

Insects found on *Araujia* species (Apocynaceae, Asclepiadoideae) in Argentina

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Abstract: The results of a survey of the natural enemies of moth plant or “tasi”, species of *Araujia* (Apocynaceae, Asclepiadoideae), present in Argentina are shown in this paper. 57 species of insects were recorded of which 17 are cited as natural enemies of these species for the first time. Their specificity was determined and their potential use as biological control agents for *Araujia hortorum* Fourn. was hypothesized. *Pseudosphex neverca* Schaus (Lepidoptera, Arctiidae), is recorded for the first time in the Buenos Aires province, Argentina.

Key Words: *Araujia hortorum*, Asclepiadoideae, natural enemies, biological control, Argentina.

Resumen: Insectos hallados en especies de *Araujia* (Apocynaceae, Asclepiadoideae) en Argentina. Los resultados de un estudio de los enemigos naturales de las “planta polilla” o “tasi”, especies del género *Araujia* (Apocynaceae, Asclepiadoideae), que se encontraron en Argentina se presentan en este documento. Se registraron 57 especies de insectos, 17 de las cuales son citadas como enemigos naturales de estas plantas por primera vez. Se determinó su especificidad y se planteó la hipótesis de su uso potencial como agentes de control biológico para *Araujia hortorum* Fourn. La especie *Pseudosphex neverca* Schaus, (Lepidoptera, Arctiidae), se cita por primera vez para la provincia de Buenos Aires, Argentina.

Palabras clave: *Araujia hortorum*, Asclepiadoideae, enemigos naturales, control biológico, Argentina.

INTRODUCTION

Few systematic studies have previously been carried out on natural insect enemies of native plants in Argentina. The well known listings of Bosq (1937, 1940, 1943) and more recently of Cordo *et al.* (2004) put emphasis on species that are important in agricultural crops, as until now, that is the sector where most surveys have been conducted.

The present study is part of a project on the biological control of *Araujia hortorum* E.Fourn., an invasive species in New Zealand. A survey was undertaken during 2004-2008, in Argentina and neighbouring countries, of the insect species found on *A. hortorum*, as well as on related genera and species, that could be of potential use as biological control agents of this plant in New Zealand.

In preliminary reports Winks & Fowler (2000) and Winks *et al.* (2004), a total of 19 insect species found on “moth plant” (*A. hortorum*) are cited

in Argentina, data that was later included in the “Catálogo de Insectos Fitófagos de la Argentina” published by Cordo *et al.* (2004). Villamil *et al.* (2005) later added 35 species to the list of phytophagous insects and predators found on *A. hortorum* and other species of the same genus (*A. angustifolia* (Hook. & Arn.) Decne., *A. sericifera* Brot., *A. odorata* (Hook. & Arn.) Fontella & Goyder and *A. brachystephana* (Griseb.) Fontella & Goyder). That list was the result of surveys undertaken in the south of Buenos Aires province and in the Argentine mesopotamia (provinces of Entre Ríos, Corrientes and Misiones). Only 10 of these species (found on five species of the moth plants studied) were identified (21 % of the total number of species).

In the present research, the study area was extended to the north and centre of Argentina, but the focus was on the north of Buenos Aires province which is considered as the most important area in Argentina as most species of moth plant studied are found there, both in anthropogenic

