# Individual Species Accounts

**1 – *H. aborensis*** Warburton, 1913 (Parasitology, 6: 121–130)

**Type depository**: IM (holotype) (Hoogstraal, H., Dhanda, V. & El Kammah, K.M. 1971. *Aborphysalis*, a new subgenus of Asian *Haemaphysalis* ticks; and identity, distribution and hosts of *H. aborensis* Warburton (resurrected) (Ixodoidea: Ixodidae). J. Parasitol., 57: 748–760)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregion**: northern Indochina subtropical forest

**Hosts**: Artiodactyla: Bovidae, Suidae, Moschidae; Carnivora: Mustelidae; Rodentia: Hystricidae (AN)
Artiodactyla: Cervidae; Carnivora: Felidae (A)
Galliformes: Phasianidae (NL)
Scandentia: Tupaiidae; Passeriformes: Paridae (N)

**Human infestation**: no

**Remarks**: Mitchell (1979) listed Muridae among the alleged hosts of Nepalese ticks collected between 1966 and 1970, including *H. aborensis* (stage not stated). However, in Hoogstraal's (1971) resurrection of *H. aborensis*, murids are not mentioned as hosts, and for that reason they do not appear in our host list.

**References**

Chen, Z., Yang, X., Bu, F., Yang, X., Yang, X. & Liu, J. 2010. Ticks (Acari: Ixodoidea: Argasidae, Ixodidae) of China. Exp. Appl. Acarol., 51: 393–404.

Hoogstraal, H., Dhanda, V. & El Kammah, K.M. 1971. *Aborphysalis*, a new subgenus of Asian *Haemaphysalis* ticks; and identity, distribution and hosts of *H. aborensis* Warburton (resurrected) (Ixodoidea: Ixodidae). J. Parasitol., 57: 748–760.

Mitchell, R.M. 1979. A list of ectoparasites from Nepalese mammals, collected during the Nepal ectoparasite program. J. Med. Entomol., 16: 227–233.


DOI 10.1007/978-94-007-7497-1_5, 

Phan Trong, C. 1977. Ve bet va con trung ky sinh o Viet Nam. Tap 1. Ve (Ixodoidea), mo ta va phan loai. Ha Noi: Khoa hoc va ky thuat, 489 pp. In Vietnamese.
Xu, R. & Li, K. 1997. A collection of ticks from Guizhou, China. Syst. Appl. Acarol., 2: 245–246.

**2 – *H. aciculifer*** Warburton, 1913 (Parasitology, 6: 121–130)

**Type depository:** BMNH (lectotype, paralectotypes) (Keirans, J.E. & Hillyard, P.D. 2001. A catalogue of the type specimens of Ixodida (Acari: Argasidae, Ixodidae) deposited in The Natural History Museum, London. Occ. Pap. Syst. Entomol. (13), 74 pp.)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Afrotropical

**Ecoregions**: tropical and subtropical grasslands, savannas and shrublands; tropical and subtropical moist broadleaf forests

**Hosts**: usual hosts for adult ticks are Artiodactyla: Bovidae.
Artiodactyla: Bovidae; Carnivora: Viverridae; Lagomorpha: Leporidae (ANL)
Carnivora: Canidae, Herpestidae (AL)
Artiodactyla: Suidae; Carnivora: Felidae (A)
Rodentia: Muridae; Galliformes: Phasianidae (NL)
Erinaceomorpha: Erinaceidae; Passeriformes: Corvidae (N)
Carnivora: Hyaenidae; Rodentia: Cricetidae (L)

**Human infestation**: no

**Remarks**: data concerning *H. aciculifer* prior to Hoogstraal and El Kammah (1972) are ignored here because of confusion with related tick species that made earlier diagnoses uncertain. See also *H. rugosa.*

**References**

Hoogstraal, H. & El Kammah, K.M. 1972. Notes on African *Haemaphysalis* ticks. X. *H.* (*Kaiseriana*) *aciculifer* Warburton and *H.* (*K.*) *rugosa* Santos Dias, the African representatives of the *spinigera* subgroup (Ixodoidea: Ixodidae). J. Parasitol., 58: 960–978.
Horak, I.G. & Boomker, J. 1998. Parasites of domestic and wild animals in South Africa. XXXV. Ixodid ticks and bot fly larvae in the Bontebok National Park. Onderstepoort J. Vet. Res., 65: 205–211.
Horak, I.G., Fourie, L.J. & Boomker, J. 1997. A ten-year study of ixodid tick infestations of bontebok and grey rhebok in the Western Cape Province, South Africa. S. Afr. J. Wildl. Res., 27: 5–10.
Norval, R.A.I. 1985. The ticks of Zimbabwe. XIV. The lesser known *Haemaphysalis* species. Zimbabwe Vet. J., 16: 54–59.
Walker, J.B. 1974. The ixodid ticks of Kenya. A review of present knowledge of their hosts and distribution. Commonwealth Institute of Entomology, London, 220 pp.

**3 – *H. aculeata*** Lavarra, 1904 (Bol. Soc. Zool. Ital. Ser. 2, 5: 255–258)

**Type depository**: BMNH (lectotype) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical dry broadleaf forests; desert and xeric shrublands

**Hosts**: usual hosts for larvae, nymphs and adults are Artiodactyla: Tragulidae.
Artiodactyla: Tragulidae (ANL)
Artiodactyla: Bovidae (AN)
Artiodactyla: Cervidae; Carnivora: Felidae, Herpestidae; Primates (unknown family); Aves (unknown order) (A)
Primates: Cercopithecidae; Galliformes: Phasianidae (NL)
Rodentia: Hystricidae; Cuculiformes: Cuculidae; Passeriformes: Pycnonotidae, Sturnidae, Timaliidae (N)
Rodentia: Muridae; Passeriformes: Muscicapidae (L)

**Human infestation**: yes (Keirans 1985)

**Remarks**: all parasitic stages of *H. aculeata* were redescribed by Geevarghese et al. (2009). Without further explanation, Geevarghese et al. (1997) reduced the host range of this tick to "man, monkey and birds." We consider records from other types of hosts in the references below to be provisionally valid.

**References**

Bhat, H.R. & Sreenivasan, M.A. 1981. Further records of the ticks of some reptilian and mammalian hosts in the Kyasanur Forest disease area, Karnataka, India. Ind. J. Parasitol., 5: 207–210.

Geevarghese, G., Mandke, O.A. & Mishra, A.C. 2009. *Haemaphysalis* (*Kaiseriana*) *aculeata* Lavarra, 1904 (Ixodoidea: Ixodidae) re-description of adult and immature stages. Acarologia, 49: 5–11.

Geevarghese, G., Fernandes, S. & Kulkarni, S.M. 1997. A checklist of Indian ticks (Acari: Ixodoidea). Ind. J. Anim. Sci., 67: 566–574.

Keirans, J.E. 1985. George Henry Falkiner Nuttall and the Nuttall tick catalogue. U. S. Dept. Agric., Agric. Res. Ser. Misc. Pub. (1438), 1785 pp.

Rajagopalan, P.K. 1972. Ixodid ticks (Acarina: Ixodidae) parasitizing wild birds in the Kyasanur Forest disease area of Shimoga District, Mysore State, India. J. Bombay Nat. Hist. Soc., 69: 55–78.

Rajagopalan, P.K. & Sreenivasan, M.A. 1981. Ixodid ticks on cattle and buffaloes in the Kyasanur Forest disease area of Karnataka State. Ind. J. Med. Res., 73: 880–889.

Rajagopalan, P.K., Patil, A.P. & Boshell, J. 1968. Ixodid ticks on their mammalian hosts in the Kyasanur Forest disease area of Mysore State, India, 1961–1964. Ind. J. Med. Res., 56:510–526.

Seneviratna, P. 1965. The Ixodoidea (ticks) of Ceylon. Parts II and III. Ceylon Vet. J., 13: 28–54.
Trapido, H., Goverdhan, M.K., Rajagopalan, P.K. & Rebello, M.J. 1964. Ticks ectoparasitic on monkeys in the Kyasanur Forest disease area of Shimoga District, Mysore State, India. Am. J. Trop. Med. Hyg., 13: 763–772.

**4 – *H. adleri*** Feldman-Musham, 1951 (Bull. Res. Counc. Israel Ser. C, 1: 96–107)

**Type depository**: not stated (Feldman-Muhsam, B. 1951. A note on east Mediterranean species of the genus *Haemaphysalis*. Bull. Res. Counc. Israel Ser. C, 1: 96–107)

**Known stages**: male, female

**Zoogeographic Region**: Palearctic

**Ecoregions**: desert and xeric shrublands

**Hosts**: Carnivora: Mustelidae (AN)
Artiodactyla: Suidae; Carnivora: Canidae, Felidae (A)

**Human infestation**: no

**Remarks**: Kolonin (2009) does not include hosts for nymphs of *H. adleri*, probably because this stage has not been described. We provisionally accept the record of Theodor and Costa (1967) of nymphs of this tick on Mustelidae.

**References**

Keysary, A., Eremeeva, M.E., Leitner, M., Din, A.B., Wikswo, M.E., Mumcuoglu, K.Y., Inbar, M., Wallach, A.D., Shanas, U., King, R. & Waner, T. 2011. Spotted fever group rickettsiae collected from wild animals in Israel. Am. J. Trop. Med. Hyg., 85: 919–923.
Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/
Morel, P.-C. 2003. Les tiques d'Afrique et du Bassin méditerranéen (1965–1995). CIRAD- EMVT, 1342 pp.
Theodor, O. & Costa, M. 1967. A survey of the parasites of wild mammals and birds in Israel. Part one. Ectoparasites. The Israel Academy of Science and Humanities, Jerusalem, 119 pp.

**5 – *H. anomala*** Warburton, 1913 (Parasitology, 6: 121–130)

**Type depository**: IM (holotype) (Hoogstraal, H., Kohls, G.M. & Trapido, H. 1967. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea, Ixodidae). *H.* (*Kaiseriana*) *anomala* Warburton: redescription, hosts, and distribution. J. Parasitol., 53: 196–201) as *Haemaphysalis cornigera anomala*

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical moist broadleaf forests

**Hosts**: usual hosts for adult ticks are Artiodactyla: Bovidae.
Artiodactyla: Bovidae, Cervidae; Carnivora: Canidae, Felidae (A)
Rodentia: Muridae; Cuculiformes: Cuculidae (NL)
Galliformes: Phasianidae; Passeriformes: Turdidae (stages unknown)

**Human infestation**: yes (Tanskul et al. 1983)

**References**

Hoogstraal, H., Dhanda, V. & Bhat, H.R. 1972. *Haemaphysalis* (*Kaiseriana*) *anomala* Warburton (Ixodoidea: Ixodidae) from India: description of immature stages and biological observations. J. Parasitol., 58: 605–610.

Mitchell, R.M. & Dick, J.A. 1978. Ectoparasites from Nepal birds. J. Bombay Nat. Hist. Soc., 74: 264–274.

Tanskul, P., Stark, H.E. & Inlao, I. 1983. A checklist of ticks of Thailand (Acari: Metastigmata: Ixodoidea). J. Med. Entomol., 20: 330–341.

**6 – *H. anomaloceraea*** Teng, 1984 (*In* Teng and Cui, 1984, Acta Zootax. Sin., 9: 37–40. In Chinese)
Camicas, J.-L., Hervy, J.-P., Adam, F. & Morel, P.-C. (1998. Les tiques du monde (Acarida, Ixodida). Nomenclature, stades décrits, hôtes, répartition. ORSTOM, Paris, 233 pp.) regard this species as a synonym of *H. shimoga* without justifying their decision. Kolonin, G.V. (2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/) considers *H. anomaloceraea* and also *H. shimoga* to be synonyms of *H. taiwana* but does not elaborate. We follow Guglielmone, A.A., Robbins, R.G., Apanaskevich, D.A., Petney, T.N., Estrada-Peña, A., Horak, I.G., Shao, R. & Barker, S.C. (2010. The Argasidae, Ixodidae and Nuttalliellidae (Acari: Ixodida) of the world: a list of valid species names. Zootaxa, 2528: 1–28), who regard *H. anomaloceraea* as a valid species, pending a robust justification of the positions taken by the authors cited above.

**Type depository**: IZAS (holotype) (Teng, K.-F. & Cui, Y.-Q. 1984. Descriptions of a new species of *Haemaphysalis* and male of *H. primitiva* Teng, 1982 from Yunnan. Acta Zootax. Sin., 9: 37–40. In Chinese)

**Known stages:** male

**Zoogeographic Region**: Oriental

**Ecoregions**: Nujiang Langcang Gorge alpine conifer and mixed forests

**Hosts**: unknown

**Human infestation**: no

**Remarks**: see above.

**References**

Chen, Z., Yang, X., Bu, F., Yang, X., Yang, X. & Liu, J. 2010. Ticks (Acari: Ixodoidea: Argasidae, Ixodidae) of China. Exp. Appl. Acarol., 51: 393–404.

Teng, K.-F. & Cui, Y.-Q. 1984. Descriptions of a new species of *Haemaphysalis* and male of *H. primitiva* Teng, 1982. Acta Zootax. Sin., 9: 37–40.

**7 – *H. anoplos*** Hoogstraal, Uilenberg & Klein, 1967 (J. Parasitol., 53: 1103–1105)

**Type depositories**: USNTC (holotype), HH (paratype) (Hoogstraal, H., Uilenberg, G. & Klein, J.-L. 1967. *Haemaphysalis* (*Rhipistoma*) *anoplos* sp. n., a spurless tick of the *elongata* group (Ixodoidea, Ixodidae) parasitizing *Nesomys rufus* Peters (Rodentia) in Madagascar. J. Parasitol., 53: 1103–1105)

**Known stages**: female

**Zoogeographic Region**: Afrotropical

**Ecoregion**: Madagascar subhumid forests

**Hosts**: Rodentia: Nesomyidae (A)

**Human infestation**: no

**Reference**

Uilenberg, G., Hoogstraal, H. & Klein, J.-M. 1979. Les tiques (Ixodoidea) de Madagascar et leur rôle vecteur. Arch. Inst. Pasteur Madagascar Num. Spéc., 153 pp.

**8 – *H. aponommoides*** Warburton, 1913 (Parasitology, 6: 121–130)

**Type depository**: BMNH (lectotype, paralectotypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*) originally named *Haemaphysalis inermis aponommoides*

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Oriental, Palearctic

**Ecoregions**: tropical and subtropical grasslands, savannas and shrublands; temperate conifer forests

**Hosts**: usual hosts for adult ticks are Artiodactyla: Bovidae.
Artiodactyla: Bovidae, Cervidae; Perissodactyla: Equidae; Carnivora: Canidae, Felidae, Ursidae; Rodentia: Sciuridae (A)
Rodentia: Muridae; Soricomorpha: Soricidae; Galliformes: Phasianidae (NL)

**Human infestation**: yes (Hoogstraal and Mitchell 1971)

**Remarks**: Mitchell (1979) listed all hosts of Nepalese ticks collected between 1966 and 1970, including *H. aponommoides* (no developmental stage stated), which was allegedly found on Cricetidae. However, cricetids are not included by Hoogstraal and Mitchell (1971) in their study of this tick, and consequently this host record does not appear in our list of hosts of *H. aponommoides*.

**References**

Chen, Z., Yang, X., Bu, F., Yang, X. & Liu, J. 2010. The ticks (Acari: Ixodoidea: Argasidae, Ixodidae) of China. Exp. Appl. Acarol., 51: 393–404.

Hoogstraal, H. & Mitchell, R.M. 1971. *Haemaphysalis* (*Alloceraea*) *aponommoides* Warburton (Ixodoidea: Ixodidae), description of immature stages, hosts, distribution, and ecology in India, Nepal, Sikkim, and China. J. Parasitol., 57: 635–645.

Mitchell, R.M. 1979. A list of ectoparasites from Nepalese mammals, collected during the Nepal ectoparasite program. J. Med. Entomol., 16: 227–233.

Phan Trong, C. 1977. Ve bet va con trung ky sinh o Viet Nam. Tap 1. Ve (Ixodoidea), mo ta va phan loai. Ha Noi: Khoa hoc va ky thuat, 489 pp. In Vietnamese.

**9 – *H. asiatica*** (Supino, 1897) (Atti Soc. Veneto-Trentina Sci. Nat. Residente Padova, Ser. 2, 3: 230–238)

**Type depository**: GM (holotype) (Hoogstraal, H. & Trapido H. 1966. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea, Ixodidae). Species described by Supino in 1897 from Burma, with special reference to *H.* (*Rhipistoma*) *asiaticus* (= *H. dentipalpis* Warburton and Nuttall). J. Parasitol., 52: 1172–1187) as *Opisthodon asiaticus.* See also below.

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical forests

**Hosts**: usual hosts for adult ticks are Carnivora: Viverridae.
Scandentia: Tupaiidae (ANL)
Carnivora: Canidae, Felidae (AN)
Artiodactyla: Suidae; Carnivora: Viverridae (A)
Rodentia: Muridae (NL)
Rodentia: Sciuridae (N)

**Human infestation**: no

**Remarks**: this tick has been treated as a synonym of *H. leachi* by several authors, but *H. asiatica* is a legitimate species, as stated in Hoogstraal and Trapido (1966), who refer to this tick as *Haemaphysalis asiaticus.* Phan Trong (1977) found adults of *H. asiatica* on Aves (Cuculiformes and Passeriformes), but we feel that these records need confirmation and they are not included in our host list. Kolonin (2009) does not recognize Scandentia as hosts of adults, but we consider this relationship, cited by Tanskul et al. (1983), to be valid.

**References**

Chen, Z., Yang, X., Bu, F., Yang, X., Yang, X. & Liu, J. 2010. Ticks (Acari: Ixodoidea: Argasidae, Ixodidae) of China. Exp. Appl. Acarol., 51: 393–404.

Grassman, L.I., Sarataphan, N., Tewes, M.E., Silvy, N.J. & Nakanakrat, T. 2004. Ticks (Acari: Ixodidae) parasitizing wild carnivores in Phu Khieo wildlife sanctuary. J. Parasitol., 90: 657–659.

Hoogstraal, H. & Trapido, H. 1966. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea: Ixodidae). Species described by Supino in 1897 from Burma, with special reference to *H.* (*R.*) *asiaticus* (= *H. dentipalpis* Warburton and Nuttall). J. Parasitol., 52: 1172–1187.

Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/

Parola, P., Cornet, J.-P., Sanogo, Y.O., Miller, R.S., Thien, H.V., González, J.-P., Raoult, D., Telford, S.R. & Wongsrichanalai, C. 2003. Detection of *Ehrlichia* spp., *Anaplasma* spp. *Rickettsia* spp., and other eubacteria in ticks from the Thai-Myanmar border and Vietnam. J. Clin. Microbiol., 41: 1600–1608.

Phan Trong, C. 1977. Ve bet va con trung ky sinh o Viet Nam. Tap 1. Ve (Ixodoidea), mo ta va phan loai. Ha Noi: Khoa hoc va ky thuat, 489 pp. In Vietnamese.

Saito, Y., Hoogstraal, H. & Vasuvat, C. 1971. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea: Ixodidae). Identity and hosts of immature stages of *H.* (*Rhipistoma*) *asiatica* (Supino) from Thailand. J. Parasitol., 57: 1099–1103.

Tanskul, P., Stark, H.E. & Inlao, I. 1983. A checklist of ticks of Thailand (Acari: Metastigmata: Ixodoidea). J. Med. Entomol., 20: 330–341.

Xu, R. & Li, K. 1997. A collection of ticks from Guizhou, China. Syst. Appl. Acarol., 2: 245–246.

**10 – *H. atheruri*** Hoogstraal, Trapido & Kohls, 1965 (J. Parasitol., 51: 114–125)

**Type depositories**: USNTC (holotype, paratypes), BMNH, IMRKL (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*) as *Haemaphysalis atherurus*

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical forests

**Hosts**: usual hosts for larvae, nymphs and adults are Rodentia: Hystricidae.
Rodentia: Hystricidae (ANL)
Scandentia: Tupaiidae; Carnivora: Canidae (A)

**Human infestation**: no

**Remarks**: see *H. traguli*, which has been confused with *H. atheruri.*

**References**

Hoogstraal, H., Trapido, H. & Kohls, G.M. 1965. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea, Ixodidae). *H. atherurus* sp. n. and redescription of type material of *H. birmaniae* Supino, 1897. J. Parasitol., 51: 114–125.

Tanskul, P., Stark, H.E. & Inlao, I. 1983. A checklist of ticks of Thailand (Acari: Metastigmata: Ixodoidea). J. Med. Entomol., 20: 330–341.

**11 – *H. bancrofti*** Nuttall & Warburton, 1915 (Ticks. A monograph of the Ixodoidea. Part III. The genus *Haemaphysalis*. Cambridge University Press, London, pp. 349–550)
See below and also *H. novaeguineae.*

**Type depository**: BMNH (lectotype, paralectotypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Australasian, Oriental

**Ecoregions**: tropical and subtropical moist broadleaf forests; tropical and subtropical grasslands, savannas and shrublands

**Hosts**: usual hosts for larvae, nymphs and adults are Diprotodontia: Macropodidae. Aves are considered exceptional hosts for this tick.
Diprotodontia: Macropodidae, Phascolarctidae (ANL)
Artiodactyla: Bovidae; Carnivora: Canidae; Peramelemorphia: Peramelidae (AN)
Dasyuromorphia: Dasyuridae (AL)
Artiodactyla: Suidae; Perissodactyla: Equidae (A)
Diprotodontia: Phalangeridae, Potoroidae; Cuculiformes: Cuculidae (N)
Chiroptera: Vespertilionidae (L)
Artiodactyla: Cervidae; Carnivora: Felidae; Diprotodontia: Macropodidae, Petauridae, Vombatidae; Peramelemorphia: Thylacomyidae; Rodentia: Muridae; Passeriformes: Corvidae, Cracticidae (stages unknown)

**Human infestation**: yes (Laan et al. 2011)

**Remarks**: Camicas et al. (1998) state that *H. bancrofti* is found exclusively in the Australasian Region, but there is a record for the Oriental Region in Hoogstraal and Kim (1985). Kolonin (2009) does not include Aves as hosts of *H. bancrofti*, but we accept the records in Roberts (1963), Laan et al. (2011) and Owen (2011) from birds. It should be noted, however, that Roberts (1963) states that a female specimen had been found on Cuculidae when, in fact, it was a nymph of *H. bancrofti* that subsequently molted to the female stage in the laboratory, as clarified by Wilkinson and Utech (1962).

**References**

Camicas, J.-L., Hervy, J.-P., Adam, F. & Morel, P.-C. 1998. Les tiques du monde (Acarida, Ixodida). Nomenclature, stades décrits, hôtes, répartition. ORSTOM, Paris, 233 pp.

Heath, A.C.G. 1986. Aspects of the biology, seasonality and host associations of *Haemaphysalis bancrofti*, *H. humerosa*, *H. bremneri* and *Ixodes tasmani* (Acari: Ixodidae). *In* C. Cremin, C. Dobson & D.E. Moorhouse (editors), Parasite lives. University of Queensland Press, St Lucia, Australia, pp. 179–188.

Hoogstraal, H. & Kim, K.C. 1985. Tick and mammal coevolution, with emphasis on *Haemaphysalis. In* K.C. Kim (editor), Coevolution of parasitic arthropods and mammals. John Wiley & Sons, New York, pp. 505–568.
Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/
Laan, B., Handasyde, K. & Beveridge, I. 2011. Occurrence of the tick *Haemaphysalis bancrofti* Nuttall & Warburton, 1915 in Victoria with additional data on its distribution and with scanning electron micrographs of life cycle stages. Proc. R. Soc. Victoria, 123: 187–197.
Oakwood, M. & Spratt, D.M. 2000. Parasites of the northern quoll, *Dasyurus hallucatus* (Marsupialia: Dasyuridae) in tropical savanna, Northern Territory. Aust. J. Zool., 48: 79–90.
Owen, I.L. 2011. Parasites of animals in Papua New Guinea recorded at the National Veterinary Laboratory: a catalogue, historical review and zoogeographical affiliations. Zootaxa, 3143: 1–163.
Roberts, F.H.S. 1963. A systematic study of the Australian species of the genus *Haemaphysalis* Koch (Acarina: Ixodidae). Aust. J. Zool., 11: 35–80.
Roberts, F.H.S. 1970. Australian ticks. CSIRO, Melbourne, 267 pp.
Wilkinson, P.R. & Utech, K.B.W. 1962. Bird hosts of *Haemaphysalis* ticks in Australia. Aust. J. Sci., 25: 169–170.

**12 – *H. bandicota*** Hoogstraal & Kohls, 1965 (J. Parasitol., 51: 460–466)

**Type depositories**: USNTC (holotype, paratypes), HH, SEATO (paratypes) (Hoogstraal, H. & Kohls, G.M. 1965. Southeast Asian *Haemaphysalis* ticks (Ixodoidea, Ixodidae). *H. bandicota* sp. n. from bandicoot rats in Taiwan, Thailand and Burma. J. Parasitol., 51: 460–466)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical moist broadleaf forests

**Hosts**: usual hosts for larvae, nymphs and adult ticks are Rodentia: Muridae. Artiodactyla are considered exceptional hosts for this tick.
Rodentia: Muridae (ANL)
Scandentia: Tupaiidae; Carnivora: Herpestidae (A, N and/or L)
Artiodactyla: Bovidae (A)

**Human infestation**: no

**Remarks**: Tanskul et al. (1983) use the term “immatures” without specifying which of the sub-adult stages of *H. bandicota* were found on hosts.

**References**

Chen, Z., Yang, X., Bu, F., Yang, X., Yang, X. & Liu, J. 2010. Ticks (Acari: Ixodoidea: Argasidae, Ixodidae) of China. Exp. Appl. Acarol., 51: 393–404.

Hoogstraal, H. & Kohls, G.M. 1965. Southeast Asian *Haemaphysalis* ticks (Ixodoidea, Ixodidae). *H. bandicota* sp. n. from bandicoot rats in Taiwan, Thailand, and Burma. J. Parasitol., 51: 460–466.

Tanskul, P., Stark, H.E. & Inlao, I. 1983. A checklist of ticks of Thailand (Acari: Metastigmata: Ixodoidea). J. Med. Entomol., 20: 330–341.

**13 – *H. bartelsi*** Schulze, 1938 (Z. Morphol. Ökol. Tiere, 34: 135–149)
This species was originally classified as *H. koningsbergeri* (Wilson, N., Hoogstraal, H. & Kohls, G.M. 1968. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea, Ixodidae). Redescription of *H.* (*Rhipistoma*) *bartelsi* Schulze (resurrected), the Indonesia flying squirrel haemaphysalid. J. Parasitol., 54: 1223–1227).

**Type depository**: USNTC (lectotype, paralectotype) (Keirans, J.E. & Clifford, C.M. 1984. A checklist of types of Ixodoidea (Acari) in the collection of the Rocky Mountain Laboratories. J. Med. Entomol., 21: 310–320)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregion**: Java rain forests

**Hosts**: Rodentia: Sciuridae (ANL)

**Human infestation**: no

**Reference**

Hoogstraal, H., Gaber, S., Van Peenen, P.F.D., Duncan, F. J. & Kadarsan, S. 1972. *Haemaphysalis* (*Rhipistoma*) *bartelsi* Schulze (Ixodoidea: Ixodidae): immature stages from a treehole nest of the Indonesian red giant flying squirrel. J. Parasitol., 58: 989–992.

**14 – *H. bequaerti*** Hoogstraal, 1956 (J. Parasitol., 42: 156–172)

**Type depositories**: USNTC (holotype, paratype), BMNH, HH, OVI (paratypes) (Keirans and Hillyard, 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Afrotropical

**Ecoregions**: tropical and subtropical grasslands, savannas and shrublands

**Hosts**: Hyracoidea: Procaviidae (ANL)

**Human infestation**: no

**Reference**

Hoogstraal, H. 1956. Notes on African *Haemaphysalis* ticks. III. The hyrax parasites, *H. bequaerti* sp. nov., *H. orientalis* N. and W., 1915 (new combination), and *H. cooleyi* Bedford, 1929 (Ixodoidea, Ixodidae). J. Parasitol., 42: 156–172.

**15 – *H. birmaniae*** Supino, 1897 (Atti Soc. Veneto-Trentina Sci. Nat. Residente Padova, Ser. 2, 3: 230–238)

**Type depositories**: GM, BMNH (syntypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*). See *H. darjeeling*.

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: temperate broadleaf deciduous forests

**Hosts**: usual hosts for larvae, nymphs and adults are Artiodactyla: Bovidae and Cervidae.
Artiodactyla: Bovidae, Cervidae (ANL)
Artiodactyla: Suidae; Carnivora: Canidae, Mustelidae; Rodentia: Hystricidae (A)

**Human infestation**: yes (Hoogstraal 1970)

**Remarks**: collection data published prior to the work of Hoogstraal (1970) have been ignored because there is considerable uncertainty concerning the identification of *H. birmaniae.*

**References**

Chen, Z., Yang, X., Bu, F., Yang, X., Yang, X. & Liu, J. 2010. Ticks (Acari: Ixodoidea: Argasidae, Ixodidae) of China. Exp. Appl. Acarol., 51: 393–404.

Hoogstraal, H. 1970. *Haemaphysalis* (*H.*) *birmaniae* Supino and *H.* (*H.*) *goral* sp. n. (Ixodoidea: Ixodidae), Asian parasites of artiodactyl mammals. J. Parasitol., 56: 1227–1238.

Keirans, J.E. 1985. George Henry Falkiner Nuttall and the Nuttall tick catalogue. U. S. Dept. Agric., Agric. Res. Ser. Misc. Pub. (1438), 1785 pp.

Phan Trong, C. 1977. Ve bet va con trung ky sinh o Viet Nam. Tap 1. Ve (Ixodoidea), mo ta va phan loai. Ha Noi: Khoa hoc va ky thuat, 489 pp. In Vietnamese.

**16 – *H. bispinosa*** Neumann, 1897 (Mém. Soc. Zool. Fr., 10: 324–420)
See remarks below.

**Type depository**: BMNH (neotype) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical moist broadleaf forests

**Hosts**: usual hosts for larvae, nymphs and adults are Artiodactyla: Bovidae and Carnivora: Canidae.
Mammalia (several orders); Galliformes: Phasianidae; Passeriformes: Sturnidae (ANL)
Psittaciformes: Psittacidae (A)

Cuculiformes: Cuculidae; Coraciiformes: Coraciidae; Passeriformes (several families) (NL)
Falconiformes: Accipitridae (L)
Charadriiformes: Charadriidae; Strigiformes: Strigidae (stages unknown)

**Human infestation**: no

**Remarks**: many specimens formerly identified as *H. bispinosa* are in fact *H. longicornis*, as discussed in Hoogstraal et al. (1968), or several other species of *Haemaphysalis* (Keirans 1985). Camicas et al. (1998) state that this species is found in the Australasian and Oriental Zoogeographic Regions, and Keirans (1985) presents Afrotropical records for *H. bispinosa.* We, however, have not found *bona fide* records for the Australasian Region, and we believe that African records are the result of mislabeling or the introduction of this tick to new environments in which it failed to become established. Guo et al. (2002) state that *H. bispinosa* has been found in Gansu Province (Palearctic) but this record was not validated in Chen et al. (2010). The latter authors describe the distribution of *H. bispinosa* as including Hubei Province, whose boundaries overlap the Palearctic and Oriental Regions. Nevertheless, we provisionally regard this species as Oriental. There is a record of *H. bispinosa* crawling on a human in Audy et al. (1960), but as the tick was not attached, we do not consider humans to be hosts of this species. Other records of *H. bispinosa* on humans are doubtful or refer to *H. longicornis* in the Australasian Region. Kolonin (2009) excludes Aves as hosts for adults of *H. bispinosa*, but the records of Rajagopalan (1972) of males and females on Aves are regarded as valid by us. Dilrukshi (2006) considers it probable that *H. bispinosa* constitutes a complex of species in Sri Lanka. See also *H. longicornis.*

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Hoogstraal, H., Lim, B.-L. & Anastos, G. 1969. *Haemaphysalis* (*Kaiseriana*) *bispinosa* Neumann (Ixodoidea: Ixodidae): evidence for consideration as an introduced species in the Malay Peninsula and Borneo. J. Parasitol., 55: 1075–1077.
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**17 – *H. borneata*** Hoogstraal, 1971 (J. Parasitol., 57: 1096–1098)

**Type depository**: BMNH (holotype) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical moist and dry broadleaf forests

**Hosts**: Artiodactyla: Cervidae (A)

**Human infestation**: no

**Remarks**: Mihalca et al. (2011) regard *H. borneata* as an endangered species.

**References**

Hoogstraal, H. 1971. *Haemaphysalis* (*Kaiseriana*) *borneata* sp. n. (Ixodoidea: Ixodidae), a tick of the *H.* (*K.*) *aculeata* group parasitizing the sambar deer in Borneo. J. Parasitol., 57: 1096–1098.

Mihalca, A.D., Gherman, C.M. & Cozma, V. 2011. Coendangered hard-ticks: threatened or threatening? Parasit. Vectors, 4 (71), 7 pp.

