Zootaxa 1839: 1–42 (2008)
www.mapress.com/zootaxa/

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

DNA barcodes for Cladocera and Copepoda from Mexico and Guatemala, highlights and new discoveries

MANUEL ELÍAS-GUTIÉRREZ[1], FERNANDO MARTÍNEZ JERÓNIMO[2], NATALIA V. IVANOVA[3], MARTHA VALDEZ-MORENO[1] & PAUL D. N. HEBERT[3]

[1]*El Colegio de la Frontera Sur, Av. Centenario km 5.5, Chetumal 77014, Quintana Roo, México. E-mail: melias@ecosur.mx; mvaldez@ecosur.mx*

[2]*Escuela Nacional de Ciencias Biológicas, Instituto Politécnico Nacional (ENCB–IPN). Apdo. Postal CON–252, Mexico, D.F. 0640 , Mexico. E-mail: fjeroni@ipn.mx*

[3]*Biodiversity Institute of Ontario, University of Guelph, Guelph N1G 2W1, Ontario, Canada. E-mail: nivanova@uoguelph.ca; phebert@uoguelph.ca*

Table of contents

Accepted by K. Meland: 17 Jun. 2008; published: 1 Aug. 2008

Abstract

DNA barcoding, based on sequence diversity in the mitochondrial COI gene, has proven an excellent tool for identifying species in many animal groups. Here, we report the first barcode studies for freshwater zooplankton from Mexico and Guatemala and discuss the taxonomic and biological implications of this work. Our studies examined 61 species of Cladocera and 21 of Copepoda, about 40% of the known fauna in this region. Sequence divergences among conspecific individuals of cladocerans and copepods averaged 0.82% and 0.79%, respectively, while sequence divergences among congeneric taxa were on average 15-20 times as high. Barcodes were successful in discriminating all species in our study, but sequences for Mexican *Daphnia exilis* overlapped with those of *D. spinulata* from Argentina. Our barcode data revealed evidence of many species overlooked by current classification systems —for example, based on COI genotypes the *Diapahanosoma birgei* group appears to include 5 species, while *Ceriodaphnia* cf. *rigaudi*, *Moina* cf. *micrura*, *Mastigodiaptomus albuquerquensis* and *Mastigodiaptomus reidae* all include 2–3 taxa. The barcode results support recent taxonomic revisions, such as recognition of the genus *Leberis*, and the presence of several species in the *D. birgei* and *Chydorus sphaericus* complexes. The present results indicate that DNA barcoding will provide powerful new insights into both the incidence of cryptic species and a better understanding of zooplankton distributions, aiding evaluation of the factors influencing competitive outcomes, and the colonization of aquatic environments.

Key words: CO1, mitochondrial DNA, Anomopoda, Ctenopoda, Branchiopoda, Maxillopoda

Introduction

Species boundaries in the two main freshwater crustacean groups, Cladocera and Copepoda, have long been uncertain. More than 25 years ago, Frey (1982) began to question the presumed broad distributions of cladocerans, suggesting that many species are regional endemics, similar to the accepted situation in calanoid copepods. The status of cyclopoid copepods remains uncertain. Some species, such as *Acanthocyclops robustus* (Sars), have been regarded as cosmopolitan, but there is increasing evidence for overlooked taxa. For example, the American species *Acanthocyclops rebecae* Fiers & Ghenne was recently split from this taxon (Fiers *et al.* 2000). Viewed collectively, it is clear that taxonomic knowledge of freshwater zooplankton is incomplete. Studies of their diversity in ‘frontier’ regions such as Mexico have revealed many new species since the early 90’s, although only a small percentage of habitats has been surveyed (Elías-Gutiérrez 1995; Elías-Gutiérrez *et al.* 1999; Elías-Gutiérrez *et al.* 2006; Elías-Gutiérrez & Suárez-Morales 2003; Grimaldo-Ortega *et al.* 1998; Suárez-Morales & Elías-Gutiérrez 2003; Suárez-Morales *et al.* 2005). It seems unlikely that taxonomic knowledge can be advanced rapidly without the adoption of new methods because the few specialists that can discriminate microcrustaceans are flooded with material. Furthermore, identifications are time-consuming and technically challenging because adults of most species are less than 0.5 mm in length and species-level assignments typically require the detailed analysis of thoracic limb morphology.

DNA barcodes, based on a segment of the mitochondrial gene cytochrome *c* oxidase subunit 1 (COI), have demonstrated their value as a powerful identification tool (Hebert *et al.* 2003a). Their ability to deliver identifications has now been validated in many animal groups (Smith *et al.* 2005; Hebert *et al.* 2004; Hogg & Hebert 2004; Ward *et al.* 2005). However, most prior barcode studies on crustaceans have focused on marine species such as decapods and euphasiids (Bucklin *et al.* 2007; Costa *et al.* 2007). Among the few studies on copepods, Bucklin *et al.* (1999) did show the efficacy of COI divergences in separating three species of marine calanoids. The discovery of deep COI divergences in the intertidal harpaticoid, *Tigriopus californicus* (Baker) by Burton & Bang-Ning (1994) was later attributed to the possible presence of sibling species (Ganz & Burton 1995). Much less barcode work has been done on freshwater crustaceans. Adamowicz *et al.* (2007) provide some results for Argentinian Centropagidae and a few studies have probed the effectiveness of barcodes in the cladoceran genus *Daphnia*. Penton *et al.* (2004) discriminated two cryptic species within the *Daphnia obtusa* Kurz complex in North America using COI sequences. Adamowicz *et al.* (2004) showed that all 15 species of *Daphnia* from Argentina could be separated with the same gene. Other studies have revealed deep genetic divergences among allopatric populations of single species. For example, Hebert *et al.* (2003b) uncovered five phylogroups (four in North America and one in South America) of *Daphnia ambigua* Scourfield, most showing more than 3% divergence. Similarly, a study on *Sida crystallina* (O.F. Müller) revealed six phylogroups showing COI sequence divergences as high as 5% (Cox & Hebert 2001). Finally, De Gelas & De Meester (2005) noted that populations of *Daphnia magna* Straus showed little COI divergence within Europe, but clear divergence from North American populations. The record level of 'intra-specific' divergence (9.5%) exists between African and Australian populations of *Daphnia lumholtzi* Sars. In each of these cases, genetically divergent populations are allopatric, impeding assessment of whether the lineages are reproductively isolated, but this seems likely in cases of deep divergence such as *D. lumholtzi*.

It is clear that barcodes (Hebert *et al.* 2003a, Padial & de la Riva 2007) can aid taxonomic studies on freshwater microcrustaceans in two ways: by speeding species identification, and highlighting cryptic species. Nevertheless, COI does have limitations derived from its maternal inheritance: hybrid individuals, which are common in several cladocerans, cannot be distinguished from their maternal parent.

The present study seeks firstly to test the ability of DNA barcodes to identify species of freshwater microcrustaceans from the megadiverse region of Mexico, ranging from the northern semi-desert region to the humid tropical south, including a few localities in the north of Guatemala. Some material from Canada, USA and Europe was also used for comparative purposes.

Methods

Specimens were collected with a plankton net (50 µm mesh size) from diverse freshwater environments (permanent and intermittent), ranging from the southern tropical forests of Guatemala to the semi-deserts of northern Mexico. The sampling polygon extended from 16–26 degrees N and 88–106 degrees W. Specimens of *Ceriodaphnia* cf. *dubia* and topotypes of *Diaphanosoma birgei* Korinek, 1981 were collected from two Canadian localities. Sampling localities are shown in Fig. 1.1 while specific geographic co-ordinates and collection dates for all localities are recorded in the project files 'Cladocera of Mexico', 'Copepoda from Mexico and Guatemala', '*Leberis* of Mexico' and '*Leptodiaptomus*' in the Barcode of Life Data System (Ratnasingham & Hebert 2007). Cultures were established for 21 species of Cladocera at the Experimental Hydrobiology Laboratory at Escuela Nacional de Ciencias Biológicas (IPN, Mexico). They were kept at 22±2 °C in reconstituted moderately hard water (U.S. Environmental Protection Agency 2002) and fed with the microalgae *Ankistrodesmus falcatus*, *Pseudokirchneriella subcapitata* (formerly *Selenastrum capricornutum*) and *Chlorella vulgaris*.

Specimens from the third cultured generation or later were fixed in 96% ethanol before molecular analysis. All other specimens were fixed shortly after capture in 96% ethanol.

Whenever possible, we barcoded at least five adults of each species from every population. Representative and apparently conspecific individuals from each locality were photographed and are kept as vouchers in the Reference Collection at El Colegio de la Frontera Sur. All identifications were based on specialized literature and direct comparison with previously deposited material in the same collection.

Sequence analysis was carried out at the Canadian Centre for DNA Barcoding using standard protocols (Hajibabaei *et al.* 2005). DNA was extracted from the whole body homogenates using a mix of Proteinase K with invertebrate lysis buffer (Ivanova *et al.* 2006) and digested overnight at 56ºC. Genomic DNA was subsequently extracted using a membrane-based approach on a Biomek NX© liquid handling station employing AcroPrep 96, 1 ml filter plates with 3.0 µm glass fiber media over 0.2 µm BioInert membrane (PALL) (Ivanova *et al.* 2006). A 658 bp segment of COI was amplified using LCOI490 and HCO2198 primers (Folmer *et al.* 2004). The 12.5 µl PCR reaction mixes included 6.25 µl of 10% trehalose, 2 µl of ultrapure water, 1.25 µl of 10X PCR buffer, 0.625 of MgCl2 (50 mM), 0.125 µl of each primer (0.01 mM), 0.0625 µl of each dNTP (0.05 mM), 0.3125 U of TaqDNA polymerase (New England Biolabs or Platinum Taq from Invitrogen), and 2.0 µl of DNA template. PCR products were visualized on pre-cast agarose gels (E-Gels©, Invitrogen) and the most intense products were selected for sequencing.

Products were labelled with BigDye© Terminator v. 3.1 Cycle Sequencing Kit (Applied Biosystems, Inc.) and sequenced bidirectionally on an ABI 3730 capillary sequencer. Sequence data, trace files, and primer details for all specimens are available within the two project files on the Barcode of Life Data System (http://www.barcodinglife.org) and on GenBank. Bidirectional sequences were assembled and simultaneously aligned in SeqScape 2.1.1 (Applied Biosystems) against the reference sequence of *Daphnia pulex* using the following settings for the analysis protocol: Kb.bcp basecaller for DyeSet/Primer KB_3730_POP7_BDTv3.mob; data was processed as a true profile with a quality threshold 'assign N's to basecalls with QV<15'; no mixed bases identification; N calls were identified by removing bases from the end until there were fewer than 4 Ns out of 20 bases; reference trimming was used to remove primer sequences. The filter settings were as follows: maximum mixed bases (%) – 20; maximum Ns (%) – 30, maximum clear range (bp) – 50; maximum sample score – 10. After automatic assembly each sequence was manually edited.

Sequences collected in this study were compared with COI sequences in GenBank for *Daphnia cheraphila* Hebert & Finston, *D. lumholtzi* Sars, *D. magna* Straus, *D. parvula* Fordyce and *D. spinulata* Birabén (see Table 1 for accession numbers). Sequence divergences were calculated using the Kimura two parameter (K2P) distance model (Kimura 1980). Neighbour-joining (NJ) trees based on K2P distances were created to provide a graphic representation of the patterning of divergence between species (Saitou & Nei 1987) and a simplified tree was constructed using the MEGA 3 software (Kumar *et al*. 2004).

TABLE 1. GenBank accesion numbers for sequences used for comparison.

Accession numbers	Species	Localities
AY380451	*Daphnia cheraphila*	NA (thesis MC Adamowicz)
AF308970 AY921417	*Daphnia lumholtzi*	New South Wales, Australia
AF308974	*Daphnia lumholtzi*	Mississipi, USA
AY803040 to AY803081, DQ166849 AF217106	*Daphnia magna*	Europe, USA and Canada
AY323126	*Daphnia parvula*	Río Coronda, Argentina
AY323099 to AY323120	*Daphnia spinulata*	Diverse localities Argentina

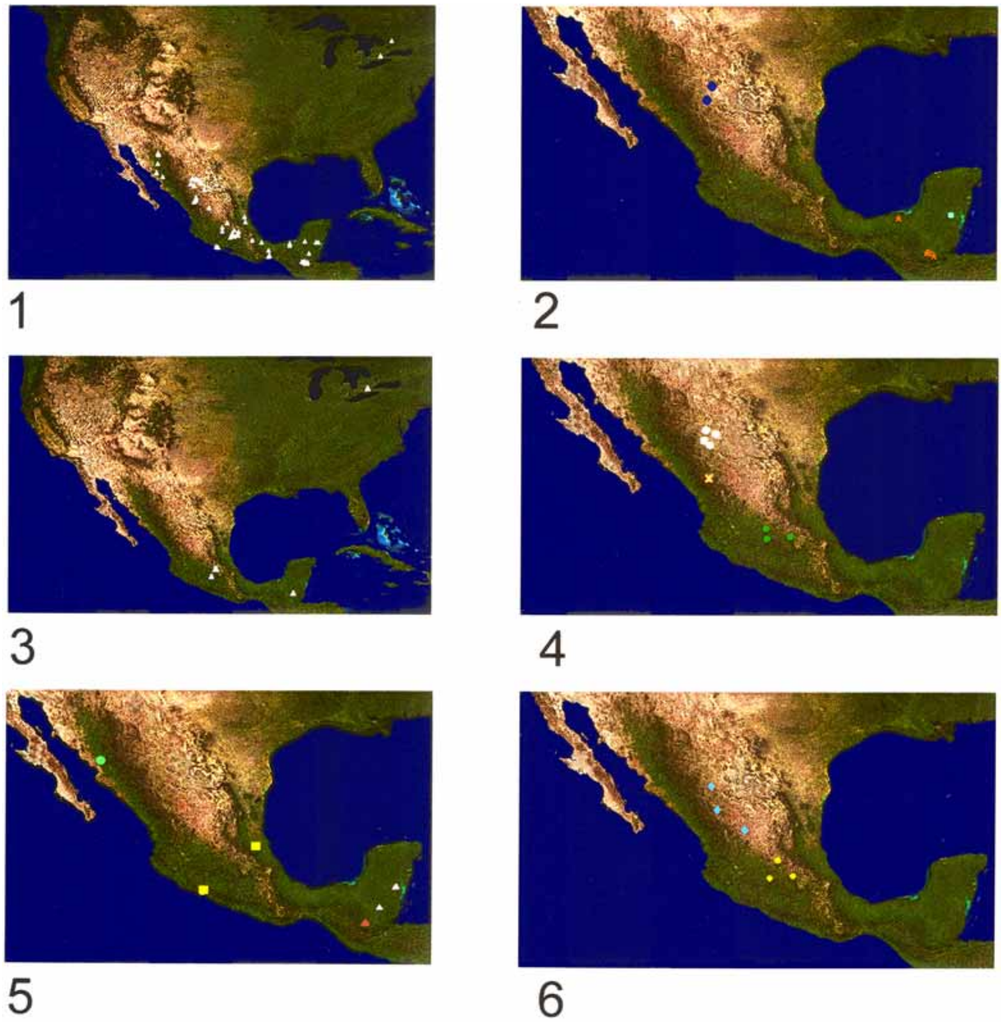


FIGURE 1. 1.1 Sampling localities for all taxa; 1.2 Distribution of *C. rigaudi* complex: ⊕ *C.* cf. *rigaudi* 1, ∧ *C.* cf. *rigaudi* 2, ʹ *C.* cf. *rigaudi* 3; 1.3 Distribution of *C.* cf. *dubia*; 1.4 *Moina micrura* group: *M.* cf. *micrura* 1, *M.* cf. *micrura* 2, ® *M.* cf. *micrura* 3; 1.5 *Arctodiaptomus dorsalis*: ℜ *A.* cf. *dorsalis*, ρ*A. dorsalis*, *A.* cf. *dorsalis* 1 from Lachua Lake, ʹ *A.* cf. *dorsalis* 2; 1.6 *Mastigodiaptomus albuquerquensis*: ♦ *M. albuquerquensis*, ⊕ *M.* cf. *albuquerquensis*.

Results

In total, DNA barcodes were gathered from 507 individuals representing 61 species of Cladocera and 21 of Copepoda. GenBank accession numbers and exact localities are provided in Appendix 1. Amplifications failed for 13 species of Cladocera and 6 species of Copepoda (mostly cyclopoids). All sequences were checked for anomalies or low quality records by the system provided by BOLD (Ratnasingham & Hebert 2007). No difference in barcode recovery was apparent between cultured (17/21) and wild-collected (82/101) species, but specimen success was higher in the former (65%) than the latter (56%).

The Appendix 2 and 3, provides full K2P/NJ trees for all 507 individuals, while Figures 2 and 3 summarize the sequence divergence patterns within and between species of each group. The average K2P distance among conspecific individuals for all cladoceran species, excluding those from GenBank averaged 0.82%, while the divergence between congeneric species averaged 17.64% (Table 2). Hence, congeneric divergences were about 20X greater than those within species, a figure similar to that reported for marine crustaceans (Costa *et al.* 2007). Copepods showed similar intraspecific divergences averaging 0.79%, while congeneric genotypes showed 17.84% divergence (Table 3). The maximum 'intra-specific' divergence value (6.44%) involved members of the *Arctodiaptomus dorsalis* (Marsh) and *Mastigodiaptomus albuqerquensis* (Herrick) complexes. In summary, divergences between species in both Cladocera and Copepoda are comparatively high (Figs. 2 and 3), and correspond well with the boundary for species recognition (0.16 subst./site) proposed by Lefebure *et al.* (2006).

TABLE 2. Genetic divergences (K2P) at different taxonomic levels for cladocerans. *Value reflects divergence between two probable cryptic species of *Diaphanosoma* cf. *heberti*.

Comparisons within	Taxa	Number of comparisons	Minimum (%)	Distance mean (%)	Maximum (%)	s.e.
species	58	2124	0	0.82	4.55*	0.02
genera	19	4819	2.94	17.64	31.72	0.08
families	6	10519	16.03	22.56	33.46	0.03
orders	2	15659	19.14	24.77	34.28	0.02
Classes	1	33453	15.46	24.11	36.45	0.02

TABLE 3. Genetic divergences (K2P) at different taxonomic levels for copepods. *Value reflects divergence between probable cryptic species of *A. dorsalis* and *M. albuquerquensis*.

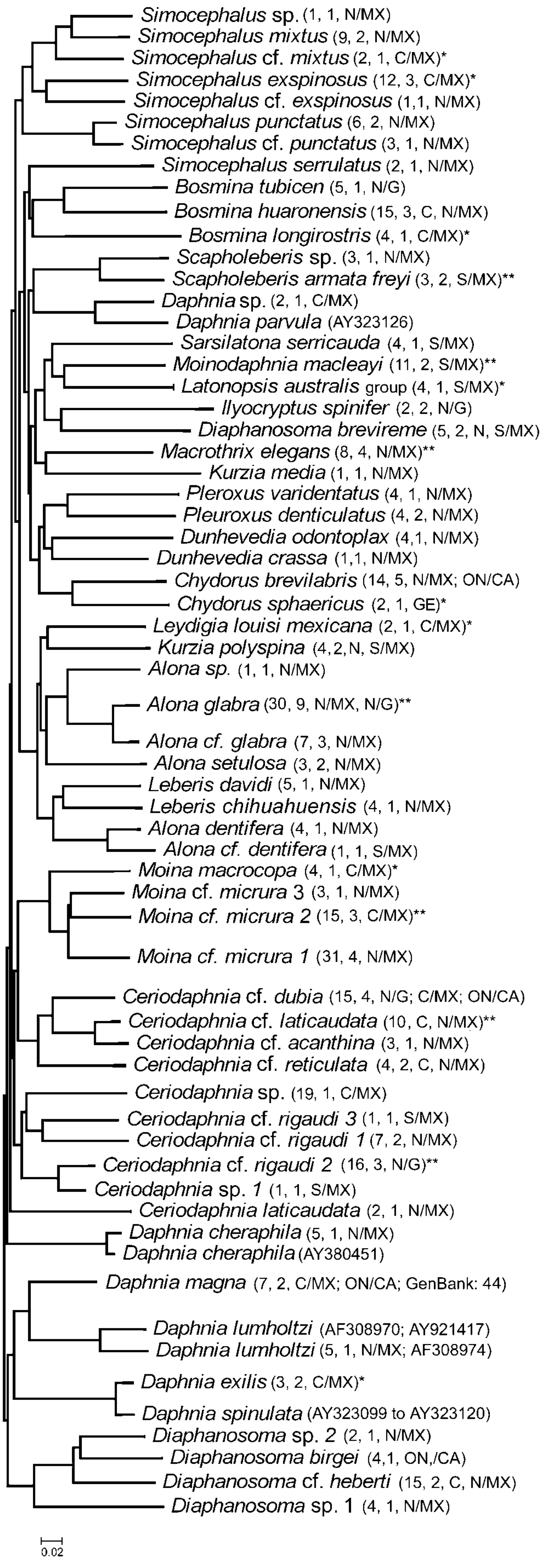
Comparisons within	Taxa	Number of comparisons	Minimum (%)	Distance mean (%)	Maximum (%)	s.e.
species	21	610	0	0.79	6.44*	0.06
genera	7	1410	2.12	17.84	28.75	0.20
families	3	3768	17.84	24.60	45.22	0.06
orders	2	315	22.49	26.64	32.87	0.09
classes	1	2808	24.38	32.39	53.13	0.13

Our results also revealed possible sibling species complexes in several supposedly well-known taxa. In total, 24 cladocerans and 9 copepods were highlighted as possible new or hidden species. Moreover, two calanoid copepods previously synonymized seem to be valid species —*Mastigodiaptomus lehmeri* (Pearse) and *Leptodiaptomus garciai* (Osorio-Tafall).

Taxonomy

In the following section we discuss the taxonomic implications of our barcode results, pointing out situations which deserve more intensive investigation.

FIGURE 2. Neighbour–joining tree of 440 COI sequences from 61 cladoceran species using K2P distances. The number of specimens sequenced, localities, and general distribution is in brackets. Abbreviations used: N = North; C = Center; S = South; CA = Canada; G = Guatemala; GE= Germany; MX = Mexico, ON = Ontario. Specimen details are available from BOLD (www.barcodinglife.org). * Sequences derive from cultured specimens; ** Sequences derive from cultured and wild specimens.



