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AMBLYOMMA DUBITATUM NEUMANN:
DESCRIPTION OF NYMPH AND REDESCRIPTION OF ADULTS,
TOGETHER WITH THE DESCRIPTION 
OF THE IMMATURE STAGES OF A. TRISTE KOCH.

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SUMMARY: The adults of Amblyomma dubitatum Neumann, 1899, originally
reported as “collected in southern Spain” are redescribed from the engorged
female type and several flat adults collected in Uruguay and Brazil. As stated
elsewhere, A. cooperi Nuttall and Warburton, 1908, a well known parasite of
Hydrochaeris hydrochaeris (Linnaeus, 1766) [=Hydrochoerus hydrochaeris (L.)] in
the Neotropical region, is a junior synonym of A. dubitatum. The nymph of A.
dubitatum is described from semiengorged specimens collected on H. hydrochaeris.
Immature stages of A. triste Koch, 1844, are described from specimens
originating from engorged females and engorged larvae, respectively. A. triste is
included in the maculatum group. It is easily distinguishable from other species in
this group because of a unique combination of shape and size of auriculae, as
well as the relative length of coxal spurs.

RESUME : Les adultes d’Amblyomma dubitatum Neumann 1899, decrits originel­
lement du sud de l’Espagne sont redécrits d’après des individus gorgés ou non
d’Uruguay et du Brésil. A cooperi Nuttall & Warburton, 1908 connus de Hydrochaeris hydrochaeris (Linnaeus, 1766) [=Hydrochoerus hydrochaeris (L.)] en
région néotropicale est un synonyme junior de A. dubitatum. La nymphe est
décrite d’individus à demi gorgés récoltés sur H. hydrochaeris. Les immatures de
A. triste sont décrits à partir des individus obtenus de femelles et de larves. A.
triste est placé dans le groupe maculatum. Il peut être distingué des autres espèces
par la combinaison unique de forme et de taille des auriculae, et par la longueur
relative des éperons coxaux.

Amblyomma dubitatum was described by Neumann in 1899 from a single engorged female. As
stated by the author, the specimen was collected probably in southern Spain (“un seul individu, noté
comme provenant de l’Espagne méridionale [coll. E. Simon]”). This mistake was repeated in the literature
about ticks in Spain, when Gil-Collado (1938, 1948) reported the species as collected in southern
Spain from cattle and Carduelis carduelis (Aves: Passeriformes). Every attempt to locate these specimens

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was unsuccessful. It remains unknown how the misidentificaition was produced as there are only three *Amblyomma* species reported from the Palearctic Region: *A. lepidum* Dönitz, 1909 from Israel, Jordan, and Iraq (Saliba et al., 1999; Yeruham et al., 1996), *A. geoemydae* (Cantor, 1847) from the Ryukyu Islands and Japan, under the synonym name of *A. caelatum* Cooper & Robinson, 1908 (Keirans & Brewster, 1981), from the Kuyshi islands (Yamaguti et al., 1971A); and *A. testudinarium* Koch, 1844 from Kyushu islands and from Japan (Kakuda et al., 1988; Fujita et al., 1996). Neumann noticed that a female, brought from the Congo and stored in the Oudemans collection “closely resembles *A. dubitatum*”. Robinson (1926) repeated the description by Neumann, and Buitendijk (1945) also cited the presence of a specimen of *A. dubitatum* in the Oudemans collection, recorded from Congo.

*A. cooperi* was described by Nuttall & Warburton in 1908 from specimens of both sexes, and redescribed by Robinson (1926). In the Neotropical tick literature, *A. cooperi* has been commonly recorded as a parasite of *Hydrochaeris hydrochaeris* (Rodentia: Hydrochaeridae) and, in a lesser extent, from *Tapirus terrestris* (Perissodactyla: Tapiridae) (see, for example, Boero, 1957). Some other new species have been described, as *A. lutzi* Aragao 1908 and *A. ypsilophorum* Schulze 1941. Although Santos Dias (1958) considered *A. lutzi* as a valid species, both *A. lutzi* and *A. ypsilophorum* have been considered as synonyms of *A. cooperi* by Jones et al., 1972. Furthermore, Santos Dias (1958) stated that *A. dubitatum* is a “species inquirendae, probably of African origin”, while Keirans (1992) did not included the species in his list of valid names of ticks.

