

## Mexican earthworms - a checklist of species

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### Summary

Listed are 104 taxa from Mexico with ratio of endemics to exotics approximately 50:50. Fragoso *et al.* (1995: Appendix 1) catalogued 47 natives from Mexico while Fragoso (2001: 131, 137) stated there were 93 described Mexican species, 46 natives and 47 exotics most in the defunct "tribes Acanthodrilini (43 spp) and Dichogastrini (40)" plus another 36 or so undescribed species [cf. Huerta *et al.* (2005) that, without further explanation, puts these taxa in Megascolecidae and Acanthodrilidae]. The current checklist is derived from sources in the Acknowledgements and References given below.

American and Mexican taxa placed by some authors in either *Diploctrema* Spencer, 1900 or its synonym *Eodrilus* Michaelsen, 1907, require re-evaluation. Many possibilities exist for generic reallocation (eg. *Hegesipyle* Kinberg, 1782; *Acanthodrilus* Perrier, 1872; *Notiodrilus* Michaelsen, 1899; etc.) but, pending resolution, taxa are provisionally transferred to the earlier genus *Microscolex* Rosa, 1887 [- see also genera listed in Blakemore (2005; 2006) "Review of Southern Ocean, South Atlantic and Subantarctic species after Lee (1994)"]. James (1990) provisionally placed two Mexican species in *Diploctrema*, viz. *D. murchiei* and *D. papillata*, but these and several other Mexican, Belizean, Chilean and Brazilian earthworms (plus the Cuban *Acanthodrilus ulrici* Michaelsen, 1923) variously placed in *Diploctrema*, *Notiodrilus* and/or *Eodrilus* and more recently in *Kaxdrilus* Fragoso & Rojas, 1994, also require clarification. The present day distribution of *Diploctrema* is restricted to northern Australia (i.e., Qld, NT, north-west WA and northern NSW), where species are found in rainforest, woodland, grassland, cultivated soils, and a few moisture retaining refugia in arid areas, and New Zealand (Blakemore, 2002; 2005), whereas those reported from Neotropical region [Mexico, El Salvador, Belize, Cuba, Guatemala by Fragoso *et al.* (1995: 111)] probably require further clarification as noted above.

**Survey Results:** Checklist of Mexican species. Family level taxonomy follows Blakemore (2000). Those natives catalogued by Fragoso *et al.* (1995: Appendix 1) or by Huerta *et al.* (2005) are marked with a \*; all cosmopolitan exotics are described in Blakemore (2002; 2006).

### Family Moniligastridae - non native

1. *Drawida barwelli* (Beddard, 1886) cosmopolitan inc. Mexico [listed by Fragoso pers. comm. (Sept, 2006) as its junior synonym that was imported to Kew Gardens: *Moniligaster bahamensis* Beddard, 1893].

**Family Ocneroдрilidae** – some natives, some exotics

1. *Eukerria mcdonaldi* (Eisen, 1893) from Baja California.
2. *Eukerria saltensis* (Beddard, 1895) cosmopolitan (including Mexico and Cuba, Rodrigues, 1999), several synonyms.
3. *Eukerria zonalis* (Eisen, 1893: 311) from Baja California overlooked taxon or synonym.
4. *Ocneroдрilus* (*Ocneroдрilus*) *occidentalis* Eisen, 1878 cosmopolitan; [Gates (1972: 274) considered *O. occidentalis* to be a parthenogenetically degraded complex and said; “*O. beddardi*, *guatemalae*, *hendrici*, *sonorae* Eisen, 1893, *O. calwoodi* Michaelsen, 1898 and *O. mexicana* Eisen, 1900 are believed to be morphs of *occidentalis* rather than species”. Many of these names were included in the genus *Ilyogenia* characterized by spermathecal pores in 8/9; but its type species, *Ilyogenia africana* Beddard, 1893, is probably a merely thecate morph of *O. occidentalis*, suggesting this genus should be combined. *Ilyogenia comondui* Eisen, 1900 is claimed as a further synonym of *O. occidentalis* by Fragoso (pers. comm. Sept. 2006)].
5. \**Phoenicoдрilus taste* Eisen, 1895 from Baja California and other regions of Mexico, sometimes inhabiting bromeliads. [Fragoso (pers. comm. Sept. 2006) includes *Phoenicoдрilus tepicensis* Eisen, 1896 and *Ocneroдрilus santixavieri* Eisen, 1900 in synonymy].

