

Article

An annotated checklist of the ticks (Acari: Ixodida) of Germany

TREVOR N. PETNEY¹, MIRIAM P. PFÄFFLE & JASMIN D. SKUBALLA

Karlsruhe Institute of Technology, KIT, Zoological Institute, Department of Ecology and Parasitology, Kornblumenstrasse 13, 76131 Karlsruhe, Germany

¹Corresponding author. E-mail: petney@kit.edu

Abstract

Ticks (Ixodida: Argasidae, Ixodidae) are the main arthropod vectors of disease in Central Europe, including Germany. One species, *Ixodes ricinus*, dominates the tick fauna throughout this area and, as such, is justifiably the most common species studied. However, this concentration on a single species has led to the neglect of a variety of other species, also often common on their wild hosts, and also involved in the natural, zoonotic cycles of disease. In this contribution we provide a checklist of the species currently known to occur in Germany. The information summarized under the endemic species includes general distribution, hosts, and basic ecology, as well as each species' medical and veterinary significance. Our aim is to bring the diversity of species present to the attention of the research community in the hope that the more neglected species will also be integrated into epidemiological models of the tick-borne diseases present.

Key words: Ticks, Argasidae, Ixodidae, Germany, checklist

Introduction

The growing recognition given to ticks as vectors of medically significant diseases in Germany has led to a massive increase in the amount of research being done on this group. Most of the publications dealing with ticks, including those involving field collections, only consider *Ixodes ricinus* (Linnaeus, 1758) in their collection data. *Ixodes ricinus* is undoubtedly the most commonly found tick in Germany; however, there is also a rich fauna of other tick species that appear to have been neglected. Some of these species, such as the hedgehog tick, *I. hexagonus* Leach, 1815, are known to be involved in the sylvatic cycles of tick-borne encephalitis (TBE) and Lyme borreliosis. The roles of other tick species in the sylvatic cycles of these diseases are either only poorly known or remain unknown in Germany.

An additional complication is our variable knowledge of the taxonomic status of a variety of European tick species, particularly in the genus *Ixodes*. The only comprehensive coverage including most European members of this genus is that of Filippova (1977), which is written in Russian and does not cover all of the species found in Central Europe. Older literature is often full of uncertainties, particularly that of the most important German tick taxonomist of the early 20th century, Paul Schulze. Between 1929 and 1937 Schulze and Schlottke (1929) and Schulze (1932, 1933a, 1937) described numerous species, subspecies or designations of *Ixodes*. *Ixodes barbarossae*, *I. melicola*, *I. sciuricola*, *I. vulpicola* and *I. vulpinus* have since all become junior synonyms of *Ixodes canisuga* Johnston, 1849; *I. arboricola arboricola*, *I. a. domesticus* and *I. passericola* are *I. arboricola* Schulze and Schlottke, 1929, as are *I. dryadis* and *I. strigicola*; while *I. plumbeus plumbeus*, *I. plumbeus obotriticus* and *I. plumbeus bavaricus* are all junior synonyms of

References

- Acunman, K. (2010) Zecken an flussnahen Biotopen in Baden-Württemberg. BSc thesis, KIT.
- Aeschlimann, A., Burgdorfer, W., Matile, H., Peter, O. & Wyler, R. (1979) Aspects nouveaux du rôle de vecteur joué par *Ixodes ricinus* L. en Suisse. *Acta Tropica*, 36, 181–191.
- Aeschlimann, A., Büttiker, W., Wiehl, P.A., Eichenberger, G., Immler, R. & Weiss, N. (1970) Présence d'*Ixodes trianguliceps* (Birula, 1895) et d'*Ixodes apronophorus* (Schulze, 1924) en Suisse (Ixodoidea, Ixodidae). *Revue Suisse de Zoologie*, 77, 527–535.
- Alani, A.J. & Herbert, I.V. (1988) Pathogenesis of infection with *Theileria recondita* (Wales) isolated from *Haemaphysalis punctata* from north Wales. *Veterinary Parasitology*, 28, 293–301.
- Alekseev, A.N. & Dubinina, H.V. (2003) Multiple infections of tick-borne pathogens in *Ixodes* spp. (Acarina: Ixodidae). *Acta Zoologica Lituanica*, 13, 311–321.
- Alekseev, A.N., Dubinina, H.V., Van de Pol, I. & Schouls, L.M. (2001) Identification of *Ehrlichia* spp. and *Borrelia burgdorferi* in *Ixodes* ticks in the Baltic regions of Russia. *Journal of Clinical Microbiology*, 39, 2237–2242.
- Angelov, L., Dimova, P. & Berbencova, W. (1996) Clinical and laboratory evidence of the importance of the tick *D. marginatus* as a vector of *B. burgdorferi* in some areas of sporadic Lyme disease in Bulgaria. *European Journal of Epidemiology*, 12, 499–502.
- Angus, B.M. (1996) The history of the cattle tick *Boophilus microplus* in Australia and achievements in its control. *International Journal of Parasitology*, 26, 1341–1355.
- Antón, E., Nogueras, M.M., Pons, I., Font, B., Munoz, T., Sanfeliu, I. & Segura, F. (2008) *Rickettsia slovacica* infection in humans in the northeast of Spain: seroprevalence study. *Vector-Borne and Zoonotic Diseases*, 8, 689–694.
- Apanaskevich, D.A. (2003) Discrimination of subspecies in a polymorphic *Hyalomma marginatum* (Acari, Ixodidae) based on immature stages. *Parazitologiya*, 37, 462–472 (in Russian).
- Apanaskevich, D.A. (2004) Discrimination of subspecies in a polymorphic *Hyalomma marginatum* (Acari, Ixodidae) based on adult stage. *Parazitologiya*, 38, 20–32 (in Russian).
- Apanaskevich, D.A. & Horak, I.G. (2008) The genus *Hyalomma* Koch, 1844: V. Re-evaluation of the taxonomic rank of taxa comprising the *H. (Euhyalomma) marginatum* Koch complex of species (Acari: Ixodidae) with redescription of all parasitic stages and notes on biology. *International Journal of Acarology*, 34, 13–42.
- Arthur, D.R. (1956) The *Ixodes* ticks of Chiroptera (Ixodoidea, Ixodidae). *Journal of Parasitology*, 42, 180–196.
- Arthur, D.R. (1960) *Ticks: a monograph of the Ixodoidea. Part V. On the genera Dermacentor, Anocentor, Cosmiomma, Boophilus and Margaropus*. Cambridge, Cambridge University Press.
- Arthur, D.R. (1963) *British ticks*. London, Butterworths.
- Arthur, D.R. (1965) *Ticks of the genus Ixodes in Africa*. London, Athlone Press.
- Aspöck, H. (1976) Arthropoden als Überträger von Infektionen des Menschen in Mitteleuropa. *Anzeiger für Schädlingskunde, Pflanzenschutz und Schädlingschutz*, 49, 164–166.
- Astobiza, I., Barral, M., Ruiz-Fons, F., Barandika, J. F., Gerrikagoitia, X., Hurtado, A. & Garcia-Perez, A. L. (2010) Molecular investigation of the occurrence of *Coxiella burnetii* in wildlife and ticks in an endemic area. *Veterinary Microbiology*, 147, 190–194.
- Attoui, H., Jaafar, F.M., Biagini, P., Cantaloube, J.-F., de Micco, P., Murphy, F. A. & de Lamballerie X. (2002) Genus *Coltivirus* (family Reoviridae): genomic and morphologic characterization of Old World and New World viruses. *Archives of Virology*, 147, 533–561.
- Aubert, M.F.A. (1975) Contribution à la l'étude du parasitisme du renard (*Vulpes vulpes* L.) par les Ixodidae (Acarina) dans le nord-est de la France. *Acarologia*, 17, 452–479.
- Aubert, M.F. (1982) Experimental transmission of rabies to the ferret by an Ixodoidea: *Pholeoixodes rugicollis* (Schulze and Schlottke, 1929). *Acarologia*, 23, 125–132 (in French).
- Babos, S. (1964) *Die Zeckenfauna Mitteleuropas*. Budapest, Akademiai Kiado.
- Baker, A.S. & Craven, J.C. (2003) Checklist of the mites (Arachnida: Acari) associated with bats (Mammalia: Chiroptera) in the British Isles. *Systematic & Applied Acarology Special Publications*, 14, 1–20.
- Bakonyi, T., Hubalek, Z., Rudolf, I. & Nowotny, N. (2005) Novel flavivirus or new lineage of West Nile virus, Central Europe. *Emerging Infectious Diseases*, 11, 225–231.
- Balashov, Y.S. (1968) Bloodsucking ticks (Ixodoidea) – vectors of diseases to man and animals. *Miscellaneous Publications of the Entomological Society of America*, 8, 161–376.

- Balashov, Y.S. (1997) Distribution of ixodid ticks (Acarina, Ixodidae) over landscapes within their ranges. *Entomological Review*, 77, 625–637 (in Russian).
- Balashov, Y.S. (2007) Harmfulness of parasitic insects and acarines to mammals and birds. *Entomological Review*, 87, 1300–1316.
- Balashov, Y.S., Grigor'eva, L.A. & Oliver, J.H. Jr. (1998) Reproductive isolation and interspecific hybridization in ixodid ticks of the *Ixodes ricinus*-*I. persulcatus* group (Acarina, Ixodidae). *Entomological Review*, 78, 500–508.
- Baldrige, G.D., Scoles, G.A., Burkhardt, N.Y., Schloeder, B., Kurtti, T.J. & Munderloh, U.G. (2009) Transovarial transmission of *Francisella*-like endosymbionts and *Anaplasma phagocytophilum* variants in *Dermacentor albipictus* (Acari: Ixodidae). *Journal of Medical Entomology*, 46, 625–632.
- Baneth, G., Mathew, J.S., Shkap, V., Macintire, D.K., Barta, J.R. & Ewing, S.A. (2003) Canine hepatozoonosis: two disease syndromes caused by separate *Hepatozoon* spp. *Trends in Parasitology*, 19, 27–31.
- Barbosa, A. & Palacios, M. (2009) Health of Antarctic birds: a review of their parasites, pathogens and diseases. *Polar Biology*, 32, 1095–1115.
- Barton, T.R., Harris, M.P., Wanless, S. & Elston, D.A. (1995) The activity periods and life-cycle of the tick *Ixodes uriae* (Acari: Ixodidae) in relation to host breeding strategies. *Parasitology*, 112, 571–580.
- Basova, N.N., Chernikova, T.M., Ermakova, R.M. & Stolbov, D.N. (1960) Q-fever and ornithosis in wild birds. *Problems of Virology*, 5, 638–644.
- Bauch, R. (1990) *Ixodes ricinus*, *Haemaphysalis concinna* und *Dermacentor reticulatus* (Ixodida, Ixodidae) im DDR-Bezirk Leipzig. *Angewandte Parasitologie*, 31, 57–64.
- Beati, L., Roux, V., Ortuna, A., Castella, J., Porta, F.S. & Raoult, D. (1996) Phenotypic and genotypic characterization of spotted fever group rickettsiae isolated from Catalan *Rhipicephalus sanguineus* ticks. *Clinical Microbiology*, 34, 2688–2694.
- Beichel, E., Petney, T.N., Hassler, D., Brückner, M. & Maiwald, M. (1996) Tick infestation patterns and prevalence of *Borrelia burgdorferi* in ticks collected at a veterinary clinic in Germany. *Veterinary Parasitology*, 65, 147–155.
- Bekleshova, A.Y., Terkskikh, I.I., Bychkova, E.N. & Smirnov, V.A. (1969) 5th Symposium of the Study of the Role of Migrating Birds in the Distribution of Arboviruses. USSR, Academy of Science USSR, Siberian branch Novosibirsk, 100 pp.
- Belozеров, V.N. (1976) Life cycles and seasonal adaptation of ixodid ticks (Acarina, Ixodidae). *Doklady Na 28 Yezhegodnykh Chteniyakh Pamyati N. A. Kholodkovskogo*, Leningrad, April 1975, pp. 53–101 (NAMRU-3 translation 1124).
- Belozеров, V.N. (1982) Diapause and biological rhythms in ticks. In: Obenchain, F.D. & Galun, R. (Eds.) *Physiology of ticks*. Oxford, Pergamon Press. pp. 469–500.
- Belozеров, V.N. (2009) Diapause and quiescence as two main kinds of dormancy and their significance in the life cycles of mites and ticks (Chelicerata: Arachnida: Acari). Part 2. Parasitiformes. *Acarina*, 17, 3–32.
- Benoit, J., Lopez-Martinez, G., Elnitsky, M., Lee, R. & Denlinger, D. (2008a) Increase in feeding by the tick, *Ixodes uriae*, on Adélie penguins during a prolonged summer. *Antarctic Science*, 21, 151–152.
- Benoit, J., Lopez-Martinez, G., Phillips, S., Elnitsky, M., Yoder, J., Lee, R. & Denlinger, D. (2008b) The seabird tick, *Ixodes uriae*, uses uric acid in penguin guano as a kairomone and guanine in tick feces as an assembly pheromone on the Antarctic Peninsula. *Polar Biology*, 31, 1445–1451.
- Benoit, J.B., Yoder, J.A., Lopez-Martinez, G., Elnitsky, M.A., Lee, R.E. Jr. & Denlinger, D.L. (2007) Habitat requirements of the seabird tick, *Ixodes uriae* (Acari: Ixodidae), from the Antarctic Peninsula in relation to water balance characteristics of eggs, non-fed and engorged stages. *Journal of Comparative Physiology B*, 177, 205–215.
- Berezin, V.V. (1971) Investigation of the ecology of arboviruses in river deltas of the Caspian and Azov sea basins. *Instituta Poliomieliya I Virusnykh Entsefalitov. Akademii Meditsinskikh Nauk SSSR*, Moscow, pp. 1–37 (NAMRU-3 translation 1160).
- Bergström, S., Haemig, P. & Olsen, B. (1999a) Distribution and abundance of the tick *Ixodes uriae* in a diverse subantarctic seabird community. *Journal of Parasitology*, 85, 25–27.
- Bergström, S., Haemig, P. & Olsen, B. (1999b) Increased mortality of black-browed albatross chicks at a colony heavily-infested with the tick *Ixodes uriae*. *International Journal for Parasitology*, 29, 1359–1361.
- Bernasconi, M.V., Casati, S., Péter, O. & Piffaretti, J.C. (2002) *Rhipicephalus* ticks infected with *Rickettsia* and *Coxiella* in southern Switzerland (Canton Ticino). *Infection, Genetics and Evolution*, 2, 111–120.
- Beugnet, F. & Marié, J.L. (2009) Emerging arthropod-borne diseases of companion animals in Europe. *Veterinary Parasitology*, 163, 298–305.

- Billeter, S.A., Levy, M.G., Chomel, B.B. & Breitschwerdt, E.B. (2008) Vector transmission of *Bartonella* species with emphasis on the potential for tick transmission. *Medical and Veterinary Entomology*, 22, 1–15.
- Biocca, E. & Corradetia, A. (1952) *Babesia missiroliei* n. sp., a badger (*Meles taxus*) parasite. *Rendiconti Istituto Superiore di Sanita*, 15, 312–314 (in Italian).
- Bogdanov, I.I. (1970) Comparative evaluation of natural tickborne encephalitis and Omsk hemorrhagic fever foci in western Siberia. *Tezisy Dokladov 2 Akarologicheskoe Soveshchanie 1970*, 1, 72–74 (NAMRU-3 translation 1465).
- Bouattour, A. (1987) Distribution des principales tiques Ixodoidea du bétail en Tunisie. *Office International des Epizooties, First African Veterinary Days*, F/044, 161–182.
- Bown, K.J., Begon, M., Bennett, M., Birtles, R.J., Burthe, S., Lambin, X., Telfer, S., Woldehiwet, Z. & Ogden, N.H. (2006) Sympatric *Ixodes trianguliceps* and *Ixodes ricinus* ticks feeding on field voles (*Microtus agrestis*): potential for increased risk of *Anaplasma phagocytophilum* in the United Kingdom. *Vector-Borne and Zoonotic Diseases*, 6, 404–410.
- Bown, K.J., Begon, M., Bennett, M., Woldehiwet, Z. & Ogden, N.H. (2003) Seasonal dynamics of *Anaplasma phagocytophila* in a rodent-tick (*Ixodes trianguliceps*) system, United Kingdom. *Emerging Infectious Diseases*, 9, 63–70.
- Boyard, C., Vourc'h, G. & Barnouin, J. (2008) The relationships between *Ixodes ricinus* and small mammal species at the woodland–pasture interface. *Experimental and Applied Acarology*, 44, 61–76.
- Brinck, P., Svdmr, A. & Von Zeipel, G. (1965) Migrating birds at Ottenby Sweden as carriers of ticks and possible transmitters of tick-borne encephalitis virus. *Oikos*, 16, 88–99.
- Bullová, E., Lukán, M., Stanko, M. & Petko, B. (2009) Spatial distribution of *Dermacentor reticulatus* tick in Slovakia in the beginning of the 21st century. *Veterinary Parasitology*, 165, 357–360.
- Bunikis, J., Olsén, B., Fingerle, V., Bonnedahl, J., Wilske, B. & Bergström, S. (1996) Molecular polymorphism of the Lyme disease agent *Borrelia garinii* in northern Europe is influenced by a novel enzootic focus in the North Atlantic. *Journal of Clinical Microbiology*, 34, 364–368.
- Butenko, A.M., Donets, M.A., Durov, V.I., Tkachenko, V.A., Perelatorov, V.D. & Chumakov, M.P. (1971) Isolation of CHF virus from *Rhipicephalus rossicus* and *Dermacentor marginatus* ticks in Rostov Oblast and Krasnodar region. In: Chumakov, M.P. (Ed.) *Crimean hemorrhagic fever; Omsk hemorrhagic fever; fever with renal syndrome. Trudy Instituta Poliomiellita I Virusnykh Entsefalitov. Akademii Meditsinskikh Nauk SSSR*, 19, 45–47 (NAMRU-3 translation 828).
- Caeiro, V. (1999) General review of tick species present in Portugal. *Parassitologia* 41 (Suppl. 1), 11–15.
- Calisher, C.H., Holmes, K.V., Dominguez, S.R., Schountz, T. & Cryan, P. (2008) Bats prove to be rich reservoirs for emerging viruses. *Microbe*, 3, 521–528.
- Camacho, A.T., Pallas, E., Gestal, J.J., Guitián, F.J., Olmeda, A.S., Telford, S.R. III & Spielman, A. (2003) *Ixodes hexagonus* is the main candidate as vector of *Theileria annae* in northeast Spain. *Veterinary Parasitology*, 112, 157–163.
- Camicas, J.L., Hervy, J.P., Adam, F. & Morel, P.C. (1998) *Ticks of the world (Acarida, Ixodida): nomenclature, described stages, hosts, distribution*. Paris, Orstom editions.
- Causey, O.R., Kemp, G.E., Hamdy Madbouly, M. & David-West, T.S. (1970) Congo virus from domestic livestock, African hedgehog, and arthropods in Nigeria. *American Journal of Tropical Medicine and Hygiene*, 19, 846–850.
- Centurier, C., Gothe, R., Hoffmann, G., Liebisch, A. & Schein, E. (1979) Die braune Hundezecke *Rhipicephalus sanguineus* (Latreille, 1806) in Deutschland, ein Problem in der Kleintierpraxis. *Berliner und Münchener Tierärztliche Wochenschrift*, 92, 472–477.
- Černý, V. (1969) About some systematic and nomenclatural problems within the sub-genus *Pholeoixodes* (Ixodidae). *Folia Parasitologica*, 16, 32.
- Černý, V. (1972) The tick fauna of Czechoslovakia. *Folia Parasitologica*, 19, 87–92.
- Černý, V. and Balát, F. (1960) A contribution to the bionomics of the tick *Ixodes arboricola* P. Schulze. *Zoologické Listy*, 9, 217–226 (in Czech).
- Charrel, R.N., Attoui, H., Butenko, A.M., Clegg, J.C., Deubel, V., Frolova, T.V., Gould, E.A., Gritsun, T.S., Heinz, F.X., Labuda, M., Lashkevich, V.A., Loktev, V., Lundkvist, A., Lvov, D.V., Mandl, C.W., Niedrig, M., Papa, A., Petrov, V.S., Plyusnin, A., Randolph, S., Süss, J., Zlobin, V.I. & de Lamballerie, X. (2004) Tick-borne virus diseases of human interest in Europe. *Clinical Microbiology and Infection*, 10, 1040–1055.
- Chastel, C. (1998) Erve and Eyach: two viruses isolated in France, neuropathogenic for humans and widely distributed in Western Europe. *Bulletin de l'Académie Nationale de Médecine*, 182, 801–810 (in French).

