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Redescription of *Archegozetes magnus* (SELLINICK, 1925) (Trhypochthonioidea) from Brazil and description of two new species of nanhermanniid mites: *Bicyrthermannia nigeriana* and *Masthermannia seropedica* (Nanhermannioidea) (Acari: Oribatida)

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ABSTRACT. This paper is the second in a series of investigations on desmonomatid mites collected from Nigeria and Brazil. Two morphological forms of a trhypochtoniid species, *Archegozetes magnus* (SELLINICK, 1925) from Brazil was redescribed. One shares similar features with *A. magnus* which was originally described from Sumatra while the other shares morphological features with a subspecies, *A. magnus mediosetosus* from Seychelles. These different morphological forms are regarded as mere variations within the populations of this highly thelytokous species, and the creation of subspecies was considered as unnecessary. *A. veracruensis* is sunk as a synonym of *A. longisetosus* which is in turn seen as another morphological form of *A. magnus* which was not present in the site investigated. The geographical distribution of *Archegozetes* was reported and it was observed that this genus is restricted to islands, coastal and inland areas close to big rivers in neotropical, Pacific and oriental regions. Two species of the family Nanhermanniidae belonging to different genera are also described. *Bicyrthermannia nigeriana* was described from Nigeria and *Masthermannia seropedica* was described from Brazil. The significant differences between each of these species and the type and related species in their respective genera were highlighted. Inadequate and/or incomplete description of many species in literature was observed as a major constraint when comparing new species with existing ones.

Key words: acarology, taxonomy, new species, Oribatida, Nothroidea, Nigeria, Brazil

INTRODUCTION

More nothroid mites of the families Trhypochtoniidae and Nanhermanniidae are described in this paper in further pursuance of our objective of providing extensive diagnoses of nothroid mites from Nigeria and Brazil.

Superfamily Trhypochthonioidea Willmann, 1931
Family Trhypochthoniidae Willmann, 1931
Genus *Archegozetes* Grandjean, 1931

Archegozetes magnus (Sellinick, 1925)

Material examined

201 adults (females): collected with pitfall traps from the floor of experimental plots of leguminous cover crops (*Arachis pintoi, Macroptilium atropupereum and Pueraria phaseoloides)* in Seropedica in Brazil.

One specimen dissected for the description and deposited in the Museum of Natural History (MNH) at Obafemi Awolowo University, Ile-Ife, Nigeria, 100 females deposited in the Department of Soil Fauna, EMBRAPA-AGROBIOLOGIA, Seropedica, RJ., Brazil. 50 females deposited in MNH. 50 females deposited at Staatliches Museum für Naturkunde, Karlsruhe (SMNK), Germany.

Reescription

Measurements: length: 664-966 µm; width: 507-692 µm.

Integument: Yellowish with reddish hues which disappear after clearing in lactic acid to give a pale yellow or yellowish brown colour. The surface is largely smooth, soft, weakly sclerotized and transparent, thus revealing the gut contents and eggs within the viscera (Fig. 3). At very high magnification, the integument appears densely punctate.

Prodorsum

The anterior end of the prodorsum is blunt (Figs 1, 2). The lateral sides extend gradually towards a wider posterior end whose base is concealed by the anterior end of the notogaster. There are four pairs of setae all of which are filliform and ciliated excepting the setiform rostral setae (*ro*) whose distal quarter is unciliated. In some specimens, the lamellar setae (*la*) is longer than *ro* while in others they are more or less equal in length. The sensillus (*ss*) is also usually longer than the interlamellar seta (*in*) but the ratio of their length varies (Fig. 3). In a few specimens, the *in* is longer than the *ss* (Fig. 4).

Notogaster

The notogaster is a more or less an oval-shaped robust structure whose actual shape is determined by the presence or absence of eggs within the viscera. It bears

15 pairs of ciliated setae whose tips are either blunt or pointed. Setae c_3 and f_2 are smaller and shorter than the rest of the notogastral setae. In one of the two morphological forms, seta c_1 is relatively long and extends to the insertion point of the seta d_1 while in the other form, c_1 does not extend to this point of insertion due to its relatively short length. In this form, c_2 is always longer than c_1. The distance between p_1 and p_2 appears reduced when the specimen is carrying eggs due to the expansion of the integument to accommodate the eggs. Thus the p_2 appears more anterior in specimens without eggs (Fig. 2). All the notogastral lyriffissures *ia, im, ip* and *ih* are more visible from the lateral view (Fig. 4). The latero-abdominal gland (*Agl*) is seen as a rounded dark brown large spot on either side of the notogaster in the region of setae e_2, f_2 and h_2. This gland is not very conspicuous in some egg-carrying specimens. The gland is more conspicuous in ventral view, (Fig. 5) where the glandular opening (*gla*) could be seen very close to the point of insertion of seta f_2.

Ventral Region

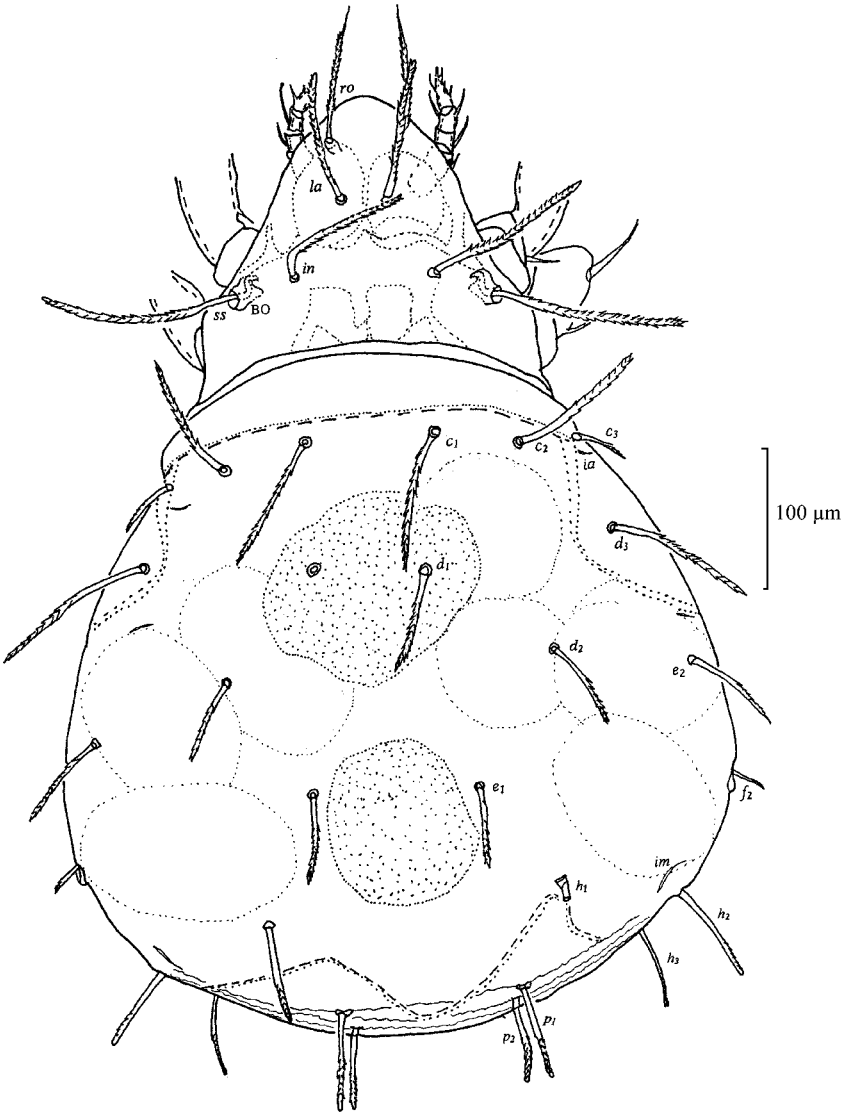
Mouthparts: The infracapitulum is the non-specialised anathric type in which there is no labiogenal articulation (GRANDJEAN 1957). The inner lobe of the rutellum covers the three pairs of adoral setae leaving their insertion points exposed (Fig. 6a). The anterior and posterior smooth setae (*a* & *h*) are long and conspicuous while the median smooth setae is very inconspicuous. The setal formula of the pedipalp is 1-1-2-10 with the tarsus bearing one solenidion (ω) and two euphatidia (ul‘ and ul‘‘). The chelate-dentate chelicerae is widest at the middle (Fig. 6c). The fixed digit bears a ciliated lateral seta (*cha*) which is longer than the dorsal smooth seta (*chb*). A spine is present on the antiaxial surface in the foveolated anterior two-thirds of the chelicera.

Coxisternal region: A transverse submental plate (*smp*) separates the infracapitulum from the epimeral region whose anterior portion is lined by an entire mentotectum (M) which lies on top of the triangular membraneous region that connects the epimeral region with the *smp* (Figs 5, 6a). Epimere I and II are separated from Epimere III and IV by a sejugal furrow. Epimeral setal formula is 3:1:3(2):3.

Legs: When at rest, the legs appear curved due to an elbow junction between the genu and the tibia. Leg IV is the longest but it is not as robust as the other legs. Setal formula is very variable and sometimes variation occurs between opposite legs of the same specimen. The most common setal formula however is I (1-5-4-8-18-3), II (1(2)-5-5-5-16-1), III (1(2)-2-4-4-12-1), IV (1-3-3-4-10-1) (Fig. 7). Solenidiotaxy is I (1-1-2), II (0-1-2) III (0-0-0), IV (0-0-0).

