

***Amblyomma* (includes most *Aponomma*)**  
(arachnid: tick)

## Overview

Arthropods are coelomate metameric invertebrate animals with a chitinous exoskeleton and jointed limbs. They undergo protostomial embryonic development and grow by cuticular moulting (ecdysis). Three main subphyla are recognized: Chelicerata, Crustacea and Hexapoda. Arachnids have chelicerate mouthparts, two tagmata (cephalothorax and abdomen), four pairs of legs and slit sensilla, but no antennae or wings. All species exhibit incomplete metamorphosis whereby eggs hatch larvae which moult to nymphs and then adults. Acarines comprise the ticks and mites which have sac-like bodies with inconspicuous segmentation and their mouthparts are confined to an anterior capitulum. Four major groups are recognized primarily on the location of their respiratory stigmata: ixodid ticks (Metastigmata), gamesid mites (Mesostigmata), trombidiform mites (Prostigmata) and sarcoptiform mites (Astigmata). Ticks have respiratory stigmata posterior to their legs. They are obligate blood-feeding ectoparasites on vertebrate hosts and their hypostomes are toothed and exposed. Two families are recognized: Argasidae and Ixodidae, known as soft and hard ticks, respectively. Ixodids have hard bodies with a dorsal scutum (shield-shaped plate) and the capitulum is not covered by the body. Larvae, nymphs and adults attach and feed on host blood, their life-cycles involving one, two or three hosts depending on whether moulting occurs on or off the host. Some 650 species of hard ticks infest mammals, birds and reptiles. Infestations by *Amblyomma* (incl. *Aponomma*) spp. occur as three-host ticks on mammals and reptiles, sometimes causing skin lesions and transmitting a range of microbial diseases.

## Classification:

Domain: Eukaryota (membrane-bound nucleus)  
Supergroup: Amorphea (unikonts with single flagellum, or nonflagellated amoebae)  
Kingdom: Metazoa (multicellular eukaryotes, heterotrophs, notably animals)  
Group: Protostomia (triploblastic, spiral cleavage)  
Subgroup: Ecdysozoa (cuticle moulted = ecdysis)  
Phylum: Arthropoda (chitinous exoskeleton, segmented body, jointed limbs, haemocoel)  
Subphylum: Chelicerata (chelicerate mouthparts, two tagmata, no antennae)  
Class: Arachnida (spiders & allies, four pairs of legs, slit sensilla, incomplete metamorphosis)  
Subclass: Acari (Acarina) (ticks and mites, segmentation inconspicuous, sac-like body, mouthparts on capitulum)  
Superorder: Parasitiformes (ticks and some mites, with posterior stigmata)  
Order: Ixodida (Metastigmata) (ticks, macroscopic, stigmata posterior to legs, hypostome toothed, ectoparasites)  
Family: Ixodidae (hard ticks, with dorsal scutum, capitulum projects anteriorly, attach and feed on 1, 2 or 3 hosts)  
Genus: *Amblyomma* (includes most *Aponomma*) (parasitic on skin of mammals/reptiles)  
Species: various species cause skin lesions in mammals

**Parasite biodiversity and host range:** Most Metazoa are multicellular triploblastic animals with differentiated tissues, many being bilaterally symmetrical with a body cavity. Most invertebrate animals are protostomes as their embryonic development involves spiral determinate cleavage. Those that moult their external cuticles during their life-cycles (process known as ecdysis) are grouped together in the unique clade Ecdysozoa, including the nematodes (roundworms), onychophorans (velvet worms), tardigrades (water bears) and arthropods (myriapods, chelicerates, crustaceans and hexapods). Arthropods have small segmented bodies encased in chitinous exoskeletons with articulated limbs. Most species are free-living in terrestrial and aquatic habitats, although a small range are ectoparasitic on other animals, some feeding on the blood or skin of vertebrates. Five subphyla are recognized: Chelicerata, Crustacea, Hexapoda, Myriapoda and Trilobita. The chelicerates typically have appendages (cheliceræ) in the form of pincers or fangs anterior to the mouthparts, 2 body parts (cephalothorax and abdomen), but no antennae or wings. Three classes are recognized: Arachnida (spiders and allies), Merostomata (horseshoe crabs) and Pycnogonida (sea spiders). Arachnids have 8 legs, slit sensilla and life-cycles involving incomplete metamorphosis whereby larvae and nymphs resemble adults. They are classified in 4 orders: Acari (acarines), Araneae (spiders), Opiliones (harvestmen) and Scorpiones (scorpions). The Acari comprises the ticks and mites which have sac-like bodies and mouthparts confined to an anterior capitulum. Four major groups are recognized primarily on the location of their respiratory stigmata (called spiracles in insects): ixodid ticks (posterior Metastigmata), gamesid mites (middle Mesostigmata), trombidiform mites (anterior Prostigmata) and sarcoptiform mites (without stigmata = Astigmata).

Major parasitic families	Biodiversity	Hosts	Parasitic stages	Pathogenesis	Disease transmission
Superorder: Parasitiformes (ticks and some mites, with posterior stigmata)					
Order: Ixodida [Metastigmata] (ticks, macroscopic, stigmata posterior to legs) [3 families]					
Argasidae (soft ticks)	5 genera, 193 species	birds, mammals	larvae, nymphs, adults	blood-sucking	viral, bacterial
Ixodidae (hard ticks)	14 genera, 705 species	birds, mammals	larvae, nymphs, adults	blood-sucking, paralysis	viral, bacterial, protozoal
Order: Mesostigmata [Gamasida] (gamesid mites, stigmata between 2 <sup>nd</sup> & 4 <sup>th</sup> legs) [100 families, 662 genera, 5,360 species]					
Macronyssidae (sucking mites)	26 genera, 127 species	birds, reptiles, mammals	nymphs, adults	blood-sucking	bacterial
Dermanyssidae (sucking mites)	5 genera, 37 species	birds, mammals	nymphs, adults	blood-sucking	viral, bacterial
Halarachnidae (lung/ear mites)	7 genera, 10 species	mammals	nymphs, adults	mucosal erosion	-
Raillietidae (ear mites)	1 genus, 7 species	mammals	nymphs, adults	ear wax	-
Rhinonyssidae (nasal mites)	30 genera, 160 species	birds	nymphs, adults	inflammation	-
Varroidae (bee mites)	1 genus, 5 species	bees	nymphs, adults	haemolymph-feeding	viral
Superorder: Acariformes (diverse group of mites, without posterior stigmata) [351 families, 32,000 species]					
Order: Prostigmata [Trombidiformes, Actinedida] (sucking mites, stigmata on capitulum) [34 superfamilies]					
Demodecidae (follicle mites)	7 genera, 65 species	mammals	larvae, nymphs, adults	inflammation	-
Cheyletidae (fur mites)	80 genera, 500 species	mammals (dogs, cats, rabbits), birds	larvae, nymphs, adults	pruritus	-
Myobiidae (fur mites)	46 genera, 185 species	mammals (rodents, bats, marsupials)	larvae, nymphs, adults	mange	-
Psorergatidae (itch mites)	3 genera, 77 species	mammals (rodents, artiodactyls)	larvae, nymphs, adults	mange	-
Trombiculidae (chigger mites)	71 genera, 3,000 species	mammals, birds	larvae	skin-feeding	bacterial
Order: Astigmata [Sarcoptiformes, Acaridida] (fur/feather/itch/dust mites, lacking stigmata) [230 families, 15,000 species]					
Sarcoptidae (itch mites)	3 genera, 42 spp./ssp.	mammals	larvae, nymphs, adults	scabies, mange	-
Psoroptidae (scab mites)	20 genera, species	mammals (carnivores, ungulates)	larvae, nymphs, adults	mange	-
Listrophoridae (fur mites)	20 genera, 170 species	mammals (esp. rodents)	larvae, nymphs, adults	mange	-
Myocoptidae (fur mites)	10 genera, 70 species	mammals (esp. rodents)	larvae, nymphs, adults	myocoptic mange	-
Cytoditidae (airsac/nasal mites)	2 genera, 12 species	birds	larvae, nymphs, adults	respiratory signs	-
Knemidokoptidae (burrowing mites)	7 genera, 16 species	birds	larvae, nymphs, adults	scaly face, scaly leg	-
Laminosioptidae (quill/skin mites)	8 genera, 25 species	birds	larvae, nymphs, adults	flesh/skin lesions	-

The superorder Parasitiformes comprises acarines with posterior respiratory stigmata and includes two major orders: the ixodid ticks (order Metastigmata) with stigmata located posterior to the legs (behind coxae III or IV); and the gamesid mites (order Mesostigmata) where they are located between the legs, sometimes associated with sinuous processes (peritremes). Ticks are further characterized by macroscopic bodies with an exposed ventral hypostome (toothed with backwardly-directed barbs), chelicerae with only 2 joints, long legs with free articulated coxae (not fused to the body wall) and a complex sensory pit (Haller's organ) on tarsus I. They are obligate blood-sucking parasites which feed on terrestrial vertebrates (mammals, birds, reptiles and some amphibians) as larvae, nymphs and adults with 1-, 2- or 3-host life-cycles. Almost 1,000 species have been classified within some 20 genera from numerous wild and domesticated animals around the world. Two main families are recognized: the Argasidae containing ~200 species of 'soft' ticks with flexible leathery cuticles, ventral capitula, short feeding times (< 1 hour) and long life-spans (up to 20 years); and the Ixodidae containing ~800 species of 'hard' ticks with rigid dorsal scutal plates, anterior capitula, long feeding times (hours to days) and shorter life-span (2-6 years). Basic characteristics of representative genera considered in this resource are tabulated below.

Genus	Capitulum				Idiosoma				Usual no. of hosts
	location	basis capitulum	mouth-parts	palps	integument	festoons	eyes	male ventral plates	
<b>Argasidae</b> (soft ticks with leathery cuticle, stigmata between coxae III)									
<i>Argas</i>	ventral	triangular	short	leg-like	stippled with lateral suture	absent	absent	absent	>3
<i>Ornithodoros</i>	ventral	rectangular	short	leg-like	mamillated	absent	usually absent	absent	>3
<i>Otobius</i>	ventral	rectangular	short	leg-like	spinose (nymphs), granulated (adult)	absent	absent	absent	1
<b>Ixodidae</b> (hard ticks with sclerotized dorsal plate (scutum), stigmata behind coxae IV)									
Prostriata (anal groove anterior)									
<i>Ixodes</i>	anterior	triangular	long	long	inornate	absent	absent	present	3
Metastriata (anal groove posterior)									
<i>Amblyomma</i> ( <i>Aponomma</i> )	anterior	rectangular	long	long	ornate	present	present	indistinct	3
<i>Rhipicephalus</i> ( <i>Boophilus</i> )	anterior	hexagonal	short	medium	some ornate	present	present	present	3
<i>Dermacentor</i>	anterior	rectangular	short	medium	often ornate	present	present	absent	3
<i>Haemaphysalis</i>	anterior	rectangular	short	short	inornate	present	absent	absent	3
<i>Hyalomma</i>	anterior	rectangular	long	long	inornate	present	present	present	2
<i>Bothriocroton</i>	anterior	pentagonal	long	long	ornate	present	absent	absent	3

The family Ixodidae contains 6 subfamilies (Amblyomminae, Bothriocrotoninae, Haemaphysalinae, Hyalomminae, Ixodinae and Rhipicephalinae) which vary in their morphology, biology, host ranges and specificity. [Note that some taxonomic authorities have merged the subfamilies Rhipicephalinae and Hyalomminae, while others have subsequently assigned the subfamilies Amblyomminae and Rhipicephalinae into the new family Amblyommidae, predominantly on the basis of molecular phylogenetic studies]. Hard ticks had previously been divided into 2 groups: the Prostriata (with the anal groove anterior to the anus) and the Metastriata (anal groove absent or posterior to anus). The Prostriata essentially comprises the subfamily Ixodinae with over 230 species assigned to the single extant genus *Ixodes* [plus one fossil genus (*Cornupalpatum*)], while the Metastriata contains members of the remaining subfamilies with over 600 species classified into 18 genera. The subfamily Amblyomminae comprises metastriate ornate ticks with eyes and festoons and males possess indistinct ventral plaques but lack adanal plates. It is a monotypic taxon and contains the single genus *Amblyomma*, which also includes several members (~30) of the defunct genus *Aponomma* (whereas other Australian *Aponomma* spp. have been split off into the new genus *Bothriocroton*). The genus is represented by large ticks with long mouthparts that inflict a painful bite, highly ornate bodies with iridescent patterns and long banded legs. Most are presumed to have 3-host life-cycles and over 130 species have been described in 13 subgenera: namely, *A. (Adenopleura)*, *A. (Amblyomma)*, *A. (Amerindia)*, *A. (Anastosiella)*, *A. (Aponomma)*, *A. (Brasiliana)*, *A. (Cernyomma)*, *A. (Fifippovania)*, *A. (Keiransiella)*, *A. (Koloninum)*, *A. (Macintosheilla)*, *A. (Theileriana)*, and *A. (Walkeriana)*. Most are parasites of reptiles, but several species feed on domestic and wild mammals and marsupials and are important parasites of livestock causing dermal lesions, anaemia, toxicoses, paralysis and transmitting infectious viral, bacterial and protozoal diseases.

<i>Amblyomma</i> species	Hosts	Clinical signs	Distribution
<i>A. acutangulatum</i>	Artiodactyla: bovid (cattle), suid (pig); Sauria: varanid (monitor)		Fiji
<i>A. agamum</i>	Sauria: lacertid (ocellated lizard, European green lizard); Serpentes: boid (boa constrictor), colubrid (grass snake, Aesculapian snake, Wagler's snake), viperid (jararacussu); Anura: alytid (painted frog), bufonid (Argentine toad, European green toad), ranid (edible frog); Testudines: emydid (European pond turtle), testudinid (Greek tortoise)		South America
<i>A. (Cernyomma) albolimbatum</i>	Sauria: scincid (sleepy lizard, Centralian blue-tongued skink, western blue-tongued lizard, bull skink, Stoke's skink,), varanid (bob-tailed goanna, lace monitor); Serpentes: elapid (eastern brown snake, dugite, gwardar, tiger snake), pythonid (northwestern carpet python); Testudines: chelid (western swamp turtle)		Australia
<i>A. albopictum</i> (syn. <i>A. haitianum</i> )	Sauria: iguanid (Cuban rock iguana, Andros Island iguana, Cayman Island brown iguana, blue iguana, rhinoceros iguana, Turks and Caicos rock iguana), leiocephalid (northern curly-tailed lizard);		Americas

	Serpentes: boid (Cuban boa); Rodentia: hystricid (tricoloured tree porcupine)		
<i>A. americanum</i> (syn. <i>A. foreli</i> , <i>Ixodes nigua</i> , <i>unipunctata</i> ) (lone star tick)	Artiodactyla: bovid (cattle, sheep, goat, blackbuck), cervid (white-tailed deer, sambar deer), suid (pig), tayassuid (collared peccary); Perissodactyla: equid (horse, mule); Didelphimorphia: didelphid (Florida opossum, Virginia opossum); Lagomorpha: leporid (eastern cottontail, rabbit, marsh rabbit, swamp rabbit, black-tailed jackrabbit, hare); Rodentia: cricetid (hispid cotton rat, marsh rice rat), geomyid (southern pocket gopher), murid (black rat, brown rat, house mouse, white-footed mouse, Florida mouse, fulvous harvest mouse, eastern woodrat), sciurid (red squirrel, pine squirrel, eastern gray squirrel, rock squirrel, fox squirrel, Mexican ground squirrel, yellow-bellied marmot, groundhog, southeastern pocket gopher, Baird's pocket gopher); Cingulata: dasypodid (nine-banded armadillo); Carnivora: canid (dog, wolf, red wolf, coyote, red fox, gray fox), felid (cat, bobcat, Florida bobcat, ocelot, mountain lion, Florida panther), mephitid (striped skunk, Florida striped skunk, eastern spotted skunk, western hog-nosed skunk), mustelid (North American river otter, American badger, Florida mink), procyonid (raccoon, ringtail), ursid (American black bear); Primates: hominid (human); Accipitriformes: accipitrid (sparrow hawk, Swainson's hawk), cathartid (turkey vulture); Caprimulgiformes: caprimulgid (common poorwill, Chuck-Will's-widow); Ciconiiformes: ardeid (little green heron); Columbiformes: columbid (common ground dove, mourning dove); Cuculiformes: cuculid (yellow-bellied cuckoo, greater roadrunner); Falconiformes: falconid (American kestrel); Galliformes: odontophorid (northern bobwhite quail), phasianid (chicken, turkey); Gruiformes: rallid (sora), Passeriformes: cardinalid (northern cardinal, summer tanager, blue grosbeak, painted bunting), corvid (American crow), fringillid (house finch, lesser goldfinch), icterid (eastern meadowlark), laniid (loggerhead shrike), mimid (brown thrasher, northern mockingbird), parid (black-crested titmouse), parulid (ovenbird, black-throated blue warbler, Florida yellowthroat), passerellid (field sparrow, lark sparrow, rufous-crowned sparrow, eastern towhee), troglodytid (canyon wren, Bewick's wren, Carolina wren), turdid (woodthrush), tyrannid (least flycatcher, scissor-tailed flycatcher, great crested flycatcher, western wood-pewee); Strigiformes: strigid (owl) (3-host cycle)	trauma, irritation, toxicosis, paralysis, 'red-meat' allergy (vector for rickettsial spotted fever, tularemia, Lyme disease, Q fever, ehrlichiosis, cytauxzoonosis)	North America
<i>A. anicornuta</i>	Artiodactyla: cervid (Philippine deer), suid (Philippine warty pig)		Philippines
<i>A. annandalei</i>	Testudines: geomydid (spiny turtle)		India
<i>A. antillorum</i>	Sauria: iguanid (lesser Antillean iguana, Anegada rock iguana), teiid (Dominican ground lizard); Serpentes: boid (Dominican boa), colubrid (Dominican racer)		Central America
<i>A. argentinae</i> (syn. <i>A. diemeniae</i> )	Anura: bufonid (cane toad); Sauria: teiid (four-toed tegu), tropidurid (spiny larva lizard, Etheridge's lava lizard); Serpentes: boid (boa, rainbow boa, yellow anaconda), viperid (jararaca pintada, Cascabel rattlesnake); Testudines: chelid (Hilaire's toadhead turtle), testudinid (Chaco tortoise); Passeriformes: turdid (Austral thrush)		South America
<i>A. arianae</i>	Serpentes: colubrid (Puerto Rican racer)		Central America
<i>A. astrion</i>	Artiodactyla: bovid (cattle, buffalo, sheep, goat), suid (pig, warthog); Proboscidea: elephantid (elephant); Afrosoricida: tenrecid (tenrec); Carnivora: canid (dog); Galliformes: phasianid (fowl)	(vector for ehrlichiosis (heartwater / cowdriosis))	Africa
<i>A. atrogenatum</i>	Testudines: testudinid (Indian star tortoise)		India
<i>A. aureolatum</i> (syn. <i>A. oblongum</i> , <i>striatum</i> )	Artiodactyla: bovid (cattle, goat), cervid (brown brocket, marsh deer), suid (pig); Perissodactyla: equid (horse); Didelphimorphia: didelphid (white-eared opossum, big-eared opossum, big lutrine opossum); Pilosa: bradypodid (three-toed sloth, brown-throated sloth), myrmecophagid (southern tamandua); Rodentia: caviid (capybara), ctenomyid (tuco-tuco), echimyid (Fischer's guara), crethizontid (Bahia porcupine), sciurid (Brazilian squirrel);	trauma, irritation (vector for rickettsiosis)	South America

