

New phenotypes of the introduced *Callidiellum rufipenne* (Motschulsky, 1860) (Coleoptera: Cerambycidae: Cerambycinae) in Argentina

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Taxonomy, new phenotypes, Coleoptera, Cerambycidae, Cerambycinae, *Callidiellum rufipenne*, Argentina

Abstract. *Callidiellum rufipenne* (Motschulsky, 1860) (Coleoptera: Cerambycidae) is naturally distributed in Asia but it was introduced into China, Korea, Russia, New Zealand, Italy, Spain, France, Croatia, Bosnia Herzegovina, Slovenia, United States of America, Canada, Denmark, Belgium, Iran, New Caledonia and Argentina. This species presents chromatic dimorphism: the males have elytra with an indefinite purple-green iridescent dark colour, while the females have a reddish colour on the elytra. New phenotypes hitherto undescribed in both sexes are presented and illustrated.

INTRODUCTION

Callidiellum rufipenne (Motschulsky, 1860) is naturally distributed in China, Japan, Riukiu Islands, Korea and Saghalien (Gressitt 1951, Švácha & Danilevsky 1987). It was introduced into Taiwan, New Zealand, Italy, Spain (Campadelli & Sama 1988, 1989, Aphis 1999), United States of America (Maier & Lemmon 2000; European Plant Protection Organization 2003, Maier 2007) and Argentina (Di Iorio 2004, Turienzo 2006, 2007). Recently in Bosnia Herzegovina, Slovenia, Iran, New Caledonia (Tavakilian & Chevillotte 2020) and Belgium (Đukić & Rapuzzi 2020, Verbeelen, 2006, Drumont et al. 2014).

The presence of *Callidiellum rufipenne* in United States is up to now known in five northeastern states: Massachusetts, Rhode Island, Connecticut, New York and New Jersey, emerged from live or dead wood of four genera and eight species of Cupressaceae (Maier 2007). In South America, it is only registered in four counties from Buenos Aires province: Berazategui, General Pueyrredón, Mar Chiquita and Pilar, emerged from dead wood of only one species of Cupressaceae (Turienzo 2007). This last author discusses other hosts plants following the phylogenetic relationships of plants and localities given in the literature. Maier (2007) mentioned that Pinaceae are not hosts in U.S.A., meanwhile Turienzo (2007) mentioned that hosts in the genera *Abies* and *Pinus* needs a further corroboration. Recorded larval host of *C. rufipenne* was doing simultaneously and complemented by Maier (2007) and Turienzo (2007) with the phenology of this insect in both hemispheres. Emergence data were given from Japan (Shibata 1994), China (Linsley Gressitt 1951), United States (Maier, 2008) and Argentina (Turienzo 2007) noted that is univoltine in both hemispheres (Shibata 1994; Maier & Lemmon 2000, Turienzo 2007).

C. rufipenne presents sexual dimorphism, the males have longer antennae than the females (usual character in the family), but also chromatic dimorphism. Males have the elytra with an indefinite purple-green iridescent dark colour, and a small spot of orange colour in the humeri, while the females have the elytra of a reddish colour. Both sexes are widely illustrated in the numerous pest alerts that appear in several webpages and in some works (Campadelli & Sama 1988, 1989, Aphis 1999, Maier & Lemmon 2000). In males two varieties were described: var. *bicolatum* Pic, with the elytra a strongly metallic violaceous or blue-violet colour and reddish humeri, and the var. *metallipenne* Pic with elytra of uniform green-bluish metallic colour or with violet dull.

According to Campadelli & Sama (1988) adults emerged in Italy have the typical coloration as those described above. When reared specimens from Argentina were sexed (Turienzo 2007), it was noted that some males and some females present an unusual coloration that was not previously described. These new phenotypes are described here and illustrated by first time.

MATERIAL AND METHODS

Reared material from *Cupressus macrocarpa* (Cupressaceae) were obtained from localities in the province of Buenos Aires, Argentina (Turienzo 2007). Specimens are deposited in the collection Osvaldo Di Iorio (ODI) (Di Iorio 2005), who identified the species.

RESULTS AND DISCUSSION

Four different phenotypes can be distinguished in each sex. Among males, the following phenotypes were observed:

- 1) Body entirely black; orange abdominal ventrites; elytra with indefinite purple-green iridescent dark colour (= var. *metallipenne* Pic).
- 2) Same as above except orange spots on the humeri. (Fig. 1) (= var. *bicolatum* Pic).
- 3) Same as 2, except orange colour darkened, somewhat reddish, extended along epipleura and lateral margins. of elytra through elytral apices; purple-green colour confined to center of both elytra, lighter than in phenotypes 1 and 2 and somewhat reddish (Fig. 2).
- 4) Body entirely black; orange abdominal ventrites; elytra of reddish colour, similarly to females (Fig. 3).