- Chastel, C., Chandler, L., le Goff, F., Chastel, O., Tesh, R. & Shope, R. (1999) Chizé virus, a new phlebovirus isolated in France from *Ixodes (Trichotoxodes) frontalis*. *Acta Virologica*, 43, 279–283.
- Chastel, C., Guiguen, C., Chastel, O. & Beaucournu, J.C. (1991) Pouvoir pathogène, rôle vecteur et hôtes nouveaux d'*Ixodes pari* (= *I. frontalis*) (Acari; Ixodoidea; Ixodidae). *Annales de Parasitologie Humaine et Comparée*, 66, 27–32.
- Chastel, C., Main, A.J., Couatarmanac'h, A., Le Lay, G., Knudson, D.L., Quillien, M.C. & Beaucournu, J.C. (1984) Isolation of Eyach virus (Reoviridae, Colorado tick fever group) from *Ixodes ricinus* and *I. ventraloi* ticks in France. *Archives of Virology*, 82, 161–171.
- Chastel, C., Monnat, J.Y., Le Lay, G. & Beaucournu, J.C. (1981a) Syndrome neurologique mortel chez une tourterelle turque (*Streptopelia decaocto*) et fixation de la tique *Ixodes pari* (= *I. frontalis*). *Annales de Parasitologie Humaine et Comparée*, 56, 349–351.
- Chastel, C., Monnat, J.Y., Le Lay, G., Guiguen, C., Quilloen, M.C. & Beaucournu, J.C. (1981b) Studies on Bunyaviridae including Zaliv Terpeniya virus isolated from *Ixodes uriae* ticks (Acarina: Ixodidae) in Brittany, France. *Archives of Virology*, 70, 356–366.
- Chen, Z., Yang, X., Bu, F., Yang, X., Yang, X. & Liu, J. (2010) Ticks (Acari: Ixodoidea: Argasidae, Ixodidae) of China. *Experimental and Applied Acarology*, 51, 393–404.
- Christian, A. (2002) Zeckenbefall am Baumränder in Mecklenburg. *Abhandlungen und Berichte des Naturkundemuseums Görlitz*, 74, 15–20.
- Chu, C.Y., Jiang, B.G., Liu, W., Zhao, Q.M., Wu, X.M., Zhang, P.H., Zhan, L., Yang, H. & Cao, W.C. (2008) Presence of pathogenic *Borrelia burgdorferi* sensu lato in ticks and rodents in Zhejiang, south-east China. *Journal of Medical Microbiology*, 57, 980–985.
- Chumakov, M.P. & Belyaeva, A.P. (1965) Experimental data on interrelationships between Omsk hemorrhagic fever and human tick-borne encephalitis viruses. In: Chumakov, M.P. (Ed.) Endemic viral infections (hemorrhagic fever with renal syndrome, Crimean hemorrhagic fever, Omsk hemorrhagic fever, and Astrakhan virus from the tick *Hyalomma p. plumbeum*). *Trudy Instituta Poliomieliita I Virusnykh Entsefalitov. Akademii Meditsinskikh Nauk SSSR* 7, 356–362 (NAMRU-3 translation 1441)
- Clifford, C.M. (1979) Tick-borne viruses of seabirds. In: Kurstak, E. (Ed.) *Arctic and Tropical Arboviruses*. Academic Press, New York, pp. 362–383.
- Clifford, C.M. & Hoogstraal, H. (1965) The occurrence of *Ixodes arboricola* Schulze and Schlottke (Ixodoidea: Ixodidae) in Africa on northward migrating birds. *Journal of Medical Entomology*, 2, 37–40.
- Comstedt, P., Asokliene, L., Eliasson, I., Olsen, B., Wallensten, A., Bunikis, J. & Bergström, S. (2009) Complex population structure of Lyme borreliosis group spirochete *Borrelia garinii* in subarctic Eurasia. *PLoS ONE* 4, e5841, doi:10.1371/journal.pone.0005841
- Cornely, M. & Schultz, U. (1992) Zur Zeckenfauna Ostdeutschlands. *Angewandte Parasitologie*, 33, 173–183.
- Cornet, J.P., Kittayapong, P. & Gonzalez, J.P. (2004) Le risque de transmission d'arbovirus par les tiques en Thaïlande. *Médecine Tropicale* 64, 43–49.
- Cotté, V., Bonnet, S., Le Rhun, D., Le Naour, E., Chauvin, A., Boulouis, H.J., Lecuelle, B., Lilin, T. & Vaysier-Taussat, M. (2008) Transmission of *Bartonella henselae* by *Ixodes ricinus*. *Emerging Infectious Diseases*, 14, 1074–1080.
- Coutinho, M.T.Z., Bueno, L.L., Sterzik, A., Fujiwara, R.T., Botelho, J.R., De Maria, M., Genaro, O. & Linardi, P.M. (2005) Participation of *Rhipicephalus sanguineus* (Acari: Ixodidae) in the epidemiology of canine visceral leishmaniasis. *Veterinary Parasitology*, 128, 149–155.
- Criado-Fornelio, A., Martinez-Marcos, A., Buling-Sarana, A. & Barba-Carretero, J.C. (2003) Presence of *Mycoplasma haemofelis*, *Mycoplasma haemominutum* and piroplasmids in cats from southern Europe: a molecular study. *Veterinary Microbiology*, 93, 307–317.
- Cringoli, G., Iori, A., Rinaldi, L., Veneziano, V. & Genchi, C. (2005) *Zecche*. Naples, Ronaldo Editore.
- Cringoli, G., Otranto, D., Testini, G., Buono, V., Di Giulio, G., Traversa, D., Lia, R., Rinaldi, L., Veneziano, V. & Puccini, V. (2002) Epidemiology of bovine tick-borne diseases in southern Italy. *Veterinary Research*, 33, 421–426.
- Cunliffe, N. (1914) *Rhipicephalus sanguineus*: variation in size and structure due to nutrition. *Parasitology*, 6, 372–378.
- Dantas-Torres, F. (2006) Do any insects other than phlebotomine sandflies (Diptera: Psychodidae) transmit *Leishmania infantum* (Kinoplastida: Trypanosomatidae) from dog to dog? *Veterinary Parasitology*, 136, 379–380.
- Dantas-Torres, F. (2008a) The brown dog tick, *Rhipicephalus sanguineus* (Latreille, 1806) (Acari: Ixodidae): from taxonomy to control. *Veterinary Parasitology*, 152, 173–185.

- Dantas-Torres, F. (2008b) Canine vector-borne diseases in Brazil. *Parasites and Vectors* 1: 24 doi: 10.1186/1756-3305-1-25.
- Dantas-Torres, F. (2011) Ticks as vectors of *Leishmania* parasites. *Trends in Parasitology*, 27, 155–159.
- Dantas-Torres, F., Lorusso, V., Testini, G., De Paiva-Cavalcanti, M., Figueredo, L.A., Stanneck, D., Mencke, N., Brandão-Filho, S.P., Alves, L.C. & Otranto, D. (2010a) Detection of *Leishmania infantum* in *Rhipicephalus sanguineus* ticks from Brazil and Italy. *Parasitology Research*, 106, 857–860.
- Dantas-Torres, F., Martins, T.F., De Paiva-Cavalcanti, M., Figueredo, L.A., Lima, B.S. & Brandão-Filho, S.P. (2010b) Transovarial passage of *Leishmania infantum* kDNA in artificially infected *Rhipicephalus sanguineus*. *Experimental Parasitology*, 125, 184–185.
- Dash, M., Byambaa, B. & Neronov, V.M. (1988) Ixodidae in Mongolia. Communication 1. Species distribution. *Meditssinskaia Parazitologiya i Parazitarnye Bolezni* (Moskva), 3, 37–42 (in Russian).
- Dautel, H., Dippel, C., Oehme, R., Hartelt, K. & Schettler, E. (2006) Evidence for an increased geographical distribution of *Dermacentor reticulatus* in Germany and detection of *Rickettsia* sp. RpA4. *International Journal of Medical Microbiology*, 296 (Suppl. 40), 149–156.
- Dautel, H. & Kahl, O. (1999) Ticks (Acari: Ixodoidea) and their medical importance in the urban environment. In: Robinson, W.H., Rettich, F. & Rambo, G.W. (Eds.) *Proceedings of the 3rd International Conference on Urban Pests*. Prague, Czech University of Agriculture July pp. 19–22.
- Dautel, H., Kahl, O. & Knülle, W. (1991) The soft tick, *Argas reflexus* (Acari, Argasidae) in urban environments and its medical significance in Berlin. *Journal of Applied Entomology*, 11, 380–390.
- Dautel, H., Kahl, O., Scheurer, S. & Knülle, W. (1994) Seasonal activities of the pigeon tick *Argas reflexus* (Acari: Argasidae) in Berlin, Germany. *Folia Parasitologica*, 41, 155–160.
- Dautel, H., Scheurer, S. & Kahl, O. (1999) The pigeon tick (*Argas reflexus*): its biology, ecology, and epidemiological aspects. *Zentralblatt für Bakteriologie*, 289, 745–753.
- De Kok, J.B., D'Oliveira, C. & Jongejan, F. (1993) Detection of the protozoan parasite *Theileria annulata* in *Hyalomma* ticks by polymerase chain reaction. *Experimental and Applied Acarology*, 17, 839–846.
- DelGiudice, G.D., Peterson, R.O. & Samuel, W.M. (1997) Trends of winter nutritional restriction, ticks, and numbers of moose on Isle Royale. *Journal of Wildlife Management*, 61, 895–903.
- Demina, T., Dzhioev, Y., Verkhozina, M., Kozlova, M., Tkachev, S., Plyusnin, A., Doroshchenko, E., Lisak, O. & Zlobin, V. (2010) Genotyping and characterization of the geographical distribution of tick-borne encephalitis virus variants with a set of molecular probes. *Journal of Medical Virology*, 82, 965–976.
- Demma, L.J., Traeger, M.S., Nicholson, W.L., Paddock, C.D., Blau, D.M., Eremeeva, M.E., Dasch, G.A., Levin, M.L., Singleton, J. Jr., Zaki, S.R., Cheek, J.E., Swerdlow, D.L. & McQuiston, J.H. (2005) Rocky Mountain spotted fever from an unexpected tick vector in Arizona. *New England Journal of Medicine*, 353, 587–594.
- De Oliveira, P.R., Bechara, G.H., Denardi, S.E., Saito, K.S., Nunes, E.T., Szabo, M.P.J. & Camargo Mathias, M.I. (2005) Comparison of the external morphology of *Rhipicephalus sanguineus* (Latreille, 1806) (Acari: Ixodidae) ticks from Brazil and Argentina. *Veterinary Parasitology*, 129, 139–147.
- Dobec, M., Golubic, D., Punda-Polic, V., Kaeppli, F. & Sievers, M. (2009) *Rickettsia helvetica* in *Dermacentor reticulatus* ticks. *Emerging Infectious Diseases*, 15, 98–100.
- Dobler, G., Wölfel, R., Schmüser, H., Essbauer, S. & Pfeffer, M. (2006) Seroprevalence of tick-borne and mosquito-borne arboviruses in European brown hares in northern and western Germany. *International Journal of Medical Microbiology*, 296, 80–83.
- Dobler, G. & Wölfel, R. (2009) Typhus and other rickettsioses: emerging infections in Germany. *Deutsches Ärzteblatt International*, 106, 348–54.
- Doby, J.M. & Bigaignon, G. (1997) Ixodid ticks parasitizing birds and their pathogenic role. *Revue de Médecine Vétérinaire*, 148, 853–660.
- Doby, J.M., Bigaignon, G., Aubert, M. & Imbert-Hameurt, C. (1991) Ectoparasites du renard et borreliosis de lyme. Recherche de *Borrelia burgdorferi* chez les tiques (Ixodidae) et insectes (Siphonaptera). *Bulletin de la Société Française de Parasitologie*, 9, 279–288.
- Doby, J.M., Degeilh, B., Cayouette, S. & Guiguen, C. (1995) Présence de *Borrelia burgdorferi* sensu lato chez *Ixodes (Trichotoxodes) pari* Leach, 1815 (Acari: Ixodidae), tique strictement spécifique des oiseaux. *Bulletin of the Exotic Pathology Society*, 88, 185–186.
- Doss, M.A., Farr, M.M., Roach, K.F. & Anastos, G. (1978) *Index-Catalogue of Medical and Veterinary Zoology. Special publication no. 3. Ticks and tick-borne diseases. IV. Geographical distribution of ticks*. Washington, D.C. United States Department of Agriculture.
- Duh, D., Petrovec, M. & Avsic-Zupanc, D. (2005) Molecular characterization of human pathogen *Babesia*

- EU1 in *Ixodes ricinus* ticks in Slovenia. *Journal of Parasitology*, 91, 463–465.
- Duneau, D., Boulonier, T., Gómez-Días, E., Petersen, A., Tveraa, T., Barrett, R.T. & McCoy, K.D. (2008) Prevalence and diversity of Lyme borreliosis bacteria in marine birds. *Infection, Genetics and Evolution*, 8, 352–359.
- Dusbábek, F. (1985) Identity of *Argas* (*Argas*) *polonicus* populations in Czechoslovakia and Poland. *Folia Parasitologica*, 32, 163–171.
- Dusbábek, F. & Rosicky, B. (1976) Argasid ticks (Argasidae, Ixodoidea) of Czechoslovakia. *Acta Scientiarum Naturalium Academiae Scientiarum Bohemicae Brno*, 10, 1–43.
- Eichler, W. (1968) Kritische Liste mitteleuropäischer Zeckenarten. *Angewandte Parasitologie*, 9, 88–97.
- Elfving, K., Olsen, B., Bergström, S., Waldenström, J., Lundkvist, A., Sjöstedt, A., Mejlon, H. & Nilsson, K. (2010) Dissemination of spotted fever *Rickettsia* agents in Europe by migrating birds. *PLoS One*, doi:10.1371/journal.pone.0008572.
- Emel'yanova, N.D. (1971) The fauna of ticks in East Siberia and Far East. *Proceedings of the 13th International Congress of Entomology* Moscow, 2–9 August 1968 1, pp. 493–494.
- Emel'yanova, N.D. (1979) Taxonomic status of ixodid ticks of the genus *Pholeoixodes* within the subfamily Ixodinae and its division into subgenera. In: Efimov, M.V. & Pronin, N.M. (Eds.) *Zooparasitology of Lake Baikal Basin*. Ulan-Ude, Akad Nauk SSSR, Sib Otd Buryat Filial Otd Biol, pp. 5–27.
- Emel'yanova, N.D., Vasil'ev, G.I., Vershinina, T.A., Derevchikov, A.G., Prokop'ev, V.N., Sonin, V.D., Sheremet'eva, O.F. & Shikhorb'eev, B.V. (1978) Migratory birds and immigrant ixodid tick species of the genus *Pholeoixodes*. *Dokl Simpoziuma Syvazi Pereletn Ptits Rol'v Rasp Arbovirus*, Novosibirsk, July–August 1976, pp. 280–282.
- Emmons, R.W. (1988) Ecology of Colorado tick fever. *Annual Review of Microbiology*, 42, 49–64.
- Enigk, K. (1944) Die Überträger der Pferdepiroplasmose in Europa. *Zeitschrift für Veterinärkunde*, 1944, 65–72.
- Enigk, K. (1958) Zum Vorkommen der Zecke *Dermacentor pictus* (Herm. 1804) in Deutschland. *Zeitschrift für Parasitenkunde*, 18, 419–422.
- Estrada-Peña, A. (1999) Geostatistics as predictive tools to estimate *Ixodes ricinus* (Acari: Ixodidae) habitat suitability in the western Palearctic from AVHRR satellite imagery. *Experimental and Applied Acarology*, 23, 337–349.
- Estrada-Peña, A. (2003) The relationships between habitat topology, critical scales of connectivity and tick abundance *Ixodes ricinus* in a heterogeneous landscape in northern Spain. *Ecography*, 26, 661–671.
- 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. & Jongejans, F. (1999) Ticks feeding on humans: a review of records on human-biting Ixodoidea with special reference to pathogen transmission. *Experimental and Applied Acarology*, 23, 685–715.
- Estrada-Peña, A., Martínez, J.M., Sánchez Acedo, C., Quilez, J. & Del Cacho, E. (2004) Phenology of the tick, *Ixodes ricinus*, in its southern distribution range (central Spain). *Medical and Veterinary Entomology*, 18, 387–397.
- Estrada-Peña, A., Oteo, J.A., Estrada-Peña, R., Gortazar, C., Osacar, J.J., Moreno, J.A. & Castella, J. (1995) *Borrelia burgdorferi* sensu lato in ticks (Acari: Ixodidae) from two different foci in Spain. *Experimental and Applied Acarology*, 19, 173–180.
- Estrada-Peña, A., Quilez, J. & Sánchez Acedo, C. (2004) Species composition, distribution, and ecological preferences of the ticks of grazing sheep in north-central Spain. *Medical and Veterinary Entomology*, 18, 123–133.
- Estrada-Peña, A. & Santos-Silva, M.M. (2005) The distribution of ticks (Acari: Ixodidae) of domestic livestock in Portugal. *Experimental and Applied Acarology*, 36, 233–246.
- Euzéby, J. (1988) Sur la taxonomie des hémosporidies. Cas des piroplasmes. *Sciences Vétérinaires, Médecine Comparée*, 90, 181–200.
- Evans, N.J., Bown, K., Timofte, D., Simpson, V.R. & Birtles, R.J. (2009) Fatal borreliosis in bat caused by relapsing fever spirochete, United Kingdom. *Emerging Infectious Diseases*, 15, 1331–1333.
- Eveleigh, E.S. & Threlfall, W. (1974) The biology of *Ixodes* (*Ceratixodes*) *uriae* White, 1852 in Newfoundland. *Acarologia*, 16, 621–635.
- Faulde, M. & Hoffmann, G. (2001) Vorkommen und Verhütung vektorassoziierter Erkrankungen des Menschen in Deutschland unter Berücksichtigung zoonotischer Aspekte. *Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz*, 44, 116–136.

