Track analysis of the Mexican species of Cerambycidae (Insecta, Coleoptera)

Víctor H. Toledo[1], Angélica Ma. Corona[1] & Juan J. Morrone[2*]

[1]Centro de Educación Ambiental e Investigación Sierra de Huautla (CEAMISH), Universidad Autónoma del Estado de Morelos, Av. Universidad 1001, Col. Chamilpa, Cuernavaca, 62210 Morelos, Mexico. victor.toledo@buzon.uaem.mx, acorona@buzon.uaem.mx
[2]Museo de Zoología, Departamento de Biología Evolutiva, Facultad de Ciencias, Universidad Nacional Autónoma de México (UNAM), Apdo. postal 70-399, 04510 Mexico-D.F., Mexico. jjm@hp.fciencias.unam.mx
*Corresponding author.

ABSTRACT. Track analysis of the Mexican species of Cerambycidae (Insecta, Coleoptera). A track analysis of 221 species belonging to 68 genera of Mexican Cerambycidae was undertaken in order to identify their main distributional patterns. Based on the comparison of the individual tracks, fifteen generalized tracks were obtained: six are placed in the Neotropical region, seven are shared by the Neotropical region and the Mexican Transition Zone, one is situated in the Mexican Transition Zone, and one is shared by the Nearctic region and the Mexican Transition Zone. Eight nodes were found in the intersection of these generalized tracks, five of them located in the Neotropical region and three in the Mexican Transition Zone. Distributional patterns of Mexican Cerambycidae show two basic patterns: one mostly Neotropical, in the Mesoamerican dominion (Mexican Pacific Coast and Mexican Gulf biogeographic provinces) and another in the Mexican Transition Zone (Transmexican Volcanic Belt and Balsas Basin biogeographic provinces).

KEYWORDS. Biogeography; generalized tracks; Mexican Transition Zone; Neotropics; panbiogeography.

RESUMO. Análise de traço das espécies mexicanas de Cerambycidae (Insecta, Coleoptera). Uma análise de traço de 221 espécies de Cerambycidae mexicanos pertencentes a 68 gêneros foi feita com o objetivo de identificar seus principais padrões de distribuição. Baseado na comparação de traços individuais, quinze traços generalizados foram obtidos: seis localizados na região Neotropical, sete foram compartilhados entre a região Neotropical e a zona de transição mexicana, uma é situada na zona de transição mexicana e uma compartilhada entre a região Neártica e a zona de transição mexicana. Oito nós biogeográficos foram encontrados na intersecção dos traços biogeográficos generalizados, cinco deles localizados na região Neotropical e três na zona de transição mexicana. Existem dois padrões de distribuição para os Cerambycidae mexicanos: um principalmente Neotropical, no domínio Mesoamericano (províncias da costa pacífica mexicana e do golfo mexicano) e outro na zona de transição mexicana.

PALAVRAS-CHAVE. Biogeografia; Neotrópico; panbiogeografia; traços generalizados; Zona de transição Mexicana.

Cerambycidae (longhorned beetles) represent one of the largest families of wood-boring Coleoptera, with approximately 9,000 American species described from Alaska to Argentina. Approximately 1,600 species have been recorded from Mexico (Monné 2005a, b; Monné & Hovore 2005). The diversity of Cerambycidae is also reflected in their coloration, body form and adult morphology, with body length varying from ± 2.5 mm (*Cyrtinus* sp.) to slightly over 17 cm (*Titanus giganteus*). Some species mimic ants (tribes Clytini and Tillomorphini), bees and wasps (Rhinotragini), and lycid beetles (Pteroplatini). Larvae are xylophagous and phytophagous, and play an important role helping reduce dead and dying trees to humus (Linsley 1961).

Taxonomic interest in Mexican Cerambycidae started in 1758 with some species described by Linnaeus (for details on the taxonomic history in Mexico, see Noguera & Chemsak 1996), and has been constant especially in the last century. Nevertheless, there are scarce distributional records (Noguera & Chemsak 1996) and phylogenetic analyses including Mexican taxa (Lingafelter 1998; Philips & Ivie 1998). Linsley (1939, 1961) presented a summary of the world distribution of Cerambycidae; he regarded climate and the availability of suitable food plants as the main factors determining their present occurrence, and the evolution and spread of past floras as the major influence in the evolutionary history of the group.

Our objective is to describe the distributional patterns of 221 species of the family Cerambycidae in Mexico applying a panbiogeographic analysis.

MATERIAL AND METHODS

We analyzed distributional data for 221 species of cerambycids (see Appendix), which correspond to 68 genera, most of them (78%) having Neotropical biogeographic affinities. Several species (63) presented few localities (one or two) and were excluded from the analysis. Distributional records analyzed for these species were only from Mexico, data from other countries were not included in the analysis. Distributional data for this study were obtained from the available literature (Bates 1879; Chemsak 1963a,b, 1964, 1967, 1969a,b, 1972, 1977, 1980, 1991, 1999; Chemsak & Hovore 2002; Chemsak & Linsley 1963a,b, 1964a,b, 1965, 1966, 1967, 1975a,b, 1976a,b, 1982a,b, 1983, 1984, 1986, 1988; Chemsak & McCarty 1997; Chemsak & Noguera 1997, 1998, 2001, 2003; Giesbert 1979, 1985, 1986, 1992, 1993; Giesbert & Chemsak 1997; Giesbert & Wappes 1999; Linsley 1962, 1970; Martins & Chemsak 1966a,b; McCarty 2001; Noguera 1993, 2002; Noguera & Chemsak 1997; Noguera *et al*. 2002; Toledo 1997, 2005a,b; Toledo *et al*. 2002).

We applied a panbiogeographic analysis, which basically

consists of plotting distributions of each species on maps, and connecting their localities together with the nearest locality via minimum distance lines. After many species have been added to the data set, the overlapping of individual tracks provides generalized tracks, which allow us to hypothesize the pre-existence of ancestral biotic components that have been fragmented by tectonic or climatic changes (Croizat 1958, 1964; Morrone & Crisci 1995; Craw *et al*. 1999; Morrone 2004). If two or more generalized tracks intersect in a given area, they determine a node, which indicates a complex area where different ancestral biotic and geological elements interrelate in time and space. Individual and generalized tracks and nodes were represented on maps of the Mexican biogeographic provinces (Morrone 2005, 2006), using ArcView 3.2 (ESRI 1998).

RESULTS

Generalized tracks. A total of 221 individual tracks were constructed. Based on their overlapping, we obtained 15 generalized tracks (Fig. 1). Six are situated in the Neotropical region, seven are shared by the Neotropical region and the Mexican Transition Zone, one is situated in the Mexican Transition Zone, and one is shared by the Nearctic region and the Mexican Transition Zone (Morrone & Márquez 2003; Morrone 2005, 2006).