**18 – *H. bremneri*** Roberts, 1963 (Aust. J. Zool., 11: 35–80)

**Type depositories**: QM (holotype, paratypes), ANIC (paratypes), USNTC (paratypes?). (Roberts, F.H.S. 1963. A systematic study of the Australian species of the genus *Haemaphysalis* Koch (Acarina: Ixodidae). Aust. J. Zool., 11: 35–80). Keirans and Clifford (1984, *op. cit.* under *H. bartelsi*) state that the USNTC "probably" contains paratypes of this species.

**Known stages**: male, female, larva

**Zoogeographic Region**: Australasian

**Ecoregion**: eastern Australia temperate forests

**Hosts**: Diprotodontia: Phalangeridae (ANL)
Artiodactyla: Bovidae; Perissodactyla: Equidae; Aegotheliformes: Aegothelidae (A)
Aves (unknown orders) (stages unknown)

**Human infestation**: no

**Remarks**: Kolonin (2009) states that the immature stages of *H. bremneri* have not been described, but there is a description of the larva in Roberts (1969). The nymph is undescribed, but the holotype of *H. bremneri* is from a nymph collected from Phalangeridae that molted into a male (Roberts 1963). Hoogstraal and Wassef (1973) and Hoogstraal and Kim (1985) state, without elaboration, that this tick may feed on various birds.

**References**

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Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/
Roberts, F.H.S. 1963. A systematic study of the Australian species of the genus *Haemaphysalis* Koch (Acarina: Ixodidae). Aust. J. Zool., 11: 35–80.
Roberts, F.H.S. 1969, The larvae of Australian Ixodidae (Acarina: Ixodoidea). J. Aust. Entomol. Soc., 8: 37–78.

**19 – *H. calcarata*** Neumann, 1902 (Arch. Parasitol., 6: 109–128)

**Type depository**: BMNH (syntypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph

**Zoogeographic Region**: Afrotropical

**Ecoregions**: tropical and subtropical grasslands, savannas and shrublands

**Hosts**: usual hosts for adult ticks are Rodentia: Sciuridae.
Rodentia: Sciuridae (AN)
Carnivora: Felidae, Herpestidae (A)
Lagomorpha: Leporidae (N)
Rodentia: Muridae (stage unknown)

**Human infestation**: no

**Remarks**: Kolonin (2009) recognizes only Felidae as hosts for adult *H. calcarata* – not Sciuridae or Herpestidae. However, we consider records of adults of this tick on Herpestidae in Iori et al. (1996) to be valid.

**References**

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Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/
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Theiler, G. 1962. The Ixodoidea parasites of vertebrates in Africa south of the Sahara (Ethiopian Region). Report to the Director of Veterinary Services, Onderstepoort, South Africa, Project S.9958, 260 pp.

**20 – *H. calva*** Nuttall & Warburton, 1915 (Ticks. A monograph of the Ixodoidea. Part III. The genus *Haemaphysalis*. Cambridge University Press, London, pp. 349–550)

**Type depository**: BMNH (lectotype, paralectotypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*) as *Haemaphysalis calvus*

**Known stages**: male, female, nymph

**Zoogeographic Region**: Oriental

**Ecoregions**: Sumatra peat swamp forests; Borneo rain forests

**Hosts**: usual hosts for adult ticks are Artiodactyla: Cervidae.
Artiodactyla: Bovidae, Cervidae, Suidae; Carnivora: Viverridae, Ursidae (A)

**Human infestation**: no

**Remarks**: the nymph of *H. calva* is only known from a nymphal pelt (Hoogstraal and Wassef 1981).

**Reference**

Hoogstraal, H. & Wassef, H.Y. 1981. *Haemaphysalis* (*Garnhamphysalis*) subgen. nov. (Acarina: Ixodidae): candidate tick vectors of hematozoa in the Oriental Region. Parasitol. Topics Spec. Publ., pp. 117–124.

**21 – *H. campanulata*** Warburton, 1908 (Proc. Cambr. Phil. Soc., 14: 508–519)

**Type depository**: BMNH (lectotype, paralectotypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Oriental, Palearctic

**Ecoregions**: temperate broadleaf and mixed forests

**Hosts**: usual hosts for larvae, nymphs and adult ticks are Carnivora: Canidae.
Carnivora: Canidae (ANL)
Mammalia (several orders) (A)
Rodentia: Muridae (NL)

**Human infestation**: yes (Yamaguti et al. 1971)

**Remarks**: Camicas et al. (1998) list the nymph of *H. campanulata* as undescribed, but it was described by Yamaguti et al. (1971). There is a record of this species' introduction into the Australasian Region, but it failed to become established there (Roberts 1963). Noh (1972) records males, females and nymphs of *H. campanulata* on Galliformes: Phasianidae, while Phan Trong (1977) reports adults of this tick from Cuculiformes and Passeriformes, and Tsai et al. (2012) record one adult of *H. campanulata* from an undetermined bird, but we feel that these records require confirmation and they have not been included in our list of hosts for this species.

**References**

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Roberts, F.H.S. 1963. A systematic study of the Australian species of the genus *Haemaphysalis* Koch (Acarina: Ixodidae). Aust. J. Zool., 11: 35–80.
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Yamaguti, N., Tipton, V.J., Keegan, H.L. & Toshioka, S. 1971. Ticks of Japan, Korea, and the Ryukyu Islands. Brigham Young Univ. Sci. Bull. Biol. Ser., 15 (1), 226 pp.

**22 – *H. canestrinii*** (Supino, 1897) (Atti Soc. Veneto-Trentina Sci. Nat. Residente Padova, Ser. 2, 3: 230–238)

**Type depository**: GM (lectotype, paralectotypes) (Hoogstraal and Trapido 1966, *op. cit.* under *H. asiatica*) as *Opisthodon canestrinii*

**Known stages**: male, female, nymph

**Zoogeographic Regions**: Oriental, Palearctic

**Ecoregions**: tropical and subtropical forests

**Hosts**: usual hosts for adult ticks are Carnivora: Canidae, Felidae and Viverridae. Aves are considered exceptional hosts for adults of this tick.
Carnivora: Viverridae (AN)
Carnivora (several families); Lagomorpha: Leporidae; Galliformes: Phasianidae (A)
Rodentia: Sciuridae, Muridae; Scandentia: Tupaiidae (N)

**Human infestation**: no

**Remarks**: data published prior to Hoogstraal (1971) have been ignored because of uncertainties concerning the identification of *H. canestrinii*. Camicas et al. (1998) treat *H. canestrinii* as an exclusively Oriental species, but several records in Teng and Jiang (1991) are from the Palearctic Region. Hoogstraal (1971) records this species

on humans, but the specimens were not actually feeding, and we have therefore not included humans as hosts of *H. canestrinii*. Kolonin (2009) ignores Aves as hosts of this species, but we regard the odd record from Aves in Hoogstraal (1971) as sound. Kolonin (2009) appears to believe that the larvae of *H. canestrinii* feed on various host species, but we have been unable to confirm this.

**References**

Camicas, J.-L., Hervy, J.-P., Adam, F. & Morel, P.-C. 1998. Les tiques du monde (Acarida, Ixodida). Nomenclature, stades décrits, hôtes, répartition. ORSTOM, Paris, 233 pp.

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Teng, K.-F. & Jiang, Z.-J. 1991. Economic insect fauna of China. Fasc. 39, Acari: Ixodidae. Science Press, Beijing, 355 pp. In Chinese.

**23 – *H. capricornis*** Hoogstraal, 1966 (J. Parasitol., 52: 783–786)

**Type depositories**: BMNH (holotype, paratypes), USNTC (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*), originally identified as *H. hystricis*, as stated in Hoogstraal, H. (1966. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea: Ixodidae). *H.* (*H.*) *capricornis* sp. n., the large Malayan serow haemaphysalid from southwestern Thailand. J. Parasitol., 52: 783–786)

**Known stages**: male

**Zoogeographic Region**: Oriental

**Ecoregion**: Tenasserim-South Thailand semi-evergreen rain forests

**Hosts**: Artiodactyla: Bovidae (A)

**Human infestation**: no

**Remarks**: Tanskul et al. (1983) list Muridae as hosts for the adults of *H. capricornis*, but this record is not included in Tanskul and Inlao (1989) (both papers refer to ticks in Thailand), and we have therefore omitted murids from our host list for this tick. Mihalca et al. (2011) regard *H. capricornis* as endangered.

**References**

Hoogstraal, H. 1966. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea: Ixodidae). *H.* (*H.*) *capricornis* sp. n., the large Malayan serow haemaphysalid from southwestern Thailand. J. Parasitol., 52: 783–786.

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Tanskul, P., Stark, H.E. & Inlao, I. 1983. A checklist of ticks of Thailand (Acari: Metastigmata: Ixodoidea). J. Med. Entomol., 20: 330–341.

**24 – *H. caucasica*** Olenev, 1928 (Dokl. Akad. Nauk USSR, Ser. A (2): 29–34. In Russian)

**Type depository**: ZIAC (lectotype, paralectotype) (Filippova, N.A. 2008. Type specimens of argasid and ixodid ticks (Ixodoidea: Argasidae, Ixodidae) in the collection of the Zoological Institute, Russian Academy of Sciences (St. Petersburg). Entomol. Rev., 88: 1002–1011)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Palearctic

**Ecoregions**: desert and xeric shrublands

**Hosts**: usual hosts for larvae, nymphs and adults are Lagomorpha: Leporidae.
Lagomorpha: Leporidae (ANL)
Artiodactyla: Bovidae; Carnivora: Canidae, Mustelidae, Ursidae (A)
Erinaceomorpha: Erinaceidae; Rodentia: Muridae; Passeriformes (several families); Coraciiformes: Upupidae; Galliformes: Phasianidae; Squamata: Lacertidae, Scincidae (NL)

**Human infestation**: yes (Filippova 1997)

**Remarks**: Camicas et al. (1998) consider pholeophilic (burrowing) mammals to be the sole hosts of this tick species, but we believe that Aves are important hosts for the larvae and nymphs of *H. caucasica*, as stated in Filippova (1997). Durden and Keirans (1996) list *H. caucasica* as an endangered species.

**References**

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Durden, L.A. & Keirans, J.E. 1996. Host-parasite coextinction and the plight of tick conservation. Am. Entomol., 42: 87–91.
Filippova, N.A. 1997. Ixodid ticks of subfamily Amblyomminae. Fauna of Russia and neighbouring countries, 4 (5), Nauka, St. Petersburg, 436 pp.

**25 – *H. celebensis*** Hoogstraal, Trapido & Kohls, 1965 (J. Parasitol., 51: 1001–1003)

**Type depository:** BMNH (holotype) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*). Originally named *H. hystricis* in Nuttall, G.H.F. & Warburton, C. (1915. Ticks. A monograph of the Ixodoidea. Part III. The genus *Haemaphysalis*. Cambridge Univ. Press, London, pp. 349–550), as stated in Hoogstraal, H.,

Trapido, H. & Kohls, G.M. (1965. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea, Ixodidae). *H.* (*Kaiseriana*) *celebensis* sp. n., from a wild boar in Celebes. J. Parasitol., 51, 1001–1003)

**Known stages**: male, female

**Zoogeographic Region**: Australasian

**Ecoregion**: Sulawesi montane rain forests

**Hosts**: usual hosts for adult ticks are Artiodactyla: Suidae.
Artiodactyla: Bovidae, Cervidae, Suidae; Perissodactyla: Equidae (A)
Rodentia: Muridae (NL)

**Human infestation**: yes (Durden et al. 2008)

**Remarks**: the larva and nymph of *H. celebensis* have not been described, but we consider records of the immature stages of this tick in Durden et al. (2008) to be provisionally valid. Kolonin (2009) ignores Equidae as hosts for *H. celebensis*, but we accept the record from this type of host in Durden et al. (2008).

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Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/

**26 – *H. chordeilis*** (Packard, 1869) (First Annual Report of the Trustees of the Peabody Academy of Sciences, Appendix, pp. 52–69)

**Type depository:** MCZ (holotype). Guglielmone, A.A., Estrada-Peña, A., Keirans, J.E. & Robbins, R.G. (2003. Ticks (Acari: Ixodida) of the Neotropical Zoogeographic Region. Special Publication of the International Consortium on Ticks and Tick-borne Diseases-2, Atalanta, Houten, The Netherlands, 173 pp.) state that the types were housed in MPAS as *Ixodes chordeilis* but have apparently been lost. However, Cooley, R.A. (1946. The genera *Boophilus*, *Rhipicephalus*, and *Haemaphysalis* (Ixodoidea) of the New World. Natl. Inst. Health Bull. (187), 54 pp.) states that "types" are in MCZ, as *Ixodes chordeilis*. The MCZ online zoological collections database (http://mczbase.mcz.harvard.edu/ accessed April 4, 2013) indicates that the holotype of *H. chordeilis* is held there.

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Nearctic

**Ecoregions**: several different Nearctic ecoregions

**Hosts**: Mammalia are considered exceptional hosts for this tick.
Galliformes: Phasianidae; Passeriformes: Icteridae (ANL)
Anseriformes: Anatidae; Caprimulgiformes: Caprimulgidae; Artiodactyla: Bovidae; Perissodactyla: Equidae; Rodentia: Sciuridae (A)

Passeriformes: Emberizidae (NL)
Falconiformes: Accipitridae; Passeriformes: Mimidae (N)
Passeriformes: Corvidae, Troglodytidae (L)
Rodentia: Geomyidae (stage unknown)

**Human infestation**: yes (Keirans 1985)

**Remarks**: Camicas et al. (1998) state that *H. chordeilis* is present in the Nearctic and Neotropical Regions, but there are no *bona fide* Neotropical records of this species, as discussed in Guglielmone et al. (2003). Cooley (1946) cites Hewitt (1915, who uses the name *H. cinnabarina*) concerning Leporidae as hosts of *H. chordeilis*, while Allan (2001) lists the domestic cat as a host without supplying details for this record. Becklund (1964) presents a table with the caption "parasites of dog and cats" in which *H. chordeilis* is included, but without specifying whether the tick was a parasite of Canidae, Felidae or both. None of the latter four authors mention the developmental stage of ticks found on hosts. These doubtful records have been excluded from our list of hosts of *H. chordeilis.* Infestation of mammals with *H. chordeilis* does not appear to be a common event. See also *H. cinnabarina.*

**References**

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Wilson, N. & Kale, H.W. 1972. Ticks collected from Indian River County, Florida (Acari: Metastigmata: Ixodidae). Florida Entomol., 55: 53–57.

**27 – *H. cinnabarina*** Koch, 1844 (Arch. Naturgesch., 10: 217–239)
This species is not included in Kolonin (2009, *op. cit*. under *H. anomaloceraea*). See also remarks below.

**Type depository**: ZMB (holotype) (Moritz, M. & Fischer, S.C. 1981. Die Typen der Arachniden-Sammlung des Zoologischen Museums Berlin. Mitt. Zool. Mus. Berlin, 57: 341–364)

**Known stages**: female

**Zoogeographic Region**: Neotropical

**Ecoregion**: the only known records mention Brazil as locality, without further geographical information

**Hosts**: unknown

**Human infestation**: no

**Remarks**: this tick is known from two specimens collected almost 170 years ago as *H. cinnabarina* and its synonym *H. sanguinolenta* Koch, 1844. Although Hoogstraal (1973) defended the Brazilian origin of *H. cinnabarina*, Guglielmone et al. (2003) did not include it as a Neotropical taxon. Their opinion was based on the statement by Keirans and Restifo (1993) that most investigators consider this name identical to *H. punctata*, and Kolonin (2009) also maintains this view. Cooley (1946) had previously believed that *H. cinnabarina* was partly a synonym of *H. chordeilis.* Recently, Barros-Battesti et al. (2008) examined the type and concurred with the opinion of Hoogstraal (1973). Consequently, we now regard *H. cinnabarina* as a tick exclusive to the Neotropical Zoogeographic Region. Camicas et al. (1998) list ungulates as hosts of this tick species, but we have found no information to support this statement. There is a record from Rodentia in Suriname (Neotropical Region) by Reyne (1923), but it requires confirmation and we have excluded it from our list of *bona fide* hosts of *H. cinnabarina.*

**References**

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Camicas, J.-L., Hervy, J.-P., Adam, F. & Morel, P.-C. 1998. Les tiques du monde (Acarida, Ixodida). Nomenclature, stades décrits, hôtes, répartition. ORSTOM, Paris, 233 pp.

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Reyne, A. 1923. Verslag van den entomoloog. Versl. Dep. Landbouw. Nijver. Handel Suriname (1922), pp. 32–39.

**28 – *H. colasbelcouri*** (Santos Dias, 1958) (Mem. Estud. Mus. Zool. Univ. Coimbra (249), 9 pp.)
Barker, S.C. & Murrell, A. (2008. Systematics and evolution of ticks with a list of valid genus and species names. *In* A.S. Bowman & P.A. Nuttall (editors), Ticks: biology, disease and control. Cambridge University Press, Cambridge, pp. 1–39) include as valid *Haemaphysalis vietnamensis* Hoogstraal & Wilson, 1966 and *H. colasbelcouri*, but the former species has since been treated as a synonym of the latter (Guglielmone, A.A., Robbins, R.G., Apaneskevich, D.A., Petney, T.N., Estrada-Peña, A. & Horak, I.G., 2009. Comments on controversial tick (Acari: Ixodida) species names and species described or resurrected from 2003 to 2008. Exp. Appl. Acarol., 48: 311–327). Kolonin (2009, *op. cit*. under *H. anomaloceraea*) includes this name as? *H. colasbelcouri* under the name *I. vietnamensis* without further explanation. Chen, Z., Yang, X., Bu, F., Yang, X., Yang, X. & Liu, J. (2010. Ticks (Acari: Ixodoidea: Argasidae, Ixodidae) of China. Exp. Appl. Acarol., 51: 393–404.) listed *H. vietnamensis* but not *H. colasbelcouri* for China, probably because they accepted Kolonin's view (*op. cit.* above).

**Type depository**: IPP (holotype, paratypes) (Santos Dias, J.A.T. 1958. Notas ixodológicas. III. Sobre duas espécies do género *Aponomma* Neumann, 1899 da Região Oriental. Mem. Estud. Mus. Zool. Univ. Coimbra (249): 1–9) as *Aponomma colasbelcouri*

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical dry broadleaf forests

**Hosts**: Artiodactyla: Bovidae, Cervidae (A)

**Human infestation**: yes (Kolonin 1995 as *H. vietnamensis*, see above)

**Remarks**: Camicas et al. (1998) list the nymph and larva of this species as undescribed, but Ding and Ying (1996) described them under the name *H. vietnamensis*. The latter authors appear to have described these immature stages from laboratory-reared specimens, although we have only seen the abstract of their paper. Mihalca et al. (2011) regard this species as endangered under the name *H. vietnamensis.*

**References**

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Mihalca, A.D., Gherman, C.M. & Cozma, V. 2011. Coendangered hard-ticks: threatened or threatening? Parasit. Vectors, 4 (71), 7 pp.

**29 – *H. colesbergensis*** Apanaskevich & Horak, 2008 (J. Parasitol., 94: 594–607)
Kolonin (2009, *op. cit*. under *H. anomaloceraea*) does not include this species in his list of Ixodidae of the world.

**Type depositories**: USNTC (holotype, paratypes), OVI, ZIAC (paratypes) (Apanaskevich, D.A. & Horak, I.G. 2008. Two new species of African *Haemaphysalis* ticks (Acari: Ixodidae), carnivore parasites of the *H.* (*Rhipistoma*) *leachi* group. J. Parasitol., 94: 594–607). This tick was originally identified as *H. leachi.*

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Afrotropical

**Ecoregions**: mediterranean woodlands and scrub; deserts and xeric shrublands

**Hosts**: Erinaceomorpha: Erinaceidae (AN)
Carnivora: Canidae, Felidae (A)

**Human infestation**: no

**Remarks**: the natural hosts for the larva of *H. colesbergensis* are unknown, and the larva and nymph were described from laboratory-reared material.

**References**

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Horak, I.G., Welman, S., Hallam, S.L., Lutermann, H. & Mzilikazi, N. 2011. Ticks of four-toed elephant shrews and Southern African hedgehogs. Onderstepoort J. Vet. Res. 78, doi:10.4102/ojvr.v78i1.243

**30 – *H. concinna*** Koch, 1844 (Arch. Naturgesch., 10: 217–239)

**Type depository**: ZMB (syntypes) (Nuttall and Warburton 1915, *op. cit.* under *H. celebensis*), but not included in ZMB (Moritz and Fischer 1981, *op. cit*. under *H. cinnabarina*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Oriental, Palearctic

**Ecoregions**: several different ecoregions within the Palearctic and Oriental Zoogeographic Regions

**Hosts**: Squamata are considered exceptional hosts for this tick.
Mammalia (several orders); Galliformes: Phasianidae; Passeriformes (several families) (ANL)
Aves (several orders); Squamata: Colubridae, Lacertidae (NL)

**Human infestation**: yes (Hillyard 1996; Bursali et al. 2012 among others)

**Remarks**: recent records of *H. concinna* from China indicate that its distribution includes the Oriental Region (Chu et al. 2008; Bian et al. 2009). These records are not included in Chen et al. (2010), but we treat them as valid. Camicas et al. (1998) do not list Aves as significant hosts for larvae and nymphs of *H. concinna*, but Kislenko and Koneva (1965), Nosek (1971) and others found Aves to be important hosts of this species. Kolonin (2009) excludes Aves as hosts for adult *H. concinna*, and Squamata are also ignored as hosts of this tick. We accept the records of *H. concinna* adults on Aves in Kislenko and Koneva (1965), as well as the unusual records on Squamata in Nosek (1971) and Krčmar (2012).

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**31 – *H. cooleyi*** Bedford, 1929 (15th Annual Report of the Director of Veterinary Services, Department of Agriculture, Union of South Africa, pp. 493–499)
See remarks below.

**Type depository**: OVI (lectotype, paralectotypes) (Hoogstraal, H. & Wassef, H.Y. 1981. Notes on African *Haemaphysalis* ticks. XIII. Identity of *H.* (*Rhipistoma*) *cooleyi*, a parasite of the rock hyrax in South Africa (Acarina: Ixodidae). Onderstepoort J. Vet. Res., 48: 135–140)

**Known stages**: male, female, nymph

**Zoogeographic Region**: Afrotropical

**Ecoregions**: rocky outcrops and mountains in subtropical savannas and shrublands

**Hosts**: Hyracoidea: Procaviidae (AN)

**Human infestation**: no

**Remarks**: Bedford (1929) includes nymphs of *H. cooleyi* from Rodentia: Pedetidae in his description of this species. However, as reported in Hoogstraal (1956), these nymphs were in fact a male and a female that had at first been classified as *H. numidiana* Neumann, 1905 (= *H. erinacei*). Subsequently, Hoogstraal (1972) decided that these specimens belonged to a new species (*H. pedetes*). Descriptions and illustrations of the male, female and nymph of *H. cooleyi* are included in Hoogstraal and Wassef (1981).

**References**

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Hoogstraal, H. 1972. Notes on African *Haemaphysalis* ticks. IX. *H.* (*Rhipistoma*) *pedetes* sp. n., a relict parasite of the springhare (Rodentia: Pedetidae) in Transvaal (Ixodoidea: Ixodidae). J. Parasitol., 58: 979–983.

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**32 – *H. cornigera*** Neumann, 1897 (Mém. Soc. Zool. Fr., 10: 324–420)
See *H. taiwana* and remarks below.

**Type depositories**: MNHN (lectotype), BMNH (paralectotype) (Keirans and Hillyard, 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Australasian, Oriental, Palearctic

**Ecoregions**: tropical and subtropical moist broadleaf forests

**Hosts**: Aves are considered exceptional hosts for adults of this tick.
Carnivora: Viverridae (ANL)
Artiodactyla: Bovidae, Cervidae; Rodentia: Muridae (AN)
Artiodactyla: Suidae; Carnivora: Canidae, Felidae, Mustelidae; Rodentia: Hystricidae; Passeriformes: Timaliidae, Turdidae; Galliformes: Phasianidae (A)
Scandentia: Tupaiidae (N)
Rodentia: Sciuridae; Soricomorpha: Soricidae (N?)

**Human infestation**: yes (Durden et al. 2008)

**Remarks**: there is considerable confusion concerning *H. cornigera* and *H. ias* (see *H. ias* for further details) and contradictory information about *H. cornigera* itself. The larva and nymph of *H. cornigera* are listed as undescribed in Camicas et al. (1998), while Anastos (1950) initially expressed doubts about the Oudemans' (1927)

descriptions of the larva and nymph based on specimens from Ambon Island (Australasian), only to later accept this locality. Durden et al. (2008) also found *H. cornigera* in Sulawesi (Australasian). The descriptions of the sub-adult stages of *H. cornigera* by Oudemans (1927) are sufficiently detailed and we have found no direct criticism of his work. Consequently, we regard his descriptions as provisionally valid. Camicas et al. (1998) state that *H. cornigera* occurs in the Oriental and Palearctic Zoogeographic Regions. However, we were unable to find *bona fide* Palearctic localities for this species prior to Yamauchi et al. (2009), who recorded its presence in Honshu (Japan). Because Ambon Island and Sulawesi lie within the Australasian Zoogeographic Region, the distribution of *H. cornigera* includes this region in addition to the Oriental and Palearctic Regions listed by Camicas et al. (1998). Tanskul et al. (1983) present information on the hosts of *H. cornigera* in Thailand, but Tanskul and Inlao (1989) later state that the ticks identified as *H. cornigera* in Thailand were in fact *H. shimoga.* Sreenivasan et al. (1972) generalized that Soricomorpha and Rodentia: Muridae and Sciuridae were hosts for nymphs of *H. cornigera*, but it is unclear from their publication whether all these hosts were infested. Kolonin (2009) lists Muridae as hosts for the immature stages of *H. cornigera*, probably following Hoogstraal et al. (1972), who refer to this tick as *H. cornigera cornigera*, and state that nymphs and larvae feed on rodents, but present information for three nymphs from vegetation. We treat the record of Oudemans (1927) of larvae and nymphs on Viverridae, the record of Warburton (1926) of nymphs on Tupaiidae, and the record of Munaf (1978) of a nymph on Muridae as provisionally valid. Kolonin (2009) does not include Aves as hosts for adult *H. cornigera*, but we consider the few records from Aves in Anastos (1950) to be provisionally valid. Clearly, the literature on *H. cornigera* contains a number of conflicting statements.

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**33 – *H. cornupunctata*** Hoogstraal & Varma, 1962 (J. Parasitol., 48: 185–194)

**Type depositories**: USNTC (holotype, paratypes), BMNH, HH, VRC, ZSI (paratypes) (Keirans and Hillyard, 2001, *op. cit.* under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Oriental, Palearctic

**Ecoregions**: montane grasslands and shrublands

**Hosts**: usual hosts for larvae, nymphs and adults are Artiodactyla: Bovidae.
Artiodactyla: Bovidae; Perissodactyla: Equidae (ANL)
Rodentia: Muridae (N)
Lagomorpha: Ochotonidae (stage unknown)

**Human infestation**: no

**Remarks**: Camicas et al. (1998) consider this species to be exclusively Oriental, but Hoogstraal and Kim (1985) include Afghanistan (Palearctic) within its range. We were unable to confirm the record of *H. cornupunctata* on Cervidae in Ghosh et al. (2007). Rao et al. (1973) state that "mouse hare" is a host of *H. cornupunctata* but do not identify the tick stage(s) collected. Kolonin (2009) does not recognize hosts of *H. cornupunctata* other than "livestock."

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Sharma, B.D. 1993. Medical & veterinary arthropod-disease ecology. Ashish Publishing House, New Delhi, 335 pp.

**34 – *H. cuspidata*** Warburton, 1910 (Parasitology, 3: 395–407)

**Type depositories**: BMNH (lectotype, paralectotypes), ZMB (paratype) [sic] (Keirans and Hillyard, 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: Sri Lanka and southwestern Ghats montane rain forests

**Hosts**: Artiodactyla: Tragulidae; Carnivora: Viverridae; Cuculiformes: Cuculidae (ANL)
Carnivora: Felidae, Herpestidae; Lagomorpha: Leporidae (A)
Artiodactyla: Bovidae; Primates: Cercopithecidae (NL)
Rodentia: Hystricidae; Coraciiformes: Bucerotidae; Galliformes: Phasianidae (N)
Rodentia: Muridae, Sciuridae; Soricomorpha: Soricidae; Passeriformes: Sylviidae (L)
Carnivora: Canidae (stage unknown)

**Human infestation**: no

**Remarks**: Kolonin (2009) does not include Aves as hosts of adults of *H. cuspidata*, but we regard the records from Cuculidae in Rajagopalan (1972) as sound. Kolonin (2009) also lists Cervidae as hosts for all parasitic stages of *H. cuspidata*, but we were unable to confirm this from the reference provided by this author and have therefore excluded Cervidae from our host list above.

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Warburton, C. 1910. On two collections of Indian ticks. Parasitology, 3: 395–407.

**35 – *H. dangi*** Phan Trong, 1977 (Ve bet va con trung ky sinh o Viet Nam. Tap 1. Ve (Ixodoidea), mo ta va phan loai. Ha Noi: Khoa hoc va ky thuat, 489 pp. In Vietnamese)

**Type depository**: AI (holotype, paratypes) (Kolonin, G.V. personal communication to Guglielmone, A.A.)

**Known stages**: male, female

**Zoogeographic Region**: Oriental

**Ecoregion**: south China-Vietnam subtropical evergreen forests

**Hosts**: Artiodactyla (several families); Carnivora: Mustelidae; Rodentia: Hystricidae (A)

**Human infestation**: no

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**36 – *H. danieli*** Černý & Hoogstraal, 1977 (J. Parasitol., 63: 567–574)
Specimens of *H. danieli* from China are considered identical to *H. pospelovashtromae* by Kolonin (2009, *op. cit*. under *H. anomaloceraea*), but no conclusive evidence is presented. See also "Remarks on some invalid names" at the beginning of this chapter for justification of the status of *H. xinjiangensis* as a junior synonym of *H. danieli*, as well as the remarks below.

**Type depository**: IPCAS (holotype) (Černý, V. & Hoogstraal, H. 1977. *Haemaphysalis* (*Allophysalis*) *danieli*, sp. n., (Ixodoidea: Ixodidae), female and tentatively associated immature stages from high mountains of northern Pakistan and Afghanistan. J. Parasitol., 63: 567–574)

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Oriental, Palearctic

**Ecoregions**: montane grasslands and shrublands in the Oriental and Palearctic Zoogeographic Regions

**Hosts**: Artiodactyla: Bovidae (A)
Lagomorpha: Ochotonidae; Rodentia: Cricetidae, Muridae, Sciuridae (NL)

**Human infestation**: no

**Remarks**: Camicas et al. (1998) state that this species is found only in the Oriental Region, but there are localities included in the original description of *H. danieli* and in Teng and Jiang (1991), Yu et al. (1997) and Chen et al. (2010) that fall within the Palearctic Region. Camicas et al. (1998) list the male of *H. danieli* as undescribed. This statement is probably a consequence of regarding *H. xinjiangensis* as a species separate from *H. danieli* when in fact the converse is true (see the first paragraph of this chapter). The male of *H. danieli* was described by Teng (1980), but under the name *H. xinjiangensis.*

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**37 – *H. darjeeling*** Hoogstraal & Dhanda, 1970 (J. Parasitol., 56: 169–174)

**Type depositories**: BMNH (holotype, paratypes), USNTC, HH, IM (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*). The specimens used in the description of *H. darjeeling* were part of the syntype series of *H. birmaniae.*

**Known stages**: male, female

**Zoogeographic Region**: Oriental

**Ecoregions**: montane grasslands and shrublands

**Hosts**: Artiodactyla: Bovidae, Cervidae, Suidae; Carnivora: Mustelidae (A)

**Human infestation**: yes (Tanskul and Inlao 1989, see below)

**Remarks**: Kolonin (2009) does not include Carnivora as hosts of *H. darjeeling*, probably because he regards the ticks found on these hosts in Tanskul and Inlao (1989) as closer to *H. quadriaculeata* than to *H. darjeeling*, as discussed in Kolonin (2003). We consider the records of this tick on Carnivora in Tanskul et al. (1983) and Tanskul and Inlao (1989) to be provisionally valid. See also *H. quadriaculeata.*

**References**

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**38 – *H. davisi*** Hoogstraal, Dhanda & Bhat, 1970 (J. Parasitol., 56: 588–595)
See remarks below.

**Type depositories:** USNTC (holotype, paratypes), BMNH, VRC, HH, IM (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph

**Zoogeographic Region**: Oriental

**Ecoregion**: temperate coniferous forests

**Hosts**: Artiodactyla: Bovidae, Cervidae; Perissodactyla: Equidae (AN)
Carnivora: Felidae, Mustelidae (A)

**Human infestation**: no

**Remarks**: specimens of *H. neumanni* Dönitz, 1905 (a synonym of *Haemaphysalis longicornis*) in Dhanda and Rao (1964) are in fact *H. davisi* (Hoogstraal et al. 1970). Camicas et al. (1998) list Aves and pholeophilic (burrowing) mammals as hosts for larvae and nymphs of this species, but we have found no references to support this statement.