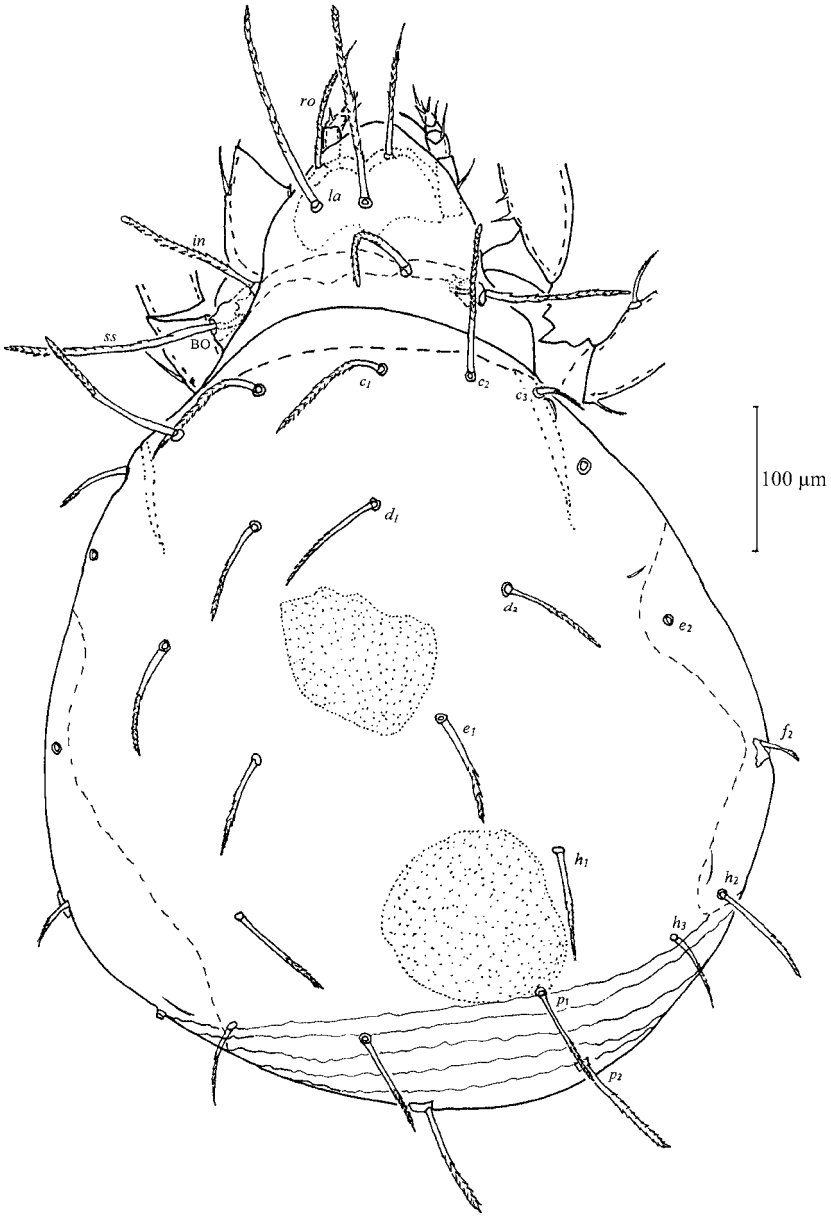
Ano-genital region: The genital plate (GP) appears like a quadrangular vase with a base smaller than the main axis and a roof-top anterior portion where the left and right plates are separated by a very thin gap which runs down the entire length of the plates, expanding at the middle and closing up at the basal opening of the genital aperture (Fig. 5). Four ciliated setae (g_1-g_4) are located very close together at the anterior tip of each plate and the remaining three, (g_3-g_7) are more widely

separated. Setae (g_6 and g_7) and sometimes (g_5) are usually shorter than seta g_1-g_4. Just after the insertion point of g_7, each of the genital plates descends gradually towards the base thus forming a lower depressed region towards the genital aperture. A thin pre-anal plate separates the GP from the elongated anal plates (AN) each of which bears two setae. The equally elongated adanal plates (AD) extend anteriorly towards the genital area, twisting at the pre-anal area into a



1. *Archegozetes magnus*: dorsal view of one morphological form

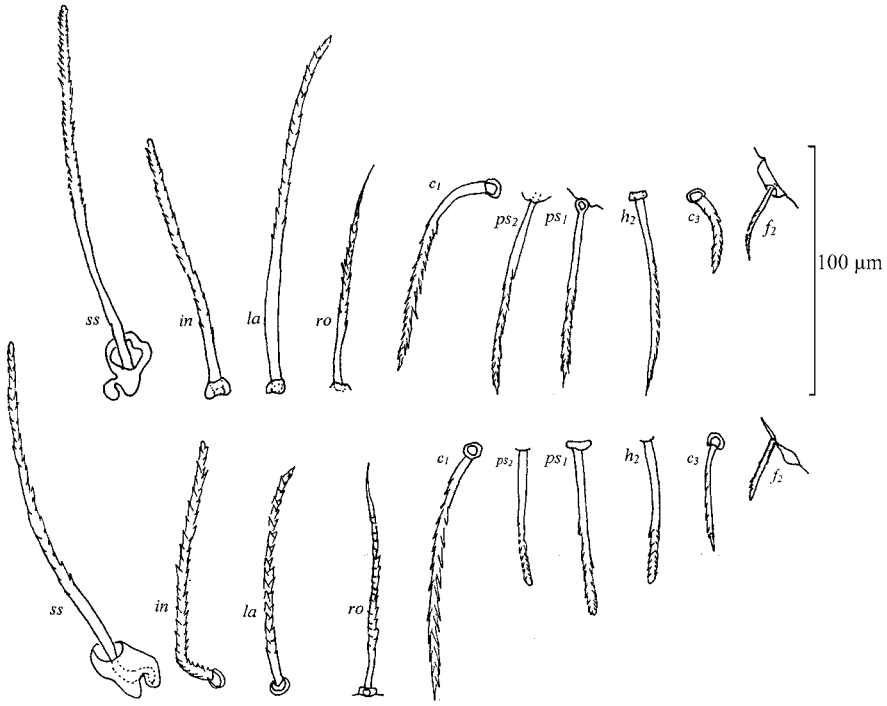
shorter and thinner anterior plate (AG) in the aggenital region. There are 3 pairs of setae on the AD but none on the AG. Lyrifissures *iad* and *ips* are located on the ventral plates immediately posterior to the twisted joint.