**Family Acanthroдрilidae s. Blakemore (2000)** - mainly natives; (“?” with the genus *Microscolex*, indicates a provisional transfer from *Diploдрema* and/or its junior synonym *Eoдрilus*).

1. \**Balanteoдрilus pearsei* Pickford, 1938 from Mexico.
2. *Diplocardia alba alba* Gates, 1943: 108 from Florida and listed from Mexico by Fragoso (pers. comm. Sept. 2006), possibly referring to its subspecies. Non *Acanthroдрilus albus* Beddard, 1895 (?= *Notioдрilus* or ?*Microscolex*) from Chile [cf. ?*Microscolex albidus* (Gates, 1973: 22) and *Zapatadroдрilus albidus* (Gates, 1973: 22)].
3. *Diplocardia alba gravida* Gates, 1977 from Mexico (omitted from Fragoso *et al.*, 1995: 111, Appendix).
4. \**Diplocardia alba mexicana* Gates, 1955: 229, overlooked taxon or synonym from Mexico?
5. \**Diplocardia eiseni* (Michaelsen, 1894) [originally *Geoдрilus eiseni* from Florida, also known from Mexico and considered an exotic there by Fragoso (2001)].
6. *Diplocardia invecta* Gates, 1955 from Texas and Mexico (possibly native).
7. \**Diplocardia keyesi* (Eisen, 1896) [originally from Ensenada, Baja California, Mexico; but also listed in "The currently recognized names of North American earthworms from the area east of the Rocky Mountains" by James ([1995: 34, tab. 1](#)); originally *Aleoдрilus keyesi*

- the type of Eisen's (1896) genus].
8. \**Kaxdrilus parvus* Fragoso & Rojas, 1994 [misspelt "porcus" in Fragoso *et al.* (1995: 111)].
  9. \**Kaxdrilus proboscithecus* Fragoso & Rojas, 1994.
  10. \**Kaxdrilus sylvicola* Fragoso & Rojas, 1994 [previously reported as *Kaxadrilus salvadorensis* (Graff, 1957) originally in *Eodrilus* but subsequently transferred to the dubious genus *Notiodrilus* then *Kaxadrilus*; from Lacandona forest, Chiapas, Mexico listed on website [http://www.conabio.gob.mx/conocimiento/regionalizacion/doctos/rhp\\_092.html](http://www.conabio.gob.mx/conocimiento/regionalizacion/doctos/rhp_092.html) [Dec. 2006].
  11. \**Larsonidrilus microcolecinus* James, 1994 [misdated "1993" in Fragoso *et al.* (1995: 111)].
  12. \**Larsonidrilus orbiculatus* James, 1994 [misdated "1993" in Fragoso *et al.* (1995: 111)].
  13. \**Lavellodrilus bonampakensis* Fragoso, 1991 [as "*Iodrilus*" (laps.) in Huerta *et al.* (2005: 76)].
  14. \**Lavellodrilus ilkus* Fragoso, 1991.
  15. \**Lavellodrilus maya* Fragoso, 1988: 12.
  16. \**Lavellodrilus parvus* Fragoso, 1988: 17.
  17. \**Lavellodrilus riparius* Fragoso, 1988: 6 [author's name bracketed in error in Huerta *et al.* (2005: 81)].
  18. \**Mayadrilus calakmulensis* Fragoso & Rojas, 1994.
  19. \**Mayadrilus rombki* Fragoso & Rojas, 1994 [correct spelling retained under ICZN (1999: Art. 31.1.2) although named for Dr Jörg Römbke with option to name "roembkei" or "roembki"].
  20. \*?*Microscolex albidus* (Gates, 1973: 22) comb. nov. - originally as *Eodrilus albidus* nom. nov. pro *Eodrilus albus* Gates, 1970: 267 (non *Diplocardia alba* Gates, 1943: 108) from a cave in Mexico; nec *Trigaster albida* Gates, 1973: 22 (= *Zapatadrilus albidus*) also from Mexico published in same paper. Miscited by Fragoso (2005:346) as "*Diplotrema albidus* (Gates 1970)" with a note that, in error, "Fragoso (1989) la identifico como *Notiodrilus albus*".
  21. *Microscolex dubius* (Fletcher, 1887) cosmopolitan.
  22. \*?*Microscolex mexicanus* (Gates, 1967) comb. nov. originally in *Eodrilus*, from Mexico.
  23. \*?*Microscolex murchiei* (James, 1990) comb. nov. originally in *Diplotrema*, from Mexico; possibly a junior synonym of ?*M. oxcutzcabensis* (Pickford, 1938) as noted under that taxon.
  24. \*?*Microscolex oxcutzcabensis* (Pickford, 1938) comb. nov. originally in *Eodrilus*, from Mexico; Rodrigues (1999: 157) from "Fragoso (com. pers.)" suggest the possibility that a junior synonym is *Diplotrema murchiei* James, 1990.
  25. \*?*Microscolex papillatus* (James, 1990) comb. nov. originally in *Diplotrema*, from Mexico.
  26. *Microscolex phosphoreus* (Dugès, 1837) cosmopolitan.
  27. *Microscolex troyeri* (Eisen, 1893) [originally *Deltania troyeri* from Golden Gate Park, San Francisco also known from Baja California and Mexico proper; synonyms, *Deltania troyeri*

