

The Argasidae, Ixodidae and Nuttalliellidae (Acari: Ixodida) of the world: a list of valid species names

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Abstract

This work is intended as a consensus list of valid tick names, following recent revisionary studies, wherein we recognize 896 species of ticks in 3 families. The Nuttalliellidae is monotypic, containing the single entity *Nuttalliella namaqua*. The Argasidae consists of 193 species, but there is widespread disagreement concerning the genera in this family, and fully 133 argasids will have to be further studied before any consensus can be reached on the issue of genus-level classification. The Ixodidae comprises 702 species in 14 genera: *Amblyomma* (130 species, of which 17 were formerly included in *Aponomma*, a genus that is still considered valid by some authors), *Anomalohimalaya* (3), *Bothriocroton* (7, all previously included in *Aponomma*), *Cosmiomma* (1), *Cornupalpatum* (1), *Compluriscutula* (1), *Dermacentor* (34, including the single member of the former genus *Anocentor*, which is still considered valid by some authors), *Haemaphysalis* (166), *Hyalomma* (27), *Ixodes* (243), *Margaropus* (3), *Nosomma* (2), *Rhipicentor* (2) and *Rhipicephalus* (82, including 5 species from the former genus *Boophilus*, which is still considered valid by some authors). We regard six names as invalid: *Amblyomma laticaudae* Warburton, 1933 is a synonym of *Amblyomma nitidum* Hirst & Hirst, 1910; *Bothriocroton decorosum* (Koch, 1867) is a synonym of *B. undatum* (Fabricius, 1775); *Haemaphysalis vietnamensis* Hoogstraal & Wilson, 1966 is a synonym of *H. colasbelcouri* (Santos Dias, 1958); *Haemaphysalis xinjiangensis* Teng, 1980 is a synonym of *H. danieli* Černý & Hoogstraal, 1977; *Hyalomma erythraeum* Tonelli-Rondelli, 1932 is a synonym of *H. impeltatum* Schulze and Schlottke, 1930 and *Rhipicephalus hoogstraali* Kolonin, 2009 was not described according to the rules of the International Code of Zoological Nomenclature.

Key words: Acari, Argasidae, Ixodidae, Nuttalliellidae, species list

Introduction

Over the last decade, tick (Acari: Ixodida) systematics has undergone a remarkable – and contentious – revolution. Between 1998 and 2008 three comprehensive lists of supposedly valid tick names were published by Camicas *et al.* (1998), Horak *et al.* (2002) and Barker and Murrell (2008). Additionally, Kolonin (2009) compiled a list of world Ixodidae, while Guglielmone *et al.* (2009) addressed controversial tick names. With the exception of Camicas *et al.* (1998), the preceding studies rely heavily on the compilations of Keirans

(1992) and Keirans and Robbins (1999). All these works disagree with one another to a greater or lesser extent. Consequently, we have attempted to combine their best elements with our own original research to develop a new global list of tick species names that are valid as of late 2009.

There are several competing genus-level classifications of the Ixodidae in Camicas and Morel (1977), Hoogstraal and Aeschlimann (1982), Black and Piesman (1994), Filippova (1994), Camicas *et al.* (1998), Barker and Murrell (2002) and Horak *et al.* (2002). Disagreements at the genus level often concern particular species groups. For example, some authorities continue to regard *Boophilus* as a valid genus, although most recent authors have relegated this group of five species to a subgenus of *Rhipicephalus*. Similarly, *Aponomma* is viewed as a valid genus by many taxonomists, but recent workers have moved some species to the genus *Bothriocroton* (the former “Australian *Aponomma* species”) and placed the remainder in *Amblyomma*. The genus *Anocentor* remains valid in some genus-level classifications, but most workers consider this monotypic genus to be, at best, a subgenus of *Dermacentor*. The greatest differences of opinion concern the largest ixodid genus – *Ixodes* – whose species have been dispersed into several genera (*Ceratixodes*, *Eschatocephalus*, *Ixodes*, *Lepidixodes*, *Pholeoixodes*, *Scaphixodes*) by Camicas and Morel (1977) and Camicas *et al.* (1998). However, this arrangement has been widely resisted and will not be further considered here.

The tumult in tick taxonomy has yielded competing genus-level classifications of the Argasidae that are vastly different from one another: Clifford *et al.* (1964) (*Antricola*, *Argas*, *Ornithodoros* and *Otobius*), Filippova (1966) (*Alveonassus*, *Antricola*, *Argas*, *Ornithodoros* and *Otobius*), Pospelova-Shtrom (1969) (*Alveonassus*, *Antricola*, *Argas*, *Carios*, *Ornithodoros* and *Otobius*), Camicas and Morel (1977) (*Alectorobius*, *Alveonassus*, *Antricola*, *Argas*, *Carios*, *Nothoaspis*, *Ogadenus*, *Ornithodoros*, *Otobius* and *Parantricola*), Hoogstraal (1985) (*Antricola*, *Argas*, *Nothoaspis*, *Ornithodoros* and *Otobius*), Klompen and Oliver (1993) (*Argas*, *Carios*, *Ornithodoros* and *Otobius*) and Camicas *et al.* (1998) (*ibid.* Camicas and Morel 1977 plus *Microargas*). Keirans (2009) retains the subgeneric classification proposed by Hoogstraal (1985). A recent molecular analysis did not settle these ongoing disputes because several alleged natural groups were poorly represented (Nava *et al.* 2009b). However, it appears that the genus *Ornithodoros*, as understood by Clifford *et al.* (1964) and Hoogstraal (1985), is not monophyletic, endorsing similar results from Klompen and Oliver (1993), whose study is especially relevant for its application of cladistic methods to demonstrate the paraphyly of the genus *Ornithodoros*, but which fails to acknowledge the contributions of Camicas and Morel (1977), further developed in Camicas *et al.* (1998), in considering the paraphyly of *Ornithodoros* as defined by the “American School”. As discussed in a recent study by Estrada-Peña *et al.* (2010), the genus-level classification of the family Argasidae is obviously much less settled than that of the Ixodidae. Indeed, most species of Argasidae can be assigned to more than one genus – there is currently no agreement on generic placement for 133 of the 193 argasid species. It will be difficult to resolve the genera of Argasidae without additional morphological and molecular studies of the type species of putatively monophyletic groups, which are vital to an understanding of argasid phylogeny (evolutionary history). Consequently, we have focused our efforts on constructing a list of valid species names in which differences in generic assignment are noted, with the hope that this information will stimulate further phylogenetic research.

The authors of the present compilation disagree on the systematic status of several tick genera, but we share a concern about the validity of species names. We have therefore adopted, but do not necessarily endorse, the genus-level classification of the Argasidae proposed by Hoogstraal (1985) (*Antricola*, *Argas*, *Nothoaspis*, *Ornithodoros* and *Otobius*), and the genus-level classification of the Ixodidae embraced by Barker and Murrell (2002) (*Amblyomma*, *Anomalohimalaya*, *Bothriocroton*, *Cosmiomma*, *Dermacentor*, *Haemaphysalis*, *Hyalomma*, *Ixodes*, *Margaropus*, *Nosomma*, *Rhipicentor* and *Rhipicephalus*). In addition, we have included the fossil genera *Cornupalpatum* and *Compluriscutula* and their species. Alongside the author of each species name we have inserted, in parentheses, the names of those genera in which the species may have been placed by other workers. The type species of the various genera of Argasidae and Ixodidae are also indicated. Where appropriate, we have included comments on particular species names. Finally, six ixodid tick names that we consider invalid are discussed immediately above the list of Ixodidae.

Argasidae

1. *Antricola armasi* de la Cruz and Estrada-Peña, 1995 (*Carios*)
2. *Antricola centralis* de la Cruz and Estrada-Peña, 1995 (*Carios*)
3. *Antricola cernyi* de la Cruz, 1978 (*Carios*)
4. *Antricola coprophilus* (McIntosh, 1935) (*Carios*). This is the type species of the genus *Antricola*; it was originally named *Ornithodoros coprophilus*.
5. *Antricola delacruz* Estrada-Peña, Barros-Battesti and Venzal, 2004 (*Carios*)
6. *Antricola granasi* de la Cruz, 1973 (*Carios*)
7. *Antricola guglielmonei* Estrada-Peña, Barros-Battesti and Venzal, 2004 (*Carios*)
8. *Antricola habanensis* de la Cruz, 1976 (*Carios*)
9. *Antricola hummelincki* de la Cruz and Estrada-Peña, 1995 (*Carios*)
10. *Antricola inexpectata* Estrada-Peña, Barros-Battesti and Venzal, 2004 (*Carios*)
11. *Antricola marginatus* (Banks, 1910) (*Carios, Paratricola*). This is the type species of the genus *Paratricola*; it was originally named *Ornithodoros marginatus*.
12. *Antricola martelorum* de la Cruz, 1978 (*Carios*)
13. *Antricola mexicanus* Hoffmann, 1958 (*Carios*). Some authors have listed the year 1958 for the original description of *Antricola mexicanus* while others have used the year 1959. An inquiry to the U.S. Library of Congress has shown that Hoffmann (1958) was actually published in 1958.
14. *Antricola naomiae* de la Cruz, 1978 (*Carios*)
15. *Antricola occidentalis* de la Cruz, 1978 (*Carios*)
16. *Antricola siboneyi* de la Cruz and Estrada-Peña, 1995 (*Carios*)
17. *Antricola silvai* Černý, 1967 (*Carios*)

1. *Argas abdussalami* Hoogstraal and McCarthy, 1965
2. *Argas africanus* Hoogstraal, Kaiser, Walker, Ledger, Converse and Rice, 1975
3. *Argas arboreus* Kaiser, Hoogstraal and Kohls, 1964
4. *Argas assimilis* Teng and Song, 1983
5. *Argas australiensis* Kohls and Hoogstraal, 1962 (*Carios*)
6. *Argas beijingensis* Teng, 1983
7. *Argas beklemischevi* Pospelova-Shtrom, Vasil'yeva and Semashko, 1963
8. *Argas boueti* Roubaud and Colas-Belcour, 1933 (*Carios*)
9. *Argas brevipes* Banks, 1908
10. *Argas brumpti* Neumann, 1907 (*Ogadenus*). This is the type species of the genus *Ogadenus*.
11. *Argas bureschi* Dryenski, 1957
12. *Argas ceylonensis* Hoogstraal and Kaiser, 1968 (*Carios*)
13. *Argas confusus* Hoogstraal, 1955 (*Carios*)
14. *Argas cooleyi* Kohls and Hoogstraal, 1960. If *Ornithodoros cooleyi* McIvor, 1941 belongs to *Argas*, it has priority here.
15. *Argas cordiformis* Hoogstraal and Kohls, 1967 (*Carios*)
16. *Argas cucumerinus* Neumann, 1901
17. *Argas dalei* Clifford, Keirans, Hoogstraal and Corwin, 1976
18. *Argas daviesi* Kaiser and Hoogstraal, 1973 (*Carios*)
19. *Argas delicatus* Neumann, 1910. This species is very close to *A. vulgaris*, as discussed in Guglielmone *et al.* (2009). We consider both names valid until the types can be compared.
20. *Argas dewae* Kaiser and Hoogstraal, 1974 (*Carios*)
21. *Argas dulus* Keirans, Clifford and Capriles, 1971
22. *Argas echinops* Hoogstraal, Uilenberg and Blanc, 1967 (*Ogadenus*)
23. *Argas falco* Kaiser and Hoogstraal, 1974
24. *Argas giganteus* Kohls and Clifford, 1968

25. *Argas gilcolladoi* Estrada-Peña, Lucientes and Sánchez, 1987
26. *Argas hermanni* Audouin, 1826
27. *Argas himalayensis* Hoogstraal and Kaiser, 1973
28. *Argas hoogstraali* Morel and Vassiliades, 1965 (*Ogadenus*)
29. *Argas japonicus* Yamaguti, Clifford and Tipton, 1968
30. *Argas keiransi* Estrada-Peña, Venzal and González-Acuña, 2003
31. *Argas lagenoplastis* Froggatt, 1906
32. *Argas latus* Filippova, 1961
33. *Argas lowryae* Kaiser and Hoogstraal, 1975
34. *Argas macrodermae* Hoogstraal, Moorhouse, Wolf and Wassef, 1977 (*Carios*)
35. *Argas macrostigmatus* Filippova, 1961
36. *Argas magnus* Neumann, 1896
37. *Argas miniatus* Koch, 1844
38. *Argas monachus* Keirans, Radovsky and Clifford, 1973
39. *Argas monolakensis* Schwan, Corwin and Brown, 1992
40. *Argas moreli* Keirans, Hoogstraal and Clifford, 1979
41. *Argas neghmei* Kohls and Hoogstraal, 1961
42. *Argas nullarborensis* Hoogstraal and Kaiser, 1973
43. *Argas persicus* (Oken, 1818)
44. *Argas polonicus* Siuda, Hoogstraal, Clifford and Wassef, 1979
45. *Argas pusillus* Kohls, 1950 (*Carios*)
46. *Argas radiatus* Railliet, 1893
47. *Argas reflexus* (Fabricius, 1794). This is the type species of the genus *Argas*; it was originally named *Acarus reflexus*.
48. *Argas ricei* Hoogstraal, Kaiser, Clifford and Keirans, 1975
49. *Argas robertsi* Hoogstraal, Kaiser and Kohls, 1968
50. *Argas sanchezi* Dugès, 1887
51. *Argas sinensis* Jeu and Zhu, 1982 (*Carios*)
52. *Argas streptopelia* Kaiser, Hoogstraal and Horner, 1970
53. *Argas striatus* Bedford, 1932
54. *Argas theilerae* Hoogstraal and Kaiser, 1970
55. *Argas transgaripepinus* White, 1846 (*Ogadenus*)
56. *Argas transversus* Banks, 1902 (*Microargas*, *Ornithodoros*). This is the type species of the genus *Microargas*; it was originally named *Argas transversa*.
57. *Argas tridentatus* Filippova, 1961
58. *Argas vespertilionis* (Latreille, 1796) (*Carios*). This is the type species of the genus *Carios*; it was originally named *Carios vespertilionis*. Camicas *et al.* (1998) and Barker and Murrell (2008) consider *Argas/Carios fischeri* Audouin, 1826 a valid name, while Guglielmone *et al.* (2009) follow Hoogstraal (1958) and Filippova (1964) in considering this name a provisional synonym of *A. vespertilionis*.
59. *Argas vulgaris* Filippova, 1961. See *A. delicatus*.
60. *Argas walkerae* Kaiser and Hoogstraal, 1969
61. *Argas zumpti* Hoogstraal, Kaiser and Kohls, 1968

1. *Nothoaspis reddelli* Keirans and Clifford, 1975 (*Carios*). This is the type species of the genus *Nothoaspis*.