2. *Archegozetes magnus*: dorsal view of another morphological form

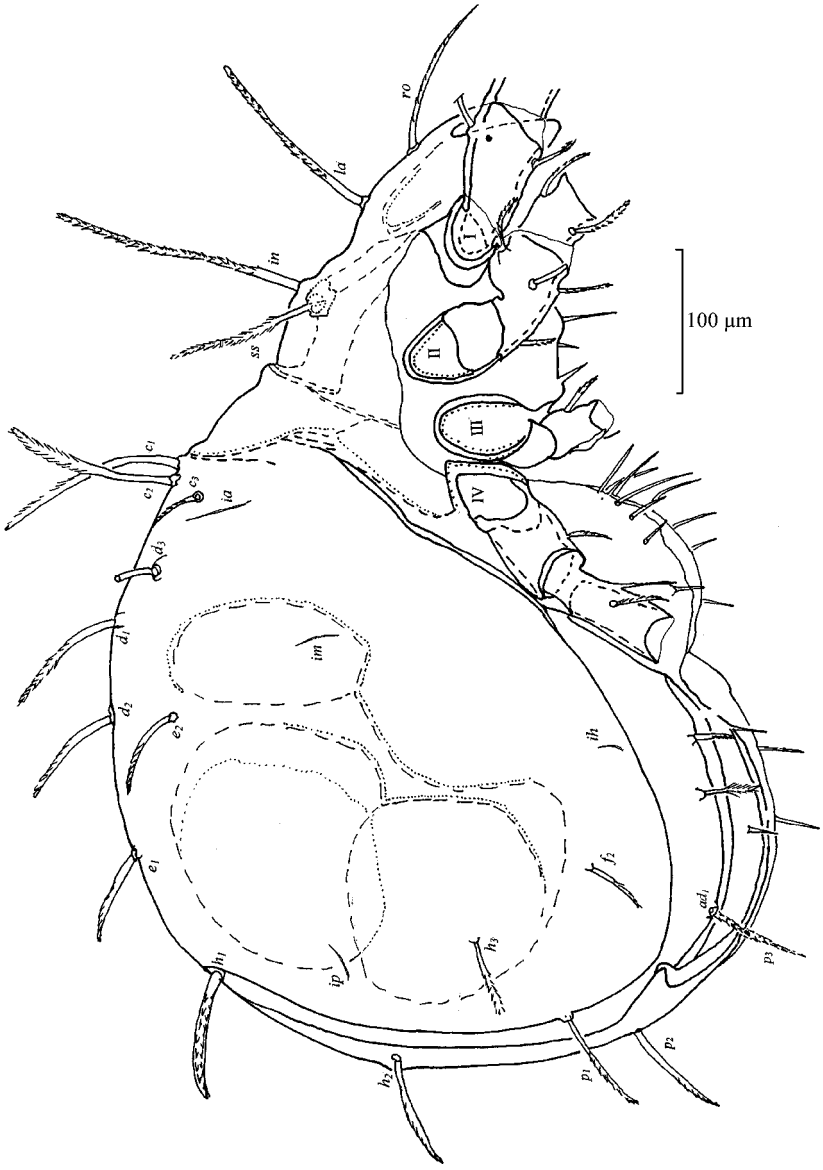
REMARKS

Two morphological forms (Figs. 1 and 2) of *Archegozetes magnus* and a few variants (Fig. 4) were trapped from leguminous plots in Seropedica, Brazil and described in this study. The morphological differences in these morphological forms occur only in respect of the relative lengths and shape of the tip of some notogastral setae. The form with relatively short seta c_1 has been identified as *A. magnus*, the type species of this genus. The second form shares similar features with *A. magnus mediosetosus* (MAHUNKA, 1978) which the author recognised as a subspecies of *A. magnus*. It also shares many similar features with *A. veracruensis* PALACIOS-VARGAS (1997) which were collected from Veracruz in Mexico. *A. magnus* was first described from Sumatra by SELLINICK (1925), its original name being *Epilohmannia* (?) *magna*. Later, this species was redescribed as *Archegozetes magna* by VAN DER HAMMEN (1955a) from materials collected from Dutch New Guinea after GRANDJEAN (1931) had created a new generic name *Archegozetes,* for this species. Between 1974 and 1981, *A. magna* was recorded in several locations in India (SANYAL 1992) but MAHUNKA (1978) preferred to use the species name *magnus* probably because of the new generic name *Archegozetes*. He collected *A. magnus mediosetosus* from Seychelles and based his designation of the specimens as a subspecies of *A. magnus* on geographical separation. This is an indica-



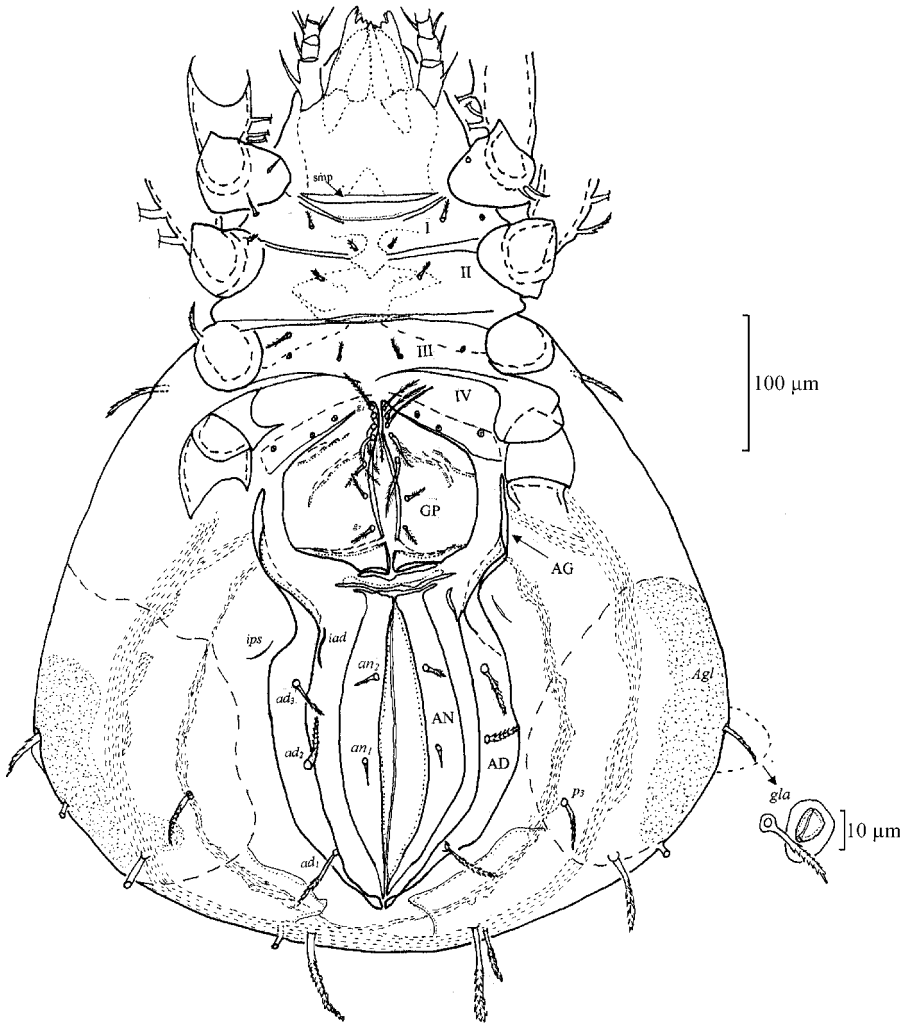
3. *Archegozetes magnus*: relative lengths of some notogastral setae; top row: morphological form illustrated in Fig. 1; bottom row: morphological form illustrated in Fig. 2

tion that the morphological differences were not enough to make a case for another species. Another subsepcies, *A. magna indicus* was named from Calcutta in India (BHADURI and RAYCHAUDURI 1968) based on its smaller size and very long notogastral setae. In view of the large variations that we have observed in this study, these traits are not enough to confer a subspecies status on a specimen. The occurrence,



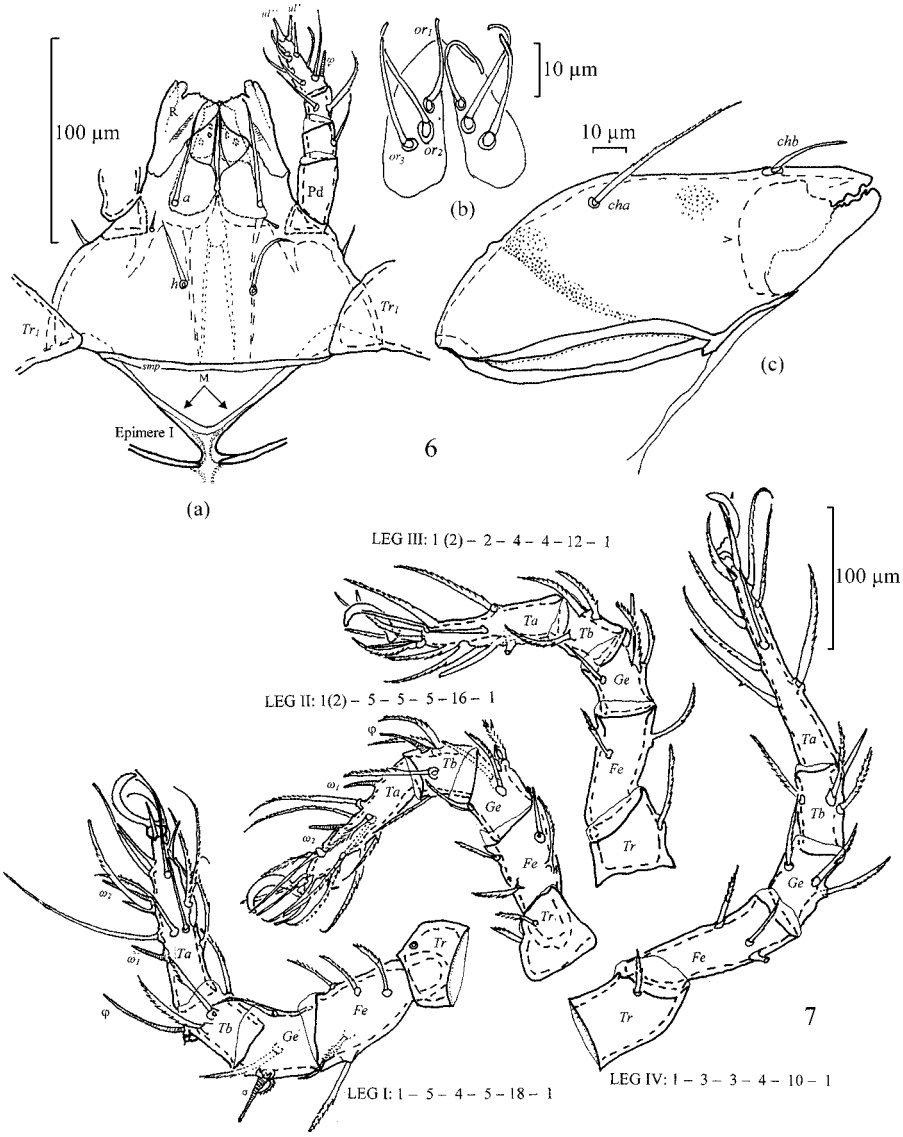
4. *Archegozetes magnus*: lateral view

in the same locality and at the same time, of two morphological forms and a few variants which exhibit the traits of some subspecies, suggests that each form is most probably a clone of this highly parthenogenetic genus (PALMER and NORTON 1990). As many as 600 specimens were caught per trap per day in the leguminous plots in southeast Brazil (BADEJO et al. 2002). VAN DER HAMMEN (1955 a) also recorded similar large numbers from a beach forest on an island in Dutch New Guinea.



