

The Nuttall and British Museum (Natural History) tick collections: lectotype designations for ticks (Acarina: Ixodoidea) described by Nuttall, Warburton, Cooper and Robinson

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Introduction

A monographic revision of the Ixodoidea was begun by Nuttall *et al.* (1908) with subsequent volumes published by Nuttall & Warburton (1911, 1915) and Robinson (1926). A further volume was produced by Arthur (1960). These works were based largely on material gathered by Nuttall and his associates and the Entomological Research Committee for Tropical Africa, forerunner of the present day Commonwealth Institute of Entomology. During his lifetime, Professor Nuttall presented a considerable number of specimens to his correspondents. In 1939, the remainder of the Nuttall Collection was donated by the Molteno Institute to the British Museum (Natural History) and at that time it was the largest tick collection in the world. Currently, the Nuttall collection is kept separately from the main tick collection of the British Museum (Natural History), and types of Ixodoidea designated by Nuttall *et al.* may be found in both collections.

Prior to the formulation of the *International Code of Zoological Nomenclature*, type specimens were frequently labelled only as 'TYPE' or 'COTYPE' with the result that many of the taxa described by Nuttall *et al.* were in need of lectotype designations. Consequently these studies were undertaken and form the basis of the present report. At the same time an attempt was made to trace the type material of all taxa described by Nuttall and his associates; appendices are therefore provided listing holotypes, previously selected lectotypes and other types together with their location, where known.

The following list of lectotypes is in alphabetical order by specific name within the genera *Argas* and *Ornithodoros* in the family Argasidae and within the genera *Amblyomma*, *Aponomma*, *Dermacentor*, *Haemaphysalis*, *Ixodes*, *Rhipicentor*, and *Rhipicephalus* in the family Ixodidae. First the species binomen, or in a few cases the trinomen as originally described, is given followed by author(s), date, page, and figure(s). Any currently recognized synonyms and the Nuttall tick catalogue number precede a statement detailing all pertinent information relating to the original collection. Next, the current status of the type material is given, including selection of a lectotype and paralectotypes and an updating of the host and locality data. This is followed by subsequent published information relating to the species in question. Finally, there is a brief statement which summarizes hosts and distribution of each tick species.

During the course of the studies reported below, each lectotype and each paralectotypic series was isolated within the vial or jar containing specimens of the taxon; the nomenclative status of this material was clearly indicated on an additional included label.

ARGASIDAE

Argas reflexus indicus Warburton, 1910 : 396.

NUTTALL 1649. 'The Indian Museum collection contained three specimens of this form. One was found in a book in the Entomological room, and another on a wall of the Museum building. The third specimen was found in a box sent from the Museum to Kurseong, E. Himalayas. The birds building in the roof of the Museum were identified as *Passer domesticus* and *Cypselus affinis*. The type species has not been recorded from India.'

TYPES. Lectotype ♀ *Argas reflexus indicus* (N1649) found in a book, Entomological room, Indian Museum, Calcutta (22°32'N, 88°22'E), India, 15.III.1910, C. A. Paiva. [Date and collector information taken from vial label].

REMARKS. A second collection (N1243) consisting of 1 ♂, 1 ♀, 1 N *A. reflexus indicus*, found in basin of water, Entomological room, Indian Museum, Calcutta, 13.IV.1910, F. H. Gravely, has a blue label with the word TYPE. We have not accorded these specimens paralectotype status because the specimen numbers and locality data do not conform to Warburton's published record.

Argas reflexus is not known to occur east of 15°00' longitude and without additional collections, the exact taxonomic status of *A. r. indicus* remains moot.

HOSTS & DISTRIBUTION. *Argas reflexus indicus* is an avian parasite known only from India.

Ornithodoros gurneyi Warburton, 1926 : 55, fig. 1

NUTTALL 3562. 'Described from two specimens taken in an old shed at Tibboburra, N.S.W., 24.XI.1922, by Mr W. B. Gurney and sent with other ticks by the Government Entomologist of N.S.W. in 1924 to the Imperial Bureau of Entomology, where it was numbered 1378.'

TYPES. Lectotype ♂ *Ornithodoros gurneyi* (N3562) taken in an old shed, Pindera Selection, Tibboburra, New South Wales, Australia; 1 N paralectotype *Ornithodoros gurneyi*, date as above, deposited in the BM(NH) 97 collection (1925.5.9.4).

HOSTS & DISTRIBUTION. *Ornithodoros gurneyi* is primarily a parasite of large macropodids (kangaroos and wallaroos) but will also attack man and dogs in most areas of Australia.

Ornithodoros piriformis Warburton, 1981 : 285, fig. 2

NUTTALL 3335. 'Described from 15 specimens taken at Mahabaleshwar, Satara District, at a height of 4200 ft, (?host) by F. H. G., 13-16.IV.12. Indian Mus. SPA./10.'

TYPES. Lectotype ♀ and 2 ♀, 1 ♂ paralectotypes *Ornithodoros piriformis* (N3335) host unknown, Robber's Cave, Mahabaleshwar (17°55'N, 73°40'E), Maharashtra, India, at a height of 1280 m, 13-16.IV.1912, F. H. G.

REMARKS. The locality Robber's Cave is taken from Nuttall's catalogue and on the vial label with the ticks. Two slides, one with hypostome palp and leg I, the other with hypostome, are both missing.

HOSTS & DISTRIBUTION. *Ornithodoros piriformis* has been collected from *Miniopterus schreibersii* from the type locality. Robber's Cave contains several other bat species including *Rousettus leschenaulti* and probably *Rhinolophus affinis*. This tick is known only from India.

IXODIDAE

Amblyomma atrogenatum Nuttall & Warburton, 1908 : 409, figs 30-32

Junior subjective synonym of *Amblyomma clypeolatum* Neumann, 1899.

NUTTALL 43. 'Description based on 6 ♂ from *Testudo elegans*, received from India at the Zoological Gardens, London, 15.VIII. removed 2.X.1905. (Preserved in spirit.)'

TYPES. Lectotype ♂ and 4 ♂ paralectotypes *Amblyomma atrogenatum* (N43) ex *Testudo elegans* received from India at Zoological Gardens, London, 15.VIII.1905. Ticks removed 2.X.1905.

REMARKS. The 4 ♂ paralectotype total includes 1 ♂ pinned specimen. An empty token tube in the Nuttall collection indicates a slide mount of 1 ♂ which is now missing.

HOSTS & DISTRIBUTION. *Amblyomma clypeolatum* is a tortoise parasite in India and Sri Lanka.

***Amblyomma caelaturum* Cooper & Robinson, 1908 : 460, figs 6–9**

Junior subjective synonym of *Amblyomma geoemydae* (Cantor, 1847).

NUTTALL 2938. Original description 'based on two ♂'s and one gorged ♀. Collected by Mr F. F. Laidlaw, Skeat Expedition, 1899, Kwala Aring, Java. Host, a tortoise (*Geoemyda spinosa*). Preserved in alcohol.'

TYPES. Lectotype ♂ and 1 ♂, 1 ♀ paralectotypes *Amblyomma caelaturum* (N2938), ex *Heosemys spinosa*, Kwala Aring, Malaysia (locality not verified) collected by Dr N. Annandale, 1899. Gift of Mr F. F. Laidlaw. Correction of locality and collector: Robinson (1926 : 230).

REMARKS. The name *A. caelaturum* was published in July, 1908. The name *A. maylanum* Neumann was published in March of the same year. Anastos (1950 : 107) sank the former as a junior synonym of *A. malayanum* on the grounds of priority. After examination of all relevant types Kohls (1957 : 87) concluded that both *A. caelaturum* and *A. malayanum* were junior synonyms of *A. geoemydae* (Cantor, 1847).

HOSTS & DISTRIBUTION. *Amblyomma geoemydae* parasitizes reptiles, especially tortoises and monitor lizards in Indonesia, Malaysia, Thailand, Ryukyu Islands, Japan, Taiwan, and the Philippines.

***Amblyomma cooperi* Nuttall & Warburton, 1908 : 410, figs 33–36**

Junior synonyms: *Amblyomma lutzi* Aragão, 1908 : 112; *Amblyomma ypsilophorum* Schulze, 1941 : 93.

NUTTALL 70. Original description, 'based on 1 ♂ and 5 ♀ collected from "Carpinchio" (*Hydrochoerus capybara*) at Puerto Cooper, Alto, Paraguay, S. America, by W. F. Cooper in 1904. (Dry specimens.)'

TYPES. Lectotype ♂ and 1 ♂, 6 ♂ paralectotypes *Amblyomma cooperi*, (N70), ex *Hydrochoerus hydrochaeris* Puerto Cooper (23°03'S, 57°43'W), Alto, Paraguay, 1904, W. F. Cooper. [Included in the above total is one slide-mounted ♀].

REMARKS. Robinson (1926 : 75) indicated that more than 1 ♂ was present in the original collection but gave no total.

HOSTS & DISTRIBUTION. *Amblyomma cooperi* is a parasite of capybaras and tapirs in Paraguay, Bolivia, Brazil, Uruguay, and Argentina.

***Amblyomma darlingi* Nuttall, 1912 : 50, figs 1–4**

Junior synonym of *Amblyomma oblongoguttatum* Koch, 1844.

NUTTALL 1285–1287. 'Described from 5 ♂, 9 ♀, 40 N, and 23 larvae found on a deer (*Odocoileus* sp.), Corozal, Panama Canal Zone, 14.VIII.1910, by A. H. Jennings, of Ancon, and 2 N, found on the nape and head of a turkey buzzard (*Catharista atratus*), Empire, Canal

Zone, IV.1911, by S. T. Darling, M. D., Chief of Laboratory, Isthmian Canal Commission, Ancon, Canal Zone. Named in honour of Dr Darling in view of his distinguished service to parasitology. The types, for which I am indebted to Dr Darling, are in Cambridge (N.1285-1287).'

TYPES. Lectotype ♂ and 2 ♂, 7 ♀ paralectotypes *Amblyomma darlingi* (N1285) ex *Odocoileus virginianus*, Corozal (08°59'N, 79°35'W), Panama, 14.VIII.1910, A. H. Jennings [above paralectotype total includes 1 ♂, 1 ♀ which were pinned and are now in the BM(NH) collection] 33N, 20L paralectotypes *Amblyomma darlingi* (N1286) same collection data as N1285; 2N paralectotypes *Amblyomma darlingi* (N1287) ex *Coragyps atratus*, perhaps from Empire Known Distance Range (09°04'N, 79°40'W), Panama, IV.1911, Dr S. T. Darling.