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**39 – *H. demidovae*** Emel'yanova, 1978 (*In* Natural conditions and resources of Prikhusbsugul (Mongolian People's Republic), O.M. Kozhova (editor). Trudy Sov. Mongol. Kompleks. Khubsugul. Eksp. Irkutsk. Gos. Univ. imeni A.A. Zhdanova, Minist. Vyssh. Spets. Obraz. RSFSR (6): 162–171. In Russian).

**Type depository**: not stated in the description of this species (Keirans, J.E. & Robbins, R.G. 1999. A world checklist of genera, subgenera, and species of ticks (Acari: Ixodida) published from 1973 to 1997. J. Vector Ecol., 24: 115–129).

**Known stages**: nymph, larva

**Zoogeographic Region**: Palearctic

**Ecoregions**: deserts and xeric shrublands

**Hosts**: Rodentia: Cricetidae, Ochotonidae, Sciuridae (NL)

**Human infestation**: no

**Reference**

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**40 – *H. doenitzi*** Warburton & Nuttall, 1909 (Parasitology, 2: 57–76)
See *H. phasiana* and *H. pavlovskyi* and remarks below.

**Type depository**: BMNH (lectotype, paralectotypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Australasian, Oriental, Palearctic

**Ecoregions**: tropical and subtropical rain forests

**Hosts**: usual hosts for larvae, nymphs and adult ticks are Cuculiformes: Cuculidae, Galliformes: Phasianidae. Mammalia and Testudines are considered exceptional hosts for this tick.
Cuculiformes: Cuculidae; Galliformes: Phasianidae; Passeriformes: Sturnidae; Rodentia: Muridae (ANL)

Falconiformes: Accipitridae, Falconidae; Passeriformes: Sylviidae; Strigiformes: Strigidae; Lagomorpha: Leporidae; Testudines: Geoemydidae (AN)
Passeriformes: Alaudidae (AL)
Coraciiformes: Coraciidae, Upupidae; Gruiformes: Rallidae; Passeriformes: Pycnonotidae (A)
Passeriformes: Pittidae, Timaliidae, Turdidae (NL)
Passeriformes: Hirundinidae, Muscicapidae; Piciformes: Capitonidae (N)

**Human infestation**: yes (Tanskul et al. 1983)

**Remarks**: although Aves are the preferred hosts of *H. doenitzi*, Kolonin (2008) believes that Mammalia are equally important as hosts. Kolonin (2009) claims that *H. phasiana* and *H. pavlovskyi* are synonyms of *H. doenitzi*, and perhaps these synonymies, which we consider invalid, are the source of Kolonin's unexplained statement concerning the host preferences of *H. doenitzi*. On the other hand, Sames et al. (2008) believe that a complex of species may be represented under the name *H. doenitzi*. Until this problem is solved, all the above names should be treated as valid. It is not clear whether or not Liu et al. (2002) found specimens of *H. doenitzi* on Soricidae, and we have therefore excluded this host group from our list above.

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Sames, W.J., Kim, H.C., Chong, S.T., Lee, I.Y., Apanaskevich, D.A., Robbins, R.G., Bast. J., Moore, R. & Klein, T.A. 2008. *Haemaphysalis* (*Ornithophysalis*) *phasiana* (Acari: Ixodidae) in the Republic of Korea: two province records and habitat descriptions. Syst. Appl. Acarol., 13: 43–50.

Tanskul, P., Stark, H.E. & Inlao, I. 1983. A checklist of ticks of Thailand (Acari: Metastigmata: Ixodoidea). J. Med. Entomol., 20: 330–341.

**41 – *H. elliptica*** (Koch, 1844) (Arch. Naturgesch., 10: 217–239)
See remarks below.

**Type depository:** ZMB (holotype) (Moritz and Fischer 1981, *op. cit*. under *H. cinnabarina*) as *Rhipistoma ellipticum*

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Afrotropical

**Ecoregions**: several Afrotropical ecoregions

**Hosts**: usual hosts for adult ticks are Carnivora: Canidae and Felidae. Aves are considered exceptional hosts for this tick.
Carnivora: Canidae, Felidae (ANL)
Mammalia (several orders) (A)
Macroscelidea: Macroscelididae (N)
Rodentia: Muridae (NL)
Passeriformes: Cisticolidae, Ploceidae (N and/or L)

**Human infestation**: yes (Apanaskevich et al. 2007)

**Remarks**: this species has frequently been confused with *H. leachi* (Apanaskevich et al. 2007). Camicas et al. (1998) listed the male and larva as the only stages of *H. elliptica* that had been described at the time of their publication; however, the female and nymph were subsequently described by Apanaskevich et al. (2007). The latter authors also indicated that subadults of *H. elliptica* feed on rodents, without identifying the families, whereas Matthee et al. (2010) collected the immature stages from Muridae. Hasle et al. (2009) do not state whether larvae, nymphs or both immature stages of *H. elliptica* were found on Passeriformes.

**References**

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Horak, I.G., Welman, S., Hallam, S.L., Lutermann, H. & Mzilikazi, N. 2011. Ticks of four-toed elephant shrews and Southern African hedgehogs. Onderstepoort J. Vet. Res., 78, doi:10.4102/ojvr.v78i1.243

Matthee, S., Horak, I.G., Van der Mescht, L., Ueckermann, E.A. & Radloff. F.G.T. 2010. Ectoparasite diversity on rodents at De Hoop Nature Reserve, Western Cape Province. Afr. Zool., 45: 213–224.
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**42 – *H. elongata*** Neumann, 1897 (Mém. Soc. Zool. Fr., 10: 324–420)

**Type depository**: BMNH (syntypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Afrotropical

**Ecoregion**: Madagascar subhumid forests

**Hosts**: usual hosts for adult ticks are Afrosoricida: Tenricidae.
Afrosoricida: Tenrecidae (ANL)
Rodentia: Muridae (A)
Carnivora: Eupleridae; Erinaceomorpha: Erinaceidae (N)

**Human infestation**: yes (Burridge 2011)

**Remarks**: Uilenberg et al. (1979) regard a record of this tick from Chiroptera as doubtful and we have therefore excluded this record from our list for *H. elongata*. Keirans and Durden (2001) cite an introduction of this species into the Nearctic Region, but *H. elongata* has not become established there. Kolonin (2009) and Burridge (2011) ignore Erinaceidae as hosts of this tick, but we consider the record of Keirans (1985) on this host valid.

**References**

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**43 – *H. erinacei*** Pavesi, 1884 (Ann. Mus. Civ. Stor. Nat. Genova, 20: 446–486)
The species *H. erinacei* described in Feldman-Muhsam, B. (1951. A note on east Mediterranean species of the genus *Haemaphysalis*. Bull. Res. Council Israel, 1: 96–107) is a synonym of *H. erinacei* Pavesi, 1884, as stated in Hoogstraal, H. (1955.

Notes on African *Haemaphysalis* ticks. I. The Mediterranean-littoral hedgehog parasite. *H. erinacei* Pavesi, 1884 (Ixodoidea, Ixodidae). J. Parasitol., 41: 221–233)

Many workers believe that this species comprises several subspecies, indicating that more than one taxon is probably included under the name *H. erinacei.* Filippova, N.A., Panova, I.V. & Musatov, S.A. (1993. Taxonomic structure of the polytypic species *Haemaphysalis erinacei* (Ixodidae). Parazitologiya, 27: 193–215. In Russian) provide a good description of the subspecies within *H. erinacei*. See "remarks on some invalid names" for an additional synonym of *H. erinacei.* See also remarks below.

**Type depository**: GM (syntypes) (Hoogstraal 1955, *op. cit*. above)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Palearctic

**Ecoregions**: mediterranean forests, woodlands and scrub

**Hosts**: Testudines are considered exceptional hosts for this tick.
Carnivora: Canidae; Erinaceomorpha: Erinaceidae (ANL)
Carnivora: Felidae, Hyaenidae, Mustelidae; Lagomorpha: Leporidae, Ochotonidae; Coraciiformes: Meropodidae; Testudines: Testudinidae (A)
Rodentia: Muridae (NL)
Rodentia: Gliridae; Apodiformes: Apodidae; Passeriformes: Motacillidae (N)
Rodentia: Dipodidae (L)
Chiroptera: Vespertilionidae; Rodentia: Calomyscidae, Cricetidae (N and/or L)
Artiodactyla: Bovidae; Carnivora: Ursidae; Rodentia: Sciuridae; Falconiformes: Falconidae; Passeriformes: Emberizidae, Muscicapidae (stages unknown)

**Human infestation**: yes (Bursali et al. 2012)

**Remarks**: Serdjukova (1956), Ushakova (1958), Gusev et al. (1961), Bakhaeva (1962), Grebenyuk (1966), and Filippova et al. (1976) call this species *H. numidiana.* We were unable to determine which immature stages were found by Filippova et al. (1976) on Chiroptera and Rodentia (Calomyscidae and Cricetidae). Tovornik and Černý (1974) doubt whether adult ticks of *H. erinacei* were found on Coraciiformes (Meropodidae) or Gruiformes (Gruidae), but Tovornik (1990) clearly states that a male was found on Meropodidae. Kolonin (2009) reduces the hosts of *H. erinacei* to "hedgehogs, small carnivores and rodents" but does not comment on this limited host range.

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**44 – *H. eupleres*** Hoogstraal, Kohls & Trapido, 1965 (J. Parasitol., 51: 997–1000)

**Type depository**: AMNH (holotype) (Hoogstraal, H. & Camicas, J.-L. 1977. *Haemaphysalis* (*Rhipistoma*) *eupleres* (Ixodoidea: Ixodidae), a parasite of the

Madagascar falanouc (mongoose): new data and male identity. J. Parasitol., 63: 1099–1102). **Note**: the Madagascar falanouc belongs to the family Eupleridae while mongoose are classified in the family Herpestidae.

**Known stages**: male, female

**Zoogeographic Region**: Afrotropical

**Ecoregion**: Madagascar lowland forests

**Hosts**: Carnivora: Eupleridae (A)

**Human infestation**: no

**Reference**

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**45 – *H. filippovae*** Bolotin, 1979 (Zool. Zh., 58: 267–269. In Russian)
Camicas et. al. (1998, *op. cit.* under *H. anomaloceraea*) and Kolonin (2009, *op. cit*. under *H. anomaloceraea*) treat this species as an abnormal form of *H. concinna* without further comment. Guglielmone et al. (2009, *op. cit*. under *H. colasbelcouri*) consider *H. filippovae* a valid species and we agree.

**Type depository**: ZIAC (holotype) (Filippova 2008, *op. cit*. under *H. caucasica*)

**Known stages**: female

**Zoogeographic Region**: Palearctic

**Ecoregions**: Ussuri broadleaf and mixed forests

**Hosts**: unknown

**Human infestation**: no

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**46 – *H. flava*** Neumann, 1897 (Mém. Soc. Zool. Fr., 10: 324–420)

**Type depository**: MNHN (syntypes) (Neumann, L.G. 1897. Révision de la famille des ixodidés (2e mémoire). Mém. Soc. Zool. Fr., 10: 324–420)

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Oriental, Palearctic

**Ecoregions**: temperate broadleaf and mixed forests

**Hosts**: Aves are considered exceptional hosts for adults of *H. flava.*
Mammalia (several orders); Galliformes: Phasianidae (ANL)
Falconiformes: Accipitridae (A)
Aves (several orders) (NL)

**Human infestation**: yes (Yamauchi et al. 2010)

**Remarks**: Camicas et al. (1998) exclude Aves as hosts for the larva and nymph of *H. flava*, but Miyamoto et al. (2000) subsequently reported the importance of Aves as hosts of the sub-adults of this tick. On the other hand, Kolonin (2009) does not recognize Aves as hosts for adult *H. flava*, but we accept the record of adults of this species on Galliformes, as reported by Teng and Jiang (1991). See also *H. montgomeryi.*

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**47 – *H. formosensis*** Neumann, 1913 (Entomol. Mitt., Suppl. Entomol., 2: 134–137)

**Type depositories**: BMNH, ZMB (syntypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*), but its presence in ZMB is not mentionated in Moritz and Fischer (1981, *op. cit*. under *H. cinnabarina*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Oriental, Palearctic

**Ecoregions**: tropical and subtropical coniferous forests

**Hosts**: Carnivora: Canidae; Lagomorpha: Leporidae (ANL)
Artiodactyla: Cervidae, Suidae; Galliformes: Phasianidae (AN)
Artiodactyla: Bovidae, Moschidae; Carnivora: Ursidae; Rodentia: Hystricidae, Muridae (A)
Carnivora: Herpestidae; Charadriiformes: Scolopacidae (NL)
Carnivora: Mustelidae; Chiroptera: Vespertilionidae; Scandentia: Tupaiidae (N)
Passeriformes: Corvidae (L)

**Human infestation**: no

**Remarks**: Camicas et al. (1998) list the larva and nymph of *H. formosensis* as undescribed, but Teng and Jiang (1991) had previously provided descriptions of both stages. Kolonin (2009) limits the hosts of *H. formosensis* to pigs, dogs and muntjacs but provides no explanation for this reduced host range.

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**48 – *H. fossae*** Hoogstraal, 1953 (Bull. Mus. Comp. Zool., 111: 37–113)

**Type depositories**: USNTC (holotype, paratypes), BMNH, HH, ISM, FMNH, MCZ, OVI, MNHN (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female.

**Zoogeographic Region**: Afrotropical

**Ecoregions**: Madagascar dry deciduous forests and succulent woodlands

**Hosts**: usual hosts for adult ticks are Carnivora: Eupleridae.
Carnivora: Eupleridae, Viverridae (A)

**Human infestation**: no.

**Reference**

Uilenberg, G., Hoogstraal, H. & Klein, J.-M. 1979. Les tiques (Ixodoidea) de Madagascar et leur rôle vecteur. Arch. Inst. Pasteur Madagascar Num. Spéc., 153 pp.

**49 – *H. fujisana*** Kitaoka, 1970 (Natl. Inst. Anim. Health Q., 10: 73–81)

**Type depositories**: NIAH (holotype, paratypes), HH, USNTC (paratypes) (Kitaoka, S. 1970. *Haemaphysalis* (*Haemaphysalis*) *fujisana* sp. n. (Ixodoidea, Ixodidae), a cattle parasite in Japan. Natl. Inst. Anim. Health Q., 10: 73–81; Keirans and Clifford 1984, *op. cit.* under *H. bartelsi*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Palearctic

**Ecoregions**: temperate broadleaf and mixed forests

**Hosts**: Artiodactyla: Bovidae (ANL)

**Human infestation**: no

**Remarks**: the male, nymph and larva of *H. fujisana* are known only from laboratory-reared specimens. Camicas et al. (1998) list pholeophilic (burrowing) mammals as hosts for the larva and nymph, but we have found no records to substantiate this.

**References**

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**50 – *H. garhwalensis*** Dhanda & Bhat, 1968 (J. Parasitol., 54: 674–678)

**Type depositories**: VRC (holotype, paratypes), BMNH, IM, HH, USNTC (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Oriental, Palearctic

**Ecoregions**: western Himalayan broadleaf forests; Upper Gangetic Plains moist deciduous forests; western Himalayan alpine shrub and meadows

**Hosts**: usual hosts for adult ticks are Artiodactyla: Bovidae. Rodentia: Cricetidae are considered exceptional hosts for adults of this tick.
Rodentia: Cricetidae (ANL)
Artiodactyla: Bovidae; Perissodactyla: Equidae (A)
Rodentia: Muridae (NL)

**Human infestation**: no

**Remarks**: Camicas et al. (1998) list Aves as hosts for larvae and nymphs of this species, but we have been unable to confirm this. Kolonin (2009) ignores Rodentia and Equidae as hosts for adult *H. garhwalensis*. Although infestation of Muridae by

adult *H. garhwalensis* appears to be an infrequent event, there are sound records for this host-parasite relationship in Dhanda et al. (1977).

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**51 – *H. goral*** Hoogstraal, 1970 (J. Parasitol., 56: 1227–1238)

**Type depository**: BMNH (holotype) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*). This tick was originally classified as *H. neumanni* Dönitz, 1905 (Keirans, J.E. 1985. George Henry Falkiner Nuttall and the Nuttall tick catalogue. U. S. Dept. Agric., Agric. Res. Ser. Misc. Publ. (1438), 1785 pp), which is a synonym of *H. longicornis.*

**Known stages**: female

**Zoogeographic Region**: Oriental

**Ecoregion**: Jian Nan subtropical evergreen forests

**Hosts**: Artiodactyla: Bovidae (A)

**Human infestation**: no

**Remarks**: Mihalca et al. (2011) regard *H. goral* as an endangered species.

**References**

Chen, Z., Yang, X., Bu, F., Yang, X., Yang, X. & Liu, J. 2010. Ticks (Acari: Ixodoidea: Argasidae, Ixodidae) of China. Exp. Appl. Acarol., 51: 393–404.

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Mihalca, A.D., Gherman, C.M. & Cozma, V. 2011. Coendangered hard-ticks: threatened or threatening? Parasit. Vectors, 4 (71), 7 pp.

**52 – *H. grochovskajae*** Kolonin, 1992 (*In* Sokolov, V.E. (editor), Zoological Researches in Vietnam. Nauka, Moscow, pp. 242–277. In Russian)

**Type depositories**: ZIAC (holotype), KC (paratype) (Filippova 2008, *op. cit*. under *H. caucasica*)

**Known stages**: female

**Zoogeographic Region**: Oriental

**Ecoregion**: northern Indochina subtropical forests

**Hosts**: Artiodactyla: Bovidae (A)

**Human infestation**: no

**Reference**

Kolonin, G.V. 1995. Review of the ixodid tick fauna (Acari: Ixodidae) of Vietnam. J. Med. Entomol., 32: 276–282.

**53 – *H. heinrichi*** Schulze, 1939 (Z. Parasitenkd., 10: 722–728)
See remarks below.

**Type depository**: USNTC (lectotype, paralectotypes) (Keirans and Clifford 1984, *op. cit.* under *H. bartelsi*)

**Known stages**: male, female, nymph

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical moist broadleaf forests

**Hosts**: Carnivora: Canidae, Mustelidae (A, N and/or L)
Rodentia: Muridae (AN)
Artiodactyla: Bovidae; Carnivora: Viverridae; Rodentia: Sciuridae (A)
Carnivora: Herpestidae; Soricomorpha: Soricidae (N and/or L)

**Human infestation**: yes (Hoogstraal and Kohls 1968)

**Remarks**: Hoogstraal and Kim (1985) state that *H. heinrichi* is a polytypic species, and therefore it is possible that two or more species are represented under the name *H. heinrichi.* The host-parasite relationships above will probably change if this statement is confirmed. Tanskul et al. (1983) and Hoogstraal and Kim (1985) use the term "immatures" without stating whether larvae, nymphs or both stages were found on hosts. Tanskul et al. (1983) present records of *H. heinrichi* adults on Bovidae that we consider provisionally valid. However, this type of host is not mentioned in Kolonin (2009).

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Tanskul, P., Stark, H.E. & Inlao, I. 1983. A checklist of ticks of Thailand (Acari: Metastigmata: Ixodoidea). J. Med. Entomol., 20: 330–341.

**54 – *H. hirsuta*** Hoogstraal, Trapido & Kohls, 1966 (J. Parasitol., 52: 169–191)

**Type depository**: MCZ (holotype, paratype) (Hoogstraal, H., Trapido, H. & Kohls, G.M. 1966. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea, Ixodidae). Speciation in the *H.* (*Kaiseriana*) *obesa* group: *H. semermis* Neumann, *H. obesa* Larrousse, *H. roubaudi* Toumanoff, *H. montgomeryi* Nuttall, and *H. hirsuta* sp. n. J. Parasitol., 52: 169–191), originally classified as *Haemaphysalis papuana*.

**Known stages**: male, female

**Zoogeographic Region**: Oriental

**Ecoregions**: Sumatran and Java rain forests

**Hosts**: Artiodactyla: Bovidae, Suidae; Carnivora: Canidae, Mustelidae; Rodentia: Hystricidae (A)
Artiodactyla: Cervidae; Carnivora: Viverridae (N and/or L)

**Human infestation**: yes (Hoogstraal and Kim 1985)

**Remarks**: Hoogstraal and Kim (1985) use the term “immatures” without specifying whether larvae, nymphs or both stages of *H. hirsuta* were found on hosts. Neither of these stages has formally been described, but we provisionally accept their diagnosis by these authors.

**References**

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Hoogstraal, H., Trapido, H. & Kohls, G.M. 1966. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea, Ixodidae). Speciation in the *H.* (*Kaiseriana*) group: *H. semermis* Neumann, *H. obesa* Larrousse, *H. roubaudi* Toumanoff, *H. montgomeryi* Nuttall, and *H. hirsuta* sp. n. J. Parasitol., 52: 169–191.
Phan Trong, C. 1977. Ve bet va con trung ky sinh o Viet Nam. Tap 1. Ve (Ixodoidea), mo ta va phan loai. Ha Noi: Khoa hoc va ky thuat, 489 pp. In Vietnamese.

**55 – *H. hispanica*** Gil Collado, J. 1938 (Brotéria Cienc. Nat., 7: 99–109)

**Type depository**: CGC-FF (holotype, paratypes) (Hoogstraal, H. & Morel, P.-C. 1970. *Haemaphysalis* (*Rhipistoma*) *hispanica* Gil Collado, a parasite of the European rabbit, redescription of adults, and description of immature stages (Ixodoidea: Ixodidae). J. Parasitol., 56: 813–822) as *Haemaphysalis campanulata hispanica*. These authors state that the type specimens were in the possession of

Professor Gil Collado, but one of us (AEP) located the CGC collection within the FF collection.

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Palearctic

**Ecoregions**: Iberian sclerophyllous and semi-deciduous forests

**Hosts**: usual hosts for adult ticks are Lagomorpha: Leporidae. Aves are considered exceptional hosts for this tick.
Lagomorpha: Leporidae (ANL)
Strigiformes: Strigidae (A)
Falconiformes: Accipitridae (L)

**Human infestation**: no

**Remarks**: González Montana et al. (1998) reported heavy infestations of dogs with *H. hispanica*, but we consider this doubtful. Santos Dias (1994) states that Gil Collado found this species on several orders of mammals, but we have been unable to confirm this. These vertebrates are not included in our host list for *H. hispanica*. Kolonin (2009) ignores the record of this tick on Aves, but we accept the exceptional record on birds in Estrada-Peña et al. (1985).

**References**

Estrada-Peña, A., Lucientes Curdi, J., Sánchez Acedo, C., Gutiérrez Galindo, J., Ocabo Meléndez, B., Galmes Femenias, M. & Castillo Hernández, J. 1985. Parasitismo accidental de *Haemaphysalis* (*Rhipistoma*) *hispanica* Gill Collado (Acari: Ixodoidea) sobre *Aquila chrysaetos*. Rev. Ibér. Parasitol., 45: 379–380.

González Montana, J.R., Rejas López, J., Alonso Diez, A.J., Alonso Alonso, M.P. & Prieto Montana, F. 1998. Utilización de citioato para controlar infestaciones por garrapatas en perros. Med. Vet. (Barcelona), 15: 143–146.

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Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/

Santos Dias, J.A.T. 1994. As carraças (Acarina: Ixodoidea) da península ibérica. Algumas considerações sobre a sua biogeografía e relacionamento com a ixodofauna afropaleártica e afrotropical. Estud. Ens. Doc. (158), 163 pp.

**56 – *H. hoodi*** Warburton & Nuttall, 1909 (Parasitology, 2: 57–76)

**Type depository:** BMNH (lectotype, paralectotypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Afrotropical

**Ecoregions**: tropical and subtropical grasslands, savannas and shrublands

**Hosts**: Mammalia are considered exceptional hosts for this tick.
Aves (several orders) (ANL)
Primates: Indriidae (AN)
Artiodactyla: Bovidae; Rodentia: Sciuridae (A, N and/or L)
Carnivora: Canidae; Lagomorpha: Leporidae; Rodentia: Hystricidae (A)
Carnivora: Viverridae (N and/or L)

**Human infestation**: no

**Remarks**: Keirans and Durden (2001) record an introduction of *H. hoodi* into the Nearctic Region, but there is no evidence that it has become established there. Theiler (1962) uses the term "immatures" without specifying whether larvae, nymphs or both stages of *H. hoodi* were found on hosts. Infestation of Mammalia by this tick is not a common event, but there are some examples of this host-parasite relationship in the references below. Kolonin (2009) ignores mammals as hosts for *H. hoodi* but provides no reason doing so.

**References**

Aeschlimann, A. 1967. Biologie et écologie des tiques (Ixodoidea) de Côte d'Ivoire. Acta Trop., 24: 281–405.

Cornet, J.-P. 1995. Contribution à l'étude des tiques (Acarina: Ixodina) de la République Centrafricaine 4. Inventaire et répartition. Acarologia, 36: 203–212.

Elbl, A. & Anastos, G. 1966. Ixodid ticks (Acarina, Ixodidae) of Central Africa. Vol. IV. Genera *Aponomma* Neumann, 1899, *Boophilus* Curtice, 1891, *Dermacentor* Koch, 1844, *Haemaphysalis* Koch, 1844, *Hyalomma* Koch, 1844 and *Rhipicentor* Nuttall and Warburton, 1908. Ann. Mus. R. Centr. Afr., Ser. 8º Sci. Zool. (148), 412 pp.

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Matthysse, J.G. & Colbo, M.H. 1987. The ixodid ticks of Uganda. Entomological Society of America, College Park, Maryland, 426 pp.

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Theiler, G. 1962. The Ixodoidea parasites of vertebrates in Africa south of the Sahara (Ethiopian Region). Report to the Director of Veterinary Services, Onderstepoort, South Africa, Project S.9958, 260 pp.

**57 – *H. hoogstraali*** Kohls, 1950 (Natl. Inst. Health Bull. (192), 28 pp)

**Type depositories**: CNHM (holotype, paratypes), USNTC (paratypes) (Kohls, G.M. 1950. Ticks (Ixodoidea) of the Philippines. Natl. Inst. Health Bull. (192), 28 pp.)

**Known stages**: male, female

**Zoogeographic Region**: Oriental

**Ecoregion**: Palawan rain forests

**Hosts**: Carnivora: Mephitidae (A)

**Human infestation**: no

**Reference**

Kohls, G.M. 1950. Ticks (Ixodoidea) of the Philippines. Natl. Inst. Health Bull. (192), 28 pp.

**58 – *H. houyi*** Nuttall & Warburton, 1915 (Ticks. A monograph of the Ixodoidea. Part III. The genus *Haemaphysalis*. Cambridge University Press, London, pp. 349–550)

**Type depositories**: BMNH (lectotype, paralectotypes), ZMB (paralectotypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*), originally named *Haemaphysalis calcarata houyi.*

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Afrotropical

**Ecoregions**: tropical and subtropical grasslands, savannas and shrublands

**Hosts**: usual hosts for larvae, nymphs and adults are Rodentia: Sciuridae.
Rodentia: Sciuridae (ANL)
Rodentia: Muridae; Soricomorpha: Soricidae (AN)
Erinaceomorpha: Erinaceidae; Carnivora: Mustelidae, Viverridae (A)
Hyracoidea: Procaviidae (stage unknown)

**Human infestation**: no

**Remarks**: Kolonin (2009) excludes records of *H. houyi* on hosts other than Sciuridae, but we accept several of the records from other hosts in the references below.

**References**

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Hoogstraal, H. 1955. Notes on African *Haemaphysalis* ticks. II. The ground-squirrel parasites, *H. calcarata* Neumann, 1902, and *H. houyi* Nuttall and Warburton, 1915 (Ixodoidea, Ixodidae). J. Parasitol., 41: 361–373.
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**59 – *H. howletti*** Warburton, 1913 (Parasitology, 6: 121–130)

**Type depository**: BMNH (lectotype, paralectotype) (Keirans and Hillyard, 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregion**: southern Vietnam lowland dry forests

**Hosts**: Rodentia: Muridae (ANL)
Lagomorpha: Leporidae; Persissodactyla: Equidae (A)
Cuculiformes: Cuculidae (N)
Rodentia: Sciuridae (L)
Carnivora: Felidae, Herpestidae; Galliformes: Phasianidae (stages unknown)

**Human infestation**: no

**Remarks**: infestation of Rodentia by a male of *H. howletti*, as reported in Dhanda (1964), is ignored by Kolonin (2009). Rao et al. (1973) list "mongoose" as a host for *H. howletti* without further discussion, which is probably why Mitchell (1979) also lists Herpestidae as hosts of *H. howletti.* As a consequence, we have tentatively included this host in our list.

**References**

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**60 – *H. humerosa*** Warburton & Nuttall, 1909 (Parasitology, 2: 57–76)

**Type depository**: BMNH (lectotype, paralectotypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Australasian

**Ecoregions**: tropical and subtropical grasslands, savannas and shrublands

**Hosts**: usual hosts for larvae, nymphs and adult ticks are Peramelemorphia: Peramelidae.
Peramelemorphia: Peramelidae; Rodentia: Muridae (ANL)
Monotremata: Tachyglossidae (A)
Cuculiformes: Cuculidae (NL)
Dasyuromorphia: Dasyuridae (L)
Artiodactyla: Bovidae; Perissodactyla: Equidae; Diprotodontia: Phalangeridae; Coraciiformes: Coraciidae (stages unknown)

**Human infestation**: yes (Stewart and De Vos 1984)

**Remarks**: Kolonin (2009) ignores Muridae as hosts for *H. humerosa*, but there are *bona fide* records of this host-parasite relationship in Roberts (1963, 1970), and more recently in Weaver and Smales (2012).

**References**

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Weaver, H.J. & Smales, L.R. 2012. Parasite assemblage of Australian species of *Pseudomys* (Rodentia: Muridae: Murinae). J. Parasitol., 98: 30–35.

**61 – *H. hylobatis*** Schulze, 1933 (Arch. Hydrobiol. Suppl. 12, 4: 490–502)

**Type depositories**: ZMB (holotype), USNTC (paratype) (Anastos, G. 1950. The scutate ticks, or Ixodidae, of Indonesia. Entomol. Am., 30: 1–144; Keirans and Clifford 1984, *op. cit.* under *H. bartelsi*). Moritz and Fischer (1981, *op. cit*. under *H. cinnabarina*) do not confirm the presence of the holotype of *H. hylobatis* in ZMB.

**Known stages**: male, female

**Zoogeographic Region**: Oriental

**Ecoregion**: Sumatran lowland rain forests

**Hosts**: Aves are considered exceptional hosts for adults of this tick.
Mammalia (several orders); Cuculiformes: Cuculidae (A)
Rodentia: Muridae (N)

**Human infestation**: yes (Hoogstraal and Kim 1985)

**Remarks**: Audy et al. (1960) state that the determination of a nymph of *H. hylobatis* from Tragulidae is tentative, and this family has therefore been excluded from our host list for this species. However, the record of a nymph from Muridae in Audy et al. (1960) is certain because the nymph molted into a female of *H. hylobatis.*

**References**

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Hoogstraal, H. & Kim, K.C. 1985. Tick and mammal coevolution, with emphasis on *Haemaphysalis. In* K.C. Kim (editor), Coevolution of parasitic arthropods and mammals. John Wiley & Sons, New York, pp. 505–568.

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**62 – *H. hyracophila*** Hoogstraal, Walker & Neitz, 1971 (J. Parasitol., 57: 417–425)

**Type depositories**: USNTC (holotype, paratypes), BMNH, OVI, SAIMR, HH (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Afrotropical

**Ecoregions**: rocky outcrops and mountains in tropical and subtropical grasslands, savannas and shrublands

**Hosts**: usual hosts for larvae, nymphs and adults are Hyracoidea: Procaviidae, while Macroscelidea are considered exceptional hosts for this tick.
Hyracoidea: Procaviidae (ANL)
Macroscelidea: Macroscelididae (NL)

**Human infestation**: no

**Remarks**: the nymphs and larvae of *H. hyracophila* collected from Procaviidae by Horak and Fourie (1986) were tentatively thought to belong to this species, a host-parasite relationship that was later confirmed by Fourie et al. (2005). Kolonin (2009) ignores the *bona fide* records of larvae and nymphs of *H. hyracophila* on Macroscelidea reported by Fourie et al. (2005), probably because the latter authors regarded the few ticks found on these hosts as "stragglers."

**References**

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Horak, I.G. & Fourie, L.J. 1986. Parasites of domestic and wild animals in South Africa. XIX. Ixodid ticks and fleas on rock dassies (*Procavia capensis*) in the Mountain Zebra National Park. Onderstepoort J. Vet. Res., 53: 123–126.

Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/

**63 – *H. hystricis*** Supino, 1897 (Atti Soc. Veneto-Trentina Sci. Nat. Residente Padova, Ser. 2, 3: 230–238)

**Type depositories**: BMNH (lectotype, paralectotype), GM (paralectotype) (Keirans and Hillyard, 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeoegraphic Regions**: Australasian, Oriental, Palearctic

**Ecoregions**: tropical and subtropical forests

**Hosts**: Aves are considered exceptional hosts for this tick.
Mammalia (several orders) (ANL)
Cuculiformes: Cuculidae (L)
Passeriformes (several families) (stages unknown)

**Human infestation**: yes (Durden et al. 2008)

**Remarks**: with the exception of the type data, records of this species published prior to Hoogstraal et al. (1965) have been ignored because of diagnostic uncertainties. Camicas et al. (1998) state that this species is found in the Oriental and Palearctic Zoogeographic Regions, but Durden et al. (2008) confirmed its presence in the Australasian Region as well. Camicas et al. (1998) include Testudines as hosts for this species because there are records from *Geoemyda spinosa* (= *Heosemys spinosa*) prior to 1965, but we regard these as doubtful and they have not been included in our host list for *H. hystricis*. These questionable records are repeated in Barnard and Durden (2000). Aves are ignored as hosts of *H. hystricis*, but without elaboration, in Kolonin (2009). We treat records of *H. hystricis* on Aves in Jiang (1983) and Yamauchi (2001) as valid.

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Yamaguti, N., Tipton, V.J., Keegan, H.L. & Toshioka, S. 1971. Ticks of Japan, Korea, and the Ryukyu Islands. Brigham Young Univ. Sci. Bull. Biol. Ser., 15 (1), 226 pp.

Yamauchi, T. 2001. A bibliographical survey of host-parasite relationships between birds and ticks from Japan. Bull. Hoshizaki Green Found., 5: 271–308. In Japanese.

**64 – *H. ias*** Nakamura & Yajima, 1937 (Rep. Gov. Exp. Stn. Anim. Hyg. Tokyo (17): 133–184. In Japanese)
See remarks below

**Type depository**: CK (holotype) (Yamaguti, N., Tipton, V.J., Keegan, H.L. & Toshioka, S. (1971. Ticks of Japan, Korea, and the Ryukyu Islands. Brigham Young Univ. Sci. Bull. Biol. Ser., 15 (1), 226 pp.)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Palearctic

**Ecoregions**: temperate broadleaf and mixed forests

**Hosts**: Artiodactyla: Cervidae (AN)
Artiodactyla: Bovidae (A)
Aves (unknown orders) (NL)
Carnivora: Canidae (N)

**Human infestation**: no

**Remarks**: Yamaguti et al. (1971) referred to this species as *H. cornigera* group, *H. cornigera*, or *H. ias*. We regard all such records in Yamaguti et al. (1971) as *H. ias.* Mori et al. (1995) refer to this tick as *H. cornigera ias*, while Shimada et al. (2003) refer to it as *H. ias.* Takada (1990) and Fujita and Takada (2007) excluded the name *ias* but retained *cornigera* as a Japanese tick. Further studies or better translations of the Japanese literature are needed in order to assess the validity of these taxa. Heath (2013) lists humans as hosts of *H. ias* as a result of a transcription error (Heath, A.C.G., personal communication to Guglielmone, A.A.). See also *H. cornigera.*

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**65 – *H. indica*** Warburton, 1910 (Parasitology, 3: 395–407)
See remarks below.

**Type depositories**: BMNH, IM (syntypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*) as *H. leachi indica*

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Afrotropical, Oriental, Palearctic

**Ecoregions**: tropical and subtropical dry broadleaf forests

**Hosts**: usual hosts for adult ticks are Carnivora: Herpestidae. Aves are considered exceptional hosts for this tick.
Carnivora: Canidae, Felidae, Herpestidae (ANL)
Carnivora: Viverridae; Lagomorpha: Leporidae; Galliformes: Phasianidae (AN)
Carnivora: Mustelidae (AL)
Artiodactyla: Cervidae; Carnivora: Hyaenidae (A)
Soricomorpha: Soricidae (N)
Passeriformes: Muscicapidae, Timaliidae (NL)
Passeriformes: Laniidae (L)
Artiodactyla: Suidae; Erinaceomorpha: Erinaceidae; Rodentia: Muridae (N and/or L)
Cuculiformes: Cuculidae; Passeriformes: Turdidae (stage unknown)

**Human infestation**: no

**Remarks**: records published prior to Hoogstraal (1970) have not been included because of diagnostic uncertainties. Camicas et al. (1998) state that this species is found only in the Oriental Region, but there are also records from the Afrotropical and Palearctic Regions. However, the distribution of *H. indica* should be considered cautiously because Hoogstraal and Kim (1985) state that more than one taxon may be included under this name. These authors assert that *H. indica* is found in the Oriental and Palearctic Zoogeographic Regions, but mention its presence also in Oman, which we regard as part of the Afrotropical Region. Kaul et al. (1978), Hoogstraal (1980) and Geevarghese and Dhanda (1995) do not specify whether they found larvae, nymphs or both immature stages of *I. indica* on hosts. Dilrukshi (2006) provides records from Bovidae, Sciuridae and Aves that he classifies as *H. leachi indica*, but these have not been included in our host list because we believe that they need confirmation. Kolonin (2009) excludes Aves as hosts of *H. indica*, but we consider the records for this group of hosts in Kaul et al. (1978) to be valid.

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**66 – *H. indoflava*** Dhanda & Bhat, 1968 (J. Parasitol., 54: 1063–1067)

**Type depositories**: VRC (holotype, paratypes), BMNH, HH, IM, USNTC (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*). The specimens used to describe this species were originally classified as *H. flava* by Sharif, M. (1928. A revision of the Indian Ixodidae with special reference to the collection in the Indian Museum. Rec. Ind. Mus., 30: 217–344).

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: desert and xeric shrublands

**Hosts**: Artiodactyla: Bovidae, Suidae; Carnivora: Canidae (A)

**Human infestation**: yes (Dhanda and Bhat 1968)

**Remarks**: Camicas et al. (1998) list the larva and nymph of *H. indoflava* as undescribed, but both stages were earlier described by Dhanda and Bhat (1970), although their hosts remain unknown.

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**67 – *H. inermis*** Birula, 1895 (Izv. Imp. Akad. Nauk, Ser. 5, 2 (4): 353–364)

**Type depository**: ZIAC (holotype) (Filippova 2008, *op. cit.* under *H. caucasica*). Keirans and Hillyard (2001, *op. cit.* under *H. aciculifer*) found that a female of *H. inermis* sent by Birula to BMNH is possibly the holotype, but the information in Filippova (2008, *op. cit.* under *H. caucasica*) contradicts this opinion. See "remarks on some invalid names" for a new synonym of *H. inermis.*

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Palearctic

**Ecoregions**: temperate broadleaf and mixed forests

**Hosts**: Aves, Squamata and Testudines are considered exceptional hosts for this tick.
Artiodactyla: Suidae (ANL)
Mammalia (several orders) (AN)
Rodentia: Cricetidae, Muridae; Squamata: Lacertidae, Viperidae; Testudines: Testudinidae (NL)
Passeriformes: Sylviidae, Muscicapidae (L)
Charadriiformes: Scolopacidae; Galliformes: Phasianidae; Passeriformes: Corvidae (stages unknown)

**Human infestation**: yes (Černý 1972; Bursali et al. 2012 among others)

**Remarks**: there are several records of *H. inermis* for Taiwan (Oriental Region); however, Robbins (2005) considers them unsound and we concur. Kolonin (2009) excludes Aves, Squamata and Testudinidae as hosts of *H. inermis*, but they are listed as hosts of this species in Hoogstraal et al. (1964), Nosek et al. (1967), Filippova (1997) and Široký et al. (2006). Nevertheless, records from these hosts appear to be exceptional.

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**68 – *H. intermedia*** Nuttall & Warburton, 1909 (Parasitology, 2: 57–76)
See *H. parva.*

**Type depository**: BMNH (lectotype) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*) originally named *Haemaphysalis bispinosa intermedia*

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical dry broadleaf forests; few ticks in desert and xeric shrublands

**Hosts**: usual hosts for adult ticks are Artiodactyla: Bovidae.
Mammalia (several orders); Cuculiformes: Cuculidae; Galliformes: Phasianidae (ANL)
Passeriformes: Muscicapidae (AN)
Passeriformes (several families) (NL)
Piciformes: Picidae; Columbiformes: Columbidae (L)

**Human infestation**: no

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**69 – *H. japonica*** Warburton, 1908 (Proc. Cambr. Phil. Soc., 14: 508–519)
It is generally held that this taxon comprises two subspecies: *H. japonica japonica* Warburton, 1908, and *H. japonica douglasi* Nuttall & Warburton, 1915. However, Japanese workers such as Kitaoka, S. (1985. Keys to the species immature stages of the Japanese *Haemaphysalis* ticks (Ixodidae). Bull. Natl. Inst. Anim. Health Q., 88: 49–63. In Japanese) and Fujita, H. & Takada, N. (2007. Identification of immature ticks in Japan. *In* Organization Committee of SADI (editor), Acari and Emerging/Reemerging Diseases. Zenkoku Nosom Kyoiku Kyokai Publishing Company, Tokyo, pp. 53–68. In Japanese, Spanish translation of legends of figures by Kori, V.), among others, treat *H. douglasi* and *H. japonica* as distinct species. Filippova, N.A. (1997. Ixodid ticks of subfamily Amblyomminae. Fauna of Russia and neighbouring countries, 4 (5), Nauka, St. Petersburg, 436 pp. In Russian) considers *H. douglasi* a subspecies of *H. japonica*, while Yamaguti et al. (1971, *op. cit.* under *H. ias*) list only *H. japonica* as valid, but stress that additional studies are needed to elucidate the relationship between *H. japonica* and *H. japonica douglasi*.

**Type depository**: BMNH (lectotype, paralectotypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*) as *Haemaphysalis japonnica* (*lapsus*).

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Palearctic

**Ecoregions**: temperate broadleaf and mixed forests

**Hosts**: Artiodactyla: Cervidae; Carnivora: Canidae, Mustelidae; Galliformes: Phasianidae; Passeriformes (several families) (ANL)
Artiodactyla: Bovidae; Carnivora: Felidae, Ursidae; Lagomorpha: Leporidae (AN)
Artiodactyla: Suidae; Erinaceomorpha: Erinaceidae; Perissodactyla: Equidae (A)
Rodentia: Cricetidae, Muridae, Sciuridae; Strigiformes: Strigidae (NL)
Charadriiformes: Scolopacidae (N)

**Human infestation**: yes (Yamauchi et al. 2010)

**Remarks**: Camicas et al. (1998) do not regard Aves as important hosts for this tick species, but the studies of Emel'yanova and Goordeeva (1969) and others indicate that the opposite is true, especially for larvae and nymphs of *H. japonica*. Kitaoka (1985) provides a record of *H. japonica* (named *H. douglasi*) from Ursidae, but we were unable to determine whether his specimen is a nymph or a larva. See above.

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**70 – *H. juxtakochi*** Cooley, 1946 (Natl. Inst. Health Bull. (187), 54 pp)

Rawlins, S.C., Mahadeo, S. & Martínez, R. (1993. A list of the ticks affecting man and animals in the Caribbean. CARAPHIN News, (6): 8–9) refer to this species as *H. juxtakichi* and treat its synonym *H. kochi* Aragão, 1908 as a valid species. See remarks on invalid names at the beginning of this chapter for the synonym of *H. kochi* Aragão, 1908 and *H. juxtakochi*.

**Type depositories**: USNTC (holotype, paratypes), MCZ, DEEZ (paratypes) (Cooley, 1946, *op. cit*. under *H. chordeilis*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Nearctic, Neotropical

**Ecoregions**: several different Nearctic and Neotropical ecoregions

**Hosts**: usual hosts for adult ticks are Artiodactyla: Cervidae.
Mammalia (several orders) (ANL)
Passeriformes: Thraupidae (A)
Passeriformes: Corvidae, Thamnophilidae, Turdidae (NL)
Falconiformes: Accipitridae (N)
Galliformes: Cracidae; Passeriformes: Emberizidae (L)

**Human infestation**: yes (Bermúdez et al. 2012)

**Remarks**: Camicas et al. (1998) state that this species is found only in the Neotropical Region, but field records from Tamaulipas (Mexico) and Ohio (USA) in Kohls (1960) and Keirans and Restifo (1993) belong to the Nearctic Region. Hoogstraal and Kim (1985) assert that immature stages of *H. juxtakochi* are primarily parasites of Cervidae and Rodentia: Dasyproctidae; however, the literature does not yield data confirming this argument.

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**71 – *H. kadarsani*** Hoogstraal & Wassef, 1977 (J. Parasitol., 63: 1103–1109)

**Type depositories**: MZB (holotype, paratypes) USNTC (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*) state that there are no paratypes of *H. kadarsani* in BMNH, despite the assertion by the authors of this species.

**Known stages**: male, female, nymph

**Zoogeographic Region**: Australasian

**Ecoregion**: Sulawesi montane rain forests

**Hosts**: Rodentia: Muridae (AN)

**Human infestation**: no

**Remarks**: Camicas et al. (1998) state that *H. kadarsani* is found in the Oriental Zoogeographic Region, but this tick is found exclusively on Sulawesi Island, which lies within the Australasian Zoogeographic Region. Durden and Keirans (1996) regard *H. kadarsani* as an endangered species.

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**72 – *H. kashmirensis*** Hoogstraal & Varma, 1962 (J. Parasitol., 48: 185–194)

**Type depositories**: USNTC (holotype, paratypes), VRC, HH, ZSI (paratypes) (Hoogstraal, H. & Varma, M.G.R. 1962. *Haemaphysalis cornupunctata* sp. n. and *H. kashmirensis* sp. n. from Kashmir, with notes on *H. sundrai* Sharif and *H. sewelli* Sharif of India and Pakistan (Ixodoidea: Ixodidae). J. Parasitol., 48: 185–194)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregion**: northwestern thorn scrub forests

**Hosts**: usual hosts for adult ticks are Artiodactyla: Bovidae; usual hosts for larvae and nymphs are Squamata: Agamidae. Squamata are considered exceptional hosts for adults of this tick.
Squamata: Agamidae (ANL)
Artiodactyla: Bovidae (A)
Rodentia: Muridae, Sciuridae (N)

**Human infestation**: no

**Remarks**: a record of adult *H. kashmirensis* from Agamidae in Hoogstraal and Kim (1985) is ignored in Kolonin (2009).

**References**

Hoogstraal, H. & Kim, K.C. 1985. Tick and mammal coevolution, with emphasis on *Haemaphysalis. In* K.C. Kim (editor), Coevolution of parasitic arthropods and mammals. John Wiley & Sons, New York, pp. 505–568.

Hoogstraal, H. & McCarthy, V.C. 1965. Hosts and distribution of *Haemaphysalis kashmirensis* with descriptions of immature stages and definition of the subgenus *Herpetobia* Canestrini (resurrected). J. Parasitol., 51: 674–679.

Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/

**73 – *H. kinneari*** Warburton, 1913 (Parasitology, 6: 121–130)
See *H. toxopei.*

**Type depository**: BMNH (holotype) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregion**: Deccan thorn scrub forests

**Hosts**: Carnivora: Canidae; Lagomorpha: Leporidae (ANL)
Carnivora: Herpestidae (AN)
Carnivora: Felidae, Ursidae (AL)
Artiodactyla: Suidae (A)
Mammalia (several orders); Galliformes: Phasianidae; Cuculiformes: Cuculidae; Passeriformes: Timaliidae, Sylviidae (NL)
Rodentia: Hystricidae; Coraciiformes: Bucerotidae; Passeriformes (several families); Piciformes: Capitonidae (L)

**Human infestation**: no

**Remarks**: Camicas et al. (1998) list the larva of *H. kinneari* as undescribed, but it had earlier been described by Trapido et al. (1964). With the exception of Bhat and Sreenivasan (1981), Rahman and Mondal (1985) and Geevarghese et al. (1997), all authors refer to this species as *H. papuana kinneari.* Geevarghese et al. (1997) limit the host range of *H. kinneari* to "tiger, wild boar, monkey and rodent" without elaboration.

**References**

Bhat, H.R. & Sreenivasan, M.A. 1981. Further records of the ticks of some reptilian and mammalian hosts in the Kyasanur Forest disease area, Karnataka, India. Ind. J. Parasitol., 5: 207–210.

Bhat, H.R., Sreenivasan, M.A. & Jacob, P.G. 1986. Ixodid ticks infesting goats in the Kyasanur Forest disease area, Shimoga District, Karnataka. Ind. J. Parasitol., 10: 39–45.

Boshell, J. & Rajagopalan, P.K. 1968. Observations on the experimental exposure of monkeys, rodents and shrews to infestation of ticks in forest in Kyasanur Forest disease area. Ind. J. Med. Res., 56 (4) (Suppl.): 573–588.

Camicas, J.-L., Hervy, J.-P., Adam, F. & Morel, P.-C. 1998. Les tiques du monde (Acarida, Ixodida). Nomenclature, stades décrits, hôtes, répartition. ORSTOM, Paris, 233 pp.

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Rahman, M.H. & Mondal, M.M.H. 1985. Tick fauna of Bangladesh. Ind. J. Parasitol., 9: 145–149.

Rajagopalan, P.K. 1972. Ixodid ticks (Acarina: Ixodidae) parasitizing wild birds in the Kyasanur Forest disease area of Shimoga District, Mysore State, India. J. Bombay Nat. Hist. Soc., 69: 55–78.
Rajagopalan, P.K. & Sreenivasan, M.A. 1981. Ixodid ticks on cattle and buffaloes in the Kyasanur Forest disease area of Karnataka State. Ind. J. Med. Res., 73: 880–889.
Rajagopalan, P.K., Patil, A.P. & Boshell, J. 1968. Ixodid ticks on their mammalian hosts in the Kyasanur Forest disease area of Mysore State, India, 1961–1964. Ind. J. Med. Res., 56: 510–526.
Trapido, H., Hoogstraal, H. & Varma, M.G.R. 1964. Status and descriptions of *Haemaphysalis p. papuana* Thorell (n. comb.) and of *H. papuana kinneari* Warburton (n. comb.) (Ixodoidea, Ixodidae) of southern Asia and New Guinea. J. Parasitol., 50: 172–188.

**74 – *H. kitaokai*** Hoogstraal, 1969 (J. Parasitol., 55: 211–221)

**Type depositories**: USNTC (holotype, paratypes), NIAH (paratypes) (Hoogstraal, H. 1969. *Haemaphysalis* (*Alloceraea*) *kitaokai* sp. n. of Japan, and keys to species in the structurally primitive subgenus *Alloceraea* Schulze of Eurasia (Ixodoidea, Ixodidae). J. Parasitol., 55: 211–221)

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Oriental, Palearctic

**Ecoregions**: temperate conifer and broadleaf forests

**Hosts**: Aves are considered exceptional hosts for this tick.
Artiodactyla: Bovidae, Cervidae (AN)
Perissodactyla: Equidae; Galliformes: Phasianidae (A)

**Human infestation**: yes (Mahara 1997)

**Remarks**: the larva of *H. kitaokai* is known only from laboratory-reared specimens (Hoogstraal 1969). Camicas et al. (1998) state that this species is exclusively Palearctic, but Teng and Jiang (1991) show that the distribution of *H. kitaokai* encompasses localities in the Oriental and Palearctic Zoogeographic Regions. Xu and Li (1997) found a female of *H. kitaokai* on Phasianidae, but Kolonin (2009) ignores Aves as hosts for adult ticks.

**References**

Camicas, J.-L., Hervy, J.-P., Adam, F. & Morel, P.-C. 1998. Les tiques du monde (Acarida, Ixodida). Nomenclature, stades décrits, hôtes, répartition. ORSTOM, Paris, 233 pp.
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Hoogstraal, H. 1969. *Haemaphysalis* (*Alloceraea*) *kitaokai* sp. n. of Japan, and keys to species in the structurally primitive subgenus *Alloceraea* Schulze of Eurasia (Ixodoidea, Ixodidae). J. Parasitol., 55: 211–221.

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Xu, R. & Li, K. 1997. A collection of ticks from Guizhou, China. Syst. Appl. Acarol., 2: 245–246.
Xu, R. & Luo, G. 1998. Ticks parasitic on *Muntiacus reevesi* and *Lepus sinensis* in Wuyi Mountains, Fujian, China. Syst. Appl. Acarol. 3: 197.
Yamaguti, N., Tipton, V.J., Keegan, H.L. & Toshioka, S. 1971. Ticks of Japan, Korea and the Ryukyu Islands. Brigham Young Univ. Sci. Bull. Biol. Ser., 15 (1), 226 pp.
Yamauchi, T. 2005. A bibliographical survey on ixodid fauna of Shimane Prefecture, Japan (Acari: Ixodidae). Bull. Hoshizaki Green Found., 8: 289–301. In Japanese.

**75 – *H. knobigera*** Prakasan & Ramani, 2007 (Int. J. Zool. Res., 3: 169–177)

This species is not included in Kolonin (2009, *op. cit*. under *H. anomaloceraea*). Guglielmone et al. (2009, *op. cit*. under *H. colasbelcouri*) doubt the validity of this species, whose description is very poor, but have included it in their list of valid names because it is uncertain whether it is a synonym of another species of *Haemaphysalis* found on Bovidae in India (Oriental Region).

**Type depository**: DA (holotype, paratypes) (Prakasan, K. & Ramani, M. 2007. Two new species of ixodid ticks (Acarina: Ixodida) from Kerala, India. Int. J. Zool. Res., 3: 169–177)

**Known stages**: male

**Zoogeographic Region**: Oriental

**Ecoregion**: southwestern Ghats moist deciduous forests

**Hosts**: Artiodactyla: Bovidae (A)

**Human infestation**: no

**Reference**

Prakasan, K. & Ramani, M. 2007. Two new species of ixodid ticks (Acarina: Ixodida) from Kerala, India. Int. J. Zool. Res., 3: 169–177.

**76 – *H. koningsbergeri*** Warburton & Nuttall, 1909 (Parasitology, 2: 57–76)

**Type depository**: BMNH (lectotype, paralectotypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical moist broadleaf forests

**Hosts**: usual hosts for adult ticks are Carnivora (several families).
Carnivora: Mustelidae; Rodentia: Muridae (A, N and/or L)
Mammalia (several orders) (A)

**Human infestation**: yes (Keirans 1985)

**Remarks**: Camicas et al. (1998) state that the larva of *H. koningsbergeri* is undescribed, but this stage was described by Kadarsan (1971). Tanskul et al. (1983) use the term "immatures" without stating whether larvae, nymphs or both stages were found on hosts, but we consider their records provisionally valid. There is a valid record of *H. koningsbergeri* from a human in Audy et al. (1960), but the specimen was merely crawling on the body and we therefore exclude humans as hosts of this tick. It is uncertain whether the nymph found in a nest of Pilocercidae by Kohls (1957) actually fed on this type of host, and Hoogstraal et al. (1972) treat the determination of a nymph of *H. koningsbergeri* on Sciuridae as tentative, while regarding a collection from Phasianidae (tick stage unknown) as probably erroneous. These records have not been included in our host list for this species.

**References**

Audy, J.R., Nadchatram, M. & Lim, B.-L. 1960. Malaysian parasites. XLIX. Host distribution of Malayan ticks (Ixodoidea). Stud. Inst. Med. Res. Malaya, 29: 225–246.

Camicas, J.-L., Hervy, J.-P., Adam, F. & Morel, P.-C. 1998. Les tiques du monde (Acarida, Ixodida). Nomenclature, stades décrits, hôtes, répartition. ORSTOM, Paris, 233 pp.

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Kohls, G.M. 1957. Malaysian parasites XVIII. Ticks (Ixodoidea) of Borneo and Malaya. Malaya (28): 65–94.

Tanskul, P., Stark, H.E. & Inlao, I. 1983. A checklist of ticks of Thailand (Acari: Metastigmata: Ixodoidea). J. Med. Entomol., 20: 330–341.

**77 – *H. kopetdaghica*** Kerbabaev, 1962 (Akad. Nauk. Turkmenistan SSR Ser. Biol. Nauk (1): 77–80. In Russian)

**Type depository**: ZIAC (neotype) (Filippova 2008, *op. cit*. under *H. caucasica*), originally named *H. warburtoni kopetdaghicus*.

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Palearctic

**Ecoregion**: Kopet Dag semi-desert

**Hosts**: usual hosts for larvae, nymphs and adult ticks are Artiodactyla: Bovidae.
Artiodactyla: Bovidae (ANL)
Perissodactyla: Equidae (AN)
Carnivora: Felidae (A)

**Human infestation**: no

**Remarks**: Mihalca et al. (2011) regard this species as endangered.

**References**

Filippova, N.A. 1997. Ixodid ticks of subfamily Amblyomminae. Fauna of Russia and neighbouring countries, 4 (5), Nauka, St. Petersburg, 436 pp. In Russian.

Hoogstraal, H. & Wassef, H.Y. 1979. *Haemaphysalis* (*Allophysalis*) *kopetdaghica*: identity and discovery of each feeding stage on the wild goat in northern Iran (Ixodoidea: Ixodidae). J. Parasitol., 65: 783–790.

Mihalca, A.D., Gherman, C.M. & Cozma, V. 2011. Coendangered hard-ticks: threatened or threatening? Parasit. Vectors, 4 (71), 7 pp.

**78 – *H. kumaonensis*** Geevarghese & Mishra, 2011 (*In* Geevarghese, G. & Mishra, A.C. 2011. *Haemaphysalis* ticks of India. Elsevier, London, 260 pp.)

**Type depositories**: not stated in Geevarghese, G. & Mishra, A.C. (2011. *Haemaphysalis* ticks of India. Elsevier, London, 260 pp.)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: undetermined

**Ecoregions**: undetermined

**Hosts**: unknown

**Human infestation**: no

**Remarks**: no locality or host data are provided for this species, and its relationship to other taxa is uncertain from the description in Geevarghese and Mishra (2011). We therefore consider this species provisionally valid.

**Reference**

Geevarghese, G. & Mishra, A.C. 2011. *Haemaphysalis* ticks of India. Elsevier, Amsterdam and several other cities, 260 pp.

**79 – *H. kutchensis*** Hoogstraal & Trapido, 1963 (J. Parasitol., 49: 489–497)

**Type depositories**: USNTC (holotype, paratypes), BMNH, ZIAC, FMNH, HH, VRC (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*). This species was originally identified as *H. bispinosa intermedia* Warburton and Nuttall, 1909, a synonym of *H. intermedia*, by Nuttall and Warburton (1915, *op. cit.* under *H. celebensis*),

as discussed in Hoogstraal, H. & Trapido, H. (1963. *Haemaphysalis kutchensis* sp. n., a common larval and nymphal parasite of birds in northwestern India (Ixodoidea, Ixodidae). J. Parasitol., 49: 489–497).

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Oriental, Palearctic

**Ecoregions**: desert and xeric shrublands

**Hosts**: Passeriformes: Sylviidae (ANL)
Carnivora: Canidae (A, N and/or L)
Rodentia: Muridae (A and/or N and/or L)
Artiodactyla: Bovidae; Carnivora: Felidae, Hyaenidae; Lagomorpha: Leporidae; Galliformes: Phasianidae; Cuculiformes: Cuculidae; Strigiformes: Strigidae (A)
Passeriformes (several families) (N)

**Human infestation**: no

**Remarks**: Camicas et al. (1998) state that this tick is found only in the Oriental Region, but following Filippova (1997), we consider it to also be present in the Palearctic Region. There is an Afrotropical record in Hoogstraal and Wassef (1985) from a migrant bird, but there is no evidence that *H. kutchensis* has become established in that region. Kaul et al. (1978) generalized that adults, nymphs and larvae of *H. kutchensis* are found on Muridae and Canidae without specifying which stages are found on each type of host. Rao et al. (1973) report parasitism of "mongoose" by *H. kutchensis* without further data, and this record has not been included in our host list for this species.

**References**

Camicas, J.-L., Hervy, J.-P., Adam, F. & Morel, P.-C. 1998. Les tiques du monde (Acarida, Ixodida). Nomenclature, stades décrits, hôtes, répartition. ORSTOM, Paris, 233 pp.

Filippova, N.A. 1997. Ixodid ticks of subfamily Amblyomminae. Fauna of Russia and neighbouring countries, 4 (5), Nauka, St. Petersburg, 436 pp. In Russian.

Hoogstraal, H. & Trapido, H. 1963. *Haemaphysalis kutchensis* sp. n., a common larval and nymphal parasite of birds in northwestern India (Ixodoidea, Ixodidae). J. Parasitol., 49: 489–497.

Hoogstraal, H. & Wassef, H.Y. 1985. *Haemaphysalis kutchensis*, an Indian-Pakistani bird and mammal tick, parasitizing a migrant whitethroat in the Sultanate of Oman. J. Parasitol., 71: 129–130.

Kaul, H.N., Mishra, A.C., Dhanda, V., Kulkarni, S.M. & Guttikar, S.N. 1978. Ectoparasitic arthropods of birds and mammals from Rajasthan State, India. Ind. J. Parasitol., 2: 19–25.

Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/

Rao, T.R., Dhanda, V., Bhat, H.R. & Kulkarni, S.M. 1973. A survey of haematophagous arthropods in western Himalayas, Sikkim and Hill Districts of West Bengal. A general account. Ind. J. Med. Res., 61: 1421–1461.

**80** – ***H. kyasanurensis*** Trapido, Hoogstraal & Rajagopalan, 1964 (J. Parasitol., 50: 295–302)

**Type depositories**: USNTC (holotype, paratypes), BMNH, VRC, ZIAC, HH (paratypes). (Trapido, H., Hoogstraal, H. & Rajagopalan, P.K. 1964. *Haemaphysalis kyasanurensis* sp. n., a member of the *formosensis* group in southern India and Ceylon (Ixodoidea, Ixodidae). J. Parasitol., 50: 295–302). However, Keirans and Hillyard (2001, *op. cit.*, under *H. aciculifer*) state that no paratypes of *H. kyasanurensis* are present in BMNH.

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregion**: south Deccan plateau dry deciduous forests

**Hosts**: usual hosts for larvae, nymphs and adults are Rodentia: Hystricidae.
Rodentia: Hystricidae; Artiodactyla: Bovidae (ANL)
Carnivora: Canidae; Rodentia: Sciuridae (AN)
Artiodactyla: Suidae; Carnivora: Felidae (A)
Primates: Cercopithecidae; Aves (several orders) (NL)
Mammalia (several orders) (L)

**Human infestation**: no

**References**

Bhat, H.R. & Sreenivasan, M.A. 1981. Further records of the ticks of some reptilian and mammalian hosts in the Kyasanur Forest disease area, Karnataka, India. Ind. J. Parasitol., 5: 207–210.

Bhat, H.R., Sreenivasan, M.A. & Jacob, P.G. 1986. Ixodid ticks infesting goats in the Kyasanur Forest disease area, Shimoga District, Karnataka. Ind. J. Parasitol., 10: 39–45.

Boshell, J. & Rajagopalan, P.K. 1968. Observations on the experimental exposure of monkeys, rodents and shrews to infestation of ticks in forest in Kyasanur Forest disease area. Ind. J. Med. Res., 56 (4) (Suppl.): 573–588.

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Rajagopalan, P.K. 1972. Ixodid ticks (Acarina: Ixodidae) parasitizing wild birds in the Kyasanur Forest disease area of Shimoga District, Mysore State, India. J. Bombay Nat. Hist. Soc., 69: 55–78.

Rajagopalan, P.K., Patil, A.P. & Boshell, J. 1968. Ixodid ticks on their mammalian hosts in the Kyasanur Forest disease area of Mysore State, India, 1961–1964. Ind. J. Med. Res., 56: 510–526.

**81 – *H. lagostrophi*** Roberts, 1963 (Aust. J. Zool., 11: 35–80)

**Type depositories**: WAM (holotype, paratypes), ANIC (paratypes) (Roberts 1963, *op. cit.* under *H. bremneri*; Halliday, B. personal communication to Guglielmone, A.A.)

**Known stages**: male, female, nymph

**Zoogeographic Region**: Australasian

**Ecoregion**: Kimberly tropical savanna

**Hosts**: usual hosts for adult ticks are Diprotodontia: Macropodidae.
Diprotodontia: Macropodidae (AN)
Peramelemorphia: Peramelidae (A)

**Human infestation**: no

**References**

Roberts, F.H.S. 1963. A systematic study of the Australian species of the genus *Haemaphysalis* Koch (Acarina: Ixodidae). Aust. J. Zool., 11: 35–80.
Roberts, F.H.S. 1970. Australian ticks. CSIRO, Melbourne, 267 pp.

**82 – *H. lagrangei*** Larrousse, 1925 (Ann. Parasitol. Hum. Comp., 3: 301–305)

**Type depositories**: IP (lectotype), CM, BMNH, USNTC (paralectotypes) (Trapido, H. 1965. Notes on critical Asian *Haemaphysalis* specimens in European museum collections, with designations of lectotypes and a neotype. Proc. Entomol. Soc. Wash., 67: 152–165; Keirans and Clifford 1984, *op. cit.* under *H. bartelsi*; Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*).