Simocephalus sp. (1, 1, N/MX)
Simocephalus mixtus (9, 2, N/MX)
Simocephalus cf. mixtus (2, 1, C/MX)*
Simocephalus exspinosus (12, 3, C/MX)*
Simocephalus cf. exspinosus (1,1, N/MX)
Simocephalus punctatus (6, 2, N/MX)
Simocephalus cf. punctatus (3, 1, N/MX)
Simocephalus serrulatus (2, 1, N/MX)
Bosmina tubicen (5, 1, N/G)
Bosmina huaronensis (15, 3, C, N/MX)
Bosmina longirostris (4, 1, C/MX)*
Scapholeberis sp. (3, 1, N/MX)
Scapholeberis armata freyi (3, 2, S/MX)**
Daphnia sp. (2, 1, C/MX)
Daphnia parvula (AY323126)
Sarsilatona serricauda (4, 1, S/MX)
Moinodaphnia macleayi (11, 2, S/MX)**
Latonopsis australis group (4, 1, S/MX)*
Ilyocryptus spinifer (2, 2, N/G)
Diaphanosoma brevireme (5, 2, N, S/MX)
Macrothrix elegans (8, 4, N/MX)**
Kurzia media (1, 1, N/MX)
Pleroxus varidentatus (4, 1, N/MX)
Pleuroxus denticulatus (4, 2, N/MX)
Dunhevedia odontoplax (4,1, N/MX)
Dunhevedia crassa (1,1, N/MX)
Chydorus brevilabris (14, 5, N/MX; ON/CA)
Chydorus sphaericus (2, 1, GE)*
Leydigia louisi mexicana (2, 1, C/MX)*
Kurzia polyspina (4,2,N, S/MX)
Alona sp. (1, 1, N/MX)
Alona glabra (30, 9, N/MX, N/G)**
Alona cf. glabra (7, 3, N/MX)
Alona setulosa (3, 2, N/MX)
Leberis davidi (5, 1, N/MX)
Leberis chihuahuensis (4, 1, N/MX)
Alona dentifera (4, 1, N/MX)
Alona cf. dentifera (1, 1, S/MX)
Moina macrocopa (4, 1, C/MX)*
Moina cf. micrura 3 (3, 1, N/MX)
Moina cf. micrura 2 (15, 3, C/MX)**
Moina cf. micrura 1 (31, 4, N/MX)
Ceriodaphnia cf. dubia (15, 4, N/G; C/MX; ON/CA)
Ceriodaphnia cf. laticaudata (10, C, N/MX)**
Ceriodaphnia cf. acanthina (3, 1, N/MX)
Ceriodaphnia cf. reticulata (4, 2, C, N/MX)
Ceriodaphnia sp. (19, 1, C/MX)
Ceriodaphnia cf. rigaudi 3 (1, 1, S/MX)
Ceriodaphnia cf. rigaudi 1 (7, 2, N/MX)
Ceriodaphnia cf. rigaudi 2 (16, 3, N/G)**
Ceriodaphnia sp. 1 (1, 1, S/MX)
Ceriodaphnia laticaudata (2, 1, N/MX)
Daphnia cheraphila (5, 1, N/MX)
Daphnia cheraphila (AY380451)
Daphnia magna (7, 2, C/MX; ON/CA; GenBank: 44)
Daphnia lumholtzi (AF308970; AY921417)
Daphnia lumholtzi (5, 1, N/MX; AF308974)
Daphnia exilis (3, 2, C/MX)*
Daphnia spinulata (AY323099 to AY323120)
Diaphanosoma sp. 2 (2, 1, N/MX)
Diaphanosoma birgei (4,1, ON,/CA)
Diaphanosoma cf. heberti (15, 2, C, N/MX)
Diaphanosoma sp. 1 (4, 1, N/MX)
0.02

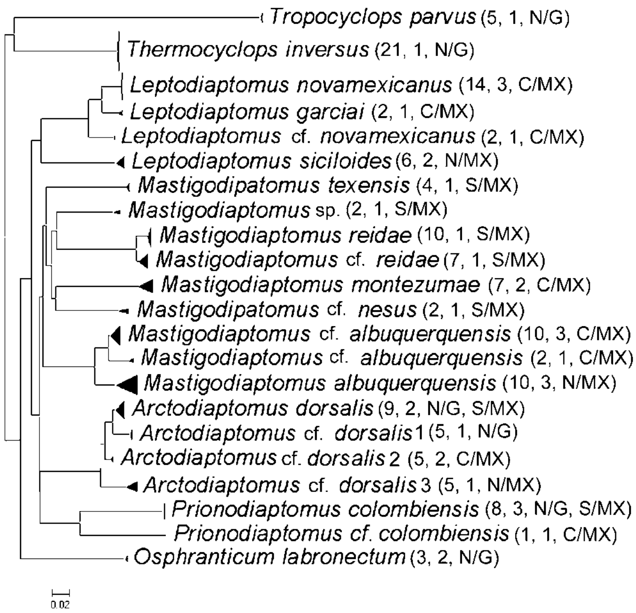


FIGURE 3. Neighbour-joining tree of 140 COI sequences from 21 copepod species using K2P distances. The number of specimens sequenced, localities, and general distribution is in brackets. Abbreviations are the same as in Figure 1. No cultured specimens were used.

Superclass Crustacea Lamarck, 1801

Class Branchiopoda Latreille, 1817

Superorder Cladocera Milne-Edwards, 1840

Order Ctenopoda Sars, 1865

Family Sididae Baird, 1850

Genus *Diaphanosoma* Fisher, 1850

Based on morphological studies, Korovchinsky (2002; 2005) concluded that *D. birgei* is a species complex in North America. Our results support this conclusion, revealing that specimens fall into four genetically divergent lineages. Specimens of *D. birgei* from its type locality (Pinehurst Lake, ON) showed 14.15% divergence from their nearest neighbour (*Diaphanosoma* sp. 2). The other three lineages included two possibly undescribed species, morphologically similar to the recently described *D. heberti* Korovchinsky. However, their status remains indeterminate until specimens from the proximity to the type locality (Newfoundland, Canada) are barcoded and their detailed morphological traits are analyzed. The third lineage is almost certainly another undescribed species related to this group (*Diaphanosoma* sp. 1).

Genus *Latonopsis* Sars, 1888

Another sidid, *Latonopsis australis* (Sars) s. str., originally described from Australia is definitively not present in Mexico. Instead this genus is now thought to include a group of species (Korovchinsky 1992), with records all around the world, including tropical and temperate regions. Again, it is necessary to barcode specimens from different regions and from the type locality in Australia to establish the taxonomic status of Mexican populations.

Order Anomopoda Sars, 1865

Family Daphniidae Straus, 1820

Genus *Daphnia* O. F. Müller, 1785

This genus was represented in our collections by six species, all well discriminated by COI sequences. Three of the species belonged to the subgenus *Daphnia* (*D. parvula*, *D. cheraphila* Hebert and Finston 1996, *Daphnia sp.*), and three to the subgenus *Ctenodaphnia* (*D. magna*, *D. exilis, D. lumholtzi*). Comparisons with sequence records in GenBank revealed that *Daphnia exilis* showed little divergence from its close relative *D. spinulata* (minimum 0.80, maximum 3.9%), from Argentina. Despite this fact, the *D. exilis* from Mexico was grouped in the same cluster, which was distinct from the cluster formed by *D. spinulata*. These two species do show allozyme (Adamowicz *et al.* 2004) and morphological differences (Benzie 2005).

Daphnia cheraphila was recently described by Hebert & Finston (1996) who included material from Mexico in their original description. Our material showed 1.94% COI divergence from sequences in GenBank for this species. Another *Daphnia*, a member of the *pulex* group, seems to represent a new species as its closest COI match (12.7%) was to *Daphnia parvula* from Río Coronda, Argentina.

We recorded the invasive species *D. lumholtzi* for the first time in Mexico in the northern state of Sonora. Given its broad distribution across the United States and its presence in southern Canada, its detection was not unexpected. The Mexican specimens showed barcode identity with populations from the other North American populations that have been sequenced (0.47% maximum) and high divergences (8.68% minimum) with Australian specimens (Havel *et al.* 2000).

Genus *Ceriodaphnia* Dana, 1853

This genus is one of the most confusing among the Daphniidae. Some species, such as the *cornuta-rigaudi* complex show morphological diversity, and have broad distributions. We found several morphs belonging to this complex showing deep barcode divergence, but any effort to clarify their relationship to named species will demand barcode and morphological analysis of topotype material. In this regard, we note that *C. cornuta* was originally described from Australia (Sars 1885) while *C. rigaudi* Richard was described from Tonkin (Vietnam) by Richard (1894b).

One species in our collections showing deep barcode divergence is an unnamed taxon (*Ceriodaphnia* sp.) from intermittent pools in the northern semi-desert regions. It possesses long, thick hairs emerging from the valves and a minute but constant rostral projection. Three more barcode lineages were all identified as *Ceriodaphnia cf. rigaudi* (named *C. cf. rigaudi* 1 to 3), due to their lack of any additional projection from the head (except the rostral protuberance) and their rounded fornices, (*C. cornuta* invariably possesses spines on its fornices). Figure 1.2 shows that the first cluster is narrowly distributed in the semi-desert regions of northern Mexico, while the second one is restricted to the south, near the coast in the Gulf of Mexico to Guatemala. In this cluster, the morph collected near Lachua Lake (Guatemala, Alta Verapaz) has a slightly shorter rostrum and lacks hair, while other forms are haired, similar to the variability observed by Berner (1985). The third lineage of *C. rigaudi* Richard was only found in the Yucatan Peninsula, but because only one specimen gave a good sequence, it is premature to draw any final conclusion. Although all three phenotypes show slight morphological differences from *C. rigaudi* s. str., there is difficulty in identifying morphological traits that discriminate them because of the high variability within each taxon.

In the northern semi-desert region, we found another species closely related to *C. acanthina* Ross, described from Manitoba (Canada), sharing its strong reticulation of the valves and short spinules. Because true *C. acanthina*, according to several authors, is restricted to the north of the continent, we identify our isolate as *C.* cf. *acanthina*.

Another species, closely related to *C. laticaudata* Müller described from Denmark, was found in ponds on the central plateau in the highlands of Mexico. Despite the geographic separation, our populations shared the projected dorsum of the postabdomen before the anus typical of this species. Similar forms have been found elsewhere, including South America (Paggi 1986). This form was placed far from another *C.* cf. *laticaudata* 1, with a much wider projection from the dorsum of the postabdomen, and with postabdominal claws that are of a more constant length. *C.* cf. *laticaudata* 1 was only found in one locality in a semi-desert region in Cuatro Ciénegas. It is important to note that ponds and lakes from this valley are rich in endemics ranging from invertebrates to vertebrates (i.e. Moline *et al.* 2004; Trapani 2003).

Finally, a highly variable and widely distributed taxon named *C.* cf. *dubia* was found from the north of the continent (Pinehurst Lake, Ontario, Canada) to Guatemala (Peten Lake) (Fig. 1.3). Limp & Fernando (1978) named the taxon inhabiting Pinehurst Lake as *C. quadrangula* (O.F. Müller), but according to Berner (1992), it is restricted to Newfoundland. In general terms, our *Ceriodaphnia* shows a different morphology than *C. dubia* Richard s. str. (sensu Berner 1992), but this material should be compared with topotypes of this species which was originally described from Sumatra by Richard (1894a).

Genus *Simocephalus* Schoedler, 1858

Eight species of *Simocephalus* were encountered in our survey. *Simocephalus exspinosus* (Koch) was restricted to the central plateau, while *S. punctatus* Orlova-Bienkowskaja was only found in the north. *S. mixtus* Sars was also detected in the north, but a morphologically similar species (*S.* cf. *mixtus*), with high divergence (14.39%) occurred on the central plateau. A smaller difference was found within the *S. punctatus* complex (4.6%). Both of these cases seem to involve cryptic species.

Genus *Scapholeberis* Schoedler, 1858

We found two species with 13.07% divergence. One is *Scapholeberis armata freyi* Dumont & Pensaert previously recorded from southern Mexico (Dumont & Pensaert 1983). The other, which was collected in the northern semi-desert region, seems to represent an undescribed species related to *S. ramneri* Dumont & Pensaert, described from Belgium (Dumont & Pensaert 1983).

Genus *Moina* Baird, 1850

Members of this genus were represented by one well defined species, *Moina macrocopa* (Straus), and by a group of three closely related genotypes in the *Moina micrura* group. According to the keys of Goulden (1968), all three phenotypes can be identified as *M. micrura*, but most cladocerologists agree that it is group of species. Evidence for this conclusion was given by Petrusek *et al.* (2004), who found reproductive isolation and deep divergence at 12S rRNA for populations of *M. micrura* from Europe and Australia, suggesting the presence of two sibling species. In the case of Mexican material, the three subgroups separated by DNA barcodes show consistent morphological and distributional differences (Fig. 1.4). *M. micrura* 1 is found in the semi-desert regions of the north, close to the Pacific side, while *M. micrura* 2 seems restricted to the highlands of the Central Plateau at sites more than 2000 m above sea level. The third group, designated as *M. micrura* 3, was found at a single northern locality, and shows an intermediate morphology to the other two types. It seems likely that none of these phenotypes are actually *M. micrura* s. str., described originally from Austria (Kurz, 1874).

Family Bosminidae Baird, 1845

Genus *Bosmina* Baird, 1845

The taxonomic status of the genus *Bosmina* remains unsettled. De Melo & Hebert (1994) and Taylor *et al.* (2002) studied populations of this genus in the northern half of the American continent using both molecular and morphological approaches, but populations in the south have only seen morphological analysis (Paggi 1979). The genus was represented in this study by three species, but *Bosmina tubicen* Brehm was only recorded from Lake Peten. *Bosmina huaronensis* Delachaux was widespread from the Central Plateau to the north, while *B. longirostris* (O.F. Müller) was restricted to one locality on the Central plateau.

Family Macrothricidae Norman & Brady, 1867

Genus *Macrothrix* Baird, 1843

Barcoding results demonstrated that *M. elegans* Sars, a species recently re-instated by Kotov *et al.* (2004), is widely distributed from Guatemala to the north of Mexico, but the species dwells far south to Argentina (see Kotov *et al.* 2004). It seems to be common in many ponds and lakes from the tropical regions.

Family Chydoridae Stebbing, 1902

Subfamily Aloninae Frey, 1967

Genus *Alona* Baird, 1843 and *Leberis* Smirnov, 1989

Sinev *et al.* (2006) recently moved *Alona diaphana-davidi* to the genus *Leberis*. Our barcode results agree with this proposal, because we observed more than 19% divergence between this genus and the most closely related species of *Alona*. We encountered two species belonging to the *L. davidi* complex, one close to *L. davidi* Richard s. str., while the other represents a related form that proved to be a new species (Elías-Gutiérrez & Valdez-Moreno 2008). Both phenotypes showed clear morphological differences in the second antenna, thoracic limbs and male postabdomen.

Alona dentifera (Sars, 1901) was divided in two groups, again with allopatric distributions. *Alona* cf. *dentifera* was found in the south, while *A. dentifera* was found in the northern semi-desert. Unfortunately, only one specimen from the south could be sequenced, so its taxonomic status remains uncertain. Interestingly, both members of the *A. dentifera* cluster showed less barcode divergence from species of *Leberis* than from other species of *Alona*. Sinev *et al.* (2004) concluded, based on morphological analyses, that there are no reasons to exclude *A. dentifera* from *Alona*, although it presents a combination of unique and rare characters, most considered as autapomorphies. Our data suggest that *A. dentifera* is not a “marginal” species of *Alona*, as concluded by Sinev *et al.* (2004), but rather a separate taxon with more than 19% divergence from the rest of the genus.

Among the "true" *Alona*, we obtained sequences from *A. setulosa* Megard and *A. glabra* Sars, 1901, the latter first described from Argentina. Although these two species are difficult to separate morphologically (Megard 1967), they are clearly valid species as evidenced by their high barcode divergence. *Alona glabra* was itself divided into two related genotypes, each broadly distributed from Guatemala to the north of Mexico, with several localities within the Cuatro Ciénegas semi-desert region. It seems that the related form from the north represents a different species.

Subfamily Chydorinae Stebbing, 1902

Genus *Chydorus* Leach, 1816

As Frey (1980) stated, the American representative of the *Chydorus sphaericus* (O.F. Müller) complex, named *C. brevilabris* Frey, is widely distributed (from Canada to northern Mexico). A comparison with *C. sphaericus* from Germany revealed more than 17.61% divergence, confirming the true species status of both.

Genus *Pleuroxus* Baird, 1843

According to Smirnov (1996), *Pleuroxus* is one of the most difficult genera of Chydorinae. Barcoding distinguished two species, both in the north: *P. varidentatus* Frey and *P. denticulatus* Birge. The latter species was recently recorded from southern Mexico (Elías-Gutiérrez *et al.* 2006). Smirnov (1996) suggested that the subgenus *Picripleuroxus* should be raised to a genus level, but Chiambeng & Dumont (2004) did not support this shift. The high barcode divergences (>20%) between the two species of *Pleuroxus* supports Smirnov's stance and accords with Sacherova & Hebert's (2003) proposal that *Pleuroxus* should be divided into several genera. Recently, Smirnov *et al.* (2006) concluded that the phylogeny of *Pleuroxus* is still not resolved sufficiently to be able to decide on generic or subgeneric boundaries, making it clear that further investigation is required.
In general our data for the family Chydoridae agree well with conclusions on generic and species boundaries proposed by Sacherova & Hebert (2003). For example *Alona* is not monophyletic, and should be partitioned into more than two genera. Part of this work has been done, e.g. the proposal of the new genus *Leberis* by Smirnov (1989), but work remains as shown in the case of *Alona dentifera*. The deep divergences found in all groups confirm the hypothesis of an ancient origin for all chydorid lineages.

Class Maxillopoda Dahl, 1956

Subclass Copepoda Milne-Edwards, 1840

Superorder Podoplea Giesbrecht, 1882

Order Cyclopoida Burmeister, 1834

Family Cyclopidae Dana, 1846

Only two cyclopoid species were included in this study, *Tropocyclops parvus* Kiefer and *Thermocyclops inversus* Kiefer, both from Peten Lake. The former species, recently re-described by Dumont (2006), is an extremely small (less than 0.4 mm) pelagic copepod. These two genotypes showed deep barcode divergence (>40%), but members of each species showed little sequence variation (0.02%).

Superorder Gymnoplea Giesbrecht, 1882

Order Calanoida Sars, 1903

Family Diaptomidae Baird, 1850

Genus *Arctodiaptomus* Kiefer, 1932

Arctodiaptomus dorsalis probably represents another species complex athough Suárez-Morales & Elías-Gutiérrez (2001) recently synonymized *Arctodiaptomus dampfi* Brehm from Peten Lake with *A. dorsalis*, originally described from Louisiana. Barcode analyses indicated that the population of *A. dorsalis* from Peten Lake (Guatemala) is conspecific with those from the Yucatan, but also revealed the likely occurrence of at least four species in this complex. The population from Lachua Lake (*A.* cf. *dorsalis* 1) showed nearly 7% COI divergence from the Yucatan/Peten Lake populations. Two additional lineages showing high COI divergence were also collected; the first one from the Sonora desert and the second one from the central region (Fig. 1.5). No morphological characters were found to distinguish these four lineages.

Genus *Mastigodiaptomus* Light, 1939

Three lineages of *Mastigodiaptomus* were found in a single small pond in the Yucatan. One of these lineages was *Mastigodiaptomus reidae* Suárez-Morales & Elías-Gutiérrez, described from a site near this locality (Suárez-Morales & Elías-Gutiérrez, 2000). The other two forms are closely related to this species, one lineage with 3% COI divergence also shows a differing shape of the male fifth thoracopod. The third lineage of *Mastigodiaptomus* seems to represent another undescribed species, with small but consistent morphological differences. This is the first report of three species of a single calanoid genus, similar in shape and size, co-existing in a single small habitat.

Another species within the same genus, *Mastigodipatomus albuquerquensis* (Herrick), is one of the most morphologically distinctive species of freshwater copepods in the southern United States and Mexico (Suárez-Morales & Elías-Gutiérrez 2000). Any specimen with a butterfly-like sclerotization of the male second basipod of the right fifth leg has traditionally been assigned to this species, but barcoding confirmed earlier suspicions of overlooked diversity. For example, Kiefer (1938) assigned the population in Patzcuaro Lake to a different subspecies, *D. albuquerquensis patzcuarensis* and Pearse (1904) described *Diaptomus lehmeri* from Mexico City, although it was later synonymized by Marsh (1907) with *D. albuquerquensis.* Our data suggest the occurrence of at least two (or even three) sibling species with disjunct distributions in Mexico (Fig. 1.6). The first species, *M. albuquerquensis*, was only found in the northern semi-desert region while the second (and possibly third), *M.* cf. *albuquerquensis* (*lehmeri*?), was apparently restricted to the Central Plateau, in localities close to Patzcuaro Lake, suggesting that they could actually be *M. lehmeri*. On the other hand, due to its broad geographic range, Bowman (1986) suggested that *M. albuquerquensis* was the original form which dispersed phoretically to the Caribbean islands, giving rise to another species, *Mastigodiaptomus nesus* Bowman. Another barcode lineage, present near the Pacific coast was morphologically close to *M. nesus*, but some subtle variations were noticed. Cervantes-Martínez *et al.* (2005) reported size differences between *M. nesus* from the Yucatan and the Caribbean islands. Possibly these could be different species whose status can be clarified by barcoding and other molecular analyses. Although the ID tree is not considered a hypothesis on evolutionary history, some clues about the relationships (especially on branching patterns at the tips of the tree) can be inferred from it, and *M.* cf. *nesus* appears close to *M. albuquerquensis*.

Genus *Leptodiaptomus* Light, 1938

Barcode analysis revealed that *Leptodiaptomus novamexicanus* (Herrick) was a group of species, reinforcing earlier conclusions based on morphology. Osorio-Tafall (1942) was the first to make this suggestion, describing *Leptodiaptomus garciai* from the unique saline Alchichica Crater Lake. Our barcoding results, together with data on ecophysiology, morphology and breeding studies (Montiel et al, 2008) support recognition of this species as a valid taxon, in opposition to the synonymy proposed by Wilson (1959). Moreover, in the State of Mexico, we found two related, but definitely different forms of *L. novamexicanus*. Again it is necessary to compare specimens from the type locality (a reservoir in Albuquerque, New Mexico) with those found in the central plateau of Mexico.

Genus *Prionodiaptomus* Light, 1939

The recent discovery of *Prionodiaptomus colombiensis* (Thiébaud) is the only South American calanoid known from Mexico (Gutiérrez-Aguirre & Suárez-Morales 2000). Barcodes highlighted a possible cryptic species distributed more to the north than the first and subsequent records, in the Gulf coastal plateau.