	<p>Carnivora: canid (dog, maned wolf, gray fox, crab-eating fox, Azara fox, Pampas fox), felid (cat, Geoffroy's cat, margay, ocelot, jaguarundi, oncilla, cougar, southern tiger cat), mustelid (lesser grison, greater grison), procyonid (South American coati, crab-eating raccoon); Primates: atelid (brown howler), hominid (human);</p> <p>Accipitriformes: accipitrid (roadside hawk), Passeriformes: conopophagid (rufous gnateater), emberizid (uniform finch, buff-throated warbling finch, green-winged saltator, rufous-collared sparrow), furnariid (white-eyed foliage-gleaner, olive spinetail, pallid spinetail, grey-bellied spinetail, rufous-capped spinetail, rufous hornero), parulid (white-rimmed warbler), passerellid (half-collared sparrow, rufous-collared sparrow), thamnophilid (plain antvireo, squamate antbird, white-shouldered fire-eye, variable antshrike, rufous-capped antshrike), thraupid (uniform finch, buff-throated warbling-finch, black-and-rufous warbling-finch, ruby-crowned tanager, black-goggled tanager, green-winged saltator, double-collared seedeater), troglodytid (house wren), turdid (white-necked thrush, creamy-bellied thrush, rufous-bellied thrush, pale-breasted thrush), tyrannid (white-throated spadebill); Strigiformes: strigid (barn owl)</p> <p>(3-host cycle)</p>		
<i>A. aureum</i>	Perissodactyla: rhinocerotid (black rhinoceros)		Africa
<i>A. auricularium</i> (syn. <i>A. beaurepairei</i> , <i>curruca</i> )	<p>Artiodactyla: suid (pig), tayassuid (collared peccary);</p> <p>Perissodactyla: equid (horse); Cingulata: chlamyphorid (pichi, greater naked-tailed armadillo, northern naked-tailed armadillo, screaming hairy-tailed armadillo, big hairy armadillo, six-banded armadillo, southern three-banded armadillo, Brazilian three-banded armadillo), dasypodid (nine-banded armadillo, seven-banded armadillo, southern six-banded armadillo, greater long-nosed armadillo, southern long-nosed armadillo, Llanos long-nosed armadillo, dwarf armadillo); Didelphimorphia: didelphid (common opossum, white-eared opossum, gray short-tailed opossum, gray four-eyed opossum, agile gracile opossum); Pilosa: myrmecophagid (giant anteater, northern tamandua, southern tamandua); Rodentia: caviid (capybara, Spix's yellow-toothed cavy, Chacoan mara), chinchillid (plains viscacha), cricetid (hispid cotton rat, spy hociudo), dasyproctid (Azara's agouti), echimiyid (common punare, highlands punare, Sao Lourenco punare, broad-headed spiny rat, Tome's spiny rat, armored rat), erethizontid (Mexican hairy dwarf porcupine); Carnivora: canid (dog, maned wolf, gray fox, crab-eating fox, hoary fox), felid (cat), mephitid (striped hog-nosed skunk), mustelid (greater grison, lesser grison), procyonid (raccoon, white-nosed coati, South American coati); Passeriformes: cardinalid (green-winged saltator, ultramarine grosbeak), furnariid (pale-legged hornero, great xenops), passerellid (rufous-collared sparrow), piprid (pale-bellied tyrant-manakin), thamnophilid (bicolored antbird, stripe-backed antbird, silvery-checked antshrike, Caatinga antshrike), thraupid (grey pileated finch, green-winged saltator), troglodytid (tropical wren, long-billed wren), turdid (creamy-bellied thrush, clay-coloured thrush, rufous-bellied thrush), tyrannid (fuscous flycatcher, lesser wagtail-tyrant), vireonid (rufous-browed peppershrike); Strigiformes: strigid (burrowing owl); Sauria: iguanid (unspecified iguana)</p>		Americas
<i>A. (Adenopleura) australiense</i>	Monotremata: tachyglossid (long-beaked echidna, short-beaked echidna); Sauria: varanid (unspecified monitor); Serpentes (unspecified snake)		Australia
<i>A. avecolens</i>	Passeriformes: furnariid (wedge-billed woodcreeper), vireonid (white-eyed vireo)		South America
<i>A. babirusae</i>	Artiodactyla: bovid (cattle, dwarf buffalo, water buffalo), cervid (Javan rusa), suid (pig, babirusa); Perissodactyla: equid (horse); Rodentia: murid (Pacific rat, Hoffmann's Sulawesi rat); Carnivora: viverrid (Malayan civet); Primates: hominid (human)		Indonesia
<i>A. badium</i>	Pholidota: manid (Sunda pangolin)		Indonesia

<i>A. barbaricum</i>	Artiodactyla: bovid (buffalo)		Africa
<i>A. barbouri</i> (syn. <i>Aponomma</i> )	Serpentes: pythonid (reticulated python)		Indonesia
<i>A. bengalense</i>	Serpentes: pythonid (python)		India
<i>A. bibroni</i> (syn. <i>A. adspersum</i> , <i>deminutivum</i> , <i>irroratum</i> )	Sauria: iguanid (rhinoceros iguana); Serpentes: boid (boa), colubrid (yellow rat snake, banded cat-eyed snake, Wagler's snake), viperid (jararacussu, Wagler's pit viper); Anura (unspecified frog)		South America
<i>A. birmittum</i>	fossil (amber)		Myanmar
<i>A. boeroi</i>	Artiodactyla: tayassuid (Chacoan peccary)		South America
<i>A. boneti</i>	Sauria: iguanid (iguana)		North America
<i>A. boulengeri</i>	Sauria: iguanid (marine iguana, Galapagos land iguana), tropidurid (Galapagos lava lizard, Hood lava lizard)		Galapagos Islands
<i>A. bouthieri</i>	Carnivora: canid (dog)		Africa
<i>A. brasiliense</i> (syn. <i>A. superbrasiliense</i> )	Artiodactyla: cervid (pampas deer, red brocket, grey brocket), suid (pig), tayassuid (collared peccary, white-lipped peccary); Perissodactyla: tapirid (South American tapir); Rodentia: caviid (capybara), cuniculid (lowland paca), dasyproctid (Azara's agouti); Pilosa: myrmecophagid (giant anteater, southern tamandua); Didelphimorphia: didelphid (big-eared opossum); Carnivora: canid (dog, maned wolf, gray fox, crab-eating fox), felid (cougar, jaguar), procyonid (South American coati); Primates: hominid (human); Accipitriformes: accipitrid (black-and-white hawk-eagle); Coraciiformes: momotid (rufous-capped motmot), Galliformes: cracid (dusky-legged guan, rusty-margined guan); Gruiformes: rallid (slaty-breasted woodrail); Passeriformes: passerellid (rufous-collared sparrow), piprid (blue manakin), thamnophilid (white-shouldered fire-eye), thraupid (ruby-crowned tanager, black-goggled tanager)		South America
<i>A. (Cernyomma) breviscutatum</i> (syn. <i>A. cyprium</i> )	Artiodactyla: bovid (cattle, banteng, buffalo, water buffalo), cervid (Javan rusa), suid (pig, New Guinea pig, Celebes warty pig); Perissodactyla: equid (horse); Diprotodontia: phalangerid (northern common cuscus); Scandentia: tupaiid (Mindanoi treeshrew); Rodentia: murid (black rat, Polynesian rat); Carnivora: canid (dog); Primates: hominid (human); Columbiformes: columbid (common emerald dove); Coraciiformes: alcedinid (collared kingfisher); Galliformes: phasianid (red junglefowl); Trogoniformes: trogonid (Philippine trogon); Testudines: cheloniid (unspecified tortoise), geoemydid (black-breasted leaf turtle, keeled box turtle)		Australia, New Guinea
<i>A. brimonto</i>	Testudines: testudinid (yellow-footed tortoise)		Africa
<i>A. caelaturum</i>	Testudines: geoemydid (spiny turtle)		Indonesia
<i>A. cajennense</i> (syn. <i>I. cayennense</i> , <i>crenatus</i> , <i>herreriae</i> ) (Cayenne tick)	Artiodactyla: bovid (cattle, buffalo, water buffalo, sheep, goat), cervid (white-tailed deer, rainforest white-tailed deer, Apará brocket deer, red brocket, brown brocket), suid (pig), tayassuid (collared peccary, white-lipped peccary); Perissodactyla: equid (horse, donkey, mule), tapirid (Baird's tapir, South American tapir); Pilosa: bradypodid (pale-throated sloth), myrmecophagid (giant anteater, southern tamandua); Cingulata: chlamyphorid (six-banded armadillo), dasypodid (nine-banded armadillo); Didelphimorphia: didelphid (common opossum, white-eared opossum, Guianan white-eared opossum, bare-tailed woolly opossum, brown four-eyed opossum); Lagomorpha: leporid (rabbit, eastern cottontail); Rodentia: caviid (guinea pig, capybara), cricetid (long-whiskered rice rat), cuniculid (lowland paca), dasyproctid (agouti, orange agouti, Azara's agouti), echimyid (armored rat, Tome's spiny rat), murid (unspecified rat), sciurid (Mexican gray squirrel); Carnivora: canid (dog, coyote, gray fox, Azara fox, crab-eating fox), felid (cat, ocelot, puma, jaguar, Mexican lion), mustelid (giant otter), procyonid (raccoon, crab-eating raccoon, South American coati); Chiroptera: phyllostomid (Jamaican fruit bat, Heller's broad-nosed bat); Primates: atelid (red-faced spider monkey, Columbian red howler), hominid (human); Accipitriformes: accipitrid (roadside hawk, harpy eagle); Apodiformes: trochilid (Planalto hermit, white-	trauma, irritation, fever (vector for rickettsial spotted fever, leptospirosis)	Americas

	<p>vented violetear, glittering-bellied emerald, sapphire-spangled emerald, fork-tailed woodnymph); Cariamiformes: cariamid (red-legged seriema); Ciconiiformes: ardeid (heron); Columbiformes: columbid (grey-fronted dove); Cuculiformes: cuculid (great lizard cuckoo); Falconiformes: falconid (falcon); Galliformes: cracid (great curassow, bare-faced curassow, crested guan, rufous-vented chachalaca), odontophorid (northern bobwhite quail), phasianid (chicken, turkey); Passeriformes: dendrocolatid (olivaceous woodcreeper, lesser woodcreeper), emberizid (masked yellowthroat), formicariid (variable antshrike, rufous-winged antshrike, plain antvireo, black-capped antwren, white-shouldered fire-eye, rufous gnat-eater), furnariid (rufous-capped spintail, sooty-fronted spintail, buff-browed foliage-gleaner, white-eyed foliage-gleaner, sharp-tailed streamcreeper), muscicapid (sooty thrush, rufous-bellied thrush, creamy-bellied thrush, pale-breasted thrush, white-collared blackbird), parulid (flavescent warbler, white-bellied warbler), passerellid (rufous-collared sparrow, saffron-billed sparrow), piprid (blue manakin, blue-backed manakin, pin-tailed manakin, greenish manakin), thraupid (bananaquit, green-winged saltator, cinnamon tanager, white-banded tanager, ruby-crowned tanager, black-goggled tanager, red-necked tanager, burnished buff-tanager, blue dacnis, uniform finch, stripe-tailed yellow-finch, serra finch, blue-black grassquit, double-collared seedeater), troglodytid (house wren), turdid (pale-breasted thrush), tyrannid (olivaceous elaenia, plain-crested elaenia, lesser elaenia, highland elaenia, grey-hooded flycatcher, sepia-capped flycatcher, mottle-cheeked tyrannulet, pearly-vented tody-tyrant, yellow-olive flatbill, white-throated spadebill, bran-coloured flycatcher, Euler's flycatcher, fuscous flycatcher, short-crested flycatcher), vireonid (rufous-browed peppershrike, rufous-crowned greenlet, red-eyed vireo); Pelecaniformes: ardeid (unspecified heron); Piciformes: picid (white-barred piculet), ramphastid (toco toucan); Strigiformes: strigid (striped owl); Struthioniformes: struthionid (ostrich); Tinamiformes: tinamid (red-winged tinamou); Sauria: iguanid (green iguana, black spiny-tailed iguana), teiid (whiptail); Serpentes: colubrid (indigo snake), viperid (rattlesnake); Testudines: emydid (common box turtle, pond slider), geoemydid (furrowed wood turtle), pelomedusid (side-necked turtle), podocnemid (yellow-spotted river turtle), testudinid (yellow-footed tortoise); Crocodylia: crocodylid (American crocodile); Anura: bufonid (cane toad) (3-host cycle)</p>		
<i>A. (Cernyomma) calabyi</i>	Sauria: varanid (perentie, sand goanna)		Australia
<i>A. calcaratum</i> (syn. <i>A. leucozomum</i> )	<p>Artiodactyla: cervid (red brocket); Perissodactyla: tapirid (South American tapir); Pilosa: choloepodid (Hoffman's two-toed sloth), cyclopedid (silky anteater), myrmecophagid (giant anteater, lesser anteater, two-toed anteater, southern tamandua, northern tamandua, long-tailed tamandua); Carnivora: canid (dog), procyonid (crab-eating raccoon); Chiroptera: phyllostomid (shadowy broad-nosed bat, long-legged bat); Primates: hominid (human); Accipitriformes: accipitrid (roadside hawk); Caprimulgiformes: trochilid (scale-throated hermit, long-tailed hermit); Coraciiformes: momotid (rufous motmot, rufous-capped motmot); Passeriformes: cardinalid (green-winged saltator, blue black grosbeak), conopophagid (rufous gnateater, black-cheeked gnateater), emberizid (pectoral sparrow, saffron-billed sparrow, red-pileated finch, thick-billed seed finch), furnariid (ochre-crested foliage-gleaner, white-collared foliage-gleaner, white-eyed foliage-gleaner, buff-browed foliage-gleaner, white-throated woodcreeper, wedge-billed woodcreeper, red-billed woodcreeper, ocellated woodcreeper, Brigida's woodcreeper, Planalto woodcreeper, rufous hornero), mimid (chalk-browed mockingbird), parulid (masked yellowthroat, golden-crowned</p>		South America

	warbler), passerellid (saffron-billed sparrow, pectoral sparrow), piprid (red-capped manakin, band-tailed manakin, blue manakin, blue-crowned manakin, blue-tailed manakin, white-crowned manakin, white-bearded manakin), thamnophilid (common scale-backed antbird, spot-backed antbird, dusky-tailed antbird, white-cheeked antbird, spot-backed antbird, bicolored antbird, white-shouldered fire-eye, black-crowned antshrike, white-shouldered antshrike, fasciated antshrike, tufted antshrike, variable antshrike, Planalto slaty antshrike, streak-capped antwren, plain antvireo), thraupid (chestnut-headed tanager, ruby-crowned tanager, silver-beaked tanager, black-goggled tanager, burnished-buff tanager, palm tanager, Sayaca tanager, red pileated finch, black-and-rufous warbling finch, thick-billed seed-finch, green-winged saltator, buffy-fronted seedeater, sooty grassquit), tityrid (greenish schiffornis), troglodytid (house wren, Cabani's wren, southern nightingale-wren), turdid (white-necked thrush, rufous-bellied thrush, creamy-bellied thrush, pale-breasted thrush, clay-coloured thrush, eastern slaty thrush, wood thrush, Swainson's thrush), tyrannid (fuscous flycatcher, brown-crested flycatcher, short-crested flycatcher, rusty-fronted tody-flycatcher, Euler's flycatcher, ochre-bellied flycatcher, gray-hooded flycatcher, sepia-capped flycatcher, ochre-faced tody-flycatcher, pearly-vented tody-tyrant, white-throated spadebill, large-headed flatbill, gray-hooded attila), vireonid (rufous-browed peppershrike, rufous-crowned greenlet); Piciformes: bucconid (white-whiskered puffbird); Strigiformes: strigid (spectacled owl)		
<i>A. calcaris</i>	Primates: hominid (human)		China
<i>A. castanedai</i>	Sauria: iguanid (iguana)		Mexico
<i>A. chabaudi</i>	Testudines: testudinid (spider tortoise, radiated tortoise, serrated hinge-back tortoise); Lagomorpha: leporid (rabbit)		Madagascar
<i>A. clypeolatum</i>	Serpentes: boid (boa); Testudines: testudinid (Indian star tortoise, serrated hinge-back tortoise)		Asia
<i>A. coelebs</i> (syn. <i>A. bispinosum</i> )	Artiodactyla: bovid (cattle, cervid (red brocket), suid (pig), tayassuid (white-lipped peccary, collared peccary); Perissodactyla: equid (horse), tapirid (South American tapir, Baird's tapir); Cingulata: dasypodid (nine-banded armadillo); Didelphimorphia: didelphid (common opossum, white-eared opossum, big-eared opossum, big lutrine opossum, brown four-eyed opossum); Lagomorpha: leporid (common tapeti); Pilosa: megalonychid (sloth), myrmecophagid (anteater); Rodentia: caviid (capybara), cricetid (common bristly mouse, Cerrado climbing mouse), cuniculid (lowland paca), dasyproctid (Azara's agouti), echimyid (common punare); Carnivora: canid (crab-eating fox), felid (cougar, jaguar, jaguarundi), mustelid (tayra), procyonid (white-nosed coati, South American coati); Primates: cebid (large-headed capuchin), hominid (human); Accipitriformes: accipitrid (gray-lined hawk, white-necked hawk); Columbiformes: columbid (white-tipped dove); Coraciiformes: momotid (rufous-capped motmot, Amazonian motmot); Passeriformes: conopophagid (rufous gnateater), mitrospingid (dusky-faced tanager), piprid (red-capped manakin, long-tailed manakin), thamnophilid (black-spotted bare-eye, East Amazon fire-eye, Planalto slaty antshrike), turdid (creamy-bellied thrush, rufous-bellied thrush, white-necked thrush, pale-breasted thrush); Piciformes: bucconid (white-whiskered puffbird, crescent-chested puffbird)		South America
<i>A. cohaerens</i>	Artiodactyla: bovid (cattle, buffalo, forest buffalo, sheep, goat, waterbuck, harnessed bushbuck, eland), hippopotamid (hippopotamus), suid (warthog); Perissodactyla: rhinocerotid (black rhinoceros); Proboscidea: elephantid (elephant); Rodentia: murid (house mouse, tree rat, Macmillan's thicket rat), thryonomyid (greater cane rat); Carnivora: hyaenid (hyena), viverrid (Cape genet); Primates: cercopithecoid (olive baboon), hominid (human); Galliformes: numidid (helmeted guinea fowl), phasianid		Africa

	(Clapperton's francolin); Passeriformes: turdid (Kurrichane thrush); Testudines (unspecified tortoise)		
<i>A. compressum</i> (syn. <i>A. javanense cuneatum</i> )	Artiodactyla: bovid (harnessed bushbuck, black duiker), suid (giant forest hog); Hyracoidea: procaviid (western tree hyrax); Pholidota: manid (giant pangolin, long-tailed pangolin, tree pangolin); Rodentia: hystricid (African brush-tailed porcupine); Bucerotiformes: bucerotid (hornbill); Ciconiiformes: bucorvid (hornbill); Galliformes: numidid (black guineafowl, plumed guineafowl); Musophagiformes: musophagid (Guinea turaco); Sauria: varanid (Nile monitor)		Africa
<i>A. concolor</i> (syn. <i>I. auricularis</i> )	Cingulata: dasypodid (big hairy armadillo, southern three-banded armadillo, Brazilian three-banded armadillo, nine-banded armadillo); Carnivora: mephitid (hog-nosed skunk), mustelid (badger)		South America
<i>A. cordiferum</i>	Artiodactyla: bovid (water buffalo), suid (pig); Pholidota: manid (pangolin); Rodentia: caviid (guinea pig), murid (black rat, Malaysian wood rat, Malayan field rat, Muller's giant Sunda rat); Primates: hominid (human); Crocodylia: alligatorid (Cuvier's dwarf caiman), crocodylid (saltwater crocodile); Sauria: varanid (monitor); Serpentes: colubrid (beauty rat snake, Sulawesi black racer, king rat snake Oriental rat snake), elapid (king cobra), pythonid (reticulated python, ball python, Sumatran short-tailed python); Testudines: geoemydid (snake-eating turtle)		Asia
<i>A. (Aponomma) crassipes</i>	Artiodactyla: bovid (cattle); Pholidota: manid (pangolin); Rodentia: hystricid (porcupine), sciurid (ground squirrel); Scandentia: tupaiid (treeshrew); Carnivora: canid (dog), mustelid (weasel), viverrid (civet); Sauria: varanid (desert monitor, Asian water monitor); Serpentes: bovid (green anaconda), elapid (banded krait), pythonid (reticulated python, black-tailed python)		Asia
<i>A. crassum</i>	Testudines: geoemydid (brown wood turtle), kinosternid (white-lipped mud turtle), testudinid (red-footed tortoise, yellow-footed tortoise); Cingulata: dasypodid (nine-banded armadillo)		South America
<i>A. crenatum</i> (syn. <i>A. subluteum</i> )	Perissodactyla: rhinocerotid (black rhinoceros, Javan rhinoceros)		Asia
<i>A. cruciferum</i>	Sauria: iguanid (rhinoceros iguana, mona ground iguana)		Central America
<i>A. curruca</i> (syn. <i>A. beaurepairei</i> )	Cingulata: dasypodid (nine-banded armadillo)		South America
<i>A. darlingi</i>	Artiodactyla: cervid (white-tailed deer); Carnivora: canid (dog); Accipitriformes: cathartid (black vulture); Galliformes: cracid (great curassow)		South America
<i>A. darwini</i> (incl. subspp. <i>darwini</i> , <i>wollebaeki</i> )	Sauria: iguanid (marine iguana), tropidurid (Galapagos lava lizard); Charadriiformes: scolopacid (least sandpiper)		Galapagos Islands
<i>A. diemeniae</i>	Serpentes: elapid (eastern brown snake)		Europe (zoo)
<i>A. dissimile</i> (syn. <i>A. bibronii</i> , <i>cubanum</i> , <i>flavidus</i> , <i>infumatum</i> , <i>Aponomma thumbi</i> , <i>Ixodes boarum</i> , <i>humanus</i> , <i>pulchellus</i> , <i>testudinis</i> )	Artiodactyla: bovid (cattle, sheep), cervid (marsh deer), tayassuid (peccary); Perissodactyla: equid (horse); Didelphimorphia: didelphid (common opossum, white-eared opossum, gray four-eyed opossum, gray short-tailed opossum, woolly mouse opossum, Linnaeus's mouse opossum); Rodentia: capromyid (hutia), caviid (capybara, Brazilian guinea pig), cricetid (terraced rice rat, cotton mouse), dasyproctid (red-rumped agouti, Central American agouti), echimyid (common punare, Tome's spiny rat), erethizontid (prehensile-tailed porcupine); Carnivora: canid (dog, crab-eating fox, South American fox), procyonid (white-nosed coati); Pilosa: bradypodid (pale-throated sloth), choleopodid (Linnaeus's two-toed sloth); Primates: hominid (human); Anura: bufonid (South American common toad, western giant toad, eastern giant toad, granular toad, lesser granulated toad, Chaco granulated toad, cane toad, cururu toad, rococo toad, tropical toad, Cuban toad, Jimi's toad); Crocodylia: alligatorid (spectacled caiman, Yacare caiman),		Americas, Africa