- crassa* + *Deltania troyeri lagunae* Eisen, 1896; apparently omitted from Reynolds & Cook (1976) and overlooked by Fragoso *et al.* (1995) although Fragoso pers. comm. (Sept. 2006) lists "*Deltania troyeri* Eisen 1896" in synonymy of *M. phosphoreus*].
28. \*?*Microscolex vasliti* (Eisen, 1896) comb. nov. originally in *Acanthodrilus*, from Mexico.
  29. \*?*Microscolex zilchi* (Graff, 1957) comb. nov. originally in *Eodrilus*, from Mexico.
  30. \**Protozapotecia aquilonalis* James, 1993 from Mexico.
  31. \**Protozapotecia australis* James, 1993 from Mexico.
  32. \**Protozapotecia koebeli* (Eisen, 1900: 197) [correction (by Michaelsen, 1900: 325) of "koebeli", nevertheless listed as *Diplocardia koebeli* by James (1990: 383) under Chapter heading "Oligochaeta: Megascolecidae and other earthworm from southern and midwestern North America" i.e. from USA, but this possibly a mistake, and by Fragoso *et al.* (1995: 111) from Mexico; this was type species of Eisen's (1900) subgenus *Naillenia*; subsequently transferred to *Protozapotecia* (eg. Fragoso pers. comm. Sept. 2006); also misspelt "*Protozapotecia koebeli*" <http://www.conabio.gob.mx/institucion/proyectos/resultados/Infl301.pdf>].
  33. \**Zapotecia amecamecae* Eisen, 1900, from Amecameca, Mexico [originally *Zapotecia ameca-mecae*; misspelt "*amecameca*" by Fragoso *et al.* (2005: 112) also misspelt "*amecamacae*"].
  34. \**Zapotecia nova* James, 1993.

#### **Family Octochaetidae s. Blakemore (2000) including Benhamiinae s. Csuzdi & Zicsi (1994)**

– some native, some introduced

1. *Dichogaster (Diplotheodrilus) affinis* (Michaelsen, 1890) cosmopolitan (inc. Mexico), many synonyms (inc. *Benhamia mexicana* Rosa, 1891 - mistakenly listed as a native "*Dichogaster mexicana* ..Michaelsen, 1900" in Fragoso *et al.* (1995: 112).
2. *Dichogaster (Diplotheodrilus) annae* (Horst, 1893) cosmopolitan (inc. Mexico and Cuba, Brown pers. comm. Dec., 2006), many synonyms.
3. *Dichogaster (Diplotheodrilus) bolau* (Michaelsen, 1891) cosmopolitan (inc. Mexico and Cuba), many synonyms.
4. *Dichogaster jaliscensis* Fragoso in Fragoso & Reynolds, 1997.
5. *Dichogaster michoacana* Fragoso in Fragoso & Reynolds, 1997.
6. *Dichogaster (Diplotheodrilus) modiglianii* (Rosa, 1896) cosmopolitan (inc. Costa Rica, Mexico and Cuba), several synonyms including *Benhamia nana* Eisen, 1896: 127 and *Benhamia papillata* Eisen, 1896: 135 from Mexico both listed as a natives and the former as "*Dichogaster nana* .. Eisen 1900" in Fragoso *et al.* (1995: 112).
7. *Dichogaster (Diplotheodrilus) saliens* (Beddard 1893) cosmopolitan (inc. Mexico, and

