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A checklist of the marine Harpacticoida (Copepoda) of the Caribbean Sea

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Abstract

Recent surveys on the benthic harpacticoids in the northwestern sector of the Caribbean have called attention to the lack of a list of species of this diverse group in this large tropical basin. A first checklist of the Caribbean harpacticoid copepods is provided herein; it is based on records in the literature and on our own data. Records from the adjacent Bahamas zone were also included. This complete list includes 178 species; the species recorded in the Caribbean and the Bahamas belong to 33 families and 94 genera. Overall, the most speciose family was the Miraciidae (27 species), followed by the Laophontidae (21), Tisbidae (17), and Ameiridae (13). Up to 15 harpacticoid families were represented by one or two species only. Excluding the Bahamian records, the number of species recorded herein for the Caribbean Basin is 139. The distribution of the species richness within the Caribbean Basin is asymmetrical; the northwestern sector (Mexican Caribbean) is the most speciose, it concentrates up to 45% of the species recorded in the Caribbean. The insular Caribbean is nearly as diverse as the continental areas (75 vs 83 species recorded, respectively). The dominance of taxa related to coastal systems with coarse and fine sands and carbonate sediments reveals the general trend in the type of habitats surveyed in the Caribbean Sea. Up to 37 species found in the Mexican Caribbean represent new records for this country. There are enormous hiatuses in the knowledge of the Caribbean harpacticoids in terms of geographic, bathymetric, and environmental coverage. It is expected this list will grow rapidly and many undescribed forms will be discovered when understudied or unexplored environments are surveyed in detail.

Key words: marine biogeography, benthic communities, invertebrate taxonomy

Introduction

Copepods constitute a widely distributed group of micro-crustaceans with free-living, parasitic, and associated forms. Among the free-living copepods, the order Harpacticoida is the most conspicuous in the marine benthic habitats; they show an amazing diversity of forms, adapted to widely differing types of environments (Huys & Boxshall 1991). These copepods are usually the second most abundant taxon in the meiofauna after the nematodes, and have been regarded as an extremely diverse group (Boxshall & Halsey 2004). For instance, the family Canthocamptidae, the most diverse within the Harpacticoida, comprises more than 600 species dwelling mainly in brackish and freshwater benthic habitats.

The worldwide monographic account of the Harpacticoida written by Lang (1948) is a benchmark in the study of the marine harpacticoid fauna. There are, however, many other valuable taxonomic accounts focused on different regions of the northern hemisphere, including temperate and tropical areas of the Pacific (Lang 1965) and the Atlantic (Huys *et al.* 1996). However, there are extensive areas, particularly in the tropics, in which the knowledge on the marine harpacticoids is limited or non-existent. Reid (1990) recorded 218 species of Harpacticoida in the northwestern tropical Atlantic (NWTa); most of the records presented therein are from studies undertaken in the Bahamas, the Gulf of Mexico, and the Bermudas. In terms of the knowledge of the harpacticoid copepod fauna, the Gulf of Mexico is probably one of the best studied area of the NWTa region (Fleeger & Clark 1979; Bell *et al.* 1987, 1988; Murrell & Fleeger 1989; Rutledge & Fleeger 1993; Fiers 1995, 1996; Suárez-Morales *et al.* 2000; Lee *et al.* 2003; Suárez-Morales *et al.* in prep.). However, even in this relatively well-known area, records come from a reduced number of habitats, mainly shallow, coastal areas; the benthic fauna of the slope and the deeper waters is still largely unknown. Only a small fraction of these NWTa regional records are effectively assignable to the Caribbean Sea. There are only a few papers published in which reference is directly made to Caribbean species (see Chappuis & Delamare Deboutteville 1956; Coull 1970, 1971; Yeatman 1976; Mielke 1983, 1994, 1995; Fiers 1984, 1986 a, b; De Troch 2001; Morales-Ramírez 2001; Suárez-Morales & Avilés 2003). Mexico is the only country within the Caribbean for which a brief account of the benthic and planktonic harpacticoids exists (Suárez-Morales & Gasca 1998; Suárez-Morales *et al.* 2000). The scarceness of studies about this highly diverse group contrasts with the outstanding biological and habitat diversity of the Caribbean Basin.