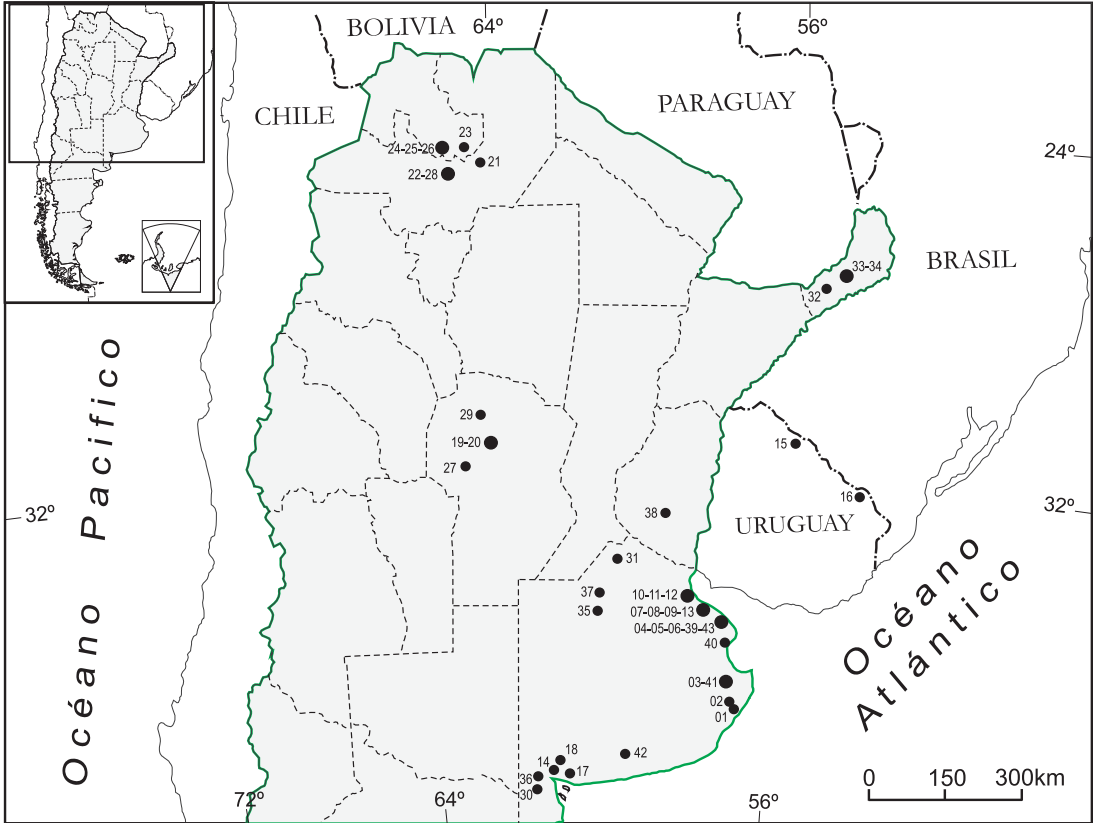


Fig. 1. Map of the sampling sites.

and pristine areas. Two other species of *Araujia* are included in this study: *A. megapotamica* (Spreng.) G. Don. and *A. plumosa* Schltld. Some insect species are proposed as biological control agents of moth plants and their use is justified.

The authors have developed this research using the traditional approach, which considered *Araujia* and *Morrenia* as distinct genera (Meyer, 1944, here referred as *sensu antico*). Nevertheless, recently both genera have been brought together as *Araujia* (Rapini *et al.*, 2011, here referred as *sensu novo*).

From the species found during the development of this project have been chosen by Landcare Research (the project sponsor) and preliminarily evaluated in laboratory, *Colaspis argentinensis* (Bechyne) (Coleoptera, Chrysomelidae) and *Toxotrypana australis* Blanchard (Diptera, Tephritidae).

MATERIALS AND METHODS

The specimens studied were collected in jars with 70 % alcohol and were deposited in the

Entomology collection in the Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" to be studied and stored.

The insects and plants, has been determined by comparison with reference collections, both in the collection of the Division of Entomology Museum of Natural History and the herbarium of the Universidad Nacional del Sur.

Sampling sites (Fig. 1)

2005-2006

01. Pinamar, route 74 km 5, Buenos Aires province, Argentina. On *Araujia hortorum*.
02. Pinamar, route 74 km 14, Buenos Aires province, Argentina. On *Araujia hortorum*.
03. Ea La Luisa, route 56, km 24, Buenos Aires province, Argentina. On *Araujia hortorum*.
04. Magdalena, 3 km south, Buenos Aires province, Argentina. On *Araujia hortorum*.
05. Magdalena, route 11, 13 km north, Buenos Aires province, Argentina. On *Araujia hortorum*.
06. La Plata, Gonnet, Buenos Aires province, Argentina. On *Araujia hortorum*.
07. Villa Elisa, Ecological Reserve, Buenos Aires province, Argentina. On *Araujia hortorum*.

