

ON SOME ZYGENTOMA (INSECTA) FROM BRAZIL WITH DESCRIPTION OF ONE NEW SPECIES OF THE GENUS *HETEROLEPISMA* ESCHERICH, 1905 (LEPISMATIDAE)

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Abstract: A new species of the genus *Heterolepisma* (Zygentoma: Lepismatidae) is described based on material obtained in Paraíba State, eastern Brazil, and compared with the most similar species as well as with the other known species of the genus known from the Neotropical Region. Samples of other Lepismatidae and Nicoletiidae (Zygentoma) are studied from Amazonas and Rio Grande do Norte States. *Namunukulina*, *N. funambuli* and *Ctenolepisma targioniana* are reported as new to Brazil. **Key words:** Zygentoma, Lepismatidae, *Heterolepisma*, new species, new records, Brazil.

Sobre algunos Zygentoma (Insecta) de Brasil y descripción de una especie nueva del género *Heterolepisma* Escherich, 1905 (Lepismatidae)

Resumen: Se describe una nueva especie del género *Heterolepisma* (Zygentoma: Lepismatidae) sobre material recolectado en el Estado de Paraíba, este de Brasil, y se la compara con las especies más próximas y con las restantes especies conocidas del género de la Región Neotropical. Se estudian también muestras de Lepismatidae y de Nicoletiidae (Zygentoma) recogidas en los Estados de Amazonas y Rio Grande do Norte. *Namunukulina*, *N. funambuli* y *Ctenolepisma targioniana* se citan por primera vez de Brasil.

Palabras clave: Zygentoma, Lepismatidae, *Heterolepisma*, nueva especie, nuevos datos, Brasil.

Sobre alguns Zygentoma (Insecta) do Brasil e descrição de uma espécie nova do género *Heterolepisma* Escherich, 1905 (Lepismatidae)

Resumo: Descreve-se uma espécie nova do género *Heterolepisma* (Zygentoma: Lepismatidae) sobre material obtido no Estado de Paraíba, leste do Brasil, e compara-se com as espécies que mais se lhe assemelham e com as restantes espécies conhecidas do género da Região Neotropical. Estudam-se amostras de outros Lepismatidae e Nicoletiidae (Zygentoma) provenientes dos Estados do Amazonas e do Rio Grande do Norte. *Namunukulina*, *N. funambuli* e *Ctenolepisma targioniana* são registados como novos para o Brasil.

Palavras-chave: Zygentoma, Lepismatidae, *Heterolepisma*, nova espécie, novos dados, Brasil.

Taxonomia / Taxonomy: *Heterolepisma serranoi* sp. n.

Introduction

Silverfish obtained in the Brazilian States of Amazonas, Paraíba and Rio Grande do Norte, are studied and one new species of genus *Heterolepisma* (Lepismatidae: Heterolepismatinae) is described from near João Pessoa, Paraíba. One other genus and two more species are reported by the first time to Brazil and several species are assigned by the first time to the Amazonas and Rio Grande do Norte States. The studied material is deposited in the entomological collections of the IICT / JBT, Zoologia, the former Centro de Zoologia of the IICT, in Lisbon, Portugal, CZ in the text, and of the Instituto Nacional de Pesquisas da Amazônia, in Manaus, Amazonas, Brazil, INPA, in the text.

Taxonomic study

Fam. Lepismatidae

Heterolepisma serranoi sp. n.

Fig. 1-24.

EXAMINED MATERIAL: Holotype male, Brazil: Paraíba: Near João Pessoa, Bramame, Jacumã, 03.10.2000, coll. A. Serrano (CZ-5165). Paratypes: 2 females, same data as for the holotype; 4 males 2 females, 2 young females, same locality, 13-

14.11.2002, same collector (CZ-5198). Non-type material: 7 juv., same locality, same date, same collector (CZ-5198). All the specimens were collected under palm leaves in the innermost sandy area of a beach.