	<p>crocodylid (American crocodile, Morelet's crocodile); Sauria: corytophanid (common basilisk), dactylid (grass anole), gekkonid (tropical house gecko), iguanid (green iguana, black iguana, Andros iguana, northeastern spiny-tail iguana, black spiny-tailed iguana, Utila spiny-tail iguana, Mexican spiny-tail iguana, rhinoceros iguana, Turks and Caicos rock iguana, northern Bahamian rock iguana), phrynosomatid (green spiny lizard, eastern fence lizard, horned lizard), teiid (green amieva, khaki amieva, giant amieva, Gaige's rainbow lizard, gold tegu), tropidurid (neotropical lava lizard, northern curly-tailed lizard), varanid (Bengal monitor); Serpentes: boid (boa, rainbow boa, brown rainbow boa, garden tree boa, mangrove tree boa, northern boa, Argentine boa, Bahamian boa, Hispaniolan boa, Mexican boa, green anaconda, yellow anaconda), colubrid (corn snake, black rat snake, tiger rat snake, indigo snake, falcon indigo snake, cobra-cipo, false water cobra, Shaw's dark ground snake, common king snake, banded cat-eyed snake, rhombic cat-eyed snake, Boddaert's tropical racer, Rio tropical racer, Baron's green racer, two-coloured massurana, green vine snake, brown vine snake, Daudin's vine snake, pine snake, ratonel, Brazilian sipo, Wagler's sipo, Wagler's snake, Shropshire's puffing snake, chicken snake, Amazon whip snake, Amazon false fer-de-lance, Japanese striped snake, South American hog-nosed snake, crowned false boa, black false boa, neotropical snail-eater, neotropical blunt-headed treesnake, royal ground snake, Shaw's dark ground snake, Norman's keelback, Mato Grosso burrowing snake, Argentine pampas snake, Troschel's pampas snake), elapid (short-tailed coral snake, Caatinga coral snake), viperid (fer-de-lance, jararaca, Martinique lancehead, eastern diamondback rattlesnake, pygmy rattlesnake, Cascabel rattlesnake, South American bushmaster, crossed pit viper, Wagler's pit viper); Testudines: chelid (big-headed pantanal swamp turtle, Geoffroy's side-necked turtle), emydid (northern map turtle, Spanish pond turtle, furrowed wood turtle, painted wood turtle, Mexican spotted wood turtle, common box turtle, Mexican box turtle, pond slider, Mediterranean pond turtle, red-eared slider), geoemydid (black-breasted leaf turtle, Indian black turtle, furrowed wood turtle, painted wood turtle, Colombian wood turtle, Mexican spotted wood turtle), kinosternid (white-lipped mud turtle, scorpion mud turtle, Tabasco mud turtle), pelomedusid (marsh terrapin), podocnemid (river tortoise), testudinid (elongated tortoise, red-footed tortoise, yellow-footed tortoise, African spurred tortoise, Chaco tortoise); Ciconiiformes: ardeid (boat-billed heron); Passeriformes: parulid (Connecticut warbler), thamnophilid (white-flanked antwren, black-crowned antshrike); Pelecaniformes: ardeid (boat-billed heron); Psittaciformes: psittacid (blue-winged macaw)</p>		
<p><i>A. (Aponomma) draconis</i></p>	<p>Sauria: varanid (Komodo dragon)</p>		<p>Indonesia</p>
<p><i>A. dubitatum</i> (syn. <i>A. cooperi</i>, <i>lutzi</i>, <i>ypsilophorum</i>)</p>	<p>Artiodactyla: bovid (cattle, buffalo), cervid (chital, brown brocket), suid (pig), tayassuid (white-lipped peccary); Perissodactyla: equid (horse), tapirid (South American tapir); Pilosa: myrmecophagid (giant anteater, southern tamandua); Didelphimorphia: didelphid (common opossum, white-eared opossum, big-eared opossum, big lutrine opossum, yellow-sided opossum); Lagomorpha: leporid (European hare); Rodentia: caviid (capybara, Brazilian guinea pig), chinchillid (plains viscacha), cricetid (Azara's grass mouse, large-headed rice rat, Maracaju oryzomys, greater marsh rat, hairy-tailed bolo mouse, climbing mouse, small-footed bristly mouse, dark hociudo, yellow pygmy rice rat, Argentine swamp rat, Waterhouse's swamp rat), echimyid (highlands punare, Paraguayan punare), erethizontid (Paraguayan hairy dwarf porcupine), myocastorid (coypu); Carnivora: canid (dog, maned wolf, crab-eating fox), felid (cougar), procyonid (South American coati, crab-eating raccoon); Chiroptera: phyllostomid (Pallas's long-tongued</p>	<p>(possible vector of rickettsioses)</p>	<p>Europe, South America</p>

	bat); Primates: atelid (black howler, brown howler), hominid (human); Passeriformes: fringillid (European goldfinch), furnarid (rufous hornero), passerellid (rufous-collared sparrow), turdid (rufous-bellied thrush); Rheiformes: rheid (greater rhea); Strigiformes: strigid (tropical screech owl)		
<i>A. eburneum</i>	Artiodactyla: bovid (cattle, buffalo, eland, antelope), giraffid (giraffe), suid (pig); Perissodactyla: rhinocerotid (rhinoceros); Carnivora: felid (lion); Sauria: varanid (tree monitor, water monitor, Nile monitor)		Africa
<i>A. (Cernyomma) echidnae</i>	Monotremata: tachyglossid (short-beaked echidna); Squamata (unspecified reptile)		Australia
<i>A. (Aponomma) elaphense</i>	Rodentia: murid (rat); Serpentes: colubrid (Trans-Pecos rat snake, black rat snake, pine snake, Texas lyre snake), viperid (black-tailed rattlesnake)		North America
<i>A. elephantinum</i>	Proboscidea: elephantid (Indian elephant)		India
<i>A. (Aponomma) exornatum</i> (syn. <i>A. arcanum</i> , <i>flavomaculatum</i> , <i>halli</i> , <i>Ixodes varani</i> )	Artiodactyla: bovid (cattle, goat, suni), suid (desert warthog); Pholidota: manid (tree pangolin); Rodentia: sciurid (striped ground squirrel, spiny-tailed squirrel, Lord Derby's scaly-tailed squirrel); Carnivora: canid (dog), herpestid (yellow mongoose); Chiroptera: pteropodid (straw-coloured fruit bat); Accipitriformes: accipitrid (black-chested snake eagle); Sauria: iguanid (iguana), scincid (giant legless skink), varanid (perentie, savannah monitor, rock monitor, Nile monitor, yellow-spotted monitor); Serpentes: boid (boa), elapid (Egyptian cobra, black-necked spitting cobra, rinkhals), pythonid (ball python, reticulated python, Central African rock python), viperid (snouted night adder, puff adder); Crocodylia: crocodylid (Nile crocodile); Testudines: testudinid (leopard tortoise, Bell's hinge-back tortoise)		Africa, Australia
<i>A. extraoculatum</i> (syn. <i>A. romitii</i> , <i>tasquei</i> )	Rodentia: caviid (capybara); Didelphimorphia: didelphid (opossum)		South America, Africa, Asia
<i>A. (Aponomma) fimbriatum</i> (syn. <i>Aponomma ecinctum</i> , <i>simplex</i> , <i>trabeatum</i> , <i>pulchrum</i> , <i>undatum fimbriatum</i> )	Artiodactyla: bovid (cattle); Perissodactyla: equid (horse); Monotremata: tachyglossid (short-beaked echidna); Galliformes: phasianid (chicken, Bulwer's pheasant); Sauria: agamid (frill-necked lizard), varanid (perentie, sand goanna, Rosenberg's goanna, lace monitor, black-headed monitor, yellow-spotted monitor, roughneck monitor, Asian water monitor, mangrove monitor); Serpentes: colubrid (green tree snake), elapid (eastern brown snake, gwardar, dugite, red-bellied black snake, mainland tiger snake, coastal taipan, rough-scaled snake), hydrophiid (sea snake), pythonid (amethystine python, black-headed python, carpet python, olive python, reticulated python, water python, woma python), typhlopod (proximus blind snake)	(possible vector for rickettsioses, tularaemia)	Australasia
<i>A. foai</i>	Perissodactyla: rhinocerotid (rhinoceros)		Africa
<i>A. fulvum</i>	Serpentes: boid (green anaconda)		South America
<i>A. furcosum</i> (syn. <i>A. decoratum</i> )	Sauria: varanid (Asian water monitor); Serpentes: colubrid (mangrove snake, oriental rat snake), pythonid (reticulated python, Burmese python); Testudines: geoemydid (giant Asian pond turtle)		Indonesia, Philippines
<i>A. (Aponomma) fuscolineatum</i>	Serpentes: pythonid (reticulated python, black-tailed python)		Asia
<i>A. fuscum</i>	Didelphimorphia: didelphid (big-eared opossum, white-eared opossum, woolly mouse-opossum, brown four-eyed opossum, gray short-tailed opossum); Cingulata: dasypodid (nine-banded armadillo, seven-banded armadillo); Rodentia: cricetid (montane grass mouse, small-footed bristly mouse, terraced rice rat, russet rice rat, hucicudo), echimyid (Sao Lourenco punare), sciurid (Brazilian squirrel); Carnivora: canid (dog, crab-eating fox), felid (southern tiger cat); Primates: hominid (human); Sauria: teiid (golden tegu, Argentine black-and-white tegu); Serpentes: boid (boa), colubrid (indigo snake, black mussurana); Crocodylia: alligatorid (broad-snouted caiman); Anura: bufonid (Argentine toad)		Central America
<i>A. geayi</i>	Didelphimorphia: didelphid (common opossum, gray four-eyed		South America

	<p>opossum, Eaton's opossum, Derby's woolly opossum, brown-eared woolly opossum, Robinson's mouse opossum); Pilosa: bradypodid (brown-throated sloth, pale-throated sloth), choloepodid (two-toed sloth, Hoffman's two-toed sloth), cyclopedid (silky anteater), myrmecophagid (northern tamandua, southern tamandua); Rodentia: echimyid (Tome's spiny rat), erethizontid (Brazilian porcupine); Chiroptera: phyllostomid (great fruit-eating bat); Primates: atelid (Amazon black howler, mantled howler monkey), callitrichid (pied tamarin); Columbiformes: columbid (grey-chested dove); Coraciiformes: momotid (rufous motmot); Passeriformes: cardinalid (blue-black grosbeak), fringillid (thick-billed euphonia), furnariid (Hoffmanns's woodcreeper, wedge-billed woodcreeper, red-billed woodcreeper, chestnut-rumped woodcreeper), passerellid (black-striped sparrow), piprid (red-capped manakin, blue-backed manakin, white-crowned manakin, white-bearded manakin, golden-collared manakin, crimson-hooded manakin, wire-tailed mankin), thamnophilid (bicolored antbird, black-headed antbird, common scale-backed antbird, cinereous antshrike, black-crowned antshrike, barred antshrike), thraupid (grey-headed tanager), turdid (white-necked thrush, black-billed thrush, pale-breasted thrush), tyrannid (bright-rumped attila, sepia-capped flycatcher, ochre-bellied flycatcher, olivaceous flatbill); Piciformes: ramphastid (channel-billed toucan); Strigiformes: strigid (tropical screech owl); Sauria: iguanid (green iguana); Serpentes: colubrid (tiger rat snake); Crocodylia: alligatorid (spectacled caiman); Testudines: testudinid (yellow-footed tortoise)</p>		
<i>A. gemma</i>	<p>Artiodactyla: bovid (cattle, buffalo, sheep, goat, bushbuck, waterbuck, impala, eland, greater kudu, lesser kudu, gnu, fringe-eared oryx, East African oryx), camelid (camel), giraffid (giraffe), suid (desert warthog); Perissodactyla: equid (horse, donkey, mule, plains zebra), rhinocerotid (black rhinoceros); Rodentia: sciurid (ground squirrel); Lagomorpha: leporid (hare); Carnivora: felid (lion), herpestid (white-tailed mongoose); Primates: hominid (human); Accipitriformes: accipitrid (hawk); Galliformes: numidid (helmeted guineafowl), phasianid (fowl); Otidiformes: otid (bustard); Passeriformes: ploceid (weaver); Struthioniformes: struthionid (ostrich); Serpentes: viperid (puff adder); Testudines: testudinid (leopard tortoise) (3-host cycle)</p>	trauma, irritation (vector for ehrlichiosis)	Africa
<i>A. geocheilone</i>	<p>Testudines: testudinid (ploughshare tortoise)</p>		Madagascar
<i>A. geoemydae</i> (syn. <i>Ixodes</i> , <i>A. caelaturum</i> , <i>A. formosanum</i> , <i>A. malayanum</i> )	<p>Artiodactyla: bovid (unspecified), cervid (unspecified), suid (pig); Pholidota: manid (Indian pangolin); Scandentia: tupaiid (common treeshrew, large treeshrew); Rodentia: hystricid (porcupine), sciurid (unspecified); Carnivora: canid (unspecified), felid (marbled cat), mustelid (unspecified), viverrid (small-toothed palm civet, banded palm civet); Primates: hominid (human); Bucerotiformes: bucerotid (black hornbill); Coraciiformes: alcedinid (Oriental dwarf kingfisher, banded kingfisher), ardeid (black bittern); Cuculiformes: cuculid (greater coucal); Galliformes: phasianid (long-billed partridge); Passeriformes: corvid (crested jay), megalaimid (red-throated barbet), pellorneid (large wren-babbler), pittid (giant pitta, Indian pitta, blue-winged pitta, hooded pitta), timaliid (gray-headed babbler), turdid (dark-sided thrush); Sauria: varanid (desert monitor, Asian water monitor, Dumeril's monitor); Serpentes: colubrid (Ryukyu odd-toothed snake, Pryer's keelback, Ryukyu green snake), elapid (unspecified), pythonid (reticulated python); Testudines: geoemydid (snake-eating turtle, yellow-margined box turtle, Amboina box turtle, Chinese box turtle, Indochinese box turtle, keeled box turtle, Asian leaf turtle, Ryukyu black-breasted leaf turtle, black-breasted leaf turtle, yellow-headed temple turtle, Arakan forest turtle, spiny turtle, Japanese pond turtle, yellow pond turtle, Chinese pond turtle, Indian black turtle), testudinid (Asian forest tortoise, elongated tortoise, Forsten's tortoise, Asian forest</p>		Asia

	tortoise, impressed tortoise)		
<i>A. gertschi</i>	Pilosa: bradypodid (pale-throated sloth, Hoffmann's three-toed sloth)		South America
<i>A. (Aponomma) gervaisi</i> (syn. <i>Ixodes ophiophilus</i> , <i>varanensis</i> )	Artiodactyla: bovid (gayal, bharal), suid (Indian boar); Pholidota: manid (pangolin); Rodentia: anomalurid (scaly-tailed squirrel); murid (rat), sciurid (ground squirrel); Carnivora: canid (wolf, jackal), mustelid (smooth-coated otter); Chiroptera: pteropodid (straw-coloured fruit bat); Anseriformes: anatid (pygmy goose); Sauria: agamid (oriental garden lizard), varanid (savannah monitor, desert monitor, mangrove monitor, clouded monitor, Nile monitor, Bengal monitor, Asian water monitor); Serpentes: boid (boa, rough-scaled sand boa), colubrid (chicken snake, Oriental rat snake, Indian rat snake, snail-eater snake, checkered keelback), elapid (Indian cobra, rinkhals, banded krait), pythonid (black-headed python, reticulated python, Asian rock python), viperid (Indian krait, Russell's viper)		Eurasia, Africa
<i>A. (Cernyomma) glauerti</i>	Sauria: varanid (twilight monitor, Kimberley rock monitor)		Australia
<i>A. goldii</i>	Pilosa: bradypodid (three-toed sloth), myrmecophagid (giant anteater, southern tamandua); Carnivora: canid (dog); Serpentes: boid (boa), elapid (coral snake), viperid (South American bushmaster); Anura: bufonid (cane toad, tropical toad, yellow cururu toad)		South America
<i>A. hadanii</i>	Artiodactyla: bovid (cattle); Perissodactyla: equid (horse), tapirid (tapir); Carnivora: canid (dog, crab-eating fox); Primates: hominid (human)		South America
<i>A. hainanense</i>	Serpentes (unspecified snake)		China
<i>A. hassalli</i>	Artiodactyla: bovid (buffalo); Proboscidea: elephantid (elephant)		Africa
<i>A. hebraeum</i> (syn. <i>A. theileri</i> , <i>Ixodes poortmani</i> ) (South African bont tick)	Artiodactyla: bovid (cattle, sheep, goat, buffalo, forest buffalo, eland, impala, roan antelope, blackbuck, duiker, blue wildebeest, suni, nyala, steenbok, greater kudu, nyala, harnessed bushbuck, Cape bushbuck), giraffid (giraffe, Cape giraffe), suid (pig, warthog); Perissodactyla: equid (horse, donkey, mule), rhinocerotid (black rhinoceros, white rhinoceros); Proboscidea: elephantid (African elephant); Lagomorpha: leporid (scrub hare, savannah hare); Pholidota: manid (ground pangolin); Rodentia: thryomyid (greater cane rat); Carnivora: canid (dog, African wild dog, Cape fox), felid (cat, black-footed cat, leopard, cheetah, lion, tiger), herpestid (banded mongoose, common dwarf mongoose), hyaenid (painted hyena, aardwolf), viverrid (African civet); Primates: cercopithecoid (grivet, chacma baboon), galagid (brown greater galago), hominid (human); Accipitriformes: accipitrid (black sparrowhawk); Bucerotiformes: bucerotid (southern yellow-billed hornbill, northern red-billed hornbill); Caprimulgiformes: caprimulgid (fiery-necked nightjar, rufous-cheeked nightjar); Coraciiformes: coraciid (European roller, racket-tailed roller); Cuculiformes: cuculid (white-breasted coucal, Senegal coucal); Galliformes: numidid (helmeted guineafowl, southern crested guineafowl), phasianid (chicken, turkey, crested francolin, Natal spurfowl, Swainson's spurfowl); Otidiformes: otidid (Kori bustard); Passeriformes: leiothrichid (white-rumped babbler), malaconotid (orange-breasted bushshrike), muscicapid (Kalahari scrub robin), ploceid (white-browed sparrow-weaver), sturnid (greater blue-eared starling); Pelecaniformes: scopid (hamerkop); Piciformes: picid (bearded woodpecker); Pteroclitiformes: pteroclid (double-banded sandgrouse, Burchell's sandgrouse); Struthioniformes: struthionid (ostrich); Sauria: gerrhosaurid (plated lizard), varanid (rock monitor, black-throated monitor, lace monitor, Nile monitor); Serpentes: viperid (unspecified viper); Testudines: testudinid (leopard tortoise) (3-host cycle)	trauma, irritation, foot abscesses (vector for ehrlichiosis, rickettsial Boutonneuse fever, African tick-bite fever, theileriosis, fowl aegyptianellosis)	South Africa
<i>A. helvolum</i> (syn. <i>feuerborni</i> )	Artiodactyla: bovid (water buffalo), suid (pig); Rodentia: murid (unspecified rat); Primates: hominid (human); Sauria: agamid		Asia