1. *Ornithodoros acinus* Whittick, 1938 (*Alveonasus*, *Argas*)
2. *Ornithodoros alactagalis* Issaakjan, 1936 (*Alectorobius*)
3. *Ornithodoros amblus* Chamberlin, 1920 (*Alectorobius*, *Carios*)
4. *Ornithodoros antiquus* Poinar, 1995. Fossil.

5. *Ornithodoros apertus* Walton, 1962
6. *Ornithodoros aragai* Fonseca, 1960 (*Alectorobius*, *Carios*). We consider this name to be provisionally valid, pending type comparison with *O. rudis* (Guglielmone *et al.* 2009).
7. *Ornithodoros arenicolous* Hoogstraal, 1953 (*Alectorobius*)
8. *Ornithodoros asperus* Warburton, 1918 (*Alectorobius*). See *O. verrucosus*.
9. *Ornithodoros azteci* Matheson, 1935 (*Alectorobius*, *Carios*)
10. *Ornithodoros batuensis* Hirst, 1929 (*Alectorobius*, *Carios*)
11. *Ornithodoros brasiliensis* Aragão, 1923 (*Alectorobius*)
12. *Ornithodoros brodyi* Matheson, 1935 (*Alectorobius*, *Carios*)
13. *Ornithodoros camicasi* (Sylla, Cornet and Marchand, 1997) (*Alectorobius*, *Carios*)
14. *Ornithodoros canestrinii* (Birula, 1895) (*Argas*, *Alveonasus*)
15. *Ornithodoros capensis* Neumann, 1901 (*Alectorobius*, *Carios*)
16. *Ornithodoros casebeeri* Jones and Clifford, 1972 (*Alectorobius*, *Carios*)
17. *Ornithodoros cheikhi* Vermeil, Marjolet and Vermeil, 1997 (*Alectorobius*, *Carios*)
18. *Ornithodoros chironectes* Jones and Clifford, 1972 (*Alectorobius*, *Carios*)
19. *Ornithodoros chiropterphila* Dhanda and Rajagopalan, 1971 (*Alectorobius*, *Carios*)
20. *Ornithodoros cholodkovskyi* Pavlovsky, 1930 (*Alectorobius*)
21. *Ornithodoros clarki* Jones and Clifford, 1972 (*Carios*)
22. *Ornithodoros collocaliae* Hoogstraal, Kadarsan, Kaiser and Van Peenen, 1974 (*Alectorobius*, *Carios*)
23. *Ornithodoros compactus* Walton, 1962
24. *Ornithodoros concanensis* Cooley and Kohls, 1941 (*Alectorobius*, *Carios*)
25. *Ornithodoros coniceps* (Canestrini, 1890) (*Alectorobius*, *Carios*)
26. *Ornithodoros cooleyi* McIvor, 1941 (*Alveonasus*, *Argas*). If this species belongs to *Argas*, it has priority over *A. cooleyi* Kohls and Hoogstraal, 1960.
27. *Ornithodoros coriaceus* Koch, 1844
28. *Ornithodoros cycluræ* de la Cruz, 1984 (*Alectorobius*, *Carios*)
29. *Ornithodoros darwini* Kohls, Clifford and Hoogstraal, 1969 (*Alectorobius*, *Carios*)
30. *Ornithodoros delanoei* Roubaud and Colas-Belcour, 1931 (*Alveonasus*, *Argas*)
31. *Ornithodoros denmarki* Kohls, Sonenshine and Clifford, 1965 (*Alectorobius*, *Carios*)
32. *Ornithodoros dugesi* Mazzotti, 1943 (*Alectorobius*, *Carios*). We consider this name to be provisionally valid (Guglielmone *et al.* 2009), although it is generally regarded as a synonym of *O. talaje*.
33. *Ornithodoros dusbabeki* Černý, 1967 (*Alectorobius*, *Carios*)
34. *Ornithodoros dyeri* Cooley and Kohls, 1940 (*Alectorobius*, *Carios*)
35. *Ornithodoros eboris* Theiler, 1959 (*Alveonasus*, *Argas*)
36. *Ornithodoros echimys* Kohls, Clifford and Jones, 1969 (*Alectorobius*, *Carios*)
37. *Ornithodoros elongatus* Kohls, Sonenshine and Clifford, 1965 (*Alectorobius*, *Carios*)
38. *Ornithodoros eptesicus* Kohls, Clifford and Jones, 1969 (*Alectorobius*, *Carios*)
39. *Ornithodoros eremicus* Cooley and Kohls, 1941
40. *Ornithodoros erraticus* (Lucas, 1849) (*Alectorobius*)
41. *Ornithodoros faini* Hoogstraal, 1960 (*Alectorobius*, *Carios*)
42. *Ornithodoros foleyi* Parrot, 1928 (*Alveonasus*, *Argas*)
43. *Ornithodoros fonsecai* (Labruna and Venzal, 2009) (n. syn.) (*Alectorobius*, *Carios*). This species was recently described by Labruna and Venzal (2009), who placed it in the genus *Carios*. However, its morphology indicates that it should be included as a member of *Ornithodoros* (as in this classification) or *Alectorobius*.
44. *Ornithodoros furcosus* Neumann, 1908 (*Alectorobius*)
45. *Ornithodoros galapagensis* Kohls, Clifford and Hoogstraal, 1969 (*Alectorobius*, *Carios*)
46. *Ornithodoros graingeri* Heisch and Guggisberg, 1953 (*Alectorobius*)
47. *Ornithodoros grenieri* Klein, 1965 (*Alectorobius*)
48. *Ornithodoros gurneyi* Warburton, 1926

49. *Ornithodoros hadiae* (Klompen, Keirans and Durden, 1995) (*Alectorobius, Carios*)
50. *Ornithodoros hasei* (Schulze, 1935) (*Alectorobius, Carios*)
51. *Ornithodoros hermsi* Wheeler, Herms and Meyer, 1935 (*Alectorobius*)
52. *Ornithodoros indica* Rau and Rao, 1971
53. *Ornithodoros jerseyi* (Klompen and Grimaldi, 2001) (*Carios*). Fossil.
54. *Ornithodoros jul* Schulze, 1940 (*Alectorobius, Carios*)
55. *Ornithodoros kelleyi* Cooley and Kohls, 1941 (*Alectorobius, Carios*)
56. *Ornithodoros knoxjonesi* Jones and Clifford, 1972 (*Alectorobius, Carios*). We consider this name provisionally valid, pending comparison with *O. dyeri* (Guglielmone *et al.* 2009).
57. *Ornithodoros kohlsi* Guglielmone and Keirans, 2002 (*Alectorobius, Carios*). Originally named *O. boliviensis* Kohls and Clifford, 1964, which is preoccupied (Guglielmone *et al.* 2009).
58. *Ornithodoros lahorensis* Neumann, 1908 (*Alveonasus, Argas*). This is the type species of the genus *Alveonasus*.
59. *Ornithodoros macmillani* Hoogstraal and Kohls, 1966 (*Alectorobius*)
60. *Ornithodoros madagascariensis* Hoogstraal, 1962 (*Alectorobius, Carios*)
61. *Ornithodoros marinkellei* Kohls, Clifford and Jones, 1969 (*Alectorobius, Carios*)
62. *Ornithodoros maritimus* Vermeil and Marguet, 1967 (*Alectorobius, Carios*)
63. *Ornithodoros marmosae* Jones and Clifford, 1972 (*Alectorobius, Carios*)
64. *Ornithodoros maroccanus* Velu, 1919. We consider this name provisionally valid, pending type comparison with *O. erraticus* (Guglielmone *et al.* 2009).
65. *Ornithodoros mimon* Kohls, Clifford and Jones, 1969 (*Alectorobius, Carios*)
66. *Ornithodoros mormoops* Kohls, Clifford and Jones, 1969 (*Alectorobius, Carios*)
67. *Ornithodoros moubata* (Murray, 1877)
68. *Ornithodoros muesebecki* Hoogstraal, 1969 (*Alectorobius, Carios*)
69. *Ornithodoros multisetosus* (Klompen, Keirans and Durden, 1995) (*Alectorobius, Carios*)
70. *Ornithodoros natalinus* Černý and Dusbábek, 1967 (*Alectorobius, Carios*)
71. *Ornithodoros nattereri* Warburton, 1927. We consider this name provisionally valid, pending comparison with *O. rostratus* (Guglielmone *et al.* 2009).
72. *Ornithodoros nicollei* Mooser, 1932
73. *Ornithodoros normandi* Larrousse, 1923 (*Alectorobius*)
74. *Ornithodoros papuensis* (Klompen, Keirans and Durden, 1995) (*Alectorobius, Carios*)
75. *Ornithodoros papillipes* (Birula, 1895) (*Alectorobius*). This species is considered a synonym of *O. tholozani* by many Western scientists (Hoogstraal, 1985), but East European workers strongly defend the validity of this name with arguments that are scientifically sound (Filippova, 1966). The uncertain status of these taxa has led us to treat them both as provisionally valid.
76. *Ornithodoros parkeri* Cooley, 1936 (*Alectorobius*)
77. *Ornithodoros peringueyi* Bedford and Hewitt, 1925 (*Argas, Ogadenus*)
78. *Ornithodoros peropteryx* Kohls, Clifford and Jones, 1969 (*Alectorobius, Carios*)
79. *Ornithodoros peruvianus* Kohls, Clifford and Jones, 1969 (*Alectorobius, Carios*)
80. *Ornithodoros peusi* (Schulze, 1943) (*Argas, Ogadenus*)
81. *Ornithodoros piriformis* Warburton, 1918 (*Alectorobius, Carios*)
82. *Ornithodoros porcinus* Walton, 1962
83. *Ornithodoros procaviae* Theodor and Costa, 1960 (*Alectorobius*)
84. *Ornithodoros puertoricensis* Fox, 1947 (*Alectorobius, Carios*)
85. *Ornithodoros rennellensis* Clifford and Sonenshine, 1962 (*Alectorobius, Carios*)
86. *Ornithodoros rioplatensis* Venzal, Estrada-Peña and Mangold, 2008 (*Alectorobius, Carios*)
87. *Ornithodoros rondoniensis* (Labruna, Terassini, Camargo, Brandão, Ribeiro and Estrada-Peña, 2008) (*Alectorobius, Carios*).
88. *Ornithodoros rossi* Kohls, Sonenshine and Clifford, 1965 (*Alectorobius, Carios*)
89. *Ornithodoros rostratus* Aragão, 1911

90. *Ornithodoros rudis* Karsch, 1880 (*Alectorobius, Carios*)
91. *Ornithodoros salahi* Hoogstraal, 1953 (*Alectorobius, Carios*)
92. *Ornithodoros savignyi* (Audouin, 1826). This is the type species of the genus *Ornithodoros*; it was originally named *Argas savignyi*. There is discrepancy concerning the year of description, which some authors consider to be 1827; this discrepancy also includes the reference for the description.
93. *Ornithodoros sawaii* Kitaoka and Suzuki, 1973 (*Alectorobius, Carios*)
94. *Ornithodoros setosus* Kohls, Clifford and Jones, 1969 (*Alectorobius, Carios*)
95. *Ornithodoros solomonis* Dumbleton, 1959 (*Alectorobius, Carios*)
96. *Ornithodoros sonrai* Sautet and Witkowski, 1943 (*Alectorobius*)
97. *Ornithodoros sparnus* Kohls and Clifford, 1963 (*Alectorobius, Otobius*)
98. *Ornithodoros spheniscus* Hoogstraal, Wassef, Hays and Keirans, 1985 (*Alectorobius, Carios*)
99. *Ornithodoros stageri* Cooley and Kohls, 1941 (*Alectorobius, Carios*)
100. *Ornithodoros tadaridae* Černý and Dusbábek, 1967 (*Alectorobius, Carios*)
101. *Ornithodoros talaje* (Guérin-Méneville, 1849) (*Alectorobius, Carios*). This is the type species of the genus *Alectorobius*; it was originally named *Argas talaje*. See also *O. dugesi*.
102. *Ornithodoros tartakovskiyi* Olenov, 1931 (*Alectorobius*)
103. *Ornithodoros tholozani* (Laboulbène and Mégnin, 1882) (*Alectorobius*). See also *O. papillipes*.
104. *Ornithodoros tiptoni* Jones and Clifford, 1972 (*Alectorobius, Carios*)
105. *Ornithodoros turicata* (Dugès, 1876) (*Alectorobius*)
106. *Ornithodoros tuttlei* Jones and Clifford, 1972 (*Alectorobius, Carios*)
107. *Ornithodoros vansomereni* Keirans, Hoogstraal and Clifford, 1977 (*Argas, Ogadenus*)
108. *Ornithodoros verrucosus* Olenov, Zasukhin and Fenyuk, 1934 (*Alectorobius*) is considered a synonym of *O. asperus* by Western workers (Hoogstraal, 1985), but Russian scientists present sound evidence for its validity (Filippova, 1966). We tentatively accept both taxa, pending further studies.
109. *Ornithodoros vigerasi* Cooley and Kohls, 1941 (*Alectorobius, Carios*)
110. *Ornithodoros yumatensis* Cooley and Kohls, 1941 (*Alectorobius, Carios*)
111. *Ornithodoros yunkerii* Keirans, Clifford and Hoogstraal, 1984 (*Alectorobius, Carios*)
112. *Ornithodoros zumpti* Heisch and Guggisberg, 1953 (*Alectorobius*)

1. *Otobius lagophilus* Cooley and Kohls, 1940
2. *Otobius megnini* (Dugès, 1883). This is the type species of the genus *Otobius*; it was originally named *Argas megnini*.