DESCRIPTION: Body length: 6.8-7.0 mm (male) 6.9-7.1 mm (female); thorax length: 2.3 mm (male) 2.2-2.3 mm (female); thorax width: 1.8 mm (male) 1.7-1.8 (female); antenna length: maximum preserved 5.1 mm (female); cercus length: maximum preserved, 4.6 mm (female); maximum total body length: 9.6 mm (male) – all the females with damaged paracercum. Body elongate, delicate, the thorax clearly longer than wide, not much detached from the abdomen base. Epidermic pigment not much darkened, violet-brown, present on the maxillary palps, legs and terminal abdomen. Scales round to ovoid, with numerous thin rays, the macrochaetae almost hyaline, all smooth. General colour of the alive specimens greyish.

Head typical, with one only row of macrochaetae along the anterior border, interrupted on the median area, plus 1+1 lateral short rows of 4-6 setae more or less perpendicular to the cephalic border and the usual row of sub-ocular macrochaetae. Antennae delicate, clearly exceeding the posterior border of metanotum, with abundant setulae, short sensorial

“points” and some elongate, sub-cylindrical, sausage-shaped sensilla; distal annuli composed by 4 divisions, alternatively with and without one isolated lateral sausage-shaped sensillum at the apex of the most apical unity (Fig. 1), sometimes also on the apex of the 4th division of the preceding subdivision. Mandibles and maxilla as usual. Maxillary palp (Fig. 2) robust; apical article cylindrical, not much longer than preceding one, ca 5 times longer than wide and lacking distal sensillum; males with 4 longitudinally arranged complex sensilla (Fig. 3), those in the females more delicate and less ramose (2 branches only). Labium without peculiar features; labial palp (Fig. 4) apical article wider than long and with 3+2 distal, compact papillae.

Pronotum (Fig. 5) with anterior setal collar, its posterior border almost straight and, like the remaining thoracic tergites, with 2+2 posterior macrochaetae; lateral margins as usual in the genus, the trichobothrial areas typical, as in Figs. 6-7. Meso- and metanotum (Fig. 8) identical, progressively more excavated along posterior border, the trichobothrial areas of metanotum as in Figs. 9-10. Pro- (Fig. 11), meso- and metasternum (Fig. 12) typical, last one with almost straight posterior border and with 1+1 apical combs with 6-7 macrochaetae, their distance ca twice each comb width. Legs robust; lanceolate, acute-pointed scale-like setae abundant on the inner and outer surfaces of femur. Spines on P I and P III as in Figs. 13-15; tarsus 4-articulated, with strong ventral spines along the first tarsomer (P I: 8-10, P II: ca 10, P III: 12), the praetarsus simple and complete.

Urotergite I with complete chaetotaxy (Fig. 16), 2+2 infralateral, 1+1 lateral and 1+1 submedian macrochaetae; urotergites II-VII similar, though with 3+3 infralateral, 3+3 lateral and (1-2)+(1-2) submedian macrochaetae; urotergite VIII (Fig. 17) lacking lateral combs, the IX with one only reduced posterolateral macrochaeta. Urotergite X sub-trapezoidal with rounded posterolateral angles, somewhat shorter in the male than in the female (Fig. 18-19).

Urosternite I with 1+1 median macrochaetae almost touching each other (Fig. 20), the II-VIII with very wide apart 1+1 lateral similar macrochaetae (Fig. 21). Urosternite V clearly concave in the median area (mainly in the male), remaining ones with the posterior border almost straight. Male with two pairs of stylets, the female with three. Inner process of coxite IX of male (Fig. 22) less than 1.5 times longer than wide at base and ca 3 times longer than the outer process. Penis big, the paramera quite reduced, as in Figs. 22-23. Coxites IX of female ca twice longer than wide at base and 3-3.2 times longer than the outer process (Fig. 24). In both sexes the ratio stylet / inner process ca 2.0. Ovipositor with 34-36 divisions, exceeding level of stylets IX by 1.1-1.6 times their own length and surpassing apex of IX coxite inner process by ca 3.5 times its length. Setation of gonapophyses VIII and IX as usual for the genus.