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical moist broadleaf forests

**Hosts**: usual hosts for adult ticks are Artiodactyla: Cervidae and Carnivora: Mustelidae and Viverridae; usual hosts for larvae and nymphs are Carnivora: Mustelidae and Viverridae. Aves and Squamata are considered exceptional hosts for this tick.
Mammalia (several orders) (ANL)
Galliformes: Phasianidae (AN)
Falconiformes: Falconidae; Passeriformes: Laniidae, Muscicapidae; Squamata: Varanidae (A)

**Human infestation**: yes (Tanskul et al. 1983)

**Remarks**: Phan Trong (1977), who refers to this tick as *H. hystricis indochinensis* Phan Trong, 1977, found this species on Squamata and Aves apart from mammals. Two records of Aves as hosts for *H. lagrangei* are also included in Hoogstraal et al. (1973). All these records have been ignored in Kolonin (2009), probably because of their infrequency.

**References**

Chen, Z., Yang, X., Bu, F., Yang, X., Yang, X. & Liu, J. 2010. Ticks (Acari: Ixodoidea: Argasidae, Ixodidae) of China. Exp. Appl. Acarol., 51: 393–404.

Hoogstraal, H., El Kammah, K.M., Santana, F.J. & Van Peenen, P.F.D. 1973. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea: Ixodidae). *H.* (*Kaiseriana*) *lagrangei* Larrouse: identity, distribution, and hosts. J. Parasitol., 59: 1118–1129.

Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/

Phan Trong, C. 1977. Ve bet va con trung ky sinh o Viet Nam. Tap 1. Ve (Ixodoidea), mo ta va phan loai. Ha Noi: Khoa hoc va ky thuat, 489 pp. In Vietnamese.

Tanskul, P., Stark, H.E. & Inlao, I. 1983. A checklist of ticks of Thailand (Acari: Metastigmata: Ixodoidea). J. Med. Entomol., 20: 330–341.

**83 – *H. laocayensis*** Phan Trong, 1977 (Ve bet va con trung ky sinh o Viet Nam. Tap 1. Ve (Ixodoidea), mo ta va phan loai. Ha Noi: Khoa hoc va ky thuat, 489 pp.) In Vietnamese.

**Type depository**: AI (holotype, paratypes) (Kolonin, G.V. personal communication to Guglielmone, A.A.)

**Known stages**: male, female

**Zoogeographic Region**: Oriental

**Ecoregion**: south China-Vietnam subtropical evergreen forests

**Hosts**: Artiodactyla: Cervidae; Carnivora: Mustelidae (A)

**Human infestation**: no

**Reference**

Kolonin, G.V. 1995. Review of the ixodid tick fauna (Acari: Ixodidae) of Vietnam. J. Med. Entomol., 32: 276–282.

**84 – *H. leachi*** (Audouin, 1826) (Explication sommaire des planches d'arachnides de l'Égypte et de la Syrie. *In* Savigny, J. 1826. Description de l'Égypte ou Recueil des Observations et des Recherches qui ont été Faites en Égypte pendant l'Expédition de l'Armée Française. Histoire Naturelle, 1 (4): 99–186. C.L.F. Panckoucke: Paris). **Note**: major discrepancies exist among citations of this reference.

**Type depository**: USNTC (neotype) (Keirans and Clifford 1984, *op. cit.* under *H. bartelsi*). Originally named *Ixodes leachii.*

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Afrotropical, Palearctic

**Ecoregions**: several Afrotropical and Palearctic ecoregions

**Hosts**: usual hosts for adult ticks are Carnivora (several families).
Carnivora (several families); Artiodactyla: Bovidae, Suidae; Primates: Cercopithecidae; Rodentia: Muridae (A)

**Human infestation**: yes (Apanaskevich et al. 2007)

**Remarks**: all stages of *H. leachi* have been misdetermined in the literature, where different species are alleged to constitute the *H. leachi* group. We have therefore ignored records of this species published prior to Apanaskevich et al. (2007), including Oriental records in Phan Trong (1977). Kolonin (2009) states that the immature stages of this tick feed "on rodents and other small mammals," supporting the assertion in Apanaskevich et al. (2007). However, the latter authors also state that a taxonomic revision of the *H. leachi* group will be necessary in order to delimit the host range of the immature stages. For this reason we have not included hosts for larvae and nymphs of this tick. Keirans and Durden (2001) record introductions of *H. leachi* or ticks from the *H. leachi* group into the Nearctic Region, but no evidence exists that any member of this group has become established there. See also *H. leachi* and *H. zumpti.*

**References**

Apanaskevich, D.A., Horak, I.G. & Camicas, J.-L. 2007. Redescription of *Haemaphysalis* (*Rhipistoma*) *elliptica* (Koch, 1844), an old taxon of the *Haemaphysalis* (*Rhipistoma*) *leachi* group from East and southern Africa, and of *Haemaphysalis* (*Rhipistoma*) *leachi* (Audouin, 1826) (Ixodida: Ixodidae). Onderstepoort J. Vet. Res., 74: 181–208.

Keirans, J.E. & Durden, L.A. 2001. Invasion: exotic ticks (Acari: Argasidae, Ixodidae) imported into the United States. A review and new records. J. Med. Entomol., 38: 850–861.

Phan Trong, C. 1977. Ve bet va con trung ky sinh o Viet Nam. Tap 1. Ve (Ixodoidea), mo ta va phan loai. Ha Noi: Khoa hoc va ky thuat, 489 pp. In Vietnamese.

**85 – *H. lemuris*** Hoogstraal, 1953 (Bull. Mus. Comp. Zool., 111: 37–113)

**Type depositories**: USNTC (holotype, paratypes), HH, MCZ, OVI (paratypes) (Hoogstraal, H. 1953. Ticks (Ixodoidea) of the Malagasy Faunal Region (excepting the Seychelles). Their origins and host-relationships; with descriptions of five new *Haemaphysalis* species. Bull. Mus. Comp. Zool., 111: 37–113)

**Known stages**: male, female, nymph

**Zoogeographic Region**: Afrotropical

**Ecoregion**: Madagascar succulent woodlands

**Hosts**: Primates: Indriidae, Lemuridae (AN)
Primates: Cheirogaleidae, Epilemuridae (N)

**Human infestation**: no

**Remarks**: Uilenberg et al. (1979) considered a record of two nymphs of *H. lemuris* from Passeriformes: Vangidae as uncertain, and this family has been excluded from our host list. Barrett et al. (2012) state that humans, domestic animals and rodents are hosts of *H. lemuris*, but we were unable to confirm this assertion with the references provided by the authors, and these hosts are not included in the list above. Durden and Keirans (1996) regard *H. lemuris* as an endangered species.

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Uilenberg, G., Hoogstraal, H. & Klein, J.-M. 1979. Les tiques (Ixodoidea) de Madagascar et leur rôle vecteur. Arch. Inst. Pasteur Madagascar Num. Spéc., 153 pp.

**86 – *H. leporispalustris*** (Packard, 1869) (First Annual Report of the Trustees of the Peabody Academy of Sciences, Appendix, pp. 56–69)

**Type depository:** MCZ (type?) (Cooley 1946, *op. cit.* under *H. chordeilis*) as *Ixodes leporispalustris.* Cooley (1946) states that the type of this species is in the MCZ, but on the museum web page for zoological collections (http://mczbase.mcz.harvard.edu/ accessed April 4, 2013), the specimen of *Ixodes leporispalustris* (as *Ixodes leporis-palustris*) bears the label "type?"

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Nearctic, Neotropical

**Ecoregions**: several different Nearctic and Neotropical ecoregions

**Hosts**: usual hosts for larvae, nymphs and adult ticks are Lagomorpha: Leporidae.
Mammalia (several orders); Galliformes: Phasianidae, Odontophoridae; Passeriformes (several families); Strigiformes: Strigidae (ANL)
Cuculiformes: Cuculidae (NL)
Caprimulgiformes: Caprimulgidae; Charadriiformes: Scolopacidae; Columbiformes: Columbidae (N)
Charadriiformes: Laridae, Sternidae; Piciformes: Picidae (L)
Falconiformes: Falconidae; Galliformes: Cracidae (stages unknown)

**Human infestation**: yes (Furman and Loomis 1984; Guglielmone et al. 2003)

**Remarks**: Neumann (1897, 1911) states that *H. leporispalustris* (cited as *H. leporis*) has been found in the Oriental Region, but we consider this determination erroneous. We also maintain that recent records of *H. leporispalustris* on Galliformes in Pakistan (Khattak et al. 2012) are in error. More recently, Han et al. (2009) state that *H. leporispalustris* is found on several wild and domestic animals in South Korea (Palearctic Region); this statement is treated as valid by Sutor et al. (2013), but we consider it to be erroneous. Kolonin (2009) excludes Aves as hosts of adult *H. leporispalustris*, but we feel that records of this stage from avian hosts listed in Bequaert (1945), Bishopp and Trembley (1945) and Hamer et al. (2012) are valid. Keirans (1985) considers his diagnoses of adults and larvae of *H. leporispalustris* on Dasyproctidae to be tentative. This mammal has therefore been provisionally excluded from our host list of *H. leporispalustris*.

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**87 – *H. lobachovi*** Kolonin, 1995 (Folia Parasitol., 42: 239)

**Type depositories**: ZMMO, KC. (Kolonin, G.V. 1995. *Haemaphysalis lobachovi* sp. n. (Acarina: Ixodidae) from porcupine (*Hystrix cristata*) from Ethiopia. Folia Parasitol., 42: 239)

**Known stages**: male

**Zoogeographic Region**: Afrotropical

**Ecoregion**: Ethiopian montane moorlands

**Hosts**: Rodentia: Hystricidae (A)

**Human infestation**: no

**Reference**

Kolonin, G.V. 1995. *Haemaphysalis lobachovi* sp. n. (Acarina: Ixodidae) from porcupine (*Hystrix cristata*) from Ethiopia. Folia Parasitol., 42: 239.

**88 – *H. longicornis*** Neumann, 1901 (Mém. Soc. Zool. Fr., 14: 249–372)
See *H. goral* and remarks below.

**Type depository**: ENV (lectotype, paralectotype) (Hoogstraal, H., Roberts, F.H.S., Kohls, G.M. & Tipton, V.J. 1968. Review of *Haemaphysalis* (*Kaiseriana*) *longicornis* Neumann (resurrected) of Australia, New Zealand, New Caledonia, Fiji, Japan, Korea,

and northeastern China and USSR, and its parthenogenetic and bisexual populations (Ixodoidea, Ixodidae). J. Parasitol., 54: 1197–1213). See also *H. goral.*

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Australasian, Oriental, Palearctic

**Ecoregions**: temperate broadleaf and mixed forests

**Hosts**: usual hosts for adult ticks are Artiodactyla: Bovidae and Cervidae, and Perissodactyla: Equidae. Aves are considered exceptional hosts for this tick.
Mammalia (several orders); Galliformes: Phasianidae (ANL)
Anseriformes. Anatidae (A)
Apterygiformes: Apterygidae; Gruiformes: Rallidae; Passeriformes (several families) (NL)
Psittaciformes: Psittacidae (N)
Charadriiformes: Laridae (L)

**Human infestation**: yes (Yamauchi et al. 2010)

**Remarks**: records prior to Hoogstraal et al. (1968) have been ignored here because of their diagnostic uncertainties. A recent study of bisexual and parthenogenetic populations of *H. longicornis* in China showed that these populations are conspecific (Chen et al. 2012). Hoogstraal et al. (1981) reported the introduction of *H. longicornis* into the northern sector of the Afrotropical Zoogeographic Region, while Keirans and Durden (2001) reported its introduction into the Nearctic and Hoogstraal et al. (1968) reported its introduction into central Pacific islands, but *H. longicornis* has apparently failed to become established at any of these localities. According to Heath et al. (1988), infestation of Aves by *H. longicornis* appears to be an infrequent event, although Hoogstraal et al. (1968) state that Somov and Shestakov (1963), who refer to this tick as *H. neumanni*, found many birds that were infested with larvae. However, the English translation of the latter study by Russian researchers does not indicate parasitism of Aves by *H. longicornis*; we therefore accept the view of Heath et al. (1998). See also *H. bispinosa* and *H. davisi.*

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**89 – *H. luzonensis*** Hoogstraal & Parrish, 1968 (J. Parasitol., 54: 402–410)

**Type depositories**: USNTC (holotype, paratypes), BMNH, HH, FMNH, PNM (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregion**: Luzon tropical pine forests

**Hosts**: usual hosts for larvae, nymphs and adult ticks are Artiodactyla: Cervidae. Artiodactyla: Cervidae, Suidae (ANL)

**Human infestation**: no

**Reference**

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**90 – *H. madagascariensis*** Colas-Belcour & Millot, 1948 (Bull. Soc. Pathol. Exot., 41: 384–388)

**Type depository**: IPP (holotype, paratype) (Hoogstraal, H. 1966. The *Haemaphysalis* ticks (Ixodoidea, Ixodidae) of birds. 2. Redescription of the type material of *H.* (*Rhipistoma*) *madagascariensis* Colas-Belcour and Millot. J. Parasitol., 52: 801–804), originally named *H. hoodi madagascariensis.*

**Known stages**: male, female

**Zoogeographic Region**: Afrotropical

**Ecoregion**: Madagascar subhumid forests

**Hosts**: Cuculiformes: Cuculidae (ANL)
Passeriformes: Vangidae (L)

**Human infestation**: no

**Remarks**: Uilenberg et al. (1979) were unable to determine the undescribed larva and nymph of this species with certainty, and we therefore consider their records provisionally valid.

**Reference**

Uilenberg, G., Hoogstraal, H. & Klein, J.-M. 1979. Les tiques (Ixodoidea) de Madagascar et leur rôle vecteur. Arch. Inst. Pasteur Madagascar Num. Spéc., 153 pp.

**91 – *H. mageshimaensis*** Saito & Hoogstraal, 1973 (J. Parasitol., 59: 569–578)

**Type depositories**: MZD (holotype, paratype), USNTC (paratypes) (Saito, Y. & Hoogstraal, H. 1973. *Haemaphysalis* (*Kaiseriana*) *mageshimaensis* sp. n. (Ixodoidea: Ixodidae), a Japanese deer parasite with bisexual and parthenogenetic reproduction. J. Parasitol., 59: 569–578)

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Oriental, Palearctic

**Ecoregions**: tropical and subtropical moist broadleaf forests

**Hosts**: Artiodactyla: Bovidae; Carnivora: Canidae, Felidae, Viverridae (ANL)
Artiodactyla: Cervidae (AN)
Artiodactyla: Suidae (A)
Rodentia: Muridae; Passeriformes: Pycnonotidae, Zosteropidae (L)

**Human infestation**: yes (Hoogstraal and Santana 1974)

**References**

Hoogstraal, H. & Santana, F.J. 1974. *Haemaphysalis* (*Kaiseriana*) *mageshimaensis* (Ixodoidea: Ixodidae): human and wild and domestic mammal hosts, and distribution in Japan, Taiwan, and China. J. Parasitol., 60: 866–869.

Kolonin, G.V. 1995. Review of the ixodid tick fauna (Acari: Ixodidae) of Vietnam. J. Med. Entomol., 32: 276–282.

**92 – *H. megalaimae*** Rajagopalan, 1963 (J. Parasitol., 49: 340–345)

**Type depositories**: USNTC (holotype, paratype), BMNH, HH, VRC, ZSI (paratypes) (Rajagopalan, P.K. 1963. *Haemaphysalis megalaimae* sp. n., a new tick from the small green barbet (*Megalaima viridis*) in India. J. Parasitol., 49: 340–345). However, Keirans and Hillyard (2001, *op. cit*. under *H. aciculifer*) do not include paratypes of this species in their list of types in the BMNH.

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregion**: northern Indochina subtropical forests

**Hosts**: Piciformes: Capitonidae (ANL)

**Human infestation**: no

**Remarks**: Miranpuri and Naithani (1978) state that *Haemaphysalis megalaimae* has been found on birds other than Capitonidae, however without specifying the species of birds. Sun et al. (2012) determined *H. megalaimae* from *Chrysolophus pictus* (Galliformes) but we feel that this record requires confirmation. Hosts listed above are according to Rajagopalan (1972).

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**93 – *H. megaspinosa*** Saito, 1969 (Acta Med. Biol., 17: 87–96)

**Type depositories**: MZD (holotype, paratype), CS (paratype). (Saito, Y. 1969. Studies on ixodid ticks. X. *Haemaphysalis megaspinosa* n. sp. (Ixodoidea, Ixodidae) from Kanagawa Prefecture, Japan. Acta Med. Biol., 17: 87–96)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Palearctic

**Ecoregions**: temperate broadleaf and mixed forests

**Hosts**: usual hosts for adult ticks are Artiodactyla: Cervidae.
Artiodactyla: Cervidae; Perissodactyla: Equidae (AN)
Artiodactyla: Bovidae, Suidae; Carnivora: Canidae, Felidae, Ursidae (A)

**Human infestation**: yes (Sishima et al. 2000)

**Remarks**: Camicas et al. (1998) state that *H. megaspinosa* is found in the Oriental and Palearctic Regions, but we found no *bona fide* records for Oriental localities. The larva of *H. megaspinosa* is known only from laboratory-reared specimens in Yamaguti et al. (1971). Camicas et al. (1998) list pholeophilic (burrowing) mammals as hosts for the larva and nymph of *H. megaspinosa*, but we have found no records that support this host-parasite association. Heath (2013) lists rodents and mustelids as hosts of *H. megaspinosa* as a result of a transcription error (Heath, A.C.G., personal communication to Guglielmone, A.A.).

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**94 – *H. menglaensis*** Pang, Chen & Xiang, 1982 (Zool. Res., 3 (Suppl.): 45–51. In Chinese)
This species is not included in Camicas et al. (1998, *op. cit.* under *H. anomaloceraea*), but no reasons are given for its omission.

**Type depository**: IME (holotype, paratypes) (Pang, D., Chen, C. & Xiang, R. 1982. Notes on ixodid ticks from southwestern Yunnan with description of a new species of *Haemaphysalis* (Acarina: Ixodidae). Zool. Res., 3 (Suppl.): 45–51. In Chinese)

**Known stages**: male, female

**Zoogeographic Region**: Oriental

**Ecoregion**: Huang He plain mixed forests

**Hosts**: Artiodactyla: Cervidae (A)

**Human infestation**: no

**References**

Camicas, J.-L., Hervy, J.-P., Adam, F. & Morel, P.-C. 1998. Les tiques du monde (Acarida, Ixodida). Nomenclature, stades décrits, hôtes, répartition. ORSTOM, Paris, 233 pp.

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**95** – ***H. minuta*** Kohls, 1950 (J. Parasitol., 36: 319–321)
**Type depositories**: USNTC (holotype, paratypes), BMNH (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical dry broadleaf forests, desert and xeric shrublands

**Hosts**: usual hosts for larvae, nymphs and adults are Galliformes: Phasianidae. Mammalia are considered exceptional hosts for this tick.
Galliformes: Phasianidae (ANL)
Carnivora: Viverridae (A)
Passeriformes: Timaliidae (NL)
Artiodactyla: Bovidae; Primates: Cercopithecidae; Rodentia: Hystricidae; Cuculiformes: Cuculidae; Passeriformes (several families) (N)
Rodentia: Muridae (L)

**Human infestation**: no

**Remarks**: Camicas et al. (1998) list the female as undescribed, but it had earlier been described by Santos Dias (1956). Trapido et al. (1964b) reported some variation among their female specimens but did not reject the description of Santos Dias (1956) and we therefore regard his description as conditionally valid. Kolonin (2009) limits the hosts of *H. minuta* to Aves and Rodentia: Hystricidae, while Hoogstraal and Kim (1985) and Camicas et al. (1998) record only Aves as hosts of this tick. We have found no evidence that might lead us to conclude that the few records of this species from Mammalia are erroneous; consequently, we regard these records as provisionally valid but believe that *H. minuta* is primarily a parasite of Aves. Rao et al. (1973) list "mongoose" as hosts for *H. minuta* but provide no further details, and we have therefore not included such hosts in our list.

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**96 – *H. mjoebergi*** Warburton, 1926 (Parasitology, 18: 55–58)

**Type depository**: BMNH (lectotype) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical moist broadleaf forests

**Hosts**: usual hosts for adult ticks are Artiodactyla: Cervidae.
Artiodactyla: Cervidae, Bovidae (A)

**Human infestation**: yes

**References**

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**97 – *H. montgomeryi*** Nuttall, 1912 (Parasitology, 5: 50–60)

**Type depositories**: BMNH (lectotype, paralectotypes), ZMB (paralectotype, see below) (Keirans and Hillyard, 2001, *op. cit*. under *H. aciculifer*). Moritz and Fischer, (1981, *op. cit*. under *H. cinnabarina*) refer to the specimen in ZMB as Paratypus, "cotype" [sic].

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Oriental, Palearctic

**Ecoregions**: montane grasslands and shrublands

**Hosts**: usual hosts for adult ticks are Artiodactyla: Bovidae.
Artiodactyla: Bovidae; Rodentia: Muridae (AN)
Artiodactyla: Camelidae, Cervidae; Carnivora: Canidae, Felidae; Perissodactyla: Equidae; Rodentia: Sciuridae; Passeriformes: Corvidae (A)
Carnívora: Herpestidae; Soricomorpha: Soricidae (N)
Carnivora (unknown families); Erinaceomorpha: Erinaceidae; Aves (unknown orders) (N and/or L)
Carnivora: Herpestidae; Galliformes: Phasianidae (tick stages unknown)

**Human infestation**: yes (Hoogstraal et al. 1966)

**Remarks**: Camicas et al. (1998) list this species as exclusively Oriental, but Hoogstraal and Kim (1985) and Chen et al. (2010) present data for Palearctic localities. Hoogstraal and Kim (1985) use the term "immatures" without specifying whether larvae, nymphs or both stages were present on hosts. We have found no *bona fide* records for hosts of larval *H. montgomeryi.*

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**98** – ***H. moreli*** Camicas, Hoogstraal & El Kammah, 1972 (J. Parasitol., 58: 1185–1196)

**Type depositories**: USNTC (holotype, paratypes), ORSTOM (paratypes) (Camicas, J.-L., Hoogstraal, H. & El Kammah, K.M. 1972. Notes on African *Haemaphysalis* ticks. VIII. *H.* (*Rhipistoma*) *moreli* sp. n., a carnivore parasite of the *H.* (*R.*) *leachi* group (Ixodoidea: Ixodidae). J. Parasitol., 58: 1185–1196; Keirans & Clifford, 1984, *op. cit.* under *H. bartelsi*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Afrotropical

**Ecoregions**: tropical and subtropical grasslands, savannas and shrublands

**Hosts**: usual hosts for adult ticks are Carnivora: Viverridae.
Carnivora: Viverridae (ANL)
Mammalia (several orders) (A)
Rodentia: Muridae (N)

**Human infestation**: no

**Remarks**: the above host list excludes adults, larvae and nymphs of *H. moreli* found in the nests of Primates: Galagidae by Camicas et al. (1972).

**References**

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**99 – *H. moschisuga*** Teng 1980 (Acta Zootax. Sin., 5: 144–149. In Chinese)

**Type depository**: IZAS (holotype, paratypes) (Teng, K.-F. 1980. Two new species of *Haemaphysalis* from China (Acarina: Ixodidae). Acta Zootax. Sin., 5: 144–149. In Chinese, NAMRU-3 translation 1777)

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Oriental, Palearctic

**Ecoregions**: deserts and xeric shrublands, montane grasslands and shrublands

**Hosts**: usual hosts for larvae, nymphs and adult ticks are Artiodactyla: Moschidae.
Artiodactyla: Moschidae (ANL)
Artiodactyla: Bovidae; Lagomorpha: Leporidae (A)
Galliformes: Phasianidae (NL)

**Human infestation**: no

**Remarks**: Camicas et al. (1998) list this species as exclusively Palearctic, but records from Yunnan Province by Teng and Jiang (1991) and Chen et al. (2010) indicate that *H. moschisuga* is also present in the Oriental Zoogeographic Region. The list of hosts above follows that of Teng (1984), but Teng and Jiang (1991) limit hosts to Artiodactyla: Bovidae and Moschidae. Kolonin (2009) retains the host profile of *H. moschisuga* according to Teng (1984), which we provisionally accept. Mihalca et al. (2011) regard this species as endangered.

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Teng, K.-F. & Jiang, Z.-J. 1991. Economic insect fauna of China. Fasc. 39, Acari: Ixodidae. Science Press, Beijing, 355 pp. In Chinese.

**100 – *H. muhsamae*** Santos Dias, 1954 (Mem. Estad. Mus. Zool. Univ. Coimbra (225), 9 pp). Considerable difficulties attend the morphological identification of this species. Santos Dias, J.A.T. (1954. Mais uma nova espécie de carraça do género *Haemaphysalis* C.L. Koch, 1884, para a fauna de Moçambique. Mem. Estud. Mus. Zool. Univ. Coimbra (225), 9 pp.) described the male, female and nymph of *H. muhsamae* (as *H. muhsami*), but Santos Dias, J.A.T. (1955. Sobre uma pequena colecçao de carraças provenientes de Tete (Moçambique). Moçambique (81): 117–132) corrected himself concerning the female and nymph used in the original description, which were in fact *H. leachi indica* (a synonym of *H. indica*). He then redescribed the female and nymph of *H. muhsamae* from new material collected in Moçambique. Kolonin (2009, *op. cit*. under *H. anomaloceraea*) omits *H. muhsamae* from his list of ixodid ticks of the world but gives no reason for this omission. *Haemaphysalis muhsamae* is treated as provisionally valid here. See remarks below.

**Type depository**: VLM (holotype, paratype) (Santos Dias, J.A.T. 1962. Tipos entomológicos em colecçao no laboratorio central de patología veterinária de Lourenço Marques. An. Serv. Vet. Moçambique (8): 63–67) as *Haemaphysalis muhsami*

**Known stages**: male, female, (nymph?)

**Zoogeographic Region**: Afrotropical

**Ecoregions**: several Afrotropical ecoregions

**Hosts**: Aves are considered exceptional hosts for this tick.
Mammalia (several orders); Strigiformes: Strigidae; Passeriformes: Muscicapidae (A)

**Human infestation**: no

**Remarks**: the nymph is described in Santos Dias (1955) but not included in Camicas et al. (1998), probably because of the difficulties involved in correctly identifying this stage. Records of *H. muhsamae* adults from Aves are rare. Because it can be quite difficult to determine this species, we have not included the few records of sub-adult ticks. Walker (1991) considers the records of Theiler (1962) of *H. leachii* [sic] *mühsami* [sic] as in fact referring to *H. spinulosa*, and Theiler's records have therefore not been included in the above host list. Keirans and Durden (2001) record the introduction of *H. muhsamae* into the Nearctic Region, but there is no evidence that it has become established there. With the exception of Keirans and Durden (2001), all authors listed below refer to this species as *Haemaphysalis leachi muhsami.*

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**101 – *H. nadchatrami*** Hoogstraal, Trapido & Kohls, 1965 (J. Parasitol., 51: 433–451)

**Type depositories**: USNTC (holotype, paratypes), BMNH, FMNH, HH, IMRKL, MCZ, MNHN, UM, ZMB (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*) as *H. papuana nadchatrami.*

**Known stages**: male, female, nymph

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical moist broadleaf forests

**Hosts**: Rodentia: Muridae (ANL)
Artiodactyla: Bovidae, Suidae; Carnivora: Canidae, Felidae, Mustelidae; Perissodactyla: Equidae, Tapiridae (A)
Artiodactyla: Tragulidae (NL)
Carnivora: Viverridae; Rodentia: Sciuridae (N)

**Human infestation**: yes (Tanskul et al. 1983)

**Remarks**: hosts for the undescribed larva of *H. nadchatrami* are recorded in Hoogstraal et al. (1972), and we regard these records as provisionally valid. Tanskul et al. (1983) identified adults of *H. nadchatrami* from Muridae. This host family is ignored for imagoes of *H. nadchatrami* in Kolonin (2009) but we consider this record provisionally valid.

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**102 – *H. nepalensis*** Hoogstraal, 1962 (J. Parasitol., 48: 195–203)

**Type depositories**: USNTC (holotype, paratype), HH (paratype) (Hoogstraal, H. 1962. *Haemaphysalis nepalensis* sp. n. from a Himalayan rodent and man, and description of the male of *H. aponommoides* Warburton (n. comb.) (Ixodoidea, Ixodidae). J. Parasitol., 48: 195–203)

**Known stages**: male, female, nymph

**Zoogeographic Regions**: Oriental, Palearctic

**Ecoregions**: montane grasslands and shrublands

**Hosts**: Artiodactyla: Bovidae (AN)
Carnivora: Felidae, Ursidae; Rodentia (unknown family) (A)

**Human infestation**: yes (Hoogstraal 1962)

**Remarks**: Camicas et al. (1998) list this species as exclusively Oriental, but there are also *bona fide* records for the Palearctic Region. Mitchell (1979) lists Carnivora: Ailuridae and Soricomorpha: Soricidae as hosts of *H. nepalensis* without stating which stages of this tick were found on these hosts, and we have therefore tentatively excluded them from our host list. Hoogstraal and Kim (1985) and Kolonin (2009) state that the immature stages of *H. nepalensis* feed on the same hosts as adults, but apart from nymphs found on Bovidae by Dhanda (1964) we were unable to confirm this. Mitchell and Dick (1978) present a record of *H. nepalensis* from Aves (tick stages unknown), but Aves are not included in Hoogstraal and Kim (1985) and are not included in our list above.

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Teng, K.-F. & Jiang, Z.-J. 1991. Economic insect fauna of China. Fasc. 39, Acari: Ixodidae. Science Press, Beijing, 355 pp. In Chinese.

**103 – *H. nesomys*** Hoogstraal, Uilenberg & Klein, 1966 (J. Parasitol., 52: 1199–1202)

**Type depository**: USNTC (holotype) (Keirans and Clifford, 1984, *op. cit.* under *H. bartelsi*)

**Known stages**: male

**Zoogeographic Region**: Afrotropical

**Ecoregion**: Madagascar subhumid forests

**Hosts**: Rodentia: Nesomyidae (A)

**Human infestation**: no

**Reference**

Uilenberg, G., Hoogstraal, H. & Klein, J.-M. 1979. Les tiques (Ixodoidea) de Madagascar et leur rôle vecteur. Arch. Inst. Pasteur Madagascar Num. Spéc., 153 pp.

**104 – *H. norvali*** Hoogstraal & Wassef, 1983 (Onderstepoort J. Vet. Res., 50: 183–189)

**Type depositories**: USNTC (holotype, paratypes), VRLH, OVI, ORSTOM (paratypes) (Hoogstraal, H. & Wassef, H.Y. 1983. Notes on African *Haemaphysalis* ticks. XV. *H.* (*Rhipistoma*) *norvali* sp. n., a hedgehog parasite of the *H.* (*R.*) *spinulosa* group in Zimbabwe (Acarina: Ixodidae). Onderstepoort J. Vet. Res., 50: 183–189)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Afrotropical

**Ecoregion**: Southern Africa bushveld

**Hosts**: Erinaceomorpha: Erinaceidae (A)

**Human infestation**: no

**Remarks**: the larva and nymph of *H. norvali* are known only from laboratory-reared specimens (Hoogstraal and Wassef 1983).

**Reference**

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**105 – *H. novaeguineae*** Hirst, 1914 (Trans. R. Soc. Lond., 20: 325–334)
This name should not be confused with *Haemaphysalis novaguineae* Krijgsman and Ponto, 1932, a synonym of *H. bancrofti* as explained in Roberts (1963, *op. cit.* under *H. bremneri*).

**Type depository:** BMNH (lectotype, paralectotypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Australasian

**Ecoregions**: tropical and subtropical moist broadleaf forests; tropical and subtropical grasslands, savannas and shrublands

**Hosts**: Artiodactyla: Cervidae, Suidae; Peramelemorphia: Peramelidae (ANL)
Diprotodontia: Macropodidae (AN)
Cuculiformes: Cuculidae (AL)
Carnivora: Canidae; Monotremata: Tachyglossidae; Perissodactyla: Equidae; Rodentia: Muridae; Gruiformes: Rallidae (A)
Carnivora: Felidae (N)
Artiodactyla: Bovidae; Chiroptera: Pteropodidae (stage unknown)

**Human infestation**: yes (Unsworth et al. 2007)

**Remarks**: Camicas et al. (1998) state that *H. novaeguineae* is found in the Australasian and Oriental Zoogeographic Regions, but we follow Hoogstraal and Kim (1985), who categorized *H. novaeguineae* as an exclusively Australasian species. Although Hoogstraal (1982) found several specimens of *H. novaeguineae* on Aves, these records are ignored by Kolonin (2009).

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**106 – *H. obesa*** Larrousse, 1925 (Ann. Parasitol. Hum. Comp., 3: 301–305)

**Type depository**: IP (lectotype) (Hoogstraal et al. 1966, *op. cit.* under *H. hirsuta*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical dry broadleaf forests

**Hosts**: Mammalia (several orders) (A)
Carnivora: Canidae, Mustelidae (N and/or L)

**Human infestation**: yes (Tanskul et al. 1983)

**Remarks**: Tanskul et al. (1983) and Hoogstraal and Kim (1985) use the term "immatures" without indicating whether larvae, nymphs or both stages were found on hosts; consequently, the hosts for the larvae and nymphs of *H. obesa* are not known with certainty.