Santos Dias (1989) resurrected *A. dubitatum* as “most probably of Oriental origin”. Camicas et al. (1998) also considered *A. dubitatum* Neumann as a valid species, with a Neotropical distribution, included in the subgenus *Dermiomma* Rondelli, with *A. cooperi*, *A. lutzi*, and *A. ypsilophorum* as synonyms of the species. However, Camicas et al. (1998) stated only that the male and female of *A. dubitatum* were described from the Neotropical faunal Region, with *Hydrochaeris* and *Tapirus* as main hosts. Furthermore, these authors considered that immature stages remain unknown, but the larva was described by Joan (1930) as *A. cooperi*.

Through the kindness of Prof. Ph. Dorchies we had the opportunity to study the only type female of *A. dubitatum*. Both males and females are redescribed and illustrated, showing morphological details from specimens collected in Uruguay and Brazil. The hitherto unknown nymph of the species is described and illustrated from specimens collected in Uruguay from *H. hydrochaeris*. Some of these nymphs moulled in the laboratory and proved to be *A. dubitatum*. The larva is not redescribed here as it was described by Joan (1930) and more recently by Amorim & Serra-Freire (1999) both as *A. cooperi*.

**Redescription of *A. dubitatum***.

**Male** (Figs. 1 to 4): Body broadly piriform, widest at the level of the first pair of festoons, with a relatively small concave margin at the level of the eyes. Scutum ornate (Fig. 1), with brown spots and stripes of variable darkness over a white background. The color and the extension of the spots are variable features. Scutum covered with coarse, relatively deep, well-defined punctations, confluent in some places. Some individuals with these spots very pale, almost of the same color as the background in dried specimens. Some others with very dark parts in dorsal scutum. Antero-accessory stripes narrow, slightly divergent anteriorly; cervical stripes narrow, diverging posteriorly. Several variations to the illustrated pattern of dorsal scutum; some specimens with lateral stripes fused in one large. Cervical grooves deep anteriorly, converging in the middle portion, then diverging posteriorly. Marginal groove continuous, from behind the eyes to festoons, formed by confluent, coarse, dark-coloured punctuations. These punctuations are interrupted in the postero-median part of the scutum in most specimens; in some males, there are a few, very small punctuations in this part of the scutum, producing an uninterrupted marginal groove. Eyes pale and flat, medium sized.

Festoons number 11, with variable coloration, with some coarse, relatively deep punctations. Venter as illustrated (Fig. 2). Ventral part of festoons very well defined, widely separated, with small ventral scuta
Figs 5-8: *A. dubitatum*, female. 5. — dorsum. 6. — venter. 7. — capitulum, dorsal. 8. — capitulum, ventral.
(carena), easily seen in most specimens from dorsal view. Spiracular plate large, oval. Genital opening at the level of coxae II. Capitulum relatively large (Figs. 3 and 4). Basis capituli rectangular, wider than long, with postero-lateral cornuae slightly prominent. Dorsal surface of basis capituli with some traces of white enamelling. Palpi relatively long and robust, with white marbling on the dorsal surface. Article I with a broad, triangular, retrograde spur on its ventral surface. Articles II and III with a chitinous, small bridge, on the ventro-internal aspect. Hypostome long, with dentition 3/3.

Coxa I with two short, subequal spurs, the internal wider, the external longer, reaching in most specimens the anterior side of the coxa II. A single, short, broad spur, continued on the internal side into a fine ridge, on each of coxae II and III. A single, long, moderately robust spur on coxa IV. The length of this spur is a very variable feature in the male of A. dubitatum. Legs long and robust, with marbling on the dorsal surface of articles.

**FEMALE** (Figs. 5-8): Body broadly piriform. Dorsum rugose (Fig. 5), densely covered by deep, coarse, confluent punctations. Dorsal scutum triangular in shape, posterior part broadly rounded, postero-lateral margins sinus, slightly concave, wider at the level of the eyes. Scutum ornate, with spots and stripes of variable darkness and extension over a white or pale yellow background. Pattern of spots and stripes as illustrated. A narrow dark border extending backwards from the ocular spot along the postero-lateral margin of the scutum. The large variation in colour of dorsal scutum as mentioned for the males is not so evident in females. Festoons number 11, well defined, widely separated, covered in part with the same kind of punctations as the dorsum. Cervical grooves short and narrow, deep and curved anteriorly, divergent posteriorly. Punctuations of the dorsal scutum numerous, moderately coarse, dark coloured, confluent in some places.

Venter as illustrated (Fig. 6). Genital opening between coxae II. Spiracular plates large, oval in shape, with a concavity towards the antero-internal body portion. Capitulum large. Basis capituli rectangular (Figs 7 and 8), clearly wider than long, with dorsal surface pale-coloured, with a few coloured patches in some specimens. Postero-lateral sides of basis capituli straight, cornua absent or faint. Porose areas large, rounded or slightly oval in shape, separated by one diameter. Palpi long and straight, with pale enamelling on dorsal surface. Article I with a broad, flat, retrograde spur on the ventral side. Article II with a large spur dorsal and one ventro-internal chitinous bridge. Article II twice as long article III. Hypostome 3/3 with denticles in rows 8-10.

