

PTYCTIMOUS MITES (ACARI, ORIBATIDA) OF THE NEOTROPICAL REGION

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Abstract.— The fauna of ptyctimous mites of the Neotropical Region is described and analysed. The number of species known from this region is 305, including 20 Arthroptyctima and 285 Euptyctima, the latter comprising 92 Euphthiracaroida and 193 Phthiracaroida. Identification keys of supercohorts, superfamilies, families, genera, subgenera and species are provided. Among the Arthroptyctima the subgenus *Mesoplophora* (*Mesoplophora*) is the richest in species. Among the Euphthiracaroida the genera *Euphthiracarus*, *Rhysotritia* and *Oribotritia* are the richest in species. Among the Phthiracaroida there are 5 genera represented by a significant and similar number of species (143 in total): *Arphthacarus*, *Austrophthiracarus*, *Notophthiracarus*, *Protophthiracarus* and *Steganacarus*. Apart from *Rhysotritia*, all genera are represented almost entirely by the native, neotropical and endemic species.

Almost half of the known Neotropical species are new: 3 Mesoplophoroidea, 33 Euphthiracaroida (mainly of *Euphthiracarus*) and as many as 79 new species are Phthiracaroida (mainly of *Steganacarus*, *Arphthacarus* and *Notophthiracarus*).

Descriptions of these 115 new species has been given: *Mesoplophora* (*Mesoplophora*) *bacilla* sp. nov., *M. (M.) brachysetosa* sp. nov., *M. (M.) sparsa* sp. nov., *Oribotritia ampliata* sp. nov., *O. dispar* sp. nov., *O. geminata* sp. nov., *O. pumila* sp. nov., *O. recta* sp. nov., *O. varia* sp. nov., *O. vicinia* sp. nov., *Mesotritia atractos* sp. nov., *M. biramula* sp. nov., *M. multisetosa* sp. nov., *M. procerus* sp. nov., *M. recursa* sp. nov., *Indotritia allocotos* sp. nov., *I. tetradis* sp. nov., *I. vestigia* sp. nov., *Euphthiracarus* (*Euphthiracarus*) *breviculus* sp. nov., *E. (E.) clavatus* sp. nov., *E. (E.) diatropos* sp. nov., *E. (E.) heterosetosus* sp. nov., *E. (E.) lanceolatus* sp. nov., *E. (E.) modicus* sp. nov., *E. (E.) nasalis* sp. nov., *E. (E.) ornatus* sp. nov., *E. (E.) parabrasiliensis* sp. nov., *E. (E.) parasimilis* sp. nov., *E. (E.) paravesciculus* sp. nov., *E. (E.) reticulatus* sp. nov., *E. (E.) vesciculus* sp. nov., *Euphthiracarus* (*Pocsia*) *insolitus* sp. nov., *E. (P.) paradisparilis* sp. nov., *E. (P.) sudamericanus* sp. nov., *Rhysotritia bacula* sp. nov., *R. ischnos* sp. nov., *Microtritia mirifica* sp. nov., *Phthiracarus aethes* sp. nov., *P. catalaucus* sp. nov., *P. closteros* sp. nov., *P. octosetosus* sp. nov., *P. opiparus* sp. nov., *P. pandus* sp. nov., *P. paraclosteros* sp. nov., *P. parashiptoni* sp. nov., *P. phoxos* sp. nov., *Hoplophthiracrus cacainus* sp. nov., *H. penicillatus* sp. nov., *H. tryssos* sp. nov., *Steganacarus* (*Rhacaplacarus*) *aduncatus* sp. nov., *S. (R.) evexus* sp. nov., *S. (R.) fusticulus* sp. nov., *S. (R.) gladius* sp. nov., *S. (R.) longipilosus* sp. nov., *S. (R.) mekistos* sp. nov., *S. (R.) multipilosus* sp. nov., *S. (R.) sedecimus* sp. nov., *S. (R.) stenodes* sp. nov., *Steganacarus* (*Steganacarus*) *absidatus* sp. nov., *S. (S.) aspergillus* sp. nov., *S. (S.) diatropos* sp. nov., *S. (S.) fecundus* sp. nov., *S. (S.) paradoxus* sp. nov., *S. (S.) pararafalskii* sp. nov., *S. (S.) phasganus* sp. nov., *S. (S.) sculptilis* sp. nov., *S. (S.) tumidus* sp. nov., *Austrophthiracarus anceps* sp. nov., *A. gongylos* sp. nov., *A. heteropilosus* sp. nov., *A. minisetosus* sp. nov., *Arphthacarus aulicis* sp. nov., *A. bulbosus* sp. nov., *A. carinatus* sp. nov., *A. catalaucus* sp. nov., *A. dikroos* sp. nov., *A. eparmatos* sp. nov., *A. exacutus* sp. nov., *A. frondeus* sp. nov., *A. fusulus* sp. nov., *A. gyros* sp. nov., *A. humilis* sp. nov., *A. impolitus* sp. nov., *A. ogmos* sp. nov., *A. pedanos* sp. nov., *A. prolixus* sp. nov., *A. quadrus* sp. nov., *A. rotundus* sp. nov., *A. striolatus* sp. nov., *A. sulcatus* sp. nov., *Protophthiracarus contiguus* sp. nov., *P. diamphidios* sp. nov., *P. filaris* sp. nov., *P. kyphos* sp. nov., *P. oculus* sp. nov., *P. oidematos* sp. nov., *P. trisulcus* sp. nov., *Notophthiracarus brachistos* sp. nov., *N. curtatus* sp. nov., *N. dilatatus* sp. nov., *N. flagellatus* sp. nov., *N. heteropilosus* sp. nov., *N. lunatus* sp. nov., *N. mastigos* sp. nov., *N. meristos* sp. nov., *N. minusculus* sp. nov., *N. ogmos* sp. nov., *N. paraflagellatus* sp. nov., *N. plegados* sp. nov., *N. rabus* sp. nov.,

