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AN OVERVIEW OF THE MEXICAN BUPRESTIDAE WITH A LISTING OF *CHRYSOBOTHRIS* SPECIES (COLEOPTERA)¹

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The Buprestidae, commonly known as metallic wood borers as adults and flat headed borers as larvae, is one of the larger families of beetles with approximately 12 000 species currently recognized. It is well represented in the tropical and temperate regions of the world with many species occurring in desert and semi-arid areas. The species of this family have a phytophagous relationship with plants. The larvae primarily are borers, girdlers and miners of plant tissues. They are known to be associated with both woody and herbaceous plants as wood borers, root-borers, branch and twig borers and girdlers, cone borers, cambium miners, leaf and stem miners, gall formers, and external root feeders. Those adults which are known to feed, have been associated with leaves, petals, pollen and fungi. What is known about the relatively few species of the family that have been studied or observed biologically, considerable host, ecological and behavioral specificities are indicated. Many species of these beetles are restricted to a single species, genus or family of plants while others may have a very broad host range that can even include coniferous and broadleaf plants. It should be mentioned also, that adults may be associated with or feed on plants that do not serve as larval hosts. Adults of the Buprestidae are known to be sun loving and are restricted in their activities under cool, cloudy or shaded conditions. Many frequent dead or dying shrubs and trees, some may prefer stumps, fallen branches or logs while others are very particular in their habitat preferences which may include dead twigs, the upper or lower bole of standing trees, thin barked

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trees rather than trees of the same species with thick bark, sun scalded tree trunks, burned trees, snow bent trees, dead trees and logs without bark or in a certain stage of decomposition, plants in a certain degree of flowering or with a certain amount of greenery of foliage and plants of a certain age or size.

The Buprestidae are generally considered to be beneficial to man and the environment. This occurs in several ways. Under forest and other conditions buprestid larvae play a major role in the breakdown of wood and helping in its reversion to soil. By killing tree branches and twigs through girdling and boring activities a helpful pruning of various tree species can occur. Also, it has been observed that an increased growth or stooling of some range plants with forage value occurs following boring by larvae in the roots of such plants. Adults of the Buprestidae who are flower visitors also may be of benefit to some plants. They may play an important role in the pollination of plant species with which they associate. On the other hand, some members of this family are known to be harmful to plants, specially forest trees. They may cause actual plant mortality, they may cause a reduction of lumber quality because of the presence of boring holes and other defects in the wood, they may cause trees to become weakened and susceptible to windthrow because of extensive boring in the wood and the cambium feeders may cause trees to become weakened and susceptible to attack by bark beetles because of top killing.

The Mexican Buprestidae are poorly known taxonomically and biologically. Very few publications are available. The old, classic papers of Chevrolat (1823-1835), Waterhouse (1882-1897) and Duges (1901) are incomplete and do not provide much information for modern day studies, while the more recent papers by Van Dyke (1942) and Cazier (1951) are regionally restricted and the studies by Fisher (1922) and Dominguez and Marquez (1969) only apply to certain genera. Until the present, 51 genera of Buprestidae have been recorded from Mexico (Table 1) and more than 620 species. There are, however, several known new genera and many species to be described. Additionally, there are certain to be many more described species yet to be discovered in Mexico and many more new species and genera awaiting discovery.

From a geographical standpoint the buprestid genera occurring in Mexico can be grouped for convenience into six categories, 1) those that also occur outside the western hemisphere, usually in tropical and subtropical areas (Cos), 2) those that primarily have a holarctic distribution