Legs as in the male, relatively long and robust. Coxa I with two stout, sub-equal spurs, shorter than the corresponding ones of the male. Coxae II and III with a single, very short, broad spur. A similar, more pronounced spur on coxa IV.

**REMARKS.** The adults of A. dubitatum are easily recognized by an unique combination of characters. In the male, the presence of carena on the ventral side of festoons, as well as the comparative size of the spurs of coxa I are diagnostic features. The female of A. dubitatum has spurs in coxae II and III small, transformed into chitinous ridges, while these spurs are long and well developed in A. scutatum (a parasite of Reptilia). The distribution and color extent of the dorsal pattern is a very variable feature, as previously described by Boero (1957). One male specimen had a 4/4 dentition in a row of denticles in the medium part of the hypostome; this feature should be regarded as a case of individual variation. Jones et al. (1972) described the scutum of the female as “lightly punctate”. The specimens studied herein, including the type, had a coarse and very punctate dorsal scutum.

**MATERIAL EXAMINED:** 1 male, 2 females, 30/IX/2000, on *H. hydrochaeris*, Department of Rocha, Uruguay, J. Venzal coll.; 10 males, 29/XI/1999, on *H. hydrochaeris*, Sao Bernardo do Campo (Sao Paulo, Brazil, 23°42'S; 46°33'W); 2 females, 27/III/1998, CO2 trap, Araçariguama (Sao Paulo, Brazil, 23°26'S; 47°04'W); 5 males, 3 females, 17/VIII/1999, molting from engorging nymphs collected on *Myocastor cuypus* (Molina, 1782) (Rodentia, Myocastoridae), Jundiaí (Sao Paulo, Brazil, 23°11'S; 46°52'W).

**NYPHY** (Figs. 9 to 13): Only semi-engorged specimens were available for description. Measurements were taken from areas which do not experience drastic changes with engorgement, but these measures should be taken with caution. All the measurements are in micrometers. Body broadly rounded. Scutum
widely triangular (Fig. 9), with posterior portion rounded and postero-lateral margins concave, from the posterior part to the level of the eyes. Scutum 690 (635-720) long, 980 (960-1100) wide. Dorsal scutum covered in some zones with “cells” of muscular insertion marks, clearly visible near the cervical grooves and close to the posterior margin. Cervical grooves short, superficial, almost straight, slightly diverging posteriorly. Eyes flat. Dorsum of semiengorged specimens covered with relatively coarse punctations, homogeneously distributed, interspersed with setae. Festoons number 11, broad, not very deep but well delineated. Venter as illustrated (Fig. 10). Spiracular plate rounded, protruding from ventral surface, surrounded by a small chitinous ridge.

Capitulum large (Figs. 11 and 12). Basis capituli hexagonal, 350 (320-390) wide, cornua absent, lateral margins of basis capituli clearly divergent from palpal insertion, then converging again to reach to posterior margin of basis capituli. Palpi 320 (312-330) long, 80 (72-88) wide, straight, and relatively narrow. Spurs or chitinous ridges absent. Hypostome 260 (250-265) long, dental formula 2/2 with denticles in rows of 4-6 under s small corona. Legs relatively long and slender. Coxal details as illustrated (Fig. 13). Coxa I with a long, pointed, posteriorly directed spur, slightly reaching the anterior margin of coxa II. Coxae II and III each with a smaller ridgelike spur. Coxa IV with a ridgelike spur slightly longer than those of coxae II and III. Legs relatively long and robust.

Larva (Figs. 19 to 23). Body outline broadly ovoid (Fig. 19), 640 (631-649) long, 420 (412-429) wide. Scutum 230 (224-233) long, 370 (364-374) wide, homogeneously punctuated, without reticulated areas. Cervical grooves superficial, relatively short, slightly diverging. Scutal setae minute. Eyes large. Festoons number: 11. Body venter as illustrated (Fig. 20).


Description of A. triste

Amblyomma triste was described by Koch in 1844 from a single female. Together with A. tigrinum Koch, it was put into synonymy with A. maculatum Koch by Neumann (1899) and Banks (1907), Hunter and Hooker (1907) and Robinson (1926). Kohls (1956) resurrected the species and redescribed the adults. Both larvae and nymphs are described herein.

