**Dorynota cornigera** (Bohemian, 1854) and **Paranota ensifera** (Bohemian, 1854) (Coleoptera: Chrysomelidae: Cassidinae) arrived in the Buenos Aires and Entre Ríos provinces (Argentina) in the second half of 20th century; with a critical revision, corrections and new records of the host plants of the Dorynotini

Paola Turienzo & Osvaldo Di Iorio

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**Introduction**

The tribe Dorynotini (Coleoptera: Chrysomelidae: Cassidinae) is represented in Argentina by 2 genera and a total of 8 species (Monrós & Viana, 1949; Simões, 2014; Simões & Sekerka, 2015), distributed in the north of the country, reaching its southernmost limit in the province of Corrientes (Table I; fig. 1). In late September 2011, during the study of pollinating insects in cultivated “lapacho rosado” trees (Bigonia sp.), student call the attention about larvae and a single adult beetle that were feeding on the leaves of the trees (fig. 2). The examination of more adults probed to be one species of Dorynotini, that was never mentioned or seen before in Buenos Aires province. Therefore, the probable causes of this enlargement of the original geographic distribution are presented and discussed, together with another species found in Entre Ríos province (Ríos de Salusso, 2005). New records of localities and host plants in the new colonized areas are also given.

**Materials and methods**

The nomenclature of the species in Dorynotini was updated from Borowiec & Świętojańska (2014), Simões (2014) and Simões & Sekerka (2015). A complete list of citations of the species in this tribe may be consulted in Monró & Viana (1949), Simões (2014) and Simões & Sekerka (2015). The tribe Dorynotini is used here according to Chaboo (2007).
Table I. Species of Dorynotini (Coleoptera: Chrysomelidae) by Argentinian provinces (based on Monrós, 1949; Monrós & Viana, 1949; Simões, 2014, and Simões & Sekerka, 2015). See abbreviations of Argentinian provinces in materials and methods. X, mentioned in literature; N, new record (material examined), remarked in grey color.

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<th>Eastern</th>
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<td>Paranota spinosa</td>
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</table>

spp. per province - 2 - 1 - 2 - 3 2 - 1 8 3 2 - 1
spp. per region 2 1 5 8

Collections mentioned in materials examined
ODIC. Osvaldo Di Iorio collection, Buenos Aires, Argentina.
PTBA. Paola Turienzo collection, Buenos Aires, Argentina (currently ODIC).

Abbreviations of Argentinian provinces used in table and map
BA, Buenos Aires; Ca, Catamarca; Ch, Córdoba; Ch, Chaco; Co, Corrientes; ER, Entre Ríos; Fo, Formosa; Ju, Jujuy; LP, La Pampa; LR, La Rioja; Me, Mendoza; Mi, Misiones; Ne, Neuquén; RN, Río Negro; Sa, Salta; SF, Santa Fe; SE, Santiago del Estero; SL, San Luis; SJ, San Juan; Tu, Tucumán.

Authors, old combinations, synonymies of the Bignoniaceae plants mentioned in the literature and the text
- Tabebuia aurea (Silva Manso) Benth. & Hook, ex Moore = Tecoma argentea Bureau et Schum. (Buchinger, 1960), = Tabebuia caruia (Mart.) Bureau (Zuloaga & Morrone, 1999)
- Tabebuia impetiginosa (Mart. ex DC.) Standl., = Tecoma ipe, auct., = Tecoma ipe var. integra (Sprague) Sandw. (Buchinger, 1960), = Tabebuia avellanedae Lor. ex Gri-seb. (Zuloaga & Morrone, 1999)
- Tabebuia lapacho (Schunk.) Sandw., = Tecoma ochracea, auct., non Cham. (Buchinger, 1960)
- Tabebuia ochracea (Cham.) Carmel., = Tecoma ochracea Cham.
- Tabebuia pulcherrima Sandw., = Tecoma ochracea, auct., non Cham. (Buchinger, 1960; Zuloaga & Morrone, 1999), = Tecoma aurea, auct., non (Silva Manso) Benth. & Hook. ex Moore (Zuloaga & Morrone, 1999)

Results
Dorynotaria corniger a (Boheman, 1854)
Figs. 1 (distribution), 2 (host damage).


Material examined and host plants: ARGENTINA: Capital Federal: Ciudad Universitaria, 26-IX-2011, 1 ex. [PTBA], Di Iorio leg., 20-XI-2011, 5 larvae fixed [PTBA], 7-XII-2011, 12 ex. [PTBA], 12-XII-2011, 3 ex. [PTBA], 16-XII-2011, 4 ex. [PTBA], 17-XII-2011, 3 ex. [PTBA], 7-I-2012, 2 ex. [PTBA], 11-I-2012, 2 ex. [DIOC], 17-XII-2012, 21 ex. [PTBA], all feeding on leaves of “lapacho rosado” (Tabebuia impetiginosa) (fig. 2).