Ixodidae

We exclude the following names from our list of Ixodidae:

(i) *Amblyomma laticaudae* Warburton, 1933 is considered valid in Camicas *et al.* (1998), Horak *et al.* (2002) and Barker and Murrell (2008); Guglielmone *et al.* (2009) do not include it in their list of controversial names, while Kolonin (2009) considers this name a synonym of *Amblyomma nitidum* Hirst and Hirst, 1910. In fact, Keirans, in Voltzit and Keirans (2002), determined that the types of these taxa are conspecific. Therefore, we agree with Kolonin (2009) that *A. laticaudae* is an invalid name.

(ii) *Bothriocroton decorosum* (Koch, 1867) is included as a member of *Aponomma* by Kolonin (2009), but this name is a synonym of *B. undatum*, as explained in Santos Dias (1993).

(iii) *Haemaphysalis vietnamensis* Hoogstraal and Wilson, 1966 is included as a valid name in Kolonin (2009), but it is a synonym of *H. colasbelcouri* (Guglielmone *et al.* 2009).

(iv) *Haemaphysalis xinjiangensis* Teng, 1980 is not included as a valid species in Kolonin (2009). Teng and Jiang (1981) consider this name a synonym of *H. danieli*, and we accept their decision, since the senior author also described *H. xinjiangensis*.

(v) *Hyalomma erythraeum* Tonelli-Rondelli, 1932 is included as a valid name in Kolonin (2009), but it

was convincingly shown to be a synonym of *H. impeltatum* by Apanaskevich and Horak (2009).

(vi) *Rhipicephalus hoogstraali* Kolonin, 2009 was described on the Internet, contrary to the rules of the International Code of Zoological Nomenclature (International Commission on Zoological Nomenclature, 2009, Articles 8.6 and 9.8), and is therefore a *nomen nudum*.

1. *Amblyomma albolimbatum* Neumann, 1907
2. *Amblyomma albopictum* Neumann, 1899
3. *Amblyomma americanum* (Linnaeus, 1758)
4. *Amblyomma antillorum* Kohls, 1969
5. *Amblyomma arcanum* Karsch, 1879 (*Aponomma*)
6. *Amblyomma argentinae* Neumann, 1905. Guglielmone *et al.* (2003) stated that the year of description for *A. argentinae* is 1904, but this is in error because Neumann recognized 1905 as the correct year. Previously, this species was incorrectly named *A. testudinis* (Guglielmone *et al.* 2009).

7. *Amblyomma astrion* Dönitz, 1909
8. *Amblyomma aureolatum* (Pallas, 1772)
9. *Amblyomma auricularium* (Conil, 1878)
10. *Amblyomma australiense* Neumann, 1905. See *A. echidnae*.
11. *Amblyomma babirussae* Schulze, 1933
12. *Amblyomma beaurepairoi* Vogelsang and Santos Dias, 1953. This species is close to *A. inornatum* and *A. auricularium* but is provisionally considered valid in Guglielmone *et al.* (2009). However, Kolonin (2009) considers it a synonym of *A. auricularium*.

13. *Amblyomma boeroi* Nava, Mangold, Mastropaolo, Venzal, Oscherov and Guglielmone, 2009
14. *Amblyomma boulengeri* Hirst and Hirst, 1910
15. *Amblyomma brasiliense* Aragão, 1908
16. *Amblyomma breviscutatum* Neumann, 1899. Until recently, this species was known as *A. cyprium* Neumann, 1899 (Guglielmone *et al.* 2009), a name still considered valid in Kolonin (2009), who does not justify his position. However, Keirans, in Voltzit and Keirans (2002), determined, as had Santos Dias (1956) before him, that the types of *A. cyprium* and *A. breviscutatum* are conspecific and that the latter name has page priority.

17. *Amblyomma cajennense* (Fabricius, 1787). This is the type species of the genus *Amblyomma*; it was originally named *Acarus cajennensis*. Beati, L. and Nava, S. (pers. comm.) believe that *A. cajennense* comprises a complex of sibling species.

18. *Amblyomma calabyi* Roberts, 1963
19. *Amblyomma calcaratum* Neumann, 1899
20. *Amblyomma chabaudi* Rageau, 1964
21. *Amblyomma clypeolatum* Neumann, 1899
22. *Amblyomma coelebs* Neumann, 1899
23. *Amblyomma cohaerens* Dönitz, 1909
24. *Amblyomma compressum* (Macalister, 1872)
25. *Amblyomma cordiferum* Neumann, 1899
26. *Amblyomma crassipes* (Neumann, 1901) (*Aponomma*). This species is similar to *A. fuscolineatum* but is provisionally considered valid because little material is available for examination and the types have not been compared (Guglielmone *et al.* 2009). Kolonin (2009), using the name *Aponomma*, considers *A. crassipes* invalid but does not include a comparison of types.

27. *Amblyomma crassum* Robinson, 1926
28. *Amblyomma crenatum* Neumann, 1899
29. *Amblyomma cruciferum* Neumann, 1901
30. *Amblyomma darwini* Hirst and Hirst, 1910
31. *Amblyomma dissimile* Koch, 1844. Guglielmone *et al.* (2009) argue in favor of this name instead of *A. bibroni* (Gervais, 1842) because of the confused history of the latter taxon.

32. *Amblyomma dubitatum* Neumann, 1899. Until recently, this species was known as *A. cooperi* Nuttall and Warburton, 1908 (Guglielmone *et al.* 2009).

33. *Amblyomma eburneum* Gerstäcker, 1873

34. *Amblyomma echidnae* Roberts, 1953. This species is very similar to *A. australiense*, but Guglielmone *et al.* (2009) consider *A. echidnae* provisionally valid until its status can be clarified. Kolonin (2009) does not include this species in his list of the Ixodidae of the world.

35. *Amblyomma elaphense* (Price, 1959) (*Aponomma*). See *A. sphenodonti*.

36. *Amblyomma exornatum* Koch, 1844 (*Aponomma*)

37. *Amblyomma extraoculatum* Neumann, 1899. See *A. romitii*.

38. *Amblyomma falsomarmoreum* Tonelli-Rondelli, 1935

39. *Amblyomma fimbriatum* Koch, 1844 (*Aponomma*)

40. *Amblyomma flavomaculatum* (Lucas, 1846) (*Aponomma*). See *A. inopinatum*.

41. *Amblyomma fulvum* Neumann, 1899

42. *Amblyomma fuscolineatum* (Lucas, 1847) (*Aponomma*). See *A. crassipes* and *A. varanense*.

43. *Amblyomma fuscum* Neumann, 1907. A valid taxon ignored in some lists of ticks (Guglielmone *et al.* 2009).

44. *Amblyomma geayi* Neumann, 1899. Guglielmone *et al.* (2009) discuss the lack of agreement concerning this name, because some authors regard *A. geayi* as a synonym of *A. perpunctatum* (Packard, 1869). However, the description of the latter taxon is inadequate, and we therefore consider the name *A. geayi* valid, pending type comparison.

45. *Amblyomma gemma* Dönitz, 1909

46. *Amblyomma geocheleone* Durden, Keirans and Smith, 2002

47. *Amblyomma geoemydae* (Cantor, 1847)

48. *Amblyomma gervaisi* (Lucas, 1847) (*Aponomma*). This is the type species of the genus *Aponomma*; it was originally named *Ixodes gervaisii*.

49. *Amblyomma glauerti* Keirans, King and Sharrad, 1994

50. *Amblyomma goeldii* Neumann, 1899

51. *Amblyomma hainanense* Teng, 1981. Kolonin (2009) considers *A. hainanense* a synonym of *A. helvolum*, but no comparison of types has been attempted. Therefore, we treat *A. hainanense* as tentatively valid.

52. *Amblyomma hebraeum* Koch, 1844

53. *Amblyomma helvolum* Koch, 1844

54. *Amblyomma hirtum* Neumann, 1906

55. *Amblyomma humerale* Koch, 1844

56. *Amblyomma imitator* Kohls, 1958

57. *Amblyomma incisum* Neumann, 1906. See *A. latepunctatum*.

58. *Amblyomma inopinatum* (Santos Dias, 1989) (*Aponomma*). This species is not included in Kolonin (2009), who appears to consider it a synonym of *A. flavomaculatum* and places it in the genus *Aponomma*.

59. *Amblyomma inornatum* (Banks, 1909)

60. *Amblyomma integrum* Karsch, 1879

61. *Amblyomma javanense* (Supino, 1897)

62. *Amblyomma komodoense* (Oudemans, 1928) (*Aponomma*)

63. *Amblyomma kraneveldi* (Anastos, 1956) (*Aponomma*)

64. *Amblyomma latepunctatum* Tonelli-Rondelli, 1939. This species was previously confused with *A. incisum* and with *A. scalpturatum* (Guglielmone *et al.* 2009).

65. *Amblyomma latum* Koch, 1844 (*Aponomma*)

66. *Amblyomma lepidum* Dönitz, 1909

67. *Amblyomma limbatum* Neumann, 1899

68. *Amblyomma loculosum* Neumann, 1907

69. *Amblyomma longirostre* (Koch, 1844)

70. *Amblyomma macfarlandi* Keirans, Hoogstraal and Clifford, 1973
71. *Amblyomma macropi* Roberts, 1953
72. *Amblyomma maculatum* Koch, 1844
73. *Amblyomma marmoreum* Koch, 1844
74. *Amblyomma moreliae* (Koch, 1867)
75. *Amblyomma moyi* Roberts, 1953
76. *Amblyomma multipunctum* Neumann, 1899
77. *Amblyomma naponense* (Packard, 1869)
78. *Amblyomma neumanni* Ribaga, 1902. Nava *et al.* (2009a) state that the description by Voltzit (2007) of *A. neumanni* actually applies to *A. parvitarsum*.
79. *Amblyomma nitidum* Hirst and Hirst, 1910. See paragraph “i” above our list of Ixodidae.
80. *Amblyomma nodosum* Neumann, 1899
81. *Amblyomma nuttalli* Dönitz, 1909
82. *Amblyomma oblongoguttatum* Koch, 1844
83. *Amblyomma orlovi* (Kolonin, 1992) (*Aponomma*). This species is considered tentatively valid in Guglielmone *et al.* (2009), who nonetheless strongly suggest that it is a synonym of *A. transversale*. Guglielmone *et al.* (2009) err in listing the date of description as 1995.
84. *Amblyomma ovale* Koch, 1844
85. *Amblyomma pacaе* Aragão, 1911
86. *Amblyomma papuanum* Hirst, 1914
87. *Amblyomma parkeri* Fonseca and Aragão, 1952. Kolonin (2009) expresses doubt about the status of this species, but Labruna *et al.* (2009a) present sound evidence for its validity.
88. *Amblyomma parvitarsum* Neumann, 1901. See *A. neumanni*.
89. *Amblyomma parvum* Aragão, 1908
90. *Amblyomma pattoni* (Neumann, 1910) (*Aponomma*)
91. *Amblyomma paulopunctatum* Neumann, 1899
92. *Amblyomma pecarium* Dunn, 1933
93. *Amblyomma personatum* Neumann, 1901
94. *Amblyomma pictum* Neumann, 1906
95. *Amblyomma pilosum* Neumann, 1899
96. *Amblyomma pomposum* Dönitz, 1909
97. *Amblyomma postoculatum* Neumann, 1899
98. *Amblyomma pseudoconcolor* Aragão, 1908
99. *Amblyomma pseudoparvum* Guglielmone, Mangold and Keirans, 1990
100. *Amblyomma quadricavum* (Schulze, 1941)
101. *Amblyomma rhinocerotis* (de Geer, 1778)
102. *Amblyomma robinsoni* Warburton, 1927
103. *Amblyomma romitii* Tonelli-Rondelli, 1939. This species was previously considered a synonym of *A. extraoculatum* (Guglielmone *et al.* 2009).
104. *Amblyomma rotundatum* Koch, 1844
105. *Amblyomma sabanerae* Stoll, 1894
106. *Amblyomma scalpturatum* Neumann, 1906. See *A. latepunctatum*.
107. *Amblyomma scutatatum* Neumann, 1899
108. *Amblyomma soembawense* (Anastos, 1956) (*Aponomma*)
109. *Amblyomma sparsum* Neumann, 1899
110. *Amblyomma sphenodonti* (Dumbleton, 1943) (*Aponomma*). Miller *et al.* (2007) believe that this species, and possibly *A. elaphense*, should be classified in a genus other than *Amblyomma*.
111. *Amblyomma splendidum* Giebel, 1877
112. *Amblyomma squamosum* Kohls, 1953
113. *Amblyomma supinoi* Neumann, 1904