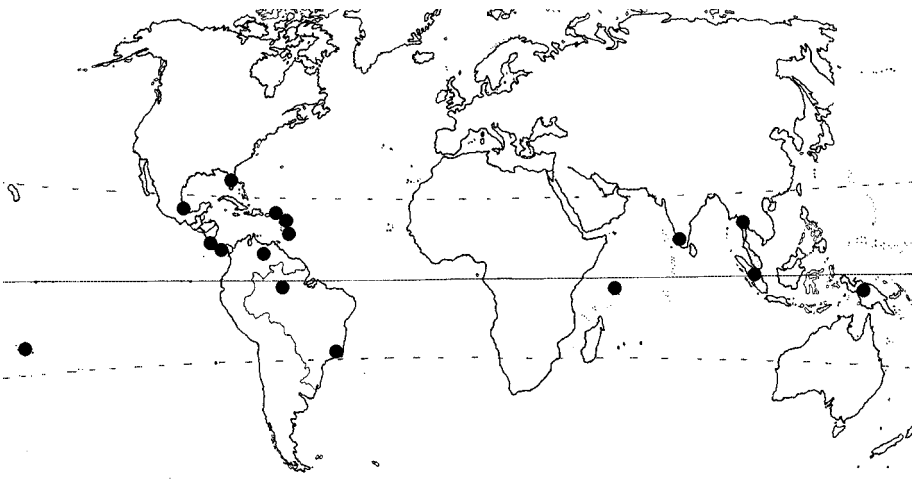
5. *Archegozetes magnus*: ventral view

Another morphospecies of *Archegozetes* (*A. longisetosus*) has also been described by AOKI (1965) from Thailand. BECK (1967) later collected this species from a forest reserve in the Amazonas in Brazil and redescribed it. This species was first recorded from India by Bhattacharya in 1979 (SANYAL 1992). It also differs from the two forms described in this study in respect of the relative length



6-7. *Archegozetes magnus*: 6 – mouthparts: (a) infracapitulum,(b) adoral setae, (c) chelicerae; 7 - legs

of the notogastral seta. In *A. longisetosus,* seta c_1 extends well beyond the insertion point of d_1 and ps_2 is as long as c_1. In *A. magnus*, p_2 is also more or less equal in length to c_1 (Fig. 3), but they are both short and c_1 does not extend to the insertion point of d_1 (Fig. 2 and VAN DER HAMMEN, 1955a – Fig 1). In *A. m. mediosetosus* (MAHUNKA, 1978) as well one of the two forms described in this study (Fig. 1), c_1 extends to the insertion point of d_1, but not well beyond it as in *A. longisetosus*, but it is twice as long as p_2 (Fig. 3). All these morphospecies fall within the same size range and all of them were reported to have occurred in large numbers where they were found. The mouthparts, ventral plates and setation of *A. magnus* and *A. longisetosus* are very similar, based on the descriptions of VAN DER HAMMEN, (1955 a, b), AOKI (1965), BECK (1967), and this present investigation. The tendency for less seta and less solenidia on the legs of the two forms described in this study on the one hand and *A. longisetosus* as described by BECK (1967) on the other, is the only indication that *A. longisetosus* may be a different species from *A. magnus*. However extreme caution must be taken before making this conclusion because of the high variability of leg setation between different specimens observed by BECK and also within each morphological form described in the study. *A. longisetosus* might as well be another clone of *A. magnus* which was not present in the leguminous plots where the specimens described in this study were collected. Detailed information on the infracapitulum, leg chaetotaxy and many important features on the ventral region of MAHUNKA's *A. m. mediosetosus* as well as PALACIOS-VARGAS' *A. veracruensis* is lacking. It is however doubtful if these features would be different from those observed in this study as well as those observed by VAN DER HAMMEN (1955 a, b) for *A. magnus* and BECK (1967) for *A. longisetosus*.



8. *Archegozetes magnus*: global distribution

From the above, it is clear that there is not enough justification for the creation of any subspecies of *A. magnus* yet. So also, *A. veracruensis* which, from the description given by the authors, is very similar to *A. magnus mediosetosus* should be sunk as a new synonym of *A. magnus*. *A. chamelensis* which was described at the same time by the same authors have already been sunk as a synonym of *A. longisetosus* by ESTRADA-VENEGAS et al. (1999). In order to confirm further if *Archegozetes* exists as clones of just one species in different geographical regions or not, extensive mophormetric investigations would have to be carried out on the type specimens of already described species and/or fresh specimens collected from more locations. The different locations in the world where *Archegozetes* has been recorded are indicated in Fig. 8. This distribution suggests clearly that *Archegozetes* is restricted to islands, coastal and inland areas close to big rivers in neo-tropical, pacific and oriental regions. This suggests that the distribution of *Archegozetes* might have occurred through water transportation and it explains partially, in the absence of genetic information, why the basic morphological traits of *A. magnus* have been retained in locations widely separated by geographical barriers.

Superfamily Nanhermanioidea SELLINICK, 1928
Family Nanhermaniidae SELLINICK, 1928
Genus *Bicyrthermannia* HAMMER, 1979

Bicyrthermannia nigeriana n. sp.

MATERIAL EXAMINED

82 adults (females) collected from forest litter in Ile-Ife.

Holotype: female from Ile-Ife, Nigeria. M.A. Badejo col., June 2000, (specimen dissected for the description) deposited in the Museum of Natural History (MNH) at Obafemi Awolowo University, Ile-Ife, Nigeria.

Paratypes: 66 females deposited in MNH. 15 females deposited at Staatliches Museum für Naturkunde, Karlsruhe (SMNK), Germany.

ETYMOLOGY

Named after its terra typica.

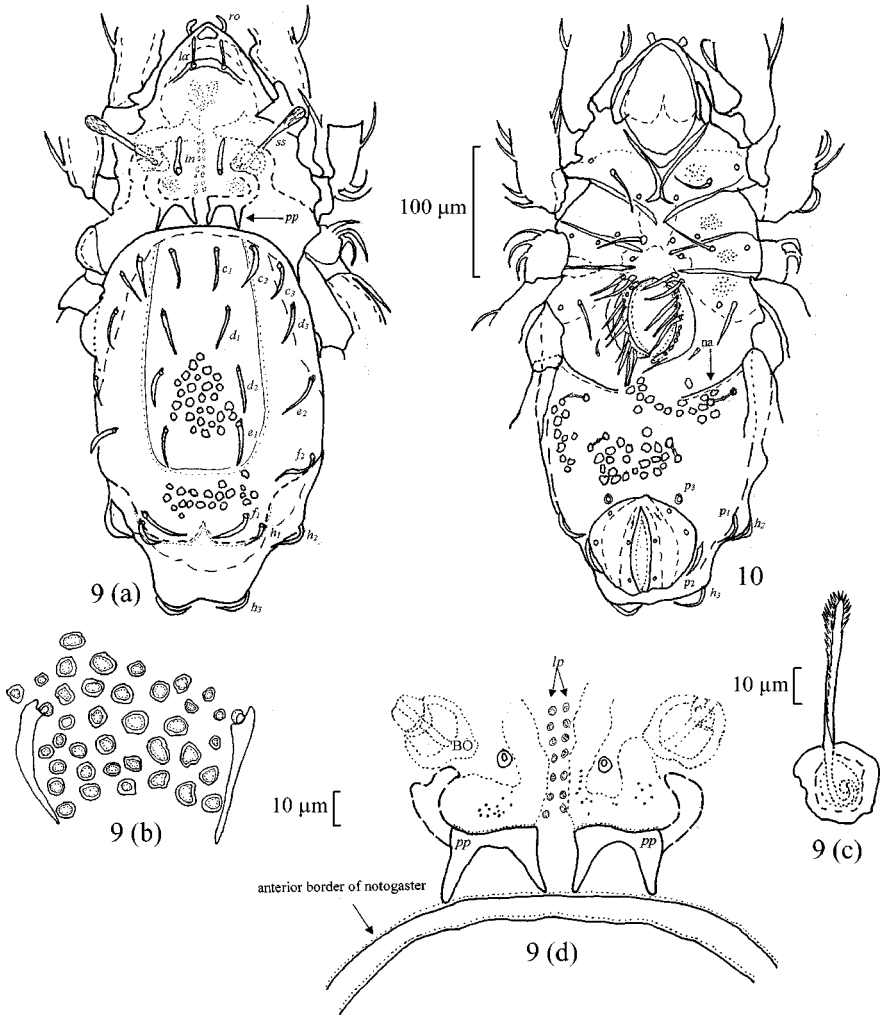
DESCRIPTION

Measurements: length: 364-464 µm; width: 155-193 µm.

Integument: The entire body is reddish brown in colour, opaque and the notogaster is densely ocellate (Figs 9 a,b). The body is covered with cerotegument and debris which adhere to the edge of the main axis and the legs.