	(Philippine sailfin lizard), iguanid (iguana), scincid (many-lined sun skink), varanid (clouded monitor, roughneck monitor, Asian water monitor, Dumeril's monitor, Komodo dragon); Serpentes: boid (boa), colubrid (brown rat snake, oriental rat snake, radiated rat snake, black copper rat snake, Chinese rat snake, red-tailed racer, mangrove snake, triangle keelback, orange-neck keelback, Sulawesi black racer), elapid (Indian cobra, Indian krait), pythonid (reticulated python); Testudines: geoemydid (giant Asian pond turtle)		
<i>A. hirtum</i>	host unknown, collected from environment		Galapagos Islands
<i>A. humerale</i> (syn. <i>A. brimonti</i> , <i>gypsatum</i> )	Perissodactyla: tapirid (Baird's tapir); Didelphimorphia: didelphid (common opossum, slender opossum, brown four-eyed opossum, gray four-eyed opossum, white-bellied woolly mouse opossum); Cingulata: dasypodid (nine-banded armadillo); Pilosa: bradyodid (pale-throated sloth), cyclopedid (silky anteater), myrmecophagid (southern tamandua); Rodentia: caviid (capybara), cricetid (common bristly mouse, unspecified rice rat), dasyproctid (red acouchi), echimyid (Roberto's spiny rat); Carnivora: procyonid (South American coati); Chiroptera: phyllostomid (big-eared woolly bat); Coraciiformes: momotid (Amazonian motmot); Passeriformes: furnariid (Hoffmann's woodcreeper, black-tailed leaf-tosser, olivaceous woodcreeper, buff-throated woodcreeper), thamnophilid (spot-backed antbird, spot-winged antbird, white-flanked antwren, East Amazonian fire-eye, cinereous antshrike, bluish-slate antshrike, common scale-backed antbird), thraupid (fulvous-crested tanager), tyrannid (olivaceous flatbill); Sauria: teiid (forest whiptail, striped forest whiptail), tropidurid (collared tree lizard, blue-lipped tree lizard, diving lizard, neotropical ground lizard); Serpentes: colubrid (velvet swamp snake, Amazon whipsnake, Guianan green snake); Testudines: geoemydid (brown wood turtle), podocnemid (South American river turtle), testudinid (yellow-footed tortoise, red-footed tortoise, ornate box turtle); Crocodylia: alligatorid (broad-snouted caiman, smooth-fronted caiman, spectacled caiman)		South America
<i>A. incisum</i> (syn. <i>A. brasiliense</i> <i>superbrasiliense</i> )	Artiodactyla: cervid (red deer, brown brocket, small red brocket); Perissodactyla: equid (horse), tapirid (South American tapir); Didelphimorphia: didelphid (big-eared opossum); Pilosa: myrmecophagid (giant anteater, southern tamandua); Lagomorpha: leporid (rabbit); Rodentia: caviid (capybara), dasyproctid (agouti); Carnivora: canid (crab-eating fox, Azara fox), felid (jaguar, cougar), procyonid (South American coati); Primates: hominid (human)		South America
<i>A. ininii</i>	Pilosa: myrmecophagid (giant anteater); Serpentes: viperid (pit viper)		Africa
<i>A. interandinum</i>	Artiodactyla: cervid (unspecified deer)		South America
<i>A. (Aponomma) inopinatus</i>	Artiodactyla: bovid (sheep); Carnivora: canid (red fox); Sauria: varanid (savannah monitor)		Mediterranean
<i>A. (Aponomma) inornatum</i>	Artiodactyla: bovid (cattle, goat), cervid (white-tailed deer), tayassuid (collared peccary); Perissodactyla: equid (horse); Cingulata: dasypodid (nine-banded armadillo); Didelphimorphia: didelphid (Virginia opossum); Lagomorpha: leporid (European rabbit, eastern cottontail, desert cottontail, black-tailed jackrabbit, hare); Rodentia: caviid (guinea pig), cricetid (hispid cotton rat, southern plains woodrat), sciurid (ground squirrel); Carnivora: canid (dog, red wolf, coyote), felid (cat, bobcat), mephitid (striped skunk), mustelid (badger), procyonid (raccoon); Primates: hominid (human); Cuculiformes: cuculid (greater roadrunner); Galliformes: phasianid (quail); Passeriformes: icterid (unspecified blackbird), mimid (unspecified), turdid (veery)		Americas
<i>A. integrum</i>	Artiodactyla: bovid (cattle, zebu, buffalo, water buffalo), cervid (sambar deer), suid (pig); tragulid (Sri Lankan spotted chevrotain); Proboscidea: elephantid (Asian elephant); Lagomorpha: leporid		India, Sri Lanka

	(Indian hare); Rodentia: hystricid (porcupine); Carnivora: canid (dog), felid (fishing cat), ursid (bear), viverrid (small Indian civet); Primates: hominid (human); Galliformes: phasianid (chicken)		
<i>A. interandinum</i>	Artiodactyla: cervid (unspecified deer)		South America
<i>A. (Aponomma) javanense</i> (syn. <i>A. compressum javanense</i> )	Artiodactyla: cervid (sambar deer), suid (pig); Pholidota: manid (Indian pangolin, Sunda pangolin, Philippine pangolin); Rodentia: hystricid (porcupine), murid (rat); Carnivora: hyaenid (striped hyena), ursid (bear); Chiroptera: vespertilionid (Javan pipistrelle); Primates: hominid (human); Sauria: scincid (unspecified long-tailed skink), varanid (Asian water monitor); Serpentes: pythonid (black-tailed python); Testudines: geoemydid (tricarinate hill turtle)		Indonesia, Sri Lanka
<i>A. (Aponomma) komodoense</i>	Sauria: varanid (Komodo dragon, Asian water monitor)		Indonesia
<i>A. (Aponomma) kraneveldi</i>	Serpentes: pythonid (black-tailed python, reticulated python, Timor python)		Indonesia
<i>A. (Aponomma) laevatum</i>	Serpentes: boid (boa constrictor)		South America
<i>A. (Aponomma) laeve</i>	Serpentes: colubrid (Central African egg-eating snake), elapid (Egyptian cobra)		Africa
<i>A. laticutatum</i>	Serpentes: pythonid (python)		India
<i>A. (Aponomma) latum</i> (syn. <i>Aponomma falsolaeve, laeve</i> )	Artiodactyla: bovid (goat); Perissodactyla: rhinocerotid (black rhinoceros); Rodentia: hystricid (porcupine), murid (red veld rat); Eulipotyphla: soricid (musk shrew); Pholidota: manid (pangolin); Primates: hominid (human); Sauria: scincid (striped skink, variable skink, giant legless skink, Cape legless skink, Guinean forest skink), varanid (rock monitor, Nile monitor); Serpentes: atractaspidid (western forest centipede-eater, slender burrowing asp), boid (sand boa), colubrid (boomslang, northern green bush snake, egg-eating snake, modest keelback, Blanding's tree snake, Blanding's cat snake, Fischer's tree snake, black-lined green snake, Angolan green snake, trinket snake, white-lipped herald snake, egg-eating snake, Smith's African water snake, olive marsh snake, forest vine snake, oriental rat snake), elapid (rinkhals, forest cobra, black-headed spitting cobra, shield-nose snake, Cape cobra, Egyptian cobra, Indian cobra, Goldie's tree cobra, snouted cobra, mamba, black mamba, eastern green mamba, western green mamba, Jameson's mamba, zebra snake, Sundevall's garter snake, golden snake), lamprophiid (rufous beaked snake, striped house snake, olive house snake, dark-bellied house snake, African house snake, Aurora house snake, brown house snake, wolf snake, Cape wolf snake, western forest file snake, black file snake, Cape file snake, Crosse's file snake, Gasca's Ethiopian snake), psammophid (olive grass snake, hissing sand snake, western yellow-bellied sand snake, Schokari sand racer), pseudaspidid (mole snake), pythonid (ball python, black-headed python, Central African rock python, Calabar python), viperid (aspic viper, Gaboon viper, pit viper, night adder, green bush viper, mole viper, puff adder, horned puff adder, Somali puff adder, snouted night adder, rhombic night adder); Testudines: testudinid (land tortoise, leopard tortoise); Anura: bufonid (toad)		Africa
<i>A. lepidum</i> (East African bont tick)	Artiodactyla: bovid (cattle, buffalo, forest buffalo, sheep, goat, Grant's gazelle, Thomson's gazelle, antelope, roan antelope, eland, tiang, hartebeest, Roosevelt's hartebeest, blue wildebeest, korrigum), camelid (camel, dromedary), giraffid (giraffe), suid (bushpig); Perissodactyla: equid (horse, mule, donkey, Burchell's zebra), rhinocerotid (rhinoceros); Lagomorpha: leporid (rabbit); Tubulidentata: orycteropodid (aardvark); Carnivora: canid (dog), felid (African wildcat, cheetah), hyaenid (spotted hyena), herpestid (meerkat); Primates: hominid (human); Accipitriformes: accipitrid (hawk); Charadriiformes: burhinid (Eurasian stone curlew); Ciconiiformes: ciconiid (cuckoo); Columbiformes: columbid (pigeon); Musophagiformes: musophagid (turaco); Otidiformes: otidid (great bustard, Denham's bustard); Strigiformes: strigid (short-eared owl); Struthioniformes: struthionid (ostrich)	(vector for ehrlichiosis (heartwater / cowdriosis))	Africa

	(3-host cycle)		
<i>A. (Cernyomma) limbatum</i>	Sauria: agamid (frill-necked lizard), scincid (sleepy lizard, common blue-tongued skink, Centralian blue-tongued skink), varanid (sand goanna, spiny-tailed monitor, yellow-spotted monitor, black-headed monitor, black-palmed rock monitor, spotted tree monitor, Argus monitor, Mitchell's water monitor); Serpentes: colubrid (green tree snake, brown tree snake), elapid (red-bellied black snake, mulga snake, northern death adder), pythonid (woma python, northwestern carpet python, olive python, water python, black-headed python, Children's python); Primates: hominid (human)		Australia
<i>A. (Adenopleura) loculosum</i> (syn. <i>A. sterna</i> )	Artiodactyla: bovid (cattle); Primates: hominid (human); Charadriiformes: larid (sooty tern, brown noddy, black noddy); Procellariiformes: procellariid (wedge-tailed shearwater); Suliformes: fregatid (lesser frigatebird, great frigatebird), sulid (red-footed booby); Squamata: scincid (Seychelles mabuaya)		Africa, Asia, Australia
<i>A. longirostre</i> (syn. <i>A. avecolens</i> )	Artiodactyla: cervid (marsh deer); Perissodactyla: equid (horse); Didelphimorphia: didelphid (common opossum); Rodentia: cricetid (large-headed rice rat), echimyid (soft-spined Atlantic spiny rat, Guyenne spiny rat), erethizontid (bristle-spined rat, bicoloured-spined porcupine, tri-coloured tree porcupine, brown hairy dwarf porcupine, pallid hairy dwarf porcupine, Bahai hairy dwarf porcupine, Andean porcupine, Mexican hairy dwarf porcupine, Paraguayan hairy dwarf porcupine, Brazilian porcupine, Rothschild's porcupine), sciurid (red-tailed squirrel); Pilosa: bradypodid (maned sloth, pale-throated sloth), myrmecophagid (giant anteater); Carnivora: canid (dog, crab-eating fox), felid (oncilla, Geoffroy's cat), mustelid (tayra); Chiroptera: phyllostomid (great fruit-eating bat, shadowy broad-nosed bat); Primates: cebid (capuchin), hominid (human); Accipitriformes: accipitrid (broad-winged hawk, bicolored hawk, white-necked hawk, roadside hawk, black-and-white hawk-eagle); Caprimulgiformes: caprimulgid (pauraque), trochilid (rufous-tailed hummingbird, swallow-tailed hummingbird, white-throated hummingbird, sombre hummingbird, glittering-bellied emerald, green hermit, long-tailed hermit, violet-capped woodnymph, grey-breasted sabre wing, Brazilian ruby, black jacobin); Columbiformes: columbid (grey-fronted dove, white-tipped dove, ruddy ground dove, ruddy quail-dove); Coraciiformes: alcedinid (American pygmy kingfisher), momotid (Amazonian motmot, rufous motmot, rufous-capped motmot); Cuculiformes: cuculid (smooth-billed ani, greater ani, squirrel cuckoo); Falconiformes: falconid (laughing falcon, barred forest falcon); Galliformes: cracid (dusky-legged guan); Gruiformes: rallid (white-throated crane); Passeriformes: cardinalid (ultramarine grosbeak, blue black grosbeak, hepatic tanager, black-headed saltator, buff-throated saltator, green-winged saltator, red-throated ant tanager, red-crowned ant tanager, sooty ant tanager), conopophagid (rufous gnateater, black-cheeked gnateater), corvid (curl-crested jay), cotingid (purple-throated fruit crow, brown-winged schiffornis, greenish schiffornis), fringillid (yellow-throated euphonia, thick-billed euphonia, chestnut-bellied euphonia, violaceous euphonia, orange-bellied euphonia), furnariid (white-browed foliage-gleaner, white-collared foliage-gleaner, white-eyed foliage-gleaner, buff-throated foliage-gleaner, buff-fronted foliage-gleaner, buff-browed foliage-gleaner, black-capped foliage-gleaner, plain-winged woodcreeper, yellow-chinned spinetail, white-chinned woodcreeper, rufous-capped spinetail, Spix's spinetail, plain xenops, plain brown woodcreeper, streak-headed woodcreeper, long-tailed woodcreeper, white-throated woodcreeper, spot-throated woodcreeper, buff-throated woodcreeper, tawny-winged woodcreeper, straight-billed woodcreeper, wedge-billed woodcreeper, narrow-billed woodcreeper, red-billed woodcreeper, chesnut-rumped woodcreeper, scaled woodcreeper, olivaceous woodcreeper, elegant woodcreeper, lesser woodcreeper, black-		Americas

striped woodcreeper, black-banded woodcreeper, cocoa woodcreeper, Amazonian barred woodcreeper, Brigida's woodcreeper, Hoffmann's woodcreeper, point-tailed palm creeper, black-billed scythe bill, red-billed scythe bill), icterid (yellow-backed oriole, yellow-rumped cacique, red-rumped cacique, scarlet-rumped cacique, Venezuelan troupial), parulid (chestnut-capped warbler, golden-crowned warbler, flavescens warbler, white-bellied warbler, white-rimmed warbler, rufous-capped warbler, masked yellowthroat), passerellid (black-striped sparrow), piprid (blue manakin, golden-headed manakin, red-capped manakin, helmeted manakin, long-tailed manakin, blue-backed manakin, blue-crowned manakin, white-crowned manakin, pin-tailed manakin, white-collared manakin, white-bearded manakin, band-tailed manakin, pin-tailed manakin, fiery-capped manakin, crimson-hooded manakin, kinglet manakin, pale-bellied tyrant-manakin), thamnophilid (dusky antbird, bicolored antbird, spotted antbird, black-headed antbird, spot-backed antbird, band-tailed antbird, common scale-backed antbird, ferruginous antbird, ferruginous-backed antbird, ocellated antbird, plain antvireo, spot-breasted antvireo, tufted antshrike, great antshrike, black antshrike, barred antshrike, bar-crested antshrike, cinereous antshrike, white-shouldered antshrike, white-bearded antshrike, black-hooded antshrike, black-crowned antshrike, variable antshrike, fasciated antshrike, northern slaty antshrike, Planalto slaty antshrike, white-eyed stipplethroat, black-bellied antwren, long-winged antwren, white-flanked antwren, black-spotted bare-eye, white-shouldered fire-eye, East Amazonian fire-eye, white-eyed stipplethroat), thraupid (bananaquit, yellow-faced grassquit, blue dacnis, palm tanager, grey-headed tanager, hooded tanager, fawn-breasted tanager, silver-beaked tanager, crimson-collared tanager, ruby-crowned tanager, flame-crested tanager, black-backed tanager, white-shouldered tanager, white-lined tanager, fulvous-crested tanager, burnished-buff tanager, green-headed tanager, chestnut-headed tanager, orange-headed tanager, golden-chevrons tanager, swallow tanager, black-goggled tanager, Brazilian tanager, Sayaca tanager, red-crowned ant tanager, sepia-capped flycatcher, black-headed saltator, lesser Antillean saltator, buff-throated saltator, green-winged saltator, uniform finch, saffron finch, chestnut-bellied seed finch, lined seedeater, double-collared seedeater, variable seedeater, white-bellied seedeater, yellow-bellied seedeater, lined seedeater), tityrid (chestnut-crowned becard, white-winged becard, brown-winged shiffornis, greenish schiffornis), troglodytid (house wren, song wren, white-breasted wood wren, black-throated wren, long-billed wren, bay wren, rufous-and-white wren, tropical wren, Cabani's wren, southern nightingale-wren), turdid (white-necked thrush, creamy-bellied thrush, rufous-bellied thrush, yellow-legged thrush, cocoa thrush, clay-coloured thrush, pale-breasted thrush, spectacled thrush, black-billed thrush, pale-breasted thrush, pale-vented thrush, sooty thrush, eastern slaty thrush, Andean slaty thrush, Hauxwell's thrush, Swainson's thrush, Varzea thrush), tyrannid (grey-hooded attila, bright-rumped attila, rufous casinornis, fuscous flycatcher, willow flycatcher, social flycatcher, bearded flycatcher, grey-hooded flycatcher, sepia-capped flycatcher, slaty-capped flycatcher, ochre-bellied flycatcher, streaked flycatcher, boat-billed flycatcher, short-crested flycatcher, royal flycatcher, yellow olive flycatcher, olive-striped flycatcher, bran-coloured flycatcher, fork-tailed flycatcher, dusky-capped flycatcher, Acadian flycatcher, Alder flycatcher, Euler's flycatcher, McConnell's flycatcher, common tody-flycatcher, rusty-fronted tody-flycatcher, slaty-headed tody-flycatcher, cattle tyrant, pearly-vented tody-tyrant, hangnest tody-tyrant, Snethlage's tody-tyrant, whiskered myiobius, southern beardless tyrannulet, mottle-cheeked tyrannulet, Restinga tyrannulet, rufous-browed peppershrike, great kiskadee,

	plain-crested elaenia, yellow-bellied elaenia, olivaceous elaenia, small-billed elaenia, greenish elaenia, stub-tailed spadebill, russet-winged spadebill, white-throated spadebill, golden-crowned spadebill, eye-ringed flatbill, grey-crowned flatbill, olivaceous flatbill, yellow-olive flatbill, southern bentbill, tropical kingbird, grey monjita, white-rumped monjita), vireonid (white-eyed vireo, red-eyed vireo, Chivi vireo); Piciformes: buconid (crescent-chested puffbird, white-whiskered puffbird), capitonid (gilded barbet), galbulid (rufous-tailed jacamar), picid (blond-crested woodpecker, yellow-eared woodpecker, white-barred piculet, golden-spangled piculet, ochre-collared piculet), ramphastid (red-necked aracari, chesnut-eared aracari, green-billed toucan, channel-billed toucan); Strigiformes: strigid (tawny-browed owl, tropical screech owl, striped owl, Stygian owl); Trogoniformes: trogonid (green-backed trogon)		
<i>A. macfarlandi</i>	Testudines: testudinid (Galapagos tortoise (subsp. Cerro Azul giant tortoise, western Santa Cruz tortoise)); Primates: hominid (human)		Galapagos Islands
<i>A. (Cernyomma) macropi</i>	Diprotodontia: macropodid (unspecified kangaroo)		Australia
<i>A. maculatum</i> (syn. <i>A. rubripes</i> ) (Gulf coast tick)	Artiodactyla: bovid (cattle, zebu, sheep, goat), cervid (Cove's white-tailed deer, Florida coastal white-tailed deer, pampas deer, sambar deer, grey brocket, guazuncho), suid (pig), tayassuid (collared peccary); Perissodactyla: equid (horse, donkey, mule); Lagomorpha: leporid (rabbit, cottontail, black-tailed jackrabbit, hare); Didelphimorphia: didelphid (common opossum); Pilosa: myrmecophagid (southern tamandua); Rodentia: caviid (guinea pig, Brazilian guinea pig, capybara), cricetid (woodland vole, hispid cotton rat, marsh rice rat, deer mouse, white-footed mouse, Florida mouse), murid (black rat, brown rat), sciurid (eastern gray squirrel, fox squirrel); Carnivora: canid (dog, maned wolf, culpeo, coyote, red fox, gray fox, South American gray fox, pampas fox, crab-eating fox, Azara fox), felid (cat, African wildcat, bobcat, Florida panther), mephitid (skunk), procyonid (raccoon), ursid (bear); Primates: hominid (human); Sauria: teiid (common golden tegu); Charadriiformes: charadriid (killdeer); Columbiformes: columbid (pigeon); Galliformes: phasianid (quail), odontophorid (northern bobwhite quail); Passeriformes: cardinalid (northern cardinal), corvid (blue jay), icterid (grackle, cowbird, eastern meadowlark, red-winged blackbird, Bower's blackbird), laniid (loggerhead shrike), mimid (northern mockingbird, brown thrasher), parulid (palm warbler), passerid (house sparrow), passerellid (eastern towhee, red-eyed towhee, white-eyed towhee, field sparrow, white-throated sparrow, swamp sparrow, grasshopper sparrow, Bachman's sparrow, dark-eyed junco), piprid (white-collared manakin), sturnid (meadowlark), troglodytid (house wren, short-billed marsh wren, Carolina wren), turdid (wood thrush, American robin, bluebird); Piciformes: picid (red-bellied woodpecker); Tinamiformes: tinamid (red-winged tinamou, spotted nothura) (3-host cycle)	trauma, irritation, gotch ear, paralysis (vector for hepatozoonosis, rickettsiosis, ehrlichiosis)	Americas
<i>A. margaritae</i>	Serpentes: colubrid (dark-headed red false boa)		South America
<i>A. marmoreum</i> (syn. <i>A. falsomarmoreum</i> )	Artiodactyla: bovid (cattle, buffalo, sheep, goat, eland, blackbuck, impala, black wildebeest, bontebok, springbok, greater kudu, red forest duiker, gemsbok, grey rhebok, reedbuck, mountain reedbuck), camelid (camel), giraffid (giraffe), suid (bushpig, warthog); Perissodactyla: equid (horse, Cape mountain zebra), rhinocerotid (black rhinoceros, white rhinoceros); Eulipotyphla: erinaceid (African hedgehog); Lagomorpha: leporid (Smith's red rock rabbit, scrub hare, Cape hare); Macroscelidea: macroscelidid (rock elephant shrew); Hyracoidea: procaviid (rock hyrax); Rodentia: caviid (guinea pig), murid (bush Karoo rat); Carnivora: canid (hunting dog, black-backed jackal, bat-eared fox), felid (cat, African wildcat, leopard, cheetah, caracal, lion), herpestid (yellow	(vector for ehrlichiosis (heartwater))	Africa