N. spiniformis sp. nov., *Atropacarus (Hoplophorella) brachys* sp. nov., *A. (H.) brevipilosus* sp. nov., *A. (H.) phymatos* sp. nov., *Atropacarus (Atropacarus) plumatus* sp. nov.

Total number of seven names are newly considered junior synonyms: *Steganacarus (Rhacaplacarus)* Niedbala, 1986 (= *Mantigueracarus* Balogh et Mahunka, 1992); *Steganacarus (Steganacarus)* Ewing, 1917 (= *Neosteganacarus* Balogh et Mahunka, 1992; = *Nortonacarus* Balogh et Mahunka, 1992); *Steganacarus (Steganacarus) rafalskii* (Niedbala, 1981) (= *Neosteganacarus cataracta* Balogh et Mahunka, 1992); *Austrophthiracarus diazae* Ojeda, 1985 (= *Calyptophthiracarus cucundus* Niedbala, 1988); *Atropacarus (Hoplophorella) hamatus* (Ewing, 1909) (= *Hoplophorella cucullata curassensis* Willmann, 1936; = *Hoplophorella cochlearia* Pérez-Iñigo et Baggio, 1933).

Newly described species are mostly endemic, the majority of them (54) come from Brazil, then from Chile (18), Mexico (10), Cuba (9) and Venezuela (7). In the other countries only single new species have been found. Most of them (over 70%) belong to Phthiracaroidea.

The number of species found in the two main zones of the Neotropical Region is as follows: 156 in Mesoamerica and 203 in South America. In Mesoamerica the number of Phthiracaroidea species is greater than those representing Eupthiracaroidea, while in South America the number of Phthiracaroidea is almost three times higher than that of Eupthiracaroidea.

In Mesoamerica there are more species of *Eupthiracarus* than those of *Austrophthiracarus* and *Notophthiracarus*. *Atropacarus (Atropacarus)* species have not been found in South America, while *Steganacarus* species have not been found in Mesoamerica. Species of the subgenus *Steganacarus (Steganacarus)* occur exclusively in Guyano-Brazilian subregion, whereas *Steganacarus (Rhacaplacarus)* occur mainly in this subregion.

Proportion of the widespread species to endemics is much higher in Mesoamerica, but the number of the Phthiracaroidea endemites in South America is three times higher than in Mesoamerica. The degree of similarity between the faunas of these zones is low.

The fauna of Mesoamerica is richer in species than that of South American subregions Guyano-Brazilian and Patagono-Andean, and is more similar in species to that of Guyano-Brazilian subregion than to that of Patagono-Andean. The degree of similarity of the faunas of Mesoamerica and the Patagono-Andean subregion and those of the Guyano-Brazilian and the Patagono-Andean subregions is low.

In Mesoamerica the subregion richest in species is the continental Central America. The fauna of the Antilles subregion, most similar to that of Central America and more similar to that of the Mexican Lowlands than Mexican Highlands, is less abundant. The faunas of the Mexican Highlands and the Mexican Lowlands are poorer in species but show clearly similar species composition. The most specific are the faunas of Central America and the Antilles, with dominant Phthiracaroidea. These faunas also show a much higher number of endemites relative to the number of widespread species. The species representing the two typically gondwanian genera *Notophthiracarus* and *Oribotritia*, are present in continental Central America but do not reach the Antilles or Mexico. The species of *Austrophthiracarus*, *Arphthiracarus*, *Protophthiracarus* and *Atropacarus (Hoplophorella)*, which are poorly represented in the Mexican subregions, are rather common in the continental Central America and the Antilles.