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**107 – *H. obtusa*** Dönitz, 1910 (Denkschr. Med.-Naturw. Ges. Jena, 16: 397–494)
See remarks below.

**Type depositories**: ZMB, BMNH (syntypes) (Moritz and Fischer 1981, *op. cit*. under *H. cinnabarina*; Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph

**Zoogeographic Region**: Afrotropical

**Ecoregion**: Madagascar subhumid forests

**Hosts**: usual hosts for adult ticks are Carnivora: Eupleridae and Viverridae.
Carnivora: Eupleridae (ANL)
Carnivora: Viverridae (AN)
Canidae (A)
Afrosoricida: Tenrecidae; Rodentia: Muridae, Nesomyidae (NL)

**Human infestation**: no

**Remarks**: the larva of *H. obtusa* has not been described. Uilenberg et al. (1979) feel that determinations of nymphs and larvae from Afrosoricida and Muridae, in the absence of adult ticks, should be considered tentative. We too regard these records as only provisionally valid. Furthermore, Uilenberg et al. (1979) state that there are "typical" and "atypical" specimens of *H. obtusa*, thus implying that more than one species may be represented under this name.

**Reference**

Uilenberg, G., Hoogstraal, H. & Klein, J.-M. 1979. Les tiques (Ixodoidea) de Madagascar et leur rôle vecteur. Arch. Inst. Pasteur Madagascar Num. Spéc., 153 pp.

**108 – *H. oliveri*** Apanaskevich & Horak, 2008 (J. Parasitol., 94: 594–607)
Some specimens of *H. oliveri* collected before its description were identified as members of the *H. leachi* group, as noted in Apanaskevich and Horak (2008, *op. cit*. under *H. colesbergensis*). Kolonin (2009, *op. cit*. under *H. anomaloceraea*) does not include this species in his list of Ixodidae of the world.

**Type depositories**: USNTC (holotype, paratypes), OVI, ZIAC (paratypes) (Apanaskevich and Horak 2008, *op. cit*. under *H. colesbergensis*)

**Known stages**: male, female, larva

**Zoogeographic Region**: Afrotropical

**Ecoregions**: Sahelian acacia savanna; east Sudanian savanna

**Hosts**: usual hosts for adult ticks are Carnivora: Canidae and Felidae.
Carnivora: Canidae, Felidae, Viverridae; Artiodactyla: Bovidae (A)

**Human infestation**: no

**Remarks**: the larva of *H. oliveri* is known only from laboratory-reared specimens (Apanaskevich and Horak 2008).

**Reference**

Apanaskevich, D.A. & Horak, I.G. 2008. Two new species of African *Haemaphysalis* ticks (Acari: Ixodidae), carnivore parasites of the *H.* (*Rhipistoma*) *leachi* group. J. Parasitol., 94: 594–607.

**109 – *H. orientalis*** Nuttall & Warburton, 1915 (Ticks. A monograph of the Ixodoidea. Part III. The genus *Haemaphysalis*. Cambridge University Press, London, pp. 349–550)
See remarks below.

**Type depository**: BMNH (lectotype, paralectotypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*), originally named *H. hoodi orientalis*.

**Known stages**: male, female

**Zoogeographic Region**: Afrotropical

**Ecoregions**: tropical and subtropical grasslands, savannas and shrublands

**Hosts**: usual hosts for adult ticks are Hyracoidea: Procaviidae.
Artiodactyla: Bovidae; Hyracoidea: Procaviidae (A)

**Human infestation**: no

**Remarks**: Santos Dias (1953) refers to this tick as *Haemaphysalis zambeziae* Santos Dias, 1953, which Hoogstraal (1956) classifies as a synonym of *H. orientalis.* Although Santos Dias later (1962) recognized this synonymy, he continued to maintain his earlier (1953) assertion that Bovidae are hosts of this species, which Hoogstraal (1956) believes to be an error, as inferred from correspondence between Santos Dias and Theiler, (quoted on page 168 of Hoogstraal 1956). Therefore, our acceptance of this host-parasite relationship in the above list is provisional. Kolonin (2009) excludes Bovidae as hosts for *H. orientalis.*

**References**

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Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/

Santos Dias, J.A.T. 1953. Sobre uma nova espécie de carraça do gênero *Haemaphysalis* Koch, 1844, (Acarina; Ixodoidea) para a fauna de Moçambique. Mem. Estud. Mus. Zool. Univ. Coimbra (219), 7 pp.

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**110 – *H. ornithophila*** Hoogstraal & Kohls, 1959 (J. Parasitol., 45: 417–420)

**Type depositories**: MCZ (holotype, paratypes), HH, USNTC (paratypes) (Hoogstraal, H. & Kohls, G.M. 1959. The *Haemaphysalis* ticks (Acarina, Ixodidae) of birds. I. *H. ornithophila* n. sp. from Burma and Thailand. J. Parasitol., 45: 417–420)

**Known stages**: male, female

**Zoogeographic Regions**: Oriental, Palearctic

**Ecoregions**: northern triangle subtropical forests; lower Gangetic plains moist deciduous forests

**Hosts**: Galliformes: Phasianidae (ANL)
Passeriformes: Turdidae (AN)
Passeriformes: Pittidae, Chloropseidae; Carnivora: Mustelidae; Lagomorpha: Leporidae; Artiodactyla: Bovidae (A)

**Human infestation**: no

**Remarks**: we have been unable to find descriptions of the larva and nymph of *H. ornithophila*. Wilson (1970), however, discusses several records of these stages from Aves that we consider tentatively valid. Kolonin (1995) states that specimens of *H. ornithophila* found on Chloropseidae are equivalent to *H. bacthaiensis* Phan Trong, 1977. Mitchell (1979) regards Cervidae as hosts of *H. ornithophila*, but this view has not been corroborated in subsequent works (Kim et al. 2009).

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Kolonin, G.V. 1995. Review of the ixodid tick fauna (Acari: Ixodidae) of Vietnam. J. Med. Entomol., 32: 276–282.

Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/
Mitchell, R.M. 1979. A list of ectoparasites from Nepalese mammals, collected during the Nepal ectoparasite program. J. Med. Entomol., 16: 227–233.
Teng, K.-F. & Jiang, Z.-J. 1991. Economic insect fauna of China. Fasc. 39, Acari: Ixodidae. Science Press, Beijing, 355 pp. In Chinese.
Wilson, N. 1970. New distributional records of ticks from Southeast Asia and the Pacific (Metastigmata: Argasidae, Ixodidae). Oriental Insects, 4: 37–46.
Xu, R. & Li, K. 1997. A collection of ticks from Guizhou, China. Syst. Appl. Acarol., 2: 245–246.

**111 – *H. palawanensis*** Kohls, 1950 (Natl. Inst. Health Bull. (192), 28 pp)

**Type depositories**: CNHM (holotype, paratypes), USNTC, PNM (paratypes) (Kohls 1950, *op. cit.* under *H. hoogstraali*)

**Known stages**: male, female

**Zoogeographic Region**: Oriental

**Ecoregion**: Palawan rain forests

**Hosts**: Carnivora (several families); Rodentia: Hystricidae, Muridae, Sciuridae; Artiodactyla: Suidae, Cervidae (A)

**Human infestation**: no

**Remarks**: Kohls (1950) found a female *H. palawanensis* crawling on a human, but we have not included humans in our host list above. Cervids are not listed as hosts of this tick in Kolonin (2009), but there is a valid record for this type of host in Kohls (1950). Durden and Keirans (1996) regard *H. palawanensis* as an endangered species.

**References**

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Kohls, G.M. 1950. Ticks (Ixodoidea) of the Philippines. Natl. Inst. Health Bull. (192), 28 pp.
Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/

**112 – *H. papuana*** Thorell, 1883 (Ann. Mus. Civ. Stor. Nat. Genova, 18: 21–69)

**Type depository**: GM (syntypes) (Anastos 1950, *op. cit.* under *H. hylobatis*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Australasian, Oriental

**Ecoregions**: tropical and subtropical moist broadleaf forests

**Hosts**: usual hosts for adult ticks are Artiodactyla: Suidae. Aves are considered exceptional hosts for this tick.
Artiodactyla: Suidae; Carnivora: Canidae (AN)
Carnivora: Ursidae (AL)
Rodentia: Muridae (A, N and/or L)
Artiodactyla: Cervidae, Moschidae; Carnivora: Felidae, Mustelidae, Viverridae; Rodentia: Hystricidae; Galliformes: Phasianidae (A)
Passeriformes: Muscicapidae (stage unknown)

**Human infestation**: yes (Tanskul et al. 1983)

**Remarks**: Camicas et al. (1998) list the larva of *H. papuana* as undescribed, but it was earlier described in Kadarsan (1971). Reports of this species published prior to Trapido et al. (1964), who refer to it as *H. papuana papuana*, have not been included in our analyses because of diagnostic uncertainties. Tanskul et al. (1983) use the term "immatures" without specifying whether they found larvae, nymphs or both stages on hosts. Yamaguti et al. (1971) state that reports of this tick from Korea, which lies within the Palearctic Region, are erroneous. According to Keirans (1985), a larva of *H. papuana* from Ursidae should be considered tentative, and we have therefore provisionally included it in our host list above. Kolonin (2009) excludes Muridae as hosts for this tick, but we accept records from these hosts in Tanskul et al. (1983) and also an odd record from Aves in Gould et al. (1970).

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Yamaguti, N., Tipton, V.J., Keegan, H.L. & Toshioka, S. 1971. Ticks of Japan, Korea, and the Ryukyu Islands. Brigham Young Univ. Sci. Bull. Biol. Ser., 15 (1), 226 pp.

**113 – *H. paraleachi*** Camicas, Hoogstraal & El Kammah, 1983 (J. Parasitol., 69: 400–404)
See remarks below

**Type depositories**: USNTC (holotype, paratypes), ORSTOM, CM (paratypes) (Camicas, J.-L., Hoogstraal, H. & El Kammah, K.M. 1983. Notes on African *Haemaphysalis* ticks. XIV. Description of adults of *H.* (*Rhipistoma*) *paraleachi* sp. n., a carnivore parasite of the *H.* (*R.*) *leachi* group (Ixodoidea: Ixodidae). J. Parasitol., 69: 400–404)

**Known stages**: male, female

**Zoogeographic Region**: Afrotropical

**Ecoregions**: several Afrotropical ecoregions

**Hosts**: usual hosts for adult ticks are Carnivora: Canidae, Felidae and Viverridae.
Rodentia: Muridae (AN)
Carnivora (several families); Artiodactyla: Bovidae; Primates: Cercopithecidae (A)

**Human infestation**: yes (El Kammah et al. 1992)

**Remarks**: Kolonin (2009) does not list hosts for nymphs of this tick, probably because the nymph has not been described, but we provisionally accept the records of this stage in Cornet (1995). Prior to its description, *H. paraleachi* was confused with *H. leachi* by several authors (Camicas et al. 1983).

**References**

Camicas, J.-L., Hoogstraal, H. & El Kammah, K.M. 1983. Notes on African *Haemaphysalis* ticks. XIV. Description of adults of *H.* (*Rhipistoma*) *paraleachi* sp. n., a carnivore parasite of the *H.* (*R.*) *leachi* group (Ixodoidea: Ixodidae). J. Parasitol., 69: 400–404
Cornet, J.-P. 1995. Contribution à l'étude des tiques (Acarina: Ixodina) de la République Centrafricaine 4. Inventaire et répartition. Acarologia, 36: 203–212.
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Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/

**114 – *H. paraturturis*** Hoogstraal, Trapido & Rebello, 1963 (J. Parasitol., 49: 686–691)

**Type depositories**: USNTC (holotype, paratypes), BMNH, VRC, IM (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*). This species was originally identified as *H. bispinosa intermedia* Warburton & Nuttall, 1909, a synonym of *H. intermedia*, by Nuttall and Warburton (1915, *op. cit.* under *H. celebensis*), as noted in Hoogstraal. H., Trapido, H. & Rebello, M.J. (1963. *Haemaphysalis paraturturis* sp. n., a carnivore parasite of the *H. turturis* group in India (Ixodoidea, Ixodidae). J. Parasitol., 49: 686–691).

**Known stages**: male, female, nymph

**Zoogeographic Region**: Oriental

**Ecoregion**: lower Gangetic Plains moist deciduous forests

**Hosts**: Carnivora: Canidae, Felidae, Ursidae; Artiodactyla: Bovidae, Suidae (A)
Cuculiformes: Cuculidae (N)
Rodentia: Muridae, Sciuridae; Soricomorpha: Soricidae; Passeriformes: Timaliidae (N and/or L)

**Human infestation**: no

**Remarks**: Kolonin (2009) does not list Rodentia, Soricomorpha and Passeriformes as hosts for this tick, but we provisionally accept records from these hosts reported by Geevarghese and Dhanda (1995), who do not specify whether their collections contained larvae, nymphs or both stages.

**References**

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Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/

**115 – *H. parmata*** Neumann, 1905 (Arch. Parasitol., 9: 225–241)

**Type depository**: BMNH (syntypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Afrotropical

**Ecoregions**: tropical and subtropical moist broadleaf forests; few ticks in tropical and subtropical grasslands, savannas and shrublands; montane grassland and shrublands

**Hosts**: usual hosts for adult ticks are Artiodactyla: Bovidae. We consider Squamata exceptional hosts for this tick, while Aves are considered exceptional hosts for adult ticks.
Mammalia (several orders); Galliformes: Phasianidae, Numididae (ANL)
Squamata: Elapidae (A)
Passeriformes: Strildidae (N)
Passeriformes: Viduidae; Squamata: Atractaspididae (L)
Ciconiiformes: Bucorvidae (N and/or L)

**Human infestation**: yes (Cornet 1995)

**Remarks**: Theiler (1962) uses the term "immatures" without specifying whether larvae, nymphs or both preimaginal stages of *H. parmata* were found on hosts. Infestations of adult ticks on Aves and any stage of development on Squamata appear to be infrequent events and have been ignored in Kolonin (2009). We, however, consider the occasional records from these hosts in Keirans (1985) and Morel (2003), among others, provisionally valid.

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**116 – *H. parva*** (Neumann, 1897) (Mém. Soc. Zool. Fr., 10: 324–420)
This species was originally designated as *Dermacentor parvus*, but Morel, P.-C. (1963. Sur quelques *Haemaphysalis* paléarctiques (Acariens, Ixodoidea). Ann. Parasitol. Hum. Comp., 38: 915–924) recognized that it was in fact a member of the genus *Haemaphysalis* and identical to *H. otophila* Schulze, 1919. Therefore, *D. parvus* and *H. otophila schulzei* Tonelli-Rondelli, 1926 are synonyms of *H. parva.* Neumann, L.G. (1908. Notes sur les ixodidés. VI. Arch. Parasitol., 12: 5–27) described *H. parva* from Ceylon (Sri Lanka); however, the name was preoccupied and the correct name for the species described by Neumann (1908) is *H. intermedia* Warburton & Nuttall, 1909, as stated in Trapido, H. & Hoogstraal, H. (1963. Status of *Haemaphysalis bispinosa* var. *intermedia* Warburton & Nuttall, 1909, next available name for *H. parva* Neumann, 1908 (preoccupied) (Ixodoidea, Ixodidae). J. Parasitol., 49: 691–692). See also remarks below.

**Type depository**: MNHN (holotype) (Neumann, 1897, *op. cit*. under *H. flava*) as *Dermacentor parvus*

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Palearctic

**Ecoregions**: mediterranean forests, woodlands and scrub

**Hosts**: Testudines are considered exceptional hosts for this tick, while Aves are considered exceptional hosts for adult ticks.
Rodentia: Sciuridae; Lagomorpha: Leporidae (AN)
Erinaceomorpha: Erinaceidae (AL)
Artiodactyla: Bovidae; Carnivora: Mustelidae; Falconiformes: Falconidae; Passeriformes: Sturnidae (A, N and/or L)
Several orders (Mammalia) (A)
Galliformes: Phasianidae (AL)
Rodentia: Cricetidae, Spalacidae; Charadriiformes: Scolopacidae; Squamata: Lacertidae (NL)
Rodentia: Dipodidae, Muridae; Falconiformes: Accipitridae; Gruiformes: Gruidae; Squamata: Colubridae (N)
Passeriformes: Muscicapidae (L)
Charadriiformes: Burhinidae, Charadriidae; Passeriformes (several families); Piciformes: Picidae (N and/or L)
Lagomorpha: Ochotonidae; Rodentia: Gliridae, Calomyscidae; Squamata: Viperidae; Testudines: Testudinidae (stages unknown)

**Human infestation**: yes (Bursali et al. 2012)

**Remarks**: Camicas et al. (1998) state that the larva of *H. parva* is undescribed, but there is a description in Filippova (1997). Ter-Vartanov et al. (1954), Hoogstraal (1959), Feider (1964), Theodor and Costa (1967) and Yeruham et al. (1996) refer to this species as *H. otophila*, while Inci et al. (2003) use the names of *H. otophila* and

*H. parva* simultaneously for ticks parasitizing Bovidae. Hoogstraal and Kim (1985) use the term "immatures" without specifying larvae, nymphs or both, while Morel (2003) presents information on larvae and nymphs of *H. parva*, but it is difficult to infer their hosts from his data. Faizi et al. (2011) recorded infestations of Squamata: Scincidae with adults, nymphs and larvae of *H. parva*, but we believe that these records need confirmation and we have not included them in our host list above. Kolonin (2009) records only Mammalia as hosts for this tick.

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**117 – *H. pavlovskyi*** Pospelova-Shtrom, 1935 (Trudy Tadzhik. Bazy Akad. Nauk SSSR (5): 205–217. In Russian)
Camicas et al. (1998, *op. cit.* under *H. anomaloceraea*) and Kolonin (2009, *op. cit*. under *H. anomaloceraea*) consider this species a synonym of *H. doenitzi*. Guglielmone et al. (2009, *op. cit*. under *H. colasbelcouri*) discussed the status of this species, concluding that it is valid, and we concur. See also *H. phasiana.*

**Type depository**: ZIAC (holotype, paratypes) (Filippova 2008, *op. cit*. under *H. caucasica*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Palearctic

**Ecoregions**: desert and xeric shrublands

**Hosts**: Galliformes: Phasianidae; Lagomorpha: Leporidae (ANL)
Passeriformes: Sylviidae (L)

**Human infestation**: no

**Remarks**: see *H. doenitzi.*

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**118 – *H. pedetes*** Hoogstraal, 1972 (J. Parasitol., 58: 979–983)

**Type depository**: BMNH (holotype, paratype) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*), originally identified as *H. cooleyi*. See also *H. cooleyi.*

**Known stages**: male, female

**Zoogeographic Region**: Afrotropical

**Ecoregions**: tropical and subtropical grasslands, savannas and shrublands

**Hosts**: usual hosts for adult ticks are Rodentia: Pedetidae.
Rodentia: Pedetidae (ANL)
Carnivora: Felidae, Mustelidae, Viverridae (A)

**Human infestation**: no

**Remarks**: we were unable to find descriptions of the larva and nymph of *H. pedetes*, but we tentatively accept records of nymphs and larvae on Pedetidae (Anderson and Kok 2003), although these have not been included in Kolonin (2009). Cumming (1998) lists Rodentia: Pedetidae as the only hosts for this tick, but Hoogstraal and Kim (1985) record parasitism of Carnivora. See also *H. cooleyi.*

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**119 – *H. pentalagi*** Pospelova-Shtrom, 1935 (Trudy Tadzhik. Bazy Akad. Nauk SSSR (5): 205–217. In Russian)

**Type depository**: ZIAC (holotype) (Filippova 2008, *op. cit*. under *H. caucasica*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregion**: Nansei Islands subtropical evergreen forests

**Hosts**: Lagomorpha: Leporidae (ANL)

**Human infestation**: no

**Remarks**: Camicas et al. (1998) state that this tick is found in the Oriental and Palearctic Zoogeographic Regions, but we found no *bona fide* records of *H. pentalagi* from the Palearctic. Mihalca et al. (2011) regard this species as endangered.

**References**

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**120 – *H. petrogalis*** Roberts, 1970 (Australian ticks. CSIRO, Melbourne, 267 pp)

**Type depositories**: QM (holotype, paratypes), ANIC, AM, USNTC (paratypes) (Roberts, F.H.S. 1970. Australian ticks. CSIRO, Melbourne, 267 pp.; Halliday, B. personal communication to Guglielmone, A.A.)

**Known stages**: male, female

**Zoogeographic Region**: Australasian

**Ecoregion**: Queensland tropical rain forests

**Hosts**: Diprotodontia: Macropodidae (A)

**Human infestation**: no

**Reference**

Roberts, F.H.S. 1970. Australian ticks. CSIRO, Melbourne, 267 pp.

**121 – *H. phasiana*** Saito, Hoogstraal & Wassef, 1974 (J. Parasitol., 60: 198–208)
Kolonin (2009, *op. cit*. under *H. anomaloceraea*) treats *H. phasiana*, as well as *H. pavlovskyi*, as synonyms of *H. doenitzi.* This decision was based on morphological differences ascribed to colonization of the periphery of the geographic range of *H. doenitzi*. We follow Guglielmone et al. (2010, *op. cit.* under *H. anomaloceraea*), maintaining that more convincing evidence is needed to conclude that *H. phasiana* and *H. pavlovskyi* are synonyms of *H. doenitzi.* See also *H. doenitzi* and remarks below.

**Type depositories**: USNTC (holotype, paratypes), CS (paratypes) (Saito, Y., Hoogstraal, H. & Wassef, H.Y. 1974. The *Haemaphysalis* ticks (Ixodoidea: Ixodidae) of birds. 4. *H.* (*Ornithophysalis*) *phasiana* sp. n. from Japan. J. Parasitol., 60: 198–208)

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Oriental, Palearctic

**Ecoregions**: temperate broadleaf and mixed forests

**Hosts**: Galliformes: Phasianidae (ANL)
Passeriformes: Emberizidae; Artiodactyla: Cervidae (AN)
Passeriformes: Muscicapidae; Lagomorpha: Leporidae (A)
Gruiformes: Turnicidae; Passeriformes: Sylviidae (N)
Passeriformes: Emberizidae (stage unknown)

**Human infestation**: no

**Remarks**: Sames et al. (2008) believe that more than one taxon is represented under the name *H. phasiana.* Hoogstraal and Kim (1985) state that *H. phasiana* is an exclusive parasite of Aves; however, there are about 20 records for this species (Sames et al. 2008), and three of them refer to ticks found on mammals. We therefore conclude that more information is needed to determine whether *H. phasiana* is indeed an exclusive parasite of Aves and whether records from Mammalia are exceptional. See also *H. doenitzi.*

**References**

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Yamauchi, T. 2001. A bibliographical survey of host-parasite relationships between birds and ticks from Japan. Bull. Hoshizaki Green Found., 5: 271–308. In Japanese.

**122 – *H. pospelovashtromae*** Hoogstraal, 1966 (J. Parasitol., 52: 787–800)
See *H. danieli.*

**Type depositories**: USNTC (holotype, paratypes), ZMB (paratype) (Moritz and Fischer 1981, *op. cit*. under *H. cinnabarina*; Keirans and Clifford 1984, *op. cit.* under *H. bartelsi*). One paratype was previously determined as *H. warburtoni* by Hoogstraal, H. (1966. *Haemaphysalis* (*Allophysalis*) *pospelovashtromae* sp. n. from USSR and redescription of the type material of *H.* (*A.*) *warburtoni* Nuttall from China (Ixodoidea, Ixodidae). J. Parasitol., 52: 787–800). See "remarks on some invalid names" for a new synonym of *H. pospelovashtromae.*

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Palearctic

**Ecoregions**: desert and xeric shrublands

**Hosts**: Artiodactyla: Bovidae, Suidae; Rodentia: Sciuridae (A)

Mammalia (several orders); Passeriformes: Sittidae (NL)

**Human infestation**: no

**Remarks**: see *H. warburtoni.*

**Reference**

Filippova, N.A. 1997. Ixodid ticks of subfamily Amblyomminae. Fauna of Russia and neighbouring countries, 4 (5), Nauka, St. Petersburg, 436 pp. In Russian.

**123 – *H. primitiva*** Teng, 1982 (Acta Zootax. Sin., 7: 46–48. In Chinese)

**Type depository**: IZAS probable (holotype) (Teng, K.-F. 1982. On the subgenus *Alloceraea* of genus *Haemaphysalis* from China, with description of a new species (Ixodoidea: Ixodidae). Acta Zootax. Sin., 7: 46–48. In Chinese, translation RR1 by Robbins, F.-M.Y.; Keirans and Robbins 1999, *op. cit.* under *H. demidovae*)

**Known stages:** male, female

**Zoogeographic Region**: Oriental

**Ecoregions**: temperate broadleaf and mixed forests

**Hosts**: unknown

**Human infestation**: no

**References**

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**124 – *H. psalistos*** Hoogstral, Kohls & Parrish, 1967 (J. Parasitol., 53: 1096–1102)

**Type depositories**: USNTC (holotype, paratypes), BMNH, BM, FMNH, HH (paratypes) (Keirans and Hillyard, 2001, *op. cit.* under *H. aciculifer*)

**Known stages**: male, female, nymph

**Zoogeographic Regions**: Australasian, Oriental

**Ecoregions**: Luzon tropical pine forests; Sulawesi montane rain forests

**Hosts**: Artiodactyla: Cervidae (AN)
Artiodactyla: Bovidae, Suidae (A)
Rodentia: Muridae (NL)

**Human infestation**: no

**Remarks**: Camicas et al. (1998) and Kolonin (2009) state that this species is exclusively Oriental, but the records of Durden et al. (2008) for Sulawesi Island belong to the Australasian Region. Kolonin (2009) does not consider Bovidae hosts for *H. psalistos*, but *bona fide* records of this relationship are reported in Durden et al. (2008). The latter authors treat their record of the undescribed larva of this tick on Muridae

as tentative, and we have therefore provisionally included murids in our host list for *H. psalistos.* Mihalca et al. (2011) regard this species as endangered.

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Hoogstraal, H., Kohls, G.M. & Parrish, D.W. 1967. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea, Ixodidae). *H.* (*Kaiseriana*) *psalistos* sp. n., a parasite of deer and boars in Luzon, Philippines. J. Parasitol., 53: 1096–1102.

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**125 – *H. punctaleachi*** Camicas, Hoogstraal & El Kammah, 1973 (J. Parasitol., 59: 563–568)

Guglielmone et al. (2010, *op. cit.* under *H. anomalocerae*) erroneously cite the year of description as 1983.

**Type depositories**: USNTC (holotype, paratype), ORSTOM (paratypes) (Camicas, J.-L., Hoogstraal, H. & El Kammah, K.M. 1973. Notes on African *Haemaphysalis* ticks. XI. *H.* (*Rhipistoma*) *punctaleachi* sp. n., a parasite of West African forest carnivores (Ixodoidea: Ixodidae). J. Parasitol., 59: 563–568)

**Known stages**: male, female

**Zoogeographic Region**: Afrotropical

**Ecoregions**: central Congolian lowland forests; Guinean lowland forests

**Hosts**: usual hosts for adult ticks are Carnivora: Viverridae.
Artiodactyla: Bovidae; Carnivora (several families); Rodentia: Hystricidae (A)

**Human infestation**: no

**Remarks**: Kolonin (2009) ignores Bovidae as hosts of *H. punctaleachi*, but there is a valid record for this type of host in Camicas et al. (1973).

**References**

Camicas, J.-L., Hoogstraal, H. & El Kammah, K.M. 1973. Notes on African *Haemaphysalis* ticks. XI. *H.* (*Rhipistoma*) *punctaleachi* sp. n., a parasite of West African forest carnivores (Ixodoidea: Ixodidae). J. Parasitol., 59: 563–568.

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**126 – *H. punctata*** Canestrini & Fanzago, 1878 (Atti R. Ist. Veneto Sci Lett. Arti (1877–1878), Ser. 5, 4: 69–208)

**Type depositories**: the types are probably lost (Nuttall and Warburton 1915, *op. cit.* under *H. celebensis*). These authors designate this species as *Haemaphysalis cinnabarina punctata.*

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Palearctic

**Ecoregions**: several Palearctic ecoregions

**Hosts**: Testudines and Squamata: Viperidae are considered exceptional hosts for this tick.
Mammalia (several orders); Aves (several orders) (ANL)
Squamata: Anguidae, Lacertidae (NL)
Squamata: Viperidae; Testudines: Testudinidae (stages unknown)

**Human infestation**: yes (Burridge 2011)

**Remarks**: there are records of introductions of *H. punctata* into the Nearctic Region but no evidence that it has become established there (Burridge 2011). Ekanem et al. (2012) reported a natural population of *H. punctata* in the Afrotropical Region, but this is regarded as an error in identification. Kolonin (2009) ignores hosts other than mammals and birds, but, although rare, there are several valid records of *H. punctata* on Squamata and Testudines in the references listed below. See also *H. cinnabarina.*

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Ekanem, M.S., Opara, K.N., Bennie, D.P. & Udo, I.O. 2012. Ectoparasites [sic] of goats in Etinan, Akwa Ibom State, Nigeria. J. Agric. Biol. Sci., 2: 108–113.

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**127 – *H. quadriaculeata*** Kolonin, 1992 (*In* V.E. Sokolov (editor), Zoological Researches in Vietnam. Nauka, Moscow, pp. 242–277. In Russian)

**Type depository**: ZIAC (holotype, paratype) (Filippova 2008, *op. cit*. under *H. caucasica*)

**Known stages**: male, female

**Zoogeographic Region**: Oriental

**Ecoregion**: south China-Vietnam subtropical evergreen forests

**Hosts**: Carnivora: Canidae, Mustelidae; Rodentia: Spalacidae (A)

**Human infestation**: no

**Remarks**: Kolonin (2003) states that the supposed illustration of the male of *H. darjeeling* in Tanskul and Inlao (1989) is closer to *H. quadriaculeata* than to *H. darjeeling.* See also *H. darjeeling.*

**References**

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**128 – *H. quinghaiensis*** Teng, 1980 (Acta Zootax. Sin., 5: 144–149. In Chinese)
This name is written as *H. qinghaiensis* in the original description, but Camicas et al. (1998, *op. cit.* under *H. anomaloceraea*) note that the correct Latin spelling is *H. quinghaiensis* and we agree.

**Type depository**: IZAS (Keirans and Robbins 1999, *op. cit*. under *H. demidovae*) as *Haemaphysalis qinghaiensis*.

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Oriental, Palearctic

**Ecoregions**: temperate broadleaf and mixed forests

**Hosts**: Artiodactyla: Bovidae; Perissodactyla: Equidae; Lagomorpha: Leporidae (ANL)

**Human infestation**: yes

**Remarks**: Camicas et al. (1998) state that *H. quinghaiensis* is found exclusively in the Oriental Region; however, most records in Teng and Jiang (1991) are from Palearctic localities. Camicas et al. (1998) regard ungulates as the only significant hosts for this tick species, but Teng and Cui (1984) stress the importance of Leporidae as hosts for *H. quinghaiensis*.

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Teng, K.-F. & Jiang, Z.-J. 1991. Economic insect fauna of China. Fasc. 39, Acari: Ixodidae. Science Press, Beijing, 355 pp. In Chinese.

**129 – *H. ramachandrai*** Dhanda, Hoogstraal & Bhat, 1970 (J. Parasitol., 56: 823–831)

**Type depositories**: VRC (holotype, paratypes), BMNH, IM, HH, USNTC, ZIAC (paratypes) (Keirans and Hillyard 2001, *op. cit.* under *H. aciculifer*; Filippova 2008, *op. cit*. under *H. caucasica*).

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregion**: Upper Gangetic plains moist deciduous forests

**Hosts**: Artiodactyla: Cervidae; Carnivora: Felidae (ANL)
Artiodactyla: Bovidae (A)

**Human infestation**: yes (Dhanda et al. 1970)

**Reference**

Dhanda, V., Hoogstraal, H. & Bhat, H.R. 1970. *Haemaphysalis* (*Kaiseriana*) *ramachandrai* sp.n. (Ixodoidea, Ixodidae), a parasite of man and domestic and wild mammals in northern India and Nepal. J. Parasitol., 56: 823–831.

**130 – *H. ratti*** Kohls, 1948 (J. Parasitol., 34: 154–157)

**Type depositories**: USNTC (holotype, paratypes), AM, BMNH (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Australasian

**Ecoregions**: tropical and subtropical grasslands, savannas and shrublands

**Hosts**: Rodentia: Muridae (ANL)
Dasyuromorphia: Dasyuridae (AL)
Peramelemorphia: Peramelidae; Diprotodontia: Phalangeridae (A)

**Human infestation**: no

**Remarks**: Kolonin (2009) states that "small marsupials" are hosts for all stages of *H. ratti*, but we have been unable to confirm this statement.

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Lorch, D., Fisher, D.O. & Spratt, D.M. 2007. Variation in ectoparasite infestation on the brown antechinus *Antechinus stuartii*, with regard to host, habitat and environmental parameters. Aust. J. Zool., 55: 169–176.

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Roberts, F.H.S. 1970. Australian ticks. CSIRO, Melbourne, 267 pp.

