

TICKS IN THE SOUTH AFRICAN ZOOLOGICAL SURVEY COLLECTION: PART XIII. GYNANDERS OF *BOOPHILUS DECOLORATUS* (KOCH, 1844) AND *AMBLYOMMA HEBRAEUM* KOCH, 1844

RAINER GOTHE*

INTRODUCTION

External features of tick gynanders have been observed and investigated in a few species only. Campana-Rouget (1959) in an excellent survey analysed and defined all known instances ranging from the simple bipartite *Protogynander*, where the external sex-linked features are equally represented, through the increasingly more complex forms of: *Deuterogynander*, where the one sex (usually the male) is reduced to a quadrant; *Metagynander*, where the one sex (usually male) is reduced to a small segment; *Gynander intriqué*, which may be a proto- or deuterogynander where islands of male or female chitin are embedded in areas of the opposite sex; *Mosaics*, where there is no definite line separating the male from the female but where the zones are intimately mixed without indication of symmetry.

DESCRIPTIONS

Boophilus decoloratus (Fig. 1 and 2)

The specimen whilst still alive "appeared to be almost completely engorged upon removal from the back of a bovine. All four legs on the male side were devoid of any noticeable reflexes. Motility was effected by the legs on the female side only, hence all movements were of a circular nature. The specimen remained fully motile for 48 hours after removal prior to placing in alcohol" (J. H. Baker, 1966 in a personal communication).

The female half, showing lines of stress, is fully engorged, whilst the male half is apparently somewhat reduced. On the dorsal surface the capitulum is divided equally, left being female, right male. The female palp is considerably longer (0.228 mm) than the male (0.178 mm); area porosa present on female side only. The female half of the scutum is complete, the boundary with the male conscutum runs somewhat obliquely. Sexually the ventral halves correspond with the dorsal halves, the male portion again appearing somewhat restricted. The male coxae are somewhat larger than the female coxae; the accessory anal and the adanal plates point sideways and are arranged one behind the other. The genital opening and the anus are in the female portion.

*From the Tropen-Institut Giessen (Germany) at present working at the Veterinary Research Institute, Onderstepoort, South Africa

TICKS IN THE SOUTH AFRICAN ZOOLOGICAL SURVEY COLLECTION

According to Campana-Rouget's terminology this specimen is a true protogynander.

Other boophilid gynanders which figure in the literature are *B. calcaratus*, described by Pavlovsky (1940) (cited by Campana-Rouget, 1959) and *B. (Uroboophilus) cyclops*, described by Schulze 1937; both are complete mosaics; and *B. microplus* listed without any details by Hoogstraal (1956).

Amblyomma hebraeum Specimen I (Fig. 3 and 4)

Dorsally the capitulum is divided equally, the right is female, the left male, with an area porosa on the right only. In this partially engorged specimen the dividing line between the female alloscutum and the posterior portion of the male conscutum runs somewhat diagonally; there are 5½ male festoons. Several islands of male cuticle are embedded in the female alloscutum. The ventral halves correspond with the dorsal halves, the dividing line, however, is nearer the perpendicular than in the *B. decoloratus* described above, the male half appearing to be "normal". Posteriorly the slightly engorged female half shows four heavily chitinized islands, two approximately in the position of the usual male plaques, and two in the position of sclerotized male ventral plates of the festoons. The genital opening and the anus are situated in the female portion.

According to the definitions of Campana-Rouget (1959) this specimen is a protogynander showing features of a "gynander intriqué", with male chitinous islands in the female half, both dorsally and ventrally.

Amblyomma hebraeum Specimen II (Fig. 5 and 6)

This specimen shows all the features of a female, except that on the posterior margin of the dorsal alloscutum there are four islands of male cuticle. From the larger of these, stress lines run into the surrounding alloscutum; opposite these elements the posterior margin shows a deep incision. Ventrally the body is entirely female.

According to Campana-Rouget's definitions this specimen is a metagynander.