Paranota ensifera (Boheman, 1854)
Fig. 1 (distribution).


Discussion

Known geographic distributions of Dorynotini in Argentina

Until 1949, *D. cornigera* was given as distributed in Salta, and Chaco (Monrós & Viana, 1949). Borowiec (2002, 2009) gives again Salta and Chaco, and added Entre Ríos, one specimen captured in 1989. During 2011, *D. cornigera* was found for the first time in the city of Buenos Aires (fig. 1).

Similarly, *P. ensifera* was given only from Salta, Misiones, Chaco, and Corrientes (Bruch, 1915; Monrós & Viana, 1949), and the same provinces were summarized by Borowiec (2002, 2009) and Simões (2014). In 1978, *P. ensifera* was seen for the first time in Entre Ríos (Paraná) (fig. 1), and later (1994) it was observed again in Crespo, 40 km southwards from Paraná (Ríos de Saluso, 2005).

In addition, Simões & Sekerka (2015) recorded *Dorynota monoceros* (Germar, 1824) in Paysandú (Uruguay), that may be another case of recent dispersal towards the south.

Host plants of Dorynotini in Argentina and adjacent countries

The species of Dorynotini feed on more than one species of the genus *Tabebuia* (= *Tecoma*, in part) (Bignoniaceae) (Appendix), with two probably accidental records on Lecythidaceae in Brazil (Jolivet, 1988). Thus they can be considered as monophagous insects of second order, i.e., on several plants of a similar section in a single genus (Jolivet, 1992), if the records of Lecythidaceae from Brazil are really accidental or product of erroneous observations. Nevertheless, plant species, countries and previous references were erroneously attributed to some insect-host associations of species of Dorynotini in compilations from Brazil and Argentina (Table II).

Fiebrig (1910), director of the Botanical Garden of Paraguay, gave a single host record for each of three species in the tribe present in Paraguay (Table II; Appendix). Regrettably, the localities of these records were not given, but Fiebrig collected materials in San Bernardino, where he have a property, and in Trinidad, where the Botanical Garden was located.
(Di Iorio 2004b). Later, these three records were compiled by Costa Lima (1936) because the insects and the plants were present in Brazil, but clearly stating that the original records were originated in Paraguay (Table II). Bosq (1934) gives D. monoceros as affecting Ipomoea sp., obviously an erroneous observation (catalogued by Roig-Juñent, 2004), that was not repeated by Bosq himself in his posterior catalogue of 1943. The first correct host of a Dorynotini in Argentina was given by Bosq (1943) (Table II; Appendix). Several specimens of P. ensifera affecting the leaves of "lapacho" in Salta (Cerro San Bernardo) during February 1944, and D. viridisignata on Tecoma sp. (probably from Formosa) were given by Monrós & Viana (1949) (Table II; Appendix). According to Buchinger (1960), the species of "lapacho" present in Cerro San Bernardo corresponds to T. impetiginosa (given as Tabebuia avellanedae).

Several specimens of D. cornigera were also captured by Monrós in the same locality (Cerro San Bernardo), date and year than P. ensifera, but no host plant was indicated (Monrós & Viana, 1949). Therefore, D. cornigera has no mention of a host in Argentina, nor in adjacent countries (Table II; Appendix), and the first known host in Argentina is presented here (material examined).

Erroneous host records in literature beginning with Costa Lima (1955), who stated that "on ipedes (Tecoma spp., T. argentea, T. ipe etc.), in Brazil and Paraguay (obs. of Fiebrig) live various species of Dorynota Chevrolat (= Batonota Hope); D. ensifera (Bohemian, 1854), D. monoceros (German, 1824), D. pugionata (Germ., 1824), D. spinosa (Boh., 1854)" [translated from Portuguese]. This paragraph can be interpreted in varied manners, one of them as in Table II, but it was interpreted in another manner for each species of Dorynotini by Silva et al. (1968) (Table II), that also added two new original records from Brazil (Appendix).

Roig-Juñent (2004) erroneously attributed two hosts in Argentina to Monrós & Viana (1949), one of them correctly mentioned from Paraguay by Monrós & Viana (1949) based of Fiebrig (1910) (Table II). Thus all host plants of Dorynotini in Argentina compiled by Roig-Juñent (2004a) are erroneous records because they were produced outside Argentina (Appendix). Furthermore, the single original records of host plants of Dorynotini in Argentina given by Bosq (1943) and Monrós & Viana (1949) were not known to Roig-Juñent (2004).