08. Berazategui, Gutiérrez, Buenos Aires, Argentina province. On *Araujia odorata*.
09. Punta Lara Reserve (Ensenada), Buenos Aires province, Argentina. On *Araujia hortorum*.
10. Quilmes, Laprida and La Plata Av., Buenos Aires province, Argentina. On *Araujia odorata*.
11. Quilmes, Calchaquí Av. and Irala street, Buenos Aires province, Argentina. On *Araujia hortorum*.
12. Quilmes, Amoedo and Gral. Mosconi Av., Buenos Aires province, Argentina. On *Araujia angustifolia*.
13. La Plata, Ringuet, Buenos Aires province, Argentina. On *Araujia hortorum*.
14. Bahía Blanca, Buenos Aires province, Argentina. On *Araujia hortorum*.
15. Rivera, Uruguay. On *Araujia brachystephana* and *A. odorata*.
16. Rio Branco, Uruguay. On *Araujia brachystephana* and *A. odorata*.
37. Junín (34° 34' 09.7" S; 60° 57' 36.5" W), Buenos Aires province, Argentina. On *Araujia hortorum*.
38. Gualeguay (33° 09' 24.0" S; 59° 15' 23.7" W), prov. Entre Ríos, Argentina. On *Araujia brachystephana*.
39. City Bell (34° 51' 42.3" S; 58° 03' 47.5" W), Buenos Aires province, Argentina. On *Araujia hortorum*.
40. Boca del Río Salado (35° 45' 04.5" S; 57° 22' 54.7" W), Buenos Aires province, Argentina. On *Araujia hortorum*.
41. Ea. La Luisa, ruta 56 Km 24 (36° 42' 15.5" S; 57° 14' 26.5" W), Buenos Aires province, Argentina. On *Araujia hortorum*.
42. Tres Arroyos (38° 22' 43.2" S; 60° 15' 53.2" W), Buenos Aires province, Argentina. On *Araujia hortorum*.
43. Gonnet, Buenos Aires province, Argentina. On *Araujia hortorum*.

2006-2008

17. Bahía Blanca, Bajo Hondo, Buenos Aires province, Argentina. On *Araujia odorata*.
18. Bahía Blanca, Barrio Patagonia, Buenos Aires province, Argentina. On *Araujia hortorum*.
19. Córdoba, General Paz, prov. Córdoba, Argentina. On *Araujia brachystephana*.
20. Córdoba, General Paz, prov. Córdoba, Argentina. On *Cynanchum* sp.
21. General Güemes, prov. Salta, Argentina. *Araujia odorata*.
22. Cerro San Bernardo, prov. Salta, Argentina. On *Philibertia latiflora*.
23. Pampa Blanca, prov. Jujuy, Argentina. On *Araujia odorata*.
24. Dique Las Maderas, prov. Jujuy, Argentina. On *Araujia odorata*.
25. Dique Las Maderas, prov. Jujuy, Argentina. On *Philibertia latiflora*.
26. Dique Las Maderas, prov. Jujuy, Argentina. On *Araujia plumosa*.
27. Los Reartes, 5 km west, prov. Córdoba, Argentina. On *Araujia odorata*.
28. San Lorenzo, prov. Salta, Argentina. On *Araujia odorata*.
29. Deán Funes, prov. Córdoba, Argentina. On *Araujia odorata*.
30. Médanos, Lago Chapalcó, Buenos Aires province, Argentina. On *Araujia odorata*.
31. Pergamino (33° 48' 45.2" S; 60° 28' 35.8" W), Buenos Aires province, Argentina. On *Araujia hortorum*.
32. Candelaria (27° 28' 50.3" S; 55° 44' 49.0" W), prov. Misiones, Argentina. On *Araujia sericifera*.
33. Eldorado (26° 23' 18.1" S; 53° 53' 39.6" W), prov. Misiones, Argentina. On *Araujia sericifera*.
34. Eldorado (26° 23' 38.4" S; 53° 53' 31.2" W), prov. Misiones, Argentina. On *Araujia sericifera*.
35. Los Toldos (34° 51' 38.4" S; 61° 00' 27.1" W), Buenos Aires province, Argentina. On *Araujia hortorum*.
36. Médanos, Frigorífico Sur (38° 48' 35.1" S; 62° 40' 59.2" W), Buenos Aires province, Argentina. On *Araujia odorata*.