Nymph (Figs. 14 to 18). All the measurements are in micrometers. Body outline narrowly piriform (Fig. 14), 1610 (1600-1720) long 902 (867-925) wide. Scutum subcircular, clearly wider than long, 580 (572-591) long, 620 (611-624) wide. Cervical grooves relatively deep, broad, sinuous, slightly diverging posteriorly. Festoons number: 11. Spiracular plate rounded. Basis capituli dorsally (Fig. 16) triangular in shape, 312 (308-316) wide, ventrally clearly hexagonal. Posterior margin straight, cornua absent. Lateral margins projected into pointed, well developed, straight prolongations. Venter of basis capituli as illustrated (Fig. 17); posterior margin straight, lateral margins diverging to reach the lateral projections. Auriculae present as two broad, relatively short, postero-externally directed spurs. Palpi long and straight. Segment I as a narrow, transverse strip, bearing 1 ventro-internal seta. Segment II 240 (232-244) long, 90 (83-92) wide, with straight margins. Number of setae: 3 internal, 1 dorso-internal, 2 dorso-lateral, 1 lateral, 1 ventro-lateral, 2 ventro-internal. Segment III rounded at the apex, with a ventral cuticular ridge, below the insertion of palpal segment IV. Segment III setal numbers as illustrated. Segment IV small, inserted into the ventro-terminal portion of segment III, with an apical tuft of 9-11 setae. Total palpal length 318 (310-324). Hypostome 288 (279-295) long, 116 (110-119) wide. dental formula 2/2, with denticles in rows of 7, under a slightly prominent rounded corona.

Coxa I (Fig. 18) with a long, pointed, posteriorly directed spur, slightly reaching the anterior margin of coxa II. Coxae II and III each with a smaller ridgelike spur. Coxa IV with a ridgelike spur slightly longer than those of coxae II and III. Legs relatively long and robust.

Larva (Figs. 19 to 23). Body outline broadly ovoid (Fig. 19), 640 (631-649) long, 420 (412-429) wide. Scutum 230 (224-233) long, 370 (364-374) wide, homogeneously punctuated, without reticulated areas. Cervical grooves superficial, relatively short, slightly diverging. Scutal setae minute. Eyes large. Festoons number: 11. Body venter as illustrated (Fig. 20).

Basis capituli dorsally (Fig. 21) hexagonal, 288 (282-294) wide. Posterior margin straight; cornua absent. Lateral margins very pointed. Venter of basis capituli as illustrated (Fig. 22), with relatively large,
broadly rounded, lateral auriculae. Palpi long and straight, 188 (179-191) long, 68 (65-70) wide. Palpal segment I as a narrow strip without any setae. Segment II virtually straight, with number of setae as follows: 2 internal, 1 dorso-internal, 2 lateral, 1 ventro-lateral, 1 ventro-internal. Palpal segment III dorsally almost semicircular, ventrally with a faint cuticular ridge below the insertion of segment IV. Setal number in segment III: 1 internal, 3 dorso-lateral. Segment IV arising from the body and an apical tuft of 8 setae. Hypostome 116 (114-117) long, 68 (65-71) wide; dental formula 2/2; denticles in rows of 6-7.

Coxa I with a retrograde spur (FIG. 23), coxae II and III with a relatively small, postero-external, rounded cuticular ridge. Legs relatively long and robust.

Remarks: The immature stages of *A. triste* display the same combination of morphological characters as noted in *A. tigrinum* and *A. maculatum*. They show the distinctive auriculae in nymphs, and spurs of different size on all or several coxae of the nymph. Larvae of *A. tigrinum* lack the relatively long spurs on coxae II and III that are replaced by rounded cuticular ridges. Nymphs of *A. triste* can be easily determined by the unique combination of auricular size and coxal spurs. The nymph of *A. maculatum* lacks the spurs on coxae III and IV (replaced by a rounded cuticular ridge) while these projections are present in *A. triste*. Furthermore, the nymphs of *A. tigrinum* lack the spur on coxa IV. Auriculae are smaller and postero-externally directed in *A. triste* while larger and posteriorly directed in *A. tigrinum* and *A. maculatum*.

*A. tigrinum* has been placed by CAMICAS et al. (1998) in the maculatum group, including *A. maculatum*, *A. triste*, *A. tigrinum*, *A. parvitarsum* Neumann and *A. neumanni* Ribaga. However, the larva and nymph of *A. neumanni* are very different from those of the other species in the group (see ESRADA-PeÑA et al., 1993) while immature stages of *A. parvitarsum* are unknown. We believe that *A. neumanni* should be removed from this group of species according to the morphological features of immature stages.


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**References**