114. *Amblyomma sylvaticum* (de Geer, 1778)
115. *Amblyomma tapirellum* Dunn, 1933
116. *Amblyomma testudinarium* Koch, 1844
117. *Amblyomma tholloni* Neumann, 1899
118. *Amblyomma tigrinum* Koch, 1844
119. *Amblyomma torrei* Pérez Viguera, 1934
120. *Amblyomma transversale* (Lucas, 1845) (*Aponomma*). Most authors consider 1844 the year of description of *A. transversale*, but the name *Ixodes transversalis* in Lucas (1844) lacks a description (i.e., it is a *nomen nudum*), and this situation was amended in Lucas (1845). See *A. orlovi*.
121. *Amblyomma triguttatum* Koch, 1844
122. *Amblyomma trimaculatum* (Lucas, 1878) (*Aponomma*)
123. *Amblyomma triste* Koch, 1844
124. *Amblyomma tuberculatum* Marx, 1894
125. *Amblyomma usingeri* Keirans, Hoogstraal and Clifford, 1973
126. *Amblyomma varanense* (Supino, 1897) (*Aponomma*). Kolonin (2009) considers *A. varanense* a synonym of *A. fuscolineatum* (both are treated as species of *Aponomma*) but without presenting evidence. We believe *A. varanense* to be valid.
127. *Amblyomma variegatum* (Fabricius, 1794)
128. *Amblyomma varium* Koch, 1844
129. *Amblyomma vikirri* Keirans, Bull and Duffield, 1996
130. *Amblyomma williamsi* Banks, 1924

1. *Anomalohimalaya cricetuli* Teng and Huang, 1981. Deng *et al.* (1999) consider this species a synonym of *A. lotozkyi* but without explanation. We therefore maintain the validity of *A. cricetuli*.

2. *Anomalohimalaya lamai* Hoogstraal, Kaiser and Mitchell, 1970. This is the type species of the genus *Anomalohimalaya*.

3. *Anomalohimalaya lotozkyi* Filippova and Panova, 1978. See *A. cricetuli*.

1. *Bothriocroton auruginans* (Schulze, 1936) (*Aponomma*)

2. *Bothriocroton concolor* (Neumann, 1899) (*Aponomma*). See *B. oudemansi*.

3. *Bothriocroton glebopalma* (Keirans, King and Sharrad, 1994) (*Aponomma*). This is the type species of the genus *Bothriocroton*, by original designation (Klompen *et al.* 2002); it was originally named *Aponomma glebopalma*.

4. *Bothriocroton hydrosauri* (Denny, 1843) (*Aponomma*). See *B. tachyglossi*.

5. *Bothriocroton oudemansi* (Neumann, 1910) (*Aponomma*). This species was considered a synonym of *B. concolor*, but there is now sound scientific evidence for its validity as a species (Guglielmone *et al.* 2009).

6. *Bothriocroton tachyglossi* (Roberts, 1953) (*Aponomma*). This species was considered a synonym of *B. hydrosauri*, but there is now convincing evidence for its validity (Guglielmone *et al.* 2009).

7. *Bothriocroton undatum* (Fabricius, 1775) (*Aponomma*). This name is considered invalid by Kolonin (2009). See *B. decorosum*, paragraph “ii” above our list of Ixodidae.

1. *Compluriscutula vetulum* Poinar and Buckley, 2008. This is the type species of the fossil genus *Compluriscutula*. It is not included in the list of Kolonin (2009).

1. *Cornupalpatum burmanicum* Poinar and Brown, 2003. This is the type species of the fossil genus *Cornupalpatum*. It is not included in the list of Kolonin (2009).

2. *Cosmiomma hippopotamensis* (Denny, 1843). This is the type species of the monotypic genus *Cosmiomma*. It was originally named *Ixodes hippopotamensis*.

1. *Dermacentor abaensis* Teng, 1963. This species is similar to *D. everestianus* but is provisionally considered valid in Guglielmone *et al.* (2009) because there has been no definitive study to support this synonymy. One of us (DAA) is currently comparing the types of *D. abaensis*, *D. everestianus* and *D. birulai* Olenev, 1927. Therefore, additional information on the specific status of these taxa should be forthcoming.

2. *Dermacentor albipictus* (Packard, 1869)

3. *Dermacentor andersoni* Stiles, 1908

4. *Dermacentor asper* Arthur, 1960. Kolonin (2009) considers *D. asper* a probable synonym of *D. sinicus* but presents no evidence for this statement.

5. *Dermacentor atrosignatus* Neumann, 1906

6. *Dermacentor auratus* Supino, 1897

7. *Dermacentor circumguttatus* Neumann, 1897

8. *Dermacentor compactus* Neumann, 1901

9. *Dermacentor confragus* (Schulze, 1933). Originally spelled *confractus*, the name was later corrected to *confragus*. The type specimens are currently being examined by one of us (TNP). We consider this name valid until studies of the type material permit a conclusive statement. Kolonin (2009) excludes this name from his list of ixodid ticks of the world.

10. *Dermacentor dispar* Cooley, 1937

11. *Dermacentor dissimilis*, Cooley 1947

12. *Dermacentor everestianus* Hirst, 1926. See *D. abaensis*.

13. *Dermacentor halli* McIntosh, 1931

14. *Dermacentor hunteri* Bishopp, 1912

15. *Dermacentor imitans* Warburton, 1933

16. *Dermacentor latus* Cooley, 1937

17. *Dermacentor marginatus* (Sulzer, 1776). See *D. niveus* and *D. ushakovae*.

18. *Dermacentor montanus* Filippova and Panova, 1974

19. *Dermacentor nitens* Neumann, 1897 (*Anocentor*). This is the type species of the genus *Anocentor*.

20. *Dermacentor niveus* Neumann, 1897. Kolonin (2009) lists this species as a synonym of *D. daghestanicus* Olenev, 1928, but, in fact, the latter name is a junior synonym of *D. niveus* (Guglielmone *et al.* 2009). Estrada-Peña and Estrada-Peña (1991) examined part of the syntype series of *D. niveus* (Cherestaneek, Iran, ex *Ovis aries*, 1882, loaned by Prof. P.-C. Morel), concluding that this species is conspecific with *D. marginatus*, a view shared by Moshaverinia *et al.* (2009). A wider comparative study of *D. marginatus*, *D. niveus* and *D. ushakovae* appears to be needed to further demonstrate the validity of these taxa. We consider *D. niveus* provisionally valid while awaiting the results of this comparison. See also *D. ushakovae*.

21. *Dermacentor nuttalli* Olenev, 1928

22. *Dermacentor occidentalis* Marx, 1892

23. *Dermacentor parumapertus* Neumann, 1901

24. *Dermacentor pavlovskiyi* Olenev, 1927

25. *Dermacentor pomerantzevi* Serdjukova, 1951

26. *Dermacentor raskemensis* Pomerantzev, 1946

27. *Dermacentor reticulatus* (Fabricius, 1794). This is the type species of the genus *Dermacentor*. It was originally named *Acarus reticulatus*.

28. *Dermacentor rhinocerinus* (Denny, 1843)

29. *Dermacentor silvarum* Olenev, 1931

30. *Dermacentor sinicus* Schulze, 1932. See *D. asper*.

31. *Dermacentor steini* (Schulze, 1933)

32. *Dermacentor taiwanensis* Sugimoto, 1935

33. *Dermacentor ushakovae* Filippova and Panova, 1987. Guglielmone *et al.* (2009) state that Camicas *et al.* (1998) consider *D. ushakovae* a junior synonym of *D. niveus*, while one of us (AEP) regards this species as a junior synonym of *D. marginatus*. However, we have elected to recognize the validity of *D. ushakovae* until type comparisons clarify its status. See also *D. niveus*.

34. *Dermacentor variabilis* (Say, 1821)

1. *Haemaphysalis aborensis* Warburton, 1913

2. *Haemaphysalis aciculifer* Warburton, 1913

3. *Haemaphysalis aculeata* Lavarra, 1904

4. *Haemaphysalis adleri* Feldman-Muhsam, 1951

5. *Haemaphysalis anomala* Warburton, 1913

6. *Haemaphysalis anomaloceraea* Teng, 1984. Guglielmone *et al.* (2009) state that Camicas *et al.* (1998) consider this species a synonym of *H. shimoga*, but we continue to treat it as valid because there are no published grounds for synonymization. Kolonin (2009) considers both taxa (*H. anomaloceraea* and *H. shimoga*) to be synonyms of *H. taiwana* but presents no justification for this position.

7. *Haemaphysalis anoplos* Hoogstraal, Uilenberg and Klein, 1967

8. *Haemaphysalis aponomoides* Warburton, 1913

9. *Haemaphysalis asiatica* (Supino, 1897)

10. *Haemaphysalis atheruri* Hoogstraal, Trapido and Kohls, 1965

11. *Haemaphysalis bancrofti* Nuttall and Warburton, 1915

12. *Haemaphysalis bandicota* Hoogstraal and Kohls, 1965

13. *Haemaphysalis bartelsi* Schulze, 1938

14. *Haemaphysalis bequaerti* Hoogstraal, 1956

15. *Haemaphysalis birmaniae* Supino, 1897

16. *Haemaphysalis bispinosa* Neumann, 1897

17. *Haemaphysalis borneata* Hoogstraal, 1971

18. *Haemaphysalis bremneri* Roberts, 1963

19. *Haemaphysalis calcarata* Neumann, 1902

20. *Haemaphysalis calva* Nuttall and Warburton, 1915

21. *Haemaphysalis campanulata* Warburton, 1908

22. *Haemaphysalis canestrinii* (Supino, 1897)

23. *Haemaphysalis capricornis* Hoogstraal, 1966

24. *Haemaphysalis caucasica* Olenov, 1928

25. *Haemaphysalis celebensis* Hoogstraal, Trapido and Kohls, 1965

26. *Haemaphysalis chordeilis* (Packard, 1869)

27. *Haemaphysalis cinnabarina* Koch, 1844. This species is not included in Kolonin's (2009) list of ixodid ticks.

28. *Haemaphysalis colasbelcouri* (Santos Dias, 1958). Originally named *Aponomma colasbelcouri* Santos Dias, 1958, this species is the senior synonym of *H. vietnamensis* (see *H. vietnamensis*, paragraph "iii" above our list of Ixodidae) (Guglielmone *et al.* 2009).

29. *Haemaphysalis colesbergensis* Apanaskevich and Horak, 2008. This species is not included in Kolonin's (2009) list of ixodid ticks.

30. *Haemaphysalis concinna* Koch, 1844. This is the type species of the genus *Haemaphysalis*. See also *H. filippovae*.

31. *Haemaphysalis cooleyi* Bedford, 1929

32. *Haemaphysalis cornigera* Neumann, 1897

33. *Haemaphysalis cornupunctata* Hoogstraal and Varma, 1962

34. *Haemaphysalis cuspidata* Warburton, 1910

35. *Haemaphysalis dangi* Phan Trong, 1977

36. *Haemaphysalis danieli* Černý and Hoogstraal, 1977. See paragraph "iv" above our list of Ixodidae. Kolonin (2009) considers specimens of this taxon from China a synonym of *H. pospelovashstromae* but provides no supporting evidence.