Generalized track 1. Southeastern Sonora to central southern Jalisco. Mexican Transition Zone (Transmexican Volcanic Belt biogeographic province) and Neotropical region, Mesoamerican dominion (Mexican Pacific Coast biogeographic province). Based on *Anelaphus badius, Cacophrissus paupe, Colobothea sinaloensis, Dectes nigripilus, Eburia laticollis, E. powelli, Ecyrus pacificus, Elytroleptus scabricollis, Euderces bicinctus, E. longicollis, E. pulcra, Lagocheirus obsoletus, Lophalia prolata, Methia occidentalis, Metironeus hesperus, Neocompsa alacris, N. tenuisima, Neotaranomis sinaloae, Oreodera brailovski, Phaea kaitlinae, P. marthae, Psyrassa cylindricollis, P. megalops, P. nigricornis, P. sinaloae, Rhodoleptus comis, R. femoratus, Sphaenothecus trilineatus, Strangalia palaspina, Tetraopes subfasciatus, Thryallis noguerai*, and *Triacetelus sericatus*.

Generalized track 2. Central southern to southwestern Jalisco. Mexican Transition Zone (Transmexican Volcanic Belt biogeographic province) and Neotropical region, Mesoamerican dominion (Mexican Pacific Coast biogeographic province). Based on *Acanthoderes noguerai, Ischnocnemis similis, Lagocheirus obsoletus, Oncideres albomarginata, O. scitula, Oreodera corticina, Phaea carnelia, P. juanitae, P. tenuata*, and *Psyrassa katsurae*.

Generalized track 3. Southwestern Jalisco to southwestern Guerrero. Neotropical region, Mesoamerican dominion (Mexican Pacific Coast biogeographic province). Based on *Acanthoderes ramirezi, Eburia chemsaki, E. clara, E. hatsuae, E. juanitae, E. laticollis, E. maccartyi, E. nigrovittata, E. paraegrota, E. powelli, Lagocheirus obsoletus, Lophalia prolata, Neoperiboeum juanitae, Phaea flavovittata, P. hogei, P. juanitae, P. marthae, Poliaenus hesperus, Psyrassa basicornis, P. cribricollis, P. cylindricollis, P. katsurae, P. levicollis, P. nigricornis, P. sthenias, Tetranodus copei*, and *Tylosis puncticollis*.

Generalized track 4. Southwestern Guerrero to southeastern Oaxaca. Neotropical region, Mesoamerican dominion (Mexican Pacific Coast biogeographic province). Based on *Eburia clara, E. laticollis, E. maccartyi, E. ribardoi, Euderces batesi, Lagocheirus obsoletus, Phaea hogei, P. kellyae, Psyrassa basicornis, P. sthenias, Sphaenothecus trilineatus*, and *Stenobatyle prolixa*.

Generalized track 5. Southeastern Oaxaca to northeastern Chiapas. Neotropical region, Mesoamerican dominion (Mexican Pacific Coast and Chiapas biogeographic provinces). Based on *Aneflus poriferus, Choriolaus howdeni, Eburia clara, E. laticollis, E. ribardoi, E. schusteri, Ecyrus lineicollis, Enaphalodes coronatus, Euderces boucardi, E. disparicus, E. reticulates, E. turnbowi, Lagocheirus cristulatus, L. simplicicornis, L. obsoletus, Metironeus hovorei, Neocompsa alacris, N. clerochroa, N. exclamationis, Oncideres ocellaris, Phaea biplagiata, P. bryani, P. flavovittata, P. helayae, P. hogei, P. kellyae, P. maccartyi, P. miniata, P. pthistica, P. semirufa, P. tenuata, P. wappesi, Psyrassa angelicae, P. basicornis, P. levicollis, P. oaxacae, P. sthenias, Sphaenothecus argenteus, S. toledoi, S. trilineatus, Sphaerionillum castaneum, Stenobatyle prolixa, Strangalia cavaventra*, and *Tetranodus copei*.

Generalized track 6. Northeastern to southeastern Chiapas. Neotropical region, Mesoamerican dominion (Mexican Pacific Coast and Chiapas biogeographic provinces). Based on *Eburia laticollis, Lagocheirus cristulatus, L. integer, L. simplicicornis, L. obsoletus, Neocompsa exclamationis, Oreodera corticina, O. fasciculosa, O. wappesi, Phaea biplagiata*, and *P. helayae*.

Generalized track 7. Northeastern to eastern Chiapas. Neotropical region, Mesoamerican dominion (Chiapas biogeographic province). Based on *Anthoboscus oculatus, Anatinoma alveolatum, Assycuera macrotela, Choriolaus howdeni, Eburia brevispinis, E. schusteri, Euderces bellus, E. boucardi, E. disparicus, E. laevicauda, E. turnbowi, E. wappesi, Megapsyrassa testacea, Oncideres ocellaris, Phaea kellyae, P. tenuata, P. wappesi, Plocaederus yucatecus, Psyrassa sthenias, Rhodoleptus nigripennis, Sphaenothecus argenteus*, and *S. toledoi*.

Generalized track 8. Southeastern Veracruz to northwestern Chiapas. Neotropical region, Mesoamerican dominion (Mexican Gulf and Chiapas biogeographic provinces). Based on *Eburia brevispinis, E. cruciata, Euderces reticulatus, Lagocheirus integer, L. binumeratus, Oncideres albomarginata, O. fisheri, O. putator putator, O. rubra, Oreodera corticina, O. fasciculosa, O. wappesi, Phaea acromela, P. pthistica*, and *Tetraopes varicornis*.

Generalized track 9. Southeastern San Luis Postosí to southeastern Veracruz. Mexican Transition Zone (Sierra Madre Oriental biogeographic province) and Neotropical region, Mesoamerican dominion (Mexican Gulf biogeographic province). Based on *Anatinoma alveolatum, Eburia*