	<p>mongoose, white-tailed mongoose, banded mongoose), hyaenid (spotted hyena, aardwolf), viverrid (pardine genet, large spotted genet, civet cat); Primates: hominid (human); Bucerotiformes: upupid (African hoopoe); Galliformes: numidid (helmeted guineafowl), phasianid (chicken, common quail, graywing francolin, Cape francolin, crested francolin, Swainson's francolin); Passeriformes: emberizid (cinnamon-breasted bunting), malaconotid (brown-crowned tchagra), ploceid (red-headed weaver, red-billed quelea); Pelecaniformes: ardeid (cattle egret); Pteroclitiformes: pteroclid (double-banded sandgrouse); Sauria: gerrhosaurid (giant plated lizard), varanid (rock monitor, ocellated monitor, Nile monitor, white-throated monitor, warrener); Serpentes: boid (boa), colubrid (tiger rat snake, common egg eater, boomslang), elapid (unspecified), pythonid (reticulated python, Central African rock python), viperid (Gaboon viper, puff adder); Testudines: cheloniid (loggerhead sea turtle), testudinid (leopard tortoise, pancake tortoise, geometric tortoise, serrated tortoise, tent tortoise, angulate tortoise, Karoo tortoise, common padloper, Karoo padloper, areolate padloper, greater padloper, southern speckled padloper, African spurred tortoise, Bell's hinge-back tortoise, Speke's hinge-back tortoise, Greek tortoise)</p> <p>(3-host cycle)</p>		
<i>A. mixtum</i>	<p>Artiodactyla: bovid (cattle, buffalo, water buffalo, sheep, goat), cervid (red deer, white-tailed deer, red brocket), suid (pig), tayassuid (collared peccary, white-lipped peccary); Perissodactyla: equid (horse, donkey, mule), tapirid (Baird's tapir); Didelphimorphia: didelphid (common opossum, Virginia opossum, brown four-eyed opossum); Cingulata: dasypodid (nine-banded armadillo); Pilosa: myrmecophagid (northern tamandua); Lagomorpha: leporid (rabbit); Rodentia: caviid (lesser capybara), cricetid (long-whiskered rice rat), cuniculid (lowland paca), echimyid (armored rat, Tome's spiny rat), murid (unspecified rat), sciurid (Mexican gray squirrel); Carnivora: canid (dog, coyote, gray fox), felid (cat, jaguar), procyonid (raccoon, white-nosed coati); Chiroptera: phyllostomid (Jamacian fruit bat); Primates: hominid (human); Accipitriformes: accipitrid (roadside hawk); Cuculiformes: cuculid (great lizard cuckoo); Galliformes: cracid (rufous-vented chachalaca), phasianid (chicken, turkey); Pelecaniformes: ardeid (unspecified heron); Crocodylia: crocodylid (American crocodile); Sauria: iguanid (green iguana, black spiny-tailed iguana); Testudines: emydid (common box turtle, red-eared slider), geoemydid (furrowed wood turtle)</p>	(vector for anaplasmosis)	Americas
<i>A. (Cernyomma) moreliae</i> (syn. <i>Ixodes</i> )	<p>Artiodactyla: bovid (cattle); Perissodactyla: equid (horse); Diprotodontia: macropodid (unspecified macropod); Primates: hominid (human); Sauria: agamid (water dragon, eastern bearded dragon, frill-necked lizard), scincid (tree-crevice skink, sleepy lizard, common blue-tongued skink, blotched blue-tongued skink), varanid (goanna, lace monitor, black-headed monitor, yellow-spotted monitor); Serpentes: colubrid (green tree snake), elapid (eastern brown snake, mainland tiger snake, coastal taipan, red-bellied black snake, mulga snake), pythonid (carpet python, northwestern carpet python, black-headed python, diamond python, water python)</p>		Australia
<i>A. (Cernyomma) moyi</i>	<p>Monotremata: tachyglossid (short-beaked echidna)</p>		Australia
<i>A. mudaliari</i>	<p>Artiodactyla: bovid (cattle, buffalo); Primates: hominid (human)</p>		India
<i>A. multipunctum</i>	<p>Artiodactyla: antilocaprid (cattle, pronghorn); Perissodactyla: tapirid (mountain tapir); Serpentes: elapid (unspecified black snake); Testudines (unspecified tortoise)</p>		North America, Australia
<i>A. naponense</i> (syn. <i>A. mantiquirensis</i> )	<p>Artiodactyla: cervid (white-tailed deer, brown brocket), suid (wild boar), tayassuid (collared peccary, white-lipped peccary); Perissodactyla: tapirid (South American tapir); Didelphimorphia: didelphid (common opossum, Robinson's mouse opossum); Pilosa:</p>		South America

	<p>myrmecophagid (giant anteater, northern tamandua, southern tamandua); Rodentia: caviid (guinea pig, capybara), cricetid (unspecified rice rat), cuniculid (lowland paca), dasyproctid (black agouti, red-rumped agouti, Central American agouti, Azara's agouti, red acouchi), echimyid (armored rat, Tome's spiny rat); Carnivora: canid (dog, crab-eating fox, gray fox), mustelid (grison), procyonid (white-nosed coati, South American coati, raccoon, crab-eating raccoon); Primates: hominid (human); Coraciiformes: momotid (rufous motmot); Galliformes: cracid (razor-billed curassow); Passeriformes: furnariid (plain-brown woodcreeper, scaly-throated leaf-tosser), piprid (red-capped manakin, blue-crowned manakin), thamnophilid (white-shouldered fire-eye, Planalto slaty antshrike), thraupid (ruby-crowned tanager), troglodytid (song wren), tyrannid (grey-hooded attila)</p>		
<i>A. (Aponomma) neglectum</i>	Sauria: varanid (rock monitor)		Africa
<i>A. neumanni</i> (syn. <i>A. furcula</i> )	Artiodactyla: bovid (cattle, sheep, goat), cervid (red brocket, brown brocket), suid (pig), tayassuid (collard peccary, Chacoan peccary); Perissodactyla: equid (horse, donkey, mule), tapirid (tapir); Pilosa: myrmecophagid (giant anteater); Carnivora: canid (dog, Pampas fox, crab-eating fox); Primates: hominid (human)		South America
<i>A. nitidum</i> (syn. <i>A. laticaudae</i> )	Serpentes: elapid (yellow-lipped sea krait, blue-lipped sea krait)		Asia
<i>A. nodosum</i>	<p>Perissodactyla: tapirid (South American tapir); Rodentia: cuniculid (lowland paca), dasyproctid (agouti), erethizontid (Brazilian porcupine); Cingulata: chlamyphorid (six-banded armadillo); Pilosa: bradypodid (three-toed sloth, brown-throated sloth), myrmecophagid (giant anteater, lesser anteater, northern tamandua, southern tamandua); Carnivora: canid (dog); Accipitriformes: accipitrid (white-necked hawk); Caprimulgiformes: trochilid (swallow-tailed hummingbird); Columbiformes: columbid (ruddy ground dove, ruddy quail-dove, white-tipped dove); Coraciiformes: momotid (rufous-capped motmot); Cuculiformes: cuculid (greater ani, squirrel cuckoo); Passeriformes: cardinalid (red-throated ant tanager, red-crowned ant tanager, blue-black grosbeak, buff-throated saltator, green-winged saltator), conopophagid (rufous gnateater, black-cheeked gnateater), fringillid (blue-naped chlorophonia), furnariid (white-collared foliage-gleaner, white-eyed foliage-gleaner, rusty-backed spinetail, plain xenops, straight-billed woodcreeper, wedge-billed woodcreeper, narrow-billed woodcreeper, buff-throated woodcreeper, cocoa woodcreeper, scaled woodcreeper, Planalto woodcreeper), icterid (red-rumped cacique, yellow-backed oriole, shiny cowbird), parulid (golden-crowned warbler, flavescent warbler), passerellid (saffron-billed sparrow, black-striped sparrow), piprid (blue manakin, red-capped manakin, white-crowned manakin, blue-crowned manakin, white-bearded manakin, band-tailed manakin, golden-collared manakin), polioptilid (tawny-faced gnatwren), thamnophilid (scaled antbird, spotted antbird, plumbeous antbird, ocellated antbird, band-tailed antbird, white-cheeked antbird, chesnut-backed antbird, southern chesnut-tailed antbird, plain antvireo, spot-breasted antvireo, slaty antwren, southern white-fringed antwren, rusty-backed antwren, black-capped antwren, great antshrike, barred antshrike, variable antshrike, fasciated antshrike, plain-winged antshrike, rufous-winged antshrike, barred antshrike, bluish-slate antshrike, black-crowned antshrike, Planalto slaty antshrike, black-spotted bare-eye), thraupid (palm tanager, silver-beaked tanager, flame-crested tanager, white-shouldered tanager, red-shouldered tanager, white-lined tanager, gray-headed tanager, ruby-crowned tanager, black-goggled tanager, flame-crested tanager, burnished-buff tanager, golden-chevroned tanager, Brazilian tanager, Sayaca tanager, greyish saltator, buff-throated saltator, green-winged saltator, streaked saltator, chesnut-bellied seed finch, double-collared</p>		South America

	<p>seed-eater, grey seed-eater, lined seed-eater, red pileated finch, red-legged honeycreeper), tityrid (white-winged becard), troglodytid (bay wren, moustached wren, house wren), turdid (creamy-bellied thrush, rufous-bellied thrush, pale-breasted thrush, clay-coloured thrush, white-necked thrush, black-billed thrush, Swainson's thrush), tyrannid (rufous casinornis, fuscous flycatcher, sepia-capped flycatcher, brown-crested flycatcher, lesser elaenia, yellow-bellied elaenia, plain-crested elaenia, highland elaenia, olivaceous elaenia, sepia-capped flycatcher, brown-crested flycatcher, alder flycatcher, social flycatcher, Euler's flycatcher, white-throated spadebill, yellow olive flatbill, pearly-vented tody-tyrant, spotted tody-flycatcher, rusty-fronted tody-flycatcher, large-headed flatbill, olivaceous flatbill, yellow-olive flatbill); Piciformes: capitonid (gilded barbet); Strigiformes: strigid (spectacled owl); Trogoniformes: trogonid (green-backed trogon); Serpentes: boid (boa)</p>		
<p><i>A. nuttalli</i> (syn. <i>A. faiai</i>, <i>silvai</i>, <i>werneri</i>)</p>	<p>Artiodactyla: bovid (buffalo, common duiker, black duiker, royal antelope, oribi), cervid (sika deer), suid (desert warthog), tragulid (water chevrotain); Eulipotyphla: erinaceid (hedgehog); Lagomorpha: leporid (hare), ochotonid (pika); Rodentia: caviid (guinea pig), cricetid (short-tailed field vole, narrow-headed vole, tundra vole, European water vole, grey red-backed vole, northern red-backed vole, Chinese striped hamster, muskrat), hystricid (tufted-tailed porcupine), murid (house mouse, striped field mouse, Large Japanese field mouse, Eurasian harvest mouse, brown rat), sciurid (marmot, long-tailed ground squirrel, Siberian chipmunk), thryonomyid (greater cane rat); Carnivora: felid (cat, leopard, panther), herpestid (Egyptian mongoose), viverrid (civet); Chiroptera: nycterid (hairy slit-faced bat); Primates: cercopithecid (western red colobus), hominid (human); Coraciiformes: coraciid (roller); Cuculiformes: cuculid (Senegal coucal); Galliformes: numidid (black guineafowl, southern crested guineafowl, plumed guineafowl), phasianid (turkey, Clapperton's francolin, double-spurred spurfowl); Passeriformes: corvid (rook, western jackdaw), emberizid (yellow-breasted bunting, pine bunting), macrosphenid (moustached grass warbler), passerellid (Eurasian tree sparrow), turdid (olive thrush); Strigiformes: strigid (Sjostedt's barred owl); Sauria: agamid (Elmenteita rock agama), varanid (rock monitor, savannah monitor, Nile monitor); Serpentes: pythonid (ball python, Central African rock python), viperid (gaboon viper, puff adder); Testudines: pelomedusid (serrated hinged terrapin, African helmeted turtle), testudinid (leopard tortoise, mountain tortoise, Bell's hinge-back tortoise)</p>		Africa, Eurasia
<p><i>A. oblongoguttatum</i> (syn. <i>A. exophthalmum</i>, <i>vittatum</i>)</p>	<p>Artiodactyla: bovid (cattle, buffalo, water buffalo, goat), cervid (red brocket, Central American red brocket, white-tailed deer, Sinloa white-tailed deer), suid (pig), tayassuid (collared peccary, white-lipped peccary); Perissodactyla: equid (horse), tapirid (South American tapir, Baird's tapir); Cingulata: dasypodid (nine-banded armadillo); Pilosa: myrmecophagid (giant anteater, southern tamandua); Didelphimorphia: didelphid (common opossum, water opossum, gray four-eyed opossum); Pilosa: choleopodid (Hoffmann's two-toed sloth), myrmecophagid (giant anteater, northern tamandua); Rodentia: caviid (capybara, lesser capybara), cricetid (unspecified rice rat), cuniculid (lowland paca), dasyproctid (black agouti, Azara's agouti, Central American agouti), echimyid (Tome's spiny rat); Carnivora: canid (dog, coyote, gray fox, crab-eating fox), felid (cat, jaguarundi, jaguar, cougar), mustelid (tayra), procyonid (raccoon, crab-eating raccoon, white-nosed coati, South American coati); Chiroptera: phyllostomid (Seba's short-tailed bat); Primates: cebid (white-faced capuchin), hominid (human); Accipitriformes: cathartid (black vulture); Galliformes: cracid (great curassow), phasianid (chicken); Passeriformes: cotingid (Guianan cock-of-the-rock), thamnophilid (black-crowned</p>		Americas

	antshrike)		
<i>A. (Aponomma) ochraceum</i>	Sauria: gerrhosaurid (Sudan plated lizard), scincid (African striped skink); Serpentes: elapid (cobra), viperid (snouted night adder)		Africa
<i>A. (Aponomma) omissus</i>	Serpentes: colubrid (western indigo snake)		South America
<i>A. (Aponomma) orlovi</i>	Serpentes: pythonid (Burmese python)		Africa
<i>A. ovale</i> (syn. <i>A. auronitens</i> , <i>beccarii</i> , <i>confine</i> , <i>fossium</i> )	Artiodactyla: bovid (cattle), cervid (marsh deer, brown brocket, red brocket, white-tailed deer), suid (pig), tayassuid (collared peccary, white-lipped peccary); Perissodactyla: equid (horse, donkey, mule), tapirid (South American tapir, Central American tapir, Baird's tapir); Didelphimorphia: didelphid (common opossum, big-eared opossum, white-eared opossum, gray four-eyed opossum, Robinson's mouse opossum); Pilosa: bradypodid (sloth), myrmecophagid (giant anteater, southern tamandua); Cingulata: dasypodid (nine-banded armadillo); Rodentia: caviid (capybara), cricetid (montane grass mouse, russet rice rat, marsh rice rat, Amazonian marsh rat, large-headed rice rat, web-footed marsh rat, scaly-footed water rat, yellow pygmy rice rat, black-footed pygmy rice rat, hispid cotton rat, rat-headed rice rat, long-whiskered rice rat, Talamancan rice rat, short-tailed cane mouse, hamster), cuniculid (lowland paca), dasyproctid (Central American agouti, Azara's agouti), echimyid (armored rat, Colombian spiny rat, Guyenne spiny rat, Napo spiny rat, Tome's spiny rat, common punare, highlands punare, Paraguayan punare), erethizontid (Paraguayan hairy dwarf porcupine), heteromyid (Trinidad spiny pocket mouse), murid (black rat); Carnivora: canid (dog, bush dog, maned wolf, coyote, gray fox, crab-eating fox, pampas fox, Azara's fox), felid (cat, Geoffroy's cat, cougar, jaguar, jaguarundi, ocelot, oncilla, margay, panther), mephitid (striped hog-nosed skunk), mustelid (tayra, greater grison, lesser grison, neotropical river otter), procyonid (white-nosed coati, South American coati, raccoon, crab-eating raccoon); Primates: atelid (brown howler), cebid (tufted capuchin, Central American squirrel monkey), hominid (human); Accipitriformes: cathartid (black vulture); Coraciiformes: momotid (rufous motmot); Galliformes: cracid (razor-billed curassow, rusty-margined guan); Gruiformes: rallid (saracura); Passeriformes: cardinalid (ultramarine grosbeak), conopophagid (rufous gnateater), formicariid (black-faced ant-thrush), furnariid (olivaceous woodcreeper), icterid (shiny cowbird), parulid (northern waterthrush), passerellid (saffron-billed sparrow, black-striped sparrow), thamnophilid (tufted antshrike, variable antshrike, southern white-fringed antwren, chesnut-backed antbird, Berton's antbird, Planalto slaty antshrike), thraupid (yellow-bellied seedeater, ruby-crowned tanager, black-goggled tanager), tityrid (brown-winged schiffornis), troglodytid (house wren, song wren, tropical wren), turdid (white-necked thrush, creamy-bellied thrush, pale-breasted thrush, rufous-bellied thrush), tyrannid (short-crested flycatcher, tropical kingbird); Anura: bufonid (unspecified toad); Testudines (unspecified turtle) (3-host cycle)	trauma, irritation (vector for hepatozoonosis)	South America
<i>A. pacae</i> (syn. <i>A. fiebrigi</i> , <i>nigrum</i> )	Artiodactyla: suid (pig), tayassuid (white-lipped peccary); Perissodactyla: tapirid (Baird's tapir); Pilosa: myrmecophagid (southern tamandua); Rodentia: caviid (capybara), cricetid (Cerrado climbing mouse), cuniculid (lowland paca), dasyproctid (black agouti, Central American agouti), echimyid (armored rat, Tome's spiny rat); Didelphimorphia: didelphid (common opossum, brown four-eyed opossum, gray four-eyed opossum); Carnivora: canid (dog); Primates: hominid (human); Gruiformes: cariamid (seriema)		South America
<i>A. (Cernyomma) papuanum</i>	Artiodactyla: cervid (deer); Monotremata: tachyglossid (short-beaked echidna); Casuariformes: casuariid (cassowary); Columbiformes: columbid (dove); Galliformes: megapodiid (megapode)		Australia