General remarks

The present study has shown that COI barcodes distinguish all previously recognized species of zooplankton included in our survey. More importantly, the barcode data suggest that current taxonomic systems seriously underestimate species diversity as we encountered many cases of deep barcode divergence between lineages that are currently viewed as conspecific. We conclude that barcoding is a powerful tool for highlighting taxonomic problems, and that its broad application will allow the rapid identification of freshwater zooplankton once the library of reference COI sequences is assembled. This step is critical and urgent if we take in account the recent disappearance of freshwater biodiversity (Naimann 2008). The evidence for cryptic species and the apparent narrow distributions of most species support earlier conclusions that the total cladoceran fauna is still grossly underestimated (Forró *et al*. 2008) and that most new discoveries will be found at low latitudes, particularly the neotropics (Adamowicz & Purvis 2005). For example, 17 new species of Cladocera have been described since 1996 from Mexico, with at least 7 suspected endemics (Elías-Gutiérrez & Suárez-Morales 2003). These conclusions can be extended to freshwater copepods, where more than 90% of species are endemic to a single zoogeographic region (Boxshall & Defayé 2008). Nevertheless, to gain definite results, topotypic material or specimens collected close to the type locality, must be barcoded.

Interestingly, this study has revealed several cases where newly recognized genera (based on morphological traits) are coincident with barcode results. In other cases, such as *Diaphanosoma* or *Daphnia*, the presence of deep barcode divergences suggests the need to partition currently recognized genera. For example, Paggi & da Rocha (1999) suggested that the *D. volzi* Stingelin group should be moved into a different genus (*Neodiaphanosoma*) and the deep barcode divergence between the *D. birgei-brachyrum* group and *D. brevireme* Sars supports this conclusion. In order to establish true inter-generic relationships it is necessary to conduct phylogenetic analyses involving other genes combined with detailed morphological information, but DNA barcodes provide an important first step towards the solution of these problems.

The current barcode results suggest the presence of many overlooked species, a conclusion reinforced by distributional and morphological differences. For example, members of the *M. albuquerquensis*, *Moina* *micrura* and *Ceriodaphnia cornuta-rigaudi* complexes show definite distributional and morphological differences, the latter involving characters that have been described in prior studies. Species from the central plateau are restricted to high altitude systems at least 2000 m above sea level. Northern semi-desert populations are also regionally restricted, and clearly different from southern populations which are themselves related with the South American fauna. These results reveal a general pattern, namely that all Mexican taxa thought to have wide distributions have now been split into complexes of related species, with deep barcode divergences. This revelation of overlooked diversity also has important ecological implications. For example, barcode results suggest the co-existence of two or more species from the *M. reidae* or *S. punctatus* complexes in some small habitats, a surprising result in light of past evidence for competitive exclusion of closely allied congeners.

Acknowledgements

Tania Garfias Espejo helped collect many of our samples. Arturo Contreras Arquieta aided our collections in the Cuatro Ciénegas protected area, while Arturo Lerma Martínez provided access to several ponds under PRONATURA Noreste protection. Jorge Ciros Pérez donated material of *Leptodiaptomus* species. Salvador Sanchez Carrillo, Luis Carlos Alatorre Cejudo, Raquel Sánchez Andrés y David H. Encinas Yépis from Instituto Tecnológico de Sonora (ITSON) provided logistic support and assisted with sampling in Sonora state. Eduardo Suárez Morales assisted with several identifications and observations of Copepoda. Henri Dumont attracted our attention to the *T. parvus* problem, and activated the sampling campaign in Guatemala. The Centro de Estudios Conservacionistas (CECON), particularly its director, Jorge Ruiz Ordoñez and the Comisión Nacional de Areas Protegidas de Guatemala (CONAP), particularly Franklin Herrera and Estuardo Secaira, aided acquisition of collection permits for Guatemala, including several protected areas. This project was carried out during a sabbatical leave of Manuel Elías-Gutiérrez and Martha Valdez-Moreno at the Department of Integrative Biology, University of Guelph. We thank all members of the Hebert laboratory, particularly Tyler Zemlak, Dirk Steinke and Gregory Downs, for fruitful discussions about molecular techniques and bioinformatics. Maria Belyaeva allowed the use of her data on chydorids from Europe for comparisons. Martha Patricia Celis-Salgado assisted us with samples near Dorset Environmental Science Center (Canada). Alexey Kotov and Elizabeth Miranda Tello critically reviewed a preliminary draft of this manuscript. DNA work was supported by grants from NSERC and from Genome Canada through the Ontario Genomics Institute to PDNH.

References

Adamowicz, S.J., Hebert, P.D.N. & Marinone, M.C. (2004) Species diversity and endemism in the *Daphnia* of Argentina: a genetic investigation. *Zoological Journal of the Linnean Society*, 140(2), 171–205.

Adamowicz, S.J. & Purvis, A. (2005) How many branchiopod crustacean species are there? Quantifying the components of underestimation. *Global Ecology and Biogeography*, 14(5), 455–468.

Adamowicz, S.J., Menu–Marque, S., Hebert, P.D.N. & Purvis, A. (2007) Molecular systematics and patterns of morphological evolution in the Centropagidae (Copepoda: Calanoida) of Argentina. *Biological Journal of the Linnean Society*, 90(2), 279–292.

Berner, D.B. (1985) Morphological differentiaton among species in the *Ceriodaphnia cornuta* complex (Crustacea, Cladocera). *Verhandlungen der Internationalen Vereinigung der Limnologie*, 22, 3099–3103.

Benzie, J.A.H. (2005) *Cladocera: The Genus Daphnia (including Daphniosis)*. Kenobi Productions & Backhuys Publishers, Ghent, Leiden, 376 pp.

Berner, D.B. (1992) *Restricted distribution of Ceriodaphnia quadrangula in North America*. Book of Abstracts XXV SIL International Congress, Barcelona, 50.

Boxshall, G.A. & Defaye D. (2008). Global diversity of copepods (Crustacea: Copepoda) in freshwater. *Hydrobiologia*, 595, 195–207.

Bowman, T.E. (1986) Freshwater Calanoid copepods of the West Indies. *Syllogeus*, 58, 237–246.

Bucklin, A., Guarnieri, M., Hill, R.S., Bentley, A.M. & Kaartvedt, S. (1999) Taxonomic and systematic assessment of planktonic copepods using mitochondrial COI sequence variation and competitive, species–specific PCR. *Hydrobiologia*, 401, 239–254.

Bucklin, A., Wiebe, P.H., Smolenack, S.B., Copley, N.J., Beaudet, J.G., Bonner, K.G., Farber–Lorda J. & Pierson, J.J. (2007) DNA barcodes for species identification of euphausiids (Euphausiacea, Crustacea), *Journal of Plankton Research* 29, 483–493.

Burton, R.S. & Bang–Ning, L. (1994) Nuclear and mitochondrial gene genealogies and allozyme polymorphism across a major phylogeographic break in the copepod *Tigriopus californicus*. *Proceedings of the National Academy of Sciences of the United States of America*, 91, 5197–5201.

Cervantes–Martínez, A., Elías–Gutiérrez, M., Gutiérrez–Aguirre, M.A. & Kotov, A.A. (2005) Ecological remarks on *Mastigodiaptomus nesus* Bowman, 1986 (Copepoda : Calanoida) in a Mexican karstic sinkhole. *Hydrobiologia*, 542: 95–102.

Chiambeng, G.Y. & Dumont, H.J. (2004) The genus *Pleuroxus* Baird, 1843 (Crustacea : Anomopoda : Chydoridae) in Cameroon, Central–West Africa. *Annales de Limnologie–International Journal of Limnology*, 40(3), 211–229.

Costa, F.O., DeWaard, J.R., Boutillier, J., Ratnasingham, S., Dooh, R.T., Hajibabaei, M. & Hebert, P.D.N. (2007) Biological identifications through DNA barcodes: the case of the Crustacea. *Canadian Journal of Fisheries and Aquatic Sciences*, 64(2), 272–295.

De Melo, R. & Hebert, P.D.N. (1994) A taxonomic reevaluation of North American Bosminidae. *Canadian Journal of Zoology*, 72, 1808–1825.

Cox, A.J. & Hebert, P.D.N. (2001) Colonization, extinction, and phylogeographic patterning in a freshwater crustacean. *Molecular Ecology*, 10(2), 371–386.

De Gelas, K. & De Meester, L. (2005) Phylogeography of *Daphnia magna* in Europe. *Molecular Ecology*, 14(3), 753–764.

Dumont, H.J. (2006) Morphology and ecology of a group of small, pelagic, tropical *Tropocyclops* (Crustacea, Copepoda, Cyclopoida), with the description of a new species from South China. *Annales de Limnologie–International Journal of Limnology*, 42(4), 261–275.

Dumont, H.J. & Pensaert J. (1983) A revision of the Scapholeberinae (Crustacea: Cladocera). *Hydrobiologia*, 100, 3–45.

Elías–Gutiérrez, M. (1995) Notas sobre los cladóceros de embalses a gran altitud en el Estado de México, México. *Anales de la Escuela Nacional de Ciencias Biológicas*, 40, 197–214.

Elías–Gutiérrez, M. & Suárez–Morales, E. (2003) *Estado actual del conocimiento de los cladoceros de México*. *In* : Barreiro–Güemes, M. T. *et al.* (Eds.), El Colegio de la Frontera Sur, Universidad Autónoma Metropolitana, Estado de Veracruz, Mexico, 171–183.

Elías–Gutiérrez, M. & Valdez–Moreno, M. (2008) A new cryptic species of *Leberis* Smirnov, 1989 (Crustacea, Cladocera, Chydoridae) from the Mexican semi–desert region, highlighted by DNA barcoding. *Hidrobiologica*, 18(1), 63–74.

Elías–Gutiérrez, M., Ciros–Pérez, J., Suárez–Morales, E. & Silva–Briano, M. (1999) The freshwater Cladocera (Orders Ctenopoda & Anomopoda) of Mexico, with comments on selected taxa. *Crustaceana*, 72(2), 171–186.

Elías–Gutiérrez, M., Kotov, A.A. & Garfias–Espejo, T. (2006) Cladocera (Crustacea: Ctenopoda, Anomopoda) from southern Mexico, Belize and northern Guatemala, with some biogeographical notes. *Zootaxa*, 1119, 1–27.

Fiers, F., Ghenne, V. & Suárez–Morales, E. (2000) New species of continental cyclopoid copepods (Crustacea, Cyclopoida) from the Yucatan Peninsula, Mexico. *Studies on Neotropical Fauna & Environment*, 35, 209–251.

Folmer, O., Black, M., Hoeh, W., Lutz, R. & Vrijenhoek, R. (1994) DNA primers for amplification of mitochondrial cytochrome c oxidase subunit I from diverse metazoan invertebrates. *Molecular Marine Biology and Biotechnology*, 3, 294–299.

Forró, L., Korovchinsky, N.M., Kotov, A.A. & Petrusek, A. (2008) Global diversity of cladocerans (Cladocera; Crustacea) in freshwater. *Hydrobiologia*, 595, 177–184.

Frey, D.G. (1980) On the plurality of *Chydorus sphaericus* (O.F. Müller) Cladocera, Chydoridae), and designation of a neotype from Sjaelso, Denmark. *Hydrobiologia*, 69(1–2), 83–123.

Frey, D.G. (1982) Questions concerning cosmopolitanism in Cladocera. *Archiv für Hydrobiologie*, 93(4), 484–502.

Ganz, H.H. & Burton, R.S. (1995) Genetic diferentiation and reproductive incompatibility among Baja California populations of the copepod *Tigriopus californicus*. *Marine Biology*, 123(4), 821–827.

Goulden, C.E. (1968) The systematics and evolution of the Moinidae. *Transactions of the American Microscopical Society*, 58, 1–101.

Grimaldo–Ortega, D., Elías–Gutiérrez, M. & Camacho–Lemus, M. (1998) Additions to Mexican freshwater copepods with the description of the female *Leptodiaptomus mexicanus* (Marsh). *Journal of Marine Systems*, 15, 381–390.

Gutiérrez–Aguirre, M. & Suárez–Morales, E. (2000) New range extension of the Diaptomid copepod *Prionodiaptomus colombiensis* Thiébaud, 1912 (Copepoda, Calanoida) with complementary description of this species. *Zoosystema*, 22(3), 507–516.

Hajibabaei, M., DeWaard, J.R., Ivanova, N.V., Ratnasingham, S., Dooh, R., Kirk, S.L., Mackie, P.M. & Hebert, P.D.N. (2005) Critical factors for assembling a high volume of DNA barcodes. *Philosophical Transactions of the Royal Society of London Series B–Biological Sciences*, 360, 1959–1967.

Havel, J.E., Colbourne, J.K. & Hebert, P.D.N. (2000) Reconstructing the history of intercontinental dispersal in *Daphnia lumholtzi* by use of genetic markers. *Limnology and Oceanography*, 45(6), 1414–1419.

Hebert, P.D.N. & Finston, T.L. (1996) A taxonomic reevaluation of North American *Daphnia* (Crustacea: Cladocera) II. New species in the *Daphnia pulex* group from the south–central United States and Mexico. *Canadian Journal of Zoology*, 74(4), 632–653.

Hebert, P.D.N., Cywinska, A., Ball, S.L. & DeWaard, J.R. (2003a) Biological identifications through DNA barcodes. *Proceedings of the Royal Society of London Series B–Biological Sciences*, 270(1512), 313–321.

Hebert, P.D.N., Witt, J.D.S. & Adamowicz, S.J. (2003b) Phylogeographical patterning in *Daphnia ambigua*: Regional divergence and intercontinental cohesion. *Limnology and Oceanography*, 48(1), 261–268.

Hebert, P.D.N., Stoeckle, M.Y., Zemlak, T.S. & Francis, C.M. (2004) Identification of birds through DNA barcodes. *PLoS Biology*, 2(10), 1657–1663.

Hogg, I.D. & Hebert, P.D.N. (2004) Biological identification of springtails (Hexapoda: Collembola) from the Canadian Arctic, using mitochondrial DNA barcodes. *Canadian Journal of Zoology*, 82(5), 749–754.

Ivanova, N.V., DeWaard, J.R. & Hebert, P.D.N. (2006) An inexpensive, automation–friendly protocol for recovering high–quality DNA. *Molecular Ecology Notes*, 6, 998–1002.

Kiefer, F. (1938) Ruderfubkrebse (Crust. Cop.) aus Mexico. *Zoologischer Anzeiger*, 115(9), 274–279.

Kimura, M. (1980) A simple method of estimating evolutionary rate of base substitutions through comparative studies. *Journal of Molecular Evolution*, 16, 111–120.

Korinek, V. (1981) *Diaphanosoma birgei* n. sp. (crustacea, Cladocera). A new species from America and its widely distributed subspecies *Diaphanosoma birgei* ssp. *lacustris* n.ssp. *Canadian Journal of Zoology*, 59, 1115–1121.

Korovchinsky, N.M. (1992) *Sididae and Holopediidae*. SPB Academic Publishing, Amsterdam, 82 p.

Korovchinsky, N.M. (2002) Description of two new species of *Diaphanosoma* Fischer, 1850 (Crustacea, Branchiopoda, Sididae) from the United States and Canada and species richness of the genus in North America. *Hydrobiologia*, 489(1–3), 45–54.

Korovchinsky, N.M. (2005) Two new species of *Diaphanosoma* Fischer, 1850 (Crustacea: Branchiopoda: Cladocera) from the United States. *International Review of Hydrobiology*, 90(2), 201–208.

Kotov, A.A., Garfias–Espejo, T. & Elías–Gutiérrez, M. (2004) Separation of two Neotropical species: *Macrothrix superaculeata* (Smirnov, 1982) versus *M. elegans* Sars, 1901 (Macrothricidae, Anomopoda, Cladocera). *Hydrobiologia*, 517(1–3), 61–88.

Kumar, S., Tamura, K. & Masatoshi, N. (2004) MEGA3: Integrated Software for Molecular Evolutionary Genetics Analysis and Sequence Alignment. *Briefings in Bioinformatics*, 5, 150–163.

Kurz, W. (1874) Dodekas neuer Cladoceren nebst einer kurzen Üebersicht der Cladocerenfauna Bühmens. *Sitzungsberichte der Akademie der Wissenschaften der ddr. Mathematik–Naturwissenschaften: Technik*, 70, 7–88.

Lefebure, T., Douady, C. J., Gouy, M. & Gibert, J. (2006) Relationship between morphological taxonomy and molecular divergence within Crustacea: Proposal of a molecular threshold to help species delimitation. *Molecular Phylogenetics and Evolution*, 40(2), 435–447.

Limp, R.P. & Fernando, C.H. (1978) Production of Cladocera inhabiting the vegetated littoral of Pinehurst Lake, Ontario, Canada. *Verhandlungen der Internationalen Vereinigung der Limnologie*, 1, 225–231.

Marsh, C.D. (1907) A revision on the North American species of Diaptomidae. *Transactions of the Wisconsin Academy of Sciences*, *Arts and Letters*, 15, 381–516.

Megard, R.O. (1967) Three new species of *Alona* (Cladocera, Chydoridae) from the United States. *Internationale Revue der Gesamten Hydrobiologie*, 52(1), 37–50.

Montiel-Martínez A., Ciros-Pérez J., Ortega-Mayagoitia E. & Elías-Gutiérrez M. (2008). Morphological, ecological, reproductive and molecular evidence for *Leptodiaptomus garciai* (Osorio-Tafall 1942) as a valid endemic species. *Journal of Plankton Research*, doi, 10.1093/plankt/fbn067.

Moline, A.B., Shuster, S.M., Hendrickson, D.A. & Marks, J.C. (2004) Genetic variation in a desert aquatic snail (*Nymphophilus minckleyi*) from Cuatro Cienegas, Coahuila, Mexico. *Hydrobiologia*, 522(1–3), 179–192.

Naiman, R.J. (2008) Freshwater animal diversity assessment – Foreword. *Hydrobiologia*, 595, 1–2.

Osorio–Tafall, B.F. (1942) Un nuevo *Diaptomus* del México central (Copepoda, Diaptomidae). *Revista Brasileira de Zoologia*, 2(2), 147–154.

Padial, J.M. & de la Riva I. (2007) Integrative taxonomists should use and produce DNA barcodes. Zootaxa, 1586, 67–68.

Paggi, J.C. (1979) Revision de las especies argentinas del género *Bosmina*, Baird agrupadas en el subgénero *Neobosmina* Lieder. (Crustacea: Cladocera). *Acta Zoologica Lilloana*, 35, 137–162.

Paggi, J.C. (1986) Aportes al conocimiento de la fauna Argentina de cladóceros, V: *Ceriodaphnia laticaudata* Müller 1867 y *C. pulchella* Sars 1862. *Revista de la Asociación de Ciencias Naturales del Litoral*, 17(1), 39–49.

Paggi, J.C. & da Rocha, C.E.F. (1999) *Neodiaphanosoma* a new genus of Sididae (Branchiopoda, Ctenopoda); with description of *N. bergamini* sp n. and comments on *N. volzi* (Stingelin 1905). *Hydrobiologia*, 397, 5–19.

Pearse, A. S. (1904) A new species of *Diaptomus* from Mexico. *American Naturalist,* 38, 889–891.

Penton, E.H., Hebert, P.D.N. & Crease, T.J. (2004) Mitochondrial DNA variation in North American populations of *Daphnia obtusa*: continentalism or cryptic endemism? *Molecular Ecology*, 13(1), 97–107.

Petrusek, A., Cerny M. & Audenaert E. (2004) Large intercontinental differentiation of *Moina micrura* (Crustacea : Anomopoda): one less cosmopolitan cladoceran? *Hydrobiologia*, 526, 73–81.

Ratnasingham, S. & Hebert, P.D.N. (2007) BOLD: The Barcode of Life Data System (www.barcodinglife.org). *Molecular Ecology Notes*, 7(3), 355–364

Richard, J. (1894a) Entomostracés recueillis dans lac Toba (Sumatra). *Annali del Museo Civico di Storia Naturale Giacomo Doria*, 14, 565–578.

Richard, J. (1894b) Sur quelques animaux intérieurs des eaux douces du Tonkin (Protozoaires, Rotifères, Entomostraces). *Mémoires de la Société Zoologique de France*, 7(2–3), 237–243.

Sacherova, V. & Hebert, P.D.N. (2003) The evolutionary history of the Chydoridae (Crustacea : Cladocera). *Biological Journal of the Linnean Society,* 79(4), 629–643.

Saitou, N. & Nei, M. (1987) The Neighbor–Joining Method: A new method for reconstructing phylogenetic trees. *Molecular Biology and Evolution*, 4(4), 406–425.

Sars, G.O. (1885) On some Australian Cladocera, raised from dried mud. *Forhandlinger i Videnskabs–Selskabei Christiania*, 8, 1–46.

Sars, G.O. (1901) Contributions to the knowledge of the fresh–water Entomostraca of South America, as shown by artificial hatching from the dried material. *Archiv for Mathematik og Naturvidenskab*, 23, 1–102.

Sinev, A.Y., Kotov, A.A. & Van Damme, K. (2004) Morphology of a Neotropical cladoceran *Alona dentifera* (Sars, 1901), and its position within the Chydoridae Stebbing, 1902 (Branchiopoda: Anomopoda). *Arthropoda Selecta,* 13(3), 99–107.

Sinev, A.Y., Van Damme, K. & Kotov, A.A. (2006) Redescription of tropical–temperate cladocerans *Alona diaphana* King, 1853 and *Alona davidi* Richard, 1895 and their translocation to *Leberis* Smirnov, 1989 (Branchiopoda: Anomopoda; Chydoridae). *Arthropoda Selecta*, 14(3), 183–205.

Smirnov, N. N. (1989). Tropical cladocera. 2. New species of the families Chydoridae, Macrothricidae and Moinidae from tropical Australia. *Zoologische Zhurnal*, 68(7), 51-58.

Smirnov, N.N. (1996) *Cladocera: The Chydorinae and Sayciinae (Chydoridae) of the World*. SPB Academic Publishing, Amsterdam, 197 p.

Smirnov, N.N., Kotov, A.A. & Coronel, J.S. (2006) Partial revision of the *aduncus*–like species of *Pleuroxus* Baird, 1843 (Chydoridae, Cladocera) from the southern hemisphere with comments on subgeneric differentiation within the genus. *Journal of Natural History,* 40(27–28), 1617–1639.

Smith, M.A., Fisher, B.L. & Hebert, P.D.N. (2005) DNA barcoding for effective biodiversity assessment of a hyperdiverse arthropod group: the ants of Madagascar. *Philosophical Transactions of the Royal Society B–Biological Sciences*, 360(1462), 1825–1834.

Suárez–Morales, E. & Elías–Gutiérrez, M. (2000) Two new *Mastigodiaptomus* (Copepoda, Diaptomidae) from Southeastern Mexico with a key for the identification of the known species of the genus. *Journal of Natural History*, 34(5), 693–708.

Suárez–Morales, E. & Elías–Gutiérrez, M. (2001) On the taxonomical status of *Arctodiaptomus dampfi* Brehm (Crustacea: Copepoda: Diaptomidae) with comments on *A. dorsalis* (Marsh). *Journal of Limnology*, 60, 11–18.

Suárez–Morales, E. & Elías–Gutiérrez, M. (2003) *Estado actual del conocimiento de los copépodos de aguas continentales de México*. *In* : Barreiro–Güemes, M. T. *et al.* (Eds), El Colegio de la Frontera Sur, Universidad Autónoma Metropolitana, Estado de Veracruz, Mexico, pp. 157–169.