HOSTS & DISTRIBUTION. *Amblyomma oblongoguttatum* occurs on a wide variety of mammalian hosts including deer, peccary, horse, cattle, dog, goat, armadillo, raccoon, etc., and ranges from the State of Sinaloa, Mexico, southward through Central America to Venezuela and Brazil.

***Amblyomma fiebrigi* Robinson, 1912 : 482, figs 3, 4**

Junior subjective synonym of *Amblyomma pacae* Aragão, 1911.

NUTTALL 1939. 'Described from 1 ♂ and 1 ♀, collected at San Bernardino, Paraguay, S. America, by Dr Karl Fiebrig. Host not specified.'

TYPES. Lectotype ♂ and 1 ♀ paralectotype *Amblyomma fiebrigi* (N2939), host unknown, San Bernardino (25°16'S, 57°19'W), Paraguay, Dr Karl Fiebrig.

REMARKS. There is no date given for this collection in the original description but both Nuttall's tick catalogue and the vial label with the ticks bear the date 1911.

HOSTS & DISTRIBUTION. *Amblyomma pacae* is most often collected, although not in large numbers, from *Agouti paca* but it has also been recorded from the genera *Dasyprocta* and *Tamandua*. This tick has been collected in British Honduras, Panama, Colombia, Venezuela, Brazil and Paraguay.

***Amblyomma laticaudae* Warburton, 1933 : 561, figs 5, 6**

BM(NH) 1933.3.15.24-26. 'Described from 1 ♂, 1 ♀ (gorged) and 1 nymph taken from a sea-snake, *Laticauda colubrina*. The ticks were adhering to the skin, shed in captivity, at the Raffles Museum, Singapore, and were sent to Cambridge by the Assistant Curator, Mr Norman Smedley, who adds the following note: "The large ♀ and others were of the same grey as the snake and usually attached to the grey parts of the body, although I observed one on a black stripe. *Laticauda colubrina* belongs to that group of the sea-snakes possessing broad ventrals, and spends quite a considerable part of its time out of water, but even so the survival of the ticks while the snake is submerged seems remarkable." Types in the British Museum (Nat. Hist.).'

TYPES. Lectotype ♂ and 1 ♀, 1 N paralectotypes *Amblyomma laticaudae* BM(NH) 1933.3.15.24-26 ex *Laticauda colubrina*, Raffles Museum, Singapore (01°17'N, 103°51'E), Republic of Singapore, VI.1930, sent by Mr Norman Smedley.

REMARKS. Collection date of VI.1930 taken from vial label.

HOSTS & DISTRIBUTION. *Amblyomma laticaudae* has been collected only from *Laticauda colubrina*, a venomous sea snake which is widely distributed throughout the tropical Indo-Pacific Islands, southern Japan to the Bay of Bengal.

***Amblyomma robinsoni* Warburton, 1927 : 408, pl. xxvii, figs 1, 2**

NUTTALL 3617. 'Described from 8 ♂ and 3 ♀ taken from *Varanus komodoensis* and contained in a tube labelled "Komodo VII, 1923, Museum Buitenzorg," Java.'

TYPES. Lectotype ♂ and 2 ♂, 1 ♀ paralectotypes *Amblyomma robinsoni* (N3617), ex *Varanus komodoensis*, Komodo Island (08°35'S, 119°28'E), Lesser Sunda Islands, Indonesia, VII.1923, ex Museum, Buitenzorg, Java.

HOSTS & DISTRIBUTION. *Amblyomma robinsoni* is apparently restricted to the giant monitor, *Varanus komodoensis*, on Komodo Island.

***Amblyomma uncatum* Nuttall & Warburton, 1908 : 412, figs 37–40**

Junior subjective synonym of *Amblyomma nodosum* Neumann, 1899.

NUTTALL 36. 'Description based on 5 ♂ from *Tamandua tetradactyla*, S. America (Zool. Society's Gardens, London, 1905. Dry specimens).'

TYPES. Lectotype ♂ and 6 ♂ paralectotypes *Amblyomma uncatum* (N36) [Lectotype and one paralectotype in alcohol, 2 paralectotypes pinned, 3 paralectotypes mounted on slides] ex *Tamandua tetradactyla*, South America, 1905.

REMARKS. The host (an anteater), from which the type series was collected, arrived at the Zoological Society's Gardens, London, 10.XII.1905 and died 22.XII.1905 (Robinson 1926 : 199). The date on the vial label is 22.XII.1905. There are also present two additional slides, one with the capitulum and leg IV of a ♂, and the second with chelicerae and hypostome of a ♂. Evidently, Nuttall & Warburton based their description on 5 of the 7 specimens comprising the collection.

HOSTS & DISTRIBUTION. *A. nodosum* adults are specific parasites of anteaters and the species has been reported from Costa Rica, Panama, Guatemala, Colombia, Bolivia, Nicaragua, Brazil and Trinidad.

***Amblyomma v-notatum* Nuttall, 1910 : 412, fig. 5**

Junior subjective synonym of *Amblyomma geayi* Neumann, 1899.

NUTTALL 1149. 'Described from (N1149) 4 ♀'s found on a sloth (*Bradypus tridactylus*), at Manaos, Brazil, by Mr T. P. Beddoes, 1903.'

TYPES. Lectotype ♀ and 2 ♀ paralectotypes *Amblyomma v-notatum* (N1149) ex *Bradypus tridactylus* Manaus (03°08'S, 60°01'W), Brazil, 1903, T. P. Beddoes.

HOSTS & DISTRIBUTION. *Amblyomma geayi* is parasitic on both *B. tridactylus*, the three-toed sloth and *Choloepus* spp. two-toed sloths in Panama, Colombia, Guyana, Surinam, Brazil and Peru.

***Amblyomma variegatum nocens* Robinson, 1912 : 480, fig. 2**

Junior subjective synonym of *Amblyomma pomposum* Dönitz, 1909.

NUTTALL 2941. 'Rhodesia, South Africa. Host not specified. Described from 2 ♂'s collected by Mr E. M. Jarvis, F.R.C.V.S., of the Dept. of Agriculture, Southern Rhodesia.'

TYPES. Lectotype ♂ *Amblyomma variegatum nocens* (N2941), Zimbabwe, Mr E. M. Jarvis.

REMARKS: There is no date given for this collection in the original description but both Nuttall's tick catalogue and the vial label with the tick bear the date 1911. Robinson (1926 : 100) stated that this collection was 'off cattle'. The second ♂ specimen of the type series could not be located.

HOSTS & DISTRIBUTION *Amblyomma pomposum* is most often collected from domestic cattle but is found on many other Artiodactyla. It is distributed in highland areas from Uganda and Zaire southward to Zambia.

***Amblyomma versicolor* Nuttall & Warburton, 1908 : 407, figs 27-29**

Junior synonym of *Amblyomma cajennense* (Fabricius, 1787).

NUTTALL 212. 'Description based on 1 ♂ and 1 ♀ from a horse, Tolosa, Oaxaca, Mexico, collected by Mr A. Laughton, 1907. (Preserved in 70% spirit.)'

TYPES. Lectotype ♂ and 1 ♀ paralectotype *Amblyomma versicolor* (N212) ex *Equus caballus*, Tolosa (22°31'N, 101°22'W), Mexico, 1.X.1907, Mr A. Laughton.

HOSTS & DISTRIBUTION. *A. cajennense* is a common species occurring in abundance on domesticated animals and less frequently from wild hosts. It readily attacks man and has been found naturally infected with the etiologic agent of Rocky Mountain spotted fever, *Rickettsia rickettsii*. The tick ranges from southern Texas in the United States southward to Argentina and the Caribbean islands.

***Aponomma draconis* Warburton, 1933 : 546, fig. 7**

Junior subjective synonym of *Aponomma komodoense* Oudemans, 1928.

NUTTALL 3875. 'Described from 3 ♂♂ and 6 ♂♂ (in poor condition) taken from a "dragon", *Varanus komodoensis*, brought from Komodo Island, Flores, Dutch East Indies, and for some years past in the Zoological Gardens, London. Communicated by Dr P. A. Buxton, April, 1931. Types in Cambridge (N. 3875).'

TYPES. Lectotype ♂ and 2 ♂, 6 ♀ paralectotypes *Aponomma draconis* (N3875) ex *Varanus komodoensis*, brought from Komodo Island (08°36'S, 119°30'E) Indonesia, and for some years past in the Zoological Gardens, London, England, IV.1931. Dr P. A. Buxton.

HOSTS & DISTRIBUTION. *Aponomma komodoense* has been collected on Komodo and nearby Flores Island, Indonesia, on *Varanus komodoensis*. One record of this tick from *Varanus salvator* in Djakarta Zoo was probably a case of accidental parasitism.

***Dermacentor imitans* Warburton, 1933 : 559, figs 3, 4**

NUTTALL 3874. 'Described from 12 ♂ and 1 ♀ taken by Mr W. J. Hamilton, Jun., on a peccary (*Pecari angulatus*) at Turrialba, Costa Rica, on August 1st, 1927, and sent to Cambridge by Prof. R. Matheson. In the same tube were specimens of *Amblyomma mantiquirens*. Types in Cambridge (N.3874).'

TYPES. Lectotype ♂ and 9 ♂, 1 ♀ paralectotypes *Dermacentor imitans* (N 3874), ex *Tayassu tajacu*, Turrialba (09°54'N, 83°41'W), Costa Rica, 1.VIII.1927, W. J. Hamilton, Jr.

HOSTS & DISTRIBUTION. Known also from Panama, Guatemala, and Mexico, *Dermacentor imitans* has been recorded from *Mazama americana* as well as from its common host, the peccary.

***Haemaphysalis aciculifer* Warburton, 1913 : 125, figs 4, 5**

NUTTALL 1981. 'Described from 1 ♂ and 1 ♀ taken, in company with *Rhipicephalus appendiculatus*, from *Cobus thomasi* (an antelope), on the N.E. shore of Lake Edward, Uganda, X. 1911, by S. A. Neave. Types in Entomol. Research Committee's Collection, No. 463 a.'