Recent ecological surveys of the harpacticoid copepods dwelling in seagrass beds along the Yucatan coast of Mexico revealed high species diversity for the western Caribbean (De Troch 2001; De Troch *et al.* 2005). In the progress of these surveys, the lack of any checklist of the harpacticoids from this area was evident and stressed the urgent need of such an account to underpin further taxonomic and ecological research. Therefore, based on the analysis of published and unpublished literature generated in this basin, and on our own data, we present the first checklist of the species of Harpacticoida

known from the Caribbean Basin. We included all the Antillean Sea, a deep basin between the Lesser Antilles (60°W) and the eastern coast of the Yucatan Peninsula (87°W) and south of the Greater Antilles (Cuba, Hispaniola) to the coasts of Central America and the northern coasts of South America (Venezuela and Colombia) (12°N). Also included in this account are records from the Bahamas by Geddes (1968a–c, 1969, 1981) and Volkmann (1979); this group of islands is adjacent and geographically outside the Basin proper but, presumably, with a related copepod fauna.

Methods and selection of records

The records presented here were generated from: 1) original observations from specimens collected by ourselves at different times (Fiers 1986a, b, 1995; DeTroch *et al.* 2005); and 2) literature records. One of our main sources of data was the basic regional list for the Caribbean, Central America, and Mexico compiled by Reid (1990). The works by Geddes (1968 a–c, 1969), Coull (1970, 1971), and Mielke (1992, 1993, 1994, 1995) were also significant sources. Synonymies of each species have been revised herein and individual records have been checked where possible. Some species included in previous lists under other names were included in this one with the new nomenclature. The list contains both planktonic and benthic forms; records of the former group of species were assigned to the country in which the record was generated but most of these species are likely to be widely distributed in the Caribbean waters.

The checklist of marine free-living harpacticoid copepods collected in the Caribbean Basin is presented using the Huys *et al.* (1996) and Boxshall and Halsey (2004) taxonomic scheme at the family and suprafamilial levels. Nomenclature within families and genera was based on Bodin (1997).

Results

The list includes 178 species of Harpacticoida plus five species not yet identified but known to belong to the genus *Ectinosoma*; there are representatives of 33 families and 94 genera. At the genus level, the family Miraciidae was the most diverse (15 genera), followed by Laophontidae (11), Ameiridae (7), and Thalestridae (6). The most speciose family was the Miraciidae (27 species), followed by the Laophontidae (21 species), Tisbidae (17 species), Ectinosomatidae (10+5 undescribed), and the Ameiridae (13 species). There are 15 families represented by one or two species only. The most species-rich genera were *Tisbe* (13 species), *Phyllopodopsyllus* (9), *Stenhelia* (9), and *Paralaophonte* (6). The number of species within the Caribbean Basin is 139.

In the following checklist, an asterisk (*) indicates species originally described from specimens collected in the Caribbean. A cross (+) indicates species that are new records

for Mexico. Records within the Caribbean Basin are presented by country (between parentheses).

Subclass Copepoda Milne-Edwards, 1840

Order Harpacticoida Sars, 1903

Suborder Polyarthra Lang, 1944

Family Longipediidae Sars, 1911

Longipedia americana Wells, 1980 (Jamaica, Panama, Mexico)

Longipedia helgolandica Klie, 1949 (Costa Rica, Barbados)

Longipedia spec. Fiers, 1984 (Bonaire)

Family Canuellidae Lang, 1944

Ellucana secunda Coull, 1971 (Mexico, Barbados)

Coullana canadensis (Willey, 1923) (Jamaica)

Scottolana antillensis Fiers, 1984 (Jamaica)