RESULTS

These are the final results of the survey of natural enemies of *Araujia*, after five years of field work (2004-2008). The authors have added 17 new natural enemies to the preliminary lists.

Record of herbivorous insects reported on different species of *Araujia* in Argentina

Featured here is the list of species found and published in the reports of the various campaigns conducted between 2000 and 2008

- (1) Species cited in Winks & Fowler (2000).
- (2) Species cited in Villamil *et al.* (2005).
- (3) Species cited in Villamil *et al.* (2006).
- (4) Species cited here for the first time are shown in **bold type**.

NOTE: Unidentified species cited in Villamil *et al.* (2005) were shown with small letters (a, b, c).

COLEOPTERA

Anobiidae

a. sp. (2)

Comments. Probably the same species as (1). On *Araujia hortorum*.

1. *Trycorynus subrutiliceps* Pic (3)

Anthribidae

1. ***Araecerus fasciculatus*** (DeGeer) (4) (Fig. 9).

Cerambycidae

2. *Acanthoderes jaspidea* (Germain) (1)

3. *Eupogonius petulans* Melzer (1)

4. *Eupromerella propinqua* (Melzer) (3)

5. *Hyperplatys argentinus* Berg (1)

6. *Neocorus ibidionoides* (Serville) (3)

7. *Urgleptes mancus* (Melzer) (1)

Chrysomelidae

8. *Chlamisus hispidulus hispidulus* (Klug) (3)9. *Colaspis argentinensis* (Bechyné) (1) (3) (4)**2. *Colaspis porosa*** Jacoby (4)10. *Cacoscelis melanoptera* (Germain) (1)

Curculionidae

11. *Araptus araujiae* (Brèthes) (1) (3) (Scolytinae) (4)12. *Araptus pubescens* (Schedl) (3) (Scolytinae) (4)**3. *Asynonychus cervinus*** (Boheman) (4) b. curculioniform larvae? (2)**Comments.** Probably the same species of Scolytinae previously cited (11, 12). On *Araujia hortorum* and *A. dorata*.**4. *Naupactus sp.1*** (4)**5. *Naupactus sp.2*** (4)**6. *Naupactus sp.3*** (4)**7. *Naupactus sp.4*** (4)13. *Rhyssomatus diversicollis* Heller (1) (3)14. *Rhyssomatus pilosipes* Heller (3) c. sp. (2)**Comments.** Without any taxonomic specifications. On *Araujia hortorum*, *A. angustifolia* and *A. brachystephana*.

Dasytidae

15. *Astylus atromaculatus* (Blanchard) (2) (4)

Meloidae

16. *Tetraonyx propinquus* Burmeister (3)

Tenebrionidae

8. *Epitragus mucidus* Berg (4)

DIPTERA

d. Pupae (did not emerge) (2)

Comments. Without any taxonomic specifications. On *Araujia hortorum*. e. leaf miner? (2)**Comments.** Without any taxonomic specifications. On *Araujia hortorum*.

vermiform larvae? (2)

Comments. Without any taxonomic specifications. On *Araujia hortorum* and *A. angustifolia*.

Muscidae

sp. ? (2)

Comments. Without any taxonomic specifications. On *Araujia hortorum*.

Syrphidae

Pupae (2)

Comments. Without any taxonomic specifications. On *Araujia odorata*.