Table 1

The genera of Mexican Buprestidae and their biogeographical occurrence.²

1. *Acherusia* Laporte and Gory (Neo), 1 sp.
2. *Acmaeodera* Eschscholtz (Cos), 65 spp.
3. *Acmaeoderoides* Van Dyke (NA), 3 spp.
4. *Acmaeoderopsis* Barr (NA), 7 spp.
5. *Actenodes* Lacordaire (Cos), 12 spp.
6. *Aegeocera* Waterhouse (NA), 4 spp.
7. *Agrilaxia* Kerremans (Neo), 4 spp.
8. *Agrilus* Curtis (Cos), 225+ spp.
9. *Anambodera* Barr (NA), 2 spp.
10. *Anthaxia* Eschscholtz (Cos), 1 sp.
11. *Brachys* Solier (NW), 11 spp.
12. *Buprestis* Linnaeus (Cos), 9 spp.
13. *Callimicra* Deyrolle, (Neo), 4 spp.
14. *Chalcangium* Waterhouse (Neo), 1 sp.
15. *Chalcophora* Solier (Holo), 2 spp.
16. *Chrysobothris* Eschscholtz (Cos), 83 spp.
17. *Chrysestes* Solier (Neo), 1 sp.
18. *Cinyra* Laporte and Gory (NW), 7 spp.
19. *Colobaster* Solier (Neo), 4 spp.
20. *Conognatha* Eschscholtz (Neo), 1 sp.
21. *Cyphothorax* Waterhouse (End), 1 sp.
22. *Dicerca* Eschscholtz (Holo), 4 spp.
23. *Euchroma* Solier (Neo), 1 sp.
24. *Exaesthetus* Waterhouse (End), 1 sp.
25. *Halecia* Laporte and Gory (Neo), 3 spp.
26. *Hippomelas* Laporte and Gory (NA), 12 spp.
27. *Hylaeogena* Obenberger (Neo), 4 sp.
28. *Hyperantha* Mannerheim (Neo), 1 sp.
29. *Isophaenus* Waterhouse (Neo), 1 sp.
30. *Leiopleura* Deyrolle (Neo), 13 spp.
31. *Lius* Deyrolle (Neo), 6 spp.
32. *Mastogenius* Solier (Neo), 1 sp.
33. *Melanophila* Eschscholtz (Cos), 12 spp.
34. *Micrasta* Kerremans (Neo), 4 spp.
35. *Mixochlorus* Waterhouse (Neo), 1 sp.
36. *Omochyseus* Waterhouse (Neo), 1 sp.
37. *Pachyschelus* Solier (NW), 21 spp.
38. *Paradormorphus* Waterhouse (Neo), 11 spp.
39. *Paragrilus* Saunders (Neo), 10 spp.
40. *Paratyndaris* Fisher (NW), 9 spp.
41. *Pelecopselaphus* Solier (Neo), 4 spp.
42. *Poecilonota* Eschscholtz (Holo), 2 spp.
43. *Polycesta* Solier (Cos), 8 spp.
44. *Psiloptera* Solier (Cos), 16 spp.
45. *Ptosima* Solier (Cos), 1 sp.

46. *Schizopus* LeConte (NA), 1 sp.
47. *Stenogaster* Solier (Neo), 3 spp
48. *Taphrocerus* Solier (NW), 14 spp.
49. *Thrincopyge* LeConte (NA), 3 spp.
50. *Trypantius* Waterhouse (Neo), 3 spp.
51. *Xenorhipis* LeConte (NW), 1 sp.

² Neo = Neotropical, Cos = Cosmopolitan, NA = North America, NW = New World, Holar = Holarctic, End = Endemic.

(Holar), 3) those that primarily are neotropical in distribution (Neo), 4) those that occur in tropical and temperate areas of the New World (NW), 5) those that are found mainly in desert areas of North America (NA), and 6) those that are endemic to Mexico (End).

A detailed discussion of the biogeography of the Mexican Buprestidae genera is not intended here. However, be it suffice to indicate that, based on currently understood distribution, 23 of the genera have neotropical roots, six are from the New World and have neotropical and temperate region affiliations, seven are North American and known mainly from desert areas of Mexico and the United States, three have a holarctic occurrence and only two genera are endemic to Mexico. Of the 10 cosmopolitan genera only *Actenodes* and *Psiloptera* can be regarded as being tropical while *Buprestis* and *Melanophila* appear to emphasize a biogeographical relationship with the holarctic region. The geographical affinities of the other six cosmopolitan genera are unclear. With regard to forest entomology, it is only among those genera with holarctic and cosmopolitan distributions that species are known to impact forest trees outside of Mexico. Included here are species of *Agrilus*, *Buprestis*, *Chrysobothris* and *Melanophila* which are associated with both coniferous and broad leaf trees. It is believed that some of the Mexican species of these genera will be found to affect forest trees as well. Unfortunately, the host relationship of the vast majority of the buprestid species in Mexico remain undocumented.

As an additional step towards a better understanding of the Buprestidae a consideration is given here to the *Chrysobothris* of Mexico. This genus has numerous species and several have been associated with forest trees. Descriptions of new species and a listing of the Mexican species of the genus were published by Dominguez and Marquez in 1969. This was followed by descriptions of other Mexican species and discussions of their ecology by Dominguez (1969). In the first paper a

total of 54 species was recorded. Now it is possible to add to this list and make certain corrections. Based on a compilation of recent published information, a total of 83 species of *Chrysobothris* can now be listed for Mexico (table 2). Thirty-seven of these species are endemic to Mexico, 32 occur in Mexico (including Baja California) and the United States and 14 species are known from Mexico and Central America. Three of the latter species also range into the United States.

Table 2

Distribution of the species of *Chrysobothris* known from Mexico.