Suárez–Morales, E., Reid, J.W. & Elías–Gutiérrez, M. (2005) Diversity and distributional patterns of neotropical freshwater copepods (Calanoida: Diaptomidae). *International Review of Hydrobiology,* 90(1), 71–83.

Taylor, D.J., Ishikane, C.R. & Haney, R.A. (2002) The systematics of Holarctic Bosminids and a revision that reconciles molecular and morphological evolution. *Limnology and Oceanography*, 47(5), 1486–1495.

Trapani, J. (2003) Morphological variability in the Cuatro Cienegas cichlid, *Cichlasoma minckleyi*. *Journal of Fish Biology*, 62(2), 276–298.

U.S. Environmental Protection Agency. (2002) *Methods for measuring the acute toxicity of effluents and receiving waters to freshwater and marine organisms*. 5th ed. U. S. Environmental Protection Agency, Office of Water (4303T). 1200 Pennsylvania Av. NW, Washington, DC 20460. EPA–821–R–02–012, viii, 266 p.

Ward, R.D., Zemlak, T.S., Innes, B.H., Last, P.R. & Hebert, P.D.N. (2005) DNA barcoding Australia´s fish species. *Philosophical Transactions of the Royal Society of London Series B–Biological Sciences*, 360(1462), 1847–1857.

Wilson, M.S. (1959) *Free–living Copepoda Calanoida*. *In*: Ward and Whipple's Freshwater Biology, 2nd ed., W. T. Edmonson, ed., Wiley, New York, pp. 738–794.

Appendix 1. GenBank accession numbers and localities for the 507 individuals representing 61 species of Cladocera and 19 of Copepoda used in this study.

Sequence Page (BOLD)	GenBank Access	Identification	Country	Locality	Lat N	Lon W
ZPLMX011-06	EU701990	*Alona glabra*	Mexico	Antiguos Mineros 3	26.791	101.994
ZPLMX013-06	EU701992	*Alona glabra*	Mexico	Antiguos Mineros 3	26.791	101.994
ZPLMX014-06	EU701989	*Alona glabra*	Mexico	Antiguos Mineros 3	26.791	101.994
ZPLMX015-06	EU701988	*Alona glabra*	Mexico	Antiguos Mineros 3	26.791	101.994
ZPLMX016-06	EU701991	*Alona glabra*	Mexico	Antiguos Mineros 1	26.79	101.996
ZPLMX019-06	EU701993	*Alona glabra*	Mexico	Antiguos Mineros 1	26.79	101.996
ZPLMX023-06	EU702260	*Moinodaphnia macleayi*	Mexico	La Mata 3	16.599	95.03
ZPLMX024-06	EU701995	*Alona glabra*	Mexico	Rio Nazas	25.5	103.64
ZPLMX025-06	EU702258	*Moinodaphnia macleayi*	Mexico	La Mata 3	16.599	95.03
ZPLMX026-06	EU701967	*Alona cf. glabra*	Mexico	Rio Nazas	25.5	103.64
ZPLMX028-06	EU702259	*Moinodaphnia macleayi*	Mexico	La Mata 3	16.599	95.03
ZPLMX029-06	EU702138	*Daphnia magna*	Mexico	Ecotoxicology Laboratory IPN	19.454	99.172
ZPLMX037-06	EU702188	*Leydigia lousi mexicana*	Mexico	Los Banos	19.67	99.849
ZPLMX038-06	EU702187	*Leydigia lousi mexicana*	Mexico	Los Banos	19.67	99.849
ZPLMX039-06	EU702189	*Macrothrix* cf. *elegans*	Mexico	Km 50 to Tampico	21.249	98.159
ZPLMX043-06	EU702174	*Dunhevedia odontoplax*	Mexico	Papasquiaro A	24.515	104.664
ZPLMX044-06	EU702175	*Dunhevedia odontoplax*	Mexico	Papasquiaro A	24.515	104.664
ZPLMX046-06	EU701960	*Alona* cf. *dentifera*	Mexico	La Penal	17.416	95.073
ZPLMX047-06	EU702264	*Pleuroxus denticulatus*	Mexico	Papasquiaro B	24.515	104.664
ZPLMX048-06	EU702263	*Pleuroxus denticulatus*	Mexico	Papasquiaro B	24.515	104.664
ZPLMX049-06	EU701994	*Alona glabra*	Mexico	Km 217 Jimenez-Torreon	27.057	104.792
ZPLMX050-06	EU701966	*Alona* cf. *glabra*	Mexico	Km 217 Jimenez-Torreon	27.057	104.792
ZPLMX053-06	EU702171	*Dunhevedia crassa*	Mexico	Nazas river	25.5	103.64
ZPLMX058-06	EU702182	*Kurzia polyspina*	Mexico	Km 50 to Tampico	21.249	98.159
ZPLMX060-06	EU702281	*Simocephalus cf. mixtus*	Mexico	Bordo San Jeronimo	19.419	99.728
ZPLMX061-06	EU702296	*Simocephalus exspinosus*	Mexico	Bordo San Jeronimo	19.419	99.728
ZPLMX063-06	EU702126	*Daphnia exilis*	Mexico	Stabilization ponds	19.452	98.995
ZPLMX064-06	EU702040	*Ceriodaphnia* cf. *laticaudata*	Mexico	Bordo San Jeronimo	19.419	99.728
ZPLMX065-06	EU702039	*Ceriodaphnia* cf. *laticaudata*	Mexico	Bordo San Jeronimo	19.419	99.728
ZPLMX066-06	EU702043	*Ceriodaphnia* cf. *reticulata*	Mexico	Los Banos	19.67	99.849
ZPLMX067-06	EU702044	*Ceriodaphnia* cf. *reticulata*	Mexico	Los Banos	19.67	99.849
ZPLMX072-06	EU702103	*Ceriodaphnia sp.*	Mexico	Papasquiaro B	24.515	104.664
ZPLMX073-06	EU702104	*Ceriodaphnia sp.*	Mexico	Papasquiaro B	24.515	104.664
ZPLMX075-06	EU702083	*Ceriodaphnia dubia*	Mexico	La Goleta	20.07	99.556
ZPLMX082-06	EU702164	*Diaphanosoma* cf. *heberti*	Mexico	La Goleta	20.07	99.556
ZPLMX083-06	EU702163	*Diaphanosoma* cf. *heberti*	Mexico	La Goleta	20.07	99.556
ZPLMX084-06	EU702271	*Sarsilatona serricauda*	Mexico	Kohunlich	18.447	88.825
ZPLMX085-06	EU702272	*Sarsilatona serricauda*	Mexico	Kohunlich	18.447	88.825

ZPLMX088-06	EU702245	*Moina* cf. *micrura3*	Mexico	Sta Barbara	23.917	104.952
ZPLMX089-06	EU702244	*Moina* cf. *micrura3*	Mexico	Sta Barbara	23.917	104.952
ZPLMX096-06	EU702275	*Scapholeberis armata freyi*	Mexico	Silvituc Lake	18.643	90.295
ZPLMX097-06	EU702274	*Scapholeberis armata freyi*	Mexico	Silvituc Lake	18.643	90.295
ZPLMX110-06	EU702261	*Pleuroxus denticulatus*	Mexico	Km 217 Jimenez-Torreon	27.057	104.792
ZPLMX111-06	EU702262	*Pleuroxus denticulatus*	Mexico	Km 217 Jimenez-Torreon	27.057	104.792
ZPLMX112-06	EU702186	*Latonopsis australis*	Mexico	Atasta-Cd Pemex Km 35	18.332	92.238
ZPLMX113-06	EU702185	*Latonopsis australis*	Mexico	Atasta-Cd Pemex Km 35	18.332	92.238
ZPLMX116-06	EU702242	*Moina* cf. *micrura2*	Mexico	La Goleta	20.07	99.556
ZPLMX119-06	EU702305	*Simocephalus mixtus*	Mexico	Papasquiaro A	24.515	104.664
ZPLMX122-06	EU702240	*Moina* cf. *micrura2*	Mexico	Cuitzeo	19.925	101.141
ZPLMX123-06	EU702241	*Moina* cf. *micrura2*	Mexico	Cuitzeo	19.925	101.141
ZPLMX125-06	EU702118	*Chydorus brevilabris*	Mexico	Antiguos Mineros 1	26.79	101.996
ZPLMX126-06	EU702117	*Chydorus brevilabris*	Mexico	Antiguos Mineros 1	26.79	101.996
ZPLMX127-06	EU702181	*Kurzia polyspina*	Mexico	Kohunlich	18.447	88.825
ZPLMX128-06	EU702295	*Simocephalus exspinosus*	Mexico	Los Banos	19.67	99.849
ZPLMX131-06	EU702067	*Ceriodaphnia* cf. *rigaudi2*	Mexico	Atasta-Cd Pemex Km 35	18.332	92.238
ZPLMX132-06	EU702101	*Ceriodaphnia sp.*	Mexico	Santa Teresita IIIA	26.351	105.265
ZPLMX133-06	EU702102	*Ceriodaphnia sp.*	Mexico	Santa Teresita IIIA	26.351	105.265
ZPLMX134-06	EU702100	*Ceriodaphnia sp.*	Mexico	Santa Teresita IIIA	26.351	105.265
ZPLMX136-06	EU702227	*Moina* cf. *micrura1*	Mexico	Km 44 Parral-Jimenez	27.047	105.218
ZPLMX137-06	EU702226	*Moina* cf. *micrura1*	Mexico	Km 44 Parral-Jimenez	27.047	105.218
ZPLMX138-06	EU702284	*Simocephalus* cf. *punctatus*	Mexico	Antiguos Mineros 5	26.789	101.992
ZPLMX139-06	EU702082	*Ceriodaphnia dubia*	Guate-mala	Peten Lake 6	16.981	89.712
ZPLMX140-06	EU702026	*Bosmina tubicen*	Guate-mala	Peten Lake 6	16.981	89.712
ZPLMX141-06	EU702025	*Bosmina tubicen*	Guate-mala	Peten Lake 6	16.981	89.712
ZPLMX142-06	EU702196	*Macrothrix elegans*	Guate-mala	Pool near Lanchua Lake	15.933	90.677
ZPLMX144-06	EU702278	*Scapholeberis sp.*	Mexico	El Chupadero	24.136	104.712
ZPLMX145-06	EU702277	*Scapholeberis sp.*	Mexico	El Chupadero	24.136	104.712
ZPLMX146-06	EU702017	*Bosmina huaronensis*	Mexico	La Goleta	20.07	99.556
ZPLMX147-06	EU702016	*Bosmina huaronensis*	Mexico	Km 25 Toluca-Atlaco-mulco	19.486	99.745
ZPLMX148-06	EU702015	*Bosmina huaronensis*	Mexico	Km 25 Toluca-Atlaco-mulco	19.486	99.745
ZPLMX149-06	EU702140	*Daphnia* sp.	Mexico	La Goleta	20.07	99.556
ZPLMX150-06	EU702139	*Daphnia* sp.	Mexico	La Goleta	20.07	99.556
ZPLMX151-06	EU702125	*Daphnia exilis*	Mexico	Los Banos	19.67	99.849
ZPLMX152-06	EU702124	*Daphnia exilis*	Mexico	Los Banos	19.67	99.849
ZPLMX153-06	EU702177	*Ilyocryptus spinifer*	Guate-mala	Road to Lachua	15.927	90.306

ZPLMX154-06	EU702176	*Ilyocryptus spinifer*	Guate-mala	Road to Chajmaic	15.776	90.145
ZPLMX155-06	EU702257	*Moinodaphnia macleayi*	Mexico	Silvituc Lake	18.643	90.295
ZPLMX157-06	EU702239	*Moina* cf. *micrura2*	Mexico	Near Salamanca	20.542	101.162
ZPLMX158-06	EU702273	*Scapholeberis armata freyi*	Mexico	Atasta-Cd Pemex Km 58	18.15	92.317
ZPLMX159-06	EU702081	*Ceriodaphnia dubia*	Mexico	Valle de Bravo	19.188	100.13
ZPLMX230-06	EU702225	*Moina* cf. *micrura1*	Mexico	End hwy. Chihuahua B	26.907	104.559
ZPLMX231-06	EU702249	*Moina macrocopa*	Mexico	Texcoco Lake	19.452	98.995
ZPLMX232-06	EU702248	*Moina macrocopa*	Mexico	Texcoco Lake	19.452	98.995
ZPLMX238-06	EU702224	*Moina* cf. *micrura1*	Mexico	El Salvador Dgo lim-netic	26.067	104.974
ZPLMX239-06	EU702223	*Moina* cf. *micrura1*	Mexico	El Salvador Dgo lim-netic	26.067	104.974
ZPLMX240-06	EU702014	*Bosmina huaronensis*	Mexico	La Goleta	20.07	99.556
ZPLMX241-06	EU702222	*Moina* cf. *micrura1*	Mexico	El Salvador Dgo lim-netic	26.067	104.974
ZPLMX242-06	EU702221	*Moina* cf. *micrura1*	Mexico	Sta Teresita III A	26.351	105.265
ZPLMX245-06	EU702220	*Moina* cf. *micrura1*	Mexico	Sta Teresita III A	26.351	105.265
ZPLMX246-06	EU702219	*Moina* cf. *micrura1*	Mexico	Sta Teresita III A	26.351	105.265
ZPLMX253-06	EU702197	*Moina* cf. *micrura1*	Mexico	Fin Carretera Chihua-hua B	26.907	104.559
ZPLMX254-06	EU702207	*Moina* cf. *micrura1*	Mexico	End hwy. Chihuahua B	26.907	104.559
ZPLMX255-06	EU702206	*Moina* cf. *micrura1*	Mexico	End hwy. Chihuahua B	26.907	104.559
ZPLMX256-06	EU702205	*Moina* cf. *micrura1*	Mexico	End hwy. Chihuahua B	26.907	104.559
ZPLMX257-06	EU702204	*Moina* cf. *micrura1*	Mexico	Sta Teresita III A	26.351	105.265
ZPLMX259-06	EU702203	*Moina* cf. *micrura1*	Mexico	Sta Teresita III A	26.351	105.265
ZPLMX260-06	EU702256	*Moinodaphnia macleayi*	Mexico	La Mata 3	16.599	95.03
ZPLMX261-06	EU702255	*Moinodaphnia macleayi*	Mexico	La Mata 3	16.599	95.03
ZPLMX262-06	EU702254	*Moinodaphnia macleayi*	Mexico	La Mata 3	16.599	95.03
ZPLMX264-06	EU702253	*Moinodaphnia macleayi*	Mexico	Silvituc Lake	18.643	90.295
ZPLMX265-06	EU702252	*Moinodaphnia macleayi*	Mexico	Silvituc Lake	18.643	90.295
ZPLMX266-06	EU702251	*Moinodaphnia macleayi*	Mexico	Silvituc Lake	18.643	90.295
ZPLMX267-06	EU702250	*Moinodaphnia macleayi*	Mexico	Silvituc Lake	18.643	90.295
ZPLMX268-06	EU702161	*Diaphanosoma* cf. *heberti*	Mexico	La Goleta	20.07	99.556
ZPLMX269-06	EU702160	*Diaphanosoma* cf. *heberti*	Mexico	La Goleta	20.07	99.556
ZPLMX270-06	EU702159	*Diaphanosoma* cf. *heberti*	Mexico	La Goleta	20.07	99.556
ZPLMX272-06	EU702053	*Ceriodaphnia* cf. *rigaudi2*	Mexico	Atasta-Cd Pemex Km 35	18.3324	92.2377
ZPLMX273-06	EU702052	*Ceriodaphnia* cf. *rigaudi2*	Mexico	Atasta-Cd Pemex Km 35	18.3324	92.2377
ZPLMX274-06	EU702066	*Ceriodaphnia* cf. *rigaudi2*	Mexico	Atasta-Cd Pemex Km 35	18.332	92.238
ZPLMX275-06	EU702099	*Ceriodaphnia* sp.	Mexico	Santa Teresita IIIA	26.351	105.265
ZPLMX276-06	EU702098	*Ceriodaphnia* sp.	Mexico	Santa Teresita IIIA	26.351	105.265
ZPLMX277-06	EU702097	*Ceriodaphnia* sp.	Mexico	Santa Teresita IIIA	26.351	105.265
ZPLMX278-06	EU702096	*Ceriodaphnia* sp.	Mexico	Santa Teresita IIIA	26.351	105.265
ZPLMX279-06	EU702095	*Ceriodaphnia* sp.	Mexico	Santa Teresita IIIA	26.351	105.265
ZPLMX280-06	EU702042	*Ceriodaphnia* cf. *reticulata*	Mexico	Papasquiaro B	24.515	104.664

ZPLMX282-06	EU702094	*Ceriodaphnia* sp.	Mexico	Papasquiaro B	24.515	104.664
ZPLMX283-06	EU702041	*Ceriodaphnia* cf. *reticulata*	Mexico	Papasquiaro B	24.515	104.664
ZPLMX284-06	EU702093	*Ceriodaphnia* sp.	Mexico	Papasquiaro B	24.515	104.664
ZPLMX285-06	EU702038	*Ceriodaphnia* cf. *laticaudata*	Mexico	Bordo San Jeronimo	19.419	99.728
ZPLMX286-06	EU702037	*Ceriodaphnia* cf. *laticaudata*	Mexico	Bordo San Jeronimo	19.419	99.728
ZPLMX287-06	EU702184	*Latonopsis australis*	Mexico	Atasta-Cd Pemex Km 35	18.332	92.238
ZPLMX288-06	EU702183	*Latonopsis australis*	Mexico	Atasta-Cd Pemex Km 35	18.332	92.238
ZPLMX289-06	EU702270	*Sarsilatona serricauda*	Mexico	Kohunlich	18.447	88.825
ZPLMX290-06	EU702269	*Sarsilatona serricauda*	Mexico	Kohunlich	18.447	88.825
ZPLMX291-06	EU702080	*Ceriodaphnia dubia*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX292-06	EU702079	*Ceriodaphnia dubia*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX293-06	EU702078	*Ceriodaphnia dubia*	Mexico	Valle de Bravo	19.188	100.13
ZPLMX294-06	EU702077	*Ceriodaphnia dubia*	Mexico	Valle de Bravo	19.188	100.13
ZPLMX295-06	EU702290	*Simocephalus exspinosus*	Mexico	Bordo San Jeronimo	19.419	99.728
ZPLMX296-06	EU702289	*Simocephalus exspinosus*	Mexico	Bordo San Jeronimo	19.419	99.728
ZPLMX297-06	EU702280	*Simocephalus* cf. *mixtus*	Mexico	Bordo San Jeronimo	19.419	99.728
ZPLMX298-06	EU702076	*Ceriodaphnia dubia*	Mexico	La Goleta	20.07	99.556
ZPLMX299-06	EU702075	*Ceriodaphnia dubia*	Mexico	La Goleta	20.07	99.556
ZPLMX300-06	EU702074	*Ceriodaphnia dubia*	Mexico	La Goleta	20.07	99.556
ZPLMX301-06	EU702073	*Ceriodaphnia dubia*	Mexico	La Goleta	20.07	99.556
ZPLMX302-06	EU702072	*Ceriodaphnia dubia*	Mexico	La Goleta	20.07	99.556
ZPLMX303-06	EU702247	*Moina macrocopa*	Mexico	Texcoco Lake	19.452	98.995
ZPLMX304-06	EU702246	*Moina macrocopa*	Mexico	Texcoco Lake	19.452	98.995
ZPLMX305-06	EU702288	*Simocephalus exspinosus*	Mexico	Los Banos	19.67	99.849
ZPLMX306-06	EU702287	*Simocephalus exspinosus*	Mexico	Los Banos	19.67	99.849
ZPLMX307-06	EU702238	*Moina* cf. *micrura2*	Mexico	La Goleta	20.07	99.556
ZPLMX308-06	EU702237	*Moina* cf. *micrura2*	Mexico	La Goleta	20.07	99.556
ZPLMX309-06	EU702236	*Moina* cf. *micrura2*	Mexico	La Goleta	20.07	99.556
ZPLMX310-06	EU702235	*Moina* cf. *micrura2*	Mexico	La Goleta	20.07	99.556
ZPLMX311-06	EU702234	*Moina* cf. *micrura2*	Mexico	La Goleta	20.07	99.556
ZPLMX312-06	EU702233	*Moina* cf. *micrura2*	Mexico	Cuitzeo	19.925	101.141
ZPLMX313-06	EU702232	*Moina* cf. *micrura2*	Mexico	Cuitzeo	19.925	101.141
ZPLMX314-06	EU702231	*Moina* cf. *micrura2*	Mexico	Cuitzeo	19.925	101.141
ZPLMX315-06	EU702230	*Moina* cf. *micrura2*	Mexico	Cuitzeo	19.925	101.141
ZPLMX316-06	EU702229	*Moina* cf. *micrura2*	Mexico	Cuitzeo	19.925	101.141
ZPLMX317-06	EU702228	*Moina* cf. *micrura2*	Mexico	Cuitzeo	19.925	101.141
ZPLMX319-06	EU702298	*Simocephalus mixtus*	Mexico	Papasquiaro A	24.515	104.664
ZPLMX320-06	EU702297	*Simocephalus mixtus*	Mexico	Papasquiaro A	24.515	104.664
ZPLMX324-06	EU702243	*Moina* cf. *micrura3*	Mexico	Sta Barbara	23.917	104.952
ZPLMX325-06	EU702116	*Chydorus brevilabris*	Mexico	Antiguos Mineros 1	26.79	101.996
ZPLMX326-06	EU702115	*Chydorus brevilabris*	Mexico	Antiguos Mineros 1	26.79	101.996
ZPLMX327-06	EU702114	*Chydorus brevilabris*	Mexico	Antiguos Mineros 1	26.79	101.996