The following amblyommas, figured in the literature, are all protogynanders: *A. neumanni* Joan, 1919, *A. variegatum* Brumpt, 1922, *A. dissimile* Brumpt, 1934, *A. cajennense* Fonseca, 1935, *A. variegatum govurensis* Santos Dias, 1953, whereas *A. scutatatum* described by Schulze (1933), *A. tholloni* described by Santos Dias (1948) and *A. imitator* described by Sundman (1965) are protogynanders "intriqués".

The gynander of *A. hebraeum*, described by Colaço (1950) (cited by Santos Dias, 1953), cannot be placed into Campana-Rouget's classification, since the article is not available.

SUMMARY

A protogynander of *B. decoloratus*, a protogynander "intriqué" of *A. hebraeum* and a metagynander of *A. hebraeum* are described.

ACKNOWLEDGEMENT

I wish to express my sincere thanks to Dr. G. Theiler for her continuous support, help and advice in the preparation of this article.

REFERENCES

- BRUMPT, E., 1922. Précis de Parasitologie, 3rd ed. Paris: Masson et Cie.
- BRUMPT, E., 1934. Le gynandromorphisme chez les Ixodidés. Un curieux cas obtenu, dans un élevage d' *Amblyomma dissimile*. *Annls Parasit. hum. comp.*, 12, 98-104.
- CAMPANA-ROUGET, Y., 1959. La tératologie des tiques. *Annls Parasit. hum. comp.*, 34, 209-260.
- FONSECA, F. DA, 1935. Gynandromorfismo em *Amblyomma cajennense* (Fabr. 1787). *Mems Inst. Butantan*, 10, 39-41.
- HOOGSTRAAL, H., 1956. African Ixodoidea. I. Ticks of the Sudan. Report NM 005, 050.29.07. U.S. Naval Medical Research Unit No. 3, Cairo, Egypt.
- SANTOS DIAS, J. A. T., 1948. Um caso de deformidade num *Amblyomma tholloni* Neum. 1899. *Mocambique*, 55, 41-45.
- SANTOS DIAS, J. A. T., 1953. A further case of gynandromorphism, observed on an *Amblyomma variegatum govurensis* T. Dias, 1950. *Anais Inst. Med. trop., Lisb.*, 10, 63-68.
- SCHULZE, P., 1933. Über Zeckengynander. *Z. Morph. Ökol. Tiere*, 26, 427-436.
- SCHULZE, P., 1937. Ein anscheinend durch Eiverschmelzung entstandener Gynander der Zecke *Uroboophilus cyclops* Minning, 1934. *Zool. Anz.*, 119, 160-166.
- SUNDMANN, J. A., 1965. A case of gynandromorphism in *Amblyomma imitator* (Acarina: Ixodidae). *Ann. ent. Soc. Am.*, 58, 592-593.