Prodorsum

The prodorsum bears four pairs of setae. The rostral setae (*ro*) is relatively short and sickle-shaped. The lamellar (*la*) and interlamellar (*in*) setae are both ensiform but the *la* is borne on a raised transverse ridge. The clavate sensilus (*ss*) is borne on a hardly protruding bothridium and it is richly spinose at the tip (Fig. 9c). Posteriorly, a semicircular internal ridge extends from the base of each bothridium (BO) and develops into an external bidentate crest, a protuberance (*pp*) which is directed downwards towards the anterior border of the notogaster



9-10. *Bicyrthermannia nigeriana*: 9 - important morphological features on the dorsal aspect: (a) dorsal view, (b) foveoles and setae on the surface of notogaster, (c) sensillus, (d) posterior region of the prodorsum showing the bidentate posterior protuberance (*pp*) and the seven pairs of light pits (*lp*); 10 – ventral view

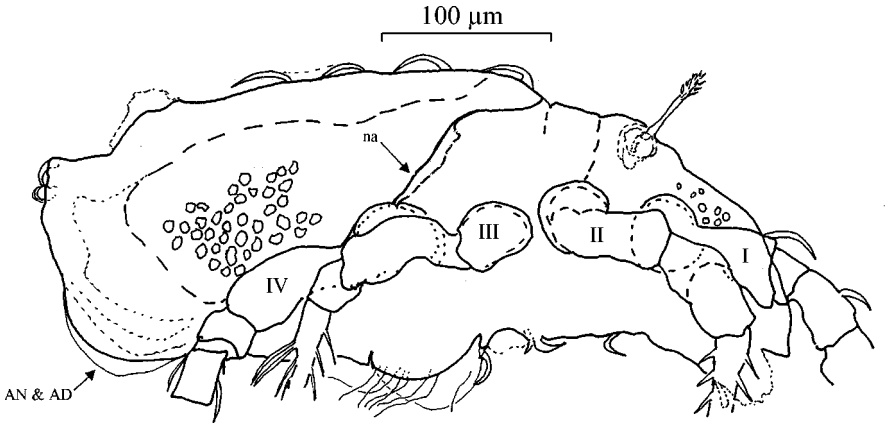
Fig. 9d). Between these two semi-circular ridges, along the mid-ventral line, are seven pairs of light pits (*lp*) arranged in two rows from the bothridial region down to the base of the *pp*.

Notogaster

The notogaster is roughly cylinderical in shape at the anterior end. The width increases slightly around the middle and decreases gradually towards the region of two raised tubercules at the posterior end. Beyond these tubercules, the notogaster decreases rather sharply to terminate in a narrower posterior end. There is a dorsal median bulge on which setae c_1, d_1, d_2 and e_1 are borne. All notogastral setae are spiniform and slightly curved. Each seta has a proximal spur (Fig. 9b) which is extremely difficult to see at low magnification. Two pairs of setae (f_1 *and* h_1) are borne on the right and left tubercules. There are 16 pairs of notogastral setae altogether but only 13 pairs are visible from the dorsal view. The remaining three pairs (p_1, p_2, p_3,) are borne on ventral part of the notogaster (Fig. 10). On the edge of the notogaster is an asclerotized thin border which extends from the dorsal region and curves into the ventral region from the right and left sides, to terminate somewhere before the midventral region. This asclerotized ligament also separates the pleural region from the notogaster below. It is indeed a notogastral-aggenital ligament (*na*) (Grandjean, 1954) which is sometimes almost concealed by cerotegument (Figs. 10, 11, 14a,d).

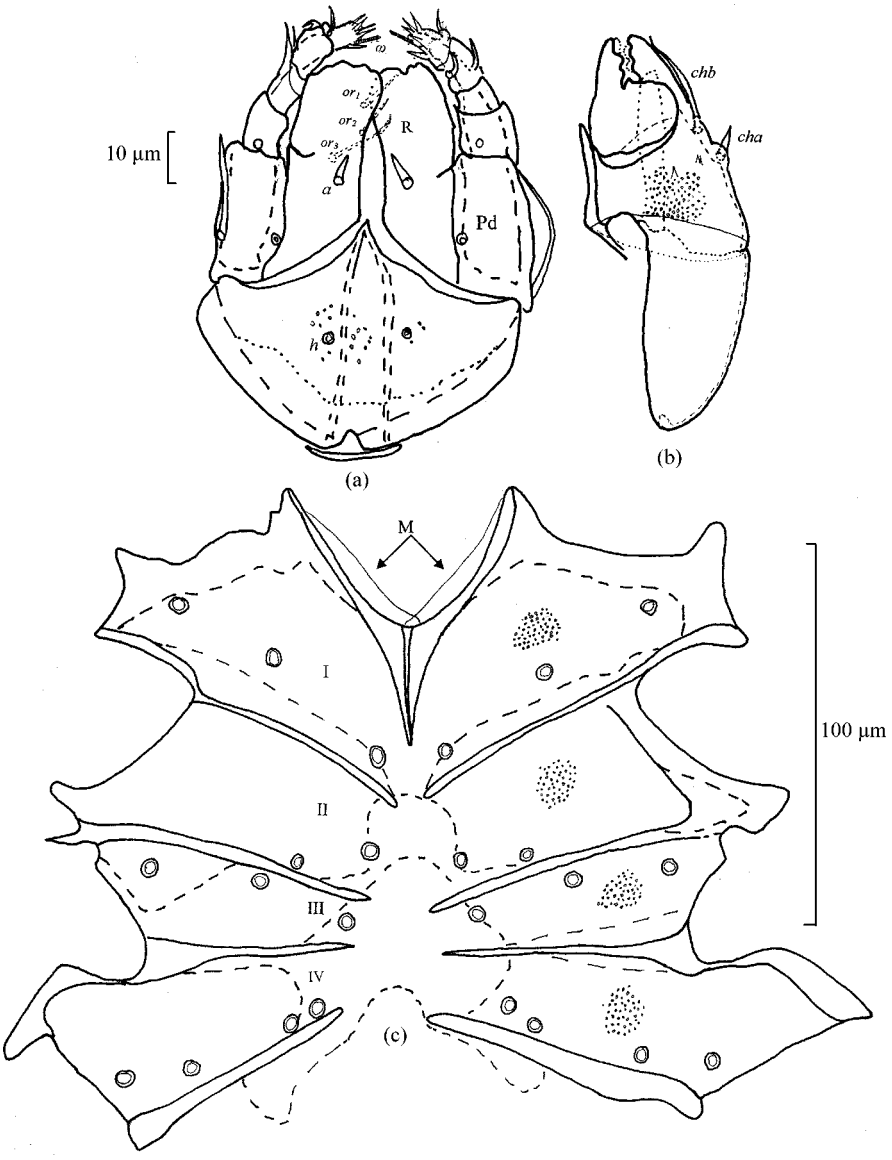
Ventral Region

Mouthparts: The infracapitulum is the stenarthric type in which the labiogenal articulation is posterior to the base of the pedipalp (Fig. 12a). The pedipalp has a rather large basal supracoxal segment which appears fused to the infracapitulum.



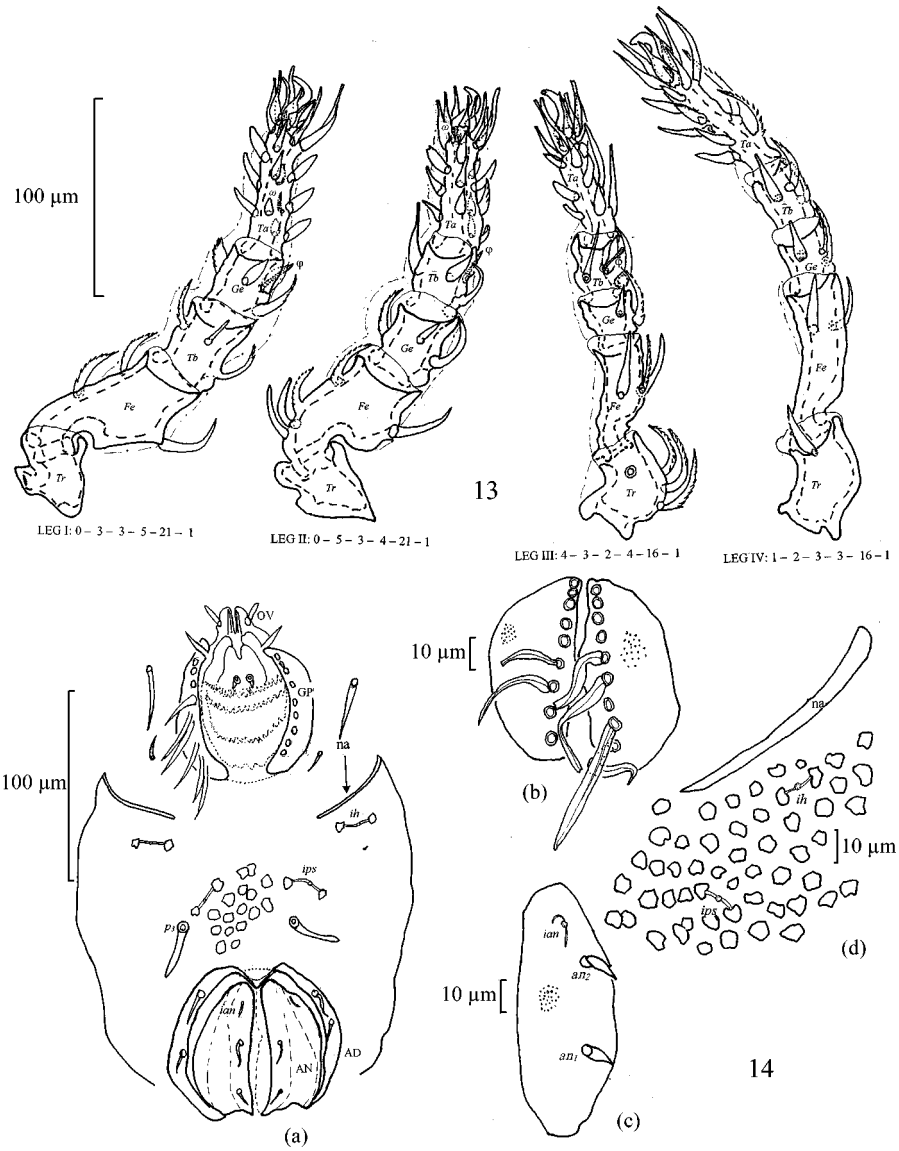
11. *Bicyrthermannia nigeriana*: lateral view