TYPES. Lectotype ♂ [designated as holotype by Hoogstraal & El Kammah, 1972 : 965], paralectotype ♀ [designated as allotype by Hoogstraal & El Kammah, 1972 : 965] (N1981) ex *Kobus kob thomasi*, N.E. shore of Lake Edward (approx. 00°25'S, 29°30'E), Uganda, X.1911, S. A. Neave [ex Entomological Research Committee 463a] BM NH 1913.8.12: 7-8.

HOSTS & DISTRIBUTION. *Haemaphysalis aciculifer* adults are parasitic on antelopes, domestic cattle, sheep, goats, Cape buffalo, hares and occasionally carnivores that prey upon

antelopes and other game. This tick has been recorded from Cameroon, Uganda, Ethiopia, Sudan, Kenya, Tanzania, Zimbabwe, and South Africa. Hoogstraal & El Kammah (1972) gave detailed host and distributional data for *H. aciculifer*.

***Haemaphysalis bancrofti* Nuttall & Warburton, 1915 : 487, figs 427–430**

Junior synonyms: *Haemaphysalis novaeguineae* Krijgsman & Ponto, 1932 : 17; *Haemaphysalis meraukensis* Taylor 1944 : 187; *Haemaphysalis krijgsmani* Kohls 1948 : 157.

NUTTALL 2100, 2114, 2115, 2689, 2691. 'Described from specimens derived from Queensland, Australia: (N. 2100), 2 ♂ and 5 ♀ from *Macropus dorsalis*, Burnett District, III.1913; (N. 2114), 1 ♀ and 1 N, found crawling on collector's trousers, at Brigaton Scrub, Burnett; (N. 2115), 1 ♂, from *Macropus giganteus*, Burnett District, III.1913; (N. 2689), 2 ♀, with eggs and larvae, the ♀s taken from *Macropus dorsalis*, Eidsvold, XII.1913; (N. 2691), 6 ♂, 3 ♀ and 2 N host (?) found at Eidsvold. All collected by Dr T. L. Bancroft, of Eidsvold, after whom the species is named.

Types in Cambridge: (N. 2100, ♂ ♀; N. 2691, N; N. 2689, larvae).

In the following collections (by Nuttall number), Professor Nuttall placed blue type labels—N2100, N2689 (ii) and N2691 (ii). Nuttall 2100 was divided, one vial containing 1 ♂, 1 ♀ the other vial containing 1 ♂, 4 ♀. In the following collections (by Nuttall number), Professor Nuttall placed blue cotype labels—N2114 (i), (ii), N2115, N2689, N2691.

TYPES. Lectotype ♂ (in vial containing 1 ♂, 1 ♀) and 1 ♂, 5 ♀ paralectotypes *Haemaphysalis bancrofti* (N2100) [1 ♀ vulva on slide] ex *Macropus dorsalis*, Burnett District, Queensland, Australia, III.1913, Dr T. L. Bancroft; paralectotypes 1 ♀ (N2114ii), 1 N (N2114i) crawling on collector's trousers, Brigaton Scrub, Burnett, Queensland, Australia, III.1913, Dr T. L. Bancroft [leg IV of N2114(i) is mounted on a slide] 1 ♂ (N2115) ex *Macropus giganteus*, Burnett District, Queensland, Australia, III.1913, Dr T. L. Bancroft; 2 ♀ (N2689), 223 L (including 7 L mounted on slides) (N2689ii) ex *Macropus dorsalis*, Eidsvold, Queensland, Australia, XII.1913, Dr T. L. Bancroft; 2 N (N2691i), 6 ♂, 3 ♀ (N2691ii), no host cited, Eidsvold, Queensland, Australia, 1913, Dr T. L. Bancroft.

REMARKS. Roberts (1963) cited the original collection data and redescribed the ♂, ♀ and nymph.

HOSTS & DISTRIBUTION. *Haemaphysalis bancrofti* is found in the coastal and subcoastal areas of Queensland and northern New South Wales, Australia, and from Kangaroo Island, South Australia (Roberts, 1970). It is also present in New Guinea. Hosts include a wide range of marsupial mammals as well as most of man's domesticated animals.

***Haemaphysalis calcarata houyi* Nuttall & Warburton, 1915 : 444**

NUTTALL 2996. 'Described from 7 ♂, 1 ♀ and 2 N from Bate, New Cameroon, collected by Dr Houy. Types in the Berlin Museum (No. 279), co-types in Cambridge (N2996).'

TYPES. Lectotype ♂ and 2 ♂, 1 ♀, 1 N paralectotypes *Haemaphysalis houyi* (N2996), host not stated, Bate Cameroun [If the coordinates given by Hoogstraal (1955) are correct, the type locality would now be called Bade, Central African Republic], no date stated, Dr Houy.

REMARKS. Hoogstraal (1954 : 307) raised the taxon to specific rank, then (1955 : 365) reviewed and illustrated *H. houyi* and from information supplied to him from J. Bequaert gave the type locality at approximately 06°40'N, 17°00'E.

HOSTS & DISTRIBUTION. *Haemaphysalis houyi* is known primarily from *Euxerus erythropus* in a narrow belt through Kenya, Uganda and Sudan westward to Senegal.

***Haemaphysalis calvus* Nuttall & Warburton, 1915 : 445, figs 378, 379**

NUTTALL 2120a. 'Described from 3 ♂ and 1 ♀ (N2120a) taken from buffalo, Sekong River, Sandakan, British North Borneo, 19.IV.1913, Dr H. F. Conyngham coll.'

TYPES. Lectotype ♂ and 2 ♂, 1 ♀ paralectotypes (N2120a) ex buffalo, Sekong River, Sandakan (05°50'N, 118°05'E), Sabah, Malaysia, 19.IV.1913, Dr H. F. Conyngham [♀ vulva mounted on a slide].

HOSTS & DISTRIBUTION. *Haemaphysalis calvus* in addition to the original collection has been recorded from *Cervus unicolor*, a tiger, and a bear in Malaysia and Thailand.

***Haemaphysalis campanulata* Warburton, 1908 : 513, figs 5, 6**

NUTTALL 897. Original description 'based on numerous specimens taken from Chinese dogs in Mongolia by Major M. L. Hearn, and received by us from Colonel Skinner in 1906.'

TYPES. Lectotype ♂ and 91 ♂, 5♀ paralectotypes *Haemaphysalis campanulata* (N897) ex Chinese dogs, Mongolia, rec'd 14.X.1906, Major M. L. Hearn.

The above paralectotype total includes 3 ♂, 1 ♀ which were previously pinned and now are retained in a separate vial and 1 ♂, 1 ♀ mounted on a slide.

REMARKS. Nuttall & Warburton (1915) stated, 'Types in Cambridge (N897); we have presented cotypes (♂ ♀) to the British Museum and London School of Tropical Medicine, also (♂) to the Museums in Paris, Berlin, Toulouse (Neumann coll.), and Washington, D.C. (U.S. Dept. Agric.).' [Those USDA specimens consist of 2 ♂, 1 ♀ and are now housed at the Rocky Mountain Laboratories (RML 109832).]

HOSTS & DISTRIBUTION. This species is known from China, Mongolia, Manchuria, Japan and Korea. Hosts include cows, horses, dogs, rats and man.

***Haemaphysalis crassa* Warburton, 1908 : 516, fig. 8**

Junior subjective synonym of *Haemaphysalis punctata* Canestrini & Fanzago, 1878.

BM(NH) 1908.1.14.103–105. 'Description based on two gorged ♀ at the British Museum, in a tube labelled *Haemaphysalis papuana*.'

TYPES. Lectotype ♀ and 1♀ paralectotype *Haemaphysalis crassa* BM(NH) 1908.1.14.103–105, ex. cattle, Zurnabad (40°30'N, 46°15'E), Azerbaijan SSR, USSR.

REMARKS. One of the five vial labels with these ticks bears the following information: '*Haemaphysalis papuana* Thorell ♀, Surnabat Antirinderpest Station, from cattle, Dr E. Dschunkovskii.' Nuttall & Warburton (1915 : 384) spell the locality Surnabad and the collector's name Dschunkowsky.

HOSTS & DISTRIBUTION. *Haemaphysalis punctata* is a parasite on most of man's domesticated animals as well as many species of ground nesting birds. This tick is found throughout central and southern Europe, northern Africa and into the Asiatic areas of Turkey and the USSR.

***Haemaphysalis hoodi* Warburton & Nuttall, 1909 : 62, figs 7, 8**

Junior synonym: *Haemaphysalis africana* Howard, 1909 : 219.

NUTTALL 424. 'Described from numerous specimens of both sexes sent by Dr P. Hood, from Bathurst, Gambia, where it occurred on fowls in May, 1908.'

TYPES. Lectotype ♂ and 14 ♂, 34 ♀ paralectotypes *Haemaphysalis hoodi* (N424) ex fowls, Bathurst, now Banjul (13°28'N, 16°39'W), Gambia, V.1908, Dr P. Hood.

REMARKS. Nuttall & Warburton (1915) p. 486 stated 'Types in Cambridge (N424, adults and N, N1364 N and L); cotypes (♂ ♀ from our collection) at Toulouse.' Specimens in collection

(N1364) mentioned by Nuttall & Warburton (1915) are the types of *Haemaphysalis africana*.

HOSTS & DISTRIBUTION. Distributed throughout the Ethiopian faunal region but perhaps found more in West rather than East Africa, it is exclusively parasitic on birds with a preference for ground dwellers.

***Haemaphysalis hoodi orientalis* Nuttall & Warburton, 1915 : 486**

Junior synonym: *Haemaphysalis zambeziae* Santos Dias 1953 : 1.

NUTTALL 2847, 2848. 'Described from 6 ♂ and 3 ♀ taken from *Procavia manningi* Wroughton, S.W. Shore of Lake Nyasa, British Central Africa, III.1910, S. A. Neave coll. Types in the Imperial Bureau of Entomology coll., London (Nos. 66a and 69); cotypes in Cambridge (N2847 and N2848, 1 ♂, 2 ♀).'