- Fauquet, C.M. (2005) *Virus taxonomy: VIII report of the International Committee on the Taxonomy of Viruses*. Amsterdam, Elsevier Academic Press, pp. 981–988.
- Fedorov, V.G. (1968) Ixodoidea ticks on humans in western Siberia. *Meditsinskaya Parazitologiya*, 37, 615–616. (NAMRU-3 translation 390).
- Fedorov, V.G. (1972) Ticks of the superfamily Ixodoidea of birds and their nests in western Siberia. In: Cherepanov, A.I. (Ed.) *Materialy 5 Simpoziuma Po Izucheniyu Roli Pereletnykh Ptits V Rasprostraneni Arbovirusov*, Novosibirsk, July 20.27, 1969, pp. 384–388 (NAMRU-3 translation 1494).
- Feider, Z. (1965) *Fauna Republicii Populare Române. Arachnida Vol. V, Fasc. 2 Acaromorpha, Suprafamilia Ixodoidea (Căpușe)*. Editura Academiei Republicii Populare Române, Bucharest.
- Fernandez-Soto, P., Perez-Sanchez, R., Encinas-Grandes, A. & Alama Sanz, R. (2006) *Rickettsia slovaca* in *Dermacentor* ticks found on humans in Spain. *European Journal of Microbiology and Infectious Diseases*, 25, 129–131.
- Filipe, A.R. & Calisher, C.H. (1984) Isolation of Thogoto virus from ticks in Portugal. *Acta Virologica*, 28, 152–155.
- Filippova, N.A. (1972) New data on ticks of the genus *Ixodes* Latr. (Ixodoidea, Ixodidae) which are specific bat parasites. *Entomologicheskoe Obozrenie*, 51, 463–475.
- Filippova, N.A. (1977) Ixodid ticks of the subfamily Ixodinae. *Fauna SSSR*, Leningrad Paukoobraznye 4. Nauka (in Russian).
- Filippova, N.A. (1985) Taiga tick, *Ixodes persulcatus* (Acarina: Ixodidae). Morphology, systematics, ecology, medical importance. *Soviet Committee for the UNESCO Programme "Man and Biosphere"*, Leningrad, 416 pp. (in Russian).
- Filippova, N.A. (1999) Systematic relationships of the *Ixodes ricinus* species complex in the Palearctic Faunal Region. In: Needham, G.R., Mitchell, R., Horn, D.J. & Welbourn, W.C. (Eds.) *Acarology IX*, vol. 2., Ohio, Ohio Biological Survey, pp. 355–361.
- Filippova, N.A. (2004) Variability of the hard dorsal idiosomal tegument pattern and other phenotypic characters as a manifestation of microevolution in *Dermacentor marginatus* (Acari: Ixodidae). *Parazitologia*, 38, 369–387 (in Russian).
- Filippova, N.A. & Panova, I.V. (2000) Intraspecific differentiation of burrow tick *Ixodes crenulatus* (Ixodidae). *Parazitologia*, 34, 265–279.
- Filippova, N.A. & Uspenskaya, I.G. (1973) *Ixodes kaiseri* Arthur 1957 (Ixodidae) species taxonomic status. *Parazitologia*, 7, 297–306.
- Fingerle, V., Munderloh, U.G., Liegl, G. & Wilske, B. (1999) Coexistence of ehrlichiae of the *phagocytophila* group with *Borrelia burgdorferi* in *Ixodes ricinus* from southern Germany. *Medical Microbiology and Immunology*, 188, 145–149.
- Fingerle, V., Schulte-Spechtel, U.C., Ruzic-Sabljic, E., Leonhard, S., Hofmann, H., Weber, K., Pfister, K., Strle, F. & Wilske, B. (2008) Epidemiological aspects and molecular characterization of *Borrelia burgdorferi* s.l. from southern Germany with special respect to the new species *Borrelia spielmanii* sp. nov. *International Journal of Medical Microbiology*, 298, 279–290.
- Földvari, G. & Farkas, R. (2005) Ixodid ticks attaching to dogs in Hungary. *Veterinary Parasitology*, 129, 125–131.
- Földvari, G., Marialigeti, M., Solymosi, N., Lucacs, Z., Majoros, G., Kosa, J.P. & Farkas, R. (2007) Hard ticks infesting dogs in Hungary and their infection with *Babesia* and *Borrelia* species. *Parasitology Research*, 101, 25–34.
- Friedhoff, K.T. (1997) Tick-borne diseases of sheep and goats caused by *Babesia*, *Theileria* or *Anaplasma* spp. *Parasitologia*, 39, 99–109.
- Gao, G.F., Jiang, W.R., Hussain, M.H., Venugopal, K., Gritsun, T.S., Reid, H.W. & Gould, E.A. (1993) Sequencing and antigenic studies of a Norwegian virus isolated from encephalomyelitic sheep confirm the existence of louping ill virus outside Great Britain and Ireland. *Journal of General Virology*, 74, 109–114.
- Gaunt, M.W. & Gould, E.A. (2005) Rapid subgroup identification of the flaviviruses using degenerate primer E-gene RT-PCR and site specific restriction enzyme analysis. *Journal of Virological Methods*, 128, 113–127.
- Gautier-Clerc, M., Clerquin, Y. & Handrich, Y. (1998) Hyperinfestation by ticks *Ixodes uriae*: a possible cause of death in adult king penguins, a long-lived sea bird. *Colonial Waterbirds*, 21, 229–233.
- Gautier-Clerc, M., Jaulhac, B., Frenot, Y., Bachelard, C., Monteil, H., Le Maho, Y. & Handrich, Y. (1999) Prevalence of *Borrelia burgdorferi* (the Lyme disease agent) antibodies in king penguin *Aptendytes pat-*

- gonicus* in Crozet Archipelago. *Polar Biology*, 22, 141–143.
- Gembitsky, A.S. (1966) On finding *Ixodes arboricola* P. Sch. and Schl. in bird's nests. *Zoologicheskyy Zhurnal*, 45, 1881–1882. (NAMRU-3 translation 266).
- George, T.D. St., Doherty, R.L., Carley, J.G., Filippich, C., Brescia, A., Casals, J., Kemp, D.H. & Brothers, N. (1985) The isolation of arboviruses including a new flavivirus and a new bunyavirus from *Ixodes (Ceraticoxodes) uriae* collected at Macquarie Island, Australia, 1975–1979. *American Journal of Tropical Medicine and Hygiene*, 34, 406–412.
- Georges, K., Loria, G.R., Riili, S., Greco, A., Caracappa, S., Jongejan, F. & Sparagno, O. (2001) Detection of haemoparasites in cattle by reverse line blot hybridisation with a note on the distribution of ticks in Sicily. *Veterinary Parasitology*, 99, 273–286.
- Gern, L., Rouvinez, E., Toutoungi, L.N. & Godfroid, E. (1997) Transmission cycles of *Borrelia burgdorferi* sensu lato involving *Ixodes ricinus* and/or *I. hexagonus* ticks and the European hedgehog, *Erinaceus europaeus*, in suburban and urban areas in Switzerland. *Folia Parasitologica*, 44, 309–314.
- Gern, L., Toutoungi, L.N., Hu, C.M. & Aeschlimann, A. (1991) *Ixodes (Pholeoixodes) hexagonus*, an efficient vector of *Borrelia burgdorferi* in the laboratory. *Medical and Veterinary Parasitology*, 5, 431–435.
- Gilot, B. & Aubert, M.F.A. (1985) Les Ixodidae (Acarines, Ixodoidea) parasites de carnivores sauvages dans les Alpes Françaises et leur avant-pays. *Acarologia*, 26, 215–233.
- Gilot, B. & Beaucournu, J.C. (1972) Premier inventaire des tiques d'oiseaux (Acarina, Ixodoidea) de l'ouest de la France. Presence d'*Ixodes unicavatus* Neumann 1908 en Bretagne. *Bulletin de la Société Scientifique de Bretagne*, 28, 131–141.
- Gilot, B. & Beaucournu, J.C. (1998) Book review: Ticks of North-West Europe by Paul D. Hillyard 1996. *Parasite*, 5, 206–208.
- Gilot, B., Beaucournu, J.C. & Chastel, C. (1997) Collecte « au drapeau » et fixation sur l'homme d'*Ixodes (Trichotoxodes) frontalis* (Panzer, 1795). *Parasite*, 2, 197–199.
- Gilot, B., Beaucournu, J.C., Pautou, D., Fayard, A. & Moncada, E. (1976a) Contribution à la connaissance de la répartition et de l'écologie d'*Ixodes trianguliceps* (Birula, 1895) (Acarina, Ixodoidea) en France, et plus particulièrement dans le Sud-Est. *Acta Tropica*, 33, 254–286.
- Gilot, B., Moncada, E. & Pautou, G. (1976b) Presence en France d'*Ixodes apronophorus* (Schulze, 1924). Ixodoidea—Ixodidae. *Annales de Parasitologie Humaine et Comparee*, 51, 601–603.
- Gilot, B. & Perez, C. (1978) Individualisation et caractérisation de deux *Ixodes* actuellement confondus: *I. festai* Rondelli, 1926, *I. ventalloi* Gil Collado, 1936 (Acarina, Ixodoidea). *Revue Suisse de Zoologie*, 85, 143–149.
- Glaser, B. & Gothe, R. (1998) Importierte anthropodenübertragene Parasiten und parasitische Arthropoden beim Hund. Erregerspektrum und epidemiologische Analyse der 1995/96 diagnostizierten Fälle. *Tierärztliche Praxis*, 26, 197–202.
- Goddard, J. (2002) A ten-year study of tick biting in Mississippi: implications for human disease transmission. *Journal of Agromedicine*, 8, 25–32.
- Gomez-Diaz, E., Doherty, P., Duneau, D. & McCoy, K. (2010) Cryptic vector divergence masks vector-specific patterns of infection: an example from the marine cycle of Lyme borreliosis. *Evolutionary Applications*, doi:10.1111/j.1752-4571.2010.00127.x.
- Gorelova, N.B., Korenberg, E.I., Kovalevskii, Iu.V., Postic, D. & Baranton, G. (1996) The isolation of borrelia from the tick *Ixodes trianguliceps* (Ixodidae) and the possible significance of this species in the epizootiology of ixodid tick-borne borreliosis. *Parazitologiya*, 30, 13–18 (in Russian).
- Gothé, R. (1968) Zum Vorkommen von *Rhipicephalus sanguineus* (Latreille 1806) in Deutschland. *Zeitschrift für Tropenmedizin und Parasitologie*, 19, 305–307.
- Gothé, R. (1999) Zeckentoxikosen. Munich, Hieronymus.
- Gothé, R. & Hamel, H.D. (1973a) Zür Ökologie eines deutschen Stammes von *Rhipicephalus sanguineus* (Latreille, 1806). *Zeitschrift für Parasitenkunde*, 41, 157–172.
- Gothé, R. & Hamel, H.D. (1973b) Epizootien von *Rhipicephalus sanguineus* (Latreille, 1806) in Deutschland. *Zentralblatt für Veterinärmedizin Reihe B*, 20, 245–249.
- Gothé, R., Stendel, W. & Holm, R. (1977) Zum Vorkommen von *Ixodes canisuga* Johnston, 1884, in Deutschland, ein Beitrag zur *Ixodes*-Fauna. *Zeitschrift für Parasitenkunde*, 53, 123–128.
- Gould, E.A. & Solomon, T. (2008) Pathogenic flaviviruses. *Lancet*, 371, 500–509.
- Graf, J.F., Mermod, C. & Aeschlimann, A. (1979) Nouvelles données concernant la distribution, l'écologie et la biologie d'*Ixodes (Exopalgiger) trianguliceps* (Birula, 1895) en Suisse (Ixodoidea, Ixodidae). *Bulletin de la Société neuchâteloise des Sciences Naturelles*, 102, 55–68.

- Grard, G., Moureau, G., Charrel, R.N., Lemasson, J.J., Gonzales, J.P., Gallian, P., Gritsun, T.S., Holmes, E.C., Gould, E.A. & de Lamballerie, X. (2007) Genetic characterization of tick-borne flaviviruses: new insights into evolution, pathogenic determinants and taxonomy. *Virology*, 361, 80–92.
- Gray, J.S. (2004) *Babesia* sp.: emerging intracellular parasites in Europe. *Polish Journal of Microbiology* 53 (Suppl.), 55–60.
- Gray, J.S., von Stedingk, M., Gürtelschmid, M. & Granström, M. (2002) Transmission studies on *Babesia microti* in *Ixodes ricinus* ticks and gerbils. *Journal of Clinical Microbiology*, 40, 1258–1263.
- Gresikova, M., Ernek, E., Kozuch, O. & Nosek, J. (1965) Some ecological aspects on Tribic virus. *Folia Parasitologica*, 17, 379–382.
- Gresikova, M. & Kaluzova, M. (1997) Biology of tick-borne encephalitis virus *Acta Virologica*, 41, 115–124.
- 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., Robbins, R.G., Apanaskevich, D.A., Petney, T.N., Estrada-Peña, A., Horak, I.H., 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.
- Guiguen, C., Monnat, J.Y. & Thibault, J.C. (1986) Apports à la connaissance des tiques (Ixodoidea) d'oiseaux marins en France continentale et en Corse. *Bulletin de la Société Française de Parasitologie*, 4, 267–272.
- Guo, S., Yuan, Z., Wu, G., Wang, W., Ma, D. & Du, H. (2002) Epidemiology of ovine theileriosis in Ganan region, Gansu Province, China. *Parasitology Research*, 88 (Suppl.), 36–37.
- Gurycova, D. (1998) First isolation of *Francisella tularensis* subsp. *tularensis* in Europe. *European Journal of Epidemiology*, 14, 797–802.
- Gylfe, A., Olsen, B., Strasevicus, D., Ras, N.M., Weihe, P., Noppa, L., Östberg, Y. Y., Baranton, G. & Bergström, S. (1999) Isolation of Lyme disease *Borrelia* from puffins (*Fratercula arctica*) and seabird ticks (*Ixodes uriae*) on the Faeroe Islands. *Journal of Clinical Microbiology*, 37, 890–896.
- Haarlof, N. (1962) Variation in the ixodid tick, *Ixodes arboricola* Schulze & Schlottke 1929. *Parasitology*, 52, 425–439.
- Haarlof, N. (1969) Another case of introduction into Denmark from Africa of the kennel tick (*Rhipicephalus sanguineus* (Latr.1806)). *Nordisk Veterinær Medicin*, 21, 445–448.
- Häselbarth, K., Tenter, A.M., Brade, V., Krieger, G. & Hunfeld, K.-P. (2007) First case of human babesiosis in Germany – clinical presentation and molecular characterization of the pathogen. *International Journal of Microbiology*, 297, 197–204.
- Haller, G. (1882) Beitrag zur Kenntnis der Milbenfauna Württembergs. *Jahreshefte des vaterländischen Verein für Naturkunde in Württemberg (Stuttgart)*, 38, 293–325.
- Halos, L., Jamal, T., Maillard, R., Beugnet, F., Le Menach, A., Boulouis, H.J. & Vayssier-Taussat, M. (2005) Evidence of *Bartonella* sp. in questing adult and nymphal *Ixodes ricinus* ticks from France and co-infection with *Borrelia burgdorferi* sensu lato and *Babesia* sp. *Veterinary Research*, 36, 79–87.
- Harris, S. & Thompson, G.B. (1978) Populations of the ticks *Ixodes* (*Pholeoixodes*) *hexagonus* and *Ixodes* (*Pholeoixodes*) *canisuga* infesting suburban foxes, *Vulpes vulpes*. *Journal of Zoology* 186: 83–93
- Hartelt, K., Oehme, R., Frank, H., Brockmann, S.O., Hassler, D. & Kimmig, P. (2004) Pathogens and symbionts in ticks: prevalence of *Anaplasma phagocytophilum* (*Ehrlichia* sp.), *Wolbachia* sp., *Rickettsia* sp., and *Babesia* sp. in southern Germany. *International Journal of Medical Microbiology*, 293 (Suppl. 37), 86–92.
- Hassan, V., Zekkyeh, T., Mozafar, S., Alireza, M., Maryam, K. & Mojtaba, T. (2010) Ectoparasites of the lesser mouse eared bat, *Myotis blythii* from Kermanshah, Iran. *Asian Pacific Journal of Tropical Medicine* 2010, 371–373.
- Hassler, D., Oehme, R., Kimmig, P. & Dobler, G. (2003) Eyach virus: first detection from ticks after more than 25 years in south-western Germany. *Deutsche Medizinische Wochenschrift*, 128, 1874.
- Hauschild, S. & Schein, E. (1996) Zur Artspezifität von *Babesia canis*. *Berliner und Münchener Tierärztliche Wochenschrift*, 109, 216–219.
- Havelka, P., Mittmann, H.W. & Ruge, K. (1989) Zum Vorkommen der Zecke *Ixodes arboricola* (Schulze u. Schlotke, 1929) (Ixodoidea, Ixodidae) in künstlichen Nisthöhlen. *Zeitschrift für Angewandte Zoologie*, 76, 485–503.