<i>A. parkeri</i>	<p>Didelphimorphia: didelphid (common opossum, white-eared opossum); Rodentia: erethizontid (Paraguayan hairy dwarf porcupine, Brazilian porcupine); Carnivora: procyonid (South American coati); Primates: atelid (brown howler, unspecified howler monkey), pithecid (black-fronted titi); Accipitriformes: accipitrid (gray-headed kite, roadside hawk, black hawk-eagle); Caprimulgiformes: trochilid (violet-capped woodnymph); Galliformes: cracid (dusky-legged guan); Passeriformes: conopophagid (rufous gnateater, black-cheeked gnateater), furnariid (white-collared foliage-gleaner, black-capped foliage-gleaner, scaled woodcreeper, olivaceous woodcreeper, plain-winged woodcreeper), piprid (blue manakin, white-bearded manakin), thamnophilid (tufted antshrike, variable antshrike), thraupid (buff-throated saltator, ruby-crowned tanager, black-goggled tanager, sooty grassquit), troglodytid (house wren), turdid (white-necked thrush), tyrannid (sepia-capped flycatcher, grey-crowned flycatcher, short-crested flycatcher, white-throated spadebill); Strigiformes: strigid (tropical screech owl)</p>		South America
<i>A. parviscutatum</i>	Pilosa: myrmecophagid (anteater)		South America
<i>A. parvitarsum</i> (syn. <i>A. altiplanum</i> )	<p>Artiodactyla: bovid (cattle, sheep, goat), camelid (alpaca, llama, guanaco, vicuna); Perissodactyla: equid (horse); Rheiformes: rheid (greater rhea, Darwin's rhea); Sphenisciformes: spheniscid (Magellanic penguin); Sauria: liolaemid (brilliant tree iguana, black tree iguana, many-spotted tree iguana, Andes tree iguana, James's tree iguana, Muller's tree iguana, Eleonor's tree iguana, Puritama's lizard, Patricia Iturra's lizard, Caylloma smooth-throated lizard, Parinacota smooth-throated lizard)</p>		South America
<i>A. parvum</i>	<p>Artiodactyla: bovid (cattle, buffalo, sheep, goat), camelid (guanaco), cervid (white-tailed deer, brown brocket), suid (pig), tayassuid (collared peccary, Chacoan peccary); Perissodactyla: equid (horse, donkey), tapirid (South American tapir); Pilosa: bradypodid (sloth), myrmecophagid (giant anteater, southern tamandua, northern tamandua); Cingulata: chlamyphorid (giant armadillo, screaming hairy armadillo, six-banded armadillo, southern three-banded armadillo), dasypodid (nine-banded armadillo, greater long-nosed armadillo); Didelphimorphia: didelphid (white-eared opossum, Virginia opossum, agile gracile opossum, gray short-tailed opossum, Karimi's fat-tailed mouse opossum, Paraguayan fat-tailed mouse opossum); Lagomorpha: leporid (eastern cottontail); Rodentia: caviid (rock cavy, common yellow-toothed cavy, Spix's yellow-toothed cavy, Chacoan mara, capybara), chinchillid (plains viscacha), cricetid (central leaf-eared mouse, Marinho's rice rat, Mamore arboreal rice rat, hispid cotton rat), dasyproctid (Azara's agouti), echimyid (broad-headed spiny rat, common punare, highlands punare), murid (house mouse, wood rat); Carnivora: canid (dog, maned wolf, coyote, gray fox, crab-eating fox, pampas fox, gray fox), felid (cat, pampas cat, Geoffroy's cat, ocelot, cougar, jaguar, jaguarundi), mustelid (lesser grison), procyonid (raccoon, crab-eating raccoon, white-nosed coati, South American coati); Chiroptera: phyllostomid (gray short-tailed bat); Primates: cebid (tufted capuchin), hominid (human); Accipitriformes: cathartid (black vulture); Columbiformes: columbid (white-tipped dove); Passeriformes: cardinalid (ultramarine grosbeak), parulid (flavescent warbler), passerellid (rufous-collared sparrow), thamnophilid (stripe-backed antbird, great antshrike, silvery-cheeked antshrike, Caatinga antshrike, Planalto slaty antshrike), thraupid (grey pileated finch, blue dacnis, silver-beaked tanager, rufous-backed thrush, golden-billed saltator, green-winged saltator, many-coloured Chaco finch, saffron finch, double-collared seedeater, yellow-bellied seedeater), troglodytid (long-billed wren, tropical wren), turdid (creamy-bellied thrush, rufous-bellied thrush), tyrannid (rufous casiornis, fuscous flycatcher, brown-crested flycatcher, fork-tailed flycatcher, white-</p>		Americas

	rumped monjita, lesser wagtail-tyrant, great kiskadee); Serpentes: boid (boa); Testudines: testudinid (Chaco tortoise)		
<i>A. patinoi</i>	Artiodactyla: bovid (cattle); Perissodactyla: equid (horse)		South America
<i>A. pattoni</i> (syn. <i>Aponomma pseudolaeve</i> )	Artiodactyla: bovid (cattle); Carnivora: herpestid (small Indian mongoose); Sauria: varanid (monitor); Serpentes: colubrid (oriental rat snake, king rat snake, yellow-necked snake, unspecified black snake), elapid (cobra), pythonid (black-tailed python); Passeriformes: chloropseid (leafbird)		Indo-China
<i>A. paulopunctatum</i> (syn. <i>A. ovatum</i> , <i>Aponomma trimaculatum</i> )	Artiodactyla: bovid (cattle, zebu), cervid (Javan rusa), hippopotamid (hippopotamus), suid (pig, bushpig, giant forest hog); Perissodactyla: equid (horse); Proboscidea: elephantid (elephant); Rodentia: thryonomyid (cane rat); Carnivora: hyaenid (striped hyena); Primates: hominid (human); Galliformes: phasianid (fowl); Sauria: scincid (prehensile-tailed skink), varanid (mangrove monitor, black-headed monitor, emerald tree monitor, yellow-spotted monitor, Bengal monitor, Asian water monitor); Serpentes: colubrid (Indian rat snake), pythonid (amethystine python)		New Guinea, Australia
<i>A. peccarium</i>	Artiodactyla: cervid (brown brocket, red brocket), tayassuid (white-lipped peccary, collared peccary); Perissodactyla: tapirid (South American tapir); Carnivora: canid (unspecified), procyonid (white-nosed coati)		Central America
<i>A. personatum</i>	Artiodactyla: bovid (unspecified); Perissodactyla: rhinocerotid (black rhinoceros, white rhinoceros); Primates: hominid (human)		Africa
<i>A. philipi</i>	Lagomorpha: leporid (cottontail, rabbit); Carnivora: canid (coyote)		North America
<i>A. pictum</i> (syn. <i>A. conspicuum</i> )	Pilosa: myrmecophagid (giant anteater, southern tamandua); Carnivora: canid (dog)		South America
<i>A. pilosum</i>	Testudines: testudinid (Galapagos tortoise (subsp. Pinzon Island giant tortoise, Santiago Island giant tortoise))		South America
<i>A. (Aponomma) politum</i>	Serpentes: pythonid (Indian python)		Asia
<i>A. pomposum</i> (Angolan bont tick)	Artiodactyla: bovid (cattle, buffalo, forest buffalo, sheep, goat, striped antelope, sable antelope, roan antelope, duiker, suni, nyala, lechwe, oribi, eland, red hartebeest, Lichtenstein's hartebeest, greater kudu, korrugum, Uganda topi, waterbuck, steenbok, southern reedbuck, harnessed bushbuck), suid (pig, bushpig, desert warthog); Perissodactyla: equid (horse, donkey, mule, Burchell's zebra), rhinocerotid (black rhinoceros); Proboscidea: elephantid (African elephant); Rodentia: thryonomyid (greater cane rat); Carnivora: canid (dog), felid (leopard), herpestid (Angolan mongoose); Primates: cercopithecid (grivet), hominid (human); Ciconiiformes: ciconiid (stork); Sauria: agamid (unspecified) (3 host cycle)	(vector for ehrlichiosis (heartwater/cowdriosis))	Africa
<i>A. (Cernyomma) postoculatum</i>	Diprotodontia: macropodid (banded hare-wallaby); Primates: hominid (human)		Australia
<i>A. pseudoconcolor</i>	Artiodactyla: bovid (cattle, buffalo, water buffalo), cervid (brown brocket); Perissodactyla: tapirid (South American tapir); Cingulata: chlamyphorid (six-banded armadillo, southern three-banded armadillo, greater naked-tailed armadillo, southern naked-backed armadillo, greater fairy armadillo, screaming hairy armadillo, big hairy armadillo, giant armadillo, pichi), dasypodid (nine-banded armadillo, southern long-nosed armadillo); Didelphimorphia: didelphid (white-eared opossum, gray four-eyed opossum); Pilosa: myrmecophagid (giant anteater, southern tamandua); Carnivora: canid (dog), mustelid (lesser grison); Primates: hominid (human); Tinamiformes: tinamid (white-bellied nothura, spotted nothura, red-winged tinamou)		South America
<i>A. pseudoparvum</i>	Artiodactyla: bovid (cattle, goat), cervid (brown brocket); Cingulata: chlamyphorid (big hairy armadillo, southern three-banded armadillo); Lagomorpha: leporid (rabbit); Rodentia: caviid (Chacoan mara), chinchillid (plains viscacha); Carnivora: canid (dog); Primates: hominid (human)		South America
<i>A. (Aponomma)</i>	Sauria: iguanid (iguana); Serpentes: boid (Hispaniolan boa, Cuban		Central

<i>quadricavum</i>	boa, Jamacian boa), colubrid (Puerto Rican racer, Cuban racer)		America
<i>A. quadrimaculatum</i>	Sauria: varanid (Asian water monitor); Serpentes: pythonid (reticulated python)		Indonesia
<i>A. quantini</i>	Artiodactyla: bovid (buffalo)		Africa
<i>A. quasicyprium</i>	Artiodactyla: bovid (cattle); Primates: atelid (Geoffroy's spider monkey)		Mexico, Fiji
<i>A. robinsoni</i>	Sauria: varanid (Komodo dragon)		Indonesia
<i>A. romarioi</i>	Primates: pithecid (black-fronted titi); Passeriformes: cardinalid (ultramarine grosbeak, red-crowned ant tanager), conophagid (rufous gnateater), furnariid (plain xenops, rufous-breasted leaftosser, plain-winged woodcreeper, scalloped woodcreeper, olivaceous woodcreeper, lesser woodcreeper, white-eyed foliage-gleaner), parulid (golden-crowned warbler), piprid (blue manakin), thamnophilid (white-shouldered fire-eye), thraupid (black-goggled tanager, ruby-crowned tanager, Brazilian tanager), tityrid (greenish schiffornis), turdid (white-necked thrush, creamy-bellied thrush, yellow-legged thrush, pale-breasted thrush, rufous-bellied thrush), tyrannid (grey-hooded attila, sepia-capped flycatcher, white-throated spadebill)		South America
<i>A. rotundatum</i>	Artiodactyla: suid (pig); Rodentia: caviid (capybara, cavy); Cingulata: dasypodid (nine-banded armadillo); Pilosa: bradypodid (brown-throated sloth), myrmecophagid (southern tamandua); Carnivora: procyonid (South American coati); Chiroptera: phyllostomid (lesser long-tongued bat); Primates: hominid (human); Sauria: iguanid (green iguana), lacertid (ocellated lizard, European green lizard), phrynosomatid (horned lizard), scincid (greater Martinique skink, Noronha skink), teiid (green ameiva, Argentine black-and-white tegu), tropidurid (diving lizard, collared tree lizard, Amazon lava lizard, Peter's lava lizard); Serpentes: boid (boa, rainbow boa, Argentine boa, green anaconda), colubrid (black false boa, indigo snake, tiger rat snake, common green racer, Lichtenstein's green racer, Paraguay green racer, Boddart's tropical racer, Rio tropical racer, Wagler's snake, grass snake, banded cat-eyed snake, green whip snake, hognose snake, giant parrot snake, Gunther's ground snake, Lema's ground snake, Wucherer's ground snake, Neuweid's tree snake, Boettger's sipo, South American sipo, Wagler's sipo, Weid's keelback, cobra-lesma, false water cobra, false coral snake, Brazilian false coral snake, Tschudi's false coral snake), elapid (painted coral snake, South American small-eyed coral snake, short-tailed coral snake, Caatinga coral snake), pythonid (Stimson's python), viperid (urutu, fer-de-lance, whitetail lancehead, golden lancehead, Brazilian lancehead, Caatinga lancehead, Martinique lancehead, jararaca, jararacussu, jararaca pintada, Cascabel rattlesnake, South American bushmaster, South American rattlesnake); Crocodylia: alligatorid (yacare caiman, smooth-fronted caiman, broad-snouted caiman, Cuvier's dwarf caiman); Urodela: salamandrid (palmate newt); Anura: alytid (painted frog), bufonid (South American common toad, cane toad, southern toad, granular toad, lesser granulated toad, Chaco granulated toad, crucifer toad, cururu toad, yellow cururu toad, jimi toad, ornate forest toad, rococo toad, common midwife toad, yellow-bellied toad, striped toad, smooth-sided toad, natterjack toad, Gild's toad, Rio Parahyba toad, European green toad, beaked toad), leptodactylid (smoky jungle frog, Cuyaba dwarf frog), pipid (Suriname toad), ranid (common frog, edible frog), scaphiopodid (plains spadefoot toad); Testudines: chelid (Argentine snake-necked turtle, Vanderhaege's toad-headed turtle, twist-necked turtle, tuberculate toadhead turtle), emydid (European pond turtle, D'Orbigny's slider), geoemydid (yellow-headed temple turtle, furrowed wood turtle), kinosternid (scorpion mud turtle), podocnemid (yellow-spotted river turtle, Arrau turtle), testudinid (red-footed tortoise, yellow-footed tortoise, Chaco tortoise, Greek tortoise)		Americas

<i>A. rugosum</i>	Serpentes: viperid (puff adder); Testudines: testudinid (leopard tortoise)		Africa
<i>A. sabanerae</i>	Didelphimorphia: didelphid (common opossum, brown four-eyed opossum, gray four-eyed opossum, Robinson's mouse opossum); Rodentia: cricetid (Talamacan rice rat), echimyid (armored rat, Tome's spiny rat); Carnivora: canid (dog), procyonid (crab-eating raccoon); Primates: hominid (human); Columbiformes: columbid (ruddy quail-dove); Passeriformes: piprid (white-collared manakin), thamnophilid (white-cheeked antbird, black-crowned antshrike); Sauria: iguanid (green iguana); Serpentes: boid (boa), colubrid (Cope's parrot snake); Testudines: emydid (pond slider, common box turtle, Mexican box turtle, Yucatan box turtle), geoemydid (large-nosed wood turtle, brown wood turtle, black wood turtle, painted wood turtle, furrowed wood turtle, spot-legged wood turtle, Colombian wood turtle, black terrapin), kinosternid (scorpion mud turtle); Anura: bufonid (forest toad)		South America
<i>A. sculpturatum</i> (syn. <i>A. latepunctatum</i> , <i>myrmecophagae</i> )	Artiodactyla: suid (pig), tayassuid (white-lipped peccary); Perissodactyla: tapirid (South American tapir); Didelphimorphia: didelphid (common opossum); Pilosa: myrmecophagid (giant anteater); Rodentia: caviid (capybara), cuniculid (lowland paca), dasyproctid (black agouti, Azara's agouti); Carnivora: canid (dog), felid (jaguar); Primates: hominid (human)		South America
<i>A. sculptum</i>	Artiodactyla: bovid (cattle, buffalo, sheep), cervid (marsh deer, red brocket, brown brocket), suid (pig), tayassuid (collared peccary, white-lipped peccary); Perissodactyla: equid (horse, donkey, mule), tapirid (South American tapir); Didelphimorphia: didelphid (white-eared opossum, big-eared opossum, agile gracile opossum, southeastern four-eyed opossum); Pilosa: bradypodid (maned sloth, brown-throated sloth), myrmecophagid (giant anteater, southern tamandua); Cingulata: chlamyphorid (southern naked-tailed armadillo, six-banded armadillo, Brazilian three-banded armadillo, giant armadillo), dasypodid (nine-banded armadillo); Lagomorpha: leporid (common tapeti); Rodentia: caviid (capybara), chinchillid (plains viscacha), cricetid (large vesper mouse, Cerrado climbing mouse, Paraguayan rice rat, highlands punare), dasyproctid (Azara's agouti), erethizontid (Brazilian porcupine, Paraguayan hairy dwarf porcupine); Carnivora: canid (dog, bush dog, maned wolf, hoary fox, crab-eating fox), felid (cat, jaguar, cougar, ocelot), mephitid (striped hog-nosed skunk), procyonid (crab-eating raccoon, South American coati); Primates: atelid (brown howler), hominid (human); Accipitriformes: accipitrid (black-collared hawk, short-tailed hawk, savannah hawk, roadside hawk, Harris's hawk, Chaco eagle, black hawk-eagle, small kite), cathartid (black vulture); Caprimulgiformes: caprimulgid (little nightjar); Caraiamiformes: cariamid (red-legged seriema); Falconiformes: falconid (crested caracara, yellow-headed caracara, American kestrel); Galliformes: cracid (red-billed curassow, bare-faced curassow, dusky-legged guan); Gruiformes: aramid (limpkin); Passeriformes: furnariid (plain-winged woodcreeper), thraupid (ruby-crowned tanager), turdid (pale-breasted thrush); Pelecaniformes: threskiornithid (buff-necked ibis); Psittaciformes: psittacid (turquoise-fronted amazon); Rheiformes: rheid (greater rhea); Strigiformes: strigid (striped owl, tropical screech owl), tytonid (barn owl); Sauria: iguanid (green iguana), teiid (Argentine black-and-white tegu)	(vector for rickettsiosis)	South America
<i>A. scutatum</i>	Artiodactyla: cervid (white-tailed deer); Pilosa: myrmecophagid (giant anteater); Didelphimorphia: didelphid (large American opossum, diminutive opossum); Rodentia: dasyproctid (orange agouti); Chiroptera: noctilionid (lesser bulldog bat); Accipitriformes: cathartid (turkey vulture, black vulture); Sauria: iguanid (green iguana, northeastern spiny-tailed iguana, black spiny-tailed iguana, Mexican spiny-tailed iguana), teiid (South American ground lizard); Serpentes: boid (boa), colubrid (western		South America

	indigo snake), viperid (Martinique lancehead); Anura: bufonid (Cuban toad)		
<i>A. serpentinum</i>	Serpentes: pythonid (Burmese python)		
<i>A. (Aponomma) soembawense</i>	Sauria: varanid (Asian water monitor); Serpentes: pythonid (reticulated python)		Indonesia
<i>A. sparsum</i> (syn. <i>A. schlottkei</i> , <i>wernerii</i> , <i>poematium</i> )	Artiodactyla: bovid (cattle, buffalo, eland), camelid (dromedary), giraffid (giraffe), suid (warthog); Perissodactyla: rhinocerotid (black rhinoceros); Proboscidea: elephantid (elephant); Macroscelidea: macroscelidid (elephant shrew); Lagomorpha: leporid (scrub hare, Natal red rock hare); Tubulidentata: orycteropid (aardvark); Rodentia: hystricid (crested porcupine, African brush-tailed porcupine); Carnivora: felid (lion); Primates: hominid (human); Coraciiformes: upupid (Eurasian hoopoe); Galliformes: numidid (guineafowl); Passeriformes: viduid (indigobird); Sauria: agamid (unspecified), iguanid (iguana), varanid (Nile monitor, savannah monitor); Serpentes: colubrid (yellow rat snake, chicken snake), pythonid (Central African rock python), viperid (puff adder); Testudines: testudinid (Greek tortoise, Mediterranean spur-thighed tortoise, leopard tortoise)	(vector for ehrlichiosis (heartwater))	Africa
<i>A. sphenodonti</i> (syn. <i>Aponomma ludovici</i> )	Rhynchocephalia: sphenodontid (tuatara); Sauria: gekkonid (Duvaucel's gecko)		New Zealand
<i>A. splendidum</i>	Artiodactyla: bovid (cattle, zebu, buffalo, forest buffalo, sheep, goat, bay duiker, Maxwell's duiker, roan antelope, royal antelope, Bate's dwarf antelope, eland, waterbuck), suid (pig, red river hog); Proboscidea: elephantid (elephant); Rodentia: thryonomyid (greater cane rat); Carnivora: canid (dog); Galliformes: numidid (helmeted guineafowl), phasianid (turkey, double-spurred spurfowl)		Africa
<i>A. squamosum</i>	Sauria: varanid (mangrove monitor)		Guam
<i>A. strobilii</i>	Perissodactyla: tapirid (South American tapir)		Central America
<i>A. sublaeve</i>	Pholidota: manid (Chinese pangolin, Sunda pangolin); Carnivora: hyaenid (striped hyena); Chiroptera: vespertilionid (pipistrelle); Sauria: scincid (unspecified), varanid (Asian water monitor); Serpentes: pythonid (black-tailed python); Testudines: geoemydid (tricarinate hill turtle)		Asia
<i>A. superbum</i>	Artiodactyla: bovid (cattle)		Africa
<i>A. supinoi</i>	Carnivora: herpestid (small Asian mongoose); Rodentia: hystricid (porcupine); Sauria: varanid (Bengal monitor); Testudines: geoemydid (spiny turtle, Indian black turtle), testudinid (elongated tortoise)		Asia
<i>A. sylvaticum</i> (syn. <i>Ixodes</i> )	Artiodactyla: cervid (white-tailed deer); Rodentia: murid (mouse); Sauria: agamid (southern spiny agama), lacertid (Knox's desert lizard); Serpentes: pseudaspidid (mole snake); Testudines: testudinid (angulate tortoise, tent tortoise, common padloper, southern speckled padloper, geometric tortoise)		Africa
<i>A. tapirellum</i>	Artiodactyla: bovid (cattle), cervid (white-tailed deer), suid (pig), tayassuid (collared peccary, white-lipped peccary); Perissodactyla: equid (horse), tapirid (Baird's tapir); Didelphimorphia: didelphid (common opossum); Pilosa: myrmecophagid (giant anteater); Rodentia: caviid (capybara), dasyproctid (Central American agouti); Carnivora: canid (dog), felid (cat), procyonid (white-nosed coati, raccoon); Chiroptera: phyllostomid (Seba's short-tailed bat); Primates: hominid (human)		Central America
<i>A. tenellum</i> (syn. <i>A. imitator</i> )	Artiodactyla: bovid (cattle, sheep, goat), cervid (white-tailed deer), tayassuid (collared peccary); Perissodactyla: equid (horse, donkey, mule); Didelphimorphia: didelphid (opossum); Rodentia: sciurid (Mexican gray squirrel); Carnivora: canid (dog); Primates: hominid (human); Cuculiformes: cuculid (greater roadrunner); Galliformes: phasianid (turkey); Passeriformes: emberizid (bunting), turdid (thrush)		Americas
<i>A. (Aponomma) tenimberense</i>	Sauria: varanid (mangrove monitor)		Indonesia