TYPES. Lectotype ♂ and 1 ♂, 1 ♀ paralectotypes *Haemaphysalis hoodi orientalis* (N2847) (Imperial Bureau of Entomology 66a) ex *Heterohyrax brucei manningi*, S.W. Shore, Lake Malawi, Malawi, III.1910, S. A. Neave [♀ vulva mounted on a slide]; BM(NH) 1914.6.15: 1-3; paralectotypes 3 ♂, 2 ♀ (N2848) (Imperial Bureau of Entomology 69), collection data as for (N2847) [1 ♂, 1 ♀ hypostome mounted on a slide].

REMARKS. Hoogstraal (1956 : 161) elevated *H. orientalis* to specific rank.

HOSTS & DISTRIBUTION. *Haemaphysalis orientalis* is a parasite of hyraxes in Malawi, Tanzania, Zambia and Mozambique.

***Haemaphysalis howletti* Warburton, 1913 : 123, figs 2, 3**

NUTTALL 1979. 'Described from 1 ♂ and 1 ♀ taken by F. M. Howlett from a hill pony at Rawalpindi, India (no date). The types are in the Quick Laboratory, Cambridge (N1979).'

TYPES. Lectotype ♂ and 1 ♀ paralectotype *Haemaphysalis howletti* ex hill pony, Rawalpindi (33°36'N, 73°04'E), Pakistan, date not stated on vial label or in Nuttall's catalogue, F. M. Howlett. [♀ vulva mounted on a slide.]

REMARKS. Nuttall & Warburton (1915 : 494) stated the collection date 1912. Dhanda (1964) redescribed the adults and described the immature stages. Nymphs and larvae were collected mostly on rodents and birds. The only adult collected was from a bandicoot. All were from the vicinity of Poona, India.

HOSTS & DISTRIBUTION. *Haemaphysalis howletti* is known from western India, northern Pakistan, and southern Nepal on the above-mentioned hosts.

***Haemaphysalis humerosa* Warburton & Nuttall, 1909 : 60, figs 4, 5**

NUTTALL 669. 'Described from 4 ♂ and 1 ♀ taken from *Perameles macrura*, Barrow Island, N.W. Australia. Presented by Hon. N. C. Rothschild.'

TYPES. Lectotype ♂ and 1 ♂, 1 ♀ paralectotypes *Haemaphysalis humerosa* (N669) (Rothschild 178) ex *Isoodon macrourus*, Barrow Island (20°48'S, 15°23'E), Australia. [♀ vulva mounted on a slide.]

REMARKS. An additional 1 ♂ of this collection was sent to Dr L. O. Howard, U.S. Department of Agriculture, Washington, D.C., 21.V.1909. Nuttall & Warburton (1915) indicated 3 ♂, 1 ♀ and 1 N present in (N669). Roberts (1963) noted that the tube label states 3 ♂ 1 ♀ off *Perameles macrura*, W. Australia. Nuttall has added the note 'one missing from 20.X.1934'.

HOSTS & DISTRIBUTION. *Haemaphysalis humerosa* is collected most frequently from the bandicoot and, in addition to Australia, has been found in New Guinea.

***Haemaphysalis inermis aponommoides* Warburton, 1913 : 128, fig. 8**

NUTTALL 1566. 'Described from numerous ♀'s taken by Colonel F. Raymond F.R.C.V.S., from a Himalayan Zebu at Belgachia, Calcutta, III.1912, in company with *Boophilus australis*. Types in the Quick Laboratory, Cambridge (N1566).'

TYPES. Lectotype ♂ and 19 ♀ paralectotypes *Haemaphysalis inermis aponommoides* (N1566), ex Himalayan Zebu cattle, Belgachia, Calcutta (22°32'N, 88°22'E), India, III.1912, Colonel F. Raymond.

REMARKS. Nuttall & Warburton (1915 : 367) repeated the original description and figures and (p. 549) listed 23 ♀ in the collections of BM(NH), Berlin Museum, and Toulouse. Hoogstraal (1961 : 317) redescribed the female and Hoogstraal (1962 : 195) described the ♂ and raised *aponommoides* to specific rank. The cattle undoubtedly were imported from the north to Calcutta, a city far from this tick's distributional range.

HOSTS & DISTRIBUTION. *Haemaphysalis aponommoides* is known from Nepal, India, Sikkim and China. Adult *H. aponommoides* primarily parasitize artiodactyls but have been found on man, dog, flying squirrel, wildcat and black bear. Immatures have been collected on pheasant and 2 shrew and 4 rodent species (Hoogstraal & Mitchell, 1971).

***Haemaphysalis japonica* [spelled *japonnica*] Warburton, 1908 : 512, figs 3, 4**

NUTTALL 1247. 'Description based on numerous specimens in a tube labelled *H. flava* at the British Museum . . . Habitat, Japan.'

TYPES. Lectotype ♂ and 1 ♀ paralectotype *Haemaphysalis japonica* (N1247) ex *Capricornis crispus* Hondo (32°27'N, 130°12'E), Kyushu, Japan, received IV.1911 [i.e., received at Cambridge University from Mr A. S. Hirst, BM(NH)], The Duke of Bedford's collector, 6 ♂, paralectotypes data as above, deposited in the BM(NH)—1908.11.7.1–11 (part).

REMARKS. Nuttall & Warburton (1915 : 403) gave the collection data for Warburton's type specimens.

HOSTS & DISTRIBUTION. *Haemaphysalis japonica* is found on dogs, deer, serow, cattle and horses in Japan, Korea, China and Southern Primor, U.S.S.R.

***Haemaphysalis japonica douglasi* Nuttall & Warburton, 1915 : 403**

Junior subjective synonym of *Haemaphysalis japonica* Warburton, 1908.

NUTTALL 1248. 'Described from 4 ♂ taken from *roe-deer*, at Ten-an-fu, Shiensi, Northern China, 19.V.1909, by Captain H. E. M. Douglas. Types in the British Museum and co-types (N.1248 2 ♂) in Cambridge.'

TYPES. Lectotype ♂ *Haemaphysalis japonica douglasi* (N1248) ex *Capreolus capreolus*, Yen-An (36°38'N, 109°27'E), Shensi, Peoples Republic of China, 19.V.1909, Captain H. E. M. Douglas. 7 ♂ paralectotypes, data as above, deposited in the BM(NH)—1911.7.7.28–36.

HOSTS & DISTRIBUTION. See *Haemaphysalis japonica*.

***Haemaphysalis koningsbergeri* Warburton & Nuttall, 1909 : 65, figs 11, 12**

NUTTALL 496. 'Described from 2 ♂ and 2 ♀ sent by Dr J. C. Koningsberger of the Zoological Museum at Buitenzorg, Java, in 1908. Its host was *Felis pardus*.'

TYPES. Lectotype ♂ and 2 ♀ paralectotypes *Haemaphysalis koningsbergeri* (N496) ex *Panthera pardus*, Java, Indonesia, received X.1908. [♀ vulva mounted on a slide].

REMARKS. Nuttall & Warburton (1915 : 467) reduced *H. koningsbergeri* to a synonym of *H. leachi*.

HOSTS & DISTRIBUTION. *Haemaphysalis koningsbergeri* is a parasite of small and medium-size carnivores and found in Vietnam, southern Thailand, Malaysia, Borneo, and on Java and Sumatra in Indonesia.

***Haemaphysalis longipalpis* Warburton, 1910 : 399, figs 4, 5**

Junior subjective synonym of *Haemaphysalis aculeata* Lavarra, 1904.

NUTTALL 1107. 'Described from 10 ♂ and 1 ♀ taken by Mr C. C. Dobell from *Tragulus meminna*, the Mouse Deer, at Colombo, Ceylon, 3.VIII.1909.'

TYPES. Lectotype ♂ and 7 ♂, 1 ♀ paralectotypes *Haemaphysalis longipalpis* (N1107) ex *Tragulus meminna*, Colombo (06°56'N, 79°51'E), Sri Lanka, 3.VIII.1909, C. C. Dobell [♀ vulva mounted on a slide.]

HOSTS & DISTRIBUTION. *Haemaphysalis aculeata* is an uncommon species. Adults are most often collected from the Mouse Deer, immatures have been recorded from *Macaca radiata* and *Paradoxurus zeylonensis*. This tick has been found in Sri Lanka, India and Indonesia.

***Haemaphysalis mjobergi* Warburton, 1926 : 57, fig. 3**

NUTTALL 3560. 'Described from two specimens in a tube labelled "Rissa equina, Borneo", in a small collection of ticks sent by Dr E. Mjöberg from Sarawak, 7.IV.24.'

TYPES. Lectotype ♂ *Haemaphysalis mjobergi* (N3560) ex *Cervus unicolor* (probably), Mt Poi, Sarawak, Malaysia, sent 7.IV.1924 by Dr. E. Mjöberg.

REMARKS. Kohls (1961 : 305) noted that 'Rissa' is probably a lapsus for *Rusa*, a name used for the sambar or red deer, *Cervus unicolor*. He also stated that the second specimen was probably returned to the Sarawak Museum but that it could not be located and may have been lost during the Japanese occupation. The collecting locality of Mt Poi was found in Nuttall's catalogue.

HOSTS & DISTRIBUTION. *Haemaphysalis mjobergi* has only been collected from *Cervus unicolor* (probably) in Kalimantan, Indonesia, and from grass and fallen leaves at Poi, southwest Sarawak, Malaysia.

***Haemaphysalis silacea* Robinson, 1912 : 478, fig. 1, a-f**

NUTTALL 1629, 2944. 'Described from 4 ♀ found on oxen allowed to run on "starvation camp" from which stock had been excluded for two years, Gonubie Park, East London, South Africa.'

TYPES. Lectotype ♀ and 1 ♀ paralectotype *Haemaphysalis silacea* (N1629), ex cattle, "Starvation Camp", Gonubie Park (32°55'S, 27°59'E), Republic of South Africa, 1911, received from W. F. Cooper [paralectotype ♀ vulva mounted on a slide]; paralectotypes 2 ♀ (N2944), collection data as for (N1629) except date given as 24.II.1911, and collector R. J. Davys.

REMARKS. Nuttall & Warburton (1915 : 418) added the collector's name, Mr R. J. Davys, and the deposition of the types—Cambridge (N1629, N2944). Hoogstraal (1963) reviewed and updated the existing knowledge on *H. silacea*.