The setal formula of the pedipalp is 1-1-2-7. The tarsal setae include one solenidion. The rutella (R) have rather blunt teeth and they overlap above the anterior adoral seta (or_1). All the three pairs of adoral setae are setiform. A pair of spiniform anterior smooth setae (*a*) is present on the genu while a pair of posterior smooth setae (*h*) is also present on the labium. The chelicerae is chelate-dentate and the



12 *Bicyrthermannia nigeriana*: (a) infracapitulum, (b) chelicera, (c) epimeral region

fixed digit bears a spiniform dorsal (*cha*) and a setiform lateral (*chb*) (Fig. 12b). There is one conspicuous spine and two other less conspicuous spines closely apposed together on the antiaxial surface of the fixed digit. A thin membrane is seen at the border between the anterior foveolated part and the posterior end.



13-14. *Bicyrthermannia nigeriana*: 13 – legs; 14 - pleural and posterior ventral regions: (a) important morphological features on the pleural and posterior ventral region, (b) genital plates, (c) anal plate, (d) upper part of the notogaster, beneath the notogastral-aggenital ligament (*na*)

Coxisternal region: The anterior end of the densely foveolate coxisternal region is covered by a pair of thin overlapping mentotectum (M) (Fig. 12c). Cerotegument is seen around the epimeral borders which are distinct but terminate just before the mid-ventral area. Epimeral setal formula is 3-2-3-4.

Legs: Legs I and II are stout and stumpy while Legs III and IV are not as stout. Leg IV is longer than other legs. All the legs are covered with cerotegument and adherent debris which is usually more on the antiaxial side than the axial side. The trochanter of each leg has a process which fits into a notch at the base of the femur in such a way that could permit a wide rotation of the legs in all directions during movement (Fig. 13). Many setae on the trochanter (*Tr*), femur (*Fe*), genu (*Ge*) and tibia (*Tb*) are sickle-shaped, some of them unilaterally ciliated. Many seta on the main axis of the tarsus (*Ta*) are smooth and squat in shape and there are tiny spines at the base of a few distal setae. Leg chaetotaxy is as follows: I (0-3-3-5-21-1), II (1-5-3-4-21-1), III (4-3-2-4-16-1), IV (1-2-3-3-16-1). Solenidiotaxy is I (0-1-1), II (0-1-1), III (0-1-0), IV (0-0-0). The solenidia are extremely difficult to see due to cerotegument cover and adherent debris.

Ano-genital region: The genital (GP) and anal (AN) plates are widely separated as the anal plate is located right on top of the notogaster at the narrow posterior end of the main axis of the body (Fig. 10). The genital plates, which are located within the pleural region are sometimes pushed sideways by the protruding ovipositor (OV) (Fig. 16a) and together they appear circular in shape and densely foveolate (Fig. 14b). Each plate bears nine smooth setae whose tips are either obtuse or truncate. Two pairs of aggenital setae are located on the pleuron on either side of the genital plates. The upper seta is about three times as long as the lower. In the posterior region, the anal and adanal plates form a compact shield which bulges out from the narrow posterior end (Figs 10, 11). There are two pairs of anal setae as well as two pairs of adanal setae which are all spiniform in shape. A lyrifissure *ian* is present on the anal plate. There are two other lyrifissures (*ips* and *ih*) which always link two foveoles together on the notogaster in the region between seta ps_3 and *na* (Fig. 14a). All the lyrifissures have a canal at the middle when viewed under high magnification (Fig. 14c, d).

REMARKS

Members of the Family Nanhermaniidae are nothroid mites whose genital and anal plates are separate and which possess a semicircular medially interrupted suture between their genital and anal plates BALOGH and BALOGH, (1992). This "semicircular suture" is what GRANDJEAN (1954) described as notogastral-aggenital ligament (*na*) which confirms that *B. nigeriana* belongs to the Family Nanhermaniidae. The genus *Bicyrthermannia* was created by HAMMER (1979) who defined it as Nanhermaniidae ".....with 16 pairs of notogastral setae (as opposed to 15 pairs in *Cythermaniia*), two of which are located close together on a dorsal posterior tubercle. The posterior crest of the prodorsum has a double tooth.....". *B. nigeriana* is however different from *B. duodentata* HAMMER, 1979, the type

specimen of this genus described from Java, and *B. foliata* which is illustrated in BALOGH and BALOGH (1992) in respect of shape of notogastral setae, number of setae on epimere II, number of pairs genital setae, relative lengths of aggenital setae, number of adanal setae and absence of lyrifissure *iad*. (Table 1). Although these differences are enough to establish a different identity for *B. nigeriana*, it will be necessary to re-investigate the type specimens of *B. duodentata* and *B. foliata*, if possible, for other important morphological details such as leg setation and solenidiotaxy as well as mouthparts which have been described in respect of *B. nigeriana* in this study. Such an exercise would only justify the establishment of a separate identity for *B. nigeriana.*

Table 1. Morphological differences between *B. nigeriana* sp.n. and other *Bicyrthermannia species*

Morphological features	***B. duodentata***	***B. foliata***	***B. nigeriana***
Shape of notogastral setae	setiform	phylliform	spiniform
Epimeral setae	3:1:3:4	3:1:3:4	3:2:3:4
Genital setae	8 pairs	8 pairs	9 pairs
Aggenital setae	both long	both long	one long, one short
Lyrrifissures *iad* *ian*	 present absent	 present absent	 absent present
Adanal setae	3 pairs	3 pairs	2 pairs

Superfamily Nanhermanioidea SELLINICK, 1928
Family Nanhermaniidae SELLINICK, 1928
Genus *Masthermannia* BERLESE, 1913

Masthermannia seropedica n. sp.

MATERIAL EXAMINED

107 adults (females) collected from plots of *Macroptilium atropupureum* in Seropedica, Brazil. Holotype: female from Seropedica, Brazil. M.A. Badejo col., November 1999, (specimen dissected for the description) deposited in the Museum of Natural History (MNH) at Obafemi Awolowo University, Ile-Ife. Nigeria.

Paratypes: 50 females deposited in the Department of Soil Fauna, EMBRAPA-AGROBIOLOGIA, Seropedica, RJ., Brazil. 46 females deposited in MNH. 10 females deposited at Staatliches Museum für Naturkunde, Karlsruhe (SMNK), Germany.

ETYMOLOGY

Named after its locus typicus.

DESCRIPTION

Measurements: length: 321-372 µm; width: 155-172 µm.

Integument: The entire body is light brown in colour with reddish hues. The notogaster is ocellate (Fig. 15a) and the entire body is covered with cerotegument and debris which are more prominent round the edge of the main axis and the legs.

Prodorsum

The broad anterior end of the prodorsum bears a pair a rostral setae (*ro*) which is strongly arched with the tips bending towards each other to touch the rostrum. It is extremely difficult to see the point of insertion of the *ro* due to cerotegument cover. After dissection, and at high magnification, the *ro* is seen to be a spiniform seta inserted dorsally on the prodorsum (Fig. 15b). The lamellar (*la*) and interlamellar (*in*) setae are both long and each bifurcates at the point of insertion with each arm extending in opposite directions along the main axis of the body. One of the arms is usually shorter than the other (Fig. 15c). The spiniform sensillus (*ss*) is borne on a bulging bothridium (BO) and it is seen under high magnification to be unilaterally ciliated (Fig. 15d).