Tephritidae (Fig. 12)

9. *Tomoplagia febrigi* Hendel (4)17. *Toxotrypana australis* Blanchard (3)

HEMIPTERA-HETEROPTERA

Coreidae:

18. *Acanonicus hahni* (Stal) (3) (4)19. *Anasa guttifera* Berg (3)20. *Eubule glyphica* Berg (2) (3)21. *Eubule sculpta* (Perty) (1) (2) (3) (4) (Figs. 2,3)**10. *Phthiacnemia picta*** (Drury) (Nymph) (4)

Lygaeidae

11. *Lygaeus alboornatus* Blanchard (4) (Fig. 6).22. *Oncopeltus unifasciatellus* Hahn (2) (3) (4) (Fig. 5).23. *Oncopeltus bergianus* (Kirkaldy) (1) (3) (4) (formerly *stali*) (Fig. 4).

Pentatomidae

12. *Edessa sp.* (Nymph) (4)**13. *Nezara viridula*** L. (4)

Scutelleridae

14. *Tetyra poecila* Berg (4)

HEMIPTERA-STERNORHYNCHA

Aphididae

24. *Aphis nerii* Boyer de Fonscolombe (1) (2) (3) (4) (Fig. 10).25. *Aphis gossypii* Glover (dark green aphids) (2)

(3) (4) i. very small yellow aphids (2)

Comments. Probably a different species to *Aphis nerii* but further study is needed. On *Araujia hortorum*.26. *Myzus persicae* (Sulzer) (3)

Lecaniidae

27. *Saissetia oleae* (Olivier) (3) (4)

Pseudococcidae

28. *Pseudococcus* sp. (mealy bugs) (2) (3)

HEMIPTERA-COLEORHYNCHA

Membracidae

15. *Ceresa uruguayensis* Berg (4) (Fig. 11).

HYMENOPTERA

Formicidae

29. *Acromyrmex lundi* Guérin (2)30. *Camponotus* sp. (2) (3)

LEPIDOPTERA

Arctiidae (Fig. 16).

16. *Pseudosphex noverca* Schaus (4)**Comments.** This is the first record of this species in Buenos Aires province.

Danaiidae

31. *Danaus erippus* (Cramer) (3) (Figs. 7,8). j. monarch larvae (2)**Comments.** Probably like the previous species. On *Araujia hortorum* and *A. angustifolia*.

Hesperiidae

32. *Pyrgus* sp. (2)



Figs. 2-12. 2. Adult and larvae of *E. sculpta* (Coreidae, Hemiptera) on fruit of *A. hortorum*. 3. Eggs of *Eubule sculpta* (Coreidae, Hemiptera) on stem of *A. odorata*. 4. Adult of *Oncopeltus bergianus* (Lygaeidae, Hemiptera) on leaf of *A. hortorum*. 5. Adult and nymphs of *Oncopeltus unifasciatellus* (Lygaeidae, Hemiptera) on fruit of *A. hortorum*. 6. Adult of *Lygaeus alboornatus* (Lygaeidae, Hemiptera) on leaf of *A. brachystephana*. 7. Egg of *Danaus erippus* (Danidae, Lepidoptera) on leaf of *A. odorata*. 8. Nymph of *D. erippus* (Danidae, Lepidoptera) on flower of *A. odorata*. 9. *Araecerus fasciculatus* (Anthribidae, Coleoptera) on *A. sericifera*. 10. *Aphis nerii* (Aphidae, Hemiptera) on leaf of *A. hortorum*. 11. *Ceresa uruguayensis* (Membracidae, Hemiptera) on stem of *A. odorata*. 12. Larvae of Tephritidae (Diptera) on fruits of *A. sericifera*.

Noctuidae

33. *Helicoverpa zea* (Boddie) (2)

34. *Rachiplusia nu* (Genée) (2)

Sphynngidae

35. *Erinnus ello* (L.) (3)

36. *Erinnus lassauxi* (Boisduval) (3)

37. *Erinnus obscura* (F.) (3) k. Unidentified butterfly (2)

Comments. Without any taxonomic specifications. On *Araujia hortorum*.

tions. On *Araujia hortorum*.

eruciform larvae (2)

Comments. Without any taxonomic specifications. On *Araujia hortorum*.