ETYMOLOGY: The new species is dedicated to its collector, Prof. Artur Serrano.

DISCUSSION: New species, with smooth macrochaetae, 3-4 longitudinally arranged (none apical) complex sensilla on distal maxillary palp article and lanceolate setae on femur of all the legs, as reported to *Heterolepisma horni* by Stach (1933, fig. 2), is a typical representative of the genus. However, specialised sensilla along antenna, considered to be absent in *Heterolepisma* and, so, in the subfamily Heterole-

pismatinae, do occur, and we were able to find similar sensilla in not yet studied material from other geographical origins, undoubtedly of the very same genus; this means that they shall occur along distal antennal chains in the other (all ?) species of the genus considered till now to lack antennal specialised sensilla. These sausage-like sensilla are also present (though not very conspicuous, eventually due to the condition of the material) in *H. insulare* (studied by Mendes, 1982, and re-examined), the only species with non-damaged antennae specimens in the CZ collection.

With 2+2 notal posterior macrochaetae, 2 median macrochaetae on urosternite I, complete chaetotaxy on urotergite I, incomplete setation on VIII (lateral macrochaetae missing), and with 2 (male) and 3 (female) pairs of stylets, *H. serranoi* sp.n. keys exclusively with three species: *H. rouxi* (Silvestri, 1915, under *Isolepisma*) from New Caledonia, the doubtful *H. trisetosa* (Escherich, 1905), and *H. zelandica* (Tillyard, 1924, under *Notolepisma*), also quite poorly described, from New Zealand.

H. rouxi is easily distinguishable by the number of urosternal macrochaetae per comb (4-6 against 1 only); further, its metasternum and X urotergite are quite distinct.

Regarding the geographical closeness of both samples (Pernambuco is South to the southern border of the Paraíba State), it sounds probable that the new species will correspond to part of the (disappeared) specimens noticed as types of *H. trisetosa* and collected in the Pernambuco State – despite the distinct reported number of setae on the urotergal combs; however and according to Mendes (1988), due to the quite reduced (and eventually incorrect) description, because of the multiplicity of assigned *Patrias Typicas* (Brazil, Indonesia and West Africa) and taking into account that all the “types” remain disappeared, *H. trisetosa* must be faced as a *species inquirenda*.

Heterolepisma zelandica (Tillyard, 1924), which original and unique description is, like that of the preceding species, extremely reduced and imprecise (and almost certainly partially incorrect also) shall belong to the group of species lacking submedian macrochaetae on urosternite I and with incomplete chaetotaxy on both the urotergites, I and VIII, as it happens with *H. howensis* (Womersley, 1942); indeed, Wygodzinsky (1961) stated about *H. zelandica*: “... *howensis* ... also agrees closely with *zelandica* ... it is very probable ... another population of *zelandica*...”.

Five further species described under the same genus (either sub *Heterolepisma* or sub *Isolepisma* – see Wygodzinsky, 1961) are known to occur in the Neotropical Region: *H. horni* Stach, 1933, was described from the Ecuador, found in the Antilles and Jamaica (Wygodzinsky, 1957, 1959) and reported from Venezuela (Mendes, 1991); *H. insulare* (Banks, 1901) is an endemic from the Galapagos Islands (Escherich, 1905, Folsom, 1924, Stach, 1932, Paclt, 1959, 1976 and Mendes, 1982); *H. annectans* (Silvestri, 1924) seems exclusive from the Chilean Juan Fernandez Islands of Masatierra and Masafuera (Silvestri, 1924 and Wygodzinsky, 1951); and *H. andina* (Silvestri, 1902) and *H. pampeana* (Silvestri, 1902) are, both, known from Argentina, South of the Rio de La Plata: *H. andina* from the provinces of Mendoza, Catamarca and Neuquén, *H. pampeana* from those of Buenos Aires, Rio Negro, La Pampa, Córdoba, Neuquén, Chubut and St.^a Cruz (Silvestri, 1902, Escherich, 1905 and Wygodzinsky, 1948, 1952). *H. annectans*, lacking notal posterior macrochaetae,