ZPLMX328-06	EU702113	*Chydorus brevilabris*	Mexico	Antiguos Mineros 1	26.79	101.996
ZPLMX329-06	EU702112	*Chydorus brevilabris*	Mexico	Antiguos Mineros 1	26.79	101.996
ZPLMX330-06	EU702202	*Moina* cf. *micrura1*	Mexico	El Salvador Dgo limnetic	26.067	104.974
ZPLMX331-06	EU702201	*Moina* cf. *micrura1*	Mexico	El Salvador Dgo limnetic	26.067	104.974
ZPLMX332-06	EU702200	*Moina* cf. *micrura1*	Mexico	El Salvador Dgo limnetic	26.067	104.974
ZPLMX334-06	EU702199	*Moina* cf. *micrura1*	Mexico	El Salvador Dgo limnetic	26.067	104.974
ZPLMX335-06	EU702218	*Moina* cf. *micrura1*	Mexico	Km 44 Parral-Jimenez	27.047	105.218
ZPLMX336-06	EU702217	*Moina* cf. *micrura1*	Mexico	Km 44 Parral-Jimenez	27.047	105.218
ZPLMX337-06	EU702216	*Moina* cf. *micrura1*	Mexico	Km 44 Parral-Jimenez	27.047	105.218
ZPLMX338-06	EU702215	*Moina* cf. *micrura1*	Mexico	Km 44 Parral-Jimenez	27.047	105.218
ZPLMX339-06	EU702214	*Moina* cf. *micrura1*	Mexico	Km 44 Parral-Jimenez	27.047	105.218
ZPLMX340-06	EU702213	*Moina* cf. *micrura1*	Mexico	Km 44 Parral-Jimenez	27.047	105.218
ZPLMX341-06	EU702212	*Moina* cf. *micrura1*	Mexico	End hwy. Chihuahua B	26.907	104.559
ZPLMX342-06	EU702211	*Moina* cf. *micrura1*	Mexico	End hwy. Chihuahua B	26.907	104.559
ZPLMX343-06	EU702210	*Moina* cf. *micrura1*	Mexico	End hwy. Chihuahua B	26.907	104.559
ZPLMX344-06	EU702209	*Moina* cf. *micrura1*	Mexico	End hwy. Chihuahua B	26.907	104.559
ZPLMX345-06	EU702208	*Moina* cf. *micrura1*	Mexico	End hwy. Chihuahua B	26.907	104.559
ZPLMX346-06	EU702198	*Moina* cf. *micrura1*	Mexico	Fin Carretera Chihuahua B	26.907	104.559
ZPLMX356-06	EU701971	*Alona dentifera*	Mexico	Papasquiaro A	24.515	104.664
ZPLMX357-06	EU701970	*Alona dentifera*	Mexico	Papasquiaro A	24.515	104.664
ZPLMX358-06	EU701969	*Alona dentifera*	Mexico	Papasquiaro A	24.515	104.664
ZPLMX359-06	EU701968	*Alona dentifera*	Mexico	Papasquiaro A	24.515	104.664
ZPLMX367-06	EU701987	*Alona glabra*	Mexico	Antiguos Mineros 2	26.791	101.994
ZPLMX369-06	EU701998	*Alona setulosa*	Mexico	Antiguos Mineros 2	26.791	101.994
ZPLMX370-06	EU701961	*Alona* cf. *glabra*	Mexico	Pozo Bonito 1	26.838	102.142
ZPLMX371-06	EU701986	*Alona glabra*	Mexico	Pozo Bonito 1	26.838	102.142
ZPLMX372-06	EU701965	*Alona* cf. *glabra*	Mexico	Pozo Bonito 1	26.838	102.142
ZPLMX374-06	EU701985	*Alona glabra*	Mexico	Antiguos Mineros 4	26.789	101.993
ZPLMX375-06	EU701984	*Alona glabra*	Mexico	Antiguos Mineros 4	26.789	101.993
ZPLMX376-06	EU701983	*Alona glabra*	Mexico	Antiguos Mineros 4	26.789	101.993
ZPLMX377-06	EU701982	*Alona glabra*	Mexico	Antiguos Mineros 4	26.789	101.993
ZPLMX378-06	EU701997	*Alona setulosa*	Mexico	Antiguos Mineros 4	26.789	101.993
ZPLMX379-06	EU701981	*Alona glabra*	Mexico	Antiguos Mineros 1	26.79	101.996
ZPLMX380-06	EU701980	*Alona glabra*	Mexico	Antiguos Mineros 1	26.79	101.996
ZPLMX381-06	EU701979	*Alona glabra*	Mexico	Antiguos Mineros 1	26.79	101.996
ZPLMX386-06	EU701964	*Alona* cf. *glabra*	Mexico	Km 217 Jimenez-Torreon	27.057	104.792
ZPLMX388-06	EU701972	*Alona glabra*	Mexico	Km 217 Jimenez-Torreon	27.057	104.792
ZPLMX393-06	EU701996	*Alona setulosa*	Mexico	Papasquiaro B	24.515	104.664
ZPLMX395-06	EU701963	*Alona* cf. *glabra*	Mexico	Sta Teresita III A	26.351	105.265
ZPLMX396-06	EU701962	*Alona* cf. *glabra*	Mexico	Sta Teresita III A	26.351	105.265
ZPLMX398-06	EU701999	*Alona* sp.	Mexico	Papasquiaro A	24.515	104.664
ZPLMX401-06	EU702013	*Bosmina huaronensis*	Mexico	La Goleta	20.07	99.556

ZPLMX402-06	EU702012	*Bosmina huaronensis*	Mexico	La Goleta	20.07	99.556
ZPLMX403-06	EU702011	*Bosmina huaronensis*	Mexico	La Goleta	20.07	99.556
ZPLMX404-06	EU702010	*Bosmina huaronensis*	Mexico	La Goleta	20.07	99.556
ZPLMX405-06	EU702009	*Bosmina huaronensis*	Mexico	Km 25 Toluca-Atlaco-mulco	19.486	99.745
ZPLMX406-06	EU702008	*Bosmina huaronensis*	Mexico	Km 25 Toluca-Atlaco-mulco	19.486	99.745
ZPLMX407-06	EU702007	*Bosmina huaronensis*	Mexico	Km 25 Toluca-Atlaco-mulco	19.486	99.745
ZPLMX409-06	EU702024	*Bosmina tubicen*	Guate-mala	Peten Lake 6	16.981	89.712
ZPLMX410-06	EU702023	*Bosmina tubicen*	Guate-mala	Peten Lake 6	16.981	89.712
ZPLMX411-06	EU702022	*Bosmina tubicen*	Guate-mala	Peten Lake 6	16.981	89.712
ZPLMX418-06	EU702068	*Ceriodaphnia* cf. *rigaudi3*	Mexico	Kohunlich	18.447	88.825
ZPLMX421-06	EU702036	*Ceriodaphnia* cf. *laticau-data*	Mexico	Antiguos Mineros 1	26.79	101.996
ZPLMX422-06	EU702035	*Ceriodaphnia* cf. *laticau-data*	Mexico	Antiguos Mineros 1	26.79	101.996
ZPLMX423-06	EU702034	*Ceriodaphnia* cf. *laticau-data*	Mexico	Antiguos Mineros 1	26.79	101.996
ZPLMX424-06	EU702033	*Ceriodaphnia* cf. *laticau-data*	Mexico	Antiguos Mineros 1	26.79	101.996
ZPLMX425-06	EU702032	*Ceriodaphnia* cf. *laticau-data*	Mexico	Antiguos Mineros 1	26.79	101.996
ZPLMX426-06	EU702085	*Ceriodaphnia laticaudata*	Mexico	Pozas Azules 1	26.308	102.013
ZPLMX427-06	EU702084	*Ceriodaphnia laticaudata*	Mexico	Pozas Azules 1	26.308	102.013
ZPLMX430-06	EU702051	*Ceriodaphnia* cf. *rigaudi1*	Mexico	End hwy. Chihuahua B	26.907	104.559
ZPLMX431-06	EU702050	*Ceriodaphnia* cf. *rigaudi1*	Mexico	End hwy. Chihuahua B	26.907	104.559
ZPLMX432-06	EU702049	*Ceriodaphnia* cf. *rigaudi1*	Mexico	End hwy. Chihuahua B	26.907	104.559
ZPLMX433-06	EU702048	*Ceriodaphnia* cf. *rigaudi1*	Mexico	El Salvador Dgo lim-netic	26.067	104.974
ZPLMX435-06	EU702047	*Ceriodaphnia* cf. *rigaudi1*	Mexico	El Salvador Dgo lim-netic	26.067	104.974
ZPLMX436-06	EU702046	*Ceriodaphnia* cf. *rigaudi1*	Mexico	El Salvador Dgo lim-netic	26.067	104.974
ZPLMX437-06	EU702045	*Ceriodaphnia* cf. *rigaudi1*	Mexico	El Salvador Dgo lim-netic	26.067	104.974
ZPLMX439-06	EU702028	*Ceriodaphnia*	Mexico	Km 50 to Tampico	21.249	98.159
ZPLMX441-06	EU702092	*Ceriodaphnia* sp.	Mexico	Km 217 Jimenez-Torreon	27.057	104.792
ZPLMX442-06	EU702091	*Ceriodaphnia* sp.	Mexico	Km 217 Jimenez-Torreon	27.057	104.792
ZPLMX443-06	EU702090	*Ceriodaphnia* sp.	Mexico	Km 217 Jimenez-Torreon	27.057	104.792
ZPLMX444-06	EU702089	*Ceriodaphnia* sp.	Mexico	Km 217 Jimenez-Torreon	27.057	104.792
ZPLMX445-06	EU702088	*Ceriodaphnia* sp.	Mexico	Highway Chihuahua-Torreon	26.84	104.427
ZPLMX446-06	EU702087	*Ceriodaphnia* sp.	Mexico	Highway Chihuahua-Torreon	26.84	104.427

ZPLMX447-06	EU702086	*Ceriodaphnia* sp.	Mexico	Highway Chihuahua-Torreon	26.84	104.427
ZPLMX448-06	EU702111	*Chydorus brevilabris*	Mexico	Nazas river	25.5	103.64
ZPLMX449-06	EU702110	*Chydorus brevilabris*	Mexico	Nazas river	25.5	103.64
ZPLMX450-06	EU702109	*Chydorus brevilabris*	Mexico	Antiguos Mineros 2	26.791	101.994
ZPLMX451-06	EU702137	*Daphnia magna*	Mexico	Ecotoxicology Laboratory IPN	19.454	99.172
ZPLMX452-06	EU702136	*Daphnia magna*	Mexico	Ecotoxicology Laboratory IPN	19.454	99.172
ZPLMX453-06	EU702135	*Daphnia magna*	Mexico	Ecotoxicology Laboratory IPN	19.454	99.172
ZPLMX454-06	EU702134	*Daphnia magna*	Mexico	Ecotoxicology Laboratory IPN	19.454	99.172
ZPLMX455-06	EU702149	*Diaphanosoma brevireme*	Mexico	Km 52 Acayucan-La Tinaja	18.506	96.056
ZPLMX457-06	EU702148	*Diaphanosoma brevireme*	Mexico	Km 52 Acayucan-La Tinaja	18.506	96.056
ZPLMX458-06	EU702147	*Diaphanosoma brevireme*	Mexico	Km 52 Acayucan-La Tinaja	18.506	96.056
ZPLMX459-06	EU702146	*Diaphanosoma brevireme*	Mexico	Km 50 to Tampico	21.249	98.159
ZPLMX460-06	EU702145	*Diaphanosoma brevireme*	Mexico	Km 50 to Tampico	21.249	98.159
ZPLMX461-06	EU702155	*Diaphanosoma* cf. *heberti*	Mexico	Km 217 Jimenez-Torreon	27.057	104.792
ZPLMX462-06	EU702154	*Diaphanosoma* cf. *heberti*	Mexico	Km 217 Jimenez-Torreon	27.057	104.792
ZPLMX463-06	EU702153	*Diaphanosoma* cf. *heberti*	Mexico	Km 217 Jimenez-Torreon	27.057	104.792
ZPLMX464-06	EU702152	*Diaphanosoma* cf. *heberti*	Mexico	Km 217 Jimenez-Torreon	27.057	104.792
ZPLMX465-06	EU702172	*Dunhevedia odontoplax*	Mexico	Papasquiaro A	24.515	104.664
ZPLMX466-06	EU702173	*Dunhevedia odontoplax*	Mexico	Papasquiaro A	24.515	104.664
ZPLMX467-06	EU702180	*Kurzia polyspina*	Mexico	Km 50 to Tampico	21.249	98.159
ZPLMX468-06	EU702179	*Kurzia polyspina*	Mexico	Km 50 to Tampico	21.249	98.159
ZPLMX472-06	EU702162	*Diaphanosoma* cf. *heberti*	Mexico	El Aguila dam A	24.196	104.662
ZPLMX473-06	EU702170	*Diaphanosoma sp2*	Mexico	El Aguila dam A	24.196	104.662
ZPLMX474-06	EU702169	*Diaphanosoma sp2*	Mexico	El Aguila dam A	24.196	104.662
ZPLMX475-06	EU702178	*Kurzia media*	Mexico	Antiguos Mineros 2	26.791	101.994
ZPLMX476-06	EU702195	*Macrothrix elegans*	Mexico	Atasta-Cd Pemex Km 58	18.15	92.317
ZPLMX485-06	EU702276	*Scapholeberis* sp.	Mexico	El Chupadero	24.136	104.712
ZPLMX488-06	EU702283	*Simocephalus* cf. *punctatus*	Mexico	Antiguos Mineros 5	26.789	101.992
ZPLMX490-06	EU702311	*Simocephalus punctatus*	Mexico	Antiguos Mineros 5	26.789	101.992
ZPLMX492-06	EU702282	*Simocephalus* cf. *punctatus*	Mexico	Antiguos Mineros 5	26.789	101.992
ZPLMX493-06	EU702304	*Simocephalus mixtus*	Mexico	Papasquiaro A	24.515	104.664
ZPLMX495-06	EU702303	*Simocephalus mixtus*	Mexico	Papasquiaro A	24.515	104.664
ZPLMX496-06	EU702302	*Simocephalus mixtus*	Mexico	Papasquiaro A	24.515	104.664
ZPLMX497-06	EU702301	*Simocephalus mixtus*	Mexico	Papasquiaro B	24.515	104.664
ZPLMX498-06	EU702300	*Simocephalus mixtus*	Mexico	Papasquiaro B	24.515	104.664
ZPLMX499-06	EU702299	*Simocephalus mixtus*	Mexico	Papasquiaro B	24.515	104.664

ZPLMX500-06	EU702294	*Simocephalus exspinosus*	Mexico	Km 47 Toluca-Atlacomulco	19.664	99.798
ZPLMX501-06	EU702293	*Simocephalus exspinosus*	Mexico	Km 47 Toluca-Atlacomulco	19.664	99.798
ZPLMX502-06	EU702292	*Simocephalus exspinosus*	Mexico	Km 47 Toluca-Atlacomulco	19.664	99.798
ZPLMX503-06	EU702291	*Simocephalus exspinosus*	Mexico	Km 47 Toluca-Atlacomulco	19.664	99.798
ZPLMX509-06	EU702310	*Simocephalus punctatus*	Mexico	Antiguos Mineros 3	26.791	101.994
ZPLMX510-06	EU702309	*Simocephalus punctatus*	Mexico	Antiguos Mineros 3	26.791	101.994
ZPLMX580-06	EU702194	*Macrothrix elegans*	Guatemala	Pond to Chajmaic	15.776	90.145
ZPLMX582-06	EU702193	*Macrothrix elegans*	Guatemala	Semococh 2	15.721	89.941
ZPLMX583-06	EU702192	*Macrothrix elegans*	Guatemala	Semococh 2	15.721	89.941
ZPLMX584-06	EU702191	*Macrothrix elegans*	Guatemala	Semococh	15.721	89.941
ZPLMX586-06	EU702190	*Macrothrix elegans*	Guatemala	San Simon River near Don Aldivar Ranch	15.836	90.289
ZPLMX587-06	EU702021	*Bosmina longirostris*	Mexico	Los Banos	19.67	99.849
ZPLMX588-06	EU702020	*Bosmina longirostris*	Mexico	Los Banos	19.67	99.849
ZPLMX590-06	EU702019	*Bosmina longirostris*	Mexico	Los Banos	19.67	99.849
ZPLMX591-06	EU702018	*Bosmina longirostris*	Mexico	Los Banos	19.67	99.849
ZPLMX592-06	EU702286	*Simocephalus exspinosus*	Mexico	Bordo San Jeronimo	19.419	99.728
ZPLMX593-06	EU702285	*Simocephalus exspinosus*	Mexico	Bordo San Jeronimo	19.419	99.728
ZPLMX595-06	EU702054	*Ceriodaphnia* cf. *rigaudi2*	Guatemala	Fray Bartolome I	15.804	89.929
ZPLMX598-06	EU702065	*Ceriodaphnia* cf. *rigaudi2*	Guatemala	Fray Bartolome I	15.804	89.929
ZPLMX599-06	EU702064	*Ceriodaphnia* cf. *rigaudi2*	Guatemala	To Lanchua	15.955	90.331
ZPLMX600-06	EU702063	*Ceriodaphnia* cf. *rigaudi2*	Guatemala	To Lanchua	15.955	90.331
ZPLMX601-06	EU702062	*Ceriodaphnia* cf. *rigaudi2*	Guatemala	To Lanchua	15.955	90.331
ZPLMX602-06	EU702061	*Ceriodaphnia* cf. *rigaudi2*	Guatemala	To Lanchua	15.955	90.331
ZPLMX603-06	EU702060	*Ceriodaphnia* cf. *rigaudi2*	Guatemala	To Lanchua	15.955	90.331
ZPLMX604-06	EU702059	*Ceriodaphnia* cf. *rigaudi2*	Guatemala	Near Xacatzun	15.893	90.247
ZPLMX605-06	EU702058	*Ceriodaphnia* cf. *rigaudi2*	Guatemala	Near Xacatzun	15.893	90.247
ZPLMX606-06	EU702057	*Ceriodaphnia* cf. *rigaudi2*	Guatemala	Near Xacatzun	15.893	90.247
ZPLMX607-06	EU702056	*Ceriodaphnia* cf. *rigaudi2*	Guatemala	Near Xacatzun	15.893	90.247
ZPLMX608-06	EU702055	*Ceriodaphnia* cf. *rigaudi2*	Guatemala	Near Xacatzun	15.893	90.247
ZPLMX609-06	EU701978	*Alona glabra*	Guatemala	To Lanchua	15.955	90.331

ZPLMX610-06	EU701977	*Alona glabra*	Guatemala	To Lanchua	15.955	90.331
ZPLMX611-06	EU701976	*Alona glabra*	Guatemala	To Lanchua	15.955	90.331
ZPLMX614-06	EU701975	*Alona glabra*	Guatemala	To Lanchua	15.955	90.331
ZPLMX615-06	EU701974	*Alona glabra*	Guatemala	Pond Near San Simon river Cave	15.783	90.344
ZPLMX616-06	EU701973	*Alona glabra*	Guatemala	Pond Near San Simon river Cave	15.783	90.344
ZPLMX819-06	EU702123	*Daphnia cheraphila*	Mexico	Angostura near Grieta	30.172	109.52
ZPLMX820-06	EU702122	*Daphnia cheraphila*	Mexico	Angostura near Grieta	30.172	109.52
ZPLMX821-06	EU702121	*Daphnia cheraphila*	Mexico	Angostura near Grieta	30.172	109.52
ZPLMX822-06	EU702120	*Daphnia cheraphila*	Mexico	Angostura near Grieta	30.172	109.52
ZPLMX823-06	EU702119	*Daphnia cheraphila*	Mexico	Angostura near Grieta	30.172	109.52
ZPLMX824-06	EU702029	*Ceriodaphnia* cf. *acanthina*	Mexico	Angostura near Grieta	30.172	109.52
ZPLMX826-06	EU702031	*Ceriodaphnia* cf. *acanthina*	Mexico	Angostura near Grieta	30.172	109.52
ZPLMX828-06	EU702030	*Ceriodaphnia* cf. *acanthina*	Mexico	Angostura near Grieta	30.172	109.52
ZPLMX830-06	EU702158	*Diaphanosoma* cf. *heberti*	Mexico	Angostura near Grieta	30.172	109.52
ZPLMX831-06	EU702157	*Diaphanosoma* cf. *heberti*	Mexico	Angostura near Grieta	30.172	109.52
ZPLMX833-06	EU702156	*Diaphanosoma* cf. *heberti*	Mexico	Angostura near Grieta	30.172	109.52
ZPLMX835-06	EU702313	*Simocephalus serrulatus*	Mexico	Chiculi 2	27.817	109.901
ZPLMX836-06	EU702312	*Simocephalus serrulatus*	Mexico	Chiculi 2	27.817	109.901
ZPLMX845-06	EU702027	*Ceriodaphnia* cf. *laticaudata*	Mexico	Angostura	30.369	109.683
ZPLMX847-06	EU702151	*Diaphanosoma* cf. *heberti*	Mexico	Angostura	30.369	109.683
ZPLMX848-06	EU702150	*Diaphanosoma* cf. *heberti*	Mexico	Angostura	30.369	109.683
ZPLMX849-06	EU702006	*Bosmina huaronensis*	Mexico	Angostura	30.369	109.683
ZPLMX850-06	EU702005	*Bosmina huaronensis*	Mexico	Angostura	30.369	109.683
ZPLMX851-06	EU702004	*Bosmina huaronensis*	Mexico	Angostura	30.369	109.683
ZPLMX852-06	EU702003	*Bosmina huaronensis*	Mexico	Angostura	30.369	109.683
ZPLMX853-06	EU702131	*Daphnia lumholtzi*	Mexico	El Novillo	28.978	109.654
ZPLMX854-06	EU702130	*Daphnia lumholtzi*	Mexico	El Novillo	28.978	109.654
ZPLMX855-06	EU702129	*Daphnia lumholtzi*	Mexico	El Novillo	28.978	109.654
ZPLMX856-06	EU702128	*Daphnia lumholtzi*	Mexico	El Novillo	28.978	109.654
ZPLMX857-06	EU702127	*Daphnia lumholtzi*	Mexico	El Novillo	28.978	109.654
ZPLMX858-06	EU702279	*Simocephalus* cf. *exspinosus*	Mexico	Chiculi 1	27.806	109.899
ZPLMX859-06	EU702314	*Simocephalus* sp.	Mexico	Chiculi 1	27.806	109.899
ZPLMX868-06	EU702168	*Diaphanosoma sp1*	Mexico	Mocuzary	27.231	109.079
ZPLMX869-06	EU702167	*Diaphanosoma sp1*	Mexico	Mocuzary	27.231	109.079
ZPLMX870-06	EU702166	*Diaphanosoma sp1*	Mexico	Mocuzary	27.231	109.079
ZPLMX871-06	EU702165	*Diaphanosoma sp1*	Mexico	Mocuzary	27.231	109.079
ZPLMX874-06	EU702108	*Chydorus brevilabris*	Mexico	Mocuzary	27.231	109.079
ZPLMX875-06	EU702107	*Chydorus brevilabris*	Mexico	Mocuzary	27.231	109.079
ZPLMX876-06	EU702106	*Chydorus brevilabris*	Mexico	Mocuzary	27.231	109.079
ZPLMX877-06	EU702105	*Chydorus brevilabris*	Mexico	Mocuzary	27.231	109.079
ZPLMX878-06	EU702268	*Pleuroxus varidentatus*	Mexico	Represa 2 Angostura	30.172	109.52
ZPLMX879-06	EU702267	*Pleuroxus varidentatus*	Mexico	Represa 2 Angostura	30.172	109.52