37. *Haemaphysalis darjeeling* Hoogstraal and Dhanda, 1970

38. *Haemaphysalis davisii* Hoogstraal, Dhanda and Bhat, 1970

39. *Haemaphysalis demidovae* Emel'yanova, 1978
40. *Haemaphysalis doenitzi* Warburton and Nuttall, 1909. See *H. pavlovskyi* and *H. phasiana*.
41. *Haemaphysalis elliptica* (Koch, 1844)
42. *Haemaphysalis elongata* Neumann, 1897
43. *Haemaphysalis erinacei* Pavesi, 1884
44. *Haemaphysalis eupleres* Hoogstraal, Kohls and Trapido, 1965
45. *Haemaphysalis filippovae* Bolotin, 1979. Although Kolonin (2009) considers *H. filippovae* a synonym of *H. concinna*, Guglielmone *et al.* (2009) provide strong arguments for supporting the validity of this taxon.
46. *Haemaphysalis flava* Neumann, 1897
47. *Haemaphysalis formosensis* Neumann, 1913
48. *Haemaphysalis fossae* Hoogstraal, 1953
49. *Haemaphysalis fujisana* Kitaoka, 1970
50. *Haemaphysalis garhwalensis* Dhanda and Bhat, 1968
51. *Haemaphysalis goral* Hoogstraal, 1970
52. *Haemaphysalis grochovskajae* Kolonin, 1992. Kolonin (2009) spells this name as *H. grochovskaja* (n. syn.).
53. *Haemaphysalis heinrichi* Schulze, 1939
54. *Haemaphysalis hirsuta* Hoogstraal, Trapido and Kohls, 1966
55. *Haemaphysalis hispanica* Gil Collado, 1938
56. *Haemaphysalis hoodi* Warburton and Nuttall, 1909
57. *Haemaphysalis hoogstraali* Kohls, 1950
58. *Haemaphysalis houyi* Nuttall and Warburton, 1915
59. *Haemaphysalis howletti* Warburton, 1913
60. *Haemaphysalis humerosa* Warburton and Nuttall, 1909
61. *Haemaphysalis hylobatis* Schulze, 1933
62. *Haemaphysalis hyracophila* Hoogstraal, Walker and Neitz, 1971
63. *Haemaphysalis hystricis* Supino, 1897
64. *Haemaphysalis ias* Nakamura and Yajima, 1937
65. *Haemaphysalis indica* Warburton, 1910
66. *Haemaphysalis indoflava* Dhanda and Bhat, 1968
67. *Haemaphysalis inermis* Birula, 1895
68. *Haemaphysalis intermedia* Warburton and Nuttall, 1909
69. *Haemaphysalis japonica* Warburton, 1908
70. *Haemaphysalis juxtakochi* Cooley, 1946
71. *Haemaphysalis kadarsani* Hoogstraal and Wassef, 1977
72. *Haemaphysalis kashmirensis* Hoogstraal and Varma, 1962
73. *Haemaphysalis kinneari* Warburton, 1913
74. *Haemaphysalis kitaokai* Hoogstraal, 1969
75. *Haemaphysalis knobigera* Prakasan and Ramani, 2007. The original description of this species is very poor and we strongly doubt its validity (Guglielmone *et al.* 2009), but we include it here pending further studies. Kolonin (2009) does not include *H. knobigera* in his list of the Ixodidae of the world.
76. *Haemaphysalis koningsbergeri* Warburton and Nuttall, 1909
77. *Haemaphysalis kopetdaghica* Kerbabaev, 1962. Kolonin (2009) spells this name as *H. kopetdagica* (n. syn.).
78. *Haemaphysalis kutchensis* Hoogstraal and Trapido, 1963
79. *Haemaphysalis kysanurensis* Trapido, Hoogstraal and Rajagopalan, 1964
80. *Haemaphysalis lagostrophii* Roberts, 1963
81. *Haemaphysalis lagrangei* Larrousse, 1925
82. *Haemaphysalis laocayensis* Phan Trong, 1977
83. *Haemaphysalis leachi* (Audouin, 1826)

84. *Haemaphysalis lemuris* Hoogstraal, 1953
85. *Haemaphysalis leporispalustris* (Packard, 1869)
86. *Haemaphysalis lobachovi* Kolonin, 1995
87. *Haemaphysalis longicornis* Neumann, 1901
88. *Haemaphysalis luzonensis* Hoogstraal and Parrish, 1968
89. *Haemaphysalis madagascariensis* Colas-Belcour and Millot, 1948
90. *Haemaphysalis mageshimaensis* Saito and Hoogstraal, 1973
91. *Haemaphysalis megalaimae* Rajagopalan, 1963
92. *Haemaphysalis megaspinosa* Saito, 1969
93. *Haemaphysalis menglaensis* Pang, Chen and Xiang, 1982
94. *Haemaphysalis minuta* Kohls, 1950
95. *Haemaphysalis mjoebergi* Warburton, 1926
96. *Haemaphysalis montgomeryi* Nuttall, 1912
97. *Haemaphysalis moreli* Camicas, Hoogstraal and El Kammah, 1972
98. *Haemaphysalis moschisuga* Teng, 1980
99. *Haemaphysalis muhsamae* Santos Dias, 1954. This species is ignored in the Kolonin (2009) list.
100. *Haemaphysalis nadchatrami* Hoogstraal, Trapido and Kohls, 1965
101. *Haemaphysalis nepalensis* Hoogstraal, 1962
102. *Haemaphysalis nesomys* Hoogstraal, Uilenberg and Klein, 1966
103. *Haemaphysalis norvali* Hoogstraal and Wassef, 1983
104. *Haemaphysalis novaeguineae* Hirst, 1914
105. *Haemaphysalis obesa* Larrousse, 1925
106. *Haemaphysalis obtusa* Dönitz, 1910
107. *Haemaphysalis oliveri* Apanaskevich and Horak, 2008. This species is not included in the Kolonin (2009) list of ixodid ticks.
108. *Haemaphysalis orientalis* Nuttall and Warburton, 1915
109. *Haemaphysalis ornithophila* Hoogstraal and Kohls, 1959
110. *Haemaphysalis palawanensis* Kohls, 1950
111. *Haemaphysalis papuana* Thorell, 1883
112. *Haemaphysalis paraleachi* Camicas, Hoogstraal and El Kammah, 1983
113. *Haemaphysalis paraturturis* Hoogstraal, Trapido and Rebello, 1963
114. *Haemaphysalis parmata* Neumann, 1905
115. *Haemaphysalis parva* (Neumann, 1897)
116. *Haemaphysalis pavlovskyi* Pospelova-Shtrom, 1935. Guglielmone *et al.* (2009) provide strong arguments for the validity of *H. pavlovskyi*, but Kolonin (2009) regards this species as a synonym of *H. doenitzi*, a position that we consider unjustified.
117. *Haemaphysalis pedetes* Hoogstraal, 1972
118. *Haemaphysalis pentalagi* Pospelova-Shtrom, 1935
119. *Haemaphysalis petrogalis* Roberts, 1970
120. *Haemaphysalis phasiana* Saito, Hoogstraal and Wassef, 1974. Kolonin (2009) considers *H. phasiana* a synonym of *H. doenitzi*, but his evidence is not conclusive.
121. *Haemaphysalis pospelovashstromae* Hoogstraal, 1966. See *H. danieli*.
122. *Haemaphysalis primitiva* Teng, 1982
123. *Haemaphysalis psalistos* Hoogstraal, Kohls and Parrish, 1967
124. *Haemaphysalis punctaleachi* Camicas, Hoogstraal and El Kammah, 1983
125. *Haemaphysalis punctata* Canestrini and Fanzago, 1878
126. *Haemaphysalis quadriaculeata* Kolonin, 1992
127. *Haemaphysalis quinghaiensis* Teng, 1980. Guglielmone *et al.* (2009) follow Camicas *et al.* (1998) in stressing that the correct Latin epithet for this species is *qinghaiensis*, not *qinghaiensis*, even though the latter spelling appears in the original description.

128. *Haemaphysalis ramachandrai* Dhanda, Hoogstraal and Bhat, 1970
129. *Haemaphysalis ratti* Kohls, 1948
130. *Haemaphysalis renschi* Schulze, 1933
131. *Haemaphysalis roubaudi* Toumanoff, 1940
132. *Haemaphysalis rugosa* Santos Dias, 1956
133. *Haemaphysalis rusae* Kohls, 1950
134. *Haemaphysalis sambar* Hoogstraal, 1971
135. *Haemaphysalis sciuri* Kohls, 1950
136. *Haemaphysalis semermis* Neumann, 1901
137. *Haemaphysalis shimoga* Trapido and Hoogstraal, 1964. See *H. anomaloceraea*.
138. *Haemaphysalis silacea* Robinson, 1912
139. *Haemaphysalis silvafelis* Hoogstraal and Trapido, 1963
140. *Haemaphysalis simplex* Neumann, 1897
141. *Haemaphysalis simplicima* Hoogstraal and Wassef, 1979
142. *Haemaphysalis sinensis* Zhang, 1981
143. *Haemaphysalis spinigera* Neumann, 1897
144. *Haemaphysalis spinulosa* Neumann, 1906
145. *Haemaphysalis subelongata* Hoogstraal, 1953
146. *Haemaphysalis subterra* Hoogstraal, El Kammah and Camicas, 1992
147. *Haemaphysalis sulcata* Canestrini and Fanzago, 1878
148. *Haemaphysalis sumatraensis* Hoogstraal, El Kammah, Kadarsan and Anastos, 1971
149. *Haemaphysalis sundrai* Sharif, 1928
150. *Haemaphysalis suntzovi* Kolonin, 1993
151. *Haemaphysalis susphilippensis* Hoogstraal, Kohls and Parrish, 1968
152. *Haemaphysalis taiwana* Sugimoto, 1936. See *H. anomaloceraea*.
153. *Haemaphysalis tauffliebi* Morel, 1965
154. *Haemaphysalis theileriae* Hoogstraal, 1953
155. *Haemaphysalis tibetensis* Hoogstraal, 1965
156. *Haemaphysalis tiptoni* Hoogstraal, 1953
157. *Haemaphysalis toxopei* Warburton, 1927. This species is ignored in Kolonin's (2009) list of the Ixodidae of the world.
158. *Haemaphysalis traguli* Oudemans, 1928
159. *Haemaphysalis traubi* Kohls, 1955
160. *Haemaphysalis turturis* Nuttall and Warburton, 1915.
161. *Haemaphysalis verticalis* Itagaki, Noda and Yamaguchi, 1944
162. *Haemaphysalis vidua* Warburton and Nuttall, 1909
163. *Haemaphysalis warburtoni* Nuttall, 1912
164. *Haemaphysalis wellingtoni* Nuttall and Warburton, 1908
165. *Haemaphysalis yeni* Toumanoff, 1944
166. *Haemaphysalis zumpti* Hoogstraal and El Kammah, 1974

1. *Hyalomma aegyptium* (Linnaeus, 1758). This is the type species of the genus *Hyalomma*, as discussed in Filippova (1984). It was originally named *Acarus aegyptius*. See also *H. dromedarii*.

2. *Hyalomma albiparmatum* Schulze, 1919. Apanaskevich & Horak (2008) consider *H. albiparmatum* a valid species but did not discount the possibility that it may be conspecific with *H. truncatum*. See also *H. nitidum*.

3. *Hyalomma anatolicum* Koch, 1844. See *H. excavatum*.

4. *Hyalomma arabica* Pegram, Hoogstraal and Wassef, 1982

5. *Hyalomma asiaticum* Schulze and Schlottke, 1930

6. *Hyalomma brevipunctata* Sharif, 1928

7. *Hyalomma dromedarii* Koch, 1844. This is the type species of the genus *Hyalomma* in Camicas *et al.* (1998), but we agree with Filippova (1984), who considers *H. aegyptium* to be the type.

8. *Hyalomma excavatum* Koch, 1844. This species was previously classified as a subspecies of *H. anatolicum* (Guglielmone *et al.* 2009).

9. *Hyalomma franchinii* Tonelli-Rondelli, 1932.

10. *Hyalomma glabrum* Delpy, 1949. This name was until recently considered a synonym of *H. turanicum* (Guglielmone *et al.* 2009).

11. *Hyalomma hussaini* Sharif, 1928

12. *Hyalomma hystricis* Dhanda and Raja, 1974

13. *Hyalomma impeltatum* Schulze and Schlottke, 1930. See *H. erythraeum*, paragraph “v” above our list of Ixodidae.

14. *Hyalomma impressum* Koch, 1844

15. *Hyalomma isaaci* Sharif, 1928. This species was previously classified as a subspecies of *H. marginatum* (Guglielmone *et al.* 2009).

16. *Hyalomma kumari* Sharif, 1928

17. *Hyalomma lusitanicum* Koch, 1844

18. *Hyalomma marginatum* Koch, 1844. See *H. isaaci*, *H. rufipes* and *H. turanicum*.

19. *Hyalomma nitidum* Schulze, 1919. Apanaskevich & Horak (2008) consider *H. nitidum* a valid species but left open the possibility that it may be conspecific with *H. truncatum*. See also *H. albiparmatum*.

20. *Hyalomma punt* Hoogstraal, Kaiser and Pedersen, 1969

21. *Hyalomma rhipicephaloides* Neumann, 1901

22. *Hyalomma rufipes* Koch, 1844. This species was previously classified as a subspecies of *H. marginatum* (Guglielmone *et al.* 2009).

23. *Hyalomma schulzei* Olenev, 1931

24. *Hyalomma scupense* Schulze, 1919. Until recently, this species was known as *H. detritum* Schulze, 1919 by many Western workers. Because this is an economically important tick, Guglielmone *et al.* (2009) proposed referring to it as *H. scupense* (= *H. detritum*) in order to avoid confusion.

25. *Hyalomma somalicum* Tonelli-Rondelli, 1935. This taxon was recently resurrected by Apanaskevich and Horak (2009).

26. *Hyalomma truncatum* Koch, 1844. See *H. albiparmatum* and *H. nitidum*.

27. *Hyalomma turanicum* Pomerantzev, 1946. This species was previously classified as a subspecies of *H. marginatum* (Guglielmone *et al.* 2009). Kolonin (2009) excludes *H. turanicum* from his list of ixodid ticks of the world.