Fig. 1-7: *Heterolepisma serranoi* sp. n. **Fig. 1.** Antenna, distal chain of flagellum – the sausage-like sensilla are visible on the upper part of annuli 2 and 4. **Fig. 2.** Maxillary palp. **Fig. 3.** Id, detail of the apical article of male. **Fig. 4.** Labial palp. **Fig. 5.** Pronotum. **Fig. 6.** Id, anterior trichobothrial area. **Fig. 7.** Id, posterior trichobothrial area. Scales: 0.1 mm.

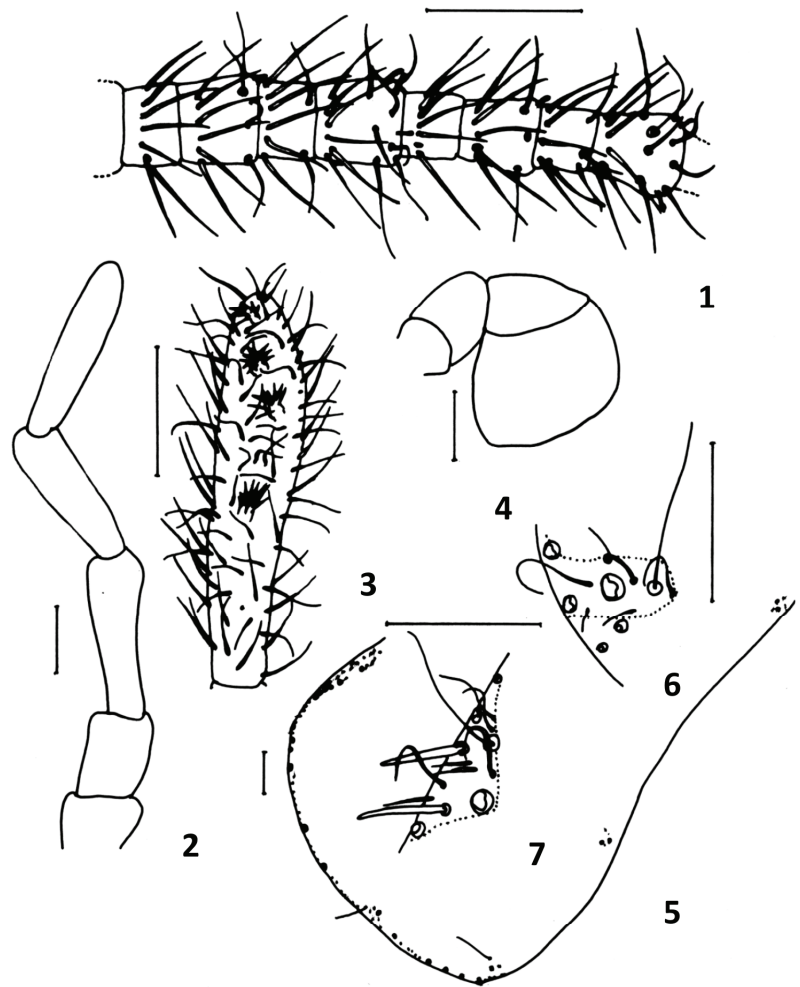
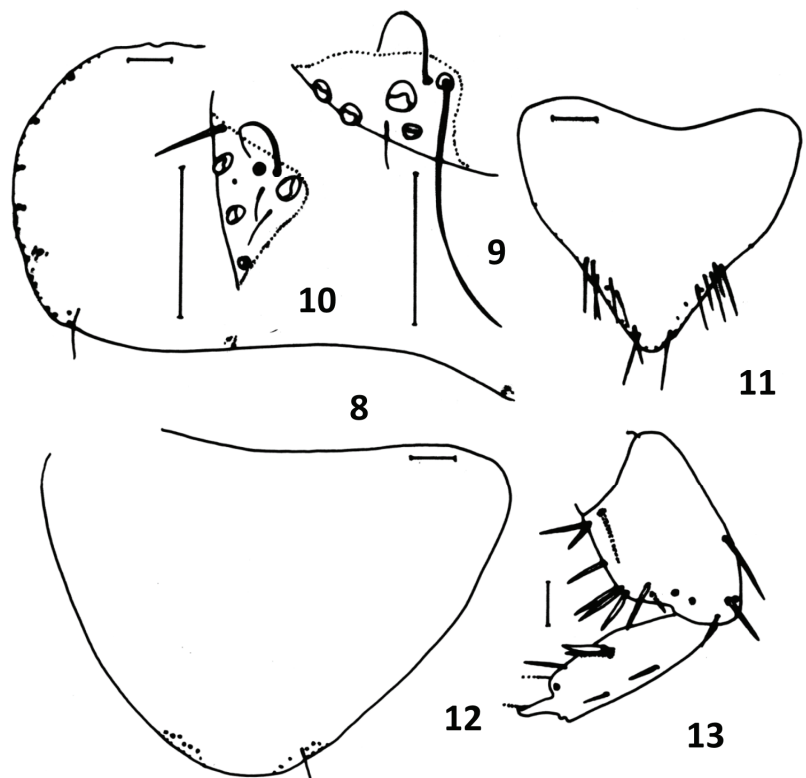