ZPLMX880-06	EU702266	*Pleuroxus varidentatus*	Mexico	Represa 2 Angostura	30.172	109.52
ZPLMX882-06	EU702265	*Pleuroxus varidentatus*	Mexico	Represa 2 Angostura	30.172	109.52
ZPLMX898-06	EU702308	*Simocephalus punctatus*	Mexico	Antiguos Mineros 2	26.791	101.994
ZPLMX899-06	EU702307	*Simocephalus punctatus*	Mexico	Antiguos Mineros 2	26.791	101.994
ZPLMX900-06	EU702306	*Simocephalus punctatus*	Mexico	Antiguos Mineros 2	26.791	101.994
ZPLMX901-06	EU702133	*Daphnia magna*	Canada	Dorset Environmental Science Center	45.225	78.929
ZPLMX902-06	EU702132	*Daphnia magna*	Canada	Dorset Environmental Science Center	45.225	78.929
ZPLMX905-06	EU702144	*Diaphanosoma birgei*	Canada	Pinehurst Lake	43.27	80.389
ZPLMX906-06	EU702143	*Diaphanosoma birgei*	Canada	Pinehurst Lake	43.27	80.389
ZPLMX907-06	EU702142	*Diaphanosoma birgei*	Canada	Pinehurst Lake	43.27	80.389
ZPLMX913-06	EU702141	*Diaphanosoma birgei*	Canada	Pinehurst Lake	43.27	80.389
ZPLMX914-06	EU702071	*Ceriodaphnia dubia*	Canada	Pinehurst Lake	43.27	80.389
ZPLMX915-06	EU702070	*Ceriodaphnia dubia*	Canada	Pinehurst Lake	43.27	80.389
ZPLMX916-06	EU702069	*Ceriodaphnia dubia*	Canada	Pinehurst Lake	43.27	80.389
ZPLMX620-06	EU350587	*Alona glabra*	Guate-mala	Near Xacatzun	15.893	90.247
ZPLMX619-06	EU350588	*Alona glabra*	Guate-mala	Near Xacatzun	15.893	90.247
ZPLMX618-06	EU350589	*Alona glabra*	Guate-mala	Near Xacatzun	15.893	90.247
ZPLMX617-06	EU350590	*Alona glabra*	Guate-mala	Pond Near San Simon river Cave	15.783	90.344
ZPLMX389-06	EU350591	*Alona glabra*	Mexico	Km 217 Jimenez-Torreon	27.057	104.792
ZPLMX387-06	EU350592	*Alona glabra*	Mexico	Km 217 Jimenez-Torreon	27.057	104.792
ZPLMX104-06	EU350597	*Leberis davidi*	Mexico	Papasquiaro A	24.515	104.664
ZPLMX351-06	EU350598	*Leberis davidi*	Mexico	Papasquiaro A	24.515	104.664
ZPLMX353-06	EU350599	*Leberis davidi*	Mexico	Papasquiaro A	24.515	104.664
ZPLMX354-06	EU350600	*Leberis davidi*	Mexico	Papasquiaro A	24.515	104.664
ZPLMX355-06	EU350601	*Leberis davidi*	Mexico	Papasquiaro A	24.515	104.664
ZPLMX156-06	EU350593	*Leberis chihuahuensis*	Mexico	Km 217 Jimenez-Torreon	27.057	104.792
ZPLMX348-06	EU350594	*Leberis chihuahuensis*	Mexico	Km 217 Jimenez-Torreon	27.057	104.792
ZPLMX349-06	EU350595	*Leberis chihuahuensis*	Mexico	Km 217 Jimenez-Torreon	27.057	104.792
ZPLMX350-06	EU350596	*Leberis chihuahuensis*	Mexico	Km 217 Jimenez-Torreon	27.057	104.792
COPEPODA						
ZPLMX924-06	EU701079	*Leptodiaptomus garciai*	Mexico	Alchichica	18.8	97.15
ZPLMX925-06	EU701068	*Leptodiaptomus* cf. *novamexicanus*	Mexico	Greenhouse	19.25	99.617
ZPLMX927-06	EU701099	*Leptodiaptomus novamexicanus*	Mexico	Pond	19.85	99.117
ZPLMX929-06	EU701098	*Leptodiaptomus novamexicanus*	Mexico	Pond	19.85	99.117
ZPLMX933-06	EU701097	*Leptodiaptomus novamexicanus*	Mexico	Pond	19.85	99.117

ZPLMX934-06	EU701096	*Leptodiaptomus novamexicanus*	Mexico	Pond	19.85	99.117
ZPLMX935-06	EU701072	*Leptodiaptomus* cf. *novamexicanus*	Mexico	Greenhouse	19.25	99.617
ZPLMX936-06	EU701095	*Leptodiaptomus novamexicanus*	Mexico	Pond	19.85	99.117
ZPLMX937-06	EU701094	*Leptodiaptomus novamexicanus*	Mexico	Pond	19.85	99.117
ZPLMX938-06	EU701093	*Leptodiaptomus novamexicanus*	Mexico	Greenhouse	19.25	99.617
ZPLMX939-06	EU701092	*Leptodiaptomus novamexicanus*	Mexico	Pond	19.85	99.117
ZPLMX940-06	EU701091	*Leptodiaptomus novamexicanus*	Mexico	Pond	19.85	99.117
ZPLMX942-06	EU701078	*Leptodiaptomus garciai*	Mexico	Alchichica	18.8	97.15
ZPLMX160-06	EU770479	*Mastigodiaptomus albuquerquensis*	Mexico	Rancho Grande to Zacatecas	23.218	102.871
ZPLMX161-06	EU770480	*Mastigodiaptomus albuquerquensis*	Mexico	Rancho Grande to Zacatecas	23.218	102.871
ZPLMX162-06	EU770499	*Mastigodiaptomus* cf. *nesus*	Mexico	Las Lagunas Gro	17.878	101.75
ZPLMX163-06	EU770500	*Mastigodiaptomus* cf. *nesus*	Mexico	Las Lagunas Gro	17.878	101.75
ZPLMX165-06	EU770484	*Mastigodiaptomus albuquerquensis*	Mexico	Papasquiaro B	24.515	104.664
ZPLMX166-06	EU770485	*Mastigodiaptomus albuquerquensis*	Mexico	Papasquiaro B	24.515	104.664
ZPLMX168-06	EU770471	*Leptodiaptomus siciloides*	Mexico	Km 113 Chihuahua-Torreon	26.46	103.978
ZPLMX170-06	EU770491	*Mastigodiaptomus* cf. *albuquerquensis*	Mexico	Cuitzeo	19.953	101.126
ZPLMX171-06	EU770492	*Mastigodiaptomus* cf. *albuquerquensis*	Mexico	Cuitzeo	19.95	101.126
ZPLMX172-06	EU770493	*Mastigodiaptomus* cf. *albuquerquensis*	Mexico	Cuitzeo	19.95	101.126
ZPLMX173-06	EU770494	*Mastigodiaptomus* cf. *albuquerquensis*	Mexico	Cuitzeo	19.95	101.126
ZPLMX175-06	EU770508	*Mastigodiaptomus montezumae*	Mexico	Km 25 Toluca-Atlacomulco	19.486	99.745
ZPLMX177-06	EU770509	*Mastigodiaptomus montezumae*	Mexico	Km 25 Toluca-Atlacomulco	19.486	99.745
ZPLMX178-06	EU770510	*Mastigodiaptomus montezumae*	Mexico	Km 25 Toluca-Atlacomulco	19.486	99.745
ZPLMX179-06	EU770511	*Mastigodiaptomus montezumae*	Mexico	Km 25 Toluca-Atlacomulco	19.486	99.745
ZPLMX181-06	EU770466	*Leptodiaptomus novamexicanus*	Mexico	Km 25 Toluca-Atlacomulco	19.486	99.745
ZPLMX182-06	EU770467	*Leptodiaptomus novamexicanus*	Mexico	Km 25 Toluca-Atlacomulco	19.486	99.745
ZPLMX183-06	EU770468	*Leptodiaptomus novamexicanus*	Mexico	Km 25 Toluca-Atlacomulco	19.486	99.745
ZPLMX184-06	EU770495	*Mastigodiaptomus* cf. *albuquerquensis*	Mexico	La Goleta	20.07	99.556
ZPLMX185-06	EU770496	*Mastigodiaptomus* cf. *albuquerquensis*	Mexico	La Goleta	20.07	99.556

ZPLMX193-06	EU770520	*Mastigodiaptomus reidae*	Mexico	Kohunlich	18.447	88.825
ZPLMX194-06	EU770521	*Mastigodiaptomus reidae*	Mexico	Kohunlich	18.447	88.825
ZPLMX195-06	EU770522	*Mastigodiaptomus reidae*	Mexico	Kohunlich	18.447	88.825
ZPLMX196-06	EU770523	*Mastigodiaptomus reidae*	Mexico	Kohunlich	18.447	88.825
ZPLMX210-06	EU770451	*Arctodiaptomus dorsalis*	Mexico	Km 50 to Tampico	21.249	98.159
ZPLMX212-06	EU770527	*Mastigodiaptomus texensis*	Mexico	Camalote	22.012	98.227
ZPLMX214-06	EU770445	*Arctodiaptomus dorsalis*	Guatemala	Lachua	15.921	90.671
ZPLMX215-06	EU770446	*Arctodiaptomus dorsalis*	Guatemala	Lachua	15.921	90.671
ZPLMX218-06	EU770460	*Arctodiaptomus dorsalis*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX219-06	EU770461	*Arctodiaptomus dorsalis*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX220-06	EU770462	*Arctodiaptomus dorsalis*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX221-06	EU770463	*Arctodiaptomus dorsalis*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX222-06	EU770531	*Osphranticum labronectum*	Guatemala	Chajmaic 2	15.776	90.145
ZPLMX226-06	EU770539	*Prionodiaptomus colombiensis*	Guatemala	Pond 2 near Lachua	15.951	90.649
ZPLMX233-06	EU770497	*Mastigodiaptomus* cf. *albuquerquensis*	Mexico	Cuitzeo	19.925	101.141
ZPLMX234-06	EU770505	*Mastigodiaptomus* cf. *reidae*	Mexico	Kohunlich	18.447	88.825
ZPLMX235-06	EU770464	*Arctodiaptomus dorsalis*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX236-06	EU770532	*Osphranticum labronectum*	Guatemala	Semococh 2	15.721	89.941
ZPLMX243-06	EU770524	*Mastigodiaptomus reidae*	Mexico	Kohunlich	18.447	88.825
ZPLMX247-06	EU770506	*Mastigodiaptomus* cf. *reidae*	Mexico	Kohunlich	18.447	88.825
ZPLMX248-06	EU770486	*Mastigodiaptomus albuquerquensis*	Mexico	El Salvador Dgo limnetic	26.067	104.974
ZPLMX250-06	EU770533	*Osphranticum labronectum*	Guatemala	Semococh 2	15.721	89.941
ZPLMX512-06	EU770457	*Arctodiaptomus dorsalis*	Mexico	Hondo River	18.497	88.507
ZPLMX513-06	EU770458	*Arctodiaptomus dorsalis*	Mexico	Hondo River	18.497	88.507
ZPLMX514-06	EU770459	*Arctodiaptomus dorsalis*	Mexico	Hondo River	18.497	88.507
ZPLMX517-06	EU770447	*Arctodiaptomus dorsalis*	Mexico	Hwy. L. Cardenas	17.987	102.013
ZPLMX518-06	EU770448	*Arctodiaptomus dorsalis*	Mexico	Hwy. L. Cardenas	17.987	102.013
ZPLMX519-06	EU770449	*Arctodiaptomus dorsalis*	Mexico	Km 50 to Tampico	21.249	98.159
ZPLMX520-06	EU770450	*Arctodiaptomus dorsalis*	Mexico	Km 50 to Tampico	21.249	98.159
ZPLMX521-06	EU770442	*Arctodiaptomus dorsalis*	Guatemala	Lachua	15.921	90.671
ZPLMX522-06	EU770443	*Arctodiaptomus dorsalis*	Guatemala	Lachua	15.921	90.671
ZPLMX523-06	EU770444	*Arctodiaptomus dorsalis*	Guatemala	Lachua	15.921	90.671
ZPLMX525-06	EU770477	*Mastigodiaptomus albuquerquensis*	Mexico	El Salvador	26.067	104.974

ZPLMX526-06	EU770481	*Mastigodiaptomus albuquerquensis*	Mexico	El Salvador Dgo limnetic	26.067	104.974
ZPLMX528-06	EU770478	*Mastigodiaptomus albuquerquensis*	Mexico	El Salvador	26.067	104.974
ZPLMX529-06	EU770488	*Mastigodiaptomus* cf. *albuquerquensis*	Mexico	La Cruz I Gto	21.193	100.574
ZPLMX530-06	EU770489	*Mastigodiaptomus* cf. *albuquerquensis*	Mexico	La Cruz I Gto	21.193	100.574
ZPLMX532-06	EU770487	*Mastigodiaptomus* cf. *albuquerquensis*	Mexico	La Cruz I	21.193	100.574
ZPLMX533-06	EU770490	*Mastigodiaptomus* cf. *albuquerquensis*	Mexico	La Cruz I Gto	21.193	100.574
ZPLMX536-06	EU770534	*Prionodiaptomus* cf. *colombiensis*	Mexico	Km 52 Acayucan-La Tinaja	18.506	96.056
ZPLMX538-06	EU770482	*Mastigodiaptomus albuquerquensis*	Mexico	Rancho Grande to Zacatecas	23.218	102.871
ZPLMX540-06	EU770483	*Mastigodiaptomus albuquerquensis*	Mexico	Rancho Grande to Zacatecas	23.218	102.871
ZPLMX541-06	EU770535	*Prionodiaptomus colombiensis*	Guatemala	To Chajmaic 2	15.776	90.145
ZPLMX542-06	EU770536	*Prionodiaptomus colombiensis*	Guatemala	To Chajmaic 2	15.776	90.145
ZPLMX543-06	EU770537	*Prionodiaptomus colombiensis*	Guatemala	To Chajmaic 2	15.776	90.145
ZPLMX544-06	EU770538	*Prionodiaptomus colombiensis*	Guatemala	To Chajmaic 2	15.776	90.145
ZPLMX545-06	EU770502	*Mastigodiaptomus* cf. *reidae*	Mexico	Kohunlich	18.447	88.825
ZPLMX546-06	EU770503	*Mastigodiaptomus* cf. *reidae*	Mexico	Kohunlich	18.447	88.825
ZPLMX547-06	EU770515	*Mastigodiaptomus reidae*	Mexico	Kohunlich	18.447	88.825
ZPLMX548-06	EU770516	*Mastigodiaptomus reidae*	Mexico	Kohunlich	18.447	88.825
ZPLMX549-06	EU770517	*Mastigodiaptomus reidae*	Mexico	Kohunlich	18.447	88.825
ZPLMX550-06	EU770501	*Mastigodiaptomus* cf. *reidae*	Mexico	Kohunlich	18.447	88.825
ZPLMX551-06	EU770504	*Mastigodiaptomus* cf. *reidae*	Mexico	Kohunlich	18.447	88.825
ZPLMX552-06	EU770518	*Mastigodiaptomus reidae*	Mexico	Kohunlich	18.447	88.825
ZPLMX553-06	EU770519	*Mastigodiaptomus reidae*	Mexico	Kohunlich	18.447	88.825
ZPLMX554-06	EU770525	*Mastigodiaptomus* sp.	Mexico	Kohunlich	18.447	88.825
ZPLMX555-06	EU770526	*Mastigodiaptomus* sp.	Mexico	Kohunlich	18.447	88.825
ZPLMX556-06	EU770507	*Mastigodiaptomus* cf. *reidae*	Mexico	Kohunlich	18.447	88.825
ZPLMX558-06	EU770528	*Mastigodiaptomus texensis*	Mexico	Camalote	22.012	98.227
ZPLMX559-06	EU770529	*Mastigodiaptomus texensis*	Mexico	Camalote	22.012	98.227
ZPLMX561-06	EU770530	*Mastigodiaptomus texensis*	Mexico	Camalote	22.012	98.227
ZPLMX562-06	EU770498	*Mastigodiaptomus* cf. *albuquerquensis*	Mexico	La Goleta	20.073	99.556
ZPLMX563-06	EU770512	*Mastigodiaptomus montezumae*	Mexico	La Goleta	20.073	99.556
ZPLMX564-06	EU770513	*Mastigodiaptomus montezumae*	Mexico	La Goleta	20.073	99.556

ZPLMX565-06	EU770514	*Mastigodiaptomus montezumae*	Mexico	La Goleta	20.073	99.556
ZPLMX566-06	EU770540	*Prionodiaptomus colombiensis*	Mexico	Matias Romero	16.714	94.972
ZPLMX567-06	EU770541	*Prionodiaptomus colombiensis*	Mexico	Matias Romero	16.714	94.972
ZPLMX568-06	EU770542	*Prionodiaptomus colombiensis*	Mexico	Matias Romero	16.714	94.972
ZPLMX716-06	EU770465	*Arctodiaptomus dorsalis*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX719-06	EU770543	*Thermocyclops inversus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX720-06	EU770544	*Thermocyclops inversus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX721-06	EU770545	*Thermocyclops inversus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX722-06	EU770546	*Thermocyclops inversus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX724-06	EU770547	*Thermocyclops inversus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX743-06	EU770548	*Thermocyclops inversus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX749-06	EU770564	*Tropocyclops parvus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX750-06	EU770565	*Tropocyclops parvus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX757-06	EU770549	*Thermocyclops inversus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX758-06	EU770566	*Tropocyclops parvus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX759-06	EU770550	*Thermocyclops inversus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX762-06	EU770567	*Tropocyclops parvus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX769-06	EU770551	*Thermocyclops inversus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX772-06	EU770552	*Thermocyclops inversus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX774-06	EU770568	*Tropocyclops parvus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX775-06	EU770553	*Thermocyclops inversus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX777-06	EU770554	*Thermocyclops inversus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX781-06	EU770555	*Thermocyclops inversus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX782-06	EU770556	*Thermocyclops inversus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX788-06	EU770557	*Thermocyclops inversus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX792-06	EU770558	*Thermocyclops inversus*	Guatemala	Peten Lake 6	16.981	89.712
ZPLMX795-06	EU770559	*Thermocyclops inversus*	Guatemala	Peten Lake 6	16.981	89.712

ZPLMX797-06	EU770560	*Thermocyclops inversus*	Guate-mala	Peten Lake 6	16.981	89.712
ZPLMX802-06	EU770561	*Thermocyclops inversus*	Guate-mala	Peten Lake 6	16.981	89.712
ZPLMX803-06	EU770562	*Thermocyclops inversus*	Guate-mala	Peten Lake 6	16.981	89.712
ZPLMX804-06	EU770563	*Thermocyclops inversus*	Guate-mala	Peten Lake 6	16.981	89.712
ZPLMX814-06	EU770472	*Leptodiaptomus siciloides*	Mexico	Angostura near Grieta	30.172	109.52
ZPLMX815-06	EU770473	*Leptodiaptomus siciloides*	Mexico	Angostura near Grieta	30.172	109.52
ZPLMX816-06	EU770474	*Leptodiaptomus siciloides*	Mexico	Angostura near Grieta	30.172	109.52
ZPLMX817-06	EU770475	*Leptodiaptomus siciloides*	Mexico	Angostura near Grieta	30.172	109.52
ZPLMX818-06	EU770476	*Leptodiaptomus siciloides*	Mexico	Angostura near Grieta	30.172	109.52
ZPLMX863-06	EU770452	*Arctodiaptomus* cf. *dorsalis*	Mexico	Mocuzary	27.231	109.079
ZPLMX864-06	EU770453	*Arctodiaptomus* cf. *dorsalis*	Mexico	Mocuzary	27.231	109.079
ZPLMX865-06	EU770454	*Arctodiaptomus* cf. *dorsalis*	Mexico	Mocuzary	27.231	109.079
ZPLMX866-06	EU770455	*Arctodiaptomus* cf. *dorsalis*	Mexico	Mocuzary	27.231	109.079
ZPLMX867-06	EU770456	*Arctodiaptomus* cf. *dorsalis*	Mexico	Mocuzary	27.231	109.079
ZPLMX921-06	EU770469	*Leptodiaptomus novamexi-canus*	Mexico	Pond	19.85	99.117
ZPLMX922-06	EU770470	*Leptodiaptomus novamexi-canus*	Mexico	Greenhouse	19.25	99.617

Appendix 2. ID tree for the 367 individuals representing 61 species of Cladocera and 71 individuals representing five species downloaded from GenBank