HOSTS & DISTRIBUTION. *Haemaphysalis silacea* is known only from South Africa but is no longer found in the type locality. Adults are found most often on cattle but have a comparatively wide host range including sheep, goat, Kudu, hare, mongoose, bushbuck, etc.

***Haemaphysalis wellingtoni* Nuttall & Warburton, 1908 : 397, figs 9-11**

NUTTALL 221. 'Description based on 1 ♂ and 2 ♀ from fowl, Sarawak, Borneo, collected by Dr A. R. Wellington, 1907.'

TYPES. Lectotype ♂ and 10 ♀, 2 N paralectotypes *Haemaphysalis wellingtoni* (N221) ex fowls, Kuching (01°33'N, 110°20'E), Sarawak, I.1907, Dr A. R. Wellington [1 ♀ vulva mounted on a slide.]

REMARKS. Nuttall & Warburton (1915 : 481) stated that 'our description is based on 2 ♂, 11 ♀ and 2 N taken from domestic fowl at Sarawak, Borneo, collected by Dr A. R. Wellington, I.1907.'

HOSTS & DISTRIBUTION. *Haemaphysalis wellingtoni* ranges from Sri Lanka and India through Burma, Thailand, Vietnam, Malaysia, to Borneo and Indonesia. It is a parasite of ground feeding birds and, occasionally, small mammals.

***Ixodes ampullaceus* Warburton, 1933 : 559, fig. 2**

Junior subjective synonym of *Ixodes ugandanus* Neumann, 1906.

NUTTALL 3873. 'Described from 2 ♀ taken by Mr Rupert L. L. Hart on the "edible rat", *Cricetomys ganibicus*, in Uganda.'

TYPES. Lectotype ♀ *Ixodes ampullaceus* (N3873) ex *Cricetomys gambianus*, Kingdom of Ankole (00°30'S, 30°30'E), Uganda, sent 11.III.1931, Mr Rupert L. L. Hart.

REMARKS. Nuttall's catalogue lists only 1 ♀ as being present in this collection rather than the 2 ♀ cited by Warburton in the original collection. The locality of Ankole and the date were also taken from his catalogue.

HOSTS & DISTRIBUTION. *Ixodes ugandanus* is primarily a rodent parasite especially of cane rats in Cameroon, Nigeria, Uganda, Tanzania, Kenya (2 records), Zimbabwe, Mozambique, and South Africa.

***Ixodes arvicolae* Warburton, 1926 : 56, fig. 2**

NUTTALL 3594, 3595. 'Described from four specimens taken by Miss G. E. Pickford and Mr G. E. Hutchinson on water-voles, *Arvicola amphibius amphibius*, at Quay, near Cambridge, in May 1925. One specimen was in company with *I. tenuirostris*. Type at Cambridge.'

TYPES. Lectotype ♀ *Ixodes arvicolae* (N3595) ex *Arvicola terrestris*, Quay (52°13'N, 00°13'E), England, 23.V.1925, Miss G. E. Pickford & Mr G. E. Hutchinson; 2 ♀ paralectotypes *Ixodes arvicolae* (N3594) from nest of *Arvicola terrestris*, Quay (52°13'N, 00°13'E), England, 21-23.V.1925, Miss G. E. Pickford & Mr G. E. Hutchinson.

REMARKS. In Nuttall's catalogue, N3594 is labelled 3 ♀ cotypes [one of which is now missing] and N3595 is labelled type. *Ixodes arvicolae* is possibly a junior synonym of *Ixodes apronophorus* Schulze, 1924.

HOSTS & DISTRIBUTION. In addition to the type host, *I. arvicolae* has been collected on the coypu, *Myocastor coypus*. The tick is known from Cambridgeshire and Kent, England.

***Ixodes caledonicus* Nuttall, 1910 : 408, figs 1-3**

NUTTALL 961, 1142, 1200. 'Described from 1 ♀ (N961) on rocks below a dove's nest, Fastcastle, Scotland, 6.IX.1909 by Dr J. H. Ashworth (Edinburgh); 1 N and 3 L (N1142) found on a young pigeon, from a dovecot [sic], at Duniface [sic], Stirlingshire, Scotland, 18.IV.1910 and 1 ♀ and 4 N (N1200) from the same source, 9.VIII.1910, communicated by Mr Williams Evans (Edinburgh).'

TYPES. Lectotype ♀ *Ixodes caledonicus* (N961) rocks below dove's nest, Fastcastle (55°56'N, 02°14'W), Scotland 6.IX.1909, Dr J. H. Ashworth [Nuttall & Warburton (1911) state J. F. Cormack and J. Waterston as collectors]; paralectotypes 3 L (N1142), 2 N (N1200) ex *Columba livia*, Dunipace (56°01'N, 03°55'W), Stirlingshire, Scotland 18.IV.1910, W. Evans.

REMARKS. Nuttall & Warburton (1911 : 346) indicated that 1 ♀, N, L were deposited in Cambridge and 1 ♀, N, L were deposited in Edinburgh. The specimens deposited in Edinburgh are now missing.

HOSTS & DISTRIBUTION. *Ixodes caledonicus* is an avian ectoparasite and ranges from Scotland to Norway, Denmark, and Germany.

***Ixodes cavipalpus* Nuttall & Warburton, 1908 : 394, figs 1–5**

NUTTALL 245. 'Description based on 2 ♂ and 7 ♀ from a baboon (*Cynocephalus babuin*), Kansanshi, N.W. Rhodesia, collected by Dr A. Yale Massey.'

TYPES. Lectotype ♂ and 3 ♀ paralectotypes (in alcohol) 1 ♂, 1 ♀ (each mounted on a slide) *Ixodes cavipalpus* (N245), ex *Papio cynocephalus*, Kansanshi (12°05'S, 26°25'E), Zambia, sent 22.I.1907 to London School of Hygiene and Tropical Medicine, Dr A. Yale Massey [A slide is present containing 1 ♂, 1 ♀ spiracular plate.]

REMARKS. Massey's (1908) mention of the name *Ixodes cavipalpus* was a nomen nudum. Nuttall & Warburton (1911) add the collection date I.1907.

HOSTS & DISTRIBUTION. *Ixodes cavipalpus* is found on a wide range of hosts including primates, carnivores, and lagomorphs but is found most often on the Artiodactyla. This tick ranges from Cameroun in West Africa, eastward through Zaire, Uganda, Kenya, and southward through Tanzania, Malawi, Zambia, Angola, Zimbabwe, Mozambique into the northern Transvaal of South Africa.

***Ixodes dentatus spinipalpis* Hadwen & Nuttall in Nuttall, 1916 : 301, figs 6–8**

NUTTALL 3180, 3181: 'My description is based on (N. 3180) 1 ♀ found on *Lepus americanus*, 1.IX.1910, (N. 3181) 3 N found on *L. americanus*, *Sciurus hudsonius douglasii* and upon a child respectively, besides 4 larvae (17 were originally collected) from *Lepus americanus*, 5.III.1910, all taken at Mount Lehman, British Columbia, Canada, by Dr S. Hadwen. Types in Cambridge.'

TYPES. Lectotype ♀ *Ixodes dentatus spinipalpis* (N3180) ex *Lepus americanus*, Mount Lehman (49°07'N, 122°23'W) British Columbia, Canada, 1.IX.1910, Dr Semour A. Hadwen; 2 N, 4 L paralectotypes *Ixodes dentatus spinipalpis* [1 N ex *Homo sapiens*; 1 N ex *Lepus americanus*; 4 L (1 L mounted on a slide) ex *Lepus americanus*], Mount Lehman (49°07'N, 122°23'W), British Columbia, Canada, 5.III.1910, Dr Semour A. Hadwen.

REMARKS. The nymph from *Tamiasciurus hudsonicus* could not be located and is not mentioned in Nuttall's catalogue of ticks. Cooley & Kohls (1942 : 1734) raised *I. spinipalpis* to specific rank.

HOSTS & DISTRIBUTION. Adults and immatures of *Ixodes spinipalpis* are found on numerous species of lagomorphs and rodents. Immatures are also found on birds. The tick is found in the Pacific and Rocky Mountain areas of the U.S.A. and in British Columbia and Alberta, Canada.

***Ixodes eichhorni* Nuttall, 1916 : 295, figs 1, 2**

NUTTALL 2672, 2675. 'Described from a ♀ found on the collector's person at Rook Island, Friedrich Wilhelmshaven, German New Guinea, IX.1913 and several unfed N's found on a Kingfisher, Manus, Admiralty Islands, IX–X.1913 by Mr A. F. Eichhorn after whom the species is named and to whom I am indebted for the specimens. Considering the part of the world they come from and the remarkable agreement in structure between the ♀ and N I attribute them to one species although they were collected from different hosts. The only species hitherto known to possess circular anal grooves is *I. rarus* Neumann, 1899, from

Africa, which differs from *I. eichhorni* in numerous respects, the coxae being unarmed and trenchant, etc. The types (N. 2672, 2675) are in Cambridge.'

TYPES. Lectotype ♀ *Ixodes eichhorni* (N2672) ex *Homo sapiens*, Rook Island, now known as Umboi Island (05°36'S, 148°00'E), Papua New Guinea, IX.1913, Mr A. F. Eichhorn; 2 N paralectotypes *Ixodes eichhorni* (N2675), ex Kingfisher, Manus Island (02°05'S, 147°00'E), Admiralty Islands.

HOSTS & DISTRIBUTION. *Ixodes eichhorni* is a parasite of birds in Papua New Guinea, New Hebrides, Admiralty Islands, and Western Samoa.

***Ixodes fecialis aegrifossus* Warburton & Nuttall, 1909 : 250.**

Junior subjective synonym of *Ixodes fecialis* Warburton & Nuttall, 1909.

NUTTALL 339. 'Described from three mutilated ♂s taken from an *Opossum*, Tamborine Mountain, Logan River, S. E. Queensland, April, 1907, and labelled "Scrub-ticks," sent by Professor R. T. Hewlett (London) who received them from the Bacteriological Institute, Brisbane.'

TYPES. Lectotype ♀ and 1 ♀ paralectotype *Ixodes fecialis aegrifossus* (N339) ex *Opossum*, Tamberine Mountain, Logan River (27°43'S, 153°18'E), Queensland, Australia, IV.1907, sent by Professor R. T. Hewlett (London) who received them from the Bacteriological Institute, Brisbane, Australia.