Fig. 8-13: *Heterolepisma serranoi* sp. n. **Fig. 8.** Metanotum. **Fig. 9.** Id, anterior trichobothrial area. **Fig. 10.** Id, posterior trichobothrial area. **Fig. 11.** Prosternum. **Fig. 12.** Metasternum. **Fig. 13.** P I, femur and tibia. Scales: 0.1 mm.



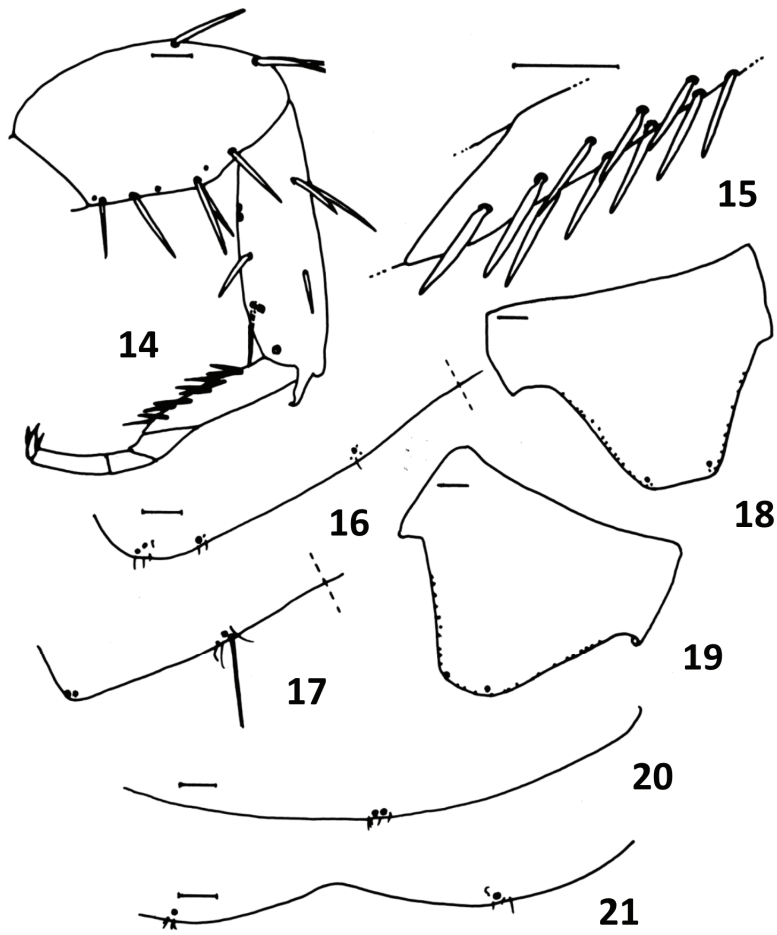


Fig. 14-21: *Heterolepisma serranoi* sp. n. **Fig. 14.** P III. **Fig. 15.** Id, ventral detail of first tarsal division. **Fig. 16.** Urotergite I. **Fig. 17.** Urotergite VIII. **Fig. 18.** Urotergite X of male. **Fig. 19.** Id, of female; **Fig. 20.** Urosternite I; **Fig. 21.** Urosternite V of male. Scales: 0.1 mm.

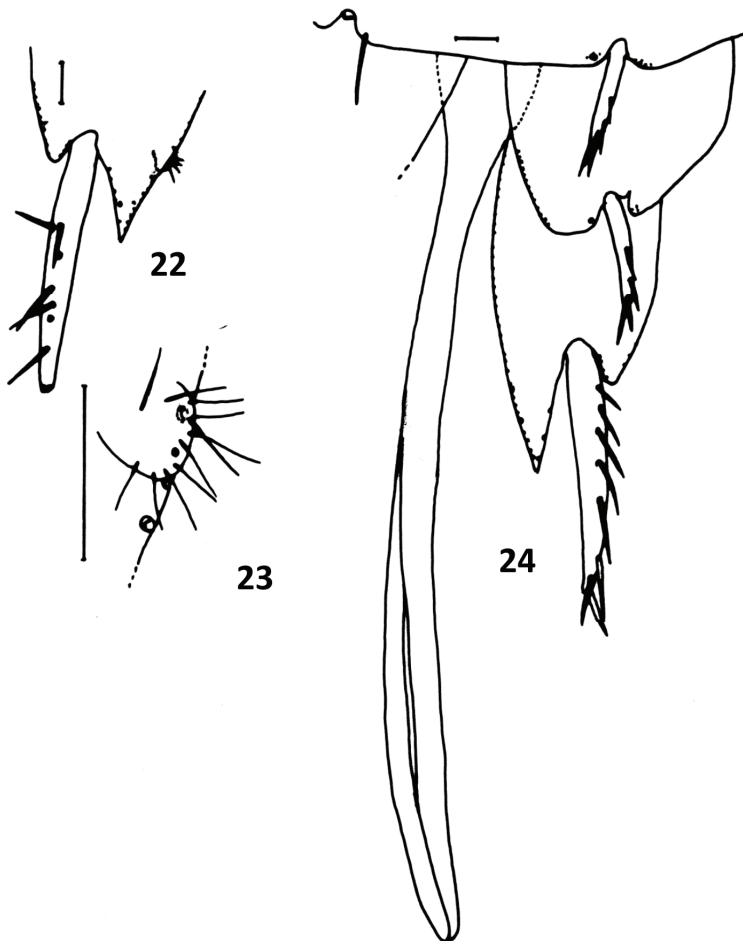


Fig. 22-24: *Heterolepisma serranoi* sp. n. **Fig. 22.** Coxite IX of male and paramerum. **Fig. 23.** Detail of paramerum. **Fig. 24.** Urosternite VII, coxites VIII and IX of female and ovipositor. Scales: 0.1 mm.

with 4 pairs of abdominal stylets (both sexes), different X urotergite, quite distinct paramera, and bare urosternite I (among other dissimilarities) is completely different from the new species; the very unique presented characteristics, rise, even, the question of its congenerity with the remaining *Heterolepisma*. *H. horni*, like *H. andina*, shows one only pair of abdominal stylets (in both sexes); further, it lacks setae on urosternite I (no information relatively to *H. andina*). *H. insularis*, has a shorter ovipositor with 20-25 divisions only and lacks also setae on the first urosternite; furthermore, it presents 1+1 macrochaetae per notum and 2-3 on the urosternal combs. Both remaining species are very poorly described: *H. andina* is reported as with 1 pair of stylets only and with a much higher number of urotergal and urosternal macrochaetae than *H. pampeana*; this one, with 2 pairs of stylets on both sexes shows, further, quite distinct metasternal combs (less setose, wider apart), a completely different prosternum and clearly longer urotergite X.