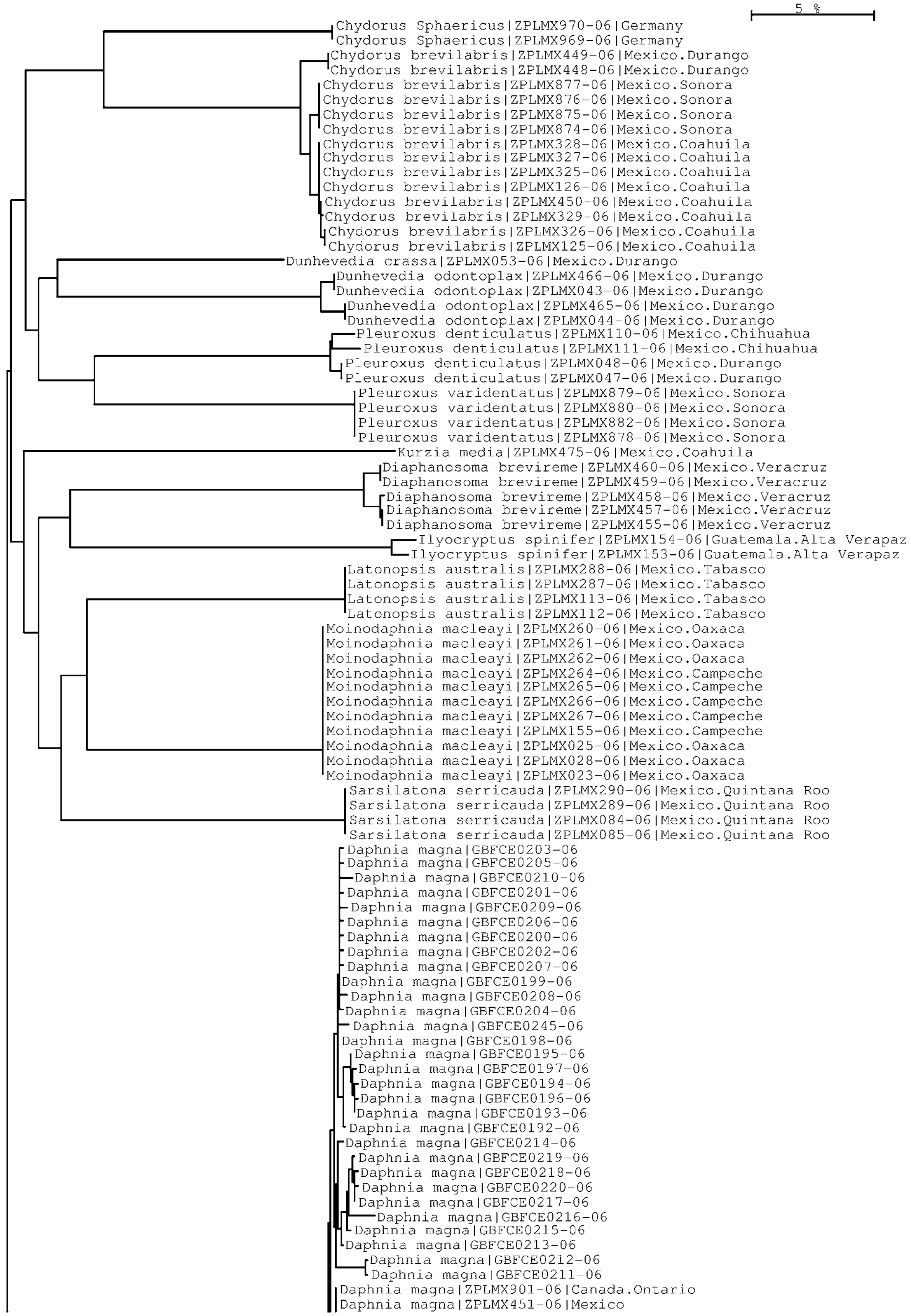
BOLD TaxonID Tree

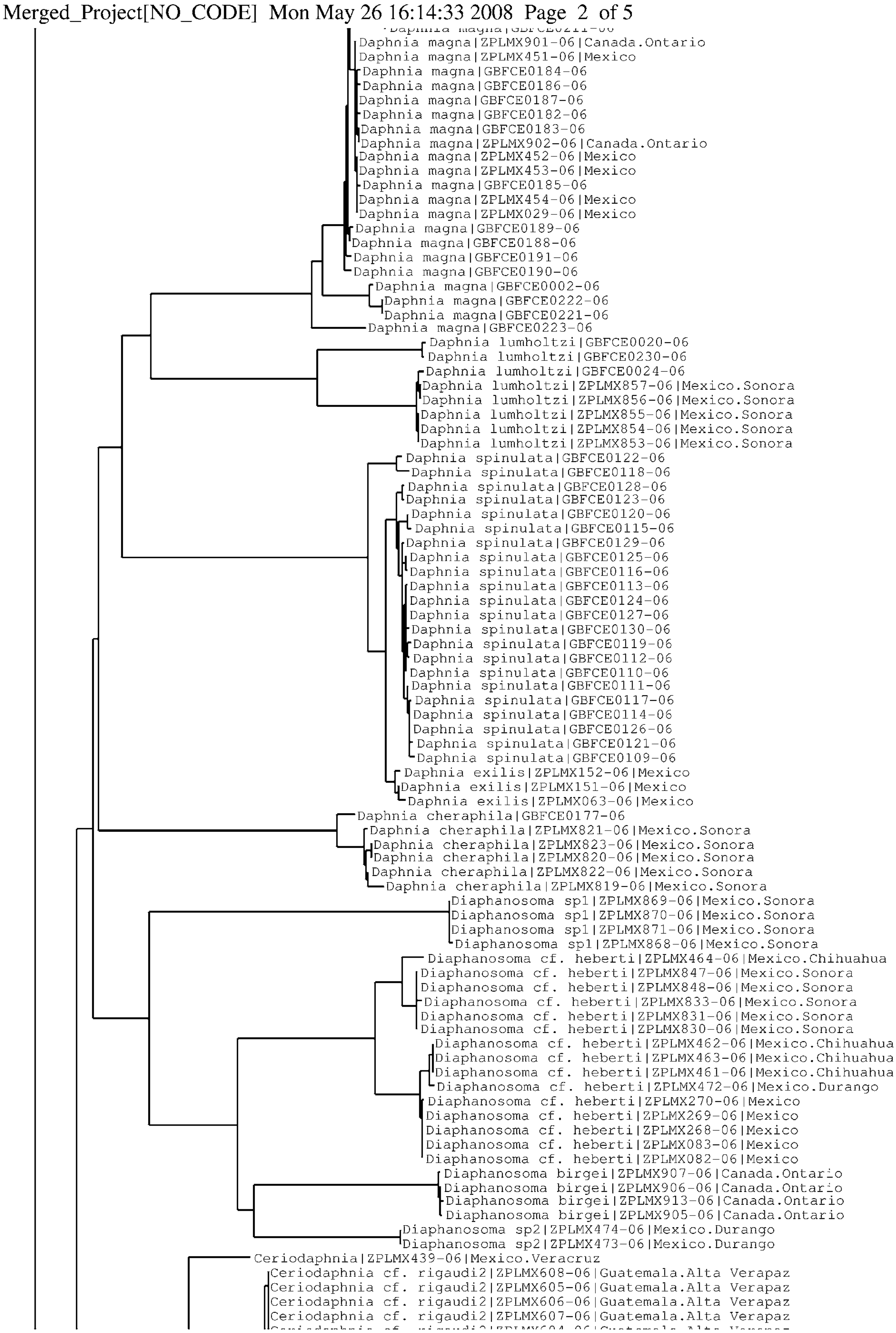
```
Project         : Merged Project[NO CODE]
Subprojects     : GenBank Daphnia and Daphniopsis (Diplostraca)[GBFCE]
                  Chydoridae of the world[CHY]
                  Cladocera of Mexico[ZPLMX]
                  Leberis of Mexico[LEBMX]
Date            : 26-May-2008
Data Type       : Nucleotide
Distance Model  : Kimura 2 Parameter
Codon Positions : 1st, 2nd, 3rd
Labels          : Country & Province, ProcessID,
Colorization    :

Sequence Count  : 440
Species count   : 61
Genus count     : 19
Family count    : 6
Unidentified    : 1
```

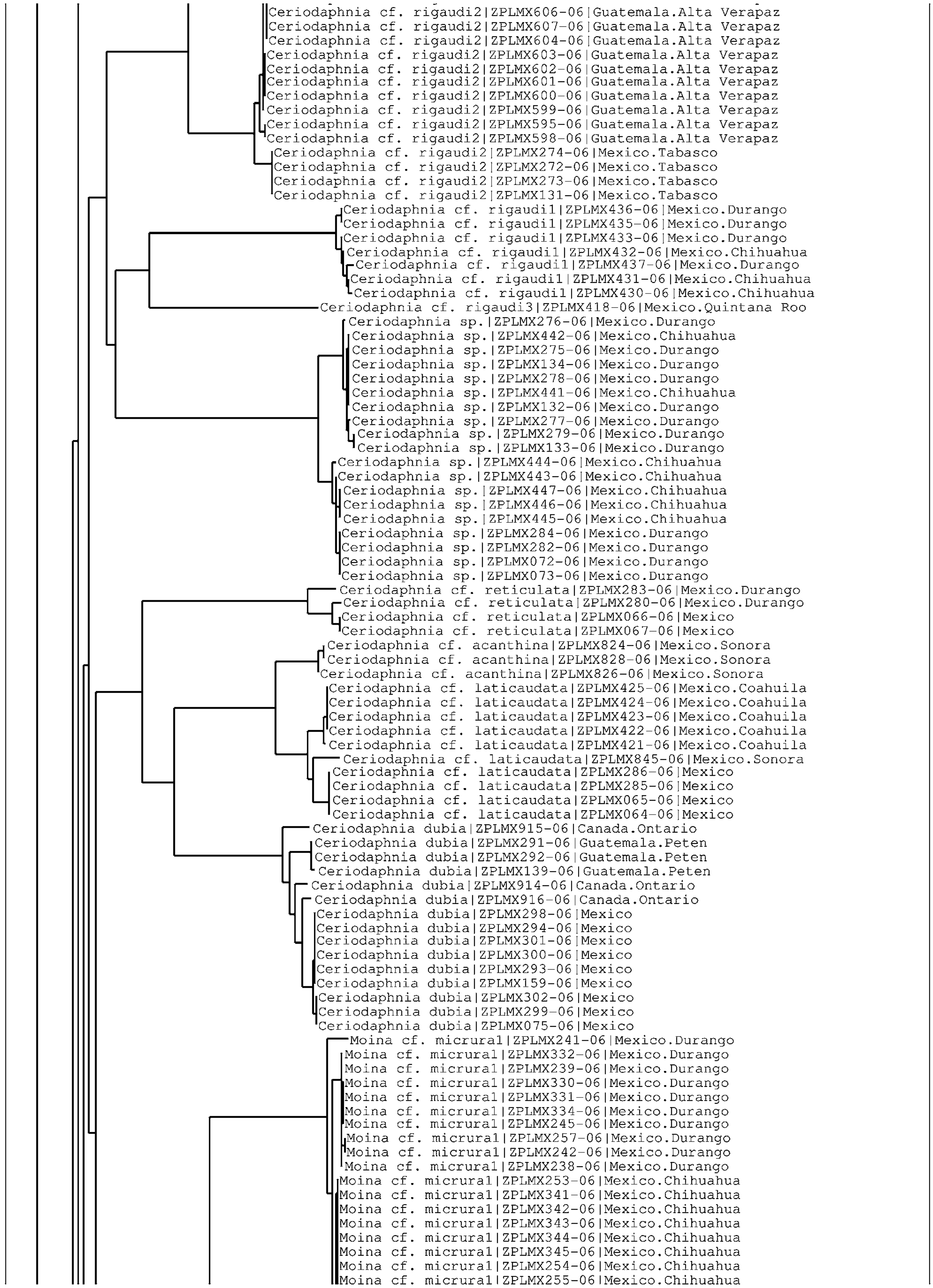
Cover Page 1/1

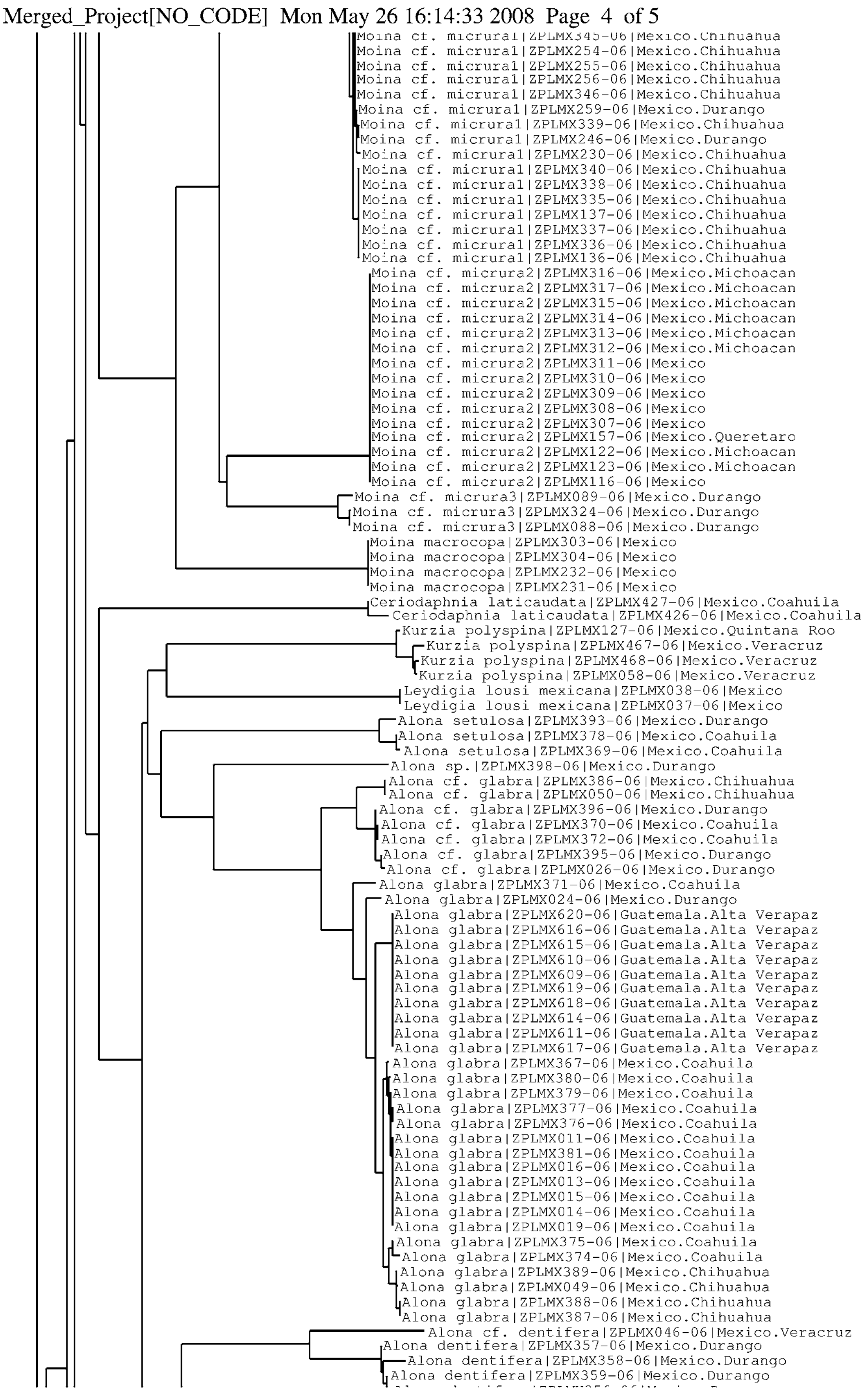
Merged_Project[NO_CODE] Mon May 26 16:14:33 2008 Page 1 of 5

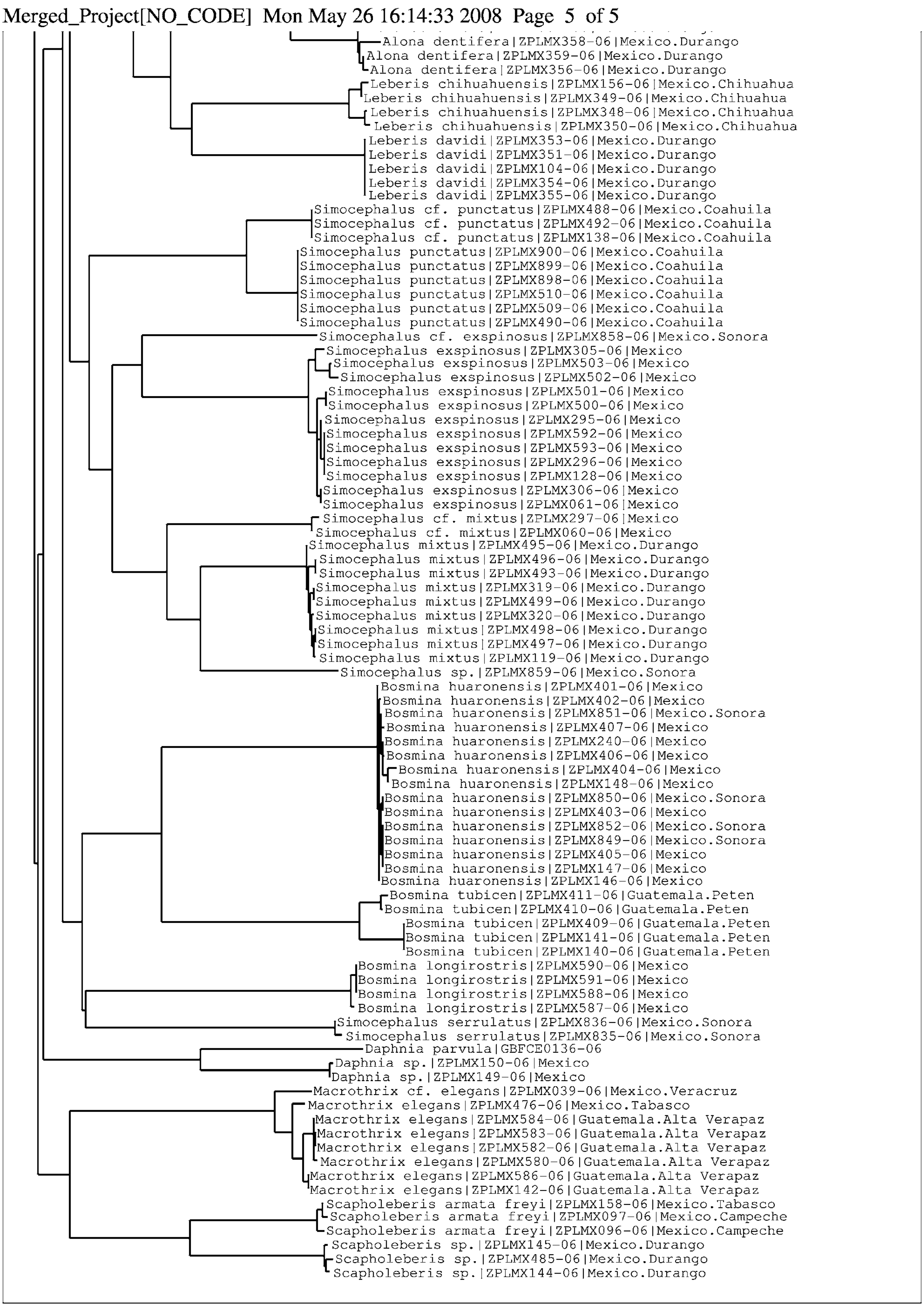



Merged_Project[NO_CODE] Mon May 26 16:14:33 2008 Page 2 of 5
Daphnia magna|ZPLMX901-06|Canada.Ontario
Daphnia magna|ZPLMX451-06|Mexico
Daphnia magna|GBFCE0184-06
Daphnia magna|GBFCE0186-06
Daphnia magna|GBFCE0187-06
Daphnia magna|GBFCE0182-06
Daphnia magna|GBFCE0183-06
Daphnia magna|ZPLMX902-06|Canada.Ontario
Daphnia magna|ZPLMX452-06|Mexico
Daphnia magna|ZPLMX453-06|Mexico
Daphnia magna|GBFCE0185-06
Daphnia magna|ZPLMX454-06|Mexico
Daphnia magna|ZPLMX029-06|Mexico
Daphnia magna|GBFCE0189-06
Daphnia magna|GBFCE0188-06
Daphnia magna|GBFCE0191-06
Daphnia magna|GBFCE0190-06
Daphnia magna|GBFCE0002-06
Daphnia magna|GBFCE0222-06
Daphnia magna|GBFCE0221-06
Daphnia magna|GBFCE0223-06
Daphnia lumholtzi|GBFCE0020-06
Daphnia lumholtzi|GBFCE0230-06
Daphnia lumholtzi|GBFCE0024-06
Daphnia lumholtzi|ZPLMX857-06|Mexico.Sonora
Daphnia lumholtzi|ZPLMX856-06|Mexico.Sonora
Daphnia lumholtzi|ZPLMX855-06|Mexico.Sonora
Daphnia lumholtzi|ZPLMX854-06|Mexico.Sonora
Daphnia lumholtzi|ZPLMX853-06|Mexico.Sonora
Daphnia spinulata|GBFCE0122-06
Daphnia spinulata|GBFCE0118-06
Daphnia spinulata|GBFCE0128-06
Daphnia spinulata|GBFCE0123-06
Daphnia spinulata|GBFCE0120-06
Daphnia spinulata|GBFCE0115-06
Daphnia spinulata|GBFCE0129-06
Daphnia spinulata|GBFCE0125-06
Daphnia spinulata|GBFCE0116-06
Daphnia spinulata|GBFCE0113-06
Daphnia spinulata|GBFCE0124-06
Daphnia spinulata|GBFCE0127-06
Daphnia spinulata|GBFCE0130-06
Daphnia spinulata|GBFCE0119-06
Daphnia spinulata|GBFCE0112-06
Daphnia spinulata|GBFCE0110-06
Daphnia spinulata|GBFCE0111-06
Daphnia spinulata|GBFCE0117-06
Daphnia spinulata|GBFCE0114-06
Daphnia spinulata|GBFCE0126-06
Daphnia spinulata|GBFCE0121-06
Daphnia spinulata|GBFCE0109-06
Daphnia exilis|ZPLMX152-06|Mexico
Daphnia exilis|ZPLMX151-06|Mexico
Daphnia exilis|ZPLMX063-06|Mexico
Daphnia cheraphila|GBFCE0177-06
Daphnia cheraphila|ZPLMX821-06|Mexico.Sonora
Daphnia cheraphila|ZPLMX823-06|Mexico.Sonora
Daphnia cheraphila|ZPLMX820-06|Mexico.Sonora
Daphnia cheraphila|ZPLMX822-06|Mexico.Sonora
Daphnia cheraphila|ZPLMX819-06|Mexico.Sonora
Diaphanosoma sp1|ZPLMX869-06|Mexico.Sonora
Diaphanosoma sp1|ZPLMX870-06|Mexico.Sonora
Diaphanosoma sp1|ZPLMX871-06|Mexico.Sonora
Diaphanosoma sp1|ZPLMX868-06|Mexico.Sonora
Diaphanosoma cf. heberti|ZPLMX464-06|Mexico.Chihuahua
Diaphanosoma cf. heberti|ZPLMX847-06|Mexico.Sonora
Diaphanosoma cf. heberti|ZPLMX848-06|Mexico.Sonora
Diaphanosoma cf. heberti|ZPLMX833-06|Mexico.Sonora
Diaphanosoma cf. heberti|ZPLMX831-06|Mexico.Sonora
Diaphanosoma cf. heberti|ZPLMX830-06|Mexico.Sonora
Diaphanosoma cf. heberti|ZPLMX462-06|Mexico.Chihuahua
Diaphanosoma cf. heberti|ZPLMX463-06|Mexico.Chihuahua
Diaphanosoma cf. heberti|ZPLMX461-06|Mexico.Chihuahua
Diaphanosoma cf. heberti|ZPLMX472-06|Mexico.Durango
Diaphanosoma cf. heberti|ZPLMX270-06|Mexico
Diaphanosoma cf. heberti|ZPLMX269-06|Mexico
Diaphanosoma cf. heberti|ZPLMX268-06|Mexico
Diaphanosoma cf. heberti|ZPLMX083-06|Mexico
Diaphanosoma cf. heberti|ZPLMX082-06|Mexico
Diaphanosoma birgei|ZPLMX907-06|Canada.Ontario
Diaphanosoma birgei|ZPLMX906-06|Canada.Ontario
Diaphanosoma birgei|ZPLMX913-06|Canada.Ontario
Diaphanosoma birgei|ZPLMX905-06|Canada.Ontario
Diaphanosoma sp2|ZPLMX474-06|Mexico.Durango
Diaphanosoma sp2|ZPLMX473-06|Mexico.Durango
Ceriodaphnia|ZPLMX439-06|Mexico.Veracruz
Ceriodaphnia cf. rigaudi2|ZPLMX608-06|Guatemala.Alta Verapaz
Ceriodaphnia cf. rigaudi2|ZPLMX605-06|Guatemala.Alta Verapaz
Ceriodaphnia cf. rigaudi2|ZPLMX606-06|Guatemala.Alta Verapaz
Ceriodaphnia cf. rigaudi2|ZPLMX607-06|Guatemala.Alta Verapaz