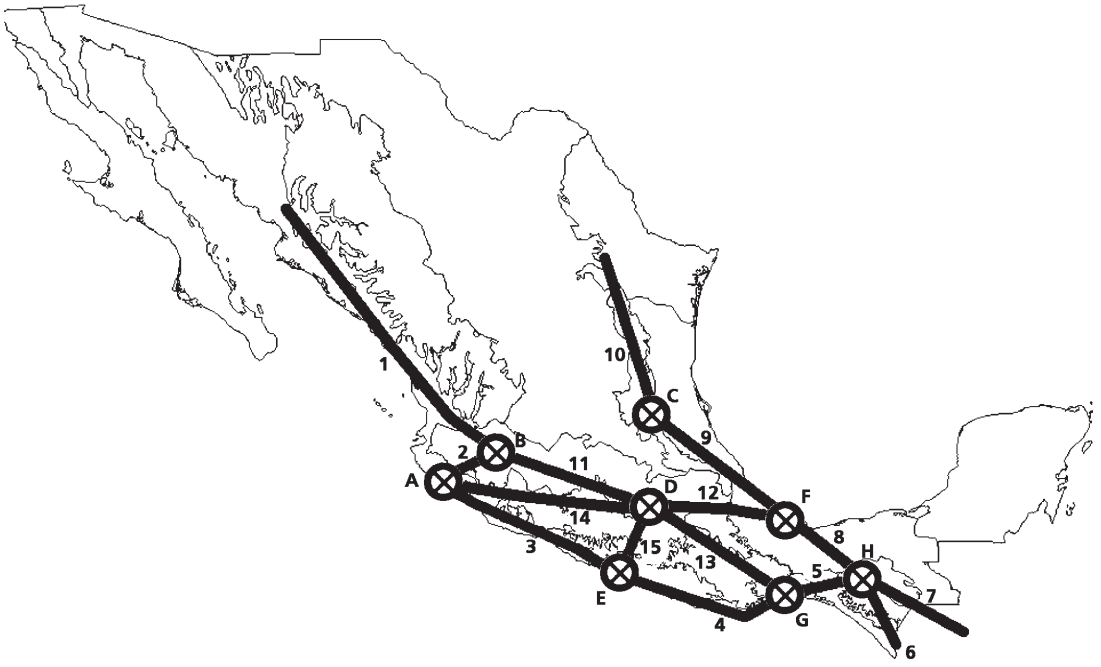

Fig. 1. Generalized tracks and nodes obtained from the biogeographic analysis of 221 species belonging to 68 genera of Mexican Cerambycidae.

brevispinis, E. mutica, Lagocheirus binumeratus, Micropsyrassa bimaculata, Neocompsa exclamationis, Oncideres cingulata texana, O. rubra, Phaea acromela, P. saperda, Psyrassa castanea, P. cribricollis, P. tympanophora, and *Tetraopes varicornis.*

Generalized track 10. Northwestern Nuevo León to southeastern San Luis Potosí. Nearctic region (Tamaulipas biogeographic province) and Mexican Transition Zone (Sierra Madre Oriental biogeographic province). Based on *Eburia mutica, Lagocheirus obsoletus, Meloemorpha aliena, Neoptychodes trilineatus, Oncideres cingulata texana, Oreodera corticina, Phaea acromela, P. tenuata, Psyrassa brevicornis*, and *P. sallaei*.

Generalized track 11. Central and southern Jalisco to central Morelos. Mexican Transition Zone (Transmexican Volcanic Belt and Balsas Basin biogeographic provinces). Based on *Acanthoderes noguerai, Ancylocera michelbacheri, Aneflomorpha crinita, Dectes nigripilus, Deltaspis cyanipes, Dexithea humeralis, Eburia poricollis, Euderces basimaculatus, E. cribripennis, Hexoplon calligrammum, Lophalia prolata, Megaderus bifasciatus, Neocompsa tenuissima, Oncideres scitula, Phaea bryani, P. carnelia, P. juanitae, P. semirufa, P. tenuata, Tetraopes subfasciatus*, and *T. varicornis*.

Generalized track 12. Central Morelos to southwestern Veracruz. Mexican Transition Zone (Balsas Basin and Transmexican Volcanic Belt biogeographic provinces) and Neotropical region, Mesoamerican dominion (Mexican Gulf biogeographic province). Based on *Assycuera macrotela, Cirrhicera leuconota, Dexithea humeralis, Elytroleptus similis, Euderces batesi, Hexoplon calligrammum, Lagocheirus funestus, L. integer, L. binumeratus, L. obsoletus, Meloemorpha aliena, Neocompsa clerochroa, Neoptychodes trilineatus, Phaea acromela, P. pthistica*, and *Tetraopes umbonatus.*

Generalized track 13. Central Morelos to southeastern Oaxaca. Mexican Transition Zone (Balsas Basin and Transmexican Volcanic Belt biogeographic provinces) and Neotropical region, Mesoamerican dominion (Mexican Pacific Coast biogeographic province). Based on *Ancylocera michelbacheri, Anelaphus hirtus, Dectes nigripilus, Eburia chemsak, E. cruciata, E. hatsuae, E. poricollis, Elytroleptus scabricollis, Euderces batesi, E. laevicauda, E. longicollis, E. perplexus, E. postipalidus, Ischnocnemis costipennis, Metironeus hesperus, Micropsyrassa reticulata, Ochraethes nigropunctatus, Phaea biplagiata, Psyrassa nigroaenea, Rhodoleptus comis, Sphaenothecus picticornis, Tetraopes cleroides, T. subfasciatus*, and *Tylosis puncticollis*.

Generalized track 14. Southwestern Jalisco to Central Morelos. Mexican Transition Zone (Balsas Basin and Transmexican Volcanic Belt biogeographic provinces) and Neotropical region, Mesoamerican dominion (Mexican Pacific Coast biogeographic province). Based on *Alphomorphus vandykei, Anelaphus hirtus, Deltaspis rubriventris, Eburia aliciae, E. cruciata, E. hatsuae, E. nigrovittata, E. rotundipennis, Elytroleptus scabricollis, Euderces cribripennis, E. longicollis, E. pulcra, Lagocheirus xileuco, Megaderus bifasciatus, Neocompsa alacris, N. clerochroa, Neoptychodes trilineatus, Oncideres senilis, Oreodera brailovski, O. glauca glauca, Phaea biplagiata, P. carnelia, P. flavovittata, P. hogei, P. maxima, Psyrassa chamelae, P. megalops, P. sinaloae, Sphaenothecus argenteus, S. picticornis, S. trilineatus*, and *Tetraopes umbonatus.*

Generalized track 15. Central Morelos to southeastern

Guerrero. Mexican Transition Zone (Balsas Basin and Transmexican Volcanic Belt biogeographic provinces) and Neotropical region, Mesoamerican dominion (Mexican Pacific Coast biogeographic province). Based on *Alphomorphus vandykei, Eburia chemsaki, E. nigrovittata, Euderces longicollis, E. perplexus, Hexoplon calligrammum, Ischnocnemis costipennis, Lagocheirus funestus, L. obsoletus, L. xileuco, Micropsyrassa reticulata, Neocompsa alacris, Oncideres senilis, Phaea kellyae, P. semirufa, P. tenuata,* and *Psyrassa cribricollis.*

Nodes. We found eight nodes in the areas where the generalized tracks intersected (Fig. 1):

Node A. Intersection of generalized tracks 2, 3, and 14. Southwestern Jalisco. Neotropical region, Mesoamerican dominion (Mexican Pacific Coast biogeographic province).