- Heath, A.C.G. & Cane, R.P. (2010) A new species of *Ixodiphagus* (Hymenoptera: Chalcidoidea: Encyrtidae) parasitizing seabird ticks in New Zealand. *New Zealand Journal of Zoology*, 37, 147–155.
- Heidrich, J., Schönberg, A., Steuber, S., Nöckler, K., Schulze, P., Voigt, W.P. & Schein, E. (1999) Investigations of skin samples from red foxes (*Vulpes vulpes*) in eastern Brandenburg (Germany) for the detection of *Borrelia burgdorferi* s.l. *Zentralblatt für Bakteriologie*, 289, 666–672.
- Heile, C., Heydorn, A.-O. & Schein, E. (2006) *Dermacentor reticulatus* (Fabricius, 1794) – Verbreitung, Biologie und Vektor von *Babesia canis* in Deutschland. *Berliner und Münchener Tierärztliche Wochenschrift*, 119, 330–334.
- Hellenbrand, W., Breuer, T. & Petersen, L. (2001) Changing epidemiology of Q fever in Germany, 1947–1999. *Emerging Infectious Diseases*, 7, 789–796.
- Hermann, J.F. (1804) *Mémoire apterilogique*. Strasbourg.
- Herwaldt, B.L., Caccio, S., Gherlinzoni, F., Aspöck, H., Slemenda, S.B., Piccaluga, P.P., Martinelli, G., Edelhofer, R., Hollenstein, U., Poletti, G., Pampiglione, S., Löschenberger, K., Tura, S. & Pieniazek, N.J. (2003) Molecular characterization of a non-*Babesia divergens* organism causing babesiosis in Europe. *Emerging Infectious Diseases*, 9, 942–948.
- Hesse, G.H. & Völker, K. (1983) Ein Beitrag zur deutschen *Haemaphysalis*-Fauna (Ixodoidea, Ixodidae): *Haemaphysalis punctata* in Nordrhein-Westfalen. *Zeitschrift für Parasitenkunde*, 69, 393.
- Hesse, G.H. & Völker, K. (1984) *Ixodes (Pholeoixodes) canisuga* (Ixodoidea: Ixodidae): Parasit des Rotfuchses (*Vulpes vulpes* L.) im Bonner Raum (Nordrhein-Westfalen) *Zeitschrift für Angewandte Entomologie*, 71, 503–504.
- Heylen, D. & Matthysen, E. (2009) Contrasting detachment strategies in two congeneric ticks (Ixodidae) parasitizing the same songbird. *Parasitology*, 137, 661–667.
- Hilger, C., Bessot, J.C., Hutt, N., Grigioni, F., De Blay, F., Pauli, G. & Hentges, F. (2005) IgE-mediated anaphylaxis caused by bites of the pigeon tick *Argas reflexus*: cloning and expression of the major allergen Arg r 1. *Journal of Allergy and Clinical Immunology*, 115, 617–622.
- Hillyard, P.D. (1996) *Ticks of north-west Europe*. London, Linnaean Society.
- Hoffmann, G. (1973) Mitteleuropäische Zecken, ihre Entwicklung, Überträgerfunktion und Bekämpfung unter Berücksichtigung viehseuchen- und seuchenpolizeilicher Aspekte. *Praktischer Schädlingsbekämpfer*, 25, 169–175.
- Hoffmann, G. (1980) Bekämpfung der braunen Hundezecke (*Rhipicephalus sanguineus* L.) in Wohnungen und Ställen. *Bundesgesundheitsblatt*, 23, 64–74.
- Hoffmann, G. (1981) Die braune Hundezecke (*Rhipicephalus sanguineus* L.) in Berlin (West) – epizootiologische Untersuchungen unter Einschaltung von Massenmedien. *Bundesgesundheitsblatt*, 24, 41–50.
- Hohorst, W. (1942) das Vorkommen von 2 seltenen Zecken, *Dermacentor marginatus* Sulzer 1776 und *Haemaphysalis concinna* Koch 1844 im Hessischen Ried. *Senckenbergiana*, 25, 94–99.
- Hohorst, W. (1943) Die Zecke *Dermacentor marginatus* Sulzer 1776, ihre Verbreitung, Lebensweise und medizinische Bedeutung. *Zeitschrift für Parasitenkunde*, 13, 118–146.
- Hoogstraal, H. (1956) *African Ixodoidea. I. Ticks of the Sudan*. Research report NM 005.050.29.07, Washington, D.C. Department of the Navy, Bureau of Medicine and Surgery.
- Hoogstraal, H. (1966) Ticks in relation to human diseases caused by viruses. *Annual Review of Entomology*, 11, 261–308.
- Hoogstraal, H.H. (1979) The epidemiology of tick-borne Crimean-Congo hemorrhagic fever in Asia, Europe and Africa. *Journal of Medical Entomology*, 15, 307–417.
- Hoogstraal, H. (1985) Argasid and nuttallielid ticks as parasites and vectors. *Advances in Parasitology*, 24, 136–220.
- Hoogstraal, H. & Kaiser, M.N. (1958) Observations on Egyptian *Hyalomma* ticks (Ixodoidea, Ixodidae). 2. Parasitism of migrating birds by immature *H. rufipes* Koch. *Annals of the Entomological Society of America*, 51, 12–16.
- Hoogstraal, H. & Kaiser, M.N. (1960) Observations on the ticks (Ixodoidea) of Libya. *Annals of the Entomological Society of America*, 53, 445–457.
- Hoogstraal, H. & Kaiser, M.N. (1961) Ticks from European-Asiatic birds migrating through Egypt into Africa. *Science*, 133, 277–278.
- Hoogstraal, H., Kaiser, M.N., Seymour, C. & Gaber, S. (1967) Noteworthy recent tick records from Egypt. 1. *Ixodes arboricola* Schulze and Schlottke infesting resident, migrant, and wintering birds in the western coastal desert. *Journal of the Egyptian Public Health Association*, 42, 223–229.
- Hoogstraal, H., Kaiser, M.N., Traylor, M.A., Guindy, E. & Gaber, S. (1963) Ticks (Ixodidae) on birds migrat-

- ing from Europe and Asia to Africa, 1959–1961. *Bulletin of the World Health Organisation*, 28, 235–263.
- Hoogstraal, H. & Kim, K.C. (1985) Tick and mammal coevolution, with emphasis on *Haemaphysalis*. In: Kim, K.C. (Ed.) *Coevolution of parasitic arthropods and mammals*. New York, Wiley, pp. 505–568.
- Hoogstraal, H. & Kohls, G.M. (1960) Observations on the subgenus *Argas* (Ixodoidea, Argasidae, *Argas*). 1. Study of *A. reflexus reflexus* (Fabricius, 1794), the European bird argasid. *Annals of the Entomological Society of America*, 53, 611–618.
- Hoogstraal, H., Traylor, M.A., Gaber, S., Malakatis, G., Guindy, E. & Helmy, I. (1964) Ticks (Ixodidae) on migrating birds in Egypt, spring and fall 1962. *Bulletin of the World Health Organisation*, 30, 355–367.
- Hoogstraal, H. & Valdez, R. (1980) Ticks (Ixodoidea) from wild sheep and goats in Iran and medical and veterinary implications. *Fieldiana Zoology* (new series), 6, 1–16.
- Hoogstraal, H., Wassef, H.Y. & Büttiker, W. (1981) Ticks (Acarina) of Saudi Arabia. Fam. Argasidae, Ixodidae. *Fauna of Saudi Arabia*, 3, 25–110.
- 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.
- Hornok, S. (2009) Allochronic seasonal peak activities of *Dermacentor* and *Haemaphysalis* spp. under continental climate in Hungary. *Veterinary Parasitology* 163, 366–369.
- Hornok, S. & Farkas, R. (2009) Influence of biotope on the distribution and peak activity of questing ixodid ticks in Hungary. *Medical and Veterinary Entomology*, 23, 41–46.
- Hornok, S., Meli, M.L., Perreten, A., Farkas, R., Willi, B., Beugnet, F., Lutz, H. & Hofmann-Lehrmann, R. (2010) Molecular investigation of hard ticks (Acari: Ixodidae) and fleas (Siphonaptera: Pulicidae) as potential vectors of rickettsial and mycoplasmal agents. *Veterinary Microbiology*, 140, 98–104.
- Hubalek, Z. (1986) Comparative biogeography of Bhanja virus in Europe. *Acta Scientiarum Naturalium Academiae Scientiarum Bohemicae Brno*, 20, 1–50.
- Hubalek, Z., Juricova, Z., Halouzka, J., Pellantova, J. & Hudec, K. (1989) Arboviruses associated with birds in southern Moravia, Czechoslovakia. *Acta Scientiarum Naturalium Academiae Scientiarum Bohemicae Brno*, 23, 1–50.
- Hubalek, Z., Sixl, W., Halouzka, J. & Mikulaskova, M. (1997) Prevalence of *Francisella tularensis* in *Dermacentor reticulatus* ticks collected in adjacent areas of the Czech and Austrian republics. *Central European Journal of Public Health*, 5, 199–201.
- Hubalek, Z., Stünzer, D., Halouzka, J., Sixl, W., Wendelin, I., Juricova, Z. & Sanogo, Y.O. (2003) Prevalence of borreliae in ixodid ticks from a floodplain forest ecosystem. *Wiener Klinische Wochenschrift*, 115, 121–124.
- Hubalek, Z., Treml, F., Halouzka, J., Juricova, Z., Hunady, M. & Janik, V. (1996) Frequent isolation of *Francisella tularensis* from *Dermacentor reticulatus* ticks in an enzootic focus of tularemia. *Medical and Veterinary Entomology*, 10, 241–246.
- Hubbard, M.J., Baker, A.S. & Cann, K.J. (1998) Distribution of *Borrelia burgdorferi* s.l. spirochaete DNA in British ticks (Argasidae and Ixodidae) since the 19th century, assessed by PCR. *Medical and Veterinary Entomology*, 12, 89–97.
- Hudde, H. & Walter, G. (1988) Verbreitung und Wirtswahl der Vogelzecke *Ixodes arboricola* (Ixodoidea, Ixodidae) in der Bundesrepublik Deutschland. *Vogelwarte*, 34, 201–207.
- Hudson, P.J. (1992) Grouse in space and time. *The Game Conservancy Trust*, Fordingbridge.
- Hunfeld, K.-P., Hildebrandt, A. & Gray, J.S. (2008) Babesiosis: recent insights into an ancient disease. *International Journal of Parasitology*, 38, 1219–1237.
- Immler, R.M. (1973) Untersuchungen zur Biologie und Ökologie der Zecke *Dermacentor reticulatus* (Fabricius, 1794) (Ixodidae) in einem endemischen Vorkommensgebiet. Ph.D. dissertation, University of Basel.
- Immler, R., Aeschlimann, A., Büttiker, W., Diehl, P.A., Eichenberger, G. & Weiss, N. (1970) Über das Vorkommen von *Dermacentor*-Zecken (Ixodoidea) in der Schweiz. *Bulletin de la Société Entomologique Suisse* 43, 99–110.
- Jaenson, T.G.T. & Jensen, J.K. (2007) Records of ticks (Acari, Ixodidae) from the Faroe Islands. *Norwegian Journal of Entomology*, 54, 11–15.
- Jaenson, T.G.T. & Tälleklint, L. (1992) Incompetence of roe deer as reservoirs of the Lyme borreliosis spirochete. *Journal of Medical Entomology*, 29, 813–817.
- Jaenson T.G.T., Tälleklint L., Lundqvist L., Olsen B., Chirico J. & Meljon, H. (1994) Geographical distribution, host associations, and vector roles of ticks (Acari: Ixodidae, Argasidae) in Sweden. *Journal of Medical Entomology*, 31, 240–256.
- Janisch, M. (1959) Geographical distribution of tick species in Hungary. *Állattani Közlemények*, 47, 103–110.

- (in Hungarian).
- Johnsen, P. (1943) *Hyalomma marginatum* Koch, en Blodmide ny for Danmark. *Entomologiske Meddelelser*, 22, 381–383.
- Kahl, O., Janetzki, C., Gray, J.S., Stein, J. & Bauch, R.J. (1992) Tick infection rates with *Borrelia: Ixodes ricinus* versus *Haemaphysalis concinna* and *Dermacentor reticulatus* in two locations in eastern Germany. *Medical and Veterinary Entomology*, 6, 363–366.
- Kahl, O., Schmidt, K., Schönberg, A., Laukamm-Josten, U., Knülle, W. & Bienzle, U. (1989) Prevalence of *Borrelia burgdorferi* in *Ixodes ricinus* ticks in Berlin (West). *Zentralblatt für Bakteriologie, Mikrobiologie und Hygiene Series A*, 270, 434–440.
- Kaiser, M.N. & Hoogstraal, H. (1974) Ticks (Ixodoidea) on migrating birds in Cyprus, fall 1967 and spring 1968, and epidemiological considerations. *Bulletin of Entomological Research*, 64, 97–110.
- Kampen, H., Poltz, W., Hartelt, K., Wölfel, R. & Faulde, M. (2007) Detection of a questing *Hyalomma marginatum marginatum* adult female (Acari, Ixodidae) in southern Germany. *Experimental and Applied Acarology*, 43, 227–231.
- Karbowiak, G. & Wita, I. (2000) Rola krwio pijnych stawonogów jako przenosicieli niepatogenicznych swidrowców z rodzaju *Trypanosoma*, grupy *Stercoraria*, w Europie. In: Buczek A, Blaszkak C (Eds.) *Stawonogi pasozytnicze i alergogenne*. KGM, Lublin, pp. 151–169.
- Karbowiak, G., Wieczorek, M., Borowski, Z. & Wita, I. (2007) The new locality of *Ixodes apronophorus* Schulze, 1924 in Biebrza National Park, Poland. *Wiadomosci Parazytologiczne*, 53, 343–345.
- Kaysser, P., Seibold, E., Mätz-Rensing, K., Pfeffer, M., Essbauer, S. & Spletstoesser, W.D. (2008) Re-emergence of tularemia in Germany: presence of *Francisella tularensis* in different rodent species in endemic areas. *BMC Infectious Diseases* 8, 157, doi: 10.1186/1471-2334-8-157.
- Keirans, J.E. (1992) Systematics of the Ixodida (Argasidae, Ixodidae, Nuttelliellidae): an overview and some problems. In: Fivaz, B.H., Petney, T.N. & Horak, I.G. (Eds.) *Tick Vector Biology: Medical and Veterinary Aspects* Heidelberg, Springer, 193 pp.
- Keirans, J.E., Needham, G.R. & Oliver, J.H. Jr. (1999) The *Ixodes ricinus* complex worldwide: diagnosis of the species in the complex, hosts and distribution. In: Needham, G.R., Mitchell, R., Horn, D.J. & Welbourn, W.C. (Eds.) *Acarology IX*, Vol 2. Ohio, Ohio Biological Survey, pp. 341–347.
- Kemper, H. (1934) Die Taubenzecke, *Argas reflexus*, als Plageerreger in menschlichen Wohnungen. *Journal of Pest Science*, 10, 139–140.
- Kharitonova, N.N. & Leonov, Yu.A. (1986) Omsk hemorrhagic fever: ecology of the agent and epizootiology. *American Journal of Tropical Medicine and Hygiene*, 35, 1318.
- Khazova, T.G. & Iastrebov, V.K. (2001) Combined focus of tick-borne encephalitis tick-borne rickettsiosis and tularaemia in the habitat of *Haemaphysalis concinna* in south central Siberia. *Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii*, 2001, 78–80 (in Russian).
- Kjemtrup, A.M. & Conrad, P.A. (2000) Human babesiosis: an emerging tick-borne disease. *International Journal of Parasitology*, 30, 1323–1337.
- Kleine-Tebbe, J., Heinatz, A., Gräser, I., Dautel, H., Nordskov Hansen, G., Kespohl, S., Rihs, H.P., Rauf-Heimsoth, M., Vater, G., Rytter, M. & Hausteint, U-F. (2006) Bites of the European pigeon tick (*Argas reflexus*): risk of IgE-mediated sensitizations and anaphylactic reactions. *Journal of Allergy and Clinical Immunology*, 117, 190–195.
- Klompen, J.S.H. & Oliver, J.H., Jr. (1993) Systematic relationships in the soft ticks (Acari: Ixodida: Argasidae). *Systematic Entomology*, 18, 313–331.
- Klompen, J.S.H., Black, W.C.IV., Keirans, J.E. & Oliver, J.H.Jr. (1996) Evolution of ticks. *Annual Reviews of Entomology*, 41, 141–161.
- Kocan, A.A., Mukolwe, S.W., Murphy, G.L., Barker, R.W. & Kocan, K.M. (1992) Isolation of *Borrelia burgdorferi* (Spirochaetales: Spirochaetaceae) from *Ixodes scapularis* and *Dermacentor albipictus* ticks (Acari: Ixodidae) in Oklahoma. *Journal of Medical Entomology* 29, 630–633.
- Kocan, K.M., De La Fuente, J., Blouin, E.F. & Garcia-Garcia, J.C. (2004) *Anaplasma marginale* (Rickettsiales: Anaplasmataceae): recent advances in defining host-pathogen adaptations of a tick-borne rickettsia. *Parasitology* 129, S285–S300.
- Koch, C.L. (1844) Systematische Uebersicht über die Ordnung der Zecken. *Archiv für Naturgeschichte*, 10, 217–239.
- Kocianova, E., Kozuch, O., Bakoss, P., Rehacek, J., Kovacova, E. (1993) The prevalence of small terrestrial mammals infected with tick-borne encephalitis virus and leptospirae in the foothills of the southern Bavarian forest, Germany. *Applied Parasitology*, 34, 283–290.

