti</i> , <i>B. divergens</i> , <i>B. duncani</i> , <i>B. venatorum</i>	Often asymptomatic; hemolytic anemia; systemic infection; severe disease in asplenic or ICH	<i>Ixodes scapularis</i> ; <i>Ixodes ricinus</i> ; <i>Ixodes persulcatus</i>	North America; Europe; Asia

References

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