Scottolana longipes (Thompson & Scott, 1903) (Jamaica)

Suborder Oligoarthra Lang, 1944

Family Aegisthidae Giesbrecht, 1892

Aegisthus aculeatus Giesbrecht, 1891 (Costa Rica)

Aegisthus mucronatus Giesbrecht, 1891 (Mexico)

Family Ambunguipediidae Huys, 1990

Ambunguipes rufocincta (Brady, 1880) (Mexico, Jamaica)

Lucayostratiotes cornuta (Geddes, 1969) (Bahamas)

Family Ameiridae Monard, 1927

Ameira parvula (Claus, 1866) (U.S. Virgin Islands)

Ameira parvuloides Lang, 1965 (Mexico) +

Karllangia obscura Mielke, 1994 (Costa Rica)*

Karllangia pulchra Mielke, 1994 (Costa Rica)*

Nitocra affinis Gurney, 1927 (Mexico)* +

Nitocra bisetosa Mielke, 1993 (Costa Rica)*

Nitocra laingensis Fiers, 1986 (Mexico)*

Parapseudoleptomesochra trisetosa (Krishnaswamy, 1957) (Venezuela)

Pseudoleptomesochrella incerta (Chappuis & Delamare Deboutteville, 1956)
(Bahamas)

Pseudoleptomesochrella venezolana Mielke, 1995 (Venezuela)*

Psyllocamptus bermudae Willey, 1930 (Mexico) +

Psyllocamptus quinquepinosus Coull, 1970 (Jamaica, U.S. Virgin Islands)*

Stenocopia longicaudata (T. Scott, 1892) (Mexico)+

Family Ancorabolidae Sars, 1909

Paralaophontodes echinatus (Willey, 1930) (Caribbean, Mexico) +

Family Canthocamptidae Sars, 1906

Mesochra pygmaea (Claus, 1863) (Barbados)

Mesochra sp. (Mexico)+

Family Cletodidae Sars, 1911

Cletodes dissimilis Willey, 1935 (Mexico) +

Enhydrosoma herrerae Bell & Kern, 1983 (Mexico) +

Enhydrosoma lacunae Jakubisiak, 1933 (Cuba)

Enhydrosomella sp. (Mexico) +

Stylicletodes stylicaudatus (Willey, 1929) (Mexico) +

Family Cletopsyllidae Huys & Willems, 1989

Retrocalcar brattstroemi (Geddes, 1981) (Bahamas)

Cletopsyllus rotundifera Fiers, 1986 (Curaçao)*

Family Clytemnestridae A. Scott, 1909

Clytemnestra rostrata (Brady, 1883) (Cuba)

Clytemnestra scutellata Dana, 1849 (Cuba, Mexico)

Family Cristacoxidae Huys, 1990

Cubanocleta noodti Petkovski, 1977 (Cuba)*

Family Euterpinidae Brian, 1921

Euterpina acutifrons Dana, 1849 (Mexico, Cuba, Curaçao, Jamaica, Panama, Puerto Rico, Trinidad & Tobago)

Family Leptopontidae Lang, 1948

Arenopontia gussoae Cottarelli, 1973 (Cuba) *

Family Leptastacidae Lang, 1948

- Cerconeotes jenniferi* (Lindgren, 1975) (Cuba, Panama)
Leptastacus spec. Coull, 1971 (U.S. Virgin Islands)

Family Darcythompsonidae Lang, 1936

- Darcythompsonia inopinata* Smirnov, 1934 (Aruba, Mexico)
Kristensenia pallida Por, 1983 (Bonaire)
Leptocaris echinatus Fiers, 1986 (Curaçao)*
Leptocaris glaber Fiers, 1986 (St. Martin)*
Leptocaris trisetous (Kunz, 1935) (Bahamas)