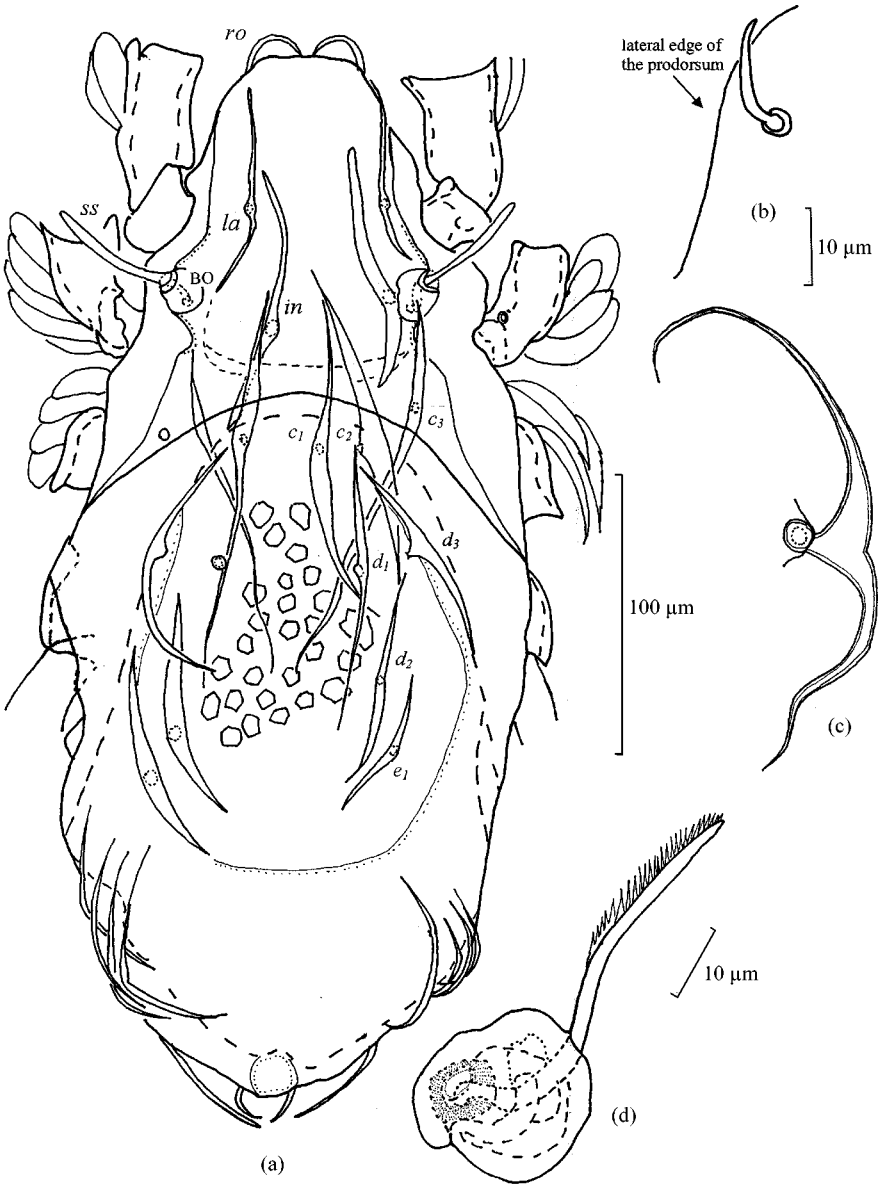
Notogaster

The anterior border of the notogaster is smooth and it disappears into the ventral region somewhere in-between the metapodosomal legs. The lateral sides slant gently towards the posterior end thus making the notogaster slightly broader at the anterior end than at the posterior end. Setae c_1, c_2, d_1, d_2, d_3 and e_1 are borne on the anterior prodorsal median bulge of the notogaster which almost extends to the upper lateral edge. Four other notogastral setae occur close together on a not very distinct lateral tubercle, while two others occur on the lower distal end of the notogaster. The remaining two setae (p_2 & p_3) occur in the ventral region (Fig. 16). Altogether there are a total of 15 pairs of notogastral setae. Each of them is borne on a flattened mammilla and bifurcate (Fig. 15b). The long arm extend far beyond their insertion points, crossing other arms amidst cerotegument and adherent debris, to give a complicated view which makes it extremely difficult to locate the source of some arms under the microscope. This situation has been extremely simplified in Figs. 15a, 17, 18. where the adherent debris and cerotegument have not been illustrated. The mammillas are more conspicuous when the animal is viewed from the lateral side (Figs 17, 18).

Ventral Region

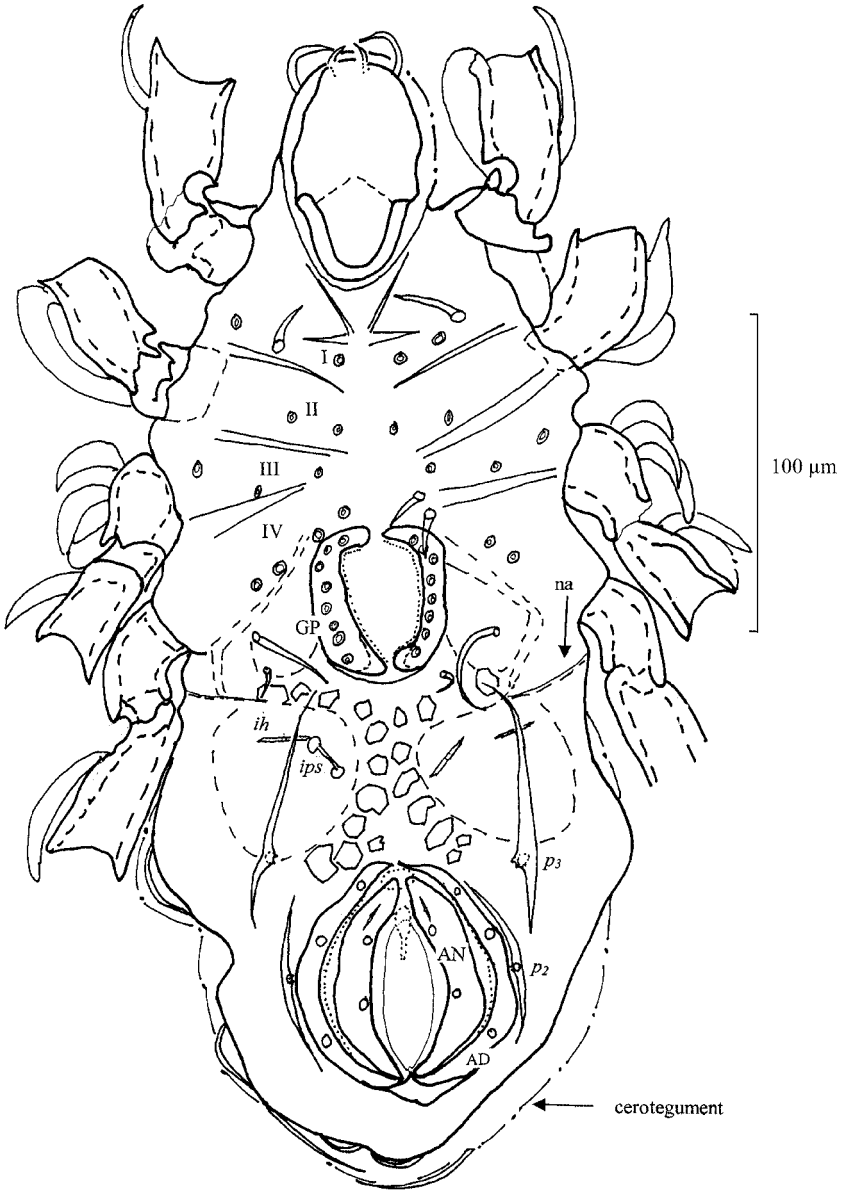
Mouthparts: The infracapitulum is the stenarthric type (Fig. 19) and very similar to the infracapitulum of *Bicyrthermannia nigeriana* (see Fig. 12a). The setal formula of the pedipalp is also 1-1-2-7. The chelicerae is also similar to the

chelicera of *B. nigeriana* except that the antiaxial spines close to the base of the dorsal setae (*cha*) are well separated.



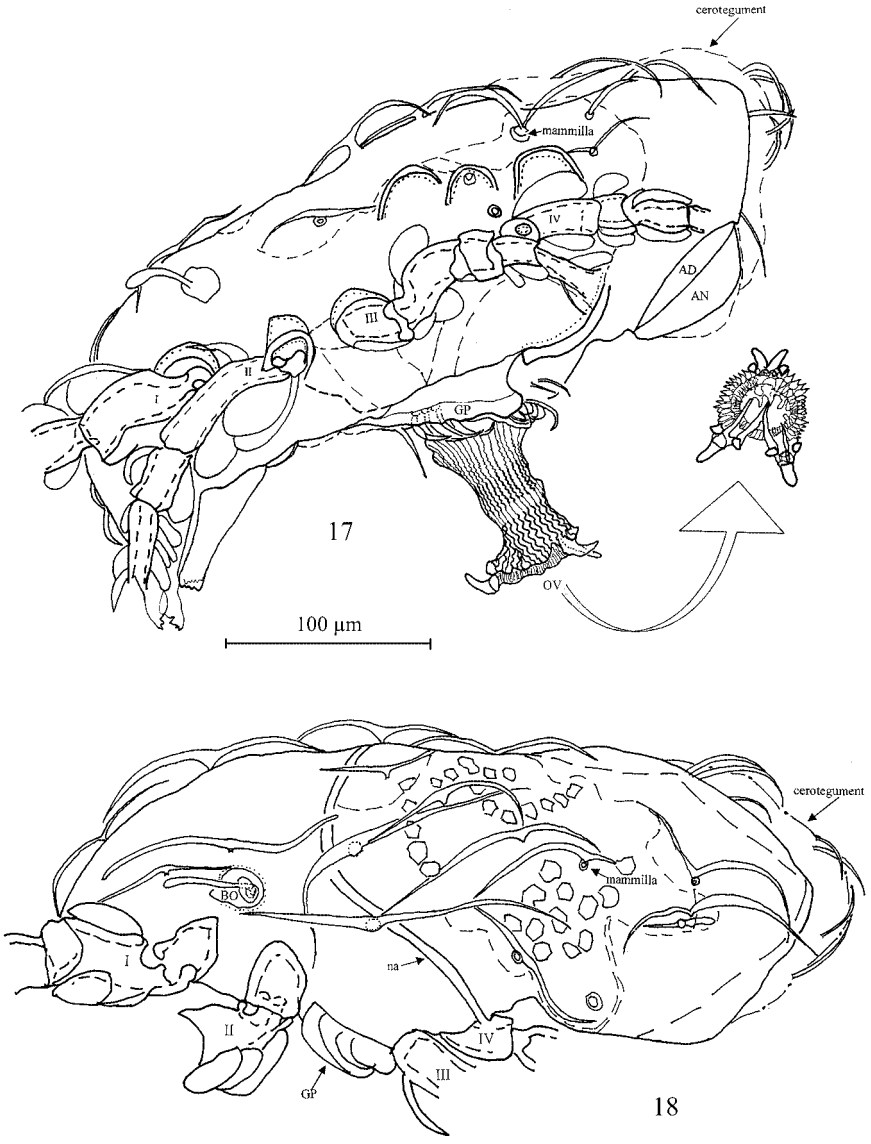
15. *Masthermannia seropedica*: (a) dorsal view, (b) rostral seta, (c) bifurcate seta, (d) sensillus