- Kok, D.J. & Fourie, L.J. (1995) The role of *Hyalomma* ticks in foot infestations and temporary lameness of sheep in a semi-arid region of South Africa. *Onderstepoort Journal of Veterinary Research*, 62, 201–206.
- Kolonin, G.V. & Boltonin, E.I. (1977) Rare ixodid ticks species in Primor'ye region. *Zoologicheskii Zhurnal*, 56, 475–476. (NAMRU-3 translation 1276).
- Koney, E.B.M., Walker, A.R., Heron, I.D., Morrow, A.N. & Ambrose, N.C. (1994) Seasonal prevalence of ticks and their association with dermatophilosis in cattle on the Accra plains of Ghana. *Revue d'Élevage et de Médecine Vétérinaire des Pays Tropicaux*, 47, 163–167.
- Korting, G.W. & Hoost, E. (1976) Taubenzecken-Dermatitis. *Deutsches Ärzteblatt*, 31, 2021–2024.
- Kozuch, O. & Nosek, J. (1971) Transmission of tick-borne encephalitis (TBE) virus by *Dermacentor marginatus* and *D. reticulatus* ticks. *Acta Virologica*, 15, 334.
- Krämer, C. (1995) Ökologische Untersuchungen zur Lebensgemeinschaften der Ektoparasiten von Kleinsäugern. *Diplomarbeit*, University of Heidelberg
- Kratzer, L. (2010) Die Verbreitung der Zecke *Dermacentor reticulatus* im Oberrheingebiet. B.Sc. thesis, KIT.
- Krauss, H., Schmeer, N. & Schiefer, H.G. (1987) Epidemiology and significance of Q fever in the Federal Republic of Germany. *Zentralblatt für Bakteriologie und Hygiene A*, 267, 42–50.
- Krivanec, K., Kopecky, E., Tomkova, E. and Grubhoffer, L. (1988) Isolation of TBE virus from the tick *Ixodes hexagonus*. *Folia Parasitologica*, 35, 273–276.
- Laakkonen, J., Terhivuo, J., Huhtamo, E., Vapalahti, O. & Uzcátegui, N. (2009) First report of *Ixodes frontalis* (Acari: Ixodidae) in Finland, an example of foreign tick species transported by a migratory bird. *Memo-randa Societatis pro Fauna et Flora Fennica*, 85, 16–19.
- Labuda, M., Jones, L.D., Williams, T., Danielova, V. & Nuttall, P.A. (1993a) Efficient transmission of tick-borne encephalitis virus between cofeeding ticks. *Journal of Medical Entomology*, 30, 295–299.
- Labuda, M., Nuttall, P.A., Kozuch, O., Eleckova, E., Williams, T., Zuffova, E. & Sabo, A. (1993b) Non-viremic transmission of tick-borne encephalitis virus: a mechanism for arbovirus survival in nature. *Experimentia*, 49, 802–805.
- Laubstein, B., Herold, D., Audring, H. & Buchholtz, I. (1993) Nächtliche Anaphylaxie durch *Argas reflexus* (Taubenzecke). *Allergologie*, 16, 370–373.
- Laurenson, M.K., Norman, R.A., Gilbert, L., Reid, H.W. & Hudson, P.J. (2003) Identifying disease reservoirs in complex systems: mountain hares as reservoirs of ticks and louping-ill virus, pathogens of red grouse. *Journal of Animal Ecology*, 72, 117–185.
- Leeson, H.S. (1951) The recorded distribution of the tick *Rhipicephalus sanguineus* (Latreille). *Bulletin of Entomological Research*, 42, 123–124.
- Lewis, J.E., Jr., Ristic, M., Smith, R.D., Lincoln, T. & Stephenson, E.H. (1977) The brown dog tick *Rhipicephalus sanguineus* and the dog as experimental hosts of *Ehrlichia canis*. *American Journal of Veterinary Research* 38, 1953–1955.
- L'Hostis, M. & Seegers, H. (2002) Tick-borne parasitic diseases in cattle: current knowledge and prospective risk analysis related to the ongoing evolution in French cattle farming systems. *Veterinary Research*, 33, 599–611.
- Lichard, M. & Kozuch, O. (1967) Persistence of tick-borne encephalitis virus in nymphs and adults of *Ixodes arboricola* and its transmission to white mice. *Acta Virologica*, 11, 480.
- Liebisch, A. (1991) Biologie und Ökologie der Zecken. In: Horst, H. (Ed.) *Einheimische Zeckenborreliose (Lyme-Krankheit) bei Mensch und Tier*. Erlangen, Perimed.
- Liebisch, A., Brandes, R. & Hoppenstedt, K. (1985) Zum Befall von Hunden und Katzen mit Zecken und Flöhen in Deutschland. *Praktischer Tierarzt*, 66, 817–819.
- Liebisch, A., Burgdorfer, W. & Rahman, M.S. (1978) Epidemiologische Untersuchungen an Schafzecken (*Dermacentor marginatus*) auf Infektionen mit Rickettsien. *Deutsche Tierärztliche Wochenschrift*, 85, 121–126.
- Liebisch, A. & Gillani, S. (1979) Experimentelle Übertragung der Hundebabesiose (*Babesia canis*) durch einheimische deutsche Zeckenarten: 1. Die braune Hundezecke (*Rhipicephalus sanguineus*). *Deutsche Tierärztliche Wochenschrift*, 86, 149–152.
- Liebisch, A. & Liebisch, G. (2003) Biologie und Ökologie der Zecken. In: Horst, H. & Liebisch, A. (Eds.) *Einheimische Zeckenborreliose (Lyme-Krankheit) bei Mensch und Tier*. 4th edition, Balingen, Spitta.
- Liebisch, A., Melfsen, J. & Rahman, M.S. (1976) Zum Vorkommen der Zecke *Haemaphysalis punctata* (Can. et Fanz., 1877) und *Babesia major* beim Rind in Norddeutschland. *Berliner und Münchener Tierärztliche Wochenschrift*, 89, 477–480.
- Liebisch, A. & Olbrich, S. (1991) The hedgehog tick, *Ixodes hexagonus* Leach, 1815, as a vector of *Borrelia*

- burgdorferi* in Europe. In: Dusbábek, F. & Bukva, V. (Eds.) *Modern Acarology*. Prague, Academia, Prague, pp. 67–71.
- Liebisch, A. & Rahman, M.S. (1976a) Zum Vorkommen und zur vektoriellen Bedeutung der Zecken *Dermacentor marginatus* (Sulzer, 1776) und *Dermacentor reticulatus* (Fabricius, 1794) in Deutschland. *Tropenmedizin und Parasitologie*, 27, 393–404.
- Liebisch, A. & Rahman, M.S. (1976b) Zum Vorkommen und zur Ökologie einiger human- und veterinärmedizinisch wichtiger Zeckenarten (Ixodidae) in Deutschland. *Zeitschrift für Angewandte Entomologie*, 82, 29–37.
- Liebisch, A. & Vauk-Hentzelt, E. (1992) The first record of the tick species *Ixodes (Ceraticodes) uriae* White, 1852 in Germany. *Zentralblatt für Bakteriologie, Mikrobiologie und Hygiene*, 325, 52–53.
- Liebisch, A. & Walter, G. (1986) Untersuchungen von Zecken bei Haus- und Wildtieren in Deutschland: Zum Vorkommen und zur Biologie der Igelzecke (*Ixodes hexagonus*) und der Fuchszecke (*Ixodes canisuga*). *Deutsche Tierärztliche Wochenschrift*, 93, 447–450.
- Liebisch, G. & Liebisch, A. (1999) Zur Diagnose wenig bekannter einheimischer durch Zecken übertragener Infektionen bei Hunden in Deutschland. *Praktischer Tierarzt*, 80, 474–482.
- Liebisch, G., Paufler, S. & Liebisch, A. (2006) Ein aktueller Fallbericht über die Gefahr der Verbreitung von Zecken durch die Aktivitäten des Menschen: Import der Zeckenart *Dermacentor albipictus* aus den USA mit einem Pferd nach Deutschland. *Praktischer Tierarzt*, 87, 874–882.
- Lillehaug, A., Mehl, R. & Gjerde, B. (2002) Importation of *Dermacentor albipictus* into Europe. *The Veterinary Record*, 151, 94–95.
- Lindgren, E., Tälleklint, L. & Polfeldt, T. (2000) Impact of climatic change on the northern latitude limit and population density of the disease-transmitting European tick *Ixodes ricinus*. *Environmental Health Perspectives*, 108, 119–123.
- Literak, I., Kocianova, E., Dusbábek, F., Martinu, J., Podzemny, P. & Sychra, O. (2007) Winter infestation of wild birds by ticks and chiggers (Acari: Ixodidae, Trombiculidae) in the Czech Republic. *Parasitology Research*, 101, 1709–1711.
- Little, S.E., Hostetler, J. & Kocan, K.M. (2007) Movement of *Rhipicephalus sanguineus* adults between co-housed dogs during active feeding. *Veterinary Parasitology*, 150, 139–145.
- Litvinov, Y.N. & Sapegina, V.F. (2003) Ectoparasites of the Altay zokor (*Myospalax myospalax*) in northern Altay. *Parazitologiya*, 37, 103–106.
- Lledó, L., Giménez-Pardo, C., Domínguez-Peñafiel, G., Sousa, R., Gegúndez, M. I., Casado, N. & Criado, A. (2010) Molecular detection of Hemoprotozoa and *Rickettsia* species in arthropods collected from wild animals in the Burgos Province, Spain. *Vector-Borne and Zoonotic Diseases (Larchmont, N.Y.)*, E-published ahead of print. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/20055580> [Accessed September 17, 2010].
- Lourenço, S. & Palmeirim, J. (2008) Which factors regulate the reproduction of ectoparasites of temperate-zone cave-dwelling bats? *Parasitology Research*, 104, 127–134.
- Lundqvist, L., Gray, J.S. & Hillyard, P.D. (1998) *Ixodes frontalis* on the Baltic island of Gotland, Sweden. *Medical and Veterinary Entomology*, 12, 215–216.
- L'vov, D.K. (1988) Omsk haemorrhagic fever. In: Monath T. (Ed.) *The Arboviruses: Epidemiology and Ecology*. Boca Raton, CRC Press, pp. 205–216.
- L'vov, D.K., Aristiva, V.A., Gromashevskii, V.L., Skvortsova, T.M., Boiko, V.A., Mel'nikova, E.E., Gushchina, E.A., Iarulova, R.A., Morozova, T.N. & Petrova, E.S. (1998) Kama, a new virus (Flaviviridae, Flavivirus, Tyuleny antigenic group), isolated from *Ixodes lividus* ticks. *Voprosy Virusologii*, 43, 71–74 (in Russian).
- L'vov, D.K., Chervonsky, V.I., Gostinshchikova, I.N., Zemit, A.S., Gromashevsky, V.L., Tsyrcin, Y.M. & Veselovskaya, O.V. (1972) Isolation of Tyuleny virus from ticks *Ixodes (Ceraticodes) putus* Pict.-Camb. 1878 collected on Commodore Islands. *Archiv für die Gesamte Virusforschung* 38, 139–142.
- L'vov, D.K., Karas, E.M., Timofeev, E.M., Tsyrcin, Yu.M., Vargina, S.G., Veselovskaya, O.V., Osipova, N.Z., Grebenyuk, Yu.I., Gromashevski, V.L., Steblyanko, S.N. & Fomina, K.B. (1973a) “Issyk-Kul” virus, a new arbovirus isolated from bats and *Argas (Carios) vespertilionis* (Latr., 1802) in the Kirghiz S.S.R. *Archiv für die Gesamte Virusforschung*, 42, 207–209.
- L'vov, D.K., Kostjukov, M.A., Daniyarov, O.A., Tukhtaev, T.M. & Sherikov, B.K. (1984) Outbreak of arbovirus infection in the Tadzhik SSR due to the Issyk-Kul virus (Issyk-Kul fever). *Voprosy Virusologii*, 29, 89–92 (in Russian).
- L'vov, D.K., Timopheeva, A.A., Smirnov, V.A., Gromashevsky, V.L., Sidorova, G.A., Nikiforov, L.P., Sazonov,

- A.A., Andreev, A.P., Skvortzova, T.M., Beresina, L.K. & Aristova, V.A. (1975) Ecology of tick-borne viruses in colonies of birds in the USSR. *Medical Biology*, 53, 325–330.
- L'vov, D.K., Tsyarkin, Y.M., Karas, E.M., Timopheev, E.M., Gromashevski, V.L., Veselovskaya, O.V., Osipova, N.Z., Fomina, K.B. & Grebenyuk, Y.I. (1973b) “Sokuluk” virus, a new group B arbovirus isolated from *Vespertilio pipistrellus* Schreber, 1775, bat in the Kirghiz S.S.R. *Archiv für die Gesamte Virusforschung*, 41, 170–174.
- Macdonald, D.W., Anwar, M., Newman, C., Woodroffe, R. & Johnson, P.J. (1999) Inter-annual differences in the age-related prevalence of *Babesia* and *Trypanosoma* parasites of European badgers (*Meles meles*). *Journal of Zoology*, 247, 65–70.
- MacLeod, J. (1932) The bionomics of *Ixodes ricinus* L., the “sheep tick” of Scotland. *Parasitology*, 24, 382–400.
- MacLeod, J. (1934) *Ixodes ricinus* in relation to its physical environment: influence of climate on development. *Parasitology*, 26, 282–305.
- MacLeod, J. (1935) *Ixodes ricinus* in relation to its physical environment. II. The factors governing survival and activity. *Parasitology*, 27, 123–144.
- Maetzel, D., Maier, W.A. & Kampen, H. (2005) *Borrelia burgdorferi* infection prevalences in questing *Ixodes ricinus* ticks (Acari: Ixodidae) in urban and suburban Bonn, western Germany. *Parasitology Research*, 95, 5–12.
- Major, L., Linn, M. L., Slade, R. W., Schroder, W. A., Hyatt, A. D., Gardner, J., Cowley, J. & Suhrbier, A. (2009) Ticks associated with Macquarie Island penguins carry arboviruses from four genera. *PLoS ONE*, 4, e4375, doi: 10.1371/journal.pone.0004375.
- Makhmetov, M.M. (1968) Spontaneous infection of *Rickettsia burneti* in ectoparasites of the sand martin. *Prirodnoy Ochagovosti Bolezney I Voprosam Parazitologii, Akademiya Nauk Kazakhskoy SSR*, 3, 70–74 (NAMRU-3 translation 202).
- Malkova, M.G. & Bogdanov, I.I. (2004) Parasite fauna of the water vole *Arvicola terrestris* and its nests in southern western Siberia. *Parazitologiya*, 38, 33–45.
- Malkova, D., Holubova, J. & Kolman, J.M. (1980) Antibodies against some arboviruses in persons with various neuropathies. *Acta Virologica* 24, 298.
- Mangin, S., Gauthier-Clerc, M., Frenot, Y., Gendner, J. & Le Maho, Y. (2003) Ticks *Ixodes uriae* and the breeding performance of a colonial seabird, king penguin *Aptenodytes patagonicus*. *Journal of Avian Biology*, 34, 30–34.
- Manilla, G. (1985) On the role of birds in the spread and circulation of tick-borne viruses. *Rivista di Parassitologia*, 44, 12–25.
- Manilla, G. (1986) Distributione delle zecche presenti in Italia (Acari: Ixodoidea). *Fragmenta Entomologica (Roma)*, 19, 57–81.
- Manilla, G. (1991) Specie nuove per l'ixodofauna Italiana. II. *Ixodes arboricola* Schulze e Schlottke, 1929. *Parassitologia*, 33, 175–181.
- Manilla, G. (1998) Fauna d'Italia 36: Acari-Ixodida. Bologne, Calderini.
- Manilla, G., Delitala, G. & Iori, A. (1992) Species nuove per l'ixodofauna Italiana. V: *Ixodes (Scaphixodes) caledonicus* Nuttall, 1910. *Rivista di Parassitologia*, 53, 177–187.
- Margos, G., Vollmer, S.A., Cornet, M., Garnier, M., Fingerle, V., Wilske, B., Bormane, A., Vitorino, L., Collares-Pereira, M., Drancourt, M. & Kurtenbach K. (2009) A new *Borrelia* species defined by multilocus sequence analysis of housekeeping genes. *Applied and Environmental Microbiology*, 75, 5410–5416.
- Marin, M.S., McKenzie, J., Guo, G.F., Reid, H.W., Antoniadis, A. & Gould, E.A. (1995) The virus causing encephalomyelitis in sheep in Spain: a new member of the tick-borne encephalitis group. *Research in Veterinary Science*, 58, 11–13.
- Márquez, F.J. (2008) Spotted fever group *Rickettsia* in ticks from southeastern Spain natural parks. *Experimental and Applied Acarology*, 45, 185–194.
- Márquez, F.J. & Constan, M.C. (1990) Infection d'*Ixodes ricinus* (L., 1758) et *Haemaphysalis punctata* Canestrini et Fanzago, 1877 (Acarina, Ixodidae) par *Borrelia burgdorferi* dans le nord de la Peninsula Ibérique (Pays Basque Espagnole et Navarre). *Bulletin de la Société Française de Parasitologie*, 8, 323–330.
- Marrelli, M., Souza, L., Marques, R., Labruna, M., Matioli, S., Tonon, A., Ribolla, P., Marinotti, O. & Schumaker, T. (2007) Taxonomic and phylogenetic relationships between neotropical species of ticks from genus *Amblyomma* (Acari: Ixodidae) inferred from second internal transcribed spacer sequences of rDNA. *Journal of Medical Entomology* 44, 222–228.
- Materna, J., Daniel, M., Metelka, L. & Harcarik, J. (2008) The vertical distribution, density and the develop-