1. *Ixodes abrocomae* Lahille, 1916. Some authors have listed the year 1916 for Lahille’s original description of *Ixodes abrocomae*, while others have used the year 1917. An inquiry to the U.S Library of Congress failed to resolve the problem. A request to the Sociedad Chilena de Biología (publisher of Revista Chilena de Historia Natural, where the description of *I. abrocomae* appeared) was not answered. We consider 1916 as the year of description of *I. abrocomae*. See also *I. sigelos*.

2. *Ixodes acuminatus* Neumann, 1901. See *I. redikorzevi*.

3. *Ixodes acutitarsus* (Karsch, 1880)

4. *Ixodes affinis* Neumann, 1899

5. *Ixodes albignaci* Uilenberg and Hoogstraal, 1969

6. *Ixodes alluaudi* Neumann, 1913

7. *Ixodes amarali* Fonseca, 1935

8. *Ixodes amersoni* Kohls, 1966

9. *Ixodes anatis* Chilton, 1904. Some authors consider the name of this species to be *I. apteridis* Maskell, 1897, a *nomen nudum* (Guglielmone *et al.* 2009).

10. *Ixodes andinus* Kohls, 1956

11. *Ixodes angustus* Neumann, 1899

12. *Ixodes antechini* Roberts, 1960
13. *Ixodes apronophorus* Schulze, 1924
14. *Ixodes arabukiensis* Arthur, 1959. This species is very similar to *I. djaronensis*, but Guglielmone *et al.* (2009) consider it valid pending a comparison of types. Kolonin (2009) excludes *I. arabukiensis* from his list of Ixodidae.
15. *Ixodes aragaoi* Fonseca, 1935
16. *Ixodes arboricola* Schulze and Schlottke, 1930
17. *Ixodes arebiensis* Arthur, 1956
18. *Ixodes asanumai* Kitaoka, 1973
19. *Ixodes aulacodi* Arthur, 1956
20. *Ixodes auriculaelongae* Arthur, 1958
21. *Ixodes auritulus* Neumann, 1904. This name is thought to represent an *Ixodes* species group (González-Acuña *et al.* 2009).
22. *Ixodes australiensis* Neumann, 1904
23. *Ixodes baergi* Cooley and Kohls, 1942
24. *Ixodes bakeri* Arthur and Clifford, 1961
25. *Ixodes banksi* Bishopp, 1911
26. *Ixodes bedfordi* Arthur, 1959
27. *Ixodes bequaerti* Cooley and Kohls, 1945
28. *Ixodes berlesei* Birula, 1895
29. *Ixodes bivari* Santos Dias, 1990. Kolonin (2009) does not include *I. bivari* in his list; apparently he regards this name as a synonym of *I. ventalloi*. One of us (AEP) examined the types of *I. bivari* and found that they differ from *I. ventalloi*, especially in the morphology of the basis capituli. Therefore, we treat *I. bivari* as valid.
30. *Ixodes boliviensis* Neumann, 1904. This species is very similar to *I. diversifossus*, but Guglielmone *et al.* (2009) consider it valid pending a comparison of types.
31. *Ixodes brewsterae* Keirans, Clifford and Walker, 1982
32. *Ixodes browningi* Arthur, 1956
33. *Ixodes brumpti* Morel, 1965
34. *Ixodes brunneus* Koch, 1844
35. *Ixodes calcarhebes* Arthur and Zulu, 1980
36. *Ixodes caledonicus* Nuttall, 1910
37. *Ixodes canisuga* Johnston, 1849. Teng and Jiang (1991) and Kolonin (2009) consider *I. canisuga* a synonym of *I. crenulatus* but provide no supporting evidence; we therefore have retained *I. canisuga* as valid.
38. *Ixodes capromydis* Èern 1966
39. *Ixodes catherinei* Keirans, Clifford and Walker, 1982
40. *Ixodes cavipalpus* Nuttall and Warburton, 1908
41. *Ixodes ceylonensis* Kohls, 1950
42. *Ixodes chilensis* Kohls, 1956
43. *Ixodes colasbelcouri* Arthur, 1957
44. *Ixodes colloclaliae* Schulze, 1937
45. *Ixodes columnae* Takada and Fujita, 1992
46. *Ixodes conepati* Cooley and Kohls, 1943
47. *Ixodes confusus* Roberts, 1960
48. *Ixodes cookei* Packard, 1869
49. *Ixodes cooleyi* Aragão and Fonseca, 1951
50. *Ixodes copei* Wilson, 1980
51. *Ixodes cordifer* Neumann, 1908
52. *Ixodes cornuae* Arthur, 1960
53. *Ixodes cornuatus* Roberts, 1960

54. *Ixodes cornutus* Lotozky, 1956. Camicas *et al.* (1998) consider *I. cornutus* a synonym of *I. rugicollis*, although Filippova (1977) redescribed *I. cornutus* as valid. We treat this species as tentatively valid, pending type comparison with *I. rugicollis*.

55. *Ixodes corwini* Keirans, Clifford and Walker, 1982

56. *Ixodes crenulatus* Koch, 1844. See *I. canisuga* and *I. prokopjevi*

57. *Ixodes cuernavacensis* Kohls and Clifford, 1966

58. *Ixodes cumulatimpunctatus* Schulze, 1943

59. *Ixodes dampfi* Cooley, 1943

60. *Ixodes daveyi* Nuttall, 1913

61. *Ixodes dawesi* Arthur, 1956

62. *Ixodes dendrolagi* Wilson, 1967

63. *Ixodes dentatus* Marx, 1899

64. *Ixodes dicei* Keirans and Ajohda, 2003

65. *Ixodes diomedae* Arthur, 1958

66. *Ixodes diversifossus* Neumann, 1899. Kolonin (2009) does not include this species in his list of world Ixodidae. See also *I. boliviensis*.

67. *Ixodes djaronensis* Neumann, 1907. See *I. arabukiensis*

68. *Ixodes domerguei* Uilenberg and Hoogstraal, 1965

69. *Ixodes downsi* Kohls, 1957

70. *Ixodes drakensbergensis* Clifford, Theiler and Baker, 1975

71. *Ixodes eadsi* Kohls and Clifford, 1964

72. *Ixodes eastoni* Keirans and Clifford, 1983

73. *Ixodes eichhorni* Nuttall, 1916

74. *Ixodes eldaricus* Dzhaparidze, 1950

75. *Ixodes elongatus* Bedford, 1929

76. *Ixodes eudypitidis* Maskell, 1885

77. *Ixodes euplecti* Arthur, 1958

78. *Ixodes evansi* Arthur, 1956

79. *Ixodes fecialis* Warburton and Nuttall, 1909

80. *Ixodes festai* Tonelli-Rondelli, 1926

81. *Ixodes filippovae* Černý, 1961. Kolonin (2009) does not include this species in his list of ixodid ticks of the world. He is probably following Filippova (1977), who considers *I. filippovae* a synonym of *I. crenulatus*. In fact, the status of *I. filippovae* is questionable and we list this species as provisionally valid while awaiting further studies.

82. *Ixodes fossulatus* Neumann, 1899

83. *Ixodes frontalis* (Panzer, 1798)

84. *Ixodes fuscipes* Koch, 1844

85. *Ixodes galapagoensis* Clifford and Hoogstraal, 1980

86. *Ixodes ghilarovi* Filippova and Panova, 1988

87. *Ixodes gibbosus* Nuttall, 1916

88. *Ixodes granulatus* Supino, 1897

89. *Ixodes gregsoni* Lindquist, Wu and Redner, 1999

90. *Ixodes guatemalensis* Kohls, 1956

91. *Ixodes hearlei* Gregson, 1941

92. *Ixodes heinrichi* Arthur, 1962

93. *Ixodes hexagonus* Leach, 1815

94. *Ixodes himalayensis* Dhanda and Kulkarni, 1969

95. *Ixodes hirsti* Hassall, 1931

96. *Ixodes holocyclus* Neumann, 1899

97. *Ixodes hoogstraali* Arthur, 1955

98. *Ixodes howelli* Cooley and Kohls, 1938
99. *Ixodes hyatti* Clifford, Hoogstraal and Kohls, 1971
100. *Ixodes hydromyidis* Swan, 1931
101. *Ixodes jacksoni* Hoogstraal, 1967
102. *Ixodes jellisoni* Cooley and Kohls, 1938
103. *Ixodes jonesae* Kohls, Sonenshine and Clifford, 1969
104. *Ixodes kaiseri* Arthur, 1957
105. *Ixodes kashmiricus* Pomerantzev, 1948. Guglielmone *et al.* (2009) asserted that the spelling *kaschmiricus* was correct. However, Pomerantzev (1950) amended the spelling *kaschmiricus* to *kashmiricus*, the valid name for this species.
106. *Ixodes kazakstani* Olenev and Sorokoumov, 1934
107. *Ixodes kerguelenensis* André and Colas-Belcour, 1942
108. *Ixodes kingi* Bishopp, 1911
109. *Ixodes kohlsi* Arthur, 1955
110. *Ixodes kopsteini* (Oudemans, 1926)
111. *Ixodes kuntzi* Hoogstraal and Kohls, 1965
112. *Ixodes laguri* Olenev, 1929
113. *Ixodes lasallei* Méndez Arocha and Ortiz, 1958
114. *Ixodes latus* Arthur, 1958
115. *Ixodes laysanensis* Wilson, 1964
116. *Ixodes lemuris* Arthur, 1958
117. *Ixodes lewisi* Arthur, 1965
118. *Ixodes lividus* Koch, 1844
119. *Ixodes longiscutatus* Boero, 1944
120. *Ixodes loricatus* Neumann, 1899
121. *Ixodes loveridgei* Arthur, 1958
122. *Ixodes luciae* Sénevet, 1940
123. *Ixodes lunatus* Neumann, 1907
124. *Ixodes luxuriosus* Schulze, 1932
125. *Ixodes macfarlanei* Keirans, Clifford and Walker, 1982
126. *Ixodes malayensis* Kohls, 1962
127. *Ixodes marmotae* Cooley and Kohls, 1938
128. *Ixodes marxi* Banks, 1908
129. *Ixodes maslovi* Emel'yanova and Kozlovskaya, 1967. Kolonin (2009) considers *I. maslovi* a synonym of *I. persulcatus*, but Guglielmone *et al.* (2009) provide arguments for its validity.
130. *Ixodes matopi* Spickett, Keirans, Norval and Clifford, 1981
131. *Ixodes mexicanus* Cooley and Kohls, 1942
132. *Ixodes minor* Neumann, 1902
133. *Ixodes minutae* Arthur, 1959
134. *Ixodes mitchelli* Kohls, Clifford and Hoogstraal, 1970
135. *Ixodes monospinosus* Saito, 1968
136. *Ixodes montoyanus* Cooley, 1944
137. *Ixodes moreli* Arthur, 1957
138. *Ixodes moscharius* Teng, 1982
139. *Ixodes moschiferi* Nemenz, 1968
140. *Ixodes muniensis* Arthur and Burrow, 1957
141. *Ixodes muris* Bishopp and Smith, 1937
142. *Ixodes murreleti* Cooley and Kohls, 1945
143. *Ixodes myospalacis* Teng, 1986
144. *Ixodes myotomys* Clifford and Hoogstraal, 1970

145. *Ixodes myrmecobii* Roberts, 1962
146. *Ixodes nairobiensis* Nuttall, 1916
147. *Ixodes nchisiensis* Arthur, 1958
148. *Ixodes nectomys* Kohls, 1956
149. *Ixodes neitzi* Clifford, Walker and Keirans, 1977
150. *Ixodes nesomys* Uilenberg and Hoogstraal, 1969
151. *Ixodes neuquenensis* Ringuelet, 1947
152. *Ixodes nicolasi* Santos Dias, 1982. Kolonin (2009) excludes this species from his list of world Ixodidae.
153. *Ixodes nipponensis* Kitaoka and Saito, 1967
154. *Ixodes nitens* Neumann, 1904
155. *Ixodes nuttalli* Lahille, 1913
156. *Ixodes nuttallianus* Schulze, 1930
157. *Ixodes occultus* Pomerantzev, 1946
158. *Ixodes ochotonae* Gregson, 1941
159. *Ixodes okapiae* Arthur, 1956
160. *Ixodes oldi* Nuttall, 1913
161. *Ixodes ornithorhynchi* Lucas, 1846
162. *Ixodes ovatus* Neumann, 1899
163. *Ixodes pacificus* Cooley and Kohls, 1943
164. *Ixodes paranaensis* Barros-Battesti, Arzua, Pichorim and Keirans, 2003
165. *Ixodes pararicinus* Keirans and Clifford, 1985
166. *Ixodes pavlovskyi* Pomerantzev, 1946
167. *Ixodes percavatus* Neumann, 1906
168. *Ixodes peromysci* Augustson, 1940
169. *Ixodes persulcatus* Schulze, 1930. See also *I. maslovi* and *I. sachalinensis*.
170. *Ixodes petauristae* Warburton, 1933
171. *Ixodes philipi* Keirans and Kohls, 1970
172. *Ixodes pilosus* Koch, 1844. McKay (1994) considers that there are three species under the name *I. pilosus*. Two of us (DAA and IGH) and co-workers are currently studying *I. pilosus* and its alleged sibling species.
173. *Ixodes pomerantzevi* Serdjukova, 1941. Guglielmone *et al.* (2009) asserted that the spelling *pomeranzevi* was correct. However, Pomerantzev (1950) amended the spelling *pomeranzevi* to *pomerantzevi*, the valid name for this species.
174. *Ixodes pomerantzi* Kohls, 1956
175. *Ixodes priscicollaris* Schulze, 1932
176. *Ixodes procaviae* Arthur and Burrow, 1957
177. *Ixodes prokopjevi* (Emel'yanova, 1979). Kolonin (2009) appears to consider this species a likely synonym of *I. crenulatus*, but we find no reason to declare *I. prokopjevi* invalid.
178. *Ixodes radfordi* Kohls, 1948
179. *Ixodes rageaui* Arthur, 1958
180. *Ixodes randrianasoloi* Uilenberg and Hoogstraal, 1969
181. *Ixodes rasmus* Neumann, 1899
182. *Ixodes redikorzevi* Olenov, 1927. Kolonin (2009) considers this species a synonym of *I. acuminatus*, but we regard it as provisionally valid.
183. *Ixodes rhabdomysae* Arthur, 1959
184. *Ixodes ricinus* (Linnaeus, 1758). This is the type species of the genus *Ixodes*; it was originally named *Acarus ricinus*.
185. *Ixodes rothschildi* Nuttall and Warburton, 1911
186. *Ixodes rotundatus* Arthur, 1958