Family Ectinosomatidae Sars, 1903

- Arenosetella palpilabra* (Nicholls, 1935) (Bahamas)
Arenosetella panamensis Mielke, 1981 (Panama)*
Arenosetella sp. (Mexico)* +
Ectinosoma virginensis Coull, 1971 (U.S. Virgin Islands)
Halectinosoma dimorphum Coull, 1970 (Barbados, U.S. Virgin Islands)
Halectinosoma gothiceps (Giesbrecht, 1881) (U.S. Virgin Islands)
Microsetella norvegica (Boeck, 1864) (Jamaica, Puerto Rico)
Microsetella rosea (Dana, 1849) (Mexico, Cuba)
Noodtiella hoodensis Mielke, 1979 (Cuba, Panama)
Pseudobradya pulchera Sars, 1920 (Barbados, U.S. Virgin Islands)
Pseudobradya spec. Coull, 1971 (U.S. Virgin Islands)
5 *Ectinosoma* sp. not identified to species (Mexico) +

Family Harpacticidae Sars, 1904

- Harpacticus dubitabilis* Herbst, 1960 (Nicaragua)*
Harpacticus gracilis Claus, 1863 (U.S. Virgin Islands)
Harpacticus gurneyi Jakubisiak, 1933 (Jamaica, Mexico)
Zausodes arenicolus C.B. Wilson, 1932 (Jamaica, Barbados)
Zausodes areolatus Geddes, 1968 (Barbados, Bahamas)
Zausodes septimus Lang, 1965 (U.S. Virgin Islands)

Family Laophontidae T. Scott, 1905

- Afrolaophonte renaudi* (Chappuis & Delamare Deboutteville, 1956) (Bahamas)
Echinolaophonte armiger (Gurney, 1927) (Mexico) +
Echinolaophonte mirabilis (Gurney, 1927) (Mexico) +
Galapagolaophonte triarticulata (Coull & Zo, 1980) (Panama)*
Klieonychocamptoides arenicola (Chappuis & Delamare Deboutteville, 1956)
(Bahamas)

- Laophonte cornuta* Philippi, 1840 (Mexico, U.S. Virgin Islands)
Laophonte plana Fiers, 1986 (Curaçao)*
Laophonte spinicauda (Vervoort, 1964) (Guadeloupe, U.S. Virgin Islands)
Laophontina spec. Coull, 1971 (U.S. Virgin Islands)
Lipomelum heteromelum Fiers, 1986 (Aruba)*
Lipomelum variabile Fiers, 1986 (Aruba, Curaçao, Jamaica)*
Loureirophonte majahualensis Fiers, 1993 (Mexico)*
Mexicolaophonte arganoi Cottarelli, 1977 (Curaçao, Hispaniola)
Mexicolaophonte sp. Mielke, 1982 (Panama)
Onychocampus mohammed (Blanchard & Richard, 1891) (Mexico, Cuba)
Paralaophonte brevirostris (Claus, 1863) (Bahamas)
Paralaophonte brevirostris fissirostris (Willey, 1935) (Jamaica, Barbados, U.S. Virgin Islands)
Paralaophonte congenera (Sars, 1908) (Jamaica, Mexico) +
Paralaophonte zimmeri (Douwe, 1929) (Bahamas)
Paralaophonte sp. 1 (Mexico)* +
Paralaophonte sp. 2 (Mexico)* +

Family Leptopontiidae Lang, 1948

- Arenopontia (Neoleptastacus) longiremis* (Chappuis, 1954) (Bahamas)
Psammopsyllus falciseta Mielke, 1983 (Cuba)*
Psammopsyllus stri Mielke, 1983 (Panama)*

Family Louriniidae Monard, 1927

- Lourinia armata* (Claus, 1866) (Mexico)

Family Metidae Sars, 1910

- Metis holothuriae* (Edwards, 1891) (Mexico)