	Mexico	Mexico & United States	Mexico & Central America	Baja California	Baja California & United States
1. <i>acaciae</i> Knull		X			
2. <i>acuminata</i> LeConte		X			
3. <i>acutipennis</i> Chevrolat		X	X		
4. <i>adelpa</i> G. & H.		X			
5. <i>aequalis</i> Waterhouse	X				
6. <i>aerea</i> Chevrolat	X				
7. <i>analís</i> LeConte		X	X		
8. <i>apicalis</i> Kerremans	X				
9. <i>armata</i> Duges	X				
10. <i>astuta</i> Waterhouse	X				
11. <i>atabalipa</i> Lap. & Gory			X		
12. <i>atrifasciata</i> LeConte		X			
13. <i>basalis</i> LeConte		X			
14. <i>beyeri</i> Schaeffer					X
15. <i>bicolor</i> Horn					X
16. <i>biramosa calida</i> Knull					X
17. <i>bispinosa</i> Schaeffer		X			
18. <i>brevitarsus</i> Nelson			X		
19. <i>capitata</i> Lap. & Gory			X		
20. <i>chacta</i> Lap. & Gory	X				
21. <i>costifrons</i> Waterhouse		X			X
22. <i>costifrons</i> Waterhouse		X			
23. <i>debilis</i> LeConte		X			
24. <i>densa</i> Waterhouse	X				
25. <i>dentipes</i> Germar		X			
26. <i>distincta</i> Gory		X	X		
27. <i>dugesi</i> Kerremans	X				
28. <i>edwardsii</i> Honr		X			
29. <i>exesa</i> LeConte		X			X
30. <i>explicationis</i> Nelson	X				

	Mexico	Mexico & United States	Mexico & Central America	Baja California	Baja California & United States
31. <i>femorata</i> (Olivier)		X			X
32. <i>foveata</i> Waterhouse	X				
33. <i>frontiscallus</i> Dominguez & Marquez	X				
34. <i>gemmata</i> LeConte		X			
35. <i>georgei</i> Nelson	X				
36. <i>guatemalensis</i> Thomson			X		
37. <i>helferi</i> Fisher					X
38. <i>humilis</i> Horn		X			
39. <i>ichthyomorpha</i> Thomson			X		
40. <i>ignota</i> Duges	X				
41. <i>inaequalis</i> Waterhouse	X				
42. <i>juncta</i> Waterhouse	X				
43. <i> knulli</i> Nelson		X			
44. <i> lancei</i> rugithorax Obenberger			X		
45. <i>lateralis</i> Waterhouse		X			X
46. <i>lixa</i> Horn		X			
47. <i>lucana</i> Horn					X
48. <i>ludificata</i> Horn		X			
49. <i>martha</i> VanDyke				X	
50. <i>melazona</i> Chevrolat			X		
51. <i>merkelii</i> Horn		X			X
52. <i>micelbacheri</i> VanDyke				X	
53. <i>micromorpha</i> Fall		X			
54. <i>modesta</i> Waterhouse	X				
55. <i>montezuma</i> Thery	X				
56. <i>nausicaa</i> Thomson			X		
57. <i>nickerli</i> Obenberger	X				
58. <i>octocola</i> LeConte		X			X
59. <i>paramodesta</i> Nelson	X				
60. <i>paratabalipa</i> Nelson	X				
61. <i>peninsularis</i> Schaeffer		X			X
62. <i>phoebe</i> Thomson	X				
63. <i>purpureoplagiata</i> Schaeffer		X			X
64. <i>quadriplagiata</i> Waterhouse	X				
65. <i>rossi</i> VanDyke		X			X
66. <i>sallaei</i> Waterhouse			X		
67. <i>schaefferi</i> Obenberger					X
68. <i>simplex</i> Waterhouse	X				
69. <i>sinaloae</i> VanDyke	X				
70. <i>sobrina</i> Duges	X				
71. <i>socialis</i> Waterhouse		X			
72. <i>stellifera</i> Waterhouse	X				

		Mexico & United States	Mexico & Central America	Baja California	Baja California & United States
73.	<i>storkani</i> Obenberger	X			
74.	<i>texcocana</i> Dominguez	X			
75.	<i>tibidens</i> Dominguez & Marquez	X			
76.	<i>totonaca</i> Dominguez & Marquez	X			
77.	<i>tresignata</i> Waterhouse	X			
78.	<i>trochantispirus</i> Dominguez & Marquez	X			
79.	<i>ulkei</i> Horn		X		
80.	<i>verityi</i> Nelson	X			
81.	<i>viridi-impressa</i> Lap. & Gory			X	
82.	<i>viridilabrata</i> Obenberger	X			
83.	<i>yucatanensis</i> VanDyke	X			

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