HOSTS & DISTRIBUTION. *Ixodes fecialis* is found on a wide range of both small and large marsupials as well as mice, rats, and occasionally man. It is found in Victoria, Tasmania, New South Wales, Queensland and Western Australia.

***Ixodes gigas* Warburton, 1910 : 397, figs 1, 2**

Junior subjective synonym of *Ixodes acutitarsus* (Karsch, 1880).

NUTTALL 1104. 'Described from two specimens in the India Museum, Calcutta (no. 5992/10 and no. ?) taken at Punkabani, Darjiling District, E. Himalayas (no host recorded).'

TYPES. Lectotype ♂ *Ixodes gigas* (N1104), host unknown, Punkabani, Darjeeling District (27°02'N, 88°16'E), India; 1 ♂ paralectotype with same data deposited in the Indian Museum, Calcutta (5992/10).

REMARKS. In Nuttall's catalogue of ticks the collecting locality is spelled Punkabari.

HOSTS & DISTRIBUTION. *Ixodes acutitarsus* will parasitize most medium to large sized wild and domestic animals and often man and has been recorded from India, Nepal, Peoples Republic of China (Tibet), Burma, Japan, and Taiwan.

***Ixodes kelloggi* Nuttall & Warburton, 1908 : 396, figs 6-8**

Junior subjective synonym of *Ixodes brunneus* Koch, 1844.

NUTTALL 278, 279, 280. 'Description based on 3 ♀, one from a thrush (from Palo Alto, Cal. 1895), one from *Cyancitta* [sic] *stelleri frontalis* (R. C. Snodgrass, coll. 1895, California), and a third from a bird (probably California), sent by Prof. V. L. Kellogg of Stanford University in 1907. (In alcohol.)'

TYPES. Lectotype ♀ *Ixodes kelloggi* (N280) ex Thrush, Palo Alto (37°21'N, 122°07'W), California, U.S.A., 14.XI.1895; 1 ♀ [slide mounted capitulum] paralectotype *Ixodes kelloggi* (N279) ex *Cyanocitta stelleri*, California, U.S.A. 15.XII.1895, R. E. Snodgrass.

REMARKS. Exact dates for (N280) and (N279) are taken from Nuttall's catalogue. The specimen from a bird, probably California (N278) is missing.

HOSTS & DISTRIBUTION. *Ixodes brunneus* is exclusively a parasite of birds usually infesting migratory species. With the exception of one record from Venezuela, valid records of *I. brunneus* have only been from the United States. For a listing of the 21 states from which it has been collected see Keirans & Clifford (1978 : 54).

***Ixodes kemp* Nuttall, 1913 : 131 fig. 1**

Junior subjective synonym of *Ixodes granulatus* Supino, 1897.

NUTTALL 2066. 'Described from eight partly gorged ♀s, found on *Sciurus erythraceus intermedius*, at Kobo (400 feet elevation), India, Abor Expedition, by S. W. Kemp, 29.III.1912. (Indian Museum, Calcutta, No. 1247/17.)'

TYPES. Lectotype ♀ and 2 ♀ paralectotypes *Ixodes kemp* (N2066) ex *Callosciurus erythraeus intermedius*, Kobo (27°47'N, 95°23'E), India (altitude 122 m), 24.III.1912, S. W. Kemp.

REMARKS. The date of 24.III.1912 is in Nuttall's catalogue and on the vial label with the ticks.

HOSTS & DISTRIBUTION. *Ixodes granulatus* is primarily a rodent parasite in Nepal, India, Vietnam, Thailand, Burma, Cambodia, Indonesia, Philippines, Malaysia, Japan, Korea, China, and Taiwan.

***Ixodes loricatus spinosus* Nuttall, 1910 : 411, fig. 4**

[Preoccupied by *spinosus* Neumann, 1899]

Junior subjective synonym of *Ixodes luciae* Senevet, 1940.

NUTTALL 647: 'Described from (N647) 3 ♀'s taken from a large Opossum, Tabasco de la Frontera, Mexico, in the month of May (ex Hon. N. C. Rothschild's collection).'

TYPES. Lectotype ♀ and 1 ♀ paralectotype *Ixodes loricatus spinosus* (N647) ex *Didelphis* sp., Frontera (18°32'N, 92°38'W), Tabasco, Mexico, May, ex Hon. N. C. Rothschild's collection.

HOSTS & DISTRIBUTION. Adults of *Ixodes luciae* prefer opossums as hosts but immatures are more often found on rodents. The tick is found from southern Mexico to Peru, Bolivia and Brazil with one record from Argentina.

***Ixodes oldi* Nuttall, 1913 : 135, fig. 3**

NUTTALL 2065. 'Described from 14 slightly engorged ♀'s found on a bush-cat, at Komatendu, Sierra Leone, West Africa, by J. J. Simpson, 13.VIII.1912 (Imperial Bureau of Entomology, No. 604).'

TYPES. Lectotype ♀ and 5 ♀ paralectotypes *Ixodes oldi* (N2065) ex bush cat (probably a West African species of *Genetta*), Komatendu, Sierra Leone (locality not verified), 13.VIII.1912, J. J. Simpson.

REMARKS. Nuttall (1913) states 14 ♀ in the original collection. In his tick catalogue, however, he recorded 7 ♀ in collection (N2065). Arthur (1958 : 47) and (1965 : 138) discusses a 'holotype ♀' deposited in the BM(NH) bearing the above original data. However, as can be seen from Nuttall's statement, he did not select a holotype.

HOSTS & DISTRIBUTION. *Ixodes oldi* is primarily a parasite of carnivores, especially genets, although it is also found on the insectivore, *Crociodura* sp. It ranges from Sierra Leone in the west, eastward to Tanzania and south to the Republic of South Africa.

***Ixodes percavatus rothschildi* Nuttall & Warburton, 1911 : 221**

NUTTALL 634. 'Described from (N634) 2 ♀'s and 3 N taken from a puffin (ex Rothschild Coll., no locality recorded).'

TYPES. Lectotype ♀ and 1 ♀, 2 N paralectotypes *Ixodes rothschildi* (N634) (Rothschild 159) ex *Fratercula arctica*, no other data.

REMARKS. Zumpt (1952 : 17) and independently Arthur (1953 : 222) gave specific rank to *I. rothschildi*. Arthur (1963 : 134) referred to 2 ♀, 3 N in the type series. One nymph is now missing.

HOSTS & DISTRIBUTION. *Ixodes rothschildi* is a parasite of marine birds in the coastal areas of Great Britain, Ireland, and France.

***Ixodes ricinoides* Nuttall, 1913 : 136, fig. 4**

[Preoccupied by *ricinoides* De Geer, 1778]

***Ixodes nuttallianus* Schulze, 1930 nom. nov.**

NUTTALL 1401, 1402. 'Described from five partially fed ♀s; one ♀ found on a *swamp deer*, Wen-chwan-hsien, near Si-ho-hsien, China, and four ♀s found on *musk deer* (same locality). The specimens, obtained by purchase from Mr T. V. Sherrin, Taxidermist, Hampton, Middlesex, are in Cambridge. (N. 1401, 1402).'

TYPES. Lectotype ♀ *Ixodes ricinoides* (N1401) ex *Hydropotes inermis*, Wen-Ch'uan (44°59'N, 81°04'E), Sinkiang Province, Peoples Republic of China 1.VII.1911, purchased from Mr T. V. Sherrin; 3 ♀ paralectotypes *Ixodes ricinoides* (N1402) ex *Mochus moschiferus*, Wen-Ch'uan (44°59'N, 81°04'E), Sinkiang Province, Peoples Republic of China, 1.VII.1911, purchased from Mr T. V. Sherrin.

REMARKS. Collection dates were taken from Nuttall's Catalogue of Ticks.

HOSTS & DISTRIBUTION. In addition to the members of the Cervidae mentioned above, *I. nuttallianus* has also been collected from the barking deer, *Muntiacus muntjak*. It has been found also on *Capricornis sumatraensis*, *Naemorhedus goral*, dog, goat, cattle and zhum [hybrid cow-yak]. *Ixodes nuttallianus* is distributed from Sinkiang Province, China, through Tibet and Nepal. For a detailed discussion of *I. nuttallianus* see Clifford *et al.* (1971).

***Ixodes ricinus gibbosus* Nuttall, 1916 : 300, fig. 5**

NUTTALL 2553. 'Described from (N2553) 5 ♂, 6 ♀ found by Mr W. H. J. van Heemstra on *Capra hircus*, Smyrna, Asiatic Turkey, XI.1913, in company with *Hyalomma aegyptium* and *Haemaphysalis cinnabarina* var. *punctata*. Types in Cambridge.'

TYPES. Lectotype ♂ and 4 ♂, 6 ♀ paralectotypes *Ixodes ricinus gibbosus* (N2553) ex domestic goat, Izmir (38°25'N, 27°09'E), Turkey, XI.1913, Mr W. H. J. van Heemstra.

REMARKS. Saratsiotis (1970 : 661) raised *I. gibbosus* to specific rank.

HOSTS & DISTRIBUTION. *Ixodes gibbosus* infests, cattle, sheep, goats, horses and camels. *Ixodes gibbosus* replaces *I. ricinus* in the drier biotopes of Italy, Greece, Yugoslavia, Albania, Bulgaria, Cyprus, Turkey, and Israel.

***Ixodes victoriensis* Nuttall, 1916, 297, fig. 3**

NUTTALL 3194. 'Described from 2 gorged ♀s from wombat (doubtless *Phascolomys mitchelli*), Victoria, Australia, X.1892, received from Dr Georgina Sweet . . . Types in the collection of Dr Sweet (No. 236a), Melbourne, Australia, and (N. 3194) in Cambridge.'

TYPES. Lectotype ♀ *Ixodes victoriensis* (N3194) from wombat (doubtless *Vombatus ursinus*) Victoria, Australia, X.1892, received from Dr Georgina Sweet.

REMARKS. The ♀ specimen in the collection of Dr Sweet (No. 236a) is now missing.

HOSTS & DISTRIBUTION. *Ixodes victoriensis* has been collected only from wombats in Victoria, Australia.

***Rhipicentor bicornis* Nuttall & Warburton, 1908 : 399, figs 12–16**

NUTTALL 320f. 'Description based on 3 ♂ and 1 ♀ collected by Dr Old in North Nyassa, British Central Africa. Host not stated (preserved in 5% formalin, then in spirit).'