- Cuba, Brown, pers. comm. Dec. 2006).
8. \**Eutrigaster (Graffia) eiseni* Csuzdi & Zicsi, 1991 listed in *Dichogaster* by Fragoso pers. comm. (Sept. 2006).
  9. \**Eutrigaster (Eutrigaster) lineri* (Righi, 1972) listed in *Dichogaster* by Fragoso pers. comm. (Sept. 2006).
  10. *Eutrigaster (Eutrigaster) maya* Csuzdi in Csuzdi & Zicsi, 2000: 73 from Mexico.
  11. \**Eutrigaster (Eutrigaster) ribaucourti* (Eisen, 1900: 235) listed, as originally, in *Dichogaster* by Fragoso pers. comm. (Sept. 2006), from Mexico City, Mexico [misspelt "ribacourti" by Csuzdi (1994: 69)].
  12. \**Eutrigaster (Graffia) sporadonephra sporadonephra* (Cognetti, 1905) listed in *Dichogaster* by Fragoso pers. comm. (Sept. 2006).
  13. \**Eutrigaster (Graffia) viridis* (Eisen, 1900) (syn. *Dichogaster paessleri* Michaelsen, 1910) listed, as originally, in *Dichogaster* by Fragoso pers. comm. (Sept. 2006) from Mexico.
  14. \**Ramiellona irpex* (Michaelsen, 1911).
  15. \**Ramiellona lavellei* Gates, 1978.
  16. \**Ramiellona mexicana* Gates, 1962.
  17. \**Ramiellona strigosa strigosa* Gates, 1962 from Guatemala and Mexico [genus misspelt as "Ramionella strigosa" in Csuzdi (1996: 46)].
  18. \**Ramiellona wilsoni* Righi, 1972 from Mexico.
  19. \**Zapatadrilus albidus* (Gates, 1973: 22) from Mexico originally *Trigaster albida* - this species was cited as "*albida, Trigaster*" in Reynolds & Cook (1976: 67) with incorrect Type material, but as "*T. alba* (see Gates, 1971; cf. *Zapatadrilus*)" in James (1991: 339), as "*Trigaster alba* Gates, 1973" in James (1991: 349), and as "*Z. albus*" or "*Zapatadrilus alba*" (sic) in James (1991: 347, 350, 352); finally corrected to *Zapatadrilus albidus* (Gates, 1973) in Fragoso *et al.*, (1995: 114). [Cf. ?*Microscolex albidus* (Gates, 1973: 22) from same publication].
  20. \**Zapatadrilus reddelli* (Gates, 1971).
  21. \**Zapatadrilus ticus* (Righi, 1972) originally *Trigaster tica*, from Mexico.
  22. \**Zapatadrilus toltecus* (Eisen, 1900) from Toluca, Mexico.
  23. \**Zapatadrilus vallescensis* (Gates, 1971).

**Family Megascolecidae s. Blakemore (2000) – not natives**

1. *Amyntas corticis* (Kinberg, 1867).
2. *Amyntas gracilis* (Kinberg, 1867).
3. *Amyntas hupeiensis* (Michaelsen, 1895) report from Mexico - G. Brown pers. comm. (Dec. 2006).

4. *Amyntas morrisoni* (Beddard, 1892) cosmopolitan, several synonyms.
5. *Metaphire californica* (Kinberg, 1867) cosmopolitan, several synonyms.
6. *Metaphire houlleti* (Perrier, 1872) from Fragoso pers. comm. (Sept. 2006).
7. *Metaphire posthuma* (Vaillant, 1868) from Fragoso pers. comm. (Sept. 2006).
8. *Perionyx excavatus* Perrier, 1872 from Fragoso (2001: 147).
9. *Pithemera bicincta* (Perrier, 1875) cosmopolitan, several synonyms.
10. *Polypheretima elongata* (Perrier, 1872) cosmopolitan, several synonyms.
11. *Polypheretima taprobanae* (Beddard, 1892) cosmopolitan, several synonyms.
12. *Pontodrilus litoralis* (Grube, 1855) cosmopolitan on shorelines, many synonyms.