187. *Ixodes rubicundus* Neumann, 1904
188. *Ixodes rubidus* Neumann, 1901
189. *Ixodes rugicollis* Schulze and Schlottke, 1930. See *I. cornutus*.
190. *Ixodes rugosus* Bishopp, 1911
191. *Ixodes sachalinensis* Filippova, 1971. Kolonin (2009) considers *I. sachalinensis* a synonym of *I. persulcatus*, but Guglielmone *et al.* (2009) have found no evidence to support this position.
192. *Ixodes scapularis* Say, 1821
193. *Ixodes schillingsi* Neumann, 1901
194. *Ixodes schulzei* Aragão and Fonseca, 1951
195. *Ixodes sculptus* Neumann, 1904
196. *Ixodes semenovi* Olenov, 1929
197. *Ixodes shahi* Clifford, Hoogstraal and Kohls, 1971
198. *Ixodes siamensis* Kitaoka and Suzuki, 1983. Kolonin (2009) considers *I. siamensis* a synonym of *I. ovatus*, but Guglielmone *et al.* (2009) treat it as provisionally valid.
199. *Ixodes sigelos* Keirans, Clifford and Corwin, 1976. In Camicas *et al.* (1998), *I. sigelos* is listed as a synonym of *I. abrocomae* Lahille, 1916, but Guglielmone *et al.* (2009) found no evidence for this arrangement and declared both names valid. Recently, Guglielmone *et al.* (in press) redescribed the male and described the female of *I. abrocomae*, thereby settling this controversy.
200. *Ixodes signatus* Birula, 1895
201. *Ixodes simplex* Neumann, 1906
202. *Ixodes sinaloa* Kohls and Clifford, 1966
203. *Ixodes sinensis* Teng, 1977
204. *Ixodes soricis* Gregson, 1942
205. *Ixodes spinae* Arthur, 1958
206. *Ixodes spinicoxalis* Neumann, 1899
207. *Ixodes spinipalpis* Hadwen and Nuttall, 1916
208. *Ixodes steini* Schulze, 1932
209. *Ixodes stilesi* Neumann, 1911
210. *Ixodes stromi* Filippova, 1957
211. *Ixodes subterraneanus* Filippova, 1961. This species was originally named *I. subterraneus* in Filippova (1961), but amended to *I. subterraneanus* in Filippova (1977).
212. *Ixodes succineus* Weidner, 1964. Fossil. This species is not included in Kolonin (2009).
213. *Ixodes taglei* Kohls, 1969
214. *Ixodes tamaulipas* Kohls and Clifford, 1966
215. *Ixodes tancitarius* Cooley and Kohls, 1942
216. *Ixodes tanuki* Saito, 1964
217. *Ixodes tapirus* Kohls, 1956
218. *Ixodes tasmani* Neumann, 1899
219. *Ixodes tecpanensis* Kohls, 1956
220. *Ixodes texanus* Banks, 1909
221. *Ixodes theilerae* Arthur, 1953
222. *Ixodes thomasae* Arthur and Burrow, 1957
223. *Ixodes tiptoni* Kohls and Clifford, 1962
224. *Ixodes tovari* Cooley, 1945
225. *Ixodes transvaalensis* Clifford and Hoogstraal, 1966
226. *Ixodes trianguliceps* Birula, 1895
227. *Ixodes trichosuri* Roberts, 1960
228. *Ixodes tropicalis* Kohls, 1956
229. *Ixodes turdus* Nakatsuji, 1942
230. *Ixodes ugandanus* Neumann, 1906

231. *Ixodes unicavatus* Neumann, 1908
232. *Ixodes uriae* White, 1852
233. *Ixodes vanidicus* Schulze, 1943
234. *Ixodes venezuelensis* Kohls, 1953
235. *Ixodes ventalloi* Gil Collado, 1936
236. *Ixodes vespertilionis* Koch, 1844
237. *Ixodes vestitus* Neumann, 1908
238. *Ixodes victoriensis* Nuttall, 1916
239. *Ixodes walkerae* Clifford, Kohls and Hoogstraal, 1968
240. *Ixodes werneri* Kohls, 1950
241. *Ixodes woodi* Bishopp, 1911
242. *Ixodes zaglossi* Kohls, 1960
243. *Ixodes zairensis* Keirans, Clifford and Walker, 1982

1. *Margaropus reidi* Hoogstraal, 1956
2. *Margaropus wileyi* Walker and Laurence, 1973
3. *Margaropus winthemi* Karsch, 1879. This is the type species of the genus *Margaropus*.

1. *Nosomma monstrosum* (Nuttall and Warburton, 1908). This is the type species of the formerly monotypic genus *Nosomma*; it was originally named *Hyalomma monstrosum*.

2. *Nosomma keralensis* Prakasan and Ramani, 2007. The original description of this species is very poor and we strongly doubt its validity (Guglielmone *et al.* 2009), but we include it here pending type comparison with *N. monstrosum*, which should readily clarify its status. Kolonin (2009) does not include this species in his list of the Ixodidae of the world.

1. *Rhipicentor bicornis* Nuttall and Warburton, 1908. This is the type species of the genus *Rhipicentor*.
2. *Rhipicentor nuttalli* Cooper and Robinson, 1908

1. *Rhipicephalus annulatus* (Say, 1821) (*Boophilus*). This is the type species of the genus *Boophilus*. This species was originally named *Ixodes annulatus*.

2. *Rhipicephalus appendiculatus* Neumann, 1901
3. *Rhipicephalus aquatilis* Walker, Keirans and Pegram, 1993
4. *Rhipicephalus armatus* Pocock, 1900
5. *Rhipicephalus arnoldi* Theiler and Zumpt, 1949
6. *Rhipicephalus aurantiacus* Neumann, 1907. Guglielmone *et al.* (2009) note that this tick is considered a synonym of *R. ziemanni* by some authors, but because there has been no comparison of types, we provisionally regard *R. aurantiacus* as valid. Kolonin (2009) does not include *R. aurantiacus* in his list of world Ixodidae.

7. *Rhipicephalus bequaerti* Zumpt, 1949
8. *Rhipicephalus bergeoni* Morel and Balis, 1976
9. *Rhipicephalus boueti* Morel, 1957
10. *Rhipicephalus bursa* Canestrini and Fanzago, 1878
11. *Rhipicephalus camicasi* Morel, Mouchet and Rodhain, 1976
12. *Rhipicephalus capensis* Koch, 1844
13. *Rhipicephalus carnivoralis* Walker, 1966
14. *Rhipicephalus cliffordi* Morel, 1965. Guglielmone *et al.* (2009) note that this tick has been considered a synonym of *R. pseudolongus*, but because there has been no comparison of types, we provisionally regard *R. cliffordi* as valid. Kolonin (2009) does not share this opinion.
15. *Rhipicephalus complanatus* Neumann, 1911
16. *Rhipicephalus compositus* Neumann, 1897

17. *Rhipicephalus cuspidatus* Neumann, 1906
18. *Rhipicephalus decoloratus* Koch, 1844 (*Boophilus*)
19. *Rhipicephalus deltoideus* Neumann, 1910
20. *Rhipicephalus distinctus* Bedford, 1932
21. *Rhipicephalus duttoni* Neumann, 1907
22. *Rhipicephalus dux* Dönitz, 1910
23. *Rhipicephalus evertsi* Neumann, 1897
24. *Rhipicephalus exophthalmos* Keirans and Walker, 1993
25. *Rhipicephalus follis* Dönitz, 1910
26. *Rhipicephalus fulvus* Neumann, 1913
27. *Rhipicephalus geigy* Aeschlimann and Morel, 1965 (*Boophilus*)
28. *Rhipicephalus gertrudae* Feldman-Muhsam, 1960
29. *Rhipicephalus glabroscutatum* Du Toit, 1941
30. *Rhipicephalus guilhoni* Morel and Vassiliades, 1963
31. *Rhipicephalus haemaphysaloides* Supino, 1897
32. *Rhipicephalus humeralis* Tonelli-Rondelli, 1926
33. *Rhipicephalus hurti* Wilson, 1954
34. *Rhipicephalus interventus* Walker, Pegram and Keirans, 1995
35. *Rhipicephalus jeanneli* Neumann, 1913
36. *Rhipicephalus kochi* Dönitz, 1905
37. *Rhipicephalus kohlsi* (Hoogstraal and Kaiser, 1960) (*Boophilus*)
38. *Rhipicephalus leporis* Pomerantzev, 1946
39. *Rhipicephalus longiceps* Warburton, 1912
40. *Rhipicephalus longicoxatus* Neumann, 1905
41. *Rhipicephalus longus* Neumann, 1907. See *R. pseudolongus*.
42. *Rhipicephalus lounsburyi* Walker, 1990
43. *Rhipicephalus lunulatus* Neumann, 1907
44. *Rhipicephalus maculatus* Neumann, 1901
45. *Rhipicephalus masseyi* Nuttall and Warburton, 1908
46. *Rhipicephalus microplus* (Canestrini, 1888) (*Boophilus*). Some authors have listed the year 1887 for the original description of *Rhipicephalus microplus* (the species was described as *Haemophysalis* [sic] *micropla*), while others have used the year 1888. An inquiry to the U.S. Library of Congress has shown that Canestrini (1887) was actually published in Padova by Stabilimento Prosperini in 1888; therefore, we recognize the latter year for the description of *R. microplus*. A recent study by Labruna *et al.* (2009b) presents evidence that populations of *R. microplus* from Australia are not conspecific with Afrotropical and Neotropical populations, although Afrotropical and Neotropical populations are conspecific.
47. *Rhipicephalus moucheti* Morel, 1965
48. *Rhipicephalus muelhensi* Zumpt, 1943
49. *Rhipicephalus muhsamae* Morel and Vassiliades, 1965
50. *Rhipicephalus neumanni* Walker, 1990
51. *Rhipicephalus nitens* Neumann, 1904
52. *Rhipicephalus oculatus* Neumann, 1901
53. *Rhipicephalus oreotragi* Walker and Horak, 2000
54. *Rhipicephalus pilans* Schulze, 1935
55. *Rhipicephalus planus* Neumann, 1907
56. *Rhipicephalus praetextatus* Gerstäcker, 1873
57. *Rhipicephalus pravus* Dönitz, 1910
58. *Rhipicephalus pseudolongus* Santos Dias, 1953. Guglielmone *et al.* (2009) note that this tick is considered a synonym of *R. longus* by some authors, but no evidence has been forthcoming to support such a view; therefore, we regard *R. pseudolongus* as tentatively valid. See also *R. cliffordi*.

59. *Rhipicephalus pulchellus* (Gerstäcker, 1873)
60. *Rhipicephalus pumilio* Schulze, 1935
61. *Rhipicephalus punctatus* Warburton, 1912. See *R. serranoi*.
62. *Rhipicephalus pusillus* Gil Collado, 1936
63. *Rhipicephalus ramachandrai* Dhanda, 1966
64. *Rhipicephalus rossicus* Yakimov and Kol-Yakimova, 1911
65. *Rhipicephalus sanguineus* (Latreille, 1806). This is the type species of the genus *Rhipicephalus*; it was originally named *Ixodes sanguineus*.
66. *Rhipicephalus scalpturatus* Santos Dias, 1959
67. *Rhipicephalus schulzei* Olenov, 1929
68. *Rhipicephalus sculptus* Warburton, 1912
69. *Rhipicephalus senegalensis* Koch, 1844
70. *Rhipicephalus serranoi* Santos Dias, 1950. Guglielmone *et al.* (2009) note that this species is considered a synonym of *R. punctatus* by some authors, but characters useful for separating the two species have been published.
71. *Rhipicephalus simpsoni* Nuttall, 1910
72. *Rhipicephalus simus* Koch, 1844
73. *Rhipicephalus sulcatus* Neumann, 1908
74. *Rhipicephalus supertritus* Neumann, 1907
75. *Rhipicephalus tetracornus* Kitaoka and Suzuki, 1983. Kolonin (2009) excludes *R. tetracornus* from his list of world Ixodidae, but the holotype nymph exists and no evidence has been proffered to support synonymization (Guglielmone *et al.* 2009).
76. *Rhipicephalus theileri* Bedford and Hewitt, 1925
77. *Rhipicephalus tricuspis* Dönitz, 1906
78. *Rhipicephalus turanicus* Pomerantzev, 1940. While most Western workers list the year 1936 for the original description of *R. turanicus*, we follow Filippova (1997), who considers 1940 to be the correct year.
79. *Rhipicephalus warburtoni* Walker and Horak, 2000
80. *Rhipicephalus zambeziensis* Walker, Norval and Corwin, 1981
81. *Rhipicephalus ziemanni* Neumann, 1904. See *R. aurantiacus*.
82. *Rhipicephalus zumpti* Santos Dias, 1950

Nuttalliellidae

1. *Nuttalliella namaqua* Bedford, 1931. This is the type species of the genus *Nuttalliella*.