Females also present four phenotypes:

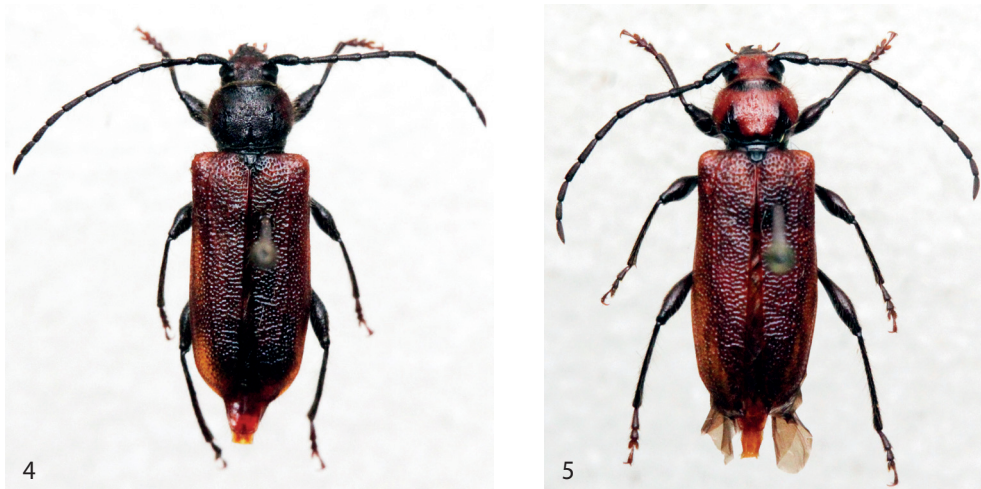
- 1) Body entirely black, with orange abdominal ventrites; elytra of indefinite purple-green iridescent dark color in central area (similarly to the males), somewhat reddish in lateral margins.
- 2) Body entirely black except orange abdominal ventrites and reddish elytra.
- 3) Pronotum black; lateral sides of prothorax reddish (majority of times not seen from above). (Fig. 4)
- 4) Prothorax reddish, with two longitudinal dark bands on pronotum departing from posterior margin without reaching anterior margin (Fig. 5).



Figs. 1-3. Male phenotypes of *Callidiellum rufipenne* from Argentina.

Frequencies of the phenotypes were variable over different years in specimens from a same locality.

The most interesting fact is that colorations that are known in males have appeared in females and *vice versa*. Causes of this phenomenon are unknown, but genetic effects are likely to appear when a small population remains isolated and inbreeding take place. This generally occur with introduced exotic species occurring as small populations.



Figs. 4-5. Female phenotypes of *Callidiellum rufipenne* from Argentina.

In some Cerambycidae beetles reared in captivity, it has been seen that inbreeding show up some unusual colorations, probably due to manifestation of recessive alleles. This situation was observed in some native argentine species: *Achryson surinamum* (Linnaeus, 1767) (Di Iorio 2005: plate 17, figs. 1, 3); *Achryson undulatum* Burmeister, 1865 (Di Iorio 2005: plate 17, figs. 4, 6). In nature, chromatic polymorphism was also observed in *Calocomus desmaresti* (Guérin-Méneville, 1831) (Di Iorio 2005: plate 5, figs. 1-8), females of *Calocomus morosus* White, 1850 (Di Iorio 2005: plate 6, figs. 2, 3), males of *Prionapterus staphilinus* Guérin-Méneville, 1831 (Di Iorio 2005: plate 9, figs. 3-6). Other species that present a really variable polychromatism are those of the genus *Ischionodonta* Chevrolat, 1859 (Di Iorio 2001).

Further studies about *C. rufipenne* in Argentina are needed in order to know what directions will follow this observed phenotypic variability and their relationships with enviromental parameters.

ACKNOWLEDGEMENTS. We are indebted to Gastón Zubarán for the photographs, to Chris Maier for his paper about *C. rufipenne* and UBACYT (Proyect X 828 to O. R. Di Iorio) for support of this project.

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Received: 7.1.2021
 Accepted: 30.5.2021
 Printed: 5.10.2021