The fauna of the Antilles shows a clear affinity with that of the continental part of Mesoamerica, and low affinity with that of South America.

The fauna of the Greater Antilles is richer, more harmonious, stabilised, with many endemic species and fewer widespread species. The fauna of the Lesser Antilles is depauperated and disharmonic, less abundant and less specific, devoid of endemic species and shows typical features of the fauna of oceanic islands. The fauna of the whole Antilles is almost homogenous, the faunas of the Greater and Lesser Antilles are similar and this similarity is greater than that between of them and the fauna of the mainland (i.e. Central America). In the Greater Antilles the genera *Notophthiracarus* and *Atropacarus (Atropacarus)* are not represented.

Analysis of the faunas of the main three climatic zones has shown that the highest number of species has been found in the tropical zone. In the temperate zone there are more species than in the subtropical one, and in the temperate zone there are more Phthiracaroidea than in the tropical and subtropical zones. The contribution of native species is high and similar. The contribution of widespread species is highest in the sub-

tropical zone. The most similar are the the tropical and subtropical faunas, less similar are those of the tropical and temperate zones, and the least similar are the subtropical and temperate faunas.

Comparison of the faunas from the five climatic zones has shown that the greatest number of species occur in the equatorial zone, lower subsequently in the tropical, subtropical and temperate zone and the least in the circumpolar zone. In the subtropical and temperate zone there are many more Phthiracaroida than Euphthiracaroida species, while in the equatorial and tropical zones this disproportion is not so pronounced. To the south of the equatorial and tropical zones the number of genera represented decreases. In the temperate and circumpolar zones there are no Protophthiracaroida and no species of *Mesotritia*, *Euphthiracarus*, *Plonaphacarus*, *Hoplophthiracarus*, *Steganacarus*, *Protophthiracarus* and *Atropacarus* (*Hoplophorella*). The strongest endemism is found in the equatorial and temperate zones. Most similar are the faunas of the equatorial and tropical zones, less similar are those of the equatorial and subtropical zones, subtropical and temperate and tropical and subtropical zones. The fauna of the circumpolar climatic zone is most similar to that of the temperate zone.

From among the types of vegetation of South America the ptyctimous mites clearly prefer the habitats of evergreen forests (close to 85% of species found), while in the other habitats there can be up to a few species. In the evergreen forests there are many more Phthiracaroida than Euphthiracaroida species. The number of native species and, in particular endemic species is high. In dry forests, thorny forests and brushwoods there are a few species, practically the same as in the evergreen forests, but in the dry forests the most abundant are neotropical species and in the thorny forests and brushwoods the most often encountered are widespread species. In the sclerophyll forests and the forests with *Nothofagus* there are mainly native species, moreover, the majority of them are exclusive, not present in other habitats. In open spaces (savannah and steppes) there are mainly (savannah) or exclusively (steppes) native species. Moreover, the majority of the species encountered in the savannahs has also been found in the forests, while the species found in the steppes have been exclusive and not occurred in other habitats.

A comparative analysis of the faunas of the 12 subregions of South America and oceanic islands has proved that, as expected, the greatest number of species has been found in subtropical habitats Tupi (73), Hylea (42) and Conqueto (40). A significant number of species have been found in the temperate subregions, e.g. Chile (32), lower in Incasien and Subanden (25) and in the islands (23), while the lowest in the subregions covered by savannahs with brushwoods and in the mountains. In all subregions there are more representatives of Phthiracaroida than Euphthiracaroida, except on the islands and in the Guarani subregion, where the proportion is the reverse. The highest number of native and endemic species occurs in the tropical Tupi and in the temperate Chile. A large number of endemites are encountered in the Patagonian subregion and they mostly represent Phthiracaroida. The least specific in this aspect are Cariri, Pampa, the Andes and the islands. The lowest number of widespread species occur in the temperate habitats in Chile and the Patagonian subregion.

The ptyctimous mite fauna of the Cocos and Galapagos Islands originates from Mesoamerica or South America, However, the Cocos Islands are not the so-called stepping stones zone for the fauna migrating from the continent to the Galapagos.

The fauna of ptyctimous mites of the Neotropical Region is characterised by a great richness and diversity, a large number of endemites and is much richer than the faunas of the other regions of the world. The similarity of the ptyctimous mite fauna of the Neotropical Region with those of the Nearctic, Ethiopian and Australian Regions is slight. The fauna of South America is also not similar to that of New Zealand.



Key words.— Acari, Ptyctima, fauna, Neotropical Region, new species, zoogeography.