ORTHOPTERA

Proscopiidae

38. sp. (2)

PSOCOPTERA

Psocidae

39. sp. (2)

Ectopsocidae

17. *Ectopsocus (brisoqi group) prob. californicus* (Banks) (4)

THYSANOPTERA

40. sp. (2) (3)

Additional informationList of parasites and predators recorded on *Araujia* species in Argentina.

COLEOPTERA

Carabidae

Lebia securigera Chaudoir (3)

Coccinellidae

Adalia bipunctata* L. (4)**Azya luteipes* Mulsant (4)***Coccinella ancoralis* (Germain) (2) (3) (4)***Cycloneda sanguinea* L. (4)***Harmonia axyridis* (Pallas) (3)

Staphilinidae

Sp. (3)

HEMIPTERA

HETEROPTERA

Pentatomidae

***Podisus aenescens* (Stål) (4)**

Reduviidae

***Zelus leucogrammus* (Perty) (4)**

HYMENOPTERA

Mutillidae

Sp. (2)

Serie Parasítica (hosts: aphids, mealybugs, coleoptera larvae)

Sp. (2)

Pompilidae

Sp. (2)

CONCLUSIONS

Results of the 2004-2008 survey

Fifty seven species of phytophagous insects were recorded on the nine species studied of *Araujia*, and some other Asclepiadoideae, of which 46 were identified to species level and eight to the genus. Another 12 unidentified morphotypes cited in Villamil *et al.* (2005) were also included with brief comments.

Parasitic and predator species found on these plants during 2005-2008 were also surveyed and commented on briefly.

Of the total of 57 phytophagous species studied it is concluded that:

The following 24 species are not very important as they are polyphytophagous: *Trycorynus subrutiliceps*, *Acanthoderes jaspidea*, *Eupogonius petulans*, *Hyperplatys argentinus*, *Urgleptes mancus*, *Chlamisus hispidulus hispidulus*, *Cacoscelis melanoptera*, *Astylus atromaculatus*, *Tetraonyx propinquus*, *Acanonicus hahni*, *Anasa guttifera*, *Acromyrmex sp.*, *Pyrgus sp.*, *Helicoverpa zea*, *Rachiplusia nu*, *Erinnus ello*, Psocidae sp., Proscopidae sp., ***Araecerus fasciculatus***, ***Epitragus mucidus***, ***Phthia picta***, ***Lygaeus alboornatus***, ***Nezara viridula***, ***Ectopsocus prob. californicus***.

The following 17 species should be studied further to evaluate their potential as biological control agents: ***Tetyra poecila***, *Eupromerella propinqua* and *Rhyssomatus pilosipes* (for to be monospecific with *Araujia odorata*); *Neocorus ibidionoides*, ***Asynonychus cervinus*** and *Erinnus obscura* (for their specificity with Asclepiadoideae); *Araptus pubescens*, *Toxotrypana australis* and *Erinnus lassauxi* (for their specificity with *Araujia odorata* and *A. brachystephana*), *Camponotus sp.* (important as a symbiont with *Pseudococcus sp.*); ***Naupactus spp. 1, 2, 3, 4***, ***Edessa sp.***, ***Tomoplagia fiebrigi*** and several species of THYSANOPTERA.

The final 16 species appear to be very important for future study on biological control: *Oncopeltus bergianus*, *Rhyssomatus diversicollis*, *Colaspis argentinensis*, ***Colaspis porosa***, *Araptus araujiae* and ***Pseudosphex noverca*** (for their specificity with *Araujia, sensu antico*); *Oncopeltus unifasciatellus*, *Eubule sculpta*, *Eubule glyphica* and *Danaus erippus* (for being restricted to *Araujia, sensu novo*); ***Ceresa uruguayensis*** (for being restricted to *Morrenia, sensu antico*); *Aphis nerii*, *Aphis gossypii*, *Myzus persicae*, *Saissetia oleae*, *Pseudococcus sp.* (These are polyphytophagous but their populations and damage caused to the plants studied are very important, as well as their capacity as virus vectors).