As a result of the taxonomic history of the species of Tabebuia, most host records of Dorynotini previously given in literature (Table II; Appendix) needs a further corroboration. For example, the original record of Tecoma ochracea by Fiebrig (1910) may be the true T. ochracea, or misidentifications of Tabebuia lapacho or Tabebuia pulcherrima (see in materials and methods the synonymies and misidentifications of the plant species in Bignoniaceae).

Larvae and adults identified as P. ensifera in Entre Ríos were seen for the first time in 1978 affecting the leaves of cultivated trees of T. impetiginosa in Paraná, and later (1994) it was observed in Crespo on the same plant (Rios de Saluso, 2005). The same situation occurred with D. cornigera in the city of Buenos Aires (material examined).

Regarding the distribution records of Dorynotini (Table I), its hosts (Table II), and the species of Tabebuia present in Argentina and adjacent countries (Table III), new host records are expected in the corresponding provinces where both insects and plants are naturally present, but also outside of its natural ranges, i.e., in places where these trees are cultivated as ornamentals, as happened in Entre Rios and Buenos Aires provinces (Fig. 1).

**Life cycle of Dorynota cornigera in Argentina**

The first adult of D. cornigera appeared on the plants in late September (early Spring), but the overwintering stage and place are unknown. Full grown larvae are found in November and during summer, feeding on all tissues of the leaves except the major ribs, skeletonizing them (fig. 2). The pupae are located in the underside of the leaves, petioles, branches and even in the bole of the tree, resembling a bird dropping by its coloration. The peak of adults was observed in December, but it is not known if this leaf-beetle has more than one generation per year.

**Expansion of some insects in Argentina in relation to its host plants and favorable weather conditions**

A number of insects from Argentina enlarged their original geographic distributions after middle of XX century. Some species of Cerambycidae (Coleoptera) followed a recent historical dispersal from north to south Argentina, sometimes on
native host plants cultivated outside its natural ranges or on cultivated exotic plants phylogenetically related to native hosts, i.e. in the same plant family (Di Iorio, 1993, 1995, 1998; Di Iorio & Farina, 2009). Another cerambycid species expanded its original distribution in Chile to southern Argentina on a native cultivated host, but also adopting a new exotic cultivated host (Turienzo & Di Iorio, 2014). The more extreme case is one species of Cerambycidae originally from Brazil and Misiones, without known native hosts, and that in Buenos Aires all known hosts in the country are exotics (Di Iorio, 2004a). Thus, both kind of plants play a crucial role in the colonization of new areas by native phytophagous insects, widening its original geographic distributions by antrropic environmental modifications.

The new records of both leaf-beetles for the provinces of Entre Ríos and Buenos Aires (Table I) are due first to the cultivation of the native “lapacho rosa” (*T. impetiginosa*) as an ornamental tree, outside its natural distribution (Buchinger, 1960; Zuloaga & Morrone, 1999), but by the other side, these new areas were also colonized by both leaf-beetles due to favorable weather conditions, particularly by the less rigorous winters occurring year by year, that would be related to the effect of the climatic change in the Southern Hemisphere.

Finally, this relationship between the expansion of the original geographic distributions of some insects and the evident climatic change in the southern hemisphere is a long progressive process that can be better documented thanks to three items provided here: 1) historical geographic data in literature (taxonomic literature must be preferred in order to avoid erroneous identifications); 2) a series of well dated specimens examined in different collections covering consecutive time periods, and 3) a deep knowledge of the insect distributions by local entomologists that can help also in the detection of erroneous records, and accordingly, the variations of the geographic distributions along the time.

### Acknowledgements

To anonymous referees by their suggestions and comments improving the text.

### References


### Table III. Species of *Tabebuia* (Bignoniaceae) by Argentinian provinces and adjacent countries.

See abbreviations of Argentinian provinces in materials and methods. D. dubious record (mentioned by Buchinger 1960); Cu, cultivated as ornamental trees (new records). Shaded cells in grey color indicate the species and the country and provinces in which the plants were recorded as hosts of Dorynotini (Coleoptera: Chrysomelidae: Cassidinae).

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<td>Sa</td>
<td>Tu</td>
<td>Ca</td>
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<td>T. caraiba (= T. argentea)</td>
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<td>Plant species (Tabebuia sp.)</td>
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</table>
Appendix

Correct records of host plants of Dorynotini from Argentina and adjacent countries. For erroneous hosts, countries, and previous references erroneously attributed see the notes below each insect species and Table II.