Acrotelsa collaris (Fabricius, 1793)

EXAMINED MATERIAL: Amazonas: Manaus, INPA, 05.05.1976, coll. Icio 1 male 2 females. Id, Estrada do Aleixo, 28.04.1976, coll. Paraluppi, 1 young male with *N. funambuli* and *Ct. rothschildi*; Id. archive, 10.06.1976, coll. Dellome, 2 males 5 juv.; Id, Conjunto Adrianopolis, ??-02-11.1995, in house, coll. B. Adis, 1 male 3 females 1 juv. (identified by H. Sturm -1985- though never published) with *Ct. rothschildi* (all the material INPA)

This synanthropic pan-tropical species was already known from Brazil though it is new to the Amazonas State. It was previously reported in the country from Rio de Janeiro and Recife (Wygodzinsky, 1948) and from Minas Gerais (Mendes, 1982).

Namunukulina funambuli Wygodzinsky, 1959

EXAMINED MATERIAL: Amazonas: Manaus, INPA, Estrada do Aleixo, 28.04.1976, coll. Paraluppi, 3 females 1 juv., with *A. collaris* and *Ct. rothschildi* (INPA)

The genus *Namunukulina* was never before reported from Brazil. Described from the Sri-Lanka, *N. funambuli* was assigned from South America in Peru (Wygodzinsky, 1959) and in Suriname (Paclt, 1966). Its capture in Manaus in association with two other synanthropic, Man-introduced silverfish, reinforces Wygodzinsky (*op. cit.*) suggestion of being a non-autochthon species in the Neotropics.

Ctenolepisma longicaudata Escherich, 1905

EXAMINED MATERIAL: Amazonas: BR-174, Km 45, 02.04.1982, coll. E. F. Ribeiro, 1 male. Manaus, Estrada de Stº. Agostinho, house, old books, 16.05.2000, coll. G. A. P. Melo, n. 2371, 2 females (all in the INPA)

This almost cosmopolite synanthropic species is new from the Amazonas State though it was previously assigned in Brazil from Santa Catarina, Rio de Janeiro, Recife and S. Paulo (Wygodzinsky, 1948) and Santos and Santa Catarina (Paclt, 1966).

Ctenolepisma rothschildi Silvestri, 1922

EXAMINED MATERIAL: Amazonas: Manaus, INPA, Estrada do Aleixo, 28.04.1976, coll. Paraluppi, 1 male with *A. collaris* and *N. funambuli*. INPA, 25.07.1977, coll. Paraluppi, 1 male; Id, 10.07.1978, coll. ?, 1 female; Id, coll. J. W. Morais,

21.04.1982, 1 juv.; Id, on books, 23.03.1994, coll. A. C. Ferreira, 1 female. Manaus, Petropolis, 21.02.1988, coll. S. S. Leite, n. 005, 1 male 1 female. INPA, Lab. Entomologia, 20-21.11.1994, coll. Albuquerque, 1 male 4 females ; Id, 24.05.1995, 1 male 6 females 7 juv. Id, Conjunto Adrianopolis, ?-02-11.1995, in house, coll. B. Adis, 1 male 3 females 1 juv. (already determined by H. Sturm -1985- but never published) with *A. collaris*. Manaus, Japiim II, direct collect on books, 10.03.2000, coll. E. C. Litaiff, n. 2100, 2 males 2 females. Manaus, Coroado II, direct collect, 08.05.2000, coll. A. C. Kaminski, n. 1264, 1 male. No locality, no date, 1 male (all the previous samples, INPA). Rio Grande do Norte: Pipa, inside the hotel, coll. A. Serrano, 19.11.2002, 1 male (CZ-5199)

The only specimen from Pipa, broken and far from well preserved, agrees however, fairly well, with the description of the species (Silvestri, 1907), its description as *C. diversisquamis* (Silvestri, 1908) and with the notes presented by Irish (1995) partially based on material from the Rio de Janeiro. Though frequently synanthropic and already known to occur in Brazil, the species is new to the Rio Grande do Norte State. Several small acarids (parasitic?, phoretic?) are attached to the pleural areas close to the thoracic sternites and to the base of the legs of this only Eastern Brazilian male.