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Table 2. Characteristics and potentialities of herbivorous insect populations found on different species of *Araujia*. Definitions of frequency categories according to Winks et al. (2004): **rare**: fewer than five individuals collected in total. **occasional**: a total of 5-24 individuals collected, **or** present at fewer than five sites. **common**: 25 or more specimens collected **and** present at five or more sites. **abundant**: more than 200 individuals collected **and** present at 10 or more sites. These data may be relative because damage caused by, for example, 10 larvae of *Rhyssomatus*, is greater than damage caused by 500 *Aphis nerii*. Different feeding habits according to Winks et al. (2004): **Foliage feeders**. **Flower/Fruit feeders**. **Sap feeders**. **Stem borers**. **Bosq (1937), Bosq (1940), Bosq (1943), Cordo et al. (2004)**: Refers to added information found in the bibliography. **rare?**: supposition based on previous knowledge of the group. **??**: unknown. Comments: Potentiality as a Biological Control Agent for Moth Plant.

Species number	Collecting site	Frequency	Feeding habits	Comments
1	-	common?	Stem borers (Bosq, 1943)	Polyphytophagous.
1	31	occasional	Bark's fruits feeders	Polyphytophagous.
2	-	rare?	Stem borers?	Polyphytophagous.
3	-	rare?	Stem borers (Bosq, 1943)	Polyphytophagous.
4	-	rare?	Stem borers?	Need to be studied. May be important due to its specificity (on <i>A. odorata</i>).
5	-	rare?	Stem borers?	Polyphytophagous.
6	-	rare?	Stem borers?	Need to be studied. May be important. Restricted to some Asclepiadoideae.
7	-	rare?	Stem borers (Bosq, 1943)	Polyphytophagous.
8	-	??	Foliage feeders?	Polyphytophagous.
9	04, 06, 07, 32	occasional	Foliage feeders	Important. Restricted to <i>Araujia (sensu antio)</i>
2	17	occasional	Foliage feeders	Need to be studied. May be important.
10	-	??	Foliage feeders?	Polyphytophagous.
11	03, 05, 34	common	Fruit feeders	Very important. Restricted to <i>Araujia (sensu antio)</i> .
12	34	common	Fruit feeders (Bosq, 1943)	Could be important. Restricted to <i>Morrenia (sensu antio)</i> .
3	06	common	Foliage feeders	Polyphytophagous.
4	06	rare	Foliage feeders	Only one specimen. May be occasional.
5	22	rare	Foliage feeders	Only one specimen. May be occasional.
6	23	rare	Foliage feeders	Only one specimen. May be occasional.
7	35	rare	Foliage feeders	Only one specimen. May be occasional.
13	04, 06, 07	occasional	Fruit feeders	Very important. Restricted to <i>Araujia (sensu antio)</i> .
14	-	occasional?	Fruit feeders (Bosq, 1943)	Could be important. Restricted to <i>Araujia odorata</i> .
15	19, 28	common	Flower / fruit feeders (Bosq, 1943)	Polyphytophagous.
16	-	??	Flower feeders?	Polyphytophagous.
8	23	rare	Flower feeders?	Only one specimen. May be occasional.
9	41	rare	Fruit feeder	Could be important.
17	-	??	Fruit feeders?	Need to be studied. May be important due to its specificity.
18	22	rare	Sap feeders	Polyphytophagous.
19	-	common?	Sap feeders	Polyphytophagous.
20	14 26	common	Sap feeders	Very important. Restricted to <i>Araujia</i> species.
21	07, 21, 23, 28, 29, 17, 30, 36, 27	common	Sap feeders	Very important. Restricted to <i>Araujia</i> species.
10	20	rare	Sap feeders	Polyphytophagous.
11	21, 28	rare	Sap feeders	Polyphytophagous.
22	15, 16, 20, 24, 17, 18, 30, 37, 38	common	Sap feeders	Very important. Restricted to <i>Araujia</i> species.
23	01, 02, 07, 16, 39, 40, 41, 42	common	Sap feeders	Very important. Restricted to <i>Araujia (sensu antio)</i> .
12	22	rare	Sap feeders	A single specimen. Polyphytophagous.
13	31	rare	Sap feeders	A single specimen. Polyphytophagous.
14	27	rare	Sap feeders	A single specimen. Polyphytophagous.
24	06, 07, 11, 12, 43	abundant	Sap feeders	Polyphytophagous but very important as a virus vector.
25	11, 43	common	Sap feeders	IDEM <i>A. nerii</i> but with less important populations.
26	-	common?	Sap feeders	IDEM <i>A. nerii</i> but with less important populations.
27	11, 43	common	Sap feeders	IDEM <i>A. nerii</i> but with less important populations.
28	08, 10, 11	abundant	Sap feeders	IDEM <i>A. nerii</i> . With important populations.