**Family Sparganophilidae** - possibly not native

1. *Sparganophilus tamesis* Benham, 1892 cosmopolitan (inc. Mexico and Guatemala), several synonyms including *Sparganophilidae eiseni* Smith, 1895 and *Sparganophilidae benhami* Eisen, 1896 from Mexico.

**Family Lumbricidae** - not natives

1. *Allolobophora chlorotica* (Savigny, 1826) cosmopolitan (inc. Mexico and Guatemala) with many synonyms.
2. *Aporrectodea caliginosa* (Savigny, 1826) many synonyms (inc. *A. turgida* Eisen, 1873).
3. *Aporrectodea longa* (Ude, 1885) cosmopolitan (inc. Mexico) with many synonyms.
4. *Aporrectodea rosea rosea* (Savigny, 1826) cosmopolitan with many synonyms.
5. *Aporrectodea trapezoides* (Dugès, 1828) cosmopolitan (inc. Mexico)
6. *Aporrectodea tuberculata* (Eisen, 1874) possibly widespread (inc. Mexico).
7. *Bimastos parvus* (Eisen, 1874).
8. *Bimastos tumidus* (Eisen, 1874) (syn. *Bimastos ducis* Stephenson, 1933) reported from Mexico (Fragoso pers. comm. Sept. 2006).
9. *Dendrobaena octaedra octaedra* (Savigny, 1826) cosmopolitan (inc. Mexico City).
10. *Dendrodrilus rubidus rubidus* (Savigny, 1826) cosmopolitan with many synonyms.
11. *Dendrodrilus rubidus tenuis* (Eisen, 1874) cosmopolitan (inc. Mexico), many synonyms.
12. *Eisenia fetida andrei* Bouché, 1972 [reported from Mexico by Fragoso (2001: 147)].
13. *Eisenia fetida fetida* (Savigny, 1826) cosmopolitan with many synonyms.
14. *Eiseniella tetraedra tetraedra* (Savigny, 1826) cosmopolitan with many synonyms.
15. *Eophila moebii* (Michaelsen, 1895) from Mexico in *Allolobophora* by Fragoso pers. comm.
16. *Eophila molleri* (Rosa, 1889) from Mexico reported in *Allolobophora* by Fragoso pers. comm..
17. *Lumbricus castaneus* (Savigny, 1826).

18. *Lumbricus rubellus* Hoffmeister, 1843.
19. *Lumbricus terrestris* Linnaeus, 1758.
20. *Octolasion cyaneum* (Savigny, 1826) cosmopolitan (inc. Mexico).
21. *Octolasion lacteum* (Örley, 1881) cosmopolitan (inc. Uruguay and Mexico).
22. *Octolasion tyrtaeum* (Savigny, 1826) cosmopolitan (inc. Mexico City).

Family **Glossoscolecidae** - some exotics, some natives.

1. ? *Onychochaeta elegans cubana* Michaelsen, 1923/4 [see note under nominal sub-species].
2. *Onychochaeta elegans elegans* (Cognetti, 1905) [possibly recorded only as its sub-species *cubana* Michaelsen although quoted as *O. elegans* by Rodriguez *et al.* (2003: 85, 86, 89) who claimed that "*Onychochaeta cubana* Zicsi, 1995: 59" is a junior synonym but this citation is incorrect as they are actually referring to the redescription by Zicsi (1995) of the taxon *Onychochaeta elegans cubana* Michaelsen, 1923 that was reported from Mexico by Rodriguez (1999: 156)].
3. *Onychochaeta windlei* (Beddard, 1890) report from Mexico - G. Brown pers. comm. (Dec. 2006).
4. \**Perisocolex brachycystis* (Cognetti, 1905) (possibly exotic).
5. *Pontoscolex corethrurus* (Müller, 1856).
6. \**Pontoscolex (Mesoscolex) cynthiae* Borges & Moreno, 1990.

Family **Eudrilidae** - non native.

1. *Eudrilus eugeniae* (Kinberg, 1867) cosmopolitan inc. Mexico (Rodriguez, 1999) and Cuba (Gates, 1972) [misspelt "eugenia" and "eugenieae" by Gonzales *et al.* (2006: 1249, 1250)]

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[End of Mexican Checklist].