Node B. Intersection of generalized tracks 1, 2, and 11. Central south Jalisco. Mexican Transition Zone (Transmexican Volcanic Belt biogeographic province).

Node C. Intersection of generalized tracks 9 and 10. Southeastern San Luis Potosí. Mexican Transition Zone (Sierra Madre Oriental biogeographic province).

Node D. Intersection of generalized tracks 11, 12, 13, 14, and 15. Northwestern Morelos. Mexican Transition Zone (Transmexican Volcanic Belt and Balsas Basin biogeographic provinces).

Node E. Intersection of generalized tracks 3, 4, and 15. Southwestern Guerrero. Neotropical region, Mesoamerican dominion (Mexican Pacific Coast biogeographic province).

Node F. Intersection of generalized tracks 8, 9, and 12. Southeastern Veracruz. Neotropical region, Mesoamerican dominion (Mexican Gulf biogeographic province).

Node G. Intersection of generalized tracks 4, 5, and 13. Southeastern Oaxaca. Neotropical region, Mesoamerican dominion (Mexican Pacific Coast biogeographic province).

Node H. Intersection of generalized tracks 5, 6, 7, and 8. Northeastern Chiapas. Neotropical region, Mesoamerican dominion (Chiapas biogeographic province).

DISCUSSION

Distributional patterns identified herein were mostly Neotropical. We found two main distributional patterns for the species analyzed, which are related to their host plants distribution. One of them, in the lowlands of the Mesoamerican dominion, where eight generalized tracks and five nodes were obtained, is associated to the tropical dry forests of the Mexican Pacific Coast and Chiapas biogeographic provinces, and tropical rain forests of the Mexican Gulf (Rzedowski 1978). The other, in the highlands of the Mexican Transition Zone, where seven generalized tracks and three nodes were established, is associated to montane forests in the Transmexican Volcanic Belt and tropical dry forests of the Balsas Basin biogeographic province. In general, Cerambycidae in Mexico have been better collected in the tropical dry forests than in other kinds of vegetation (Chemsak & Noguera 1993; Noguera *et al*. 2002; Toledo *et al*. 2002).

The convergence of five generalized tracks in node D, which is situated in the Mexican Transition Zone (Transmexican Volcanic Belt- Balsas Basin biogeographic provinces), supports the hypothesis that it is a complex area where biotic elements with different origins overlap (Halffter 1987; Morrone & Márquez 2001). The absence of generalized tracks in the Nearctic region may indicate the lack of elements with Nearctic biogeographic affinities. Therefore, the results obtained are considered preliminary, because it would be necessary to include more distributional records from different national and international collections, recent systematic collects, and new species records with different biogeographic affinities, in order to complement the work and corroborate our hypothesis.

REFERENCES

Bates, H. W. 1879-1886. **Biologia Centrali-America, Insecta, Coleoptera, Longicornia**. Vol 5, 436 pp. London.

Chemsak, J. A. 1963a. Synopsis of the genus *Ancylocera* in Mexico. **Journal of the Kansas Entomological Society 36**: 104–109.

Chemsak, J. A. 1963b. Taxonomy and bionomics of the genus *Tetraopes*. **University of California Publications in Entomology 30**: 1–90.

Chemsak, J. A. 1964. A new species of Mexican *Ancylocera* with records of others. **Entomological News 75**: 108–110.

Chemsak, J. A. 1967. Review of the genus *Championa* Bates. **The Pan-Pacific Entomologist 43**: 43–48.

Chemsak, J. A. 1969a. New Mexican and Central American species of *Strangalia* Audinet-Serville. **Journal of the New York Entomological Society 77**: 2–9.

Chemsak, J. A. 1969b. Records and descriptions of Mexican and Central American Tillomorphini. **The Pan-Pacific Entomologist 45**: 303–317.

Chemsak, J. A. 1972. Review of the genus *Cirrhicera* Thomson. **The Pan-Pacific Entomologist 48**: 86–93.

Chemsak, J. A. 1977. Records and descriptions of some Mexican species of the genus *Phaea* Newman. **The Pan-Pacific Entomologist 53**: 269–276.

Chemsak, J. A. 1980. Revision of the genus *Stenobatyle* Casey. **The Pan-Pacific Entomologist 56**: 113–120.

Chemsak, J. A. 1991. New Mexican and Central American Elaphidiini. **Anales del Instituto de Biología, UNAM, Serie Zoología 62**: 469–480.

Chemsak, J. A. 1999. Revision of the genus *Phaea* Newman. **Occasional Papers of the Consortium Coleopterorum 3**: 36–101.

Chemsak, J. A. & F. T. Hovore. 2002. New Mexican and Central American species of Acanthoderini (Lamiinae) with notes on others, parts 1 & 2. **Les Cahiers Magellanes 15**: 1–32, **16**: 1–26.

Chemsak, J. A. & E. G. Linsley. 1963a. Synopsis of the known Mexican species of *Aneflus*. **Bulletin of Brooklyn Entomological Society 5**: 80–96.

Chemsak, J. A. & E. G. Linsley. 1963b. The genera of Hesperophanine Cerambycidae presently known from Mexico, with description of several new species. **Journal of the Kansas Entomological Society 36**: 207–230.

Chemsak, J. A. & E. G. Linsley. 1964a. Descriptions and records of Hesperophanini with keys to the species of *Anatinomma* and *Amphelictus*. **Journal of the Kansas Entomological Society 37**: 216–226.

Chemsak, J. A. & E. G. Linsley. 1964b. Descriptions and records of Mexican Methiini. **The Pan-Pacific Entomologist 40**: 158–161.

Chemsak, J. A. & E. G. Linsley. 1965. A revised key to the species of *Elytroleptus* with notes on variation and geographical distribution. **The Pan-Pacific Entomologist 41**: 193–199.

Chemsak, J. A. & E. G. Linsley. 1966. The genus *Tigrinestola* Breuning. **The Pan-Pacific Entomologist 42**: 239–243.

Chemsak, J. A. & E. G. Linsley. 1967. A review of the genus *Sphaerionillum* Bates. **The Pan-Pacific Entomologist 43**: 40–43.

Chemsak, J. A. & E. G. Linsley. 1975a. New species of the genus *Aneflomorpha* from Mexico. **The Pan-Pacific Entomologist 51**: 201–204.

Chemsak, J. A. & E. G. Linsley. 1975b. Mexican Pogonocherini. **The Pan-Pacific Entomologist 51**: 271–286.

Chemsak, J. A. & E. G. Linsley. 1976a. A new genus of Mexican and Central American Lepturinae with a review of the genus *Neoleptura* Thomson. **Journal of the Kansas Entomological Society 49**: 177–187.