- ment of the tick *Ixodes ricinus* in mountain areas influenced by climate changes (the Krkonose Mts., Czech Republic). *International Journal of Medical Microbiology* 298 (Suppl. 1), 25–37.
- Matjila, P. T., Leisewitz, A. L., Jongejan, F. & Penzhorn, B. L. (2008) Molecular detection of tick-borne protozoal and ehrlichial infections in domestic dogs in South Africa. *Veterinary Parasitology*, 155, 152–157.
- Matsumo, K., Parola, P., Brouqui, P. & Raoult, D. (2004) *Rickettsia aeschlimanni* in *Hyalomma* ticks from Corsica. *European Journal of Clinical Microbiology and Infectious Diseases*, 23, 732–734.
- Matsumoto, K., Grzeszczuk, A., Brouqui, P. & Raoult, D. (2009) *Rickettsia raoultii* and *Anaplasma phagocytophilum* in *Dermacentor reticulatus* ticks collected from Bialowieza Primeval Forest European bison (*Bison bonasus bonasus*), Poland. *Clinical Microbiology and Infection*, 15, 286–287.
- Matuschka, F.R., Richter, D., Fischer, P. & Spielman, A. (1990) Nocturnal detachment of the tick *Ixodes hexagonus* from nocturnally active hosts. *Medical and Veterinary Entomology*, 4, 415–420.
- Mediannikov, O., Matsumoto, K., Samoylenko, I., Drancourt, M., Roux, V., Rydkina, E., Davoust, B., Tarasevich, I., Brouqui, P. & Fournier, P. (2008) *Rickettsia raoultii* sp. nov., a spotted fever group rickettsia associated with *Dermacentor* ticks in Europe and Russia. *International Journal of Systematic and Evolutionary Microbiology*, 58, 1635–1639.
- Mediannikov, O., Sekeyová, Z., Birg, M. & Raoult, D. (2010) A novel obligate intracellular gamma-proteobacterium associated with ixodid ticks, *Diplorickettsia massiliensis*, gen. nov., sp. nov. *PloS one* 5, e11478. doi: 10.1099/ijms.0.64952-0.
- Mehl, R., Michaelsen, J. & Lid, G. (1984) Ticks (Acari, Ixodidae) on migratory birds in Norway. *Fauna Norvegica Series B*, 31, 46–58.
- Merhej, V. & Raoult, D. (2010) Rickettsial evolution in the light of comparative genomics. *Biological Reviews*, 86, 379–405.
- Millan, J., Gortazar, C., Martín-Mateo, M.P. & Villafuente, R. (2004) Comparative survey of the ectoparasite fauna of wild and farm-reared red-legged partridges (*Alectoris rufa*), with an ecological study in wild populations. *Parasitology Research*, 93, 79–85.
- Milne, A. (1947) The ecology of the sheep tick, *Ixodes ricinus* L.: the infestation of hill sheep. *Parasitology*, 38, 34–50.
- Milne, A. (1949) The ecology of the sheep tick, *Ixodes ricinus* L.: spatial distribution. *Parasitology*, 40, 35–45.
- Monks, D., Fisher, M. & Forbes, N.A. (2006) *Ixodes frontalis* and avian tick-related syndrome in the United Kingdom. *Journal of Small Animal Practice*, 47, 451–455.
- Monod, R.Y., Aeschlimann, A. & Derscheid, J.M. (1986) Sur 3 infections à trypanosomes observées chez *Hyalomma detritum*, *Ixodes ricinus* et *Rhipicephalus sanguineus* (Acarina: Ixodidae). *Schweizer Archiv für Tierheilkunde*, 128, 243–254.
- Mooring, M.S. & Samuel, W.M. (1999) Premature loss of winter hair in free-ranging moose (*Alces alces*) infested with winter ticks (*Dermacentor albipictus*) is correlated with grooming rate. *Canadian Journal of Zoology*, 77, 148–156.
- Moraes-Filho, J., Marcili, A., Nieri-Bastos, F.A., Richtzenhain, L.J. & Labruna, M.B. (2011) Genetic analysis of ticks belonging to the *Rhipicephalus sanguineus* group in Latin America. *Acta Tropica*, 117, 51–55.
- Morel, P.C. (1969) Contribution à la connaissance de la distribution des tiques (Acariens, Ixodidae et Amblyomidae) en Afrique éthiopienne continentale. Ph.D. dissertation, University of Paris, Paris.
- Movila, A., Gatewood, A., Toderas, I., Duca, M., Papero, M., Uspenskaia, I., Conovalov, J. & Fish, D. (2008) Prevalence of *Borrelia burgdorferi* sensu lato in *Ixodes ricinus* and *Ixodes lividus* ticks collected from wild birds in the Republic of Moldova. *International Journal of Medical Microbiology*, 298, 149–153.
- Müller, J., Ciupa, W. & Seelig, K.-J. (1975) Zum Vorkommen von *Ixodes lividus* Koch (syn. *I. plumbeus* Leach) auf Uferschwalben, *Riparia riparia* (L.), im Kreis Staßfurt. *Hercynia*, 12, 320–324.
- Mukhammdkulov, M. (1970) Wild bird hosts of argasid and ixodid ticks in northern Tadzhikistan. *Izvestiya Akademii Nauk Tadzhikskoy SSR, Otdelenie Sel'skokhozyaystvennogo Biologii Nauk*, 3, 87–89 (NAMRU-3 translation 591).
- Munaf, H.B. (1976) The first record of *Hunterellus hookeri* parasitizing *Rhipicephalus sanguineus* in Indonesia. *Southeast Asian Journal of Tropical Medicine and Public Health*, 7, 492.
- Muzaffar, S.B. & Jones, I.L. (2004) Parasites and diseases of the auks (Alcidae) of the world and their ecology – a review. *Marine Ecology*, 32, 121–146.
- Nava, S., Guglielmone, A.A. & Mangold, A.J. (2009) An overview of systematics and evolution of ticks. *Frontiers in Bioscience*, 14, 2857–2877.
- Nefedova, V.V., Korenberg, E.I., Fadeeva, I.A. & Gorelova, N.B. (2005) Genetic characteristics of human pathogenic *Borrelia* isolated from *Ixodes trianguliceps* Bir. and *Ixodes pavlovskyi* Pom. *Meditinskaya*

- parazitologiya i parazitarnye bolezni*, 2005 (2), 9–12 (in Russian).
- Negrobov, V.P. & Borodin, V.S. (1964) Einige seltene Zeckenfunde im mittleren Teil der DDR. *Angewandte Parasitologie*, 5, 107–111.
- Newson, R.M. & Holmes, R.G. (1968) Some ectoparasites of the coypu (*Myocastor coypus*) in eastern England. *Journal of Animal Ecology*, 37, 471–481.
- Nijhof, A.M., Bodaan, C., Postigo, M., Nieuwenhuijs, H., Opsteegh, M., Franssen, L., Jebbink, F. & Jongejan, F. (2007) Ticks and associated pathogens collected from domestic animals in the Netherlands. *Vector-Borne and Zoonotic Diseases*, 7, 585–595.
- Nilsson, A. (1974) Distribution, host relations, and seasonal occurrence of *Ixodes trianguliceps* Birula (Acari) in Fennoscandia. *Folia Parasitologica*, 21, 233–241.
- Nilsson, K., Lindquist, O., Liu, A.J., Jaenson, T.G.T., Friman, G. & Pahlson, C. (1999) *Rickettsia helvetica* in *Ixodes ricinus* ticks in Sweden. *Journal of Clinical Microbiology*, 37, 400–403.
- Norris, D.E., Klompen, J.S.E., Keirans, J.E., Lane, R.S., Piesman, J. & Black, W.C. (1997) Taxonomic status of *Ixodes neotomae* and *I. spinipalpis* (Acari: Ixodidae) based on mitochondrial DNA evidence. *Journal of Medical Entomology*, 34, 696–703.
- Nosek, J. (1971a) The ecology, bionomics, and behaviour of *Haemaphysalis* (*Haemaphysalis*) *concinna* tick. *Zeitschrift für Parasitenkunde*, 36, 233–241.
- Nosek, J. (1971b) The ecology, bionomics, and behaviour of *Haemaphysalis* (*Aboimisis*) *punctata* tick in Central Europe. *Zeitschrift für Parasitenkunde*, 37, 198–210.
- Nosek, J. (1972) The ecology and public health importance of *Dermacentor marginatus* and *D. reticulatus* ticks in central Europe. *Folia Parasitologica*, 19, 93–102.
- Nosek, J. & Grulich, I. (1967) The relationship between the tick-borne encephalitis virus and the ticks and mammals of the Tribec Mountain Range. *Bulletin of the World Health Organisation*, 36 (Suppl. 1), 31–47.
- Nosek, J. & Sixl, W. (1972) Central-European ticks (Ixodoidea): key for determination. *Mitteilungen der Abteilung fuer Zoologie am Landesmuseum Joanneum*, 1, 61–92.
- Nouredine, R., Chauvin, A. & Plantard, O. (2011) Lack of genetic structure among Eurasian populations of the tick *Ixodes ricinus* contrasts with marked divergence from North African populations. *International Journal for Parasitology*, 41, 183–192.
- Nuttall, G.H.F. (1911a) On the adaptations of ticks to the habits of their hosts. *Parasitology*, 4, 46–67.
- Nuttall, G.H.F. (1911b) Notes on ticks. I. *Parasitology*, 4, 175–182.
- Nuttall, G.H.F. (1913) Observations on the biology of Ixodidae. *Parasitology*, 6, 68–118.
- Nuttall, P.A. (1984) Transmission of viruses to wild life by ticks. In: Mayo, M.A. & Harrap, K.A. (Eds.) *Vectors in virus biology* London, Academic Press.
- O'Donnell, T.G. (1971) Density and host relations of *Ixodes trianguliceps* Bir. in woodland and grassland areas. *Proceedings of the 3rd International Congress of Acarology*, Prague, 1971.
- Ogandzhanian, A.M. (1984) New species of ixodid ticks for the fauna of Armenia. *Parazitologiya*, 18, 181–182 (in Russian).
- Ogden, N.H., Cripps, P., Davison, C.C., Owen, G., Parry, J.M., Timms, B.J. & Forbes, A.B. (2000) The ixodid tick species attaching to domestic dogs and cats in Great Britain and Ireland. *Medical and Veterinary Entomology*, 14, 332–338.
- Olbrich, S. & Liebisch, A. (1991) Epidemiologische Untersuchungen zum Befall von Zecken mit Borreliose-Erregern von Kleinsäugetieren aus Norddeutschland. *Deutsche Tierärztliche Wochenschrift*, 98, 228–230.
- Olenev, N.O. (1931): Die Zecken (Ixodoidea) der Fauna Russlands. *Parasitology Research*, 4, 126–139.
- Oliver, J.H. Jr. (1989) Biology and systematics of ticks (Acari: Ixodidae). *Annual Review of Ecology and Systematics*, 20, 397–430.
- Olmeda, A.S., Armstrong, P.M., Rosenthal, B.M., Valladares, B., Del Castillo, A., De Armas, F., Miguelez, M., Gonzalez, A., Rodriguez Rodriguez, J.A., Spielman, A. & Telford, S.R. III. (1997) A subtropical case of human babesiosis. *Acta Tropica*, 67, 229–234.
- Olmeda-García, A.S. & Rodríguez-Rodríguez, J.A. (1994) Stage-specific development of a filarial nematode (*Dipetalonema dracunculoides*) in vector ticks. *Journal of Helminthology*, 68, 231–235.
- Olmeda-García, A.S., Rodríguez-Rodríguez, J.A. & Rojo-Vázquez, F.A. (1993) Experimental transmission of *Dipetalonema dracunculoides* (Cobbold 1870) by *Rhipicephalus sanguineus* (Latreille 1806). *Veterinary Parasitology*, 47, 339–342.
- Olsen, B., Duffy, D.C., Jaenson, T.G.T., Gylfe, A., Bonnedahl, J. & Bergström, S. (1995) Transhemispheric exchange of Lyme disease spirochetes by seabirds. *Journal of Clinical Microbiology*, 33, 3270–3274.
- Olsen, B., Jaenson, T.G.T., Noppa, L., Bunikis, J. & Bergström, S. (1993) A Lyme borreliosis cycle in seabirds

- and *Ixodes uriae* ticks. *Nature*, 362, 340–342.
- Olsufjev, N.G. & Petrov, V.G. (1960) Discovery of *Haemaphysalis concinna* Koch ticks naturally infected by tularaemia agent. *Trudy Instituta Zoologii. Akademiya Nauk Kazakhskoy SSR*, 10, 54–56 (NAMRU-3 translation 231).
- Ono, Z. (1967) A bird tick new to Japan *Ixodes lividus* (C.L. Koch 1844). *Japanese Journal of Sanitary Zoology*, 18, 217 (NAMRU-3 translation 474).
- Osacar-Jimenez, J.J., Estrada-Peña, A. & Lucientes-Curdi, J. (1998) Ticks (Acarina: Ixodidae) of wild birds in the Ebro Middle Basin (North-East Spain). *Acarologia*, 39, 23–31.
- Ouhelli, H. (1988) Ecologie des *Hyalomma* (Ixodidae) parasites de Bovins au Maroc. *Acta Parasitologica Polonica*, 33, 273–282.
- Page, R.J. & Langton, S.D. (1996) The occurrence of ixodid ticks on wild mink *Mustela vison* in England and Wales. *Medical and Veterinary Entomology*, 10, 359–364.
- Panzer, G.W.F. (1798) *Faunae Insectorum Germanicae Initia. Deutschlands Insekten*, Nürnberg, Felseckersche Buchhandlung.
- Papadopoulos, B., Morel, P.C. & Aeschlimann, A. (1996) Ticks of domestic animals in the Macedonian region of Greece. *Veterinary Parasitology*, 63, 25–40.
- Parola, P. & Raoult, D. (2001) Ticks and tickborne bacterial diseases in humans: an emerging infectious threat. *Ticks and Tick-Borne Diseases*, 32, 897–928.
- Parola, P., Rovey, C., Rolain, J.M., Brouqui, P., Davoust, B. & Raoult, D. (2009) *Rickettsia slovaca* and *R. raoulti* in tick-borne rickettsioses. *Emerging Infectious Diseases*, 15, 1105–1108.
- Pawelczyk, A., Bajer, A., Behnke, J.M., Gilbert, F.S. & Sinski, E. (2004) Factors affecting the component community structure of haemoparasites in common voles (*Microtus arvalis*) from the Mazury Lake District region of Poland. *Parasitology Research*, 92, 270–284.
- Pegram, R.G., Clifford, C.M., Walker, J.B. & Keirans, J.E. (1987a) Clarification of the *Rhipicephalus sanguineus* group (Acari, Ixodoidea, Ixodidae). I. *R. sulcatus* Neumann, 1908 and *R. turanicus* Pomerantzev, 1936. *Systematic Parasitology*, 10, 3–26.
- Pegram, R.G., Keirans, J.E., Clifford, C.M. & Walker, J.B. (1987b) Clarification of the *Rhipicephalus sanguineus* group (Acari, Ixodoidea, Ixodidae). II. *R. sanguineus* (Latreille, 1806) and related species. *Systematic Parasitology*, 10, 27–44.
- Peirce, M.A. & Prince, P.A. (1980) *Hepatozoon albatrossi* sp. nov. (Eucoccidia: hepatozoidae) from *Diomedea* spp. in the Antarctic. *Journal of Natural History*, 14, 447–452.
- Perez-Eid, C. (2007) *Les tiques: identification, biologie, importance médicale et vétérinaire*. Paris, Tec & Doc Lavoisier.
- Perret, J.-L., Rais, O., Gern, L. (2004) Influence of climate on the proportion of *Ixodes ricinus* nymphs and adults in a tick population. *Journal of Medical Entomology*, 41, 361–365.
- Peter, O., Burgdorfer, W., Aeschlimann, A. & Chatelanat, P. (1984) *Rickettsia conorii* isolated from *Rhipicephalus sanguineus* introduced into Switzerland on a pet dog. *Zeitschrift für Parasitenkunde*, 70, 265–270.
- Petney, T.N., Beichel, E., Maiwald, M. & Hassler, D. (1996) *Ixodes ventraloi*: a new tick record for Germany. *Applied Parasitology*, 37, 96–98.
- Pfäffle, M., Petney, T.N., Skuballa, J. & Taraschewski, H. (2011) Comparative population dynamics of a generalist (*Ixodes ricinus*) and specialist tick (*I. hexagonus*) species from European hedgehogs. *Experimental and Applied Acarology* 54, 151–164
- Pichon, B., Kahl, O., Hammer, B. & Gray, J.S. (2006) Pathogens and host DNA in *Ixodes ricinus* nymphal ticks from a German forest. *Vector-Borne and Zoonotic Diseases*, 6, 382–387.
- Pichot, J., Gilot, B., Almire, N., Polette, K. & Degeilh, B. (1997) *Ixodes* populations (*Ixodes ricinus* Linné, 1758; *Ixodes hexagonus* Leach, 1815) in the city of Lyon: preliminary results. *Parasite*, 4, 167–171.
- Pietzsch, M., Mitchell, R., Jameson, L., Morgan, C., Medlock, J., Collins, D., Chamberlain, J., Gould, E., Hewson, R., Taylor, M. & Leach, S. (2008) Preliminary evaluation of exotic tick species and exotic pathogens imported on migratory birds into the British Isles. *Veterinary Parasitology*, 155, 328–332.
- Pisanu, B., Marsot, M., Marmet, J., Chapuis, J.L., Réale, D. & Vourc'h, G. (2010) Introduced Siberian chipmunks are more heavily infested by ixodid ticks than are native bank voles in a suburban forest in France. *International Journal for Parasitology*, 40, 1277–1283.
- Plantonov, A.E., Karan, L.S., Kolyasnikova, N.M., Makhneva, N.A., Toporkova, M.G., Maleev, V.V., Fish, D. & Krause, P.J. (2011) Humans infected with relapsing fever spirochete *Borrelia miyamotoi*, Russia. *Emerging Infectious Diseases*, 17, 1816–1823.
- Pluta, S., Hartelt, K., Oehme, R., Mackenstedt, U. & Kimmig, P. (2010) Prevalence of *Coxiella burnetii* and