<p><i>A. testudinarium</i> (syn. <i>A. distinctum</i>, <i>fallax</i>, <i>infestum</i>, <i>I.</i> <i>auriscuclellatus</i>)</p>	<p>Artiodactyla: bovid (cattle, banteng, nelore, zebu, buffalo, water buffalo, sheep, guar, goat, Japanese serow, Taiwan serow), cervid (Indian muntjac, sambar deer), suid (pig, bushpig, banded pig, wild boar, Celebes warty pig, Javan warty pig, Philippine warty pig, Bornean bearded pig), tragulid (mouse-deer); Perissodactyla: equid (horse), rhinocerotid (Javan rhinoceros, Sumatran rhinoceros), tapirid (Malayan tapir); Proboscidea: elephantid (elephant); Pholidota: manid (long-tailed pangolin, Chinese pangolin); Scandentia: tupaiid (common treeshrew); Rodentia: hystricid (Indian crested porcupine, Philippine porcupine), murid (Bower's white-toothed rat), sciurid (Culion tree squirrel, parti-coloured flying squirrel, white-bellied giant flying squirrel); Carnivora: canid (dog, golden jackal), felid (tiger), herpestid (Javan mongoose), hyaenid (striped hyena), mephitid (Palawan stink-badger), mustelid (Burmese ferret-badger), viverrid (Asian palm civet); Primates: hominid (human), hylobatid (Hoolock gibbon); Charadriiformes: scolopacid (sandpiper); Galliformes: phasianid (chicken); Passeriformes: corvid (raven); Sauria: varanid (monitor); Serpentes: colubrid (tiger keelback, steppes ratsnake), pythonid (python), viperid (ussuri pit viper); Testudines: emydid (pond turtle); Anura: microhylid (ornate chorus frog)</p>		<p>Indo-China, Asia</p>
<p><i>A. tholloni</i></p>	<p>Artiodactyla: bovid (cattle, buffalo, sheep, goat, antelope, dorcas gazelle), hippopotamid (hippopotamus), suid (pig, bushpig, red river hog); Perissodactyla: equid (horse), rhinocerotid (black rhinoceros, white rhinoceros); Proboscidea: elephantid (African elephant); Carnivora: canid (dog), felid (leopard), herpestid (banded mongoose); Primates: hominid (human); Accipitriformes: accipitrid (hawk); Musophagiformes: musophagid (turaco); Passeriformes: pittid (green-breasted pitta); Sauria: chamaeleonid (graceful chameleon); Testudines: testudinid (Bell's hinge-back tortoise, Speke's hinge-back tortoise, leopard tortoise)</p>		<p>Africa</p>
<p><i>A. tigrinum</i> (syn. <i>A.</i> <i>complanatum</i>)</p>	<p>Artiodactyla: bovid (cattle, sheep, goat), cervid (marsh deer, brown brocket), suid (pig), tayassuid (peccary); Perissodactyla: equid (horse); Rodentia: caviid (common yellow-toothed cavy, Spix's yellow-toothed cavy, capybara), cricetid (dolorous grass mouse, Molina's grass mouse, Spegazzini's grass mouse, small vesper mouse, drylands vesper mouse, Cordoba vesper mouse, central leaf-eared mouse, yellow-rumped leaf-eared mouse, fulvous pygmy rice rat, long-tailed pygmy rice rat, Argentine bolo mouse), murid (black rat); Cingulata: dasypodid (armadillo); Carnivora: canid (dog, maned wolf, crab-eating fox, culpeo, pampas fox, South American gray fox, hoary fox), felid (cat, ocelot, cougar, jaguar), procyonid (South American coati); Primates: hominid (human); Columbiformes: columbid (Picui ground dove, eared dove); Cuculiformes: cuculid (guira cuckoo); Galliformes: odontophorid (California quail); Passeriformes: furnariid (short-billed canastero, lark-like brushrunner, crested hornero, rufous hornero, brown cacholote, pale-breasted spinetail, Chaco earthcreeper, scimitar-billed woodcreeper), ictericid (grayish baywing, shiny cowbird), passerellid (Chaco sparrow, rufous-collared sparrow), polioptilid (masked gnatcatcher), rhinocryptid (crested gallito), thraupid (red pileated finch, black-crested finch, ringed warbling finch, red-crested cardinal, saffron finch, many-coloured Chaco finch, grassland yellow finch, golden-billed saltator, Brazilian tanager, blue-black grassquit), troglodytid (house wren), turdid (creamy-bellied thrush), tyrannid (great kiskadee); Strigiformes: strigid (striped owl); Tinamiformes: tinamid (elegant crested tinamou, red-winged tinamou, Chilean tinamou, spotted nothura)</p>	<p>(vector for rickettsiosis and possibly Q fever)</p>	<p>South America</p>
<p><i>A. tonelliae</i></p>	<p>Artiodactyla: bovid (cattle), cervid (brocket deer), tayassuid (collared peccary, white-lipped peccary, Chacoan peccary); Perissodactyla: equid (horse); Pilosa: myrmecophagid (giant anteater, southern tamandua); Rodentia: caviid (capybara); Carnivora: canid (dog), felid (cougar); Primates: hominid (human)</p>	<p>(possible vector for rickettsiosis)</p>	<p>South America</p>

<i>A. torrei</i>	Sauria: iguanid (Cuban rock iguana, northern Bahamian rock iguana, Mona ground iguana, Cayman Island brown iguana), tropidurid (Cuban side-blotched curlytail); Anura: bufonid (toad)		Americas
<i>A. (Aponomma) transversale</i> (syn. <i>I. globulus, transversalis</i> )	Artiodactyla: bovid (sable antelope); Serpentes: boid (boa), pythonid (Central African rock python, ball python, Asian python)		Africa
<i>A. (Cernyomma) triguttatum</i> (incl. subspp. <i>ornatissimum, queenslandicus, rosei, triguttatum</i> ) (ornate kangaroo tick)	Artiodactyla: bovid (cattle, zebu, sheep, goat), suid (pig); Perissodactyla: equid (horse); Monotremata: ornithorhynchid (platypus), tachyglossid (short-beaked echidna); Dasyuromorphia: myrmecobiid (numbat); Diprotodontia: macropodid (eastern grey kangaroo, western grey kangaroo, common wallaroo, red kangaroo, black-striped wallaby, agile wallaby, tammar wallaby, swamp wallaby, bridled nailtail wallaby), phascolarctid (koala), potoroid (northern bettong); Lagomorpha: leporid (rabbit); Rodentia: murid (black rat); Carnivora: canid (dog, dingo), felid (cat); Primates: hominid (human); Sauria: scincid (sleepy lizard) (3-host cycle)	trauma, irritation	Australia
<i>A. triste</i>	Artiodactyla: bovid (cattle, goat), cervid (marsh deer, brocket deer, pampas deer), suid (pig); Perissodactyla: equid (horse), tapirid (South American tapir); Didelphimorphia: didelphid (common opossum, yellow-sided opossum, gray short-tailed opossum, agile gracile opossum); Pilosa: myrmecophagid (giant anteater); Rodentia: caviid (Brazilian guinea pig, capybara), cricetid (Azara's grass mouse, large vesper mouse, delicate vesper mouse, unspecified climbing mouse, web-footed marsh rat, Amazonian marsh rat, hairy-tailed bolo mouse, dark bolo mouse, yellow pygmy rice rat, black-footed pygmy rice rat, Marinho's rice rat, long-nosed hocicudo, spy hocicudo, red hocicudo, Argentine swamp rat, Waterhouse's swamp rat), echimyid (common punare); Carnivora: canid (dog, maned wolf, crab-eating fox, hoary fox), felid (cat, pampas cat, jaguar, jaguarundi, cougar); Chiroptera: vespertilionid (silver-tipped myotis); Primates: hominid (human); Gruiformes: rallid (russet-crowned crane); Passeriformes: furnariid (pale-legged hornero, rufous hornero, greater thornbird), passerellid (rufous-collared sparrow), thraupid (black-and-rufous warbling finch, double-collared seedeater), turdid (rufous-bellied thrush)		Americas
<i>A. tuberculatum</i>	Artiodactyla: bovid (cattle), cervid (white-tailed deer); Lagomorpha: leporid (cottontail); Rodentia: sciurid (gray squirrel, Sherman's fox squirrel, southeastern pocket gopher); Carnivora: canid (dog, red fox, gray fox); Primates: hominid (human); Accipitriformes: accipitrid (unspecified hawk); Falconiformes: falconid (American kestrel); Galliformes: phasianid (chicken); Passeriformes: sturnid (southern meadowlark), turdid (hermit thrush); Strigiformes: strigid (unspecified owl); Sauria: phrynosomatid (eastern fence lizard); Testudines: emydid (diamondback terrapin), testudinid (gopher tortoise)		South America
<i>A. uncatum</i>	Pilosa: myrmecophagid (southern tamandua)		South America
<i>A. usingeri</i>	Sauria: iguanid (Galapagos land iguana); Testudines: testudinid (Galapagos tortoise (3 subspp. Volcan Wolf giant tortoise, Darwin volcano giant tortoise, Alcedo volcano giant tortoise); Primates: hominid (human)		Galapagos Islands
<i>A. (Aponomma) varanense</i> (syn. <i>Aponomma fraudigerum, lucasi</i> )	Artiodactyla: bovid (gaya, bharal), suid (Indian boar); Pholidota: manid (Sunda pangolin); Carnivora: canid (dog, jackal), herpestid (short-tailed mongoose), mustelid (smooth-coated otter), viverrid (small-toothed palm civet); Sauria: agamid (sailfin lizard), varanid (desert monitor, mangrove monitor, clouded monitor, roughneck monitor, Asian water monitor, Bengal monitor, Dumeril's monitor); Serpentes: boa (Russell's boa), colubrid (mangrove snake, Oriental rat snake), elapid (king cobra, Indian cobra, banded krait, Indian krait), pythonid (reticulated python, Indian python), viperid (Russell's viper); Testudines: geoemydid (Amboina box turtle)		Africa
<i>A. variegatum</i>	Artiodactyla: bovid (cattle, zebu, gaur, buffalo, water buffalo,	trauma, irritation	Africa,

<p>(syn. <i>A. elegans</i>, <i>venustum</i>) (variegated/tropical bont tick)</p>	<p>sheep, goat, eland, giant eland, klipspringer, southern reedbuck, Bohor reedbuck, bushbuck, harnessed bushbuck, steenbok, waterbuck, blackbuck, roan antelope, sable antelope, blue wildebeest, hartebeest, Lelwel hartebeest, Lichtenstein's hartebeest, tiang, impala, nyala, common duiker, blue duiker, red-flanked duiker, red-fronted gazelle, Arabian gazelle, Bright's gazelle, Grant's gazelle, Thomson's gazelle, forest antelope, long-snouted dikdik, Gunther's dikdik, Kirk's dikdik, Roosevelt's duikerbok, oribi, nyala, lechwe, kob, topi, tiang, korrigum, suni, tsessebe, sitatunga, greater kudu, kongoni), camelid (dromedary), cervid (sambar deer), giraffid (giraffe), suid (pig, bushpig, red river hog, warthog); Perissodactyla: equid (horse, donkey, mule, plains zebra, Burchell's zebra), rhinocerotid (white rhinoceros, black rhinoceros); Proboscidea: elephantid (African bush elephant); Tubulidentata: orycteropodid (aardvark); Eulipotyphla: erinaceid (four-toed hedgehog, North African hedgehog, Sudanese hedgehog); Pholidota: manid (ground pangolin); Lagomorpha: leporid (savannah hare, Cape hare); Afrosoricida: tenrecid (tailless tenrec, Madagascar tenrec); Rodentia: hystricid (Indian crested porcupine), murid (house mouse, black rat, yellow-spotted brush-furred rat, gracile tateril), sciurid (striped ground squirrel), thryonomyid (greater cane rat); Carnivora: canid (dog, African wolf, Arabian wolf, golden jackal, silver jackal, long-eared fox, bat-eared fox, Arabian red fox), felid (cat, leopard, cheetah, lion, serval), herpestid (common slender mongoose, white-tailed mongoose, Egyptian mongoose, small Indian mongoose), hyaenid (spotted hyena), viverrid (civet, Cape genet); Primates: cercopithecoid (patas monkey, mona monkey, grivet), galagid (brown greater galago, Senegal bushbaby), hominid (human); Accipitriformes: accipitrid (long-legged buzzard, hooded vulture, white-backed vulture); Anseriformes: anatid (muscovy duck, white-faced whistling duck, spur-winged goose); Bucerotiformes: bucerotid (African grey hornbill, Abyssinian ground hornbill); Columbiformes: columbid (common ground dove); Cuculiformes: cuculid (Malagasy coucal, Senegal coucal); Galliformes: numidid (helmeted guineafowl), phasianid (chicken, double-spurred spurfowl, Clapperton's francolin, yellow-necked spurfowl, turkey); Otidiformes: otidid (black-bellied bustard, long-legged bustard); Passeriformes: acanthizid (grey thornbill, ground thornbill), icterid (Carib grackle), laniid (black-crowned tchagra), malaconotid (black-crowned tchagra), muscicapid (sooty chat), thraupid (black-faced grassquit); Pelecaniformes: ardeid (cattle egret), ciconiid (Abdim's stork), pelecanid (brown pelican); Strigiformes: strigid (Verreaux's eagle-owl); Struthioniformes: struthionid (ostrich); Sauria: chamaeleonid (panther chameleon, African chameleon), varanid (Nile monitor); Serpentes: viperid (puff adder, Somali puff adder) (3-host cycle)</p>	<p>(vector for ehrlichiosis, Q fever, rickettsial African tick bite fever, theileriosis, Nairobi sheep disease virus, tularaemia, Crimean-Congo haemorrhagic fever, dermatophilosis)</p>	<p>Caribbean</p>
<p><i>A. varium</i></p>	<p>Artiodactyla: bovid (steenbok), tayassuid (peccary); Pilosa: bradypodid (pale-throated sloth, brown-throated sloth, maned sloth), choleopodid (Linnaeus's two-toed sloth, Hoffman's two-toed sloth), myrmecophagid (southern tamandua); Didelphimorphia: didelphid (common opossum, Eaton's opossum); Rodentia: caviid (cavy), dasyproctid (red-rumped agouti), echimyid (Tome's spiny rat); Carnivora: canid (dog), procyonid (white-nosed coati); Columbiformes: columbid (grey-fronted dove); Passeriformes: cardinalid (red-throated ant tanager), furnariid (buff-throated foliage-gleaner, plain-brown woodcreeper, wedge-billed woodcreeper, buff-throated woodcreeper), icterid (shiny cowbird), piprid (red-capped manakin, golden-collared manakin, pale-bellied tyrant-manakin), thamnophilid (white-cheeked antbird), troglodytid (song wren), turdid (orange-billed nightingale-thrush), tyrannid (golden-faced tyrannulet); Piciformes: buconid (white-whiskered puffbird); Sauria: iguanid (northeastern spinytail iguana);</p>		<p>South America</p>

	Serpentes: boid (boa, green anaconda); Anura: bufonid (cane toad)		
<i>A. venezuelense</i>	Pilosa: myrmecophagid (southern tamandua)		South America
<i>A. versicolor</i>	Perissodactyla: equid (horse)		Mexico
<i>A. (Cernyomma) vikirri</i>	Sauria: scincid (Gidgee skink, Stokes's skink, sleepy lizard)		Australia
<i>A. williamsi</i>	Sauria: iguanid (Galapagos land iguana, unspecified sea iguana)		Galapagos Islands
<i>A. yajimai</i>	Artiodactyla: bovid (cattle, buffalo, water buffalo)		Taiwan
<i>A. yucumense</i>	Didelphimorphia: didelphid (big-eared opossum); Rodentia: cricetid (montane grass mouse, russet rice rat, rat-headed rice rat, hociucudo)		South America

**Parasite morphology:** *Amblyomma* spp. form 4 distinct types of morphological stages during their development: eggs; larvae; nymphs; and adults. Eggs are glossy brown oval stages measuring 0.4-0.5 mm long and they occur in large clusters. Larvae (also known as seed ticks) are discoidal (round flattened) stages measuring 0.5-1.0 mm long and they are usually pale yellow-brown in colour. They have an anterior capitulum (head) with long forwardly-projecting palps and mouthparts. The posterior idiosoma (body) has a sclerotized dorsal shield (scutum), lateral eyes, posterior festoons and 6 long ventral legs. Larvae lack respiratory stigmata and tracheae, and the anus does not yet have a posterior groove. Nymphs are also discoidal stages measuring 1.5-2.5 mm long and they are usually darker brown in colour with irregular coloured patterns on their dorsal surfaces. The capitulum has a subrectangular basis capitulum and long palps, and the idiosoma has a dorsal scutum, lateral eyes, posterior festoons and the ventral anus now has a posterior anal groove. Nymphs have 8 long ventral legs and a pair of lateral respiratory stigmata surrounded by rounded plates. Adults are large robust ticks with oval dorsal profiles but are somewhat dorsoventrally flattened when unfed (different species range in length from 3-10 mm long when unfed). However, female ticks may swell enormously in size when engorging with blood, forming large globular sacs up to 20 mm long. *Amblyomma* ticks are usually quite distinctive due to their highly ornate bodies and long banded legs. Females are often brown in colour when unfed, but may change to blue-grey to black when engorged, while males usually remain pale orange to brown. Both sexes have a hardened sclerotized shield or plate (scutum) on the anterior dorsal surface of the idiosoma (almost completely covering males (= conscutum) but restricted to an anterior shield in females). The scutum contains elaborate patterns of coloured iridescent enamel ranging from white-cream to orange to pink-red depending on species. Adults have an anterior capitulum that is visible from above (whereas argasids have a ventral capitulum not visible from above). The capitulum comprises the basis capitulum (integumental ring encircling mouthparts) and the gnathosoma bearing the mouthparts (palps, chelicerae and hypostome), but lacks antennae (like all ticks). The basis capitulum is rectangular (sometimes subtriangular) with straight lateral margins (not triangular like *Ixodes*, nor hexagonal like *Rhipicephalus/Boophilus*, nor pentagonal like *Bothriocroton*). On females, the dorsal surface of the basis capitulum bears 2 porose areas (clusters of pores) which are used to help waterproof eggs. The mouthparts are long and well-adapted for piercing skin and sucking blood. The lateral palps are segmented and have long second segments and short third segments. The palps are sensory structures that move laterally and do not enter the skin when feeding. The chelicerae are specialized cutting structures with long curved shafts terminating in cutting digits with recurved teeth. They are used horizontally to cut a channel in skin ripping and tearing flesh to form small pools of blood. The central barbed hypostome is then inserted in the pools to facilitate feeding as well as to help anchor the tick to the host. A feeding tube (buccal canal) is formed dorsally by the chelicerae and ventrally by the hypostome and used to ingest blood as well as to inject saliva from long paired salivary glands. Blood is sucked up by a muscular pharynx (with pharyngeal valve) and delivered via a short tubular oesophagus to the large saccular midgut (ventriculus) with several pairs of blind-ending lateral diverticula (caeca) often looped or branched. Waste material from the midgut and from excretory Malpighian tubules is collected into a rectal sac that opens to the ventral subterminal anus. The anus has a posterior (metastrate) anal groove (whereas *Ixodes* has anterior (prostrate) anal groove). The posterior body margin has a series of grooves (festoons) which impart a toothed appearance (unclear in engorged females). In some species (e.g. *A. hebraeum*) the festoons have pale enamel colourings, whereas other species (e.g. *A. variegatum*) have no festoon enamelling. *Amblyomma* spp. also have a pair of simple (convex or flat) eyes located laterally on the scutum. However, members of the subgenus *A. (Aponomma)* (comprising former *Aponomma* spp.) lack eyes, and are sometimes referred to as eyeless *Amblyomma* spp. All adult ticks have 8 long well-developed legs arising from the ventral idiosoma. The legs are jointed and have 6 segments (coxae, trochanter, femur, patella (genu), tibia and tarsus), all terminating in a pair of claws and a pad-like pulvillus (the latter absent in argasids). The legs of most species are banded, with pale rings around the distal ends of central segments. Both sexes have a long external spur and a short internal spur on coxae I (argasid coxae without spurs), and they have a sensory structure (Haller's organ) located on dorsal tarsi I which is used to detect odours, body heat and vibrations. Adults also have respiratory stigmata with large rounded plates located behind coxae IV (cf. argasids have small stigmata between coxae III). Adults display marked sexual dimorphism in body size (females are larger, especially when engorged), scutal plates (small in females, large in males), and secretory structures (females with porose areas). Males also have ventral plaques which are more or less indistinct sclerotized plates just anterior to the ventral scutes, but they do not have distinct adanal shields (like *Rhipicephalus/Boophilus* and *Hyalomma*) and the ventral plaques are lacking in the eyeless *Amblyomma* spp. Males have paired tubular testes connected by vas efferentia to a common vas deferens (with a large multilobed accessory gland) leading to the ejaculatory duct. The genital opening (gonopore) is situated on the ventral midbody and has a sclerotized flap (genital apron) but no external genitalia. Males produce packets of spermatids (spermatophores) which are transferred to females. Adult female ticks have a single saccular ovary with paired oviducts connecting to the common uterus which has tubular accessory glands (including Gene's organ) which secrete coatings to waterproof eggs. The vagina has a cervical region that acts as receptaculum seminis (to store spermatophores) and a

vestibular region (that prolapses during oviposition). The gonopore is V- or U-shaped and is located on the ventral midbody and partly covered by an anterior genital apron.