Chemsak, J. A. & E. G. Linsley. 1976b. The genus *Triacetelus* Bates. **The Pan-Pacific Entomologist 52**: 216–219.

Chemsak, J. A. & E. G. Linsley. 1982a. Review of the genus *Rhodoleptus* Linsley. **The Coleopterists Bulletin 36**: 390–394.

Chemsak, J. A. & E. G. Linsley. 1982b. New Mexican Purpuricenini. **Wasmann Journal of Biology 40**: 71–76.

Chemsak, J. A. & E. G. Linsley. 1983. Confirmation of the occurrence of *Echthistatus* in Mexico and description of a related new genus. **International Journal of Entomology 25**: 226–230.

Chemsak, J. A. & E. G. Linsley. 1984. New genera and species of Neotropical Cerambycidae. **The Pan-Pacific Entomologist 60**: 279–288.

Chemsak, J. A. & E. G. Linsley. 1986. New Lamiinae from Mexico. **Journal of the New York Entomological Society 94**: 20–31.

Chemsak, J. A. & E. G. Linsley. 1988. Additional new species of Cerambycidae from the Estación de Biología Chamela, Mexico and environs. **Folia Entomológica Mexicana 77**: 123–140.

Chemsak, J. A. & J. D. McCarty. 1997. Review of the genus *Thryallis* Thomson. **The Coleopterists Bulletin 51**: 101–112.

Chemsak, J. A. & F. A. Noguera. 1993. Annotated checklist of the Cerambycidae of the Estación de Biología Chamela, Jalisco, Mexico, with descriptions of new genera and species. **Folia Entomológica Mexicana 89**: 55–102.

Chemsak, J. A. & F. A. Noguera. 1997. New Mexican Cerambycidae. **Occasional Papers of the Consortium Coleopterorum 1**: 6–14.

Chemsak, J. A. & F. A. Noguera. 1998. Review of the genus *Sphaenothecus* Dupont. **The Pan-Pacific Entomologist 74**: 12–26.

Chemsak, J. A. & F. A. Noguera. 2001. New Mexican and Central American Cerambycidae. **Occasional Papers of the Consortium Coleopterorum 4**: 50–55.

Chemsak, J. A. & F. A. Noguera. 2003. New species of *Anelaphus* Linsley from Mexico, Central and South America (Coleoptera: Cerambycidae). **The Pan-Pacific Entomologist 79**: 58–65.

Craw, R. C., J. R. Grehan & M. J. Heads. 1999. **Panbiogeography: Tracking the history of life**. Oxford University Press, New York.

Croizat, L. 1958. **Panbiogeography. Vols. 1 y 2**. Published by the author, Caracas.

Croizat, L. 1964. **Space, time, form: The biological synthesis.** Published by the author, Caracas.

ESRI (Environmental Systems Research Institute). 1998. **ArcView GIS 3.2.**

Giesbert, E. F. 1979. A review of the Mexican and Central American species of *Colobothea* Serville. **The Coleopterists Bulletin 33**: 415–438.

Giesbert, E. F. 1985. Two new species of Cerambycinae from Quintana Roo, Mexico. **The Coleopterists Bulletin 39**: 80–85.

Giesbert, E. F. 1986. A new species of *Strangalia* from Western Mexico. **The Pan-Pacific Entomologist 62**: 140–143.

Giesbert, E. F. 1992. Two new species of Cerambycidae from the State of Chiapas, Mexico. **The Coleopterists Bulletin 46**: 155–159.

Giesbert, E. F. 1993. New species of Cerambycinae from Guatemala and Chiapas, Mexico. **The Coleopterists Bulletin 47**: 137–149.

Giesbert, E. F. & J. A. Chemsak. 1997. A review of the genus *Euderces* LeConte (Tillomorphini). **Proceedings of the Califiornia Academy of Sciences 49**: 211–286.

Giesbert, E. F. & J. E. Wappes. 1999. Further studies in the Lepturini of Central America. Part II. **Occasional Papers of the Consortium Coleopterorum 3**: 8–14.

Halffter, G. 1987. Biogeography of the montane entomofauna of Mexico and Central America. **Annual Review of Entomology 32**: 95–114.

Lingafelter, S. W. 1998. The genera of Elaphidiini Thomson 1864. **Memoirs of the Entomological Society of Washington 20**: 1–118.

Linsley, E. G. 1939. The origin and distribution at the Cerambycidae of North America, with special reference to the fauna of the Pacific slope. **Proceedings of the Pacific Science Congress, Science Association, 6th Meeting 4**: 269–282.

Linsley, E. G. 1961. The Cerambycidae of North America. Part I. Introduction. **University of California Publications in Entomology 18**: 1–135.

Linsley, E. G. 1962. Synopsis of the genus *Elytroleptus* Dugés. **Folia Entomológica Mexicana 3**: 1–13.

Linsley, E. G. 1970. New genera and species in the Lepturine complex related to *Euryptera* and *Choriolaus*. **The Pan-Pacific Entomologist 46**: 128–141.

Martins, U. R. & J. A. Chemsak. 1966a. Synopsis of the known Mexican Ibidionini. **Journal of the Kansas Entomological Society 39**: 454–467.

Martins, U. R. & J. A. Chemsak. 1966b. Revision of the genus *Micropsyrassa* Linsley. **The Pan-Pacific Entomologist 42**: 120–126.

McCarty, J. D. 2001. A review of the Mexican species *Oreodera* Audinet-Serville (Lamiinae). **Occasional Papers of the Consortium Coleopterorum 4**: 13–34.

Monné, M. A. 2005a. Catalogue of the Cerambycidae (Coleoptera) of the Neotropical region. Part I. Subfamily Cerambycinae. **Zootaxa 946**: 1–765.

Monné, M. A. 2005b. Catalogue of the Cerambycidae (Coleoptera) of the Neotropical region. Part II. Subfamily Lamiinae. **Zootaxa 1023**: 1–760.

Monné, M. A. & F. T. Hovore. 2005. **Electronic checklist of the Cerambycidae of the Western Hemisphere**. Bioquip, 393 pp.

Morrone, J. J. 2004. Panbiogeografía, componentes bióticos y zonas de transición. **Revista Brasileira de Entomologia 48**: 149–162.

Morrone, J. J. 2005. Hacia una síntesis biogeográfica de México. **Revista Mexicana de Biodiversidad 76**: 207-252.

Morrone, J. J. 2006. Biogeographic areas and Transition Zones of Latin America and the Caribbean Islands, based on panbiogeographic and cladistic analyses of the entomofauna. **Annual Review of Entomology 51**: 467-494.