Family Miraciidae Dana, 1846

- Amphiascoides subdebilis* (Willey, 1935) (Mexico, Barbados) +
Amphiascoides walteri Suárez-Morales, 2004 (Mexico)*
Amphiascus dentiformis Coull, 1971 (U.S. Virgin Islands)
Amphiascus parvus Sars, 1906 (Mexico) +
Bulbamphiascus imus (Brady, 1872) (U.S. Virgin Islands)
Haloschizopera sp. (Mexico) +
Macrosetella gracilis (Dana, 1849) (Mexico, Cuba, Costa Rica)
Miracia efferata Dana, 1852 (Mexico, Cuba, Jamaica, Puerto Rico)
Oculosetella gracilis (Dana, 1852) (Cuba)
Paramphiascopsis ekmani Lang, 1965 (Mexico) +

Psammotopa trisetosa Mielke, 1995 (Venezuela) +
Pseudodiosaccopsis brunneus (Willey, 1932) (Mexico) +
Robertgurneya rostrata (Gurney, 1927) (Jamaica, U.S. Virgin Islands)
Robertsonia irrasa (A. Scott, 1902) (Barbados)
Robertsonia knoxi (Thompson & A. Scott, 1903) (Jamaica, Mexico) +
Schizopera haitiana Kiefer, 1934 (Hispaniola)*
Schizopera triacantha Kiefer, 1934 (Mexico)
6 new species of *Stenhelia Delavalia* (Mexico)* +
3 new species of *Stenhelia Stenhelia* (Mexico)* +
Typhlamphiascus pectinifer Lang, 1965 (Mexico) +

Family Orthopsyllidae Huys, 1990

Orthopsyllus linearis s.str. (Claus, 1866) (Mexico, Barbados)+

Family Paramesochridae Lang, 1944

Apodopsyllus africanus Kunz, 1962 (Barbados)
Apodopsyllus cubensis Mielke, 1988 (Cuba)*
Apodopsyllus vermiculiformis Lang, 1965 (Mexico) +
Kliopsyllus regulextans Mielke, 1984 (Panama)*
Kliopsyllus similis Mielke, 1984 (Panama)*

Family Parastenheliidae Lang, 1944

Parastenhelia hornelli Thompson & Scott, 1903 (Jamaica, Barbados, U.S. Virgin Islands)

Family Peltidiidae Sars, 1904

Peltidium nichollsi Geddes 1968c (Bahamas)
Peltidium lernerii Geddes, 1968c (Bahamas)
Peltidium perturbatum Geddes, 1968c (Bahamas)
Peltidium fenestratum Geddes, 1968c (Bahamas)

Family Porcellidiidae Boeck, 1865

Porcellidium ovatum Haller, 1879 (Bahamas)
Porcellidium trisetosum Geddes, 1968c (Bahamas, Mexico) +

Family Paranannopidae Por, 1986

Sentiropsis minuta (Coull, 1969) (Barbados)

Family Rhizothrichidae Por, 1986

Rhizothrix n.sp. (Mexico) * +

Family Tegastidae Sars, 1904

- Tegastes* sp (Geddes, 1968c) (Bahamas)
Tegastes sp. 1 (Mexico) * +
Syngastes cornalinus Monard, 1924 (Bahamas)
Syngastes pietschmanni Pesta, 1932 (Bahamas)
Syngastes glomeratus Geddes, 1968c (Bahamas)
Syngastes gibbus Geddes, 1968c (Bahamas)
Syngastes langi Geddes, 1968c (Bahamas)

Family Tetragonicipitidae Lang, 1944

- Diagoniceps laevis* Willey, 1930 (Mexico) +
Godianiceps maya Fiers, 1995 (Mexico) *
Laophontella typica Thompson & A. Scott, 1903 (Bahamas)
Odaginiceps clarkae Fiers, 1995 (Mexico) *
Oniscopsis robinsoni Chappuis & Delamare Deboutteville, 1956 (Bahamas)
Phyllopodopsyllus bahamensis Geddes, 1968a (Bahamas)
Phyllopodopsyllus opisthoceratus Geddes, 1968a (Bahamas)
Phyllopodopsyllus parafurciger Geddes, 1968a (Bahamas)
Phyllopodopsyllus carinatus Mielke, 1992 (Costa Rica) *
Phyllopodopsyllus chavei Coull, 1970 (Barbados)
Phyllopodopsyllus gertrudi costaricensis Mielke, 1992 (Costa Rica) *
Phyllopodopsyllus setouchiensis Kitazima, 1981 (Costa Rica)
Phyllopodopsyllus spec. Coull, 1970 (Barbados)
Phyllopodopsyllus n. sp. *pauli*-group (Mexico) +