**Site of infection:** All motile developmental stages (larvae, nymphs and adults) are ectoparasitic on a range of vertebrate hosts. Infestations have been reported on reptiles (16 lizard families, 12 snake families, 10 tortoise families, 2 crocodile families), amphibians (7 frog families, one newt family), birds (35 passerine families, 54 non-passerine families belonging to 28 orders, including waterfowl, seabirds, shore birds, terrestrial birds, forest birds and birds of prey) and mammals (69 families belonging to 20 orders, including ungulates, insectivores, marsupials, monotremes, lagomorphs, rodents, carnivores, bats and primates). Most species have broad host ranges, although different developmental stages seem to have host preferences, with larvae and nymphs generally infesting small ground-dwelling animals, while adults are also able to infest larger animals. Ticks usually infest skin with plentiful folds and sparse coverings of hair, feathers or scales, notably the ears, axillae and udders, but they may be found on other body regions during heavy infestations.

**Pathogenesis:** *Amblyomma* spp. are haematophagous parasites that require bloodmeals in order to develop further and complete their life-cycles. Larvae, nymphs and adults feed on blood before dropping off to digest their meals, moult to the next stage or to lay eggs. All developmental stages feed once to repletion over several days. They have long mouthparts that inflict painful bites as their chelicerae rip and tear tissues creating blood pools into which they insert their hypostomes (feeding process known as telmophagy). They attach firmly during feeding using a salivary cement that helps create a feeding lesion in the dermis. Tick saliva also contains many vaso-active compounds with analgesic, anticoagulatory, vasodilatory and vascular permeability properties. Heavy infestations may cause significant blood loss resulting in anaemia and sometimes jaundice. Tick bites cause local tissue trauma with irritation, inflammation, erythema, oedema, pruritus, focal necrosis and granuloma formation. Some hosts may exhibit allergic or hypersensitivity reactions to tick saliva which heightens inflammation and granuloma formation (sometimes causing a deformity in the ears of cattle known as gotch ear). Animals exhibit biting-stress (tick worry) and attempt to groom by licking, biting, scratching, rubbing affected areas, often worsening wounds and making them susceptible to secondary infections by bacteria, or screwworms and other myiasis flies. Livestock are distracted from feeding efficiently and may exhibit production losses due to anorexia, poor growth, reduced weight gain, reduced milk production and the decreased value of hides due to bites and granulomas. Some species (e.g. *A. americanum*) have also been associated with tick paralysis in people and dogs, where neurotoxins in the saliva cause motor paralysis with muscular paresis, incoordination, and sometimes respiratory abnormalities. The species *A. variegatum* has also been found to cause transient immuno-suppression in sheep and cattle, allowing bacteria skin infections to flourish resulting in dermatophilosis (lumpy wool, foot rot). Feeding ticks may act as efficient biological or mechanical vectors for the transmission of various infectious microbial diseases, with transmission occurring during feeding (via saliva), during fluid regulation (via regurgitation) or during waste elimination (via defaecation). Some microbes may multiply in tick tissues (amplification vectors), most survive tick metamorphic changes (trans-stadial transmission), and some are even transferred vertically to tick eggs (trans-ovarian transmission). Various tick species have been shown to transmit haemoprotozoan parasites causing babesiosis (tick fever) and theileriosis; rickettsial bacteria causing heartwater (cowdriosis), monocytic and granulocytic ehrlichioses, spotted fevers, African tick bite fever, and anaplasmosis; spirochaetes causing borreliosis, Lyme disease, and southern tick-associated rash illness; proteobacteria causing coxiellosis (Q fever); coccobacilli causing tularemia; viruses causing yellow fever and Crimean-Congo haemorrhagic fever, as well as a range of arthropod-borne (arbo-) viruses (e.g. Dugbe, Thogoto, Bhanja, Jos and Heartland viruses). Ticks bites by *A. americanum* have also been associated with predisposing humans to red meat allergies (called alpha-gal syndrome) by transferring carbohydrate allergens (galactose-alpha-1,3-galactose) resulting in delayed urticarial or anaphylactic reactions when the body becomes overloaded with IgE antibodies.

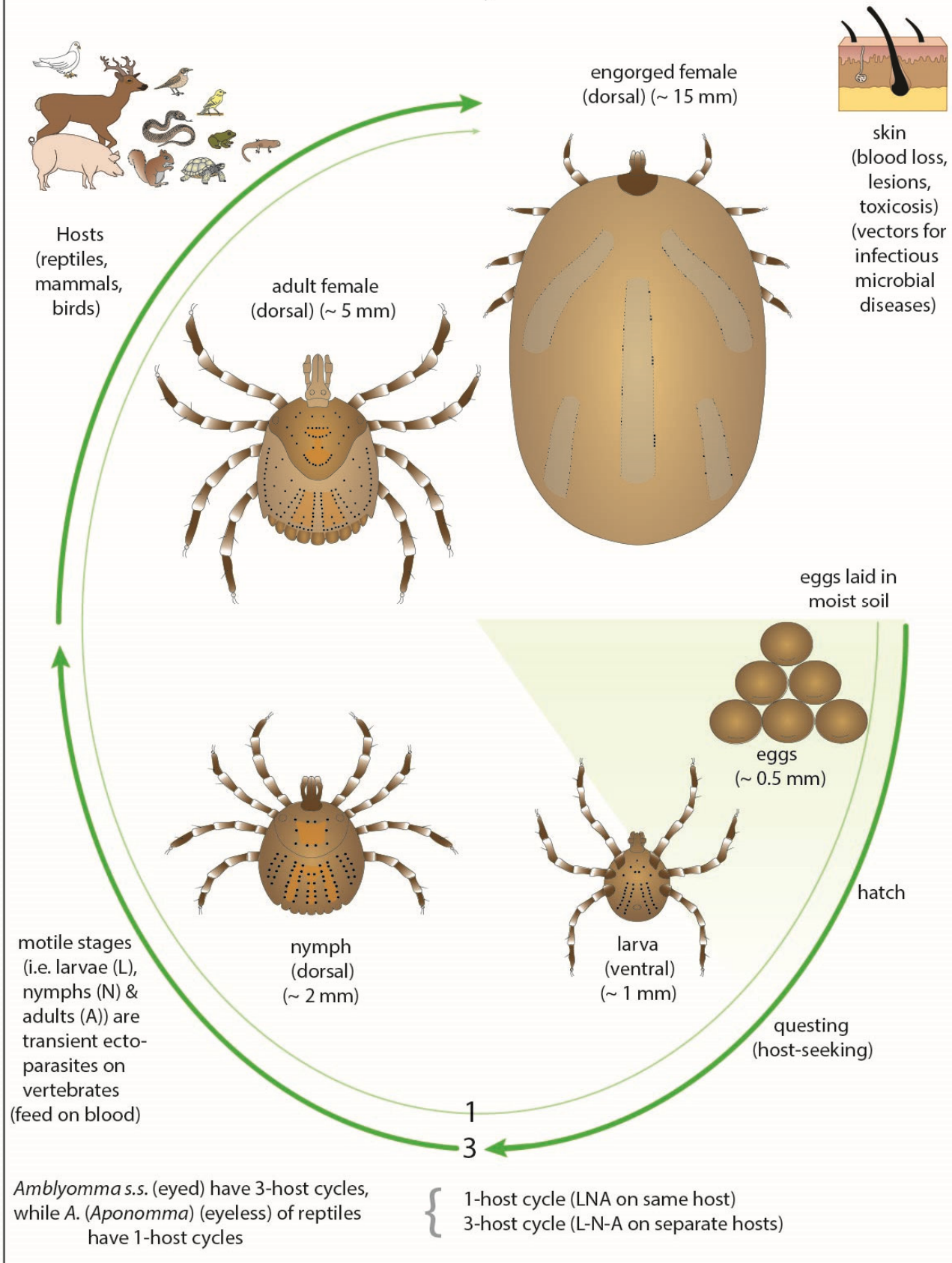
**Developmental cycle and mode of transmission:** Like all ticks, *Amblyomma* spp. undergo incomplete (hemimetabolous) metamorphosis, where eggs hatch larvae which moult to nymphs and then adults. Each motile stage feeds on a separate host, so members of the genus *Amblyomma sensu stricto* (i.e. the eyed *Amblyomma* spp.) have 3-host life-cycles. In contrast, the 30 former *Aponomma* spp. transferred to the subgenus *Amblyomma (Aponomma)* (that is, the eyeless *Amblyomma* spp.) have one-host life-cycles, where all developmental stages occur on the same host, usually reptiles. The following description pertains to ticks with 3-host cycles. Gravid female ticks lay eggs in large clusters on shaded moist soil where they hatch after 4-15 weeks depending on environmental conditions (longer in cold conditions). The emergent 6-legged larvae then spend time seeking hosts, usually small ground-dwelling reptiles, birds or mammals (particularly rodents). The larvae of many species ascend vegetation and wait for passing hosts (ambush strategy). They respond to host odours, body heat and vibrations by actively waving their forelegs in the air (questing behaviour). The larvae of some species have also been shown to scuttle along the ground towards hosts (hunter strategy) when stimulated by host odours (and also pheromones released by resident ticks). Larvae may survive in the external environment for several weeks to months searching for hosts depending on environmental conditions. Having located a host, the larvae attach and feed on blood for 4-6 days and then drop off onto the ground. They seek shelter and enter a pre-moult phase for 2-3 weeks to digest their bloodmeals. They moult to 8-legged nymphs which then spend time seeking hosts (usually small ground-dwelling animals but also larger animals), mostly by questing, sometimes by hunting. Ixodids only form one nymphal instar, whereas argasids may form 2-7 instars. Nymphs can also survive in the external environment for several months depending on prevailing conditions (longer in colder climates). Once a host is located, they attach to the skin and feed on blood for 4-7 days before dropping off. They seek shelter to digest their bloodmeals over several weeks before moulting to adult ticks. Adults seek hosts (larger animals including livestock)

by questing or hunting and they may survive for several months before locating a host. Both male and female ticks require a bloodmeal to become sexually mature, but males feed sporadically while moving about the host for mates, while females attach to feed and wait for a roving mate. Following mating, the females engorge on blood swelling to many times their original body size. When replete, the females detach and drop off the host onto the ground. Fertilized females rest for several days and then begin laying eggs in large batches over a few weeks. Females may lay up to 5,000 eggs before becoming spent and dying shortly thereafter. Some species may complete their entire life-cycle in as little as 80-100 days under ideal conditions, but they generally take longer as each stage rests in the environment before moulting and then may take some time to locate a host. The duration of the life-cycle is influenced mainly by seasonal variations in climatic factors (particularly temperature and humidity) as well as the availability of hosts. Tick stages are most active during mild conditions in spring and autumn, and may overwinter in the environment and over-summer on hosts. The life-cycle may be completed twice a year in tropical and subtropical regions, once a year in temperate regions with mild winters, and sometimes once every 2-3 years in temperate regions with cold winters.

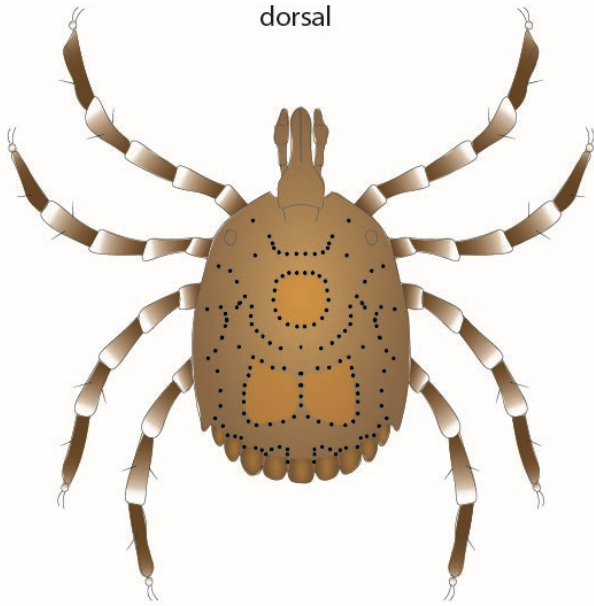
**Differential diagnosis:** While infestations may be suspected on clinical grounds (skin lesions, anaemia), other disease entities may cause similar non-specific symptoms/signs, including other ectoparasites and a range of dermatological conditions. Infestations are conventionally diagnosed by the direct detection of tick stages feeding on the skin, with confirmation provided by their careful removal and subsequent microscopic examination. *Amblyomma* ticks are readily identified by their unique morphological characteristics, notably their ornate bodies with festoons, long banded legs and long mouthparts. Specimens may be snap frozen or fixed in alcohol for molecular characterization studies. Free-living stages may be collected by dragging or flagging blankets over pastures and bushes (for questing stages) or by using static dry ice (carbon dioxide) traps (for hunting stages). Molecular biological techniques have also been used to characterize species by polymerase chain reaction (PCR) amplification of nuclear (18S and 28S ribosomal RNA, internal transcribed spacer regions 1 and 2) and mitochondrial (12S and 16S ribosomal RNA, cytochrome c oxidase subunit I, nicotinamide adenine dinucleotide dehydrogenase subunit 5) gene sequences.

**Treatment and control:** Infestations are usually treated using topical or systemic acaricides, as ticks are difficult to remove intact due to their long mouthparts. Successful treatments have been reported using arsenical preparations, organochlorines (dichlorodiphenyl-trichloroethane (DDT), lindane), organophosphates (coumaphos, malathion, chlorpyrifos, fenthion, dichlorvos, cythoate, diazinon, propetamphos, phosmet, ronnel, chlorfenvinphos, dioxathion, fenchlorvos, stirofos, trichlorfon), carbamates (carbaryl), pyrethroids (permethrin, flumethrin, deltamethrin, decamethrin, cypermethrin, cyprothrin, alphamethrin), formamidines (amitraz), macrocyclic lactones (ivermectin, selamectin), phenylpyrazoles (fipronil), chloronicotinyls (imidacloprid), isoxazolines (afoxolaner, fluralaner), some natural products (rotenone) and some insect growth regulators (methoprene, pyriproxyfen). These chemicals are available in a range of sprays, dips, dusts, emulsions, impregnated collars or tags, drenches, tablets, spot-ons, pour-ons, or injections. Treatment often needs to be repeated as animals rapidly become re-infested, although slow-release formulations or compounds with long-lasting residual activity help reduce treatment frequency. Livestock that are corralled every night have been shown to benefit from evening footbaths as larvae attaching to the feet tend to migrate upwards overnight. Regrettably, the incorrect or over-usage of many acaricides has led to the development of drug resistance in many tick populations, particularly against arsenic compounds, organochlorines (especially DDT), and some organophosphates, pyrethroids and formamidines. It is recommended that acaricides be used in cyclic rotation and that tick populations be regularly tested drug resistance (by *in situ* or *in vitro* egg hatch tests, and larval or adult development tests). Integrated tick management strategies should be adopted by producers, particularly those based around strategic treatments, spelling pastures and wildlife control. Livestock health management should include regular screening for ticks, placing new livestock into temporary quarantine, treating animals therapeutically and prophylactically during peak seasons, and even culling heavily infested livestock or those refractory to treatment. Grazing management strategies include rotating animals between pastures, de-stocking or cultivating pastures for a season, clearing excess vegetation (cut, slash, burn, or plough), avoiding over-stocking, treating small areas and holding facilities with long-lasting environmental acaricides (e.g. pyrethroids), and stabling or housing animals indoors overnight. Wildlife management should aim to reduce the availability of suitable reservoir hosts by fencing, hunting, trapping, diverting migration routes, providing medicated supplementary feeds or installing self-treatment devices (rubbing posts, rollers). A number of mathematical prediction models have recently been developed to help producers manage interventions based on many bionomic factors, including location (latitude, longitude, elevation), climate (temperature, moisture, rainfall, photoperiod), vegetation type and structure, land-use and animal husbandry. Several studies on biocontrol have shown that spraying hosts or pastures with entomopathogenic fungi (*Beauveria* and *Metarhizium*) have reduced populations of *A. variegatum* in experimental and field situations, but no products have yet been commercialized.

# Amblyomma

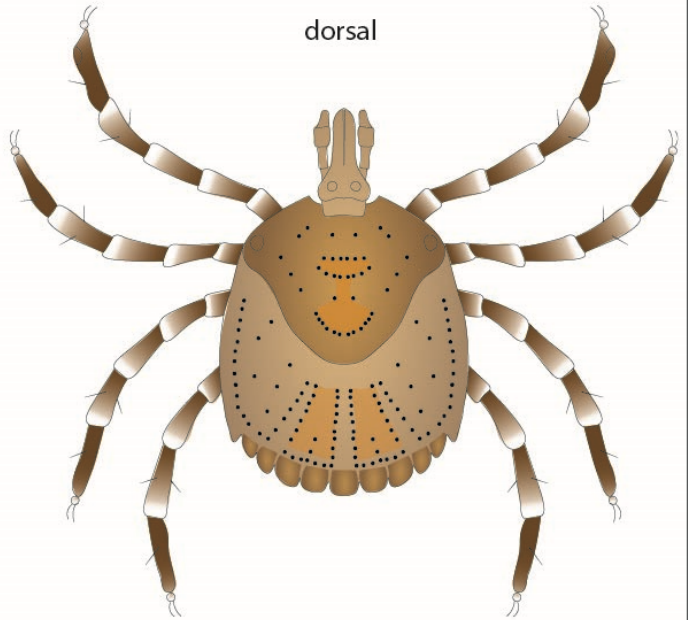


*Amblyomma*



dorsal

male (~ 4 mm)



dorsal

adult ticks

female (~ 4 mm)



ventral



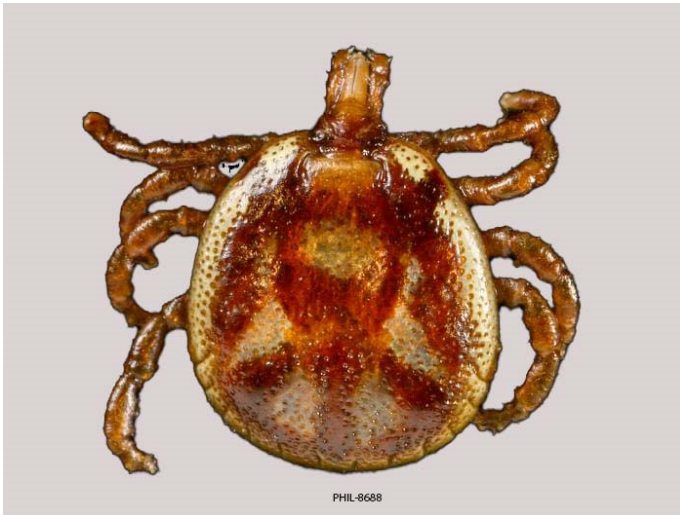
ventral



*Amblyomma* adults



*Amblyomma* adult, engorged female and eggs



*Amblyomma (Aponomma)* adult



*Amblyomma* larva