Morrone, J. J. & J. V. Crisci. 1995. Historical biogeography: Introduction to methods. **Annual Review of Ecology and Systematics 26**: 373–401.

Morrone, J. J. & Márquez, J. 2001. Halffter's Mexican transition zone, beetle generalized tracks, and geographical homology. **Journal of Biogeography 28**: 635–650.

Morrone, J. J. & J. Márquez. 2003. Aproximación a un Atlas Biogeográfico de México: Componentes bióticos principales y provincias biogeográficas. *In*: J. J. Morrone & J. Llorente Bousquets, eds. ***Una perspectiva latinoamericana de la biogeografía.*** pp. 217–220. Las Prensas de Ciencias, UNAM, México, D. F.

Noguera, F. A. 1993. Revisión taxonómica del genero *Oncideres* Serville en Mexico. **Folia Entomológica Mexicana 88**: 9–60.

Noguera, F. A. 2002. Revisión taxonómica de las especies del género *Eburia* Lepeletier & A.-Serville in Lacordaire de Norte y Centroamérica. **Folia Entomológica Mexicana 41**: 1–167.

Noguera, F. A. & J. A. Chemsak. 1996. Cerambycidae. p. 381–409. **Biodiversidad, taxonomía y biogeografía de artrópodos de México: Hacia una síntesis de su conocimiento** (eds, *In*:

Llorente-Bousquets J. García Aldrete A. N. & González Soriano E.), Vol. I. Instituto de Biología, UNAM. México.

Noguera, F. A. & J. A. Chemsak. 1997. New species and notes on the genus *Championa* Bates with a key to the species. **Occasional Papers of the Consortium Coleopterorum 1**: 1–5.

Noguera, F. A., S. Zaragoza-Caballero J. A. Chemsak, A. Rodríguez-Palafox, E. Ramírez, E. González-Soriano & R. Ayala. 2002. Diversity of the family Cerambycidae of the tropical dry forest of Mexico, I. Sierra de Huatla, Morelos. **Annals of the Entomological Society of America 95**: 617–627.

Philips, T. K. & M. A. Ivie. 1998. The Methiini of the West Indies with notes on the circum-Caribbean species. **Entomologica Scandinavica 29**: 57–87.

Rzedowski, J. 1978. **Vegetación de México.** Edit. Limusa, México, D. F. 431 pp.

Toledo, V. H. 1997. Revisión taxonómica del género *Lagocheirus* para México y Centroamérica. **Folia Entomológica Mexicana 101**: 1–58.

Toledo, V. H. 2005a. Revisión taxonómica del género *Psyrassa* Pascoe (Coleoptera: Cerambycidae). **Acta Zoológica Mexicana, Nueva Serie 21**: 1–64.

Toledo, V. H. 2005b. New distributional records for Mexican Cerambycidae (Coleoptera). **The Coleopterists Bulletin 59**: 415–422.

Toledo, V. H., F. A. Noguera, J. A. Chemsak, F. T. Hovore & E. F. Giesbert. 2002. The cerambycid fauna of the tropical dry forest of "El Aguacero," Chiapas, Mexico. **The Coleopterists Bulletin 56**: 515–532.

APPENDIX

List of species of the family Cerambycidae (Coleoptera) analyzed, with references consulted between square brackets.