TYPES. Lectotype ♂ and 2 ♂ [1 ♂ in alcohol, 1 ♂ mounted on two slides, i.e., capitulum, body] paralectotypes *Rhipicentor bicornis* (N320f), host unknown, Malawi, III.1907, Dr J. E. S. Old.

REMARKS. The 1 ♀ *Rhipicentor bicornis* is missing.

HOSTS & DISTRIBUTION. *Rhipicentor bicornis* has been collected on cattle, goats, jackal, eland, dogs, lions, and several other hosts in Zaire, Ruanda, Burundi, Angola, Zambia, Malawi, Zimbabwe, and Namibia.

***Rhipicephalus coriaceus* Nuttall & Warburton, 1908 : 402, figs 17–20**

Junior subjective synonym of *Rhipicephalus supertritus* Neumann, 1907.

NUTTALL 320e. 'Description based on 2 ♂ and 6 ♀ collected in North Nyassa, British Central Africa, by Dr Old, 1907; 1 ♂ (the larger) from Benguela, W. Africa, collected by Dr F. C. Wellman, 1907. Hosts not stated. (Preserved in 4% formalin, transferred to spirit).'

TYPES. Lectotype ♀ and 1 ♂, 2 ♀ [1 ♀ mounted on a slide] paralectotypes *Rhipicephalus coriaceus* (N320e) host unknown, Malawi, III.1907, Dr J. E. S. Old; 1 ♂ paralectotype *Rhipicephalus coriaceus* (N320e), Distrito de Benguela (12°00'S, 15°00'E), Angola, 1907, Dr F. Creighton Wellman.

REMARKS. The paralectotype ♀ in alcohol has had its genital aperture removed and mounted on a slide. A photograph of this structure appeared in Feldman-Muhsam (1956 : pl. III, fig. 11).

HOSTS & DISTRIBUTION. *Rhipicephalus supertritus* adults have been collected on Carnivora-*Panthera leo*, Perissodactyla-*Diceros bicornis* and *Equus burchelli* and many species of Artiodactyla. The tick ranges from Sudan, Zaire, Tanzania, Angola, Zambia, and Malawi to Mozambique.

***Rhipicephalus evertsi albigeniculatus* Nuttall & Warburton, 1916 : 327**

Junior subjective synonym of *Rhipicephalus evertsi mimeticus* Dönitz, 1910.

NUTTALL 1619, 1650c, 1694b: 'Received by us from the Lower Congo, only differs from the above [reddish yellow legs] in having banded legs.'

TYPES. Lectotype ♂ and 15 ♂, 8 ♀ paralectotypes *Rhipicephalus evertsi albigeniculatus* (N1650c) ex cattle, Mateba Island (05°54'S, 12°50'E), Zaire, 23–30.IV.1912. Received from Professor Meuleman (Brussels); 5 ♂, 3 ♀ paralectotypes *Rhipicephalus evertsi albigeniculatus* (N1694b) ex cattle Mateba Island (05°54'S, 12°50'E), Zaire, received 22.VI.1912; 2 ♂ paralectotypes *Rhipicephalus evertsi albigeniculatus* (N1619) ex cattle, Kasonga either (05°28'S, 21°11'E) or (05°42'S, 18°48'E), Zaire, Drs Dutton & Todd.

HOSTS & DISTRIBUTION. *Rhipicephalus e. mimeticus* parasitizes cattle, horses, sheep, goats, and a few of the larger wild hosts such as zebras and antelope. It occurs in drier areas of southern Africa and can be found together with *R. e. evertsi* in the savannahs of northern Angola and southwestern Zaire.

***Rhipicephalus longiceps* Warburton, 1912 : 11, figs 6, 7**

NUTTALL 351, 393. 'Described from 18 ♂s and 3 ♀s (No. 351) from "Klipspringer Bok" taken by Dr F. C. Wellman in 1907 in the Benguella Hinterland, Angola, long. E.15°05' lat. 12°44', altitude 1360 metres, and 19 ♂s and 2 ♀s. (No. 393) in a mixed collection of ticks taken by the same collector in the same district during 1908 but with no host recorded. Types in Cambridge.'

TYPES. Lectotype ♂ and 17 ♂, 2 ♀ (1 ♂ abnormal) paralectotypes *Rhipicephalus longiceps* (N351), ex *Oreotragus oreotragus*, Benguela (12°35'S, 13°25'E), Angola, received 3.XII.1907, sent by Dr F. Creighton Wellman [♀ vulva mounted on a slide]; paralectotypes 15 ♂, 2 ♀ (N393), host not stated, Benguela (12°35'S, 13°25'E), Angola, 3.V.1908, Dr F. Creighton Wellman.

REMARKS. The one abnormal ♂ from N351 was described and figured by Nuttall (1914 : 253). Santos Dias (1958) examined the type-material of this species and stated that it consisted of: 12 ♂♂ and 1 ♀ (*Types*), from a 'Klipspringer bok' (*Oreotragus* sp.), Benguela, by Dr F. C. Wellman, 30/12/1907—No. 351, ex-Nuttall collection; 12 ♂♂ and 1 ♀ (*Cotypes*), by the same collector (3/5/1908), at the same locality and host—No. 393, ex-Nuttall collection.

HOSTS & DISTRIBUTION. *Rhipicephalus longiceps* is a rare tick known only from Angola and Southwest Africa (Namibia) and parasitic upon kudu and klipspringer bok.

***Rhipicephalus masseyi* Nuttall & Warburton, 1908 : 404, figs 21–26**

NUTTALL 246. 'Description based on 31 ♂ and 21 ♀ from *Bos caffer*, Kansanshi, N.W. Rhodesia, collected by Dr A. Yale Massey, 1907 (preserved in spirit).'

TYPES. Lectotype ♂ and a total of 21 ♂, 13 ♀ paralectotypes [19 ♂, 10 ♀ in alcohol, 1 ♂, 2 ♀, chelicerae mounted on slides plus 1 ♂, 1 ♀ in alcohol deposited in the BM(NH) collection—1906.11.6.11–12] *Rhipicephalus masseyi* (N246) ex *Syncerus caffer*, Kansanshi (12°05'S, 26°25'E), Zambia, 1907, Dr A. Yale Massey [1 ♀ vulva mounted on a slide].

HOSTS & DISTRIBUTION. Adult *Rhipicephalus masseyi* have been collected from *Atilax paludinosus*, *Phacochoerus aethiopicus*, *Potamochoerus porcus*, *Tragelaphus angasi*, *T. scriptus*, and *Syncerus caffer* in Rwanda, Zaire, Tanzania (southern), Angola, Zambia and Mozambique.

***Rhipicephalus neavei* Warburton, 1912 : 7, figs 2, 3**

Junior subjective synonym of *Rhipicephalus kochi* Dönitz, 1905.

NUTTALL 1414. 'The specimens which appeared most characteristic and were selected as types were taken by Mr S. A. Neave from an eland near the mouth of the Tasangazi R., Luangwe Valley, N.E. Rhodesia [E.R.C. No. 168]. Types at British Museum and Cambridge.'

TYPES. Lectotype ♂ and 3 ♂, 4 ♀ paralectotypes *Rhipicephalus neavei* (N1414) ex *Taurotragus oryx* near mouth of the Lusangazi River (13°25'S, 31°34'E), Luangwa Valley, Eastern Province, Zambia, 1.IX.1910, Mr S. A. Neave; 14 ♂, 6 ♀ paralectotypes, collection data as above, deposited in the BM(NH) collection (Reg. No. 1911.12.5.16–40).

REMARKS. Santos Dias (1958 : 478) cited this collection as containing 1 ♂, 1 ♀.

HOSTS & DISTRIBUTION. Adults of *Rhipicephalus kochi* are found on medium to large-size mammals in central and eastern Africa and as far south as Zambia.

***Rhipicephalus neavei* var. *punctatus* Warburton 1912 : 10, figs 4, 5**

NUTTALL 1411. 'Described from 13 ♂s and 8 ♀s from Kudu, near Fort Mlangeni, Central

Angoniland, Nyasaland (Neave, V.1910, E.R.C. No. 132), 1 ♀ from *Impala aepiciros melampur* (sic) on N.-W. shore of L. Nyasa (Neave, VII.1910, E.R.C. No. 127), and 1 ♀ from reed-buck, Valley of Rukuru R., N. Nyasaland (Neave, 26.VI.1910, E.R.C. No. 158) . . . Types at British Museum and Cambridge.'

TYPES. Lectotype ♂ and 1 ♂, 1 ♀ paralectotypes *Rhipicephalus neavei punctatus* (N1411) ex *Tragelaphus strepsiceros*, near Fort Mlangeni (14°41'S, 34°32'E), Ncheu District, Malawi, V.1910, S. A. Neave; 11 ♂, 4 ♀ paralectotypes, collection data as above, deposited in the BM(NH) collection (Reg. No. 1911.12.5.41-50).

REMARKS. Santos Dias (1951 : 373) raised *Rhipicephalus punctatus* to specific status.

HOSTS & DISTRIBUTION. Host predilections and distributional data for *Rhipicephalus punctatus* in Africa are very poorly known because so few collections of this species have been accurately identified.

***Rhipicephalus sculptus* Warburton, 1912 : 13, figs 8, 9**

NUTTALL 1409, 1448. 'Described from 11 ♂s and 5 ♀s (E.R.C. No. 230a) [This is Nuttall 1448] from roan antelope, Mpalali R., Marimba, Nyasaland (Old, I.1911) . . . 1 ♂ (E.R.C. No. 227a) [This collection is now missing] from the same locality and host . . . 3 ♂ and 1 ♀ (No. 115b) [This is Nuttall 1409] from zebra, S. Rukura Valley, N. Nyasaland (Neave, VI.1910) . . . Types at the British Museum and Cambridge.'

TYPES. Lectotype ♂ and 1 ♀ paralectotype *Rhipicephalus sculptus* (N1409), ex *Equus burchelli*, locality possibly South Rukuru River (10°44'S, 34°14'E), Malawi, VI.1910, S. A. Neave; paralectotypes 2 ♂, data as above, deposited in the BM(NH) collection. Reg. no. 1911.12.5.53-54; paralectotypes 3 ♂, 2 ♀ (N1448) ex *Hippotragus equinus*, locality possibly Mpala River, now known as Mipala River (15°55'S, 35°16'E), Malawi, 1.I.1911, Dr J. E. S. Old [♀ vulva mounted on a slide].