Family Thalestridae Sars, 1905

- Dactylopusia tisboides* (Claus, 1863) (Jamaica, Mexico) +
Diarthrodes tetrastachyus Yeatman, 1976 (Jamaica, Mexico)
Eudactylopus lucayosi Geddes, 1969 (Bahamas)
Eudactylopus robustus (Claus, 1863) (Bahamas)
Idomene aemula (Thompson & Scott, 1903) (Barbados)
Idomene purpurocineta (Norman & Scott, 1905) (Mexico) +
Paradactylopodia cf. *brevicornis* (Claus, 1866) (Mexico) +
Phyllothalestris harringtoni Willey, 1935 (Bahamas)
Phyllothalestris mysis (Claus, 1863) (Jamaica)

Family Tisbidae Stebbing, 1910

- Scutellidium longicauda* (Philippi, 1840) (Jamaica, Mexico)
Tisbe acanthifera Vervoort, 1962 (Bahamas)
Tisbe bermudensis Willey, 1930 (Bahamas)

- Tisbe biminiensis* Volkmann-Rocco, 1973 (Bahamas)
Tisbe coulli Volkmann, 1979a (Bahamas)
Tisbe cucumariae Humes, 1957 (Bahamas)
Tisbe ensifer Fischer, 1860 (Trinidad & Tobago)
Tisbe furcata (Baird, 1837) (Puerto Rico)
Tisbe iantina Volkmann, 1979a (Bahamas, Panama)
Tisbe longipes Volkman, 1979a (Bahamas)
Tisbe ramphigera Volkmann, 1979c (Barbados, U.S. Virgin Islands)
Tisbe tenera (Sars, 1905) (Barbados)
Tisbe variana Volkmann, 1979a (Bahamas, Panama)
Tisbe spec. Coull, 1971 (U.S. Virgin Islands)
Tisbella alba Volkmann, 1979b (Bahamas)
Tisbella pulchella (C.B. Wilson, 1932) (Bahamas)
Tisbella rosea Volkmann, 1979b (Bahamas)