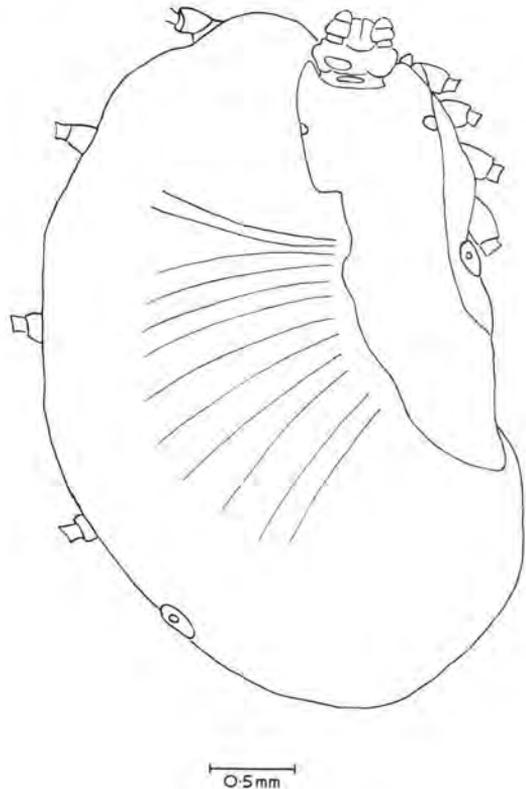


FIG. 1.—*B. decoloratus*—Dorsal view—
protogynander

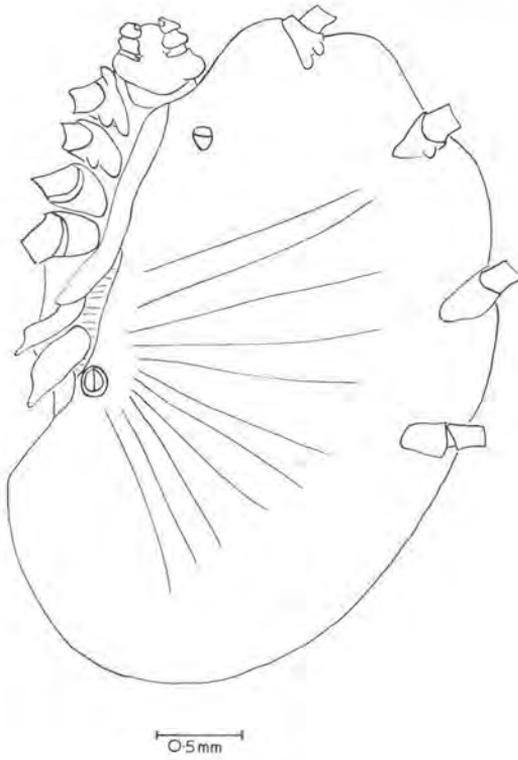


FIG. 2.—*B. decoloratus*—Ventral view—
protogynander

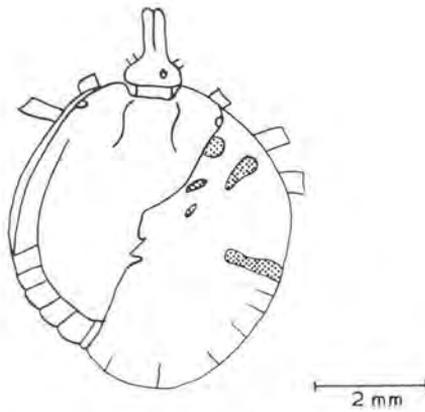


FIG. 3.—*A. hebraeum*—Dorsal view—
gynander intriqué

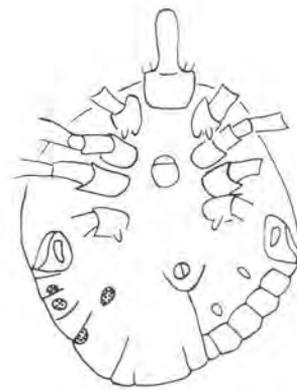
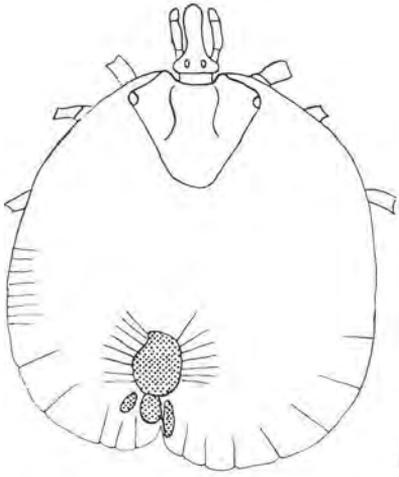


FIG. 4.—*A. hebraeum*—Ventral view—
gynander intriqué



2 mm

FIG. 5.—*A. hebraeum*—Dorsal view—
metagynander

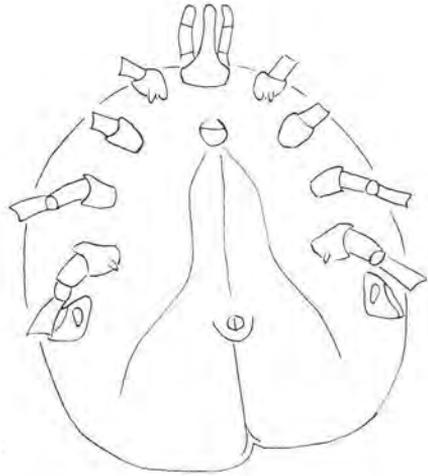


FIG. 6.—*A. hebraeum*—Ventral view—
metagynander