1. *Acanthoderes albifrons* Chemsak & Hovore [Chemsak & Hovore 2002].
2. *A. amplitoris* Chemsak & Hovore [Chemsak & Hovore 2002].
3. *A. bicolor* Chemsak & Hovore [Chemsak & Hovore 2002].
4. *A. linsleyi* Chemsak & Hovore [Chemsak & Hovore 2002].
5. *A. noguerai* Chemsak & Hovore [Chemsak & Hovore 2002].
6. *A. ramirezi* Chemsak & Hovore [Chemsak & Hovore 2002].
7. *Alphomorphus vandykei* (Linsley) [Chemsak & Linsley 1975b].
8. *Anatinomma alveolatum* Bates [Chemsak & Linsley, 1963b 1964].
9. *Ancylocera michelbacheri* Chemsak [Chemsak 1963a].
10. *Aneflomorpha crinita* Chemsak & Linsley [Chemsak & Linsley 1975a].
11. *A. ruficollis* Chemsak & Linsley [Chemsak & Linsley 1975a].
12. *Aneflus glabropunctatus* Chemsak & Linsley [Chemsak & Linsley 1963a].
13. *A. minutivestis* Chemsak & Linsley [Chemsak & Linsley 1963a].
14. *A. poriferus* Giesbert [Giesbert 1993].
15. *Anelaphus badius* Chemsak [Chemsak 1991].
16. *A. hirtus* Chemsak & Noguera [Chemsak & Noguera 2003].
17. *Anthoboscus oculatus* Giesbert [Giesbert 1992; Toledo *et al*. 2002].
18. *A. tricolor* (Chevrolat) [Toledo 2005b].
19. *Assycuera macrotela* Bates [Chemsak 1964].
20. *Cacophrissus pauper* Bates [Chemsak & Linsley 1963b].
21. *Cacostola janzeni* Chemsak & Linsley [Chemsak & Linsley 1986].
22. *Ceralocyna cribricollis* (Bates) [Chemsak 1963a].
23. *Cirrhicera cristipennis* Bates [Chemsak 1972].
24. *C. leuconota* Laporte [Chemsak 1972].
25. *Colobothea sinaloensis* Giesbert [Giesbert 1979].
26. *Crossidius mexicanus* Chemsak & Noguera [Chemsak & Noguera 1997].
27. *Championa elegans* Chemsak [Chemsak 1967].
28. *C. westcotti* Noguera & Chemsak [Noguera & Chemsak 1997].
29. *Choriolaus howdeni* Giesbert & Wappes [Giesbert & Wappes 1999].
30. *Dectes nigripilus* Chemsak & Linsley [Chemsak & Linsley 1986].
31. *Deltaspis cyanipes* Bates [Toledo 2005b].
32. *D. rubriventris* Bates [Toledo 2005b].
33. *Dexithea humeralis* Chemsak & Noguera [Chemsak & Noguera 2001].
34. *Eburia aegrota* Bates [Noguera 2002].
35. *E. aliciae* Noguera [Noguera 2002].
36. *E. baroni* Bates [Noguera 2002].
37. *E. blancaneaui* Bates [Noguera 2002].
38. *E. brevicornis* Chemsak & Linsley [Noguera 2002].
39. *E. brevispinis* Bates [Noguera 2002].
40. *E. bruneicomis* Chemsak & Linsley [Noguera 2002].
41. *E. clara* Bates [Noguera 2002].
42. *E. cruciata* (Linsley) [Noguera 2002].
43. *E. cubae* (Fisher) [Noguera 2002].
44. *E. championi* Bates [Noguera 2002].
45. *E. chemsaki* Noguera [Noguera 2002].
46. *E. falli* Linsley [Noguera 2002].
47. *E. fuliginea* (Bates) [Noguera 2002].
48. *E. haldemani* LeConte [Noguera 2002].
49. *E. hatsueae* Chemsak & Giesbert [Noguera 2002].
50. *E. juanitae* Chemsak & Linsley [Noguera 2002].
51. *E. laticollis* Bates [Noguera 2002].
52. *E. maccartyi* Noguera [Noguera 2002].
53. *E. mutica* LeConte [Noguera 2002].
54. *E. nigrovittata* Bates [Noguera 2002].
55. *E. opaca* Chemsak & Linsley [Noguera 2002].
56. *E. ovicollis* LeConte [Noguera 2002].
57. *E. paraegrota* Chemsak & Linsley [Noguera 2002].
58. *E. patruelis* Bates [Noguera 2002].
59. *E. pedestris* White [Noguera 2002].
60. *E. poricollis* Chemsak & Linsley [Noguera 2002].
61. *E. porulosa* Bates [Noguera 2002].
62. *E. powelli* Chemsak & Linsley [Noguera 2002].
63. *E. ribardoi* Noguera [Noguera 2002].
64. *E. rotundipennis* Bates [Noguera 2002].
65. *E. schusteri* Giesbert [Giesbert 1993; Noguera 2002].
66. *Ecyrus ciliatus* Chemsak & Linsley [Chemsak & Linsley 1975b].
67. *E. lineicollis* Chemsak & Linsley [Chemsak & Linsley 1975b].
68. *E. pacificus* Linsley [Chemsak & Linsley 1975b].
69. *Echthistatus spinosus* Pascoe [Chemsak & Linsley 1983].
70. *Elytroleptus apicalis* LeConte [Chemsak & Linsley 1965; Linsley 1962].
71. *E. divisus* (LeConte) [Linsley 1962].
72. *E. ignitus* (LeConte) [Linsley 1962].
73. *E. pallidus pallidus* (Thomson) [Chemsak & Linsley 1965; Linsley 1962].
74. *E. scabricollis* Bates [Chemsak & Linsley 1965; Linsley 1962].
75. *E. similis* Chemsak & Linsley [Chemsak & Linsley 1965].
76. *Enaphalodes coronatus* (White) [Toledo 2005b].
77. *Erichsonia dentifrons* Westwood [Toledo 2005b].
78. *Erosida yucatana* Giesbert [Giesbert 1985].
79. *Euderces batesi* Giesbert & Chemsak [Giesbert & Chemsak 1997].
80. *E. basimaculatus* Giesbert & Chemsak [Giesbert & Chemsak 1997].
81. *E. bellus* Giesbert & Chemsak [Giesbert & Chemsak 1997].
82. *E. bicinctus* (Linsley) [Chemsak 1969b].
83. *E. biplagiatus* Giesbert & Chemsak [Giesbert & Chemsak 1997].
84. *E. boucardi* (Chevrolat) [Chemsak 1969b].
85. *E. brailovskyi* Giesbert & Chemsak [Giesbert & Chemsak 1997].
86. *E. cribripennis* Bates [Chemsak 1969b].
87. *E. disparicus* Giesbert & Chemsak [Giesbert & Chemsak 1997].
88. *E. laevicauda* Bates [Chemsak 1969b; Giesbert & Chemsak 1997].
89. *E. longicollis* (Linsley) [Linsley 1935; Chemsak 1969b].
90. *E. noguerai* Giesbert & Chemsak [Giesbert & Chemsak 1997].
91. *E. perplexus* Giesbert & Chemsak [Giesbert & Chemsak 1997].
92. *E. postipallidus* Giesbert & Chemsak [Giesbert & Chemsak 1997].
93. *E. pulcher* (Bates) [Chemsak 1969b; Giesbert & Chemsak 1997].
94. *E. reichei* LeConte [Chemsak 1969b; Giesbert & Chemsak 1997].
95. *E. reticulatus* (Bates) [Giesbert & Chemsak 1997].