REMARKS. Santos Dias (1958 : 479) indicated 1 ♂ 1 ♀ present in N1409 and 3 ♂ 2 ♀ present in N1448. Although he did not mention the latter Nuttall number, he listed all relevant collection data.

HOSTS & DISTRIBUTION. *Rhipicephalus sculptus* is a rare species known only from the zebra and a few members of the Artiodactyla in eastern and southern Africa.

***Rhipicephalus simpsoni* Nuttall, 1910 : 413, figs 6, 7**

NUTTALL 1214. 'Described from 5 ♂s and 11 ♀s found on a large rodent, Oshogbo, S. Nigeria, W. Africa, 28.II.1910, J. J. Simpson (N1214). (41b, Entomological Research Committee for Tropical Africa).'

TYPES. Lectotype ♂ and 1 ♂, 1 ♀ paralectotypes *Rhipicephalus simpsoni* (N1214), ex *Thryonomys* sp. (probably), Oshogbo (07°46'N, 04°34'E), Nigeria, 28.II.1910, J. J. Simpson [♀ vulva mounted on a slide]. Paralectotypes 1 ♂, 4 ♀ *Rhipicephalus simpsoni*, data as above, deposited in the BM(NH) collection Reg. no. 1911.5.10.6.12.

REMARKS. Santos Dias (1958) indicated 2 ♂, 1 ♀ *R. simpsoni* present in Nuttall 1214 when he examined the Nuttall collection in 1955.

HOSTS & DISTRIBUTION. *Rhipicephalus simpsoni* is a specific parasite of cane rats, *Thryonomys* spp. and is widely distributed in the Ethiopian faunal region.

Acknowledgements

We are grateful to Mr K. H. Hyatt, Arachnida Section, Zoology Department, British Museum (Natural History) for his cooperation during this study. Mr Donald Macfarlane,

Commonwealth Institute of Entomology, generously gave of his time and provided us with his expertise in matters nomenclatural. We also thank the following individuals in assisting in locating or confirming the presence or absence of types of species described by Nuttall *et al.* and now under their care: Dr S. K. Gupta, Zoological Survey of India, Calcutta; Professor Ph. Dorchies, École Nationale Vétérinaire, Toulouse; Dr M. Moritz, Museum für Naturkunde, Berlin; Dr J. A. Campbell, Department of Zoology, University of Edinburgh; Dr A. Neboiss, Department of Entomology, National Museum of Victoria; and Dr G. Pretzmann, Naturhistorisches Museum, Vienna. This work is part of a research project on Professor G. H. F. Nuttall and the Nuttall Tick Catalogue conducted while the senior author was on a Visiting Scientist assignment to the British Museum (Natural History) 1977–1978 from Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Allergy and Infectious Diseases, Epidemiology Branch, Rocky Mountain Laboratories, Hamilton, Montana 59840, U.S.A.

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Manuscript accepted for publication 10 December 1980.

Appendix I

Holotypes and previously selected lectotypes of tick species described by Nuttall, Warburton, Cooper, and Robinson

Nuttall Collection Number	Original Name	Senior Subjective Synonym	Type Status and Depository
1106	<i>Amblyomma annandalei</i> Warburton, 1910: 403, fig. 8	<i>A. supinoi</i> Neumann, 1905	Holotype ♀ BM(NH) Nuttall Coll.
*None	<i>Amblyomma crassum</i> Robinson, 1926 : 177, fig. 83	—	Holotype ♀ BM(NH) reg. No. 1926.7.27.1
3615	<i>Amblyomma dammermani</i> Warburton, 1927 : 409, pl. XXVII, fig. 3	<i>A. cyprium</i> Neumann, 1899	Holotype ♀ BM(NH) Nuttall Coll.
2940	<i>Amblyomma longirostrum</i> Cooper & Robinson, 1908 : 457, figs 1–5	<i>A. humerale</i> C. L. Koch 1844	Holotype ♀ Depository unknown
565	<i>Amblyomma quasicyprum</i> Robinson, 1926 : 237, fig. 117	<i>A. cyprium</i> Neumann, 1899	Holotype ♀ Depository unknown
2943	<i>Aponomma quadratum</i> Cooper & Robinson, 1908 : 468, figs 22–24	<i>A. varanensis</i> Supino, 1897	Holotype ♂ BM(NH) Nuttall Coll.
2942	<i>Aponomma simplex</i> Cooper & Robinson, 1908 : 466, figs 18–21	<i>A. fimbriatum</i> C. L. Koch, 1844	Holotype ♂ BM(NH) Nuttall Coll.
515a	<i>Haemaphysalis bispinosa</i> <i>intermedia</i>	—	Lectotype ♀ Hoogstraal & Trapido (1963) BM(NH) Nuttall Coll.
1108	<i>Haemaphysalis cuspidata</i> Warburton, 1910 : 401, figs 6, 7	—	Lectotype ♂ Trapido (1965) BM(NH) Nuttall Coll.
693a	<i>Haemaphysalis dentipalpis</i> Warburton & Nuttall, 1909 : 67, fig. 14	<i>H. asiaticus</i> (Supino, 1897)	Lectotype ♂ Hoogstraal & Trapido, (1966) BM(NH) Nuttall Coll.
635	<i>Haemaphysalis doenitzi</i> Warburton & Nuttall, 1909 : 64, figs 9, 10	—	Lectotype ♀ Hoogstraal & Wassef (1973) BM(NH) Nuttall Coll.

Appendix I continued

Nuttall Collection Number	Original Name	Senior Subjective Synonym	Type Status and Depository
1997	<i>Haemaphysalis kinneari</i> Warburton, 1913 : 127, fig. 6	—	Holotype ♀ BM(NH) Nuttall Coll.
760, 761, 762	<i>Haemaphysalis</i> <i>montgomeryi</i> Nuttall, 1912 : 57, figs 7, 8	—	Lectotype ♂ (N760) Hoogstraal <i>et al.</i> (1966) BM(NH) Nuttall Coll.
540c	<i>Haemaphysalis proxima</i> Warburton & Nuttall, 1909 : 61, fig. 6	<i>H. cornigera</i> Neumann, 1897	Holotype ♀ BM(NH) Nuttall Coll.
1647	<i>Haemaphysalis spiniceps</i> Warburton & Nuttall, 1909 : 68, fig. 15	<i>H. cornigera</i> Neumann, 1897	Holotype ♂ BM(NH) Nuttall Coll.
3614	<i>Haemaphysalis toxopei</i> Warburton, 1927 : 407, fig. 3	—	Lectotype ♂ Hoogstraal (1964) BM(NH) Nuttall Coll.
1648	<i>Haemaphysalis vidua</i> Warburton & Nuttall, 1909 : 66, fig. 13	—	Holotype ♂ BM(NH) Nuttall Coll.
1400	<i>Haemaphysalis warburtoni</i> Nuttall, 1912 : 55, figs 5, 6	—	Lectotype ♂ Hoogstraal (1966) BM(NH) Nuttall Coll.
1219	<i>Hyalomma monstrosus</i> Nuttall & Warburton, 1908 : 414, figs 41–45	—	Holotype ♂ Depository unknown
*None	<i>Ixodes daveyi</i> † Nuttall, 1913 : 133, fig. 2	—	Holotype ♀ BM(NH) reg. No. 1913.8.12.6
650	<i>Ixodes fecialis</i> Warburton & Nuttall, 1909 : 58, figs 1, 2	—	Holotype ♀ BM(NH) Nuttall Coll.
*None	<i>Ixodes nairobiensis</i> Nuttall, 1916 : 299, fig. 4	—	Holotype ♀ BM(NH) reg. No. 1915.10.14.1
3872	<i>Ixodes petauristae</i> Warburton, 1933 : 558, fig. 1	—	Holotype ♀ BM(NH) Nuttall Coll.
3581	<i>Ixodes theodori</i> Warburton, 1927 : 405, fig. 2	<i>I. acuminatus</i> Neumann, 1901	Holotype ♀ BM(NH) Nuttall Coll.
1103	<i>Rhipicephalus breviceps</i> Warburton, 1910 : 398, fig. 3	<i>R. sanguineus</i> (Latreille, 1806)	Holotype ♀ BM(NH) Nuttall Coll.

*Specimens donated to the British Museum (Natural History) by Nuttall *et al.* or described from material in the Museum collections.

Appendix II

Types of tick species described by Nuttall, Warburton, Cooper, and Robinson which are not contained in the collections of the British Museum (Natural History)

Species	Location	Comments
<i>Aponomma javanense</i> Cooper & Robinson, 1908	Unknown	'Description based on 3 ♀'s.'
<i>Aponomma gervaisi lucasi</i> Warburton, 1910	ZSI, Calcutta	—
<i>Haemaphysalis aborensis</i> Warburton, 1913	ZSI, Calcutta	—
<i>Haemaphysalis cornigera anomala</i> Warburton, 1913	ZSI, Calcutta	—
<i>Haemaphysalis leachi indica</i> Warburton, 1910	ZSI, Calcutta	—
<i>Haemaphysalis turturis</i> Nuttall & Warburton, 1915	MNHU, Berlin	—
<i>Ixodes neumanni</i> Nuttall & Warburton, 1911	ENV, Toulouse	—
<i>Ornithodoros asperus</i> Warburton, 1918	MNHU, Berlin	—
<i>Ornithodoros nattereri</i> Warburton, 1927	NM, Wien	—
<i>Rhipicentor nuttalli</i> Cooper & Robinson, 1908	Unknown	'Description based on a single ♂.'
<i>Rhipicephalus phthirioides</i> Cooper & Robinson, 1907	Unknown	'Description based on two dried ticks . . . a male and a female . . .'

ZSI, Calcutta = Zoological Survey of India, Calcutta (formerly Indian Museum, Calcutta).

MNHU, Berlin = Museum für Naturkunde der Humboldt-Universität, Berlin, D.D.R.

ENV, Toulouse = L'École Nationale Vétérinaire de Toulouse, France.

NM, Wien = Naturhistorisches Museum, Wien, Austria.



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