- Rickettsia* spp. in ticks and rodents in southern Germany. *Ticks and Tick-Borne Diseases*, 1, 145–147.
- Pluta, S., Tewald, F., Hartelt, K., Oehme, R., Kimmig, P. & Mackenstedt, U. (2009) *Rickettsia slovaca* in *Dermacentor marginatus* ticks, Germany. *Emerging Infectious Diseases*, 15, 2077–2078.
- Pomerantzev, B.I. (1950) *Fauna of the USSR. Arachida Vol 4, no. 2, Ixodid ticks (Ixodidae)*. Moscow, Academy of Sciences USSR.
- Postic, D., Korenberg, E., Gorelova, N., Kovalevski, Y.V., Bellenger, E. & Baranton, G. (1997) *Borrelia burgdorferi* sensu lato in Russia and neighbouring countries: high incidence of mixed isolates. *Research in Microbiology*, 148, 691–702.
- Poupon, M.A., Lommano, E., Humair, P.F., Douet, V., Rais, O., Schaad, M., Jenni, L. & Gern, L. (2006) Prevalence of *Borrelia burgdorferi* sensu lato in ticks collected from migratory birds in Switzerland. *Applied and Environmental Microbiology*, 72, 976–979.
- Putzig, P. (1939) Rauchschwalben Sterben durch Zecken (Ixodidae) verursacht. *Vogelzug*, 10, 25–27.
- Radda, A. (1973) Die Zeckenenzephalitis in Europa. *Angewandte Zoologie*, 60, 409–461.
- Radda, A., Kunz, C.H. & Hofmann, H. (1968) Nachweis von Antikörpern in Wildseren zur Erfassung von Herden des Virus der Frühsommer-Meningo-Enzephalitis in Niederösterreich. *Zentralblatt für Bakteriologie I*, 208, 88–93.
- Randolph, S.E. (1975) Patterns of distribution of the tick *Ixodes trianguliceps* Birula on its hosts. *Journal of Animal Ecology*, 44, 451–474.
- Randolph, S.E. (1995) Quantifying parameters in the transmission of *Babesia microti* by the tick *Ixodes trianguliceps* amongst voles (*Myodes glareolus*). *Parasitology*, 110, 287–295.
- Randolph, S.E. (2004a) Evidence that climate change has caused ‘emergence’ of tick-borne diseases in Europe? *International Journal of Medical Microbiology* 297 (Suppl. 37), 5–15.
- Randolph, S.E. (2004b) Tick ecology: processes and patterns behind the epidemiological risk posed by ixodid ticks as vectors. *Parasitology*, 129, 37–65.
- Randolph, S.E., Green, R.M., Hoodless, A.N. & Peacey, M.F. (2002) An empirical quantitative framework for the seasonal population dynamics of the tick *Ixodes ricinus*. *International Journal for Parasitology* 32: 979–989.
- Raoult, D., Fournier, P.E., Ereemeeva, M., Graves, S., Kelly, P.J., Oteo, J.A., Skeyova, S., Tamura, A., Tarasevich, I. & Zhang, I. (2005) Naming of Rickettsiae and rickettsial diseases. *Annals of the New York Academy of Sciences*, 1063, 1–12.
- Rar, V.A., Livanova, N.N., Panov, V.V., Kozlova, I.V., Pukhovskaya, N.M., Vyschins, N.P., Tkachev, S.E. & Ivanov, L.I. (2008) Prevalence of *Anaplasma* and *Ehrlichia* species in *Ixodes persulcatus* ticks and small mammals from different regions of the Asian part of Russia. *International Journal of Medical Microbiology*, 298, 222–230.
- Rauter, C. & Hartung, T. (2005) Prevalence of *Borrelia burgdorferi* sensu lato genospecies in *Ixodes ricinus* ticks in Europe: a metaanalysis. *Applied and Environmental Microbiology*, 71, 7203–7216.
- Ravdonikas, O.V., Chumakov, M.P., Solovey, E.A., Ivanov, D.I. & Korsh, P. (1971) Importance of the marsh-burrow inhabiting *Ixodes apronophorus* P. Sch. tick in Omsk hemorrhagic fever virus circulation in a natural focus. In: Chumakov, M.P. (Ed.) Viral hemorrhagic fevers. Crimean hemorrhagic fever, Omsk hemorrhagic fever with renal syndrome. *Trudy Instituta Poliomieliita I Virusnykh Entsefalitov. Akademii Meditsinskikh Nauk SSSR*, 19, 485–491 (NAMRU-3 translation 643).
- Rees, D.J., Dioli, M. & Kirkendall, L.R. (2003) Molecules and morphology: evidence for cryptic hybridization in African *Hyalomma* (Acari: Ixodidae). *Molecular Phylogenetics and Evolution*, 27, 131–142.
- Rehacek, J. (1984) *Rickettsia slovaca*, the organism and its ecology. *Acta Scientiarum Naturalium Academiae Scientiarum Bohemicae Brno*, 18, 1–50.
- Rehacek, J., Kaaserer, B., Urvölgyi, J., Lukacova, E., Kocianova, E. (1994) Isolation of *Coxiella burnetii* and an unknown rickettsial organism from *Ixodes ricinus* ticks collected in Austria. *European Journal of Epidemiology*, 10, 719–723.
- Rehacek, J., Kovacova, E. & Kocianova, E. (1996) Isolation of *Nosema slovaca* (Microsporidiae) from *Dermacentor reticulatus* ticks (Acari: Ixodidae) collected in Hungary. *Experimental and Applied Accarology*, 20, 57–60.
- Rehacek, J., Liebisch, A., Urvölgyi, J. & Kovacova, E. (1977) Rickettsiae of the spotted fever group isolated from *Dermacentor marginatus* ticks in south Germany. *Zentralblatt für Bakteriologie (A)*, 239, 275–281.
- Rehacek, J., Urvölgyi, J., Kocianova, E., Sekeyova, Z., Vavrekova, M., Kovacova, E. (1991) Extensive examination of different tick species for infestation with *Coxiella burnetii* in Slovakia. *European Journal of Epidemiology*, 7, 299–303.

- Rehse-Küpper, B., Casals, J., Rehse, E. & Ackermann, R. (1976) Eyach, an arthropod borne-virus related to Colorado tick fever virus in the Federal Republic of Germany. *Acta Virologica*, 20, 339–342.
- Reid, H.W. (1975) Experimental infection of red grouse with louping-ill virus. I. The viraemia and antibody response. *Journal of Comparative Parasitology*, 85, 223–229.
- Renvoisé, A., Mediannikov, O. & Raoult, D. (2009) Old and new tick-borne rickettsioses. *International Health*, 1, 17–25.
- Richter, D. & Matuschka, F.R. (2010) Elimination of Lyme disease spirochetes from ticks feeding on domestic ruminants. *Applied and Environmental Microbiology*, 76, 7650–7652.
- Richter, D. & Matuschka, F.R. (2011) Differential risk for Lyme disease along hiking trail, Germany. *Emerging Infectious Disease*, 17, 1704–1706.
- Richter, D., Schlee, D.B. & Matuschka, F.R. (2003) Relapsing fever-like spirochetes infecting European vector tick of Lyme disease agent. *Emerging Infectious Diseases*, 9, 697–701.
- Roberts, F.R.S. (1970) *The Ticks of Australia*. CSIRO, Melbourne.
- Rosà, R., Pugliese, A., Ghosh, M., Perkins, S.E. and Rizzoli, A. (2007) Temporal variation of *Ixodes ricinus* intensity on the rodent host *Apodemus flavicollis* in relation to local climate and host dynamics. *Vector-Borne and Zoonotic Diseases*, 7, 285–295.
- Rovero, C., Brouqui, P. & Raoult, D. (2008) Questions on Mediterranean spotted fever a century after its discovery. *Emerging Infectious Diseases*, 14, 1360–1367.
- Rubina, M., Braverman, Y. & Frish, K. (1984) Ticks collected from domestic animals in Sinai and adjoining areas in Israel and their medical and veterinary importance. *Cahiers de O.R.S.T.O.M. Serie Entomologie et Parsitologie*, 22, 303–311.
- Rumer, L., Graser, E., Hillebrand, T., Talaska, T., Dautel, H., Mediannikov, O., Roy Chowhury, P., Sheshukova, O., Mante, O.D. & Niedrig, M. (2011) *Rickettsia aeschlimanni* in *Hyalomma marginatum* ticks, Germany. *Emerging Infectious Diseases*, 17, 325–326.
- Rydkina, E., Roux, V., Festisova, N., Rudakov, N., Gafarova, M., Tarasevich, I. & Raoult, D. (1999) New rickettsiae in ticks collected in territories of the former Soviet Union. *Emerging Infectious Diseases*, 5, 811–814.
- Saikkku, P., Ulmanen, I. & Brummer-Korvenkontio, M. (1971) Ticks (Ixodidae) on migratory birds in Finland. *Acta Entomologica Fennica*, 28, 46–51.
- Sanogo, Y.O., Zeaiter, Z., Caruso, G., Merola, F., Shpynov, S., Brouqui, P. & Raoult, D. (2003) *Bartonella henselae* in *Ixodes ricinus* ticks (Acari: Ixodida) removed from humans, Belluno Province, Italy. *Emerging Infectious Diseases*, 9, 329–332.
- Santos, A.S., Bacellar, F. & Dumler, J.S. (2008) A 4-year study of *Anaplasma phagocytophilum* in Portugal. *Clinical Microbiology and Infection*, 15 (Suppl. 2), 46–47.
- Santos-Silva, M.M., Sousa, R., Santos, A.S., Melo, P., Encarnacao, V. & Bacellar, F. (2006) Ticks parasitizing wild birds in Portugal: detection of *Rickettsia aeschlimanni*, *R. helvetica* and *R. massiliae*. *Experimental and Applied Acarology*, 39, 331–338.
- Schiller, F., Kemter, J., Perlewitz, J. & Körting, H.-J. (1990) Taubenzeckendermatitis. *Zeitschrift für Ärztliche Fortbildung*, 84, 877–878.
- Schilling, F., Böttcher, M. & Walter, G. (1981) Probleme des Zeckenbefalls bei Nestlingen des Wanderfalken (*Falco peregrinus*). *Journal of Ornithology* (Suppl.), 359–367.
- Schmidt, E. (1987) Nachweise von Acari bei Chiropteren im Bezirk Neubrandenburg (DDR). *Angewandte Parasitologie*, 28, 103–107.
- Schmidt, E. (1990) Zum Vorkommen von Zecken auf Uferschwalben (*Riparia riparia* L.) im Bezirk Neubrandenburg. *Beiträge zur Vogelkunde*, 36, 293–295.
- Schöffel, I., Schein, E., Wittstadt, U. & Hentsche, J. (1991) Zur Parasitenfauna des Rotfuchses in Berlin (West). *Berliner und Münchener Tierärztliche Wochenschrift*, 104, 153–157.
- Schouls, L.M., Van de Pol, I., Rijpkema, S.G. & Schot, C.S. (1999) Detection and identification of *Ehrlichia*, *Borrelia burgdorferi* sensu lato, and *Bartonella* species in Dutch *Ixodes ricinus* ticks. *Journal of Clinical Microbiology*, 37, 2215–2222.
- Schulze, P. (1924) *Ixodes apronophorus* n. sp. eine neue deutsche Zecke von *Arvicola amphibius* L. *Zoologischer Anzeiger*, 59, 281–284.
- Schulze, P. (1925) Endemisches Vorkommen einer Mediterranen Zecke (*Dermacentor reticulatus* F.) in Deutschland. *Zoomorphology*, 3, 704–705.
- Schulze, P. (1929) Zecken Ixodides. *Tierwelt Mitteleuropas*. Leipzig.
- Schulze, P. (1930) Erster Beitrag zu einer Zeckenfauna Schwedens. *Meddelanden Fran Göteborgs Musei Zoo-*

- logiska Avdelning, 54, 1–18.
- Schulze, P. (1932) Die Zecken als Vogelparasiten. *Journal of Ornithology*, 80, 318–329.
- Schulze, P. (1933a) Neue und wenig bekannte deutsche *Ixodes* Arten. *Zeitschrift für Parasitenkunde*, 6, 432–437.
- Schulze, P. (1933b) Die Arten der Zeckengattung *Dermacentor* s.l. aus Europa, Asien und Neu-Guinea. *Zeitschrift für Parasitenkunde*, 6, 416–431.
- Schulze, P. (1934) Neue und wenig bekannte deutsche *Ixodes*-Arten. *Zeitschrift für Parasitenkunde*, 6, 432–437.
- Schulze, P. (1937) Die Kleinhöhlenbewohnenden Zecken der Artengruppe um *Ixodes autumnalis* Leach 1815. *Parasitology Research*, 9, 351–372.
- Schulze, P. (1938) Über die “bipolar” Zecke *Ceratixodes uriae* (White) = *putus* (Pick.-Cambr.). *Zoologischer Anzeiger*, 123, 12–17.
- Schulze, P. (1939) Über schwedische, rumänische und nordamerikanische Formen von *Ixodes ricinus* (L.) und über *Haemaphysalis punctata* Can. et Franz. *F. autumnalis* P. Sch. *Arkiv for Zoologi*, 31, 1–8.
- Schulze, P. (1941) Zur Lebensgeschichte der Igelzecke *Ixodes hexagonus* Leach. *Zoologischer Anzeiger*, 135, 270–275.
- Schulze, P. (1944) Formenkreis Ixodidae. In: Brohmer, P. (Ed.) *Fauna von Deutschland*, 5th edition, pp. 453–458.
- Schulze, P. & Schlottke, E. (1929) Kleinhöhlenbewohnende deutsche Zecken mit Beschreibung dreier neuer Baumhöhlenbrüter und einer Bestimmungstabelle der Deutschen *Ixodes*. *Sitzungsberichte und Abhandlungen der Naturfreunde Gesellschaft Rostock*, 2, 95–112.
- Schwarz, A., Maier, W.A., Kistemann, T. & Kampen, H. (2009) Analysis of the distribution of the tick *Ixodes ricinus* L. (Acari: Ixodidae) in a nature reserve of western Germany using geographic information systems. *International Journal of Hygiene and Environmental Health*, 212, 87–96.
- Sekeyova, Z., Roux, V., Xu, W.-B., Rehacek, J. & Raoult, D. (1998) *Rickettsia slovaca* sp. nov., a member of the spotted fever group rickettsiae. *International Journal of Systematic Bacteriology*, 48, 1455–1462.
- Shepherd, A.J., Swanepoel, R., Cornel, A.J. & Mathee, O. (1989) Experimental studies on the replication and transmission of Crimean-Congo hemorrhagic fever virus in some African tick species. *American Journal of Tropical Medicine and Hygiene*, 40, 326–331.
- Shepherd, A.J., Swanepoel, R., Shepherd, S.P., Leman, P.A. & Mathee, O. (1991) Viremic transmission of Crimean-Congo hemorrhagic fever virus to ticks. *Epidemiology and Infection*, 106, 373–382.
- Shi, Z., Yang, Y., Li, Q. & Zhao, H. (2004) Study on species and geographic distribution of ticks in the Gansu Province. *Chinese Journal of Veterinary Science and Technology*, 34, 48–49.
- Shiryaev, D.T., Shevchenko, S.F., Tokarev, S.A. & Orekhova, I.M. (1966) Experimental study of *Hyalomma plumbeum plumbeum* Panz. and *Haemaphysalis punctata* Can. and Fanz. Ticks as tularemia vectors. *Meditinskaya Parazitologiya i Parazitarnye Bolezni Moscow*, 35, 305–309.
- Silaghi, C., Gilles, J., Höhle, M., Fingerle, V., Just, F.T. & Pfister, K. (2008) *Anaplasma phagocytophilum* infection in *Ixodes ricinus*, Bavaria, Germany. *Emerging Infectious Diseases*, 14, 972–974.
- Silva, M.M., Formosinho, P., Melo, P., Santos, A. & Filipe, A.R. (2001) Ixodidae (Acari: Ixodidae) parasitas de aves silváticas em Portugal. *RPCV*, 96, 197–199.
- Simser, J.A., Palmer, A.T., Fingerle, V., Wilske, B., Kurtti, T.J. & Munderloh, U.G. (2002) *Rickettsia monacensis* sp. nov., a spotted fever group rickettsia, from ticks (*Ixodes ricinus*) collected in a European city park. *Applied and Environmental Microbiology*, 68, 4559–4566.
- Sinski, E., Bajer, A., Welc, R., Pawelczyk, A., Ogrzewalska, M. & Behnke, J.M. (2006) *Babesia microti*: prevalence in wild rodents and *Ixodes ricinus* ticks from the Mazury Lake District of north-eastern Poland. *International Journal of Medical Microbiology*, 296, 137–143.
- Siuda, K. (1985) *Ixodes (Trichotoixodes) frontalis* (Panzer, 1798), (Acari: Ixodida: Ixodidae) – a new species for Polish fauna. *Przegląd Zoologiczny*, 29, 498–502 (in Polish).
- Siuda, K., Hoogstraal, H., Clifford, C.M. & Wassef, H.Y. (1979) Observations on the genus *Argas* (Ixodoidea: Argasidae: *Argas*). 17. *Argas (A.) polonicus* sp. n. parasitizing domestic pigeons in Krakow, Poland. *Journal of Parasitology*, 65, 170–181.
- Siuda, K., Majczyk, A. & Nowak, M. (2006) Ticks (Acari: Ixodida) parasitizing birds (Aves) in Poland. *Biology Letters*, 43, 147–151.
- Siuda, K., Nowak, M. & Gierczak, M. (2010) Confirmation of occurrence of *Ixodes (Pholeoixodes) rugicollis* Schulze et Schlottke, 1929 (Acari: Ixodidae) in Poland, including the morphological description and diagnostic features of this species. *Wiadomości Parazytologiczne*, 56, 77–80.

- Siuda, K., Stanko, M., Piksa, K. & Gorz, A. (2009) Ticks (Acari: Ixodidae) parasitizing bats in Poland and Slovakia. *Wiadomosci Parazytologiczne*, 55, 39–45.
- Siuda, K., Szczesniak-Zarzycka Dulkiewicz, J. & Derylo, A. (1982) Data on knowledge of the tick fauna (Ixodides) of the mammals in Poland. *Wiadomosci Parazytologiczne*, 28, 63–67.
- Skuballa, J., Oehme, R., Hartelt, K., Petney, T.N., Bücher, T., Kimmig, P. & Taraschewski, H. (2007) European hedgehogs as hosts for *Borrelia* spp., Germany. *Emerging Infectious Diseases*, 13, 952–953.
- Skuballa, J., Pfäffle, M., Petney, T.N. & Taraschewski, H. (2010) Molecular detection of *Anaplasma phagocytophilum* in the European hedgehog (*Erinaceus europaeus*) and its ticks. *Vector-Borne and Zoonotic Diseases*, 10, 1055–1057.
- Skuballa, J., Petney, T., Pfäffle, M., Oehme, R., Hartelt, H., Fingerle, V., Kimmig, P. & Taraschewski, H. (2011) Occurrence of different *Borrelia burgdorferi* sensu lato genospecies including *B. afzelii*, *B. bavariensis* and *B. spielmanii* in hedgehogs (*Erinaceus* spp.) in Europe. *Ticks and Tick-Borne Diseases*, 3, 8–13.
- Smith, M.W. (1972) The life history of *Ixodes canisuga* (Johnston 1849) under laboratory conditions. *Annals of Tropical Medicine and Parasitology*, 66, 281–286.
- Snow, K.R. & Arthur, D.R. (1970) larvae of the *Ixodes ricinus* complex of species. *Parasitology*, 60, 27–38.
- Sonenshine, D.E., Kohls, G.M. & Clifford, C.M. (1969) *Ixodes crenulatus* Koch, 1844 synonymy with *Ixodes kaiseri* Arthur, 1957 and redescription of the male, female, nymph, and larva (Acarina: Ixodidae). *Acarologia*, 11, 193–206.
- Spitalska, E. & Kocianova, E. (2003) detection of *Coxiella burnetii* collected in Slovakia and Hungary. *European Journal of Epidemiology*, 18, 262–266.
- Spyridaki, I., Psaroulaki, A., Loukaides, F., Antoniou, M., Hadjichristodolou, C. & Tselentis, Y. (2002) Isolation of *Coxiella burnetii* by a centrifugation shell-vial assay from ticks collected in Cyprus: detection by nested polymerase chain reaction (PCR) and by PCR-restriction fragment length polymorphism analyses. *American Journal of Tropical Medicine and Hygiene*, 66, 86–90.
- Sreter, T., Szell, Z. & Varga, I. (2003) Ectoparasite infestations of red foxes (*Vulpes vulpes*) in Hungary. *Veterinary Parasitology*, 115, 349–354.
- Sreter, T., Szell, Z. & Varga, I. (2005) Spatial distribution of *Dermacentor reticulatus* and *Ixodes ricinus* in Hungary: evidence for change? *Veterinary Parasitology*, 128, 347–351.
- Sreter-Lancz, Z., Szell, Z., Kovacs, G., Egyed, L., Marialigeti, K. & Sreter, T. (2006) Rickettsiae of the spotted fever group in ixodid ticks from Hungary: identification of a new genotype ('*Candidatus* Rickettsia kotlani'). *Annals of Tropical Medicine and Parasitology*, 100, 229–236.
- Sreter-Lancz, Z., Szell, Z., Sreter, T. & Marialigeti, K. (2009) Detection of a novel *Francisella* in *Dermacentor reticulatus*: a need for careful evaluation of PCR-based identification of *Francisella tularensis* in Eurasian ticks. *Vector-Borne and Zoonotic Diseases*, 9, 123–126.
- Stanczak, J. (2006) Detection of spotted fever group (SFG) rickettsiae in *Dermacentor reticulatus* (Acari: Ixodidae) in Poland. *International Journal of Medical Microbiology*, 296, 144–148.
- Stern, C. (2005) Untersuchungen zur Rolle von Zugvögeln (Passeriformes) als Verschlepper von Zecken (Acari: Ixodidae) und *Borrelia burgdorferi* s. l. Diploma thesis, University of Bonn.
- Strube, C., Montenegro, V.M., Epe, C., Eckelt, E. & Schnieder, T. (2010) Establishment of a minor groove binder-probe based quantitative real time PCR to detect *Borrelia burgdorferi* sensu lato and differentiation of *Borrelia spielmanii* by ospA-specific conventional PCR. *Parasites & Vectors*, 3, 69.
- Stübs, J. (1960) Untersuchungen über die Zeckenfauna einheimischer Wildsäuger. Ein Beitrag zur Kenntnis der Zeckenfauna Mecklenburgs. *Wissenschaftliche Zeitschrift der Ernst-Moritz-Arndt-Universität Greifswald Mathematisch-Naturwissenschaftliche Reihe*, 9, 177–188.
- Süss, J., Fingerle, V., Hunfeld, K.P., Schrader, C. & Wilske, B. (2004) Durch Zecken übertragene humanpathogene und bisher als apathogen geltende Mikroorganismen in Europa. Teil II: Bakterien, Parasiten und Mischinfektionen. *Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz*, 47, 470–486.
- Sukhomlinova, O.I. (1977) Ecology of ixodid ticks from small mammals in the Leningrad Oblast. *Parazitologiya*, 11, 436–441 (in Russian).
- Sun, Y. & Xu, R. (2003) Ability of *Ixodes persulcatus*, *Haemaphysalis concinna* and *Dermacentor silvarum* ticks to acquire and transstadially transmit *Borrelia garinii*. *Experimental and Applied Acarology*, 31, 151–160.
- Szep, T. & Möller, A.P. (1999) Cost of parasitism and host immune defence in sand martin *Riparia riparia*: a role for parent-offspring conflict? *Oecologia*, 119, 9–15.
- Szep, T. & Möller, A.P. (2000) Exposure to ectoparasites increases within-brood variability in size and body