Merged_Project[NO_CODE] Mon May 26 16:14:33 2008 Page 3 of 5




Merged_Project[NO_CODE] Mon May 26 16:14:33 2008 Page 4 of 5
Moina cf. micrura1|ZPLMX345-06|Mexico.Chihuahua
Moina cf. micrura1|ZPLMX254-06|Mexico.Chihuahua
Moina cf. micrura1|ZPLMX255-06|Mexico.Chihuahua
Moina cf. micrura1|ZPLMX256-06|Mexico.Chihuahua
Moina cf. micrura1|ZPLMX346-06|Mexico.Chihuahua
Moina cf. micrura1|ZPLMX259-06|Mexico.Durango
Moina cf. micrura1|ZPLMX339-06|Mexico.Chihuahua
Moina cf. micrura1|ZPLMX246-06|Mexico.Durango
Moina cf. micrura1|ZPLMX230-06|Mexico.Chihuahua
Moina cf. micrura1|ZPLMX340-06|Mexico.Chihuahua
Moina cf. micrura1|ZPLMX338-06|Mexico.Chihuahua
Moina cf. micrura1|ZPLMX335-06|Mexico.Chihuahua
Moina cf. micrura1|ZPLMX137-06|Mexico.Chihuahua
Moina cf. micrura1|ZPLMX337-06|Mexico.Chihuahua
Moina cf. micrura1|ZPLMX336-06|Mexico.Chihuahua
Moina cf. micrura1|ZPLMX136-06|Mexico.Chihuahua
Moina cf. micrura2|ZPLMX316-06|Mexico.Michoacan
Moina cf. micrura2|ZPLMX317-06|Mexico.Michoacan
Moina cf. micrura2|ZPLMX315-06|Mexico.Michoacan
Moina cf. micrura2|ZPLMX314-06|Mexico.Michoacan
Moina cf. micrura2|ZPLMX313-06|Mexico.Michoacan
Moina cf. micrura2|ZPLMX312-06|Mexico.Michoacan
Moina cf. micrura2|ZPLMX311-06|Mexico
Moina cf. micrura2|ZPLMX310-06|Mexico
Moina cf. micrura2|ZPLMX309-06|Mexico
Moina cf. micrura2|ZPLMX308-06|Mexico
Moina cf. micrura2|ZPLMX307-06|Mexico
Moina cf. micrura2|ZPLMX157-06|Mexico.Queretaro
Moina cf. micrura2|ZPLMX122-06|Mexico.Michoacan
Moina cf. micrura2|ZPLMX123-06|Mexico.Michoacan
Moina cf. micrura2|ZPLMX116-06|Mexico
Moina cf. micrura3|ZPLMX089-06|Mexico.Durango
Moina cf. micrura3|ZPLMX324-06|Mexico.Durango
Moina cf. micrura3|ZPLMX088-06|Mexico.Durango
Moina macrocopa|ZPLMX303-06|Mexico
Moina macrocopa|ZPLMX304-06|Mexico
Moina macrocopa|ZPLMX232-06|Mexico
Moina macrocopa|ZPLMX231-06|Mexico
Ceriodaphnia laticaudata|ZPLMX427-06|Mexico.Coahuila
Ceriodaphnia laticaudata|ZPLMX426-06|Mexico.Coahuila
Kurzia polyspina|ZPLMX127-06|Mexico.Quintana Roo
Kurzia polyspina|ZPLMX467-06|Mexico.Veracruz
Kurzia polyspina|ZPLMX468-06|Mexico.Veracruz
Kurzia polyspina|ZPLMX058-06|Mexico.Veracruz
Leydigia lousi mexicana|ZPLMX038-06|Mexico
Leydigia lousi mexicana|ZPLMX037-06|Mexico
Alona setulosa|ZPLMX393-06|Mexico.Durango
Alona setulosa|ZPLMX378-06|Mexico.Coahuila
Alona setulosa|ZPLMX369-06|Mexico.Coahuila
Alona sp.|ZPLMX398-06|Mexico.Durango
Alona cf. glabra|ZPLMX386-06|Mexico.Chihuahua
Alona cf. glabra|ZPLMX050-06|Mexico.Chihuahua
Alona cf. glabra|ZPLMX396-06|Mexico.Durango
Alona cf. glabra|ZPLMX370-06|Mexico.Coahuila
Alona cf. glabra|ZPLMX372-06|Mexico.Coahuila
Alona cf. glabra|ZPLMX395-06|Mexico.Durango
Alona cf. glabra|ZPLMX026-06|Mexico.Durango
Alona glabra|ZPLMX371-06|Mexico.Coahuila
Alona glabra|ZPLMX024-06|Mexico.Durango
Alona glabra|ZPLMX620-06|Guatemala.Alta Verapaz
Alona glabra|ZPLMX616-06|Guatemala.Alta Verapaz
Alona glabra|ZPLMX615-06|Guatemala.Alta Verapaz
Alona glabra|ZPLMX610-06|Guatemala.Alta Verapaz
Alona glabra|ZPLMX609-06|Guatemala.Alta Verapaz
Alona glabra|ZPLMX619-06|Guatemala.Alta Verapaz
Alona glabra|ZPLMX618-06|Guatemala.Alta Verapaz
Alona glabra|ZPLMX614-06|Guatemala.Alta Verapaz
Alona glabra|ZPLMX611-06|Guatemala.Alta Verapaz
Alona glabra|ZPLMX617-06|Guatemala.Alta Verapaz
Alona glabra|ZPLMX367-06|Mexico.Coahuila
Alona glabra|ZPLMX380-06|Mexico.Coahuila
Alona glabra|ZPLMX379-06|Mexico.Coahuila
Alona glabra|ZPLMX377-06|Mexico.Coahuila
Alona glabra|ZPLMX376-06|Mexico.Coahuila
Alona glabra|ZPLMX011-06|Mexico.Coahuila
Alona glabra|ZPLMX381-06|Mexico.Coahuila
Alona glabra|ZPLMX016-06|Mexico.Coahuila
Alona glabra|ZPLMX013-06|Mexico.Coahuila
Alona glabra|ZPLMX015-06|Mexico.Coahuila
Alona glabra|ZPLMX014-06|Mexico.Coahuila
Alona glabra|ZPLMX019-06|Mexico.Coahuila
Alona glabra|ZPLMX375-06|Mexico.Coahuila
Alona glabra|ZPLMX374-06|Mexico.Coahuila
Alona glabra|ZPLMX389-06|Mexico.Chihuahua
Alona glabra|ZPLMX049-06|Mexico.Chihuahua
Alona glabra|ZPLMX388-06|Mexico.Chihuahua
Alona glabra|ZPLMX387-06|Mexico.Chihuahua
Alona cf. dentifera|ZPLMX046-06|Mexico.Veracruz
Alona dentifera|ZPLMX357-06|Mexico.Durango
Alona dentifera|ZPLMX358-06|Mexico.Durango
Alona dentifera|ZPLMX359-06|Mexico.Durango



Merged_Project[NO_CODE] Mon May 26 16:14:33 2008 Page 5 of 5
Alona dentifera|ZPLMX358-06|Mexico.Durango
Alona dentifera|ZPLMX359-06|Mexico.Durango
Alona dentifera|ZPLMX356-06|Mexico.Durango
Leberis chihuahuensis|ZPLMX156-06|Mexico.Chihuahua
Leberis chihuahuensis|ZPLMX349-06|Mexico.Chihuahua
Leberis chihuahuensis|ZPLMX348-06|Mexico.Chihuahua
Leberis chihuahuensis|ZPLMX350-06|Mexico.Chihuahua
Leberis davidi|ZPLMX353-06|Mexico.Durango
Leberis davidi|ZPLMX351-06|Mexico.Durango
Leberis davidi|ZPLMX104-06|Mexico.Durango
Leberis davidi|ZPLMX354-06|Mexico.Durango
Leberis davidi|ZPLMX355-06|Mexico.Durango
Simocephalus cf. punctatus|ZPLMX488-06|Mexico.Coahuila
Simocephalus cf. punctatus|ZPLMX492-06|Mexico.Coahuila
Simocephalus cf. punctatus|ZPLMX138-06|Mexico.Coahuila
Simocephalus punctatus|ZPLMX900-06|Mexico.Coahuila
Simocephalus punctatus|ZPLMX899-06|Mexico.Coahuila
Simocephalus punctatus|ZPLMX898-06|Mexico.Coahuila
Simocephalus punctatus|ZPLMX510-06|Mexico.Coahuila
Simocephalus punctatus|ZPLMX509-06|Mexico.Coahuila
Simocephalus punctatus|ZPLMX490-06|Mexico.Coahuila
Simocephalus cf. exspinosus|ZPLMX858-06|Mexico.Sonora
Simocephalus exspinosus|ZPLMX305-06|Mexico
Simocephalus exspinosus|ZPLMX503-06|Mexico
Simocephalus exspinosus|ZPLMX502-06|Mexico
Simocephalus exspinosus|ZPLMX501-06|Mexico
Simocephalus exspinosus|ZPLMX500-06|Mexico
Simocephalus exspinosus|ZPLMX295-06|Mexico
Simocephalus exspinosus|ZPLMX592-06|Mexico
Simocephalus exspinosus|ZPLMX593-06|Mexico
Simocephalus exspinosus|ZPLMX296-06|Mexico
Simocephalus exspinosus|ZPLMX128-06|Mexico
Simocephalus exspinosus|ZPLMX306-06|Mexico
Simocephalus exspinosus|ZPLMX061-06|Mexico
Simocephalus cf. mixtus|ZPLMX297-06|Mexico
Simocephalus cf. mixtus|ZPLMX060-06|Mexico
Simocephalus mixtus|ZPLMX495-06|Mexico.Durango
Simocephalus mixtus|ZPLMX496-06|Mexico.Durango
Simocephalus mixtus|ZPLMX493-06|Mexico.Durango
Simocephalus mixtus|ZPLMX319-06|Mexico.Durango
Simocephalus mixtus|ZPLMX499-06|Mexico.Durango
Simocephalus mixtus|ZPLMX320-06|Mexico.Durango
Simocephalus mixtus|ZPLMX498-06|Mexico.Durango
Simocephalus mixtus|ZPLMX497-06|Mexico.Durango
Simocephalus mixtus|ZPLMX119-06|Mexico.Durango
Simocephalus sp.|ZPLMX859-06|Mexico.Sonora
Bosmina huaronensis|ZPLMX401-06|Mexico
Bosmina huaronensis|ZPLMX402-06|Mexico
Bosmina huaronensis|ZPLMX851-06|Mexico.Sonora
Bosmina huaronensis|ZPLMX407-06|Mexico
Bosmina huaronensis|ZPLMX240-06|Mexico
Bosmina huaronensis|ZPLMX406-06|Mexico
Bosmina huaronensis|ZPLMX404-06|Mexico
Bosmina huaronensis|ZPLMX148-06|Mexico
Bosmina huaronensis|ZPLMX850-06|Mexico.Sonora
Bosmina huaronensis|ZPLMX403-06|Mexico
Bosmina huaronensis|ZPLMX852-06|Mexico.Sonora
Bosmina huaronensis|ZPLMX849-06|Mexico.Sonora
Bosmina huaronensis|ZPLMX405-06|Mexico
Bosmina huaronensis|ZPLMX147-06|Mexico
Bosmina huaronensis|ZPLMX146-06|Mexico
Bosmina tubicen|ZPLMX411-06|Guatemala.Peten
Bosmina tubicen|ZPLMX410-06|Guatemala.Peten
Bosmina tubicen|ZPLMX409-06|Guatemala.Peten
Bosmina tubicen|ZPLMX141-06|Guatemala.Peten
Bosmina tubicen|ZPLMX140-06|Guatemala.Peten
Bosmina longirostris|ZPLMX590-06|Mexico
Bosmina longirostris|ZPLMX591-06|Mexico
Bosmina longirostris|ZPLMX588-06|Mexico
Bosmina longirostris|ZPLMX587-06|Mexico
Simocephalus serrulatus|ZPLMX836-06|Mexico.Sonora
Simocephalus serrulatus|ZPLMX835-06|Mexico.Sonora
Daphnia parvula|GBFCE0136-06
Daphnia sp.|ZPLMX150-06|Mexico
Daphnia sp.|ZPLMX149-06|Mexico
Macrothrix cf. elegans|ZPLMX039-06|Mexico.Veracruz
Macrothrix elegans|ZPLMX476-06|Mexico.Tabasco
Macrothrix elegans|ZPLMX584-06|Guatemala.Alta Verapaz
Macrothrix elegans|ZPLMX583-06|Guatemala.Alta Verapaz
Macrothrix elegans|ZPLMX582-06|Guatemala.Alta Verapaz
Macrothrix elegans|ZPLMX580-06|Guatemala.Alta Verapaz
Macrothrix elegans|ZPLMX586-06|Guatemala.Alta Verapaz
Macrothrix elegans|ZPLMX142-06|Guatemala.Alta Verapaz
Scapholeberis armata freyi|ZPLMX158-06|Mexico.Tabasco
Scapholeberis armata freyi|ZPLMX097-06|Mexico.Campeche
Scapholeberis armata freyi|ZPLMX096-06|Mexico.Campeche
Scapholeberis sp.|ZPLMX145-06|Mexico.Durango
Scapholeberis sp.|ZPLMX485-06|Mexico.Durango
Scapholeberis sp.|ZPLMX144-06|Mexico.Durango

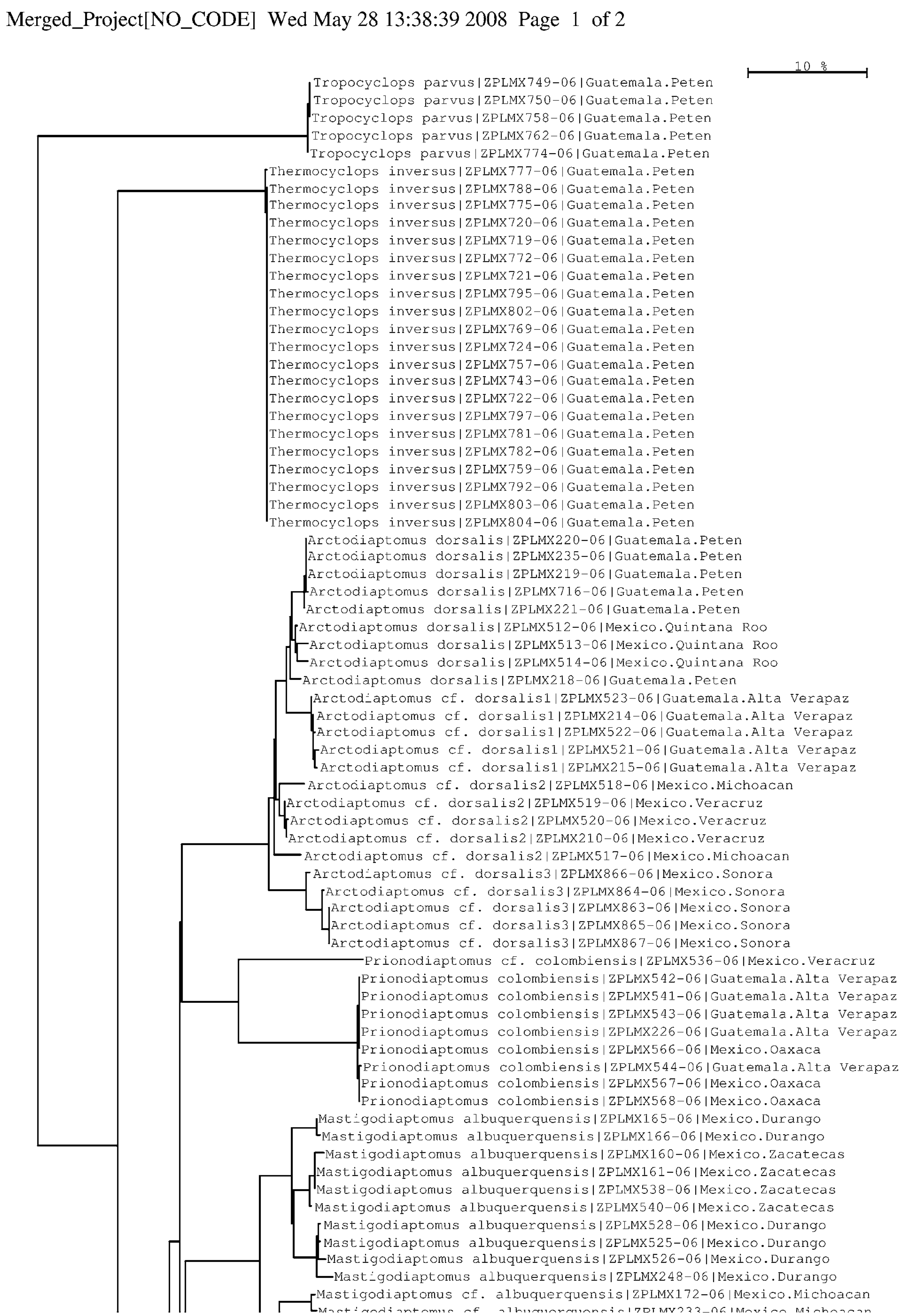
Appendix 3. ID tree for the 140 individuals representing 21 species of Copepoda

BOLD TaxonID Tree

```
Project          : Merged Project[NO CODE]
Subprojects      : Copepoda of Mexico and Guatemala[COPMG]
                   Leptodiaptomus[LEPMX]
Date             : 28-May-2008
Data Type        : Nucleotide
Distance Model   : Kimura 2 Parameter
Codon Positions  : 1st, 2nd, 3rd
Labels           : Country & Province, ProcessID,
Colorization     :

Sequence Count   : 140
Species count    : 21
Genus count      : 7
Family count     : 3
Unidentified     : 0
```

Cover Page 1/1



Merged_Project[NO_CODE] Wed May 28 13:38:39 2008 Page 1 of 2
10 %
Tropocyclops parvus|ZPLMX749-06|Guatemala.Peten
Tropocyclops parvus|ZPLMX750-06|Guatemala.Peten
Tropocyclops parvus|ZPLMX758-06|Guatemala.Peten
Tropocyclops parvus|ZPLMX762-06|Guatemala.Peten
Tropocyclops parvus|ZPLMX774-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX777-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX788-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX775-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX720-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX719-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX772-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX721-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX795-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX802-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX769-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX724-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX757-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX743-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX722-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX797-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX781-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX782-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX759-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX792-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX803-06|Guatemala.Peten
Thermocyclops inversus|ZPLMX804-06|Guatemala.Peten
Arctodiaptomus dorsalis|ZPLMX220-06|Guatemala.Peten
Arctodiaptomus dorsalis|ZPLMX235-06|Guatemala.Peten
Arctodiaptomus dorsalis|ZPLMX219-06|Guatemala.Peten
Arctodiaptomus dorsalis|ZPLMX716-06|Guatemala.Peten
Arctodiaptomus dorsalis|ZPLMX221-06|Guatemala.Peten
Arctodiaptomus dorsalis|ZPLMX512-06|Mexico.Quintana Roo
Arctodiaptomus dorsalis|ZPLMX513-06|Mexico.Quintana Roo
Arctodiaptomus dorsalis|ZPLMX514-06|Mexico.Quintana Roo
Arctodiaptomus dorsalis|ZPLMX218-06|Guatemala.Peten
Arctodiaptomus cf. dorsalis1|ZPLMX523-06|Guatemala.Alta Verapaz
Arctodiaptomus cf. dorsalis1|ZPLMX214-06|Guatemala.Alta Verapaz
Arctodiaptomus cf. dorsalis1|ZPLMX522-06|Guatemala.Alta Verapaz
Arctodiaptomus cf. dorsalis1|ZPLMX521-06|Guatemala.Alta Verapaz
Arctodiaptomus cf. dorsalis1|ZPLMX215-06|Guatemala.Alta Verapaz
Arctodiaptomus cf. dorsalis2|ZPLMX518-06|Mexico.Michoacan
Arctodiaptomus cf. dorsalis2|ZPLMX519-06|Mexico.Veracruz
Arctodiaptomus cf. dorsalis2|ZPLMX520-06|Mexico.Veracruz
Arctodiaptomus cf. dorsalis2|ZPLMX210-06|Mexico.Veracruz
Arctodiaptomus cf. dorsalis2|ZPLMX517-06|Mexico.Michoacan
Arctodiaptomus cf. dorsalis3|ZPLMX866-06|Mexico.Sonora
Arctodiaptomus cf. dorsalis3|ZPLMX864-06|Mexico.Sonora
Arctodiaptomus cf. dorsalis3|ZPLMX863-06|Mexico.Sonora
Arctodiaptomus cf. dorsalis3|ZPLMX865-06|Mexico.Sonora
Arctodiaptomus cf. dorsalis3|ZPLMX867-06|Mexico.Sonora
Prionodiaptomus cf. colombiensis|ZPLMX536-06|Mexico.Veracruz
Prionodiaptomus colombiensis|ZPLMX542-06|Guatemala.Alta Verapaz
Prionodiaptomus colombiensis|ZPLMX541-06|Guatemala.Alta Verapaz
Prionodiaptomus colombiensis|ZPLMX543-06|Guatemala.Alta Verapaz
Prionodiaptomus colombiensis|ZPLMX226-06|Guatemala.Alta Verapaz
Prionodiaptomus colombiensis|ZPLMX566-06|Mexico.Oaxaca
Prionodiaptomus colombiensis|ZPLMX544-06|Guatemala.Alta Verapaz
Prionodiaptomus colombiensis|ZPLMX567-06|Mexico.Oaxaca
Prionodiaptomus colombiensis|ZPLMX568-06|Mexico.Oaxaca
Mastigodiaptomus albuquerquensis|ZPLMX165-06|Mexico.Durango
Mastigodiaptomus albuquerquensis|ZPLMX166-06|Mexico.Durango
Mastigodiaptomus albuquerquensis|ZPLMX160-06|Mexico.Zacatecas
Mastigodiaptomus albuquerquensis|ZPLMX161-06|Mexico.Zacatecas
Mastigodiaptomus albuquerquensis|ZPLMX538-06|Mexico.Zacatecas
Mastigodiaptomus albuquerquensis|ZPLMX540-06|Mexico.Zacatecas
Mastigodiaptomus albuquerquensis|ZPLMX528-06|Mexico.Durango
Mastigodiaptomus albuquerquensis|ZPLMX525-06|Mexico.Durango
Mastigodiaptomus albuquerquensis|ZPLMX526-06|Mexico.Durango
Mastigodiaptomus albuquerquensis|ZPLMX248-06|Mexico.Durango
Mastigodiaptomus cf. albuquerquensis|ZPLMX172-06|Mexico.Michoacan

Merged_Project[NO_CODE] Wed May 28 13:38:39 2008 Page 2 of 2