**131 – *H. renschi*** Schulze, 1933 (Arch. Hydrobiol. Suppl., 12, 4: 490–502)

**Type depository**: USNTC (neotype) (Keirans and Clifford, 1984, *op. cit.* under *H. bartelsi*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Australasian, Oriental

**Ecoregions**: Sumatra and Java rain forest; Lesser Sundas deciduous forests

**Hosts**: Artiodactyla: Bovidae, Cervidae; Perissodactyla: Equidae (ANL)
Artiodactyla: Suidae; Carnivora: Canidae (A)
Charadriiformes: Sternidae (N)
Rodentia: Muridae (L)

**Human infestation**: no

**Remarks**: Camicas et al. (1998) maintain that *H. renschi* is a strictly Oriental species, but the records of Durden et al. (2008) for Sulawesi Island indicate that this tick is also present in the Australasian Region. Additionally, Durden et al. (2008) recorded the larva of *H. renschi* from Muridae, but this, as well as the record from Aves in Hoogstraal and Anastos (1968), is ignored in Kolonin (2009).

**References**

Camicas, J.-L., Hervy, J.-P., Adam, F. & Morel, P.-C. 1998. Les tiques du monde (Acarida, Ixodida). Nomenclature, stades décrits, hôtes, répartition. ORSTOM, Paris, 233 pp.

Durden, L.A., Merker, S. & Beati, L. 2008. The tick fauna of Sulawesi, Indonesia (Acari: Ixodoidea: Argasidae and Ixodidae). Exp. Appl. Acarol., 45: 85–110.

Hoogstraal, H. & Anastos, G. 1968. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea: Ixodidae). Redescription of *H.* (*Kaiseriana*) *renschi* Schulze (resurrected), and its hosts and distribution in Indonesia. J. Parasitol., 54: 1214–1222.

Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/

**132 – *H. roubaudi*** Toumanoff, 1940 (Rev. Méd. Fr. Extr.-Orient, 18: 463–490)

**Type depositories**: IPP, USNTC (syntypes) (Hoogstraal et al. 1966, *op. cit.* under *H. hirsuta*)

**Known stages**: male

**Zoogeographic Region**: Oriental

**Ecoregion**: southeastern Indochina dry evergreen forests

**Hosts**: Artiodactyla: Cervidae (A)

**Human infestation**: yes (Kolonin 1995)

**References**

Hoogstraal, H., Trapido, H. & Kohls, G.M. 1966. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea, Ixodidae). Speciation in the *H.* (*Kaiseriana*) *obesa* group: *H. semermis* Neumann, *H. obesa* Larrousse, *H. roubaudi* Toumanoff, *H. montgomeryi* Nuttall, and *H. hirsuta* sp. n. J. Parasitol., 52: 169–191.

Kolonin, G.V. 1995. Review of the ixodid tick fauna (Acari: Ixodidae) of Vietnam. J. Med. Entomol., 32: 276–282.

**133 – *H. rugosa*** Santos Dias, 1956 (Mem. Estud. Mus. Zool. Univ. Coimbra (242), 9 pp.)

**Type depository**: BMNH (holotype) (Hoogstraal, H. & El Kammah, K.M. 1972. Notes on African *Haemaphysalis* ticks. X. *H.* (*Kaiseriana*) *aciculifer* Warburton and *H.* (*K.*) *rugosa* Santos Dias, the African representatives of the *spinigera* subgroup (Ixodoidea: Ixodidae). J. Parasitol., 58: 960–978; Keirans, J.E. 1985. George Henry Falkiner Nuttall and the Nuttall tick catalogue. U. S. Dept. Agric., Agric. Res. Ser. Misc. Pub. (1438), 1785 pp.), as *H. aciculifer rugosa*, originally identified as *H. aciculifer*, as stated in Santos Dias, J.A.T. (1956. Notas ixodológicas. Sobre duas entidades do género *Haemaphysalis* C.L. Koch, 1844. Mem. Estud. Mus. Zool. Univ. Coimbra (242), 9 pp.). Surprisingly, Keirans and Hillyard (2001, *op. cit*. under *H. aciculifer*) do not record the presence of the holotype of *H. rugosa* in BMNH.

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Afrotropical

**Ecoregions**: tropical and subtropical grasslands, savannas and shrublands

**Hosts**: usual hosts for adult ticks are Artiodactyla: Bovidae.
Carnivora: Viverridae (ANL)
Carnivora: Herpestidae (AN)
Artiodactyla: Bovidae (A)
Lagomorpha: Leporidae; Rodentia: Muridae (N)

**Human infestation**: no

**Remarks**: we regard records by Camicas (1978) of *H. rugosa* from Muridae and Leporidae as valid, but Cumming (1998) seemingly does not recognize these. A record of *H. rugosa* from Felidae that was considered questionable by Hoogstraal and El-Kammah (1972) has not been included in the host list above. Cornet (1995) makes a general statement, which we have been unable to confirm, that ungulates and carnivores are specific hosts for all parasitic stages of *H. rugosa*, but he is probably confusing *H. aciculifer* with *H. rugosa.* Cornet (1995), supported by Rousselot (1951), states that Canidae are hosts of *H. rugosa.* However, the latter author lists Canidae as hosts of *H. aciculifer*, not *H. rugosa.* We have been unable to find records of larvae and nymphs of *H. rugosa* from any ungulate host and have excluded them from the list above.

**References**

Camicas, J.-L. 1978. Contribution à l'étude des tiques du Sénégal (Acarida: Ixodida) 2. Description des stades préimaginales d'*Haemaphysalis* (*Kaiseriana*) *rugosa* Santos Dias, 1956. Cah. ORSTOM Sér. Entomol. Méd. Parasitol., 16: 23–28.

Cornet, J.-P. 1995. Contribution à l'étude des tiques (Acarina: Ixodina) de la République Centrafricaine 4. Inventaire et répartition. Acarologia, 36: 203–212.

Cumming, G.S. 1998. Host preference in African ticks (Acari: Ixodida): a quantitative data set. Bull. Entomol. Res., 88: 379–406.

Hoogstraal, H. & El Kammah, K.M. 1972. Notes on African *Haemaphysalis* ticks. X. *H.* (*Kaiseriana*) *aciculifer* Warburton and *H.* (*K.*) *rugosa* Santos Dias, the African representatives of the *spinigera* subgroup (Ixodoidea: Ixodidae). J. Parasitol., 58: 960–978.

Rousselot, R. 1951. *Ixodes* de l'Afrique noire. Bull. Soc. Pathol. Exot., 44: 307–309.

Walker, J.B. 1991. A review of the ixodid ticks (Acari, Ixodidae) occurring in southern Africa. Onderstepoort J. Vet. Res., 58: 81–105.

**134 – *H. rusae*** Kohls, 1950 (Natl. Inst. Health Bull. (192), 28 pp.)

**Type depository**: CNHM (holotype, paratype), USNTC (holotype) (Kohls, 1950, *op. cit.* under *H. hoogstraali*)

**Known stages**: male, female, nymph

**Zoogeographic Regions**: Australasian, Oriental

**Ecoregions**: tropical and subtropical moist broadleaf forests

**Hosts**: usual hosts for adult ticks are Artiodactyla: Cervidae and Suidae.
Artiodactyla: Suidae (AN)
Artiodactyla: Cervidae; Diprotodontia: Macropodidae (A)

**Human infestation**: no

**Remarks**: Hoogstraal and Wassef (1983) state that the presence of this tick species in the Australasian Region is a result of its hosts having entered this region from the Oriental Region. This is highly speculative and we provisionally consider the Australasian Region to be part of the natural range of *H. rusae.*

**Reference**

Hoogstraal, H. & Wassef, H.Y. 1983. *Haemaphysalis* (*Garnhamphysalis*) *rusae* (Ixodoidea: Ixodidae): identity, deer and pig hosts, and distribution in Luzon and Mindanao. J. Parasitol., 69: 215–220.

**135 – *H. sambar*** Hoogstraal, 1971 (J. Parasitol., 57: 173–176)

**Type depository**: BMNH (holotype) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*). The holotype of this species is in the Nuttall Collection, held in the BMNH, and was previously identified as *H. campanulata* (Hoogstraal, H. 1971. *Haemaphysalis* (*H.*) *sambar* sp. n. (Ixodoidea: Ixodidae), a parasite of the sambar deer in southern India. J. Parasitol., 57: 173–196).

**Known stages**: male

**Zoogeographic Region**: Oriental

**Ecoregion**: south western Ghats montane rain forests

**Hosts**: Artiodactyla: Cervidae (A)

**Human infestation**: no

**Remarks**: Mihalca et al. (2011) regard *H. sambar* as an endangered species.

**References**

Hoogstraal, H. 1971. *Haemaphysalis* (*H.*) *sambar* sp. n. (Ixodoidea: Ixodidae), a parasite of the sambar deer in southern India. J. Parasitol., 57: 173–196.
Mihalca, A.D., Gherman, C.M. & Cozma, V. 2011. Coendangered hard-ticks: threatened or threatening? Parasit. Vectors, 4 (71), 7 pp.

**136 – *H. sciuri*** Kohls, 1950 (Natl. Inst. Health Bull. (192), 28 pp.)

**Type depositories**: CNHM (holotype, paratype), USNTC (paratype) (Kohls 1950, *op. cit.* under *H. hoogstraali*)

**Known stages**: male

**Zoogeographic Region**: Oriental

**Ecoregion**: Mindanao-eastern visayas rain forests

**Hosts**: Rodentia: Sciuridae (A)

**Human infestation**: no

**Reference**

Kohls, G.M. 1950. Ticks (Ixodoidea) of the Philippines. Natl. Inst. Health Bull. (192), 28 pp.

**137 – *H. semermis*** Neumann, 1901 (Mém. Soc. Zool. Fr., 14: 249–372)

**Type depository:** MNHN (holotype) (Trapido, 1965, *op. cit.* under *H. lagrangei*)

**Known stages**: male, female, nymph

**Zoogeographic Region**: Oriental

**Ecoregions**: Sumatra and Java rain forests; Lesser Sundas deciduous forests

**Hosts**: Artiodactyla: Tragulidae; Rodentia: Muridae (ANL)
Carnivora: Canidae; Viverridae (AN)
Artiodactyla: Cervidae, Suidae; Carnivora: Felidae, Ursidae; Perissodactyla: Tapiridae (A)
Rodentia: Sciuridae; Scandentia: Tupaiidae (N)

**Human infestation**: yes (Hoogstraal et al. 1972)

**Remarks**: references to *H. semermis* published prior to Hoogstraal et al. (1965) have not been included in our analyses because of diagnostic uncertainties. Camicas et al. (1998) state that only ungulates are hosts of adults of this tick. We, however, believe that Hoogstraal et al. (1965) provide a reliable source of data indicating that hosts other than ungulates are also important for the natural maintenance of adults of *H. semermis*. We have been unable to find a description of the larva of *H. semermis*; nevertheless, we provisionally accept records of this stage in Hoogstraal et al. (1972). Lim (1972) recorded adults of *H. semermis* on Muridae, but Kolonin (2009) seems to have considered this record invalid and did not include Rodentia as hosts for adults. We regard Lim's record as tentatively valid.

**References**

Camicas, J.-L., Hervy, J.-P., Adam, F. & Morel, P.-C. 1998. Les tiques du monde (Acarida, Ixodida). Nomenclature, stades décrits, hôtes, répartition. ORSTOM, Paris, 233 pp.

Hoogstraal, H., Trapido, H. & Kohls, G.M. 1965. Southeast Asian *Haemaphysalis* ticks (Ixodoidea, Ixodidae). *H.* (*Kaiseriana*) *papuana nadchatrami* ssp. n. and redescription of *H.* (*K.*) *semermis* Neumann. J. Parasitol., 51: 433–451.

Hoogstraal, H., Lim, B.L., Nadchatram, M. & Anastos, G. 1972. The Gunong Benom Expedition 1967. 8. Ticks (Ixodidae) of Gunong Benom and their altitudinal distribution, hosts and medical relationships. Bull. Br. Mus. (Nat. Hist.) Zool., 23: 167–186.
Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/
Lim, B.L. 1972. Host-relationship and seasonal abundance of immature ticks (*Haemaphysalis* spp. and *Dermacentor* spp.) in primary and mixed-secondary rainforests in west Malaysia. Southeast Asia J. Trop. Med. Publ. Health, 3: 605–612.

**138 – *H. shimoga*** Trapido & Hoogstraal, 1964 (J. Parasitol., 50: 303–310)
Based on a comparison of descriptive illustrations, Kolonin (2009, *op. cit*. under *H. anomaloceraea*) treats *H. shimoga* as a synonym of *H. taiwana*, but we believe that illustrations provide insufficient grounds for such a decision. Camicas et al. (1998, *op. cit*. under *H. anomaloceraea*) regard *H. anomaloceraea* as a synonym of *H. shimoga*, without justifying this decision apart from a vague statement about "Kolonin, 1997 (*in litt.*)," a reference that we have been unable to find. See *H. anomaloceraea.*

**Type depositories**: USNTC (holotype, paratypes), BMNH, VRC, HH (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*), as *H. cornigera shimoga*

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical dry broadleaf forests

**Hosts**: Rodentia: Muridae (A, N and/or L)
Artiodactyla: Bovidae, Cervidae, Suidae; Rodentia: Sciuridae (A)

**Human infestation**: yes (Tanskul and Inlao 1989)

**Remarks**: the larva and nymph of *H. shimoga* were described from laboratory-reared specimens (Trapido and Hoogstraal 1964). Tanskul and Inlao (1989) use the term "immatures" without specifying which of the immature stages naturally infested Muridae. These records are treated as provisionally valid here. See also *H. cornigera.*

**References**

Phan Trong, C. 1977. Ve bet va con trung ky sinh o Viet Nam. Tap 1. Ve (Ixodoidea), mo ta va phan loai. Ha Noi: Khoa hoc va ky thuat, 489 pp. In Vietnamese.
Rajagopalan, P.K., Patil, A.P. & Boshell, J. 1968. Ixodid ticks on their mammalian hosts in the Kyasanur Forest disease area of Mysore State, India, 1961–1964. Ind. J. Med. Res., 56: 510–526.
Tanskul, P. & Inlao, I. 1989. Keys to the adult ticks of *Haemaphysalis* Koch, 1844, in Thailand with notes on changes in taxonomy (Acari: Ixodoidea: Ixodidae). J. Med. Entomol., 26: 573–601.
Trapido, H. & Hoogstraal, H. 1964. *Haemaphysalis cornigera shimoga* subsp. n. from southern India (Ixodoidea, Ixodidae). J. Parasitol., 50: 303–310.

**139 – *H. silacea*** Robinson, 1912 (Parasitology, 4: 474–484)

**Type depository**: BMNH (lectotype, paralectotypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Afrotropical

**Ecoregions**: tropical and subtropical grasslands, savannas and shrublands

**Hosts**: usual hosts for larvae, nymphs and adults are Artiodactyla: Bovidae.
Artiodactyla: Bovidae; Carnivora: Canidae; Lagomorpha: Leporidae (ANL)
Carnivora: Felidae (AN)
Carnivora: Herpestidae (A, N and/or L)
Macroscelidea: Macroscelididae; Galliformes: Numididae; Ciconiiformes: Threskiornithidae (NL)
Passeriformes: Alaudidae, Corvidae, Pycnonotidae (N)
Carnivora: Hyaenidae; Perissodactyla: Rhinocerotidae; Rodentia: Muridae (L)

**Human infestation**: yes (Horak et al. 2002)

**Remarks**: Theiler (1962) uses the term "immatures" without specifying whether they are larvae, nymphs or both. She also states that adults infest Aves but provides no data to support this observation.

**References**

Cumming, G.S. 1998. Host preference in African ticks (Acari: Ixodida): a quantitative data set. Bull. Entomol. Res., 88: 379–406.

Hoogstraal, H. 1963. Notes on African *Haemaphysalis* ticks. V. Redescription and relationships of *H. silacea* Robinson, 1912, from South Africa (Ixodoidea, Ixodidae). J. Parasitol., 49: 830–837.

Horak, I.G. 2001. Conservation of rare parasites. Proc. Int. Joint. Conf. Vet. Conserv. Biol. Wild Manag. Taronga Zoo, Sydney, Australia, Jul. 1–6, 2001, A. Martin & L. Vogelnest (editors), pp. 45–49.

Horak, I.G. & Knight, M.M. 1986. A comparison of the tick burdens of wild animals in a nature reserve and on an adjacent farm where tick control is practised. J. S. Afr. Vet. Ass., 57: 199–203.

Horak, I.G., Jacot Guillarmod, A., Moolman, L.C. & De Vos, V. 1987. Parasites of domestic and wild animals in South Africa. XXII. Ixodid ticks on domestic dogs and on wild carnivores. Onderstepoort J. Vet. Res., 54: 573–580.

Horak, I.G., Fourie, L.J., Heyne, H., Walker, J.B. & Needham, G.R. 2002. Ixodid ticks feeding on humans in South Africa: with notes on preferred hosts, geographic distribution, seasonal occurrence and transmission of pathogens. Exp. Appl. Acarol., 27: 113–136.

Horak, I.G., Welman, S., Hallam, S.L., Lutermann, H. & Mzilikazi, N. 2011. Ticks of four-toed elephant shrews and Southern African hedgehogs. Onderstepoort J. Vet. Res., 78, doi:10.4102/ojvr.v78i1.243

Knapp, S.E., Krecek, R.C., Horak, I.G. & Penzhorn, B.L. 1997. Helminths and arthropods of black and white rhinoceroses in southern Africa. J. Wildl. Dis., 33: 492–502.
Norval, R.A.I. 1975. Studies on the ecology of *Haemaphysalis silacea* Robinson 1912 (Acarina: Ixodidae). J. Parasitol., 61: 730–736.
Theiler, G. 1962. The Ixodoidea parasites of vertebrates in Africa south of the Sahara (Ethiopian Region). Report to the Director of Veterinary Services, Onderstepoort, South Africa, Project S.9958, 260 pp.

**140 – *H. silvafelis*** Hoogstraal & Trapido, 1963 (J. Parasitol., 49: 346–349)

**Type depositories**: USNTC (holotype, paratypes), ZSI, HH (paratypes) (Hoogstraal, H. & Trapido H. 1963. *Haemaphysalis silvafelis* sp. n., a parasite of the jungle cat in southern India (Ixodoidea: Ixodidae). J. Parasitol., 49: 346–349)

**Known stages**: male, female

**Zoogeographic Region**: Oriental

**Ecoregion**: eastern highlands moist deciduous forests

**Hosts**: usual hosts for adult ticks are Carnivora: Felidae.
Carnivora: Felidae; Lagomorpha: Leporidae (A)
Rodentia: Sciuridae; Cuculiformes: Cuculidae (N)

**Human infestation**: no
**Remarks**: Kolonin (2009) does not include Aves as hosts of *H. silvafelis* or recognize hosts for nymphs of this tick, probably because this stage remains undescribed. However, we regard the records of nymphs of *H. silvafelis* on Cuculidae and Sciuridae in Geevarghese and Dhanda (1995) as provisionally valid.

**References**

Camicas, J.-L., Hervy, J.-P., Adam, F. & Morel, P.-C. 1998. Les tiques du monde (Acarida, Ixodida). Nomenclature, stades décrits, hôtes, répartition. ORSTOM, Paris, 233 pp.
Geevarghese, G. & Dhanda, V. 1995. Ixodid ticks of Maharashtra State, India. Acarologia, 36: 309–313.
Hoogstraal, H. & Trapido H. 1963. *Haemaphysalis silvafelis* sp. n., a parasite of the jungle cat in southern India (Ixodoidea: Ixodidae). J. Parasitol., 49: 346–349.
Kaul, H.N., Dhanda, V. & Mishra, A.C. 1979. A survey of ixodid ticks in Orissa State, India. Ind. J. Anim. Sci., 49: 707–712.
Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/

**141 – *H. simplex*** Neumann, 1897 (Mém. Soc. Zool. Fr., 10: 324–420)

**Type depository**: BMNH (syntypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Afrotropical

**Ecoregion**: Madagascar dry deciduous forests

**Hosts**: usual hosts for larvae, nymphs and adults are Afrosoricida: Tenrecidae. Aves and Primates are considered exceptional hosts for this tick.
Afrosoricida: Tenrecidae (ANL)
Primates: Indriidae (AN)
Rodentia: Muridae; Ciconiiformes: Threskiornithidae (A)
Primates: Cheirogaleidae (N)

**Human infestation**: no

**Remarks**: Camicas et al. (1998) list the larva of *H. simplex* as undescribed, but it had previously been described in Uilenberg et al. (1979). Primates are not included as hosts of *H. simplex* in Kolonin (2009), probably because Uilenberg et al. (1979) considered this type of host "accidental." We see no reason to exclude Primates as hosts of this tick, although such parasitism may be unusual. The records of nymphs of *H. simplex* on Cheirogaleidae are considered provisionally valid by Rodríguez et al. (2012).

**References**

Camicas, J.-L., Hervy, J.-P., Adam, F. & Morel, P.-C. 1998. Les tiques du monde (Acarida, Ixodida). Nomenclature, stades décrits, hôtes, répartition. ORSTOM, Paris, 233 pp.

Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/

Rodríguez, I.A., Rasoazanabary, E. & Godfrey, L.R. 2012. Multiple ectoparasites infest *Microcebus griseorufus* at Beza Mahafaly Special Reserve, Madagascar. Madagascar Cons. Develop., 7: 45–48.

Uilenberg, G., Hoogstraal, H. & Klein, J.-M. 1979. Les tiques (Ixodoidea) de Madagascar et leur rôle vecteur. Arch. Inst. Pasteur Madagascar Num. Spéc., 153 pp.

**142 – *H. simplicima*** Hoogstraal & Wassef, 1979 (*In* Uilenberg, G., Hoogstraal, H. & Klein, J.-M. 1979. Arch. Inst. Pasteur Madagascar Spec. Numb., 153 pp.)

**Type depositories**: USNTC (holotype, paratypes), BMNH, IPT (paratypes) (Keirans and Hillyard 2001, *op. cit.* under *H. aciculifer*)

**Known stages**: male, female, nymph

**Zoogeographic Region**: Afrotropical

**Ecoregion**: Madagascar spiny thickets

**Hosts**: Afrosoricida: Tenrecidae (AN)

**Human infestation**: no

**Remarks**: Durden and Keirans (1996) regard *H. simplicima* as an endangered species.

**References**

Durden, L.A. & Keirans, J.E. 1996. Host-parasite coextinction and the plight of tick conservation. Am. Entomol., 42: 87–91.

Uilenberg, G., Hoogstraal, H. & Klein, J.-M. 1979. Les tiques (Ixodoidea) de Madagascar et leur rôle vecteur. Arch. Inst. Pasteur Madagascar Num. Spéc., 153 pp.

**143 – *H. sinensis*** Zhang, 1981 (Acta Vet. Zoot. Sin., 12: 169–173. In Chinese)
This tick is ignored in Camicas et al. (1998, *op. cit*. under *H. anomaloceraea*), but it has been included in all recent lists of the ticks of the world. Consequently, we see no reason to question its validity.

**Type depository**: IAHVS (syntypes inferred by the English summary of the Chinese article) (Zhang, S.-X. 1981. A new species of *Haemaphysalis* Koch, 1844 – *Haemaphysalis sinensis* sp. nov. Acta Vet. Zoot. Sin., 12: 169–173. In Chinese)

**Known stages**: male, female

**Zoogeographic Region**: Palearctic

**Ecoregions**: montane grasslands and shrublands

**Hosts**: Artiodactyla: Bovidae (A)

**Human infestation**: no

**References**

Chen, Z., Yang, X., Bu, F., Yang, X., Yang, X. & Liu, J. 2010. Ticks (Acari: Ixodoidea: Argasidae, Ixodidae) of China. Exp. Appl. Acarol., 51: 393–404.

Keirans, J.E. & Robbins, R.G. 1999. A world checklist of genera, subgenera, and species of ticks (Acari: Ixodida) published from 1973 – 1997. J. Vector Ecol., 24: 115–129.

Zhang, S.-X. 1981. A new species of *Haemaphysalis* Koch, 1844 – *Haemaphysalis sinensis* sp. nov. Acta Vet. Zoot. Sin., 12: 169–173. In Chinese.

**144 – *H. spinigera*** Neumann, 1897 (Mém. Soc. Zool. Fr., 10: 324–420)

**Type depository**: ENV (holotype) (Trapido 1965, *op. cit*. under *H. lagrangei*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical dry broadleaf forests

**Hosts**: Mammals (several orders) (ANL)
Galliformes: Phasianidae (A?, NL)
Aves (several orders) (NL)

**Human infestation**: yes (Mitchell et al. 1966)

**Remarks**: Rajagopalan (1972) found adults of *H. spinigera* on Phasianidae, but Kolonin (2009) did not include Aves as hosts for adults of this tick, probably because Rajagopalan (1972) stated that adults found on Galliformes were teneral and apparently not feeding on these hosts.

**References**

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Kolonin, G.V. 1995. Review of the ixodid tick fauna (Acari: Ixodidae) of Vietnam. J. Med. Entomol., 32: 276–282.

Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/

Mitchell, R.M. & Dick, J.A. 1978. Ectoparasites from Nepal birds. J. Bombay Nat. Hist. Soc., 74: 264–274.

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Rajagopalan, P.K. 1972. Ixodid ticks (Acarina: Ixodidae) parasitizing wild birds in the Kyasanur Forest disease area of Shimoga District, Mysore State, India. J. Bombay Nat. Hist. Soc., 69: 55–78.

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**145 – *H. spinulosa*** Neumann, 1906 (Arch. Parasitol., 10: 195–219)

**Type depository**: BMNH (syntypes) (Neumann, L.G. 1906. Notes sur les Ixodidés. IV. Arch. Parasitol., 10: 195–219), but Keirans and Hillyard (2001, *op. cit*. under *H. aciculifer*) state that there are no types of *H. spinulosa* in BMNH.

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Afrotropical

**Ecoregions**: tropical and subtropical grasslands, savannas and shrublands; few ticks in tropical and subtropical moist broadleaf forests

**Hosts**: usual hosts for adult ticks are Carnivora (several families).
Mammalia (several orders) (A)

**Human infestation**: no

**Remarks**: Horak et al. (1987) and Fourie et al. (1992) note the difficulties involved in distinguishing larvae and nymphs of *H. spinulosa* from those of *H. elliptica* (at the time identified as *H. leachi*). Consequently, references to these stages of *H. spinulosa* have been omitted, including those of Hussein and Mustafa (1985), who allegedly worked with larvae and nymphs of this species. Cumming (1998) includes Aves as hosts for *H. spinulosa*, but sound records for this tick on birds have not been found. Matthysse and Colbo (1987) state that the type specimen of *H. spinulosa* was collected from Rodentia: Thryonomyidae, but we have been unable to confirm this in Neumann (1906) or any subsequent publication. See also *H. zumpti*.

**References**

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Morel, P.-C. & Rodhain, F. 1972. Contribution à la connaissance des tiques du sud de l'Éthiopie. Bull. Soc. Pathol. Exot., 65: 725–732.

Neumann, L.G. 1906. Notes sur les Ixodidés. IV. Arch. Parasitol., 10: 195–219.

Norval, R.A.I. 1984. The ticks of Zimbabwe. IX. *Haemaphysalis leachi* and *Haemaphysalis spinulosa*. Zimbabwe Vet. J., 15: 9–17.

**146 – *H. subelongata*** Hoogstraal, 1953 (Bull. Mus. Comp. Zool., 111: 37–113)

**Type depositories**: USNTC (holotype, paratypes), BMNH, FMNH, HH, MCZ, OVI, ISM (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Afrotropical

**Ecoregion**: Madagascar lowlands forests

**Hosts**: usual hosts for larvae, nymphs and adults are Afrosoricida-Tenricidae.
Afrosoricida: Tenricidae (ANL)
Rodentia: Muridae (N)
Rodentia: Nesomyidae (L)

**Human infestation**: no

**Remarks**: Durden and Keirans (1996) regard *H. subelongata* as an endangered species.

**References**

Durden, L.A. & Keirans, J.E. 1996. Host-parasite coextinction and the plight of tick conservation. Am. Entomol., 42: 87–91.

Uilenberg, G., Hoogstraal, H. & Klein, J.-M. 1979. Les tiques (Ixodoidea) de Madagascar et leur rôle vecteur. Arch. Inst. Pasteur Madagascar Num. Spéc., 153 pp.

**147 – *H. subterra*** Hoogstraal, El Kammah & Camicas, 1992 (Int. J. Acarol., 18: 213–220)

**Type depositories**: USNTC (holotype, paratypes), HH, ORSTOM (paratypes) (Hoogstraal, H., El Kammah, K.M. & Camicas, J.-L. 1992. Notes on African *Haemaphysalis* ticks: XVI. *H. (Rhipistoma) subterra* sp. n., a new member of the *leachi* group (Ixodoidea: Ixodidae). Int. J. Acarol., 18: 213–220)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Afrotropical

**Ecoregions**: tropical and subtropical grasslands, savannas and shrublands

**Hosts**: usual hosts for adult ticks are Carnivora: Herpestidae.
Rodentia: Spalacidae (ANL)
Carnivora: Herpestidae (AN)
Artiodactyla: Viverridae; Rodentia: Muridae (A)

**Human infestation**: no

**Remarks**: Hoogstraal et al. (1992) do not explicitly identify some hosts of the larvae of *H. subterra*. In the abstract of their paper, they state that "immatures" are found mainly on Rodentia (Muridae and Spalacidae), but in "material examined" there is no clear reference to larvae or nymphs of *H. subterra* feeding on Muridae. We thus provisionally exclude Muridae as hosts for the sub-adult stages of this tick.

**Reference**

Hoogstraal, H., El Kammah, K.M. & Camicas, J.-L. 1992. Notes on African *Haemaphysalis* ticks: XVI. *H. (Rhipistoma) subterra* sp. n., a new member of the *leachi* group (Ixodoidea: Ixodidae). Int. J. Acarol., 18: 213–220.

**148 – *H. sulcata*** Canestrini & Fanzago, 1878 (Atti R. Ist. Veneto Sci. Lett. Arti (1877–1878), Ser. 5, 4: 69–208)
See the initial section of this chapter for the synonymy of *H. cholodkovskyi* and *H. cretica* with *H. sulcata*.

**Type depositories**: undetermined

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Afrotropical, Oriental, Palearctic

**Ecoregions**: several ecoregions in the Afrotropical, Oriental and Palearctic Zoogeographic Regions

**Hosts**: usual hosts for adult ticks are Artiodactyla: Bovidae, while Testudines are considered exceptional hosts for adults and Chiroptera for larvae of this tick.
Testudines: Testudinidae (ANL)
Artiodactyla: Bovidae; Carnivora: Canidae (AN)
Several orders (Mammalia) (A)
Aves (several orders); Squamata (several families); Carnivora: Mustelidae; Lagomorpha: Ochotonidae; Rodentia: Cricetidae, Muridae (NL)
Chiroptera: Vespertilionidae; Rodentia: Calomyscidae, Dipodidae, Sciuridae (L)

**Human infestation**: yes (Bursali et al. 2012)

**Remarks**: Camicas et al. (1998) state that *H. sulcata* is found in the Oriental and Palearctic Regions, but Al-Khalifa et al. (2006) present sound records for the Afrotropical Region. Yeruham et al. (1996) refer to this tick as *H. cretica*.

**References**

Al-Khalifa, M.S., Diab, F.M., Al-Asgah, N.A., Hussein, H.S. & Khalil, G.M. 2006. Ticks (Acari: Argasidae, Ixodidae) recorded on wild animals in Saudi Arabia. Fauna Arabia, 22: 225–231.

Bursali, A., Keskin, A. & Tekin, S. 2012. A review of the ticks (Acari: Ixodida) of Turkey: species diversity, hosts and geographical distribution. Exp. Appl. Acarol., 57: 91–104.

Camicas, J.-L., Hervy, J.-P., Adam, F. & Morel, P.-C. 1998. Les tiques du monde (Acarida, Ixodida). Nomenclature, stades décrits, hôtes, répartition. ORSTOM, Paris, 233 pp.

Chen, Z., Yang, X., Bu, F., Yang, X., Yang, X. & Liu, J. 2010. Ticks (Acari: Ixodoidea: Argasidae, Ixodidae) of China. Exp. Appl. Acarol., 51: 393–404.

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Hoogstraal, H. & Kim, K.C. 1985. Tick and mammal coevolution, with emphasis on *Haemaphysalis. In* K.C. Kim (editor), Coevolution of parasitic arthropods and mammals. John Wiley & Sons, New York, pp. 505–568.

Keskin, A., Bursali, A., Kumlutas, Y., Ilgaz, C. & Tekin, S. 2013. The parasitism of immature stages of the *Haemaphysalis sulcata* (Acari: Ixodidae) on some reptiles in Turkey. J. Parasitol., in press.

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Široký, P., Petrželková, K.J., Kamler, D., Mihalca, A.D. & Modrý, D. 2006. *Hyalomma aegyptium* as dominant tick in tortoises of the genus *Testudo* in Balkan countries, with notes on its host preferences. Exp. Appl. Acarol., 40: 279–290.