### Dorynota bellicosa Boheman, 1854
- **“ipê do brejo”**
  - **BRAZIL:** São Paulo: Lorena, A. Azevedo pers. obs., adults feeding leaves (Silva et al. 1968).

### Dorynota bidens (Fabricius, 1781)
- **Tecoma spp.**
  - **BRAZIL:** Rio de Janeiro: São Bento, A. Silva pers. obs., adults feeding leaves (Silva et al. 1968).

### Dorynota monoceros (Germar, 1824)
- **Tecoma impetiginosa**
  - **PARAGUAY:** [prob. San Bernardino or Trinidad] (Fiebrig 1910); (Costa Lima 1936); (Silva et al. 1968).
  - **NOTE:** Silva et al. (1968) erroneously attributed Tecoma spp., and *T. argentea* for *D. monoceros*, given by Costa Lima (1955).

### Dorynota parallela Blanchard, [1837]
- **Tabebuia speciosa (“ipê amarelo”)**
  - **BRAZIL:** Bahía (Marques et al. 2006).

### Dorynota pugionota (Germar, 1824)
- **Lecythis sp. (“sapucaia”)**
  - **BRAZIL:** Monlevade, Ferreira pers. obs. (Silva et al. 1968); dubious record.
- **Tabebuia heptaphylla**
  - **BRAZIL:** Rio de Janeiro: J. Simões pers. obs. (Costa Lima 1936); (Silva et al. 1968).
- **Tabebuia obtusata**
  - **BRAZIL:** (Velloso et al. 1953; Silva et al. 1968).
  - **Tecoma sp.**
  - **ARGENTINA:** locality not stated, prob. Misiones (Bosq 1943).
  - **NOTE:** Tecoma argentea, attributed to *D. pugionota*, was mentioned by Costa Lima (1955) in a general manner, later erroneously compiled by Silva et al. (1968) (Table II).

### Dorynota viridisignata (Boheman, 1854)
- **Tecoma sp.**
  - **[prob. ARGENTINA]: Formosa: Riacho Pilagá, Estancia Guaycolec, IX-1948, A. Martinez leg., Col. Monrós; on leaves of “lapacho” (Monrós & Viana 1949).**

### Paranota ensifera (Boheman, 1854)
- **Tabebuia avellanedae**
  - **“lapacho”: Monrós & Viana 1949.**
  - **ARGENTINA:** Salta: Cerro San Bernardo, larvae and adults feeding on leaves of “lapacho” (Monrós & Viana 1949).
- **Tabebuia ochracea**
  - **PARAGUAY:** [prob. San Bernardino or Trinidad] (Fiebrig 1910); (Costa Lima 1936); (Silva et al. 1968).
  - **NOTE 1:** Monrós & Viana (1949) never mentioned *T. argentea, T. ipe* and *T. ochracea* as host plants of this species (Table II). Thus, the records of these three plants given by Roig-Juñent (2004), based on Monrós & Viana (1949), are erroneous.
  - **NOTE 2:** Tecoma argentea and Tecoma ipe were erroneously attributed to *P. ensifera* by Costa Lima (1955), and compiled by Silva et al. (1968) (Table II).
  - **NOTE 3:** Tecoma ochracea may be the true Tabebuia ochracea, or misidentifications of Tabebuia lapacho or Tabebuia pulcherrima.

### Paranota spinosa (Boheman, 1854)
- **Lecythis sp. (“sapucaia”)**
  - **BRAZIL:** Monlevade, Ferreira pers. obs. (Silva et al. 1968); dubious record.
- **Tabebuia aurea**
  - **Tecoma argentea:** Fiebrig 1910; Costa Lima 1936; Monrós & Viana 1949; Silva et al. 1968.
- **Tabebuia caraiba:** Roig-Juñent 2004 (not in Argentina)
  - **PARAGUAY:** [prob. San Bernardino or Trinidad] (Fiebrig 1910); (Costa Lima 1936); (Monrós & Viana 1949); (Silva et al. 1968).
- **Tabebuia obtusata**
  - **BRAZIL:** (Velloso et al. 1953; Silva et al. 1968).
  - **NOTE 1:** Tecoma ipe and Tecoma sp. were erroneously attributed to *P. ensifera* by Costa Lima (1955), and compiled by Silva et al. (1968) (Table II).
  - **NOTE 2:** Tabebuia caraiba (= Tecoma argentea) was erroneously given as a host plant in Argentina by Roig-Juñent (2004).