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References

- Apanaskevich, D.A. & Horak, I.G. (2008) The genus *Hyalomma*. VI. Systematics of *H. (Euhyalomma) truncatum* and the closely related species, *H. (E.) albiparmatum* and *H. (E.) nitidum* (Acari: Ixodidae). *Experimental and Applied Acarology*, 44, 115–136.
- Apanaskevich, D.A. & Horak I.G. (2009) The genus *Hyalomma* Koch, 1844. IX. Redescription of all parasitic stages of *H. (Euhyalomma) impeltatum* Schulze and Schlottke, 1930 and *H. (E.) somalicum* Tonelli Rondelli, 1935 (Acari: Ixodidae). *Systematic Parasitology*, 73, 199–218.
- Audouin, J.V. (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.
- Barker, S.C. & Murrell, A. (2002) Phylogeny, evolution and historical zoogeography of ticks: a review of recent progress. *Experimental and Applied Acarology*, 28, 55–68.
- Barker, S.C. & Murrell, A. (2008) Systematics and evolution of ticks with a list of valid genus and species names. In: Bowman A.S., Nuttall P. (Eds.) *Ticks: biology, disease and control*. Cambridge University Press, pp. 1–39.
- Black, W.C. & Piesman, J. (1994) Phylogeny of hard- and soft-tick taxa (Acari: Ixodida) based on mitochondrial 16S rDNA sequences. *Proceedings of the National Academy of Sciences USA*, 91, 10034–10038.
- Camicas, J.L. & Morel, P.C. (1977) Position systématique et classification des tiques (Acarida: Ixodida). *Acarologia*, 18, 410–420.
- Camicas, J.L., Hervy, J.P., Adam, F. & Morel, P.C. (1998) *Les tiques du monde. Nomenclature, stades décrits, hôtes, répartition (Acarida, Ixodida)*. Orstom, Paris.
- Canestrini, G. (1888) Intorno da alcuni Acari ed Opilonidi dell'America. *Atti Società Veneto-Trentina Scienze Naturali Padova Residente Padua*, 11, 100–109.
- Clifford, C.M., Kohls, G.M. & Sonenshine, D.E. (1964) The systematics of the subfamily Ornithodorinae (Acarina: Argasidae). I. The genera and subgenera. *Annals of the Entomological Society of America*, 57, 429–437.
- Estrada-Peña, A. & Estrada-Peña, R. (1991) Notes on *Dermacentor* ticks: redescription of *D. marginatus* with the synonymies of *D. niveus* and *D. daghestanicus* (Acari: Ixodidae). *Journal of Medical Entomology*, 28, 2–15.
- Estrada-Peña, A., Mangold, A.J., Nava, S., Venzal, J.M., Labruna, M.B. & Guglielmone, A.A. (2010) A review of the systematics of the tick family Argasidae (Ixodida). *Acarologia*, in press.
- Deng, G.L., Jiang, W., Ye, R.Y. et al. (sic) (1999) The fauna of ticks and mites in the Yeerqiang river valley in Xinjiang, China. *Endemic Disease Bulletin*, 14, 55–57. In Chinese.
- Filippova, N.A. (1961) Contribution to the taxonomy of ticks of the *crenulatus* group (Ixodidae, *Ixodes*, Pholeoixodes). *Parazitologicheskij Sbornik Zoologicheskij Institut Akademija Nauk SSSR*, 20, 226–247. In Russian, English translation by the Translation Unit, Library Branch, Division of Research Services, National Institutes of Health, Bethesda, Maryland.
- Filippova, N.A. (1964) Data on ticks of the subfamily Argasinae (Ixodoidea, Argasidae). Report II. Taxonomy of Palearctic Argasinae and diagnoses of the species of the USSR fauna for all active phases in the life cycle. *Parazitologicheskij Sbornik Zoologicheskij Institut Akademija Nauk SSSR*, 22, 7–27. In Russian.
- Filippova, N.A. (1966) *Argasid ticks (Argasidae)*. *Fauna SSSR* 4 (3), Nauka, Moscow, Leningrad, 255 pp. In Russian.
- Filippova, N.A. (1977) *Ixodid ticks (Ixodinae)*. *Fauna USSR New Ser.* 4 (4), Nauka, Moscow, Leningrad, 316 pp. In Russian.
- Filippova, N.A. (1984) Taxonomy of ticks of the family Ixodidae (Acarina: Parasitiformes) in the USSR fauna and plans for studying it. *Parazitologicheskij Sbornik Zoologicheskij Institut Akademija Nauk SSSR*, 32: 61–78. In Russian, English translation 1796 from Medical Zoology Department, United States Naval Medical Research Unit Number Three, Cairo, Egypt.
- Filippova, N.A. (1994) Classification of the subfamily Amblyomminae (Ixodidae) in connection with a reinvestigation of the chaetotaxy of the anal valves. *Parazitologiya*, 28, 3–12. In Russian.
- Filippova, N.A. (1997) Ixodid ticks of subfamily Amblyomminae. In *Fauna of Russia and neighbouring countries*, 4(5), Nauka Publishing House, St. Petersburg, 436 pp. In Russian.
- González-Acuña, D., Mangold, A.J., Robbins, R.G. & Guglielmone, A.A. (2009) New host and locality records for the *Ixodes auritulus* Neumann, 1904 (Acari: Ixodidae) species group in northern Chile. *Systematic & Applied Acarology*, 14, 47–50.
- 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.
- Guglielmone, A.A., Robbins, R.G., Apanaskevich, 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. *Experimental and Applied Acarology*, 48, 311–327.
- Guglielmone, A.A., Nava, S., Bazán-León, E.A., Vásquez, R.A. & Mangold, A.J. Redescription of the male and description of the female of *Ixodes abrocomae* Lahille, 1916 (Acari: Ixodidae). *Systematic Parasitology*, in press.
- Hoffmann, A. (1958) Una especie de *Antricola* (Acarina, Argasidae) en México. *Anales de la Escuela Nacional de Ciencias Biológicas*, 9, 97–107.
- Hoogstraal, H. (1958) Bat ticks of the genus *Argas* (Ixodoidea, Argasidae). 3. The subgenus *Carios*, a redescription of *A. (C.) vespertilionis* (Latreille, 1802) and variation within an Egyptian population. *Annals of the Entomological Society of America*. 51: 11–26.
- Hoogstraal, H. (1985) Argasid and nuttalliellid ticks as parasites and vectors. *Advances in Parasitology*, 24, 135–238.
- Hoogstraal, H. & Aeschlimann, A. (1982) Tick-host specificity. *Bulletin de la Société Entomologique Suisse*, 55, 5–32.
- Horak, I.G., Camicas, J.L. & Keirans, J.E. (2002) The Argasidae, Ixodidae and Nuttalliellidae (Acari: Ixodida): a world list of valid tick names. *Experimental and Applied Acarology*, 28, 27–54.
- International Commission on Zoological Nomenclature (1999) *International Code of Zoological Nomenclature*, 4th. Ed., The International Trust for Zoological Nomenclature 1999, 306 pp.
- Keirans, J.E. (1992) Systematics of the Ixodida (Argasidae, Ixodidae, Nuttalliellidae): an overview and some problems. In: Fivaz, B., Petney, T., Horak, I. (Eds.) *Tick vector biology. Medical and veterinary aspects*. Springer – Verlag, pp. 1–21.
- Keirans, J.E. (2009) Order Ixodida. In Krantz G.W., Walter D.E. (Eds.) *A manual of acarology* 3rd ed, Texas Tech Univ. Press, pp. 111–123.
- Keirans, J.E. & Robbins, R.G. (1999) A world checklist of genera, subgenera, and species of ticks (Acari: Ixodida) published from 1973–1997. *Journal of Vector Ecology*, 24, 115–129.
- Klompen, J.S.H. & Oliver, J.H. (1993) Systematic relationships in the soft ticks (Acari: Ixodida: Argasidae). *Systematic Entomology*, 18, 313–331.
- Klompen, H., Dobson, S.J. & Barker, S.C. (2002) A new subfamily, Bothriocrotoninae n. subfam., for the genus *Bothriocroton* Keirans, King & Sharrad, 1994 status amend. (Ixodida: Ixodidae), and the synonymy of *Aponomma* Neumann, 1899 with *Amblyomma* Koch, 1844. *Systematic Parasitology*, 53, 101–107.
- Kolonin, G.V. (2009) *Fauna of ixodid ticks of the world*. <http://www.kolonin.org/> (August 24, 2009). Last accessed 8 Jun 2010.
- Labruna, M.B. & Venzal, J.M. (2009) *Carios fonsecai* sp. n. (Acari, Argasidae), a bat tick from the central-western region in Brazil. *Acta Parasitologica*, 54, 355–363.
- Labruna, M.B., Onofrio, V.C., Beati, L., Arzua, M., Bertola, P.B. & Barros-Battesti, D.M. (2009a) Redescription of the female, description of the male, and several new records of *Amblyomma parkeri* (Acari: Ixodidae), a South American tick species. *Experimental and Applied Acarology*, 49, 243–260.
- Labruna, M.B., Naranjo, V., Mangold, A.J., Thompson, C., Estrada-Peña, A., Guglielmone, A.A., Jongejan, F. & de la Fuente, J. (2009b) Allopatric speciation in ticks: genetic and reproductive divergence between geographic strains of *Rhipicephalus (Boophilus) microplus*. *BMC Evolutionary Biology*, 9, 46.
- Lahille, F. (1916) Descripción de un nuevo ixódido chileno. *Revista Chilena de Historia Natural*, 20, 107–108.
- Lucas, M.H. (1844) Note sur une nouvelle espèce d'Arachnide qui appartient au genre *Ixodes*. *Revue Zoologique de la Société Cuvierienne*, 7, 71.
- Lucas, M.H. (1845) Sur une nouvelle espèce d'Arachnide qui appartient au genre *Ixodes*, et qui vit dans le contour interne de la cavité orbitaire de *Python sebae*, Duméril et Bibron (*Coluber sebae*, Gmelin). *Annales de la Société Entomologique de France, Série. 2*, 3, 61–65.
- McKay, I.J. (1994) Two new species of ixodid ticks closely related to *Ixodes pilosus* (Acari: Ixodidae). *Journal of the South African Veterinary Association*, 65, 158.
- Miller, H.C., Conrad, A.M., Barker, S.C. & Daugherty, C.H. (2007) Distribution and phylogenetic analyses of an endangered tick, *Amblyomma sphenodonti*. *New Zealand Journal of Zoology*, 34, 97–105.
- Moshaverinia, A., Shayan, P., Nabian, S. & Rahbari, S. (2009) Genetic evidence for conspecificity between *Dermacentor marginatus* and *Dermacentor niveus*. *Parasitology Research*, 105, 1125–1132.
- Nava, S., Estrada-Peña, A., Mangold, A.J. & Guglielmone, A.A. (2009a) Ecology of *Amblyomma neumanni* (Acari: Ixodidae). *Acta Tropica*, 111, 226–236.
- Nava, S., Guglielmone, A.A., Mangold, A.J. (2009b) An overview of the systematics and evolution of ticks. *Frontiers in Bioscience*, 14, 2857–2877.
- Pomerantzev, B.I. (1950) Ixodid ticks (Ixodidae). *Fauna SSSR, Paukoobraznye*, 4 (2), 224 pp. In Russian.
- Pospelova-Shtrom, M.V. (1969) On the Argasidae system (with description of two new subfamilies, three new tribes and one new genus). *Meditinskaya Parasitologiya i Parazitarnye Bolezni*, 15, 47–58. In Russian.

- Santos Dias, J.A.T. (1956) Invalidação de algumas espécies ixodológicas originalmente determinadas em resultado de indevida rotulagem de material. *Anais do Instituto de Medicina Tropical*, 13, 199–208.
- Santos Dias, J.A.T. (1993) Contribuição para o estudo da sistemática e taxonomia das espécies de género *Aponomma* Neumann, 1899 (Acarina-Ixodoidea). *Estudos, Ensaios e Documentos*, (157), 1–204.
- Teng, K. & Jiang, Z. (1991) *Economic insect of fauna of China. Fasc. 39 Acari: Ixodidae*. Science Press, Beijing, 355 pp. In Chinese.
- Voltzit, O.V. (2007) A review of Neotropical *Amblyomma* species (Acari: Ixodidae). *Acarina*, 15, 3–134.
- Voltzit, O.V. & Keirans, J.E. (2002) A review of Asian *Amblyomma* species (Acari, Ixodida, Ixodidae). *Acarina*, 10, 95–136.