Table 2. Cont.

Species number	Collecting site	Frequency	Feeding habits	Comments
15	27	occasional	Sap feeders	Need to be studied. May be important.
29	-	abundant?	Foliage feeders	Polyphytophagous.
30	06	abundant	See comments	Many species of this genus, and also other ants, are symbionts of mealy bugs.
16	06	common	Foliage feeders	Need to be studied. May be important due to its specificity.
31	09	occasional	Foliage feeders	Very important. Restricted to <i>Araujia</i> species.
32	-	??	??	Polyphytophagous.
33	-	??	??	Polyphytophagous.
34	-	??	??	Polyphytophagous.
35	-	??	Foliage feeders?	Polyphytophagous.
36	-	??	Foliage feeders?	Need to be studied. May be important due to its specificity.
37	-	??	Foliage feeders?	Need to be studied. May be important as restricted to some Asclepiadoideae.
38	-	??	Foliage feeders	Need to be studied. There are no records of species of this family in the genera studied.
39	-	occasional?	Sap feeders	Need to be studied. There are no records of species of this family in the genera studied.
17	43	common	Foliage feeders	Polyphytophagous.
40	15	rare	Flower feeders?	Need to be studied. There are no records of species of this family in the genera studied.

Table 3. Comments on parasite and predator populations found on different species of *Araujia*. Note: Frequency: see previous table. (23): Collecting site.

Taxon	Common name	Frequency	Comments
<i>Lebia securigera</i> .	Ground beetles	Rare (23)	On <i>Araujia hortorum</i>
<i>Adalia bipunctata</i>	Ladybirds	Rare (DLC)	On <i>Araujia odorata</i>
<i>Azya luteipes</i>	Ladybirds	Occasional (GON)	On <i>Araujia hortorum</i> Predating <i>Aphis nerii</i> on
<i>Coccinella ancoralis</i>	Ladybirds	Common (6, 8, 22, 23, 193, 196, FRIG. SUR)	<i>Araujia odorata</i> , <i>A. hortorum</i> , <i>A. angustifolia</i> and <i>Funastrum gracile</i>
<i>Harmonia axyridis</i>	Ladybirds	Occasional (21)	On <i>Araujia hortorum</i>
<i>Cycloneda sanguinea</i>	Ladybirds	Common (20)	On <i>Araujia angustifolia</i>
Staphilinidae	Rove beetles	Rare (IV)	On <i>Araujia hortorum</i>
<i>Podisus aenescens</i>	Spined soldier bug	Rare (208, 8M)	On <i>Philibertia latiflora</i> and <i>Araujia sericifera</i>
<i>Zelus leucogrammus</i>	Assassin bug	Rare (197)	On <i>Philibertia latiflora</i>
Mutillidae	Ant Wasps	rare	On <i>Araujia odorata</i>
Serie Parasítica	Parasitic wasps	rare?	On <i>Araujia hortorum</i>
Pompilidae	Wasps	rare	On <i>Araujia odorata</i>

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