Ctenolepisma targioniana Silvestri, 1908

EXAMINED MATERIAL: Amazonas: Manaus, Ponta Negra, Stº Agostinho, 12.12.1991, coll. Arruda, 4 males 4 females (INPA)

New to the Amazonas, the species was reported only once from Brazil, to the States of Rio Grande do Norte and Pernambuco (Wygodzinsky, 1952), where, like in the present case, it certainly concerns accidental introductions. Known in South America from Venezuela and from the Curaçao Island, its main (and, we believe, original) range corresponds to the central and eastern Africa, where it is known from the former Zaire, Rwanda, Uganda and Tanzania.

Fam. Nicoletiidae

Nicoletia phytophila Gervais, 1844

EXAMINED MATERIAL: Amazonas: Manaus, AM-1, Km 31, 08.05.1976, coll. Elisiana, 1 female; Id, Res. Duce, 04.12.1980, coll. J. A. Rafael, 3 females. Id, 19-20.03.1994, coll. A. M. C. Rebello, 1 female. Id, AM-010, Reserva Adolpho Duce, 02º 55' 51" S, 59º 58' 29" W, 01.03.2000, coll. N. de J. Fraga, decaying tree trunk, 3 females. Id, manual collect, decaying tree trunk, n. 2572, coll. R. Viana, 1 female. Id, n. 1190, coll. A. S. G. Silva, 1 female. Id, Km 26, 01.03.2000, coll. A. C. Kaminski, direct n. 2157, 1 female. Id, Km 30, 29.02.2000, tree trunk, coll. A. Alvan, 4 females. Id, 11-14.03.2000, coll. Câmara *et al.*, 1 juv. Id, P. Beserra, 1 female. Manaus, Parque Dez, 18.05.2000, coll. R. Viana, n. 2572, 1 female. Id, Estrada do Aleixo, Km 7, 20.05.1977, coll. Elisa, 1 female. Estrada BR-174, Km 30, 30.04.1976, coll. Paraluppi, 1 female. Id, campus FUA, 21.04.1988, coll. S. S. Leite, n. 006, 1 female 3 juv. Id, campus Ufam, 31.03.1994, coll. C. Delgado, 2 females. Id, Estrada V-08, Campus III, ??-07.1996, Berlese, n. 2439, coll. V. Câmara, 1 female. Id, INPA, 10.06.1988, coll. ?, 1 female. Id, 22.04.1994, coll. Kempson, Rocha e Silva, 1 female. Id, 20.05.1977, coll. F. Rufino, 1 female 1 juv. K30, 2F2,

06.02.1990, coll. M. O. Ribeiro, 1 juv. (all the material, INPA)

The species, widely distributed along warm areas and reported also from European greenhouses, known exclusively by females along most of its range, was already assigned from the Brazilian Amazonas (no precise location) by Wygodzinsky (1980) who adds the diagnostic features of the genus, some notes on the species and establishes the definitive synonymy of *Nicoletia (Anelpistina) meinerti* relatively to *N. phytophila*.

Acknowledgements

We are deeply obliged to our friend and colleague Prof. Artur Serano, from the Faculty of Sciences of the Lisbon University, by the offered samples from the Eastern Brazil, and to Dr. Augusto L. Henriques, researcher in the INPA, Manaus, for the loaned specimens from the Brazilian Amazonas; we thank, further, the corrections proposed by the referees.

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