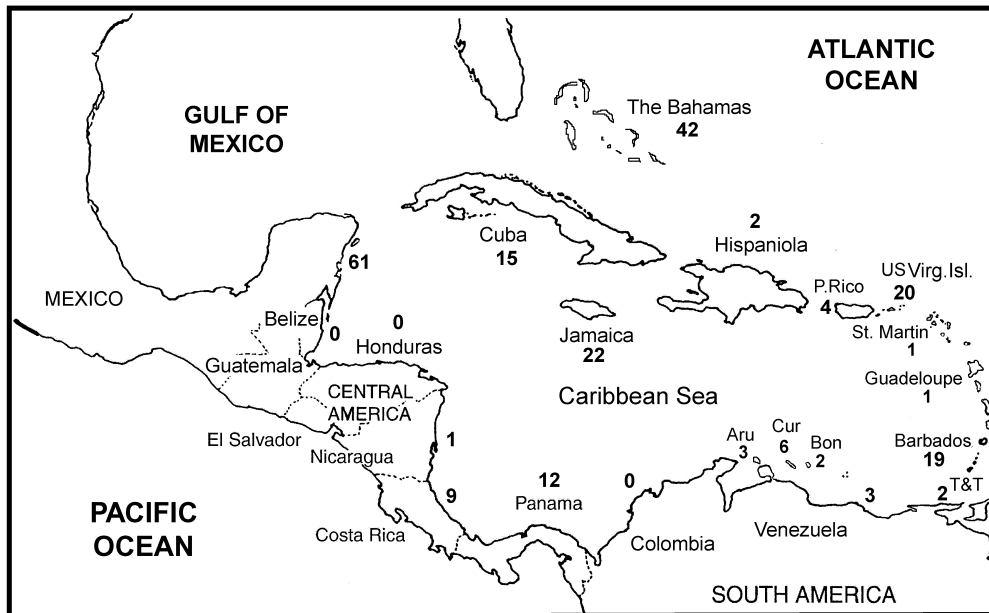


FIGURE 1. The Caribbean Basin showing the countries in which harpacticoids have been recorded and the number of records of Harpacticoida related to each country/island.

Comments

The following diversity considerations and comparisons are referred to species recorded within the Caribbean Basin only; hence, records from the Bahamas are excluded. Out of this group of 39 Bahamian species only three have been found in the Caribbean. The distribution of the species richness (number of species) of Harpacticoida in the Caribbean

is quite asymmetrical when considering each of the three large zones of this basin (eastern, central, western) and the different countries from which these records come (see Fig. 1). The westernmost sector of the Basin (Mexico, Costa Rica, Cuba, Nicaragua) has 81 species, the highest known diversity and 59 % of all species recorded in the Caribbean. The central fringe (Panama, Jamaica, Colombia, Hispaniola) has 33 species, which is 24 % of all the species recorded from the Caribbean. Forty-eight species (35 % of Caribbean total) are known from the easternmost part of the Caribbean (Venezuela, Puerto Rico, U.S. Virgin Islands, Lesser Antilles). The diversity of the Harpacticoida is less asymmetrical when the insular and the continental areas of the Caribbean are compared: 83 species in the continental areas and 75 in the islands; most of the diversity recorded in continental areas (61 species) are from the Mexican coasts. The U.S. Virgin Islands, Barbados, and Jamaica are the islands around which the harpacticoid fauna is best known, with approximately 20 species records for each island. In terms of number of individual records in the insular and continental countries, there are 94 records from the islands and 79 from the continental Caribbean.

Discussion

In the regional frame, previous to this work, there were 75 nominal species of Harpacticoida known within the geographic limits of the Caribbean (Coull 1970, 1971; Fiers 1984, 1986 a, b, 1995; Reid 1990; Suárez-Morales & Gasca 1998); hence, the 57 species added, have not been hitherto recorded in this basin and some are undescribed forms; this new figure (132 species) represents an increase of 75%. Up to 36 species were described from specimens collected in the Caribbean and some of them, not found elsewhere, could be considered as probable endemics of this basin. There are 42 species of Harpacticoida recorded in the Bahamas, which remains as one of the best studied areas in the NWTA.

There are 37 species recorded in the Mexican Caribbean not previously reported from Mexico (Suárez-Morales & Gasca, 1998; Suárez-Morales *et al.* 2000) (marked with a cross in the list). These new records represent an increase of more than 75 % to the knowledge of the Mexican marine harpacticoid fauna. Studies on the free-living marine (coastal, neritic, oceanic) copepods from Mexican waters, including the Gulf of Mexico, the Mexican Caribbean, and the Pacific Ocean yielded more than 475 species (Suárez-Morales *et al.* 2000). As in other local or regional accounts of the free-living copepods, the benthic harpacticoids represented only a small fraction of this survey with only 36 species reported. It is important to note that this substantial increase in the number of species recorded in Mexican waters was based on a short-term survey in a geographically small area and restricted to only one habitat type (seagrass beds) in the Mexican Caribbean (De Troch *et al.* 2005). Thus, it is expected the local and regional lists could grow rapidly as taxonomically oriented investigations are developed.