96. *E. tibialis* Giesbert & Chemsak [Giesbert & Chemsak 1997].
97. *E. turnbowi* Giesbert & Chemsak [Giesbert & Chemsak 1997].
98. *E. wappesi* Giesbert & Chemsak [Giesbert & Chemsak 1997].
99. *Giesbertia rugosa* Chemsak & Linsley [Chemsak & Linsley 1984].
100. *Heterachthes integripennis* (Bates) [Martins & Chemsak 1966a].
101. *Hexoplon calligrammum* Bates [Martins & Chemsak 1966a].
102. *Ischnocnemis costipennis* Thomson [Toledo 2005b].
103. *I. similis* Chemsak & Noguera [Chemsak & Noguera 1997].
104. *Lagocheirus binumeratus* Thomson [Toledo 1997].
105. *L. cristulatus* Bates [Toledo 1997].
106. *L. funestus* Thomson [Toledo 1997].
107. *L. integer* Bates [Toledo 1997].
108. *L. lugubris* Dillon [Toledo 1997].
109. *L. obsoletus* Thomson [Toledo 1997].
110. *L. procerus* Casey [Toledo 1997].
111. *L. simplicicornis* Bates [Toledo 1997].
112. *L. xileuco* Toledo [Toledo 1997].
113. *Lasiogaster costipennis* Gahan [Toledo 2005b].
114. *Lochmaeocles cretatus* Chemsak & Linsley [Chemsak & Linsley 1986].
115. *L. nigritarsus* Chemsak & Linsley [Chemsak & Linsley 1986].
116. *Lophalia prolata* Chemsak & Linsley [Chemsak & Linsley 1988].
117. *Megaderus bifasciatus* Dupont [Toledo 2005b].
118. *Megapsyrassa testacea* Giesbert [Giesbert 1993].
119. *Meloemorpha aliena* (Bates) [Chemsak & Linsley 1976a].
120. *Methia occidentalis* Chemsak & Linsley [Chemsak & Linsley 1964b].
121. *Metironeus hesperus* Chemsak [Chemsak 1991].
122. *M. hovorei* Chemsak [Chemsak 1991].
123. *Micropsyrassa bimaculata* (Bates) [Martins & Chemsak 1966b].
124. *M. reticulata* Martins & Chemsak [Martins & Chemsak 1966b].
125. *Neocompsa alacris* (Bates) [Martins & Chemsak 1966a].
126. *N. clerochroa* (Thomson) [Martins & Chemsak 1966a].
127. *N. exclamationis* (Thomson) [Martins & Chemsak 1966a].
128. *N. tenuissima* (Bates) [Martins & Chemsak 1966a].
129. *Neoleptura alpina* Chemsak & Linsley [Chemsak & Linsley 1976a].
130. *Neoperiboeum juanitae* Chemsak [Chemsak 1991].
131. *Neoptychodes trilineatus* Linnaeus [Toledo 2005b].
132. *Neospondylis mexicanus* (Bates) [Bates 1879].
133. *Neotaranomis sinaloae* Chemsak & Linsley [Chemsak & Linsley 1982b].
134. *Ochraethes nigropunctatus* Chevrolat [Noguera *et al.* 2002; Toledo 2005b].
135. *O. octomaculata* Chemsak & Noguera [Chemsak & Noguera 2001].
136. *Ochraethes tomentosus* (Chevrolat) [Toledo 2005b].
137. *Oncideres albipilosa* Noguera [Noguera 1993].
138. *O. albomarginata chamela* Chemsak & Giesbert [Noguera 1993].
139. *O. cingulata texana* Horn [Noguera 1993].
140. *O. fisheri* Dillon & Dillon [Noguera 1993].
141. *O. ocellaris* Bates [Noguera 1993].
142. *O. putator putator* Thomson [Noguera 1993].
143. *O. rubra* Franz [Noguera 1993].
144. *O. scitula* Bates [Noguera 1993].
145. *O. senilis* Bates [Noguera 1993].
146. *Oreodera brailovskyi* Chemsak & Noguera [McCarty 2001].
147. *O. copei* McCarty [McCarty 2001].
148. *O. corticina* Thomson [McCarty 2001].
149. *O. fasciculosa* Thomson [McCarty 2001].
150. *O. glauca glauca* (Linnaeus) [McCarty 2001].
151. *O. wappesi* McCarty [McCarty 2001].
152. *Phaea acromela* Pascoe [Chemsak 1999].
153. *P. biplagiata* Chemsak [Chemsak 1977].
154. *P. bryani* Chemsak [Chemsak 1999].
155. *P. carnelia* Chemsak & Linsley [Chemsak 1999].
156. *P. eyai* Chemsak [Chemsak 1999].
157. *P. flavovittata* Bates [Chemsak 1999].
158. *P. haleyae* Chemsak [Chemsak 1999].
159. *P. hogei* Bates [Chemsak 1999].
160. *P. juanitae* Chemsak & Linsley [Chemsak 1999].
161. *P. kaitlinae* Chemsak [Chemsak 1999].
162. *P. kellyae* Chemsak [Chemsak 1999].
163. *P. maccartyi* Chemsak [Chemsak 1999].
164. *P. marthae* Chemsak [Chemsak 1999].
165. *P. maryannae* Chemsak [Chemsak 1977].
166. *P. maxima* Bates [Chemsak 1999].
167. *P. miniata* Pascoe [Chemsak 1999].
168. *P. phthisica* Bates [Chemsak 1999].
169. *P. saperda* Newman [Chemsak 1999].
170. *P. semirufa* Bates [Chemsak 1999].
171. *P. tenuata* Bates [Chemsak 1999].
172. *P. tricolor* Bates [Chemsak 1999].
173. *P. wappesi* Chemsak [Chemsak 1999].
174. *Platerosida howdeni* Linsley [Linsley 1970].
175. *Plectromerus wappesi* Giesbert [Giesbert 1985].
176. *Plocaederus yucatecus* (Chemsak & Noguera) [Chemsak & Noguera 1997].
177. *Poliaenus concolor* (Schaeffer) [Chemsak & Linsley 1975b].
178. *P. hesperus* Chemsak & Linsley [Chemsak & Linsley 1988].
179. *Psyrassa aliena* (Linsley) [Toledo 2005a].
180. *P. angelicae* (Toledo) [Toledo 2005a].
181. *P. basicornis* Pascoe [Toledo 2005a].
182. *P. brevicornis* Linsley [Toledo 2005a].
183. *P. castanea* Bates [Toledo 2005a].
184. *P. cribricollis* (Bates) [Toledo 2005a].
185. *P. cylindricollis* Linsley [Toledo 2005a].
186. *P. chamelae* Toledo [Toledo 2005a].
187. *P. chemsaki* Toledo [Toledo 2005a].
188. *P. katsurae* Chemsak & Noguera [Toledo 2005a].
189. *P. levicollis* Chemsak & Noguera [Toledo 2005a].
190. *P. megalops* Chemsak & Noguera [Toledo 2005a].
191. *P. nigricornis* Bates [Toledo 2005a].
192. *P. nigroaenea* Bates [Toledo 2005a].
193. *P. oaxacae* Toledo [Toledo 2005a].
194. *P. sallaei* Bates [Toledo 2005a].
195. *P. sinaloae* Linsley [Toledo 2005a].
196. *P. sthenias* Bates [Toledo 2005a].
197. *P. tympanophora* Bates [Toledo 2005a].
198. *Rhodoleptus comis* (Bates) [Chemsak & Linsley 1982a].
199. *R. femoratus* (Schaeffer) [Chemsak & Linsley 1982a].
200. *R. nigripennis* Giesbert [Giesbert 1993].
201. *Sphaenothecus argenteus* Bates [Chemsak & Noguera 1998].
202. *S. picticornis* Bates [Chemsak & Noguera 1998].
203. *S. trilineatus* Dupont [Chemsak & Noguera 1998].
204. *Sphaerionillum castaneum* Chemsak & Linsley [Chemsak & Linsley 1967].
205. *Stenobatyle prolixa* (Bates) [Chemsak 1980].
206. *Strangalia auripilis* Chemsak [Chemsak 1969a].
207. *S. cavaventra* Chemsak [Chemsak 1969a].
208. *S. hamatipes* Giesbert [Giesbert 1986].
209. *S. palaspina* Chemsak [Chemsak 1969a].
210. *Tetranodus copei* Chemsak & Linsley [Chemsak & Linsley 1988].
211. *T. niveicollis* Linell [Chemsak 1969b].
212. *Tetraopes cleriodes* Thomson [Chemsak 1963b].
213. *T. subfasciatus* Bates [Chemsak 1963b].
214. *T. thoreyi* Bates [Chemsak 1963b].
215. *T. umbonatus* LeConte [Chemsak 1963b].
216. *T. varicornis* Laporte [Chemsak 1963b].
217. *Thryallis leucophaeus* (White) [Chemsak & McCarty 1997].
218. *T. noguerai* Chemsak & McCarty [Chemsak & McCarty 1997].
219. *Tigrinestola howdeni* Chemsak & Linsley [Chemsak & Linsley 1966].
220. *Triacetelus sericatus* Bates [Chemsak & Linsley 1976b].
221. *Tylosis puncticollis* Bates [Toledo 2005b].

Received 31/08/2006; accepted 02/03/2007