Coxisternal region: As in *B. nigeriana*, the epimeral borders do not extend to the mid-ventral area. Epimeral setal formula is also 3-2-3-4. The whole of the epimeral region is fused without any trace of a sejugal furrow (Fig. 18).



16. *Masthermannia seropedica*: ventral view

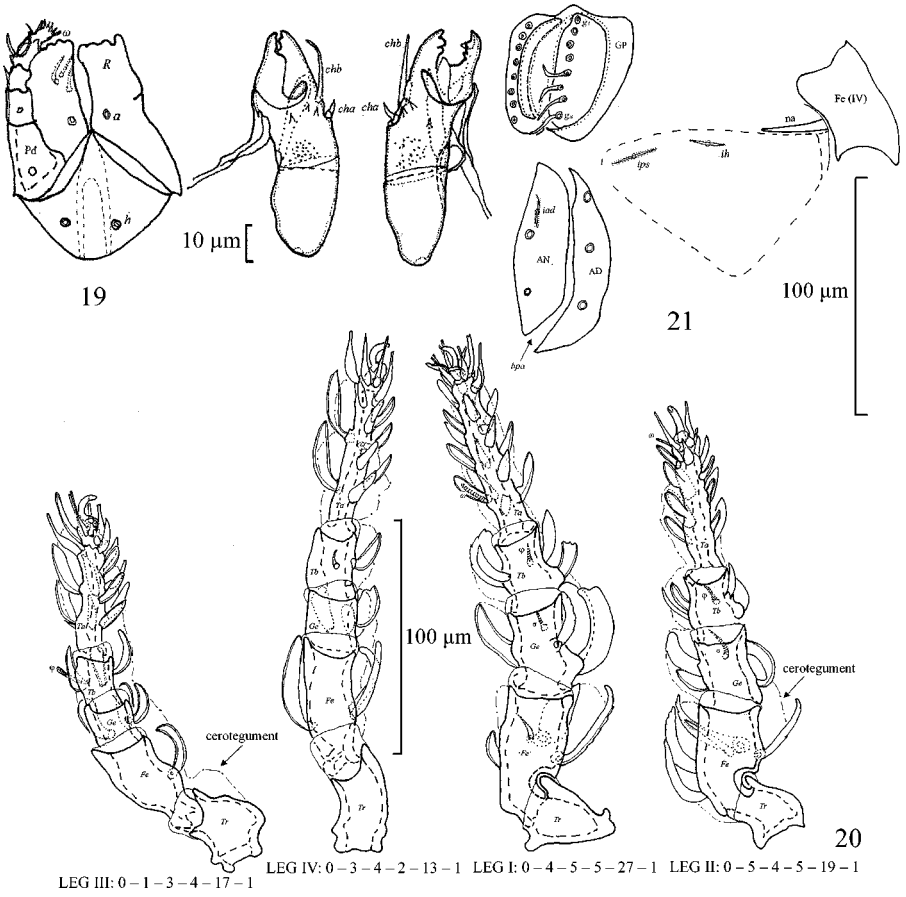
Legs: Legs I and IV are longer than legs II and III, leg III being the shortest and thinnest (Fig. 20). There are thick linings of cerotegument on both sides of the legs where they either partially conceal some lateral setae or occupy the space between the setae and the main axis of the legs. The process-notch joint between the trochanter and femur observed in *B. nigeriana* is also present on the legs but more prominent on legs I and II than on legs III and IV. A very prominent feature



17-18. *Masthermannia seropedica*: 17 - lateral view showing a protruding ovipositor; 18 - dorso-lateral view

of the legs are the broad, sickle-shaped lateral setae with thickened edges. The tips of most of these setae are obtuse but a few have emarginate or wavy truncate tips. Leg chaetotaxy is as follows: I (0-4-5-5-27-1), II (0-5-4-5-19-1), III (0-1-3-4-17-1), IV (0-3-4-2-13-1). Solenidiotaxy is I (1-1-1), II (1-1-1), III (0-1-0), IV (0-0-0).

Ano-genital region: The genital plates (GP) are located within the pleural region (Fig. 16). The whole structure appears to have an entire basal sclerite with an apiculate anterior end (Fig. 21). The plates are attached to this basal sclerite in such a manner that each plate can open to allow the protrusion of the ovipositor (OV) as illustrated in Fig. 17. Each plate bears eight smooth spiniform setae (g_1 – g_8). As in *B. nigeriana*, two pairs of aggenital setae are located on the pleuron on either side of the genital plates. The upper seta is also about three times as long as the lower. A thin notogaster-aggenital ligament (*na*) separates the pleural region



19-21. *Masthermannia seropedica*: 19 - infracapitulum and the right and left chelicerae; 20 – legs; 21 - posterior ventral region showing the ventral plates and lyrifissures

from the notogaster on which the anal (AN) and adanal (AD) plates are borne (Figs. 16, 21). As aforesaid, this asclerotized ligament (*na*) is a continuation of the anterior notogastral border which is best seen from the dorso-lateral aspect which is illustrated in Fig. 18. The anal and adanal plates can be seen bulging out of the main axis of the body from the lateral view (Fig. 17) but they do not protrude beyond the lower distal tip of the notogaster as in *B. nigeriana* (see Fig. 11). These plates are separated on each side by a thin pleuro-anal ligament *bpa* (GRANDJEAN 1956) (Figs. 16, 21). There are two pairs of anal setae and three pairs of adanal setae. Lyrifissure *iad* is present on AN, while *ips* and *ih* are present on the notogaster within the clear circular regions devoid of cerotegument below *na* (Figs. 16, 21). Each lyrifissure also has a canal at the middle when viewed under high magnification as in *N. nigeriana*.

Table 2. Morphological differences between *M. seropedica* sp.n. and *M. ornatissima*.

Morphological features	***M. ornatissima***	***M. seropedica***
Size	Length:444-540µm Width: 192-240µm	Length:321-372µm Width: 155-172µm
Rostral setae	bifurcate	simple and spiniform
Notogaster	rounded anteriorly, cylindrical posteriorly	simply wider anteriorly
Epimeral setae	4:1:3:5	3:2:3:4
Genital setae	9 pairs	8 pairs
Lyrrifissures	*ian* absent	*ian* present

REMARKS

The genus *Masthermannia* was created by BERLESE in 1913 when he redescribed *Angelia mammilaris* which he had described earlier in 1904 (JUNK 1977). Several years later GRANDJEAN (1954) created the genus *Posthermannia* which was sunk as a synonym of *Masthermannia* by VAN DER HAMMEN (1959). The current diagnostic feature of *Masthermannia* is the bifurcate notogastral setae with extremely long, flagellate branches (BALOGH and BALOGH 1992). *Masthermannia seropedica* is therefore a typical *Masthermannia* which deserves to be given a separate identity from the few described species of this genus because of certain unique features, among which are the rostral seta which is not bifurcate, absence of protruding dentes at the anterior end of the prodorsum and hardly conspicuous mammilliform tubercles at the base of the notogastral setae. *M. seropedica* shares many similar features with *Masthermannia ornatissima* which was described by

PÈREZ-IÑIGO and BAGGIO (1988) from Sao Paulo but the significant differences in their size and other important morphological features strengthen the case for the establishment of a different identity for *M. seropedica*. These differences are presented in Table 2. Notable among them is the organisation of the notogaster which makes it easier to distinguish between setae h_1, h_2 *and* h_3 in *M. ornatissima* than in *M. seropedica,* where these setae are packed together on the dorso-lateral edge in such a way that it is extremely difficult to ascertain their homology (see Fig. 15 a). It should be noted however that comparison of these two species remain limited to only the features of *M. ornatissima* described by the authors. For example, leg chaetotaxy and solenidiotaxy are not the same in *M. seropedica* and *Posthermannia nematophora* (= *M. mammillaris*), but PÈREZ-IÑIGO and BAGGIO (1988) reported that the legs of *M. ornatissima* are comparable with the legs of this species. So also, the features of the mouthparts and types of lyrifissures posed by *M. ornatissima* were not described. A much more detailed comparison would only be possible if the type specimens of *M. ornatissima* are examined.

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