Yeruham, I., Hadani, A., Galker, F. & Rosen, S. 1996. The seasonal occurrence of ticks (Acari: Ixodidae) on sheep and in the field in the Judean area of Israel. Exp. Appl. Acarol., 20: 47–56.

**149 – *H. sumatraensis*** Hoogstraal, El Kammah, Kadarsan & Anastos, 1971 (J. Parasitol., 57: 1104–1109)

**Type depositories**: MZB (holotype, paratypes), USNTC, BMNH, HH (paratypes) (Hoogstraal, H., El Kammah, K.M., Kadarsan, S. & Anastos, G. 1971. *Haemaphysalis* (*H.*) *sumatraensis* sp. n. (Ixodoidea: Ixodidae), a tick parasitizing the tiger, boar and sambar deer in Indonesia. J. Parasitol., 57: 1104–1109), but Keirans and Hillyard (2001, *op. cit*. under *H. aciculifer*) state that there are no types of *H. sumatraensis* in BMNH.

**Known stages**: male, female, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: Sumatra and western Java rain forests

**Hosts**: Artiodactyla: Cervidae, Suidae; Carnivora: Canidae, Felidae (A)
Carnivora: Viverridae (N and/or L)

**Human infestation**: no

**Remarks**: Camicas et al. (1998) list the larva of *H. sumatraensis* as undescribed, but it was described by Kadarsan (1971). Hoogstraal and Kim (1985) use the term "immatures" without specifying whether they mean larvae, nymphs or both stages. The nymph of *H. sumatraensis* has not been described, but we consider the records of undetermined sub-adult stages in Hoogstraal and Kim (1985) provisionally valid.

**References**

Camicas, J.-L., Hervy, J.-P., Adam, F. & Morel, P.-C. 1998. Les tiques du monde (Acarida, Ixodida). Nomenclature, stades décrits, hôtes, répartition. ORSTOM, Paris, 233 pp.

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Kadarsan, S. 1971. Larval ixodid ticks of Indonesia (Acarina: Ixodidae). Ph.D. Dissertation, University of Maryland, 182 pp.

**150 – *H. sundrai*** Sharif, 1928 (Rec. Ind. Mus., 30: 217–344)

Ghosh, S., Bansal, G.C., Gupta, S.C., Ray, D., Khan, M.Q., Irshad, H., Shahiduzzaman, Md., Seitzer, U. & Ahmed, J.S. (2007. Status of tick distribution in Bangladesh, India and Pakistan. Parasitol. Res., 101 (Suppl. 2): 207–216) and Barker and Murrell (2008, *op. cit*. under *H. colasbelcouri*) treat *Haemaphysalis himalaya* Hoogstraal, 1966 and *H. sundrai* as valid species, but, as discussed in Guglielmone et al. (2009, *op. cit*. under *H. colasbelcouri*), the former is a synonym of the latter.

**Type depository**: USNTC (lectotype) (Keirans and Clifford 1984, *op. cit*. under *H. bartelsi*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical moist broadleaf forests

**Hosts**: Artiodactyla: Bovidae, Cervidae (ANL)

**Human infestation**: no

**Remarks**: Hoogstraal and El Kammah (1970) refer to this species as *H. himalaya*.

**Reference**

Hoogstraal, H. & El Kammah, K.M. 1970. *Haemaphysalis (Herpetobia) himalaya* Hoogstraal (Ixodoidea: Ixodidae), description of immature stages, hosts, and distribution. J. Parasitol., 56: 1023–1027.

**151 – *H. suntzovi*** Kolonin, 1993 (J. Med. Entomol., 30: 996–968)

**Type depositories**: ZIAC (holotype, paratypes), BMNH, MCZ, USNTC (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female

**Zoogeographic Region**: Oriental

**Ecoregion**: northern Indochina subtropical forests

**Hosts**: Artiodactyla: Suidae; Rodentia: Hystricidae (A)

**Human infestation**: no

**Reference**

Kolonin, G.V. 1995. Review of the ixodid tick fauna (Acari: Ixodidae) of Vietnam. J. Med. Entomol., 32: 276–282.

**152 – *H. susphilippensis*** Hoogstraal, Kohls & Parrish, 1968 (J. Parasitol., 54: 616–621)

**Type depositories**: USNTC (holotype, paratypes), BMNH, FMNH, HH, BM (paratypes). (Hoogstraal, H., Kohls, G.M. & Parrish, D.W. 1968. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea, Ixodidae). *H. (Kaiseriana) susphilippensis* sp. n., a parasite of Luzon and Mindanao boars. J. Parasitol., 54: 616–621). Keirans and Hillyard (2001, *op. cit*. under *H. aciculifer)* report that there are no types of this species in BMNH.

**Known stages**: male, female

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical moist broadleaf forests

**Hosts**: usual hosts for adult ticks are Artiodactyla: Suidae.
Artiodactyla: Cervidae, Suidae (A)

**Human infestation**: no

**Reference**

Hoogstraal, H., Kohls, G.M. & Parrish, D.W. 1968. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea, Ixodidae). *H. (Kaiseriana) susphilippensis* sp. n., a parasite of Luzon and Mindanao boars. J. Parasitol., 54: 616–621.

**153 – *H. taiwana*** Sugimoto, 1936 (J. Soc. Trop. Agric. Taiwan, 8: 336–346. In Japanese)
Considerable confusion exists concerning this name. Teng, K.-F. & Jiang, Z.-J. (1991. Economic insect fauna of China. Fasc. 39, Acari: Ixodidae. Science Press, Beijing, 355 pp. In Chinese) regard *H. taiwana* as a synonym of *H. cornigera*, but Chen, Z., Yang, X., Bu, F., Yang, X., Yang, X. & Liu, J. (2010. Ticks (Acari: Ixodoidea: Argasidae, Ixodidae) of China. Exp. Appl. Acarol., 51: 393–404) list *H. taiwana* as present in China. Kolonin (2009, *op. cit*. under *H. anomaloceraea*) reduces *H. shimoga* to a synonym of *H. taiwana*. We consider *H. taiwana* a valid name, as discussed in Guglielmone et al. (2010, *op. cit*. under *H. anomaloceraea*), but it is obvious that a comparative study of these taxa is needed in order to solve this problem. See also *H. anomaloceraea* and *H. shimoga*.

**Type depository**: undetermined, as *Haemaphysalis cornigera taiwana*

**Known stages**: male, female

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical dry broadleaf forests

**Hosts**: Artiodactyla: Bovidae (A)

**Human infestation**: no

**Remarks**: Camicas et al. (1998) list the larva and nymph of *H. taiwana* as described, but we have been unable to find descriptions of either stage. Kolonin (2009) extends the host range of *H. taiwana* to include Cervidae and "small mammals," probably because he includes hosts of *H. shimoga* among the hosts of *H. taiwana*. There are records of *H. cornigera taiwana* in the Chinese tick literature (*i.e.,* Guo et al. 2000) that were not included in our analysis. See above.

**References**

Camicas, J.-L., Hervy, J.-P., Adam, F. & Morel, P.-C. 1998. Les tiques du monde (Acarida, Ixodida). Nomenclature, stades décrits, hôtes, répartition. ORSTOM, Paris, 233 pp.

Guo, Y., Wan, K., Xu, S. et al. [sic] 2000. The discovery and study on the natural focus of Lyme disease in eastern Guandong Province. Chin. J. Zoon., 16: 42–45. In Chinese.

Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/

Luh, P.-L. & Woo, W.-C. 1950. A list of Chinese ticks. Chin. J. Entomol., 1: 195–222. In Chinese, NAMRU-3 translation 19.

**154 – *H. tauffliebi*** Morel, 1965 (Acarologia, 7: 281–285)

**Type depository**: not stated (Morel, P.-C. 1965. Description de *Haemaphysalis tauffliebi* n. sp. d'Afrique Central (Acariens, Ixodoidea). Acarologia, 7: 281–285)

**Known stages**: male, female

**Zoogeographic Region**: Afrotropical

**Ecoregions**: tropical and subtropical grasslands, savannas and shrublands

**Hosts**: Rodentia: Hystricidae (ANL)
Passeriformes: Motacillidae (AN)
Rodentia: Muridae; Carnivora: Felidae (N)

**Human infestation**: no

**Remarks**: Hoogstraal and Wassef (1973) state that the larva and nymph of *H. tauffliebi* are known, but we have been unable to find any description of them. Consequently, we regard records of larvae and nymphs on the hosts above as only provisionally valid. Cumming (1998) recognizes only Rodentia as hosts for this tick, but there are records in Morel and Rodhain (1972) from other orders of mammals,

and Hoogstraal and Wassef (1973) and Hoogstraal and Kim (1985) list Aves as hosts for *H. taufflebi*. Kolonin (2009) does not recognize Felidae, as reported by Morel and Rodhain (1972), or Aves as hosts.

**References**

Cumming, G.S. 1998. Host preference in African ticks (Acari: Ixodida): a quantitative data set. Bull. Entomol. Res., 88: 379–406.

Hoogstraal, H. & Kim, K.C. 1985. Tick and mammal coevolution, with emphasis on *Haemaphysalis*. *In* K.C. Kim (editor), Coevolution of parasitic arthropods and mammals. John Wiley & Sons, New York, pp. 505–568.

Hoogstraal, H. & Wassef, H.Y. 1973. The *Haemaphysalis* ticks (Ixodoidea: Ixodidae) of birds. 3.*H.* (*Ornithophysalis*) subgen. n.: definition, species, hosts and distribution in the Oriental, Palearctic, Malagasy, and Ethiopian Faunal Regions. J. Parasitol., 59: 1099–1117.

Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/

Morel, P.-C. & Rodhain, F. 1972. Contribution à la connaissance des tiques du sud de l'Éthiopie. Bull. Soc. Pathol. Exot., 65: 725–732.

Walker, J.B. 1991. A review of the ixodid ticks (Acari, Ixodidae) occurring in southern Africa. Onderstepoort J. Vet. Res., 58: 81–105.

**155 – *H. theilerae*** Hoogstraal, 1953 (Bull. Mus. Comp. Zool., 111: 37–113)

**Type depositories**: USNTC (holotype, paratypes), BMNH, FMNH, MCZ, MNHN, OVI (paratypes) (Hoogstraal, H. 1953. Ticks (Ixodoidea) of the Malagasy Faunal Region (excepting the Seychelles). Their origins and host-relationships; with descriptions of five new *Haemaphysalis* species. Bull. Mus. Comp. Zool., 111: 37–113), but Keirans and Hillyard (2001, *op. cit*. under *H. aciculifer*) state that there are no type specimens of *H. theilerae* in BMNH.

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Afrotropical

**Ecoregion**: Madagascar lowland forests

**Hosts**: Afrosoricida: Tenrecidae (ANL)

**Human infestation**: no

**Remarks**: Durden and Keirans (1996) regard *H. theilerae* as an endangered species.

**References**

Durden, L.A. & Keirans, J.E. 1996. Host-parasite coextinction and the plight of tick conservation. Am. Entomol., 42: 87–91.

Uilenberg, G., Hoogstraal, H. & Klein, J.-M. 1979. Les tiques (Ixodoidea) de Madagascar et leur rôle vecteur. Arch. Inst. Pasteur Madagascar Num. Spéc., 153 pp.

**156 – *H. tibetensis*** Hoogstraal, 1965 (J. Parasitol., 51: 452–459)

**Type depositories**: BMNH (holotype, paratypes), USNTC (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph

**Zoogeographic Region**: Palearctic

**Ecoregions**: montane grasslands and shrublands

**Hosts**: Carnivora: Canidae (AN)
Artiodactyla: Bovidae (A)

**Human infestation**: no

**Remarks**: Kolonin (2009) states that the immature stages of *H. tibetensis* have not been described, but the nymph had earlier been described by Hoogstraal (1965). Camicas et al. (1998) list only ungulates as hosts for adults of this tick, but this in error because the original description of *H. tibetensis* includes several specimens collected from Canidae.

**References**

Camicas, J.-L., Hervy, J.-P., Adam, F. & Morel, P.-C. 1998. Les tiques du monde (Acarida, Ixodida). Nomenclature, stades décrits, hôtes, répartition. ORSTOM, Paris, 233 pp.

Chen, Z., Yang, X., Bu, F., Yang, X., Yang, X. & Liu, J. 2010. Ticks (Acari: Ixodoidea: Argasidae, Ixodidae) of China. Exp. Appl. Acarol., 51: 393–404.

Hoogstraal, H. 1965. *Haemaphysalis tibetensis* sp. n., and its significance in elucidating phylogenetic patterns in the genus (Ixodoidea, Ixodidae). J. Parasitol., 51: 452–459.

Kolonin, G.V. 2009. Fauna of ixodid ticks of the world. http://www.kolonin.org/

Teng, K.-F. 1982. Acarina: Ixodidae. *In* Insects of Xizang (Tibet) Volume II, Institute of Zoology, Academia Sinica, pp. 449–461. In Chinese, translation by Robbins, F.-M.Y.

**157 – *H. tiptoni*** Hoogstraal, 1953 (Bull. Mus. Comp. Zool., 111: 37–113)

**Type depositories**: USNTC (holotype, paratypes), BMNH, FMNH, HH, MCZ, OVI, MNHN, ISM (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female

**Zoogeographic Region**: Afrotropical

**Ecoregion**: Madagascar lowland forests

**Hosts**: Afrosoricida: Tenrecidae (A)

**Human infestation**: no

**Remarks**: Durden and Keirans (1996) regard *H. tiptoni* as an endangered species.

**References**

Durden, L.A. & Keirans, J.E. 1996. Host-parasite coextinction and the plight of tick conservation. Am. Entomol., 42: 87–91.

Uilenberg, G., Hoogstraal, H. & Klein, J.-M. 1979. Les tiques (Ixodoidea) de Madagascar et leur rôle vecteur. Arch. Inst. Pasteur Madagascar Num. Spéc., 153 pp.

**158 – *H. toxopei*** Warburton, 1927 (Parasitology, 19: 405–410)
Kolonin (2009, *op. cit*. under *H. anomaloceraea*) excludes *H. toxopei* from his list of ixodids of the world, giving no reason for doing so. Perhaps he followed Anastos (1950, *op. cit*. under *H. hylobatis*), who regards *H. toxopei* as a synonym of *H. kinneari* based on Warburton, C. (1927. On five new species of ticks (Arachnida Ixodoidea), *Ornithodorus* [sic] *nattereri, Ixodes theodori, Haemaphysalis toxopei, Amblyomma robinsoni* and *A. dammermani*, with a note on the ornate nymph of *A. latum*. Parasitology, 19: 405–410). However, Warburton's statement is treated as a *lapsus* in Trapido, H., Hoogstraal, H. & Varma, M.G.R. (1964. Status and descriptions of *Haemaphysalis p. papuana* Thorell (n. comb.) and of *H. papuana kinneari* Warburton (n. comb.) (Ixodidae) of southern Asia and New Guinea. J. Parasitol., 50: 172–188). *Haemaphysalis toxopei* is a valid species.

**Type depository**: BMNH (lectotype, paralectotypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female

**Zoogeographic Regions**: Australasian, Oriental

**Ecoregions**: tropical and subtropical moist broadleaf forests

**Hosts**: Chiroptera: Pteropodidae (AN)
Carnivora: Canidae (A)

**Human infestation**: no

**Remarks**: although the nymphal stage of *H. toxopei* has not been described, we regard a single collection from Chiroptera in Durden et al. (2008) as provisionally valid. Hoogstraal (1964) refers to this tick as *H. papuana toxopei*.

**References**

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Hoogstraal, H. 1964. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea, Ixodidae). Redescription, hosts, and distribution of *H. traguli* Oudemans. The larva and nymph of *H. vidua* W. and N. Identity of *H. papuana toxopei* Warburton (n. comb.). J. Parasitol., 50: 765–782.

**159** – ***H. traguli*** Oudemans, 1928 (Entomol. Ber., 7 (164): 374–383)

**Type depository**: LMNH (syntypes) (Hoogstraal, H. 1964. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea, Ixodidae). Redescription, hosts, and distribution of *H. traguli* Oudemans. The larva and nymph of *H. vidua* W. and N. Identity of *H. papuana toxopei* Warburton. J. Parasitol., 50: 765–782)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical moist broadleaf forests; few ticks in tropical and subtropical dry broadleaf forests

**Hosts**: usual hosts for larvae, nymphs and adults are Artiodactyla: Tragulidae.
Artiodactyla: Tragulidae (ANL)
Artiodactyla: Suidae; Rodentia: Muridae (A)

**Human infestation**: no

**Remarks**: Nadchatram et al. (1966) regard diagnoses of nymphs of *H. traguli* from Scandentia as tentative, and these hosts have therefore not been included in our list. These authors also erroneously refer to *H. traguli* as *H. atheruri* on page 133 of their paper. Kolonin (2009) excludes Suidae from his list of hosts for this tick, but we regard the record from this type of host in Keirans (1985) as valid.

**References**

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Nadchatram, M., Domrow, R. & Ng, C.K. 1966. Parasitic Acarina of the mammals. Bull. Nat. Mus. State Singapore (34): 129–140.

**160 – *H. traubi*** Kohls, 1955 (J. Parasitol., 41: 312–315)

**Type depositories**: USNTC (holotype, paratype), BMNH (paratype) (Keirans and Hillyard, 2001, *op. cit*. under *H. aciculifer*).

**Known stages**: male, female

**Zoogeographic Region**: Oriental

**Ecoregion**: Borneo rain forests

**Hosts**: Artiodactyla: Cervidae, Suidae (A)

**Human infestation**: no

**Reference**

Hoogstraal, H. & El Kammah, K.M. 1971. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea: Ixodidae). *H.* (*H.*) *traubi* Kohls, redescription of male, description of female, and new artiodactyl host and Malayan distribution records. J. Parasitol., 57: 426–431.

**161 – *H. turturis*** Nuttall & Warburton, 1915 (Ticks. A monograph of the Ixodoidea. Part III. The genus *Haemaphysalis*. Cambridge University Press, London, pp. 349–550)

**Type depository**: ZMB (holotype) (Moritz and Fischer 1981, *op. cit*. under *H. cinnabarina*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical dry broadleaf forests

**Hosts**: Aves are considered exceptional hosts for adults of this tick.
Mammalia (several orders); Cuculiformes: Cuculidae; Galliformes: Phasianidae; Passeriformes: Turdidae (ANL)
Columbiformes: Columbidae (A)
Passeriformes (several families); Piciformes: Picidae (NL)
Psittaciformes: Psittacidae (N)

**Human infestation**: yes (Prakasan and Ramani 2003)

**Remarks**: Camicas et al. (1998) unaccountably do not specify any hosts for the larvae and nymphs of *H. turturis*. Kolonin (2009) ignores Aves as hosts for adult *H. turturis*, but there is evidence for this host-parasite relationship in Trapido et al. (1963), who redescribed the holotype collected from Columbidae, and in Rajagopalan (1972), who found small numbers of adult *H. turturis* on Aves.

**References**

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Rajagopalan, P.K., Patil, A.P. & Boshell, J. 1968. Ixodid ticks on their mammalian hosts in the Kyasanur Forest disease area of Mysore State, India, 1961–1964. Ind. J. Med. Res., 56: 510–526.
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Trapido, H., Goverdhan, M.K., Rajagopalan, P.K. & Rebello, M.J. 1964. Ticks ectoparasitic on monkeys in the Kyasanur Forest disease area of Shimoga District, Mysore State, India. Am. J. Trop. Med. Hyg., 13: 763–772.

**162 – *H. verticalis*** Itagaki, Noda & Yamaguchi, 1944 (*In* Ticks parasitic on domestic animals of Asia. Japanese Horse-Racing Association, Tokyo, 97 pp. In Japanese)

**Type depository**: NSM (syntypes, but apparently lost) (Emel'yanova, N.D. & Hoogstraal, H. 1973. *Haemaphysalis verticalis* Itagaki, Noda, and Yamaguchi: rediscovery in China, adult and immature identity, rodent hosts, distribution, and medical relationships (Ixodoidea: Ixodidae). J. Parasitol., 59: 724–733)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Palearctic

**Ecoregions**: temperate grasslands, savannas and shrublands

**Hosts**: usual hosts for larvae, nymphs and adults are Rodentia: Sciuridae. Aves are considered exceptional hosts for this tick.
Rodentia: Sciuridae, Muridae (ANL)
Mammalia (several orders); Passeriformes: Passeridae (A)

**Human infestation**: no

**Remarks**: the information obtained on host relationships in Teng and Jiang (1991) and Ma (1996) is inferred, and because of our inability to fully understand what stages were found on particular hosts, we have limited ourselves to adult ticks. Kolonin (2009) excludes Aves as hosts for *H. verticalis*, but we consider a record in Teng and Jiang (1991) from Passeriformes as provisionally valid.

**References**

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Zhuo, H.-M. & Su, J.-Y. 2003. Study of Lyme disease in Xilinguole District of Inner Mongolia. Chin. J. Vet. Med., 39: 6–7. In Chinese.

**163 – *H. vidua*** Warburton & Nuttall, 1909 (Parasitology, 2: 57–76)

**Type depository**: BMNH (holotype) (Keirans and Hillyard, 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Oriental

**Ecoregions**: tropical and subtropical moist broadleaf forests

**Hosts**: Carnivora: Viverridae (ANL)

**Human infestation**: no

**Reference**

Hoogstraal, H. 1964. Studies on Southeast Asian *Haemaphysalis* ticks (Ixodoidea, Ixodidae). Redescription, hosts, and distribution of *H. traguli* Oudemans. The larva and nymph of *H. vidua* W. and N. Identity of *H. papuana toxopei* Warburton (n. comb.). J. Parasitol., 50: 765–782.

**164 – *H. warburtoni*** Nuttall, 1912 (Parasitology, 5: 50–60)

**Type depository**: BMNH (lectotype, paralectotypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Oriental, Palearctic

**Ecoregion**: lower Gangetic Plains moist deciduous forests

**Hosts**: Artiodactyla: Bovidae (ANL)
Rodentia: Muridae; Galliformes: Phasianidae (NL)

**Human infestation**: no

**Remarks**: papers on *H. warburtoni* adults published prior to Hoogstraal (1966) and those on larvae and nymphs published prior to Hoogstraal (1971) have not been

considered in our analyses because of diagnostic uncertainties. Mitchell (1979) listed all the hosts of Nepalese ticks collected from 1966 to 1970, including those of *H. warburtoni* (no developmental stage provided), which was allegedly found on Cricetidae. This host is not included in Hoogstraal (1971) and it has been excluded from our list for *H. warburtoni*. There is also a record of *H. warburtoni* feeding on a human in Kirghizia (Sartbaev 1955), but according to the range statement in Hoogstraal (1966), the species was probably *H. pospelovashtromae*. Pending resolution of this matter, we have excluded humans from our list of hosts of *H. warburtoni* and *H. pospelovashtromae*.

**References**

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**165 – *H. wellingtoni*** Nuttall & Warburton, 1908 (Proc. Cambr. Philos. Soc., 14: 392–416)

**Type depository**: BMNH (lectotype, paralectotypes) (Keirans and Hillyard, 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Australasian, Oriental

**Ecoregions**: tropical and subtropical moist broadleaf forests; few ticks in tropical and subtropical dry broadleaf forests

**Hosts**: usual hosts for larvae, nymphs and adults are Galliformes: Phasianidae. Mammalia (several orders); Aves (several orders) (ANL)

**Human infestation**: yes (Durden et al. 2008)

**Remarks**: Yamaguti et al. (1971) and Miyamoto et al. (1993) provide *bona fide* records of *H. wellingtoni* for the Palearctic Region, but the ticks had been found on migratory birds and this species is probably not established there. Joyce (1965) reports its introduction into remote Pacific islands, where it has also failed to become established.

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**166 – *H. yeni*** Toumanoff, 1944 (*In* Les tiques (Ixodoidea) de l'Indochine. Instituts Pasteur de l'Indochine, S.I.L.I., Saigon, 220 pp.)

**Type depository**: IPP (lectotype) (Hoogstraal, H. & Trapido, H. 1966. Redescription of the type materials of *Haemaphysalis (Kaiseriana) bispinosa* Neumann (India), *H. (K.) neumanni* Dönitz (Japan), *H. (K.) lagrangei* Larrousse (Vietnam), and *H. (K.) yeni* Toumanoff (Vietnam) (Ixodoidea: Ixodidae). J. Parasitol., 52: 1188–1198)

**Known stages**: male, female, nymph, larva

**Zoogeographic Regions**: Oriental, Palearctic

**Ecoregions**: tropical and subtropical dry broadleaf forests

**Hosts**: usual hosts for adult ticks are Artiodactyla: Cervidae.
Artiodactyla: Cervidae; Lagomorpha: Leporidae (ANL)
Carnivora: Canidae (AN)
Carnivora: Felidae, Viverridae (A, N and/or L)
Artiodactyla: Bovidae (A)

**Human infestation**: no

**Remarks**: Camicas et al. (1998) state that this tick is found exclusively in the Oriental Zoogeographic Region, but there are now also *bona fide* records of *H. yeni* for the Palearctic Region in Inokuma et al. (2002), among others. Kolonin (2009) mentions immature stages feeding on several hosts without specifying whether larvae, nymphs or both stages of *H. yeni* were found on Viverridae. He also ignores Leporidae as hosts for this tick, but we accept records from this type of host in Xu and Luo (1998).

**References**

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Xu, R. & Luo, G. 1998. Ticks parasitic on *Muntiacus reevesi* and *Lepus sinensis* in Wuyi Mountains, Fujian, China. Syst. Appl. Acarol., 3: 197.

**167 – *H. zumpti*** Hoogstraal & El Kammah, 1974 (J. Parasitol., 60: 188–197)

**Type depositories**: USNTC (holotype, paratypes), BMNH, FMNH, HH, OVI, SAIMR, CM (paratypes) (Keirans and Hillyard 2001, *op. cit*. under *H. aciculifer*)

**Known stages**: male, female, nymph, larva

**Zoogeographic Region**: Afrotropical

**Ecoregion**: southern Africa bushveld

**Hosts**: Carnivora: Herpestidae, Hyaenidae; Rodentia: Sciuridae (ANL)
Carnivora: Viverridae (AN)
Carnivora (several orders) (A)

**Human infestation**: no

**Remarks**: Cumming (1998) states that Carnivora are the only hosts for *H. zumpti*, but this species has also been collected from Sciuridae (Hoogstraal and El Kammah 1974). Walker (1991) stresses the difficulties involved in separating larvae and nymphs of *H. zumpti* from those of *H. leachi* and *H. spinulosa*. However, we accept the records in Hoogstraal and El Kammah (1974) and Horak et al. (2000) of larval and nymphal *H. zumpti* on the hosts listed above.

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## Synopsis of the Genus *Haemaphysalis*

A synopsis of the genus *Haemaphysalis* is presented in Tables 1 and 2. The Oriental Region contains the greatest number of species occurring exclusively in a single zoogeographic region (64, or 38 % of the total), while the Neotropical and Nearctic Regions contain the least number of species confined to a single region, namely *H. cinnabarina* (known from two specimens collected almost 170 years ago) and *H. chordeilis*, respectively. Six species are widely distributed. Four of these species – *H. cornigera, H. doenitzi, H. hystricis* and *H. longicornis* – occur in the Australasian, Oriental and Palearctic Zoogeographic Regions, while two species – *H. indica* and *H. sulcata* – occur in the Afrotropical, Oriental and Palearctic Regions. As a genus, haemaphysalids are confined to 12 combinations of zoogeographic regions.

**Table 1** Numbers and percentages of all species of *Haemaphysalis*, by zoogeographic region(s), number known to feed on humans (% of the total number of species in a particular region) and number of species for which all stages (larva, nymph, male and/or female) are known (% of the total number of species in a particular region)

| Regions | No. of species | % | No. of species on humans | No. of species of which all stages are known |
|---|---|---|---|---|
| Oriental | 64 | 38.3 | 20 (31.2) | 30 (46.9) |
| Afrotropical | 38 | 22.8 | 5 (13.2) | 19 (50.0) |
| Oriental-Palearctic | 19 | 11.4 | 9 (47.4) | 17 (89.5) |
| Palearctic | 19 | 11.4 | 7 (36.8) | 14 (73.7) |
| Australasian | 8 | 4.8 | 3 (37.5) | 3 (37.5) |
| Australasian-Oriental | 7 | 4.2 | 3 (42.9) | 4 (57.1) |
| Australasian-Oriental-Palearctic | 4 | 2.4 | 4 (100) | 4 (100) |
| Nearctic-Neotropical | 2 | 1.2 | 2 (100) | 2 (100) |
| Afrotropical-Oriental-Palearctic | 2 | 1.2 | 1 (50.0) | 2 (100) |
| Afrotropical-Palearctic | 1 | 0.6 | 1 (100) | 1 (100) |
| Nearctic | 1 | 0.6 | 1 (100) | 1 (100) |
| Neotropical | 1 | 0.6 | 0 | 0 |
| Undetermined | 1 | 0.6 | 0 | 1 (100) |
| **Total** | **167** | | **56 (33.5)** | **98 (58.7)** |

**Table 2** Number and percentages of the 85 species of *Haemaphysalis* whose adult (female and/or male), larval and nymphal stages as well as natural hosts are known, including or excluding exceptional hosts

| Hosts | No. of species | % | No. of species | % |
|---|---|---|---|---|
| | Including exceptional hosts | | Excluding exceptional hosts | |
| Aves + Mammalia | 45 | 52.9 | 34 | 40.0 |
| Mammalia | 29 | 34.1 | 41 | 48.2 |
| Aves + Mammalia + Squamata + Testudines | 4 | 4.7 | 1 | 1.2 |
| Aves + Mammalia + Squamata | 3 | 3.5 | 3 | 3.5 |
| Aves + Mammalia + Testudines | 2 | 2.4 | 0 | 0 |
| Aves | 1 | 1.2 | 5 | 5.9 |
| Mammalia + Squamata | 1 | 1.2 | 1 | 1.2 |
| **Total** | **85** | | **85** | |

Our overall analyses indicate that 118 species (71 %) occur in regions that constituted Gondwanaland, 20 species (12 %) are found in lands that formed Laurasia, and the remaining 28 species (17 %) occur in areas that were part of both ancient continents.

A total of 56 species (33 %) have been recorded as feeding on humans.

The larva, nymph and at least one adult stage are known for just 98 (59 %) of the 167 species of *Haemaphysalis* that we recognize as valid. Clearly, efforts should be made to expand our knowledge of the taxonomy of the subadult stages of this genus in order to better understand the phylogenetic relationships of haemaphysalids as a whole. Nevertheless, most parasitic stages of species within the Palearctic and Oriental-Palearctic Region are known.

Host utilization by the 85 species of *Haemaphysalis* whose adult (female and/or male) and sub-adult stages are known, together with their natural hosts, is presented in Table 2, first including exceptional hosts, and then excluding these hosts. Although all parasitic stages of *H. colasbelcouri, H. colesbergensis, H. fujisana, H. kitaokai, H. megaspinosa, H. norvali*, and *H. shimoga* are known, one or more of these stages are known only from laboratory-reared specimens. On the other hand, the natural hosts of the larva or the nymph of *H. indoflava, H. leachi, H. montgomeryi, H. obesa* and *H. spinulosa* are not known with certainty, and while the male, female, nymph and larva of *H. kumaonensis* are known, their hosts are not. These 13 species have therefore been excluded from our analysis.

When exceptional hosts are included, *Haemaphysalis* ticks parasitize seven categories of hosts (Table 2). The only exclusive hosts are Mammalia (29 species or 34 % of the total), and Aves, which are exclusive hosts for the Oriental *H. megalaimae*. However, Mammalia are exclusive and non-exclusive hosts for 84 species (99 %), and Aves are exclusive or non-exclusive hosts for 55 species (65 %). The most common combination of hosts is Mammalia + Aves (45 species or 53 %). By comparison, the contribution of Squamata and Testudines is insignificant because these groups are hosts of just 8 and 6 species of *Haemaphysalis*, respectively, and even then only in combination with two to three other types of hosts for the corresponding species (Table 2). Anura and Crocodilia are not known to host *Haemaphysalis* ticks.

The pattern of host utilization undergoes important changes when exceptional hosts are excluded from the analysis. First, the categories of hosts diminish to six, because the combination Aves + Mammalia + Testudines drops out. Mammalia increases its share as exclusive hosts for almost half of the species (41, or 48 %). Four species – *H. chordeilis, H. doenitzi, H. hoodi* and *H. minuta* – join *H. megalaimae* as exclusive parasites of Aves (6 % of the total). The most common combination of hosts is still Mammalia + Aves (34 species, or 40 %), followed by the three combinations of hosts shown in Table 2. The representation of Squamata as hosts is now reduced to five species, the Palearctic *H. caucasica, H. parva* and *H. punctata*, the Oriental *H. kashmirensis*, and the Afrotropical, Oriental and Palearctic species *H. sulcata*. However, the role of Squamata is certainly relevant for the maintenance of larvae and nymphs of *H. kashmirensis*. *Haemaphysalis sulcata* is the only species with Testudinidae as non-exclusive hosts when exceptional hosts are excluded from the analysis; among other types of hosts, the larvae and nymphs of *H. sulcata* are also found on Testudinidae and on Squamata.