- mass in the sand martin. *Oecologia*, 125, 201–207.
- Tälleklint, L. (1996) Lyme borreliosis spirochetes in *Ixodes ricinus* and *Haemaphysalis punctata* ticks (Acari: Ixodidae) on three islands in the Baltic Sea. *Experimental and Applied Acarology*, 20, 467–476.
- Tarasevich, L.N., Tagil'tdev, A.A. & Mal'kov, G.B. (1971) Reisolation of tick-borne encephalitis virus from *Ixodes crenulatus* Koch ticks in southern Omsk Oblast. *Tezisy Dokladov Voprosy Meditsinskoy Virusologii, Instituta Virusologii imeni Ivanovsky, D. I., Akademiya Meditsinskaya Nauk SSSR*, 2, 134–135 (NAMRU-3 translation 508).
- Teng, K. & Jiang, Z. (1991) *Economic insect fauna of China: 39 Acari: Ixodidae*. Beijing, Science Press.
- Thompson, G.B. & Arthur, D.R. (1955) Records of ticks collected from birds in the British Isles, III. *Annals and Magazine of Natural History Series* 12, 8, 17–60.
- Thorud, C. (1999) Experimentelle Infektion der Vogelzecke *Ixodes (Pholeoixodes) arboricola* with *Borrelia burgdorferi* sensu lato. Thesis, Veterinary Medical University, Hannover.
- Toledo, A., Jado, I., Olmeda, A.S., Casado-Nistal, M.A., Gil, H., Escudero, R. & Anda, P. (2009a) Detection of *Coxiella burnetii* in ticks collected from Central Spain. *Vector-Borne and Zoonotic Diseases*, 9, 465–468.
- Toledo, A., Olmeda, A.S., Escudero, R., Jado, I., Valcárcel, F., Casado-Nistal, Rodríguez-Vargas, M., M.A., Gil, H. & Anda, P. (2009b) Tick-borne zoonotic bacteria in ticks collected from Central Spain. *American Journal of Tropical Medicine and Hygiene*, 81, 67–74.
- Toutoungi, L.N., Gern, L. & Aeschlimann, A. (1993a) Biology of *Ixodes (Pholeoixodes) hexagonus* under laboratory conditions. Part I. Immature stages. *Experimental and Applied Acarology*, 17, 655–662.
- Toutoungi, L.N., Gern, L. & Aeschlimann, A. (1993b) Biology of *Ixodes (Pholeoixodes) hexagonus* under laboratory conditions. Part II. Effect of mating on feeding and fecundity of females. *Experimental and Applied Acarology*, 19, 233–245.
- Toutoungi, L.N., Gern, L., Aeschlimann, A. & Debrot, S. (1991) A propos du genre *Pholioixodes*, parasite des carnivores en Suisse. *Acarologia*, 32, 311–328.
- Tovornik, D. (1988) Geographic distribution and other population parameters of *Ixodes (Exopalpiger) trianguliceps* (Birula, 1895) in Yugoslavia. *Biologiya Vestnik*, 36, 33–54.
- Trautmann, A., Amschler, A., Schultz, K.D., Bröcker, E.B. & Klein, C.E. (1995) Anaphylaktische reaktionen durch Taubenzecken. *Dermatosen*, 43, 215–218.
- Treib, J., Dobler, G., Haaß, A., Frösner, G.G. & Schimrigk, K. (1998) Thunderclap headache caused by Erve virus. *Archives of Neurology*, 50, 509–511.
- Tretyakov, K. (2009) Small mammals and their parasites (ixodid ticks) in urban forests and parks of St. Petersburg. *Estonian Journal of Ecology*, 58, 232–239.
- Uchikawa, K. & Sato, A. (1969) The occurrence of *Argas japonicus* and *Ixodes lividus* in Nagano Prefecture, Japan (Ixodoidea: Argasidae, Ixodidae). *Journal of Medical Entomology*, 6, 95–97.
- Uilenberg, G. (1986) Highlights in recent research on tick-borne diseases of domestic animals. *Journal of Parasitology*, 72, 485–491.
- Ulmanen, I. (1972) Distribution and ecology of *Ixodes trianguliceps* Birula (Acarina, Ixodidae) in Finland. *Annales Zoologici Fennici*, 9, 111–115.
- Ulmanen, I., Saikku, P., Vikberg, P. & Sorjonen, J. (1977) *Ixodes lividus* (Acari) in sand martin colonies in Fennoscandia. *Oikos*, 28, 20–26.
- Vargina, S.G., Kuchuk, L.A., Gershtein, V.I. & Karas, F.R. (1982) Transmission of Issyk Kul virus by *Argas vespertilionis* ticks in experiment. In: L'vov, D.K. (Ed.) Ecology of viruses. Moscow, *Sbornik Nauchnykh Trudov. Instituta Virusologii imeni D. I. Ivanovsky, Akademiya Meditsinskaya Nauk SSSR* (NAMRU-3 translation 1660).
- Veraldi, S., Scarabelli, G. & Grimalt, R. (1996) Acute urticaria caused by pigeon ticks (*Argas reflexus*). *International Journal of Dermatology*, 35, 34–35.
- Verani, P., Balducci, M., Lopes, M.C. & Sacca, G. (1970) Isolation of Bhanja virus from *Haemaphysalis* ticks in Italy. *American Journal of Tropical Medicine and Hygiene*, 19, 103–105.
- Viitala, J., Kojola, T. & Ylönen, H. (1986) Voles killed by ticks – an unsuccessful attempt to introduce north Finnish *Clethrionomys rufocanus* into an enclosure in central Finland. *Annales Entomologici Fennici*, 52, 32–35.
- Voigts, H. & Oudemans, A.C. (1906) Zur Kenntnis der Milben-Fauna von Bremen. *Abhandlungen Naturwissenschaftlicher Verein zu Bremen*, 18, 199–253.
- Vshivkov, F.N. & Filippova, N.A. (1957) A new ixodid tick (Acarina, Ixodidae) from the Crimea. *Review of Entomology SSSR*, 36, 553–560 (in Russian).
- Wahl, J., Keller, T. & Sudfeldt, C. (2004) Verbreitung und Bestand des Kormorans *Phalacrocorax carbo* in

- Deutschland im Januar 2003 – Ergebnisse einer bundesweiten Schlafplatzzählung. *Vogelwelt*, 125, 1–10.
- Walker, J.B., Keirans, J.E. & Horak, I.G. (2000) *The Genus Rhipicephalus (Acari, Ixodidae). A Guide to the Brown Ticks of the World*. Cambridge, Cambridge University Press.
- Walter, G. (1980) Untersuchungen zur Zeckenfauna der Kleinsäuger des Naturschutzgebietes Hagenburger Moor. *Beiträge zur Naturkunde Niedersachsens*, 33, 99–103.
- Walter, G. (1981a) Isolierung von *Babesia microti* (Franca 1912) aus freilebenden Nymphen von *Ixodes ricinus* (Linnaeus 1758). *Acta Tropica*, 38, 187–188.
- Walter, G. (1981b) Zur Saisondynamik und Biologie von *Ixodes trianguliceps* Birula, 1895 (Ixodoidea, Ixodidae) in Norddeutschland. *Zeitschrift für Angewandte Entomologie*, 92, 433–440.
- Walter, G. (1982) Transmission of *Babesia microti* by nymphs of *Dermacentor marginatus*, *D. reticulatus*, *Haemaphysalis punctata*, *Rhipicephalus sanguineus* and *Ixodes hexagonus*, in Germany. *Zeitschrift für Parasitenkunde*, 66, 353–354.
- Walter, G. & Kock, D. (1985) Records of *Ixodes vespertilionis*, *I. simplex* and *Argas vespertilionis* (Ixodoidea: Ixodidae, Argasidae) from German bats (Chiroptera). *Zeitschrift für Parasitenkunde*, 71, 107–111.
- Walter, G., Kock, D. & Liebisch, A. (1986) Beitrag zur Zecken-Fauna der Bundesrepublik Deutschland. *Senckenbergiana biologica*, 67, 199–206.
- Walter, G. & Liebisch, A. (1980) Untersuchungen zur Ökologie einiger Blutprotozoen bei wildlebenden Kleinsäugetern in Norddeutschland. *Acta Tropica*, 37, 31–40.
- Walter, G., Liebisch, A. & Streichert, J. (1979a) Untersuchungen zur Biologie und Verbreitung von Zecken (Ixodoidea, Ixodidae) in Norddeutschland. I. Die Vogelzecken *Ixodes lividus* (C.L. Koch 1844) und *Ixodes arboricola* (Schulze & Schlottke 1929). *Zeitschrift für Angewandte Zoologie*, 66, 65–73.
- Walter, G., Liebisch, A. & Vauk, G. (1979b) Untersuchungen zur Biologie und Verbreitung von Zecken (Ixodoidea, Ixodidae) in Norddeutschland. II. Zecken der Zugvögel auf der Insel Helgoland. *Zeitschrift für Angewandte Zoologie*, 67, 449–476.
- Walter, G. & Rackow, W. (2007) Außergewöhnlich hoher Befall einer Nordfledermaus, *Eptesicus nilssonii*, mit der Lederzecke, *Argas vespertilionis* (Argasidae). *Nyctalus*, 12, 372–378.
- Walter, G. & Streichert, J. (1984) Eine einfache Methode zum Sammeln der Zeckenart *Ixodes lividus* Koch 1844 aus Nestern der Uferschwalbe (*Riparia riparia*). *Angewandte Zoologie*, 71, 225–231.
- Walter, G. & Weber, G. (1981) Untersuchungen zur Übertragung (transstadial, transovarial) von *Babesia microti*, Stamm "Hannover 1," in *Ixodes ricinus*. *Tropenmedizin und Parasitologie*, 32, 228–230.
- Walton, G.A. & O'Donnell, T.G. (1967) Observations on *Ixodes ricinus* and louping ill in Ireland. In: Evans, G.O. (Ed.) *Proceedings of the 2nd International Congress of Acarology*, Sutton Bonington (England) 19th–25th July, 1967, Akademiai Kiado, Budapest, pp. 601–608.
- Wengi, N., Willi, B., Baretta, F.S., Cattori, V., Riond, B., Meli, M.L., Reusch, C.E., Lutz, H. & Hofmann-Lehmann, R. (2008) Real-time PCR-based prevalence study, infection follow-up and molecular characterization of canine hemotropic mycoplasmas. *Veterinary Microbiology*, 126, 132–141.
- Wielinga, P.R., Gaasenbeek, C., Fonville, M., De Boer, A., De Vries, A., Dimmers, W., Akkerhuis Op Jagers, G., Schouls, L.M., Borgsteede, F. & Van der Giessen, J.W.B. (2006) Longitudinal analysis of tick densities and *Borrelia*, *Anaplasma*, and *Ehrlichia* infections of *Ixodes ricinus* ticks in different habitat areas in the Netherlands. *Applied and Environmental Microbiology*, 72, 7594–7601.
- Wilson, N. (1970) Metastigmata: Ixodidae of South Georgia, Heard and Kerguelen. *Pacific Insect Monographs*, 23, 78–88.
- Winkhardt, H.J. (1979) Untersuchungen über den Entwicklungszyklus von *Dipetalonema rugosicauda* (syn. *Wehrdikmansia* r.) (Nematoda: Filarioidea). I. Experimentelle Infektion der Tecke *Ixodes ricinus* mit Mikrofilarien durch künstliche Fütterung. *Tropenmedizin und Parasitologie*, 30, 455–462.
- Winkhardt, H.J. (1980) Untersuchungen über den Entwicklungszyklus von *Dipetalonema rugosicauda* (syn. *Wehrdikmansia* r.) (Nematoda: Filarioidea). II. Die Entwicklung von *Dipetalonema rugosicauda* im Zwischenwirt *Ixodes ricinus* und Untersuchungen über das Vorkommen der Mikrofilarien im Reh (*Capreolus capreolus*). *Tropenmedizin und Parasitologie*, 31, 21–30.
- Winter, M., Stubbe, M. & Heidecke, D. (2005) Zur Ökologie des Waschbären (*Procyon lotor* L., 1758) in Sachsen-Anhalt. *Beiträge zur Jagd- und Wildforschung*, 30, 303–322.
- Woessner, R., Grauer, M.T., Langenbach, J., Dobler, G., Kroeger, J., Mielke, H.G., Mueller, P., Haass, A. & Treib, J. (2000) The Erve virus: possible mode of transmission and reservoir. *Infection*, 28, 164–166.
- Xu, G., Fang, Q.Q., Keirans, J.E. & Durden, L.A. (2003) Molecular phylogenetic analyses indicate that the *Ixodes ricinus* complex is a paraphyletic group. *Journal of Parasitology*, 89, 452–457.
- Yabsley, M.J., McKibben, J., Macpherson, C.M., Cattan, P.F., Cherry, N.A., Hegarty, B.C., Breitschwerdt,

- E.B., O'Connor, T., Chandrashekar, R., Paterson, T., Perea, M.L., Ball, G., Friesen, S., Goedde, J., Henderson, B. & Sylvester, W. (2008) Prevalence of *Ehrlichia canis*, *Anaplasma platys*, *Babesia canis vogeli*, *Hepatozoon canis*, *Bartonella vinsonii berkhoffii*, and *Rickettsia* spp. in dogs from Grenada. *Veterinary Parasitology*, 151, 279–285.
- Yamaguti, N., Tipton, V.J., Keegan, H.L. & Toshioka, S. (1971) Ticks of Japan, Korea, and the Ryukyu Islands. *Brigham Young University Science Bulletin Biological Series*, 15(1), 1–185.
- Yeruham, I., Rosen, S., Hadani, A. & Braverman, Y. (1999) Arthropod parasites of Nubian ibexes (*Capra ibex nubiana*) and gazelles (*Gazella gazelle*) in Israel. *Veterinary Parasitology*, 83, 167–173.
- Yousfi-Monod, R. & Aeschlimann, A. (1986) Recherches sur les tiques (Acarina, Ixodidae), parasites de bovidés dans l'ouest Algérien. I. Inventaire systématique et dynamique saisonnière. *Annales de Parasitologie Humaine et Comparée*, 61, 341–358.
- Yunker, C.E., Clifford, C.M., Keirans, J.E., Thomas, L.A. & Cory, J. (1973) Tickborne viruses in western North America. II. Yaquina Head, a new arbovirus of the kemeroovo group isolated from *Ixodes uriae*. *Journal of Medical Entomology*, 20, 264–269.
- Zahler, M. & Gothe, R. (1997) Endemisierungsrisiko von *Babesia canis* durch *Dermacentor reticulatus* in Deutschland. Eine epidemiologische Studie. *Tierärztliche Praxis*, 25, 388–392.
- Zahler, M., Schein, E., Rinder, H. & Gothe, R. (1998) Characteristic genotypes discriminate between *Babesia canis* isolates of differing vector specificity and pathogenicity to dogs. *Parasitology Research*, 84, 544–548.
- Zahler, M., Steffenz, T., Lutz, W.-C., Hähnel, H. & Gothe, R. (2000) *Babesia canis* und *Dermacentor reticulatus* in München, ein neuer Naturherd in Deutschland. *Tierärztliche Praxis*, 28, 116–120.
- Zakaryan, V.A., Gromashevski, V.L., Chubkova, A.I., Akopyan, G.S. & Skvortsova, T.N. (1974) Isolation of Bhanja virus from *Dermacentor marginatus* ticks in the Armenian SSR. *Ekologia Virusov* (Moskva), 2, 82–84 (in Russian).
- Zumpt, F. (1944) Die Hundezecke in Deutschland. *Desinfektion und Schädlingsbekämpfung*, 26, 7–9.
- Zygner, W., Górski, P. & Wedrychowicz, H. (2009) New localities of *Dermacentor reticulatus* tick (vector of *Babesia canis canis*) in central and eastern Poland. *Polish Journal of Veterinary Science*, 12, 549–555.
- Zygner, W. & Wedrychowicz, H. (2006) Occurrence of hard ticks in dogs from Warsaw area. *Annals of Agricultural and Environmental Medicine*, 13, 355–35.

Accepted by R.G. Robbins: 17 Feb. 2012; published 25 Jun. 2012