There is a strong asymmetry in the distribution of the records of Harpacticoida in the Caribbean region. The known diversity of the harpacticoid fauna of the insular and continental Caribbean is similar, but the former is currently better known in terms of number of records, than that of the continental areas. In contrast to areas/countries with many records and a relatively high diversity, there are several countries and Antillean islands for which there no records of marine Harpacticoida published (e.g. Belize, Colombia, Lesser Antilles Islands) (see Fig. 1).

The Harpacticoida is an extremely diverse group of copepods, with well over 3,000 species belonging to 460 genera and 52 families (Huys *et al.* 1996; Boxshall & Halsey 2004). The relatively low diversity of the Caribbean harpacticoid fauna (178 species, 94 genera) with respect to other regions, such as the northeast Atlantic, where Huys *et al.* (1996) recognized more than 800 species and 190 genera, is probably related to the scarceness of regional specialists and the relatively low taxonomically-oriented efforts dedicated to unveil this diverse fauna. However, some other well-explored areas, such as the Californian (Lang 1965), and the Brazilian (Reid 1998) coasts also have a relatively low number of species (179 and 104, respectively) recorded.

Most of the benthic species recorded in the Caribbean are coastal-neritic forms dwelling in different habitats. Within the harpacticoid communities there are familial, and in many instances generic and specific, associations with particular habitat types. While much of this parallelism (*sensu* Thorson 1957) in community structure around the world is the result of certain families being interstitial (and thus in sandy sediments), others being burrowers (in muds), others being strictly epiphytic (and thus in the phytal), the specificity of the assemblages is remarkable (Hicks & Coull 1983). This high level of habitat specificity was also true for the copepod families recorded from different Caribbean environments: coarse grained sands tend to be dominated by epibenthic forms of the Laophontidae, so far the most diverse family in the Caribbean records. Also found in these habitats are Ectinosomatidae and Miraciidae (*Amphiascus*) and representatives of these taxa are present in the Caribbean. According to Boxshall and Halsey (2004), the families Cylindropsyllidae, Paramesochridae, some Ectinosomatidae (*Arenosetella*), and some Ameiridae (*Ameira*, *Parapseudoleptomesochra*) are typical of fine and medium sandy sediments; representatives of all these taxa are present in the Caribbean.

Shallow muddy substrates harbor forms of *Ectinosoma* and in the Caribbean there are at least five new species in this genus (which are in the process of description by these authors). Also present in these muddy substrates are species of Cletodidae, Miraciidae (*Robertsonia*, *Stenhelia*), Canuellidae and Longipediidae. Up to nine undescribed species of *Stenhelia* are present in the Caribbean.

Calcareous shell-gravel and carbonate sands harbor Tetragonicipitidae, represented by six genera and 14 species in the Caribbean; up to nine species of the diverse genus *Phyllopodopsyllus* have been known to occur in Caribbean waters. According to Boxshall and Halsey (2004), this is among the most distinctive taxa of this habitat. The Tegastidae and Thalestridae, mainly epiphytic forms, are also represented in the Caribbean fauna as

part of the fauna of intertidal habitats (e.g. seagrass beds) that have been surveyed recently (De Troch 2001; De Troch *et al.* 2005). The shallow, coastal areas have received most attention and sampling effort from the copepodologists in the Caribbean region, however, it is expected other Caribbean habitats such as the estuaries, rocky beaches, and reef-related areas (in particular), will reveal an even larger number of taxa. For instance, in a tropical reef lagoon of the tropical Pacific, Villiers and Bodiou (1996) found a quite speciose assemblage of which more than one third of the taxa were undescribed. This reef-related community was dominated by miraciid genera such as *Stenhelia* and *Amphiascus*. The world's second largest coral reef barrier runs along the western Caribbean and this area constitutes an amazingly large and yet unexplored habitat for harpacticoid copepods, as do other unexplored areas of the Caribbean such as the deeper areas off the narrow slope and the bathyal floors.

The majority of harpacticoid research carried out in the Caribbean and the NWT region is ecologically oriented. However, this highlights the need for reliable taxonomic work in the region; on which ecological interpretations can be based.

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