New records of *Moluchia strigata* (Blanchard, 1851) (Blattodea: Ectobiidae) in Mediterranean Matorral, Central Chile

Nuevos registros de *Moluchia strigata* (Blanchard, 1851) (Blattodea: Ectobiidae) en el Matorral Mediterráneo de Chile Central

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Despite of commonly been associated with antrophized habitats, most cockroaches do not overlap with human habitats (Schal *et al*. 1984, Frank & Lounibos 2010, Maekawa & Nalepa 2011). Wild Blattodea have been reported as relevant participants of nutrient cycling and organic matter turnover (Irmer & Furch 1979, Geng & Côté 2002). Moreover, cockroaches are part of several ecological interactions, including pollination (Bell *et al*. 2007, Nagamitsu & Inoue 1997, Momose *et al*. 1998, Vlasáková *et al*. 2008). Therefore, in addition to its zoological and evolutionary relevance, these insects can be used for environmental monitoring and litter quality bioindicators (Gerlach *et al*. 2013).

Native Chilean cockroaches have been seldom studied and information on its distribution is scarce and incomplete (Moroni & Camousseight 1976). Despite of this, there are at least 12 described species belonging to four different genuses: *Eurycotis* Stal 1838, *Ischnoptera* Burmeister 1838*, Phidon* Rehn 1933, *Epilampra* Burmeister 1838 and *Moluchia* (Camousseight 2008, Beccaloni 2015).

To this date there is no updated revision on Chilean native cockroach distribution, nor published studies on their zoology, behavior or ecology. The most recent publications on native Chile cockroaches corresponded exclusively to reviews and records from entomological collections (Camousseight 2008, Moroni & Camousseight 1976). From the available information, there are scattered records for several neotropical genera of Ectobiidae, as *Ischnoptera*, *Lamproblatta* Hebard 1919 y *Neoblattella* Shelford 1911 living in association with native plants; in leaves, under fallen stems and within plant's structures such as bracts and inflorescence buds (Rehn & Hebard 1916, Roth & Willis 1960).

The genus *Moluchia* Rehn, 1933 corresponds to a Neotropical cockroach group (Blattodea) belonging to the family Ectobiidae Brunner von Wattenwyl, 1865 (Beccaloni 2015). To the best of our knowledge, the only key for identifying *Moluchia* species was published by Rehn in 1933, where he used number of flanges per tergite as main diagnosis feature ("tergal specialization") (Fig. 2C). This was associated to a glandular specialization in male dorsal side of abdomen (Rehn 1933). Due to the specificity of this trait, Rehn's key does not allow sorting nymphs or females specimens. Moreover his work does not include the species described by Princis, *M. dahli* and *M. brasiliensis* (Princis 1952, Rehn 1933).

In this note, we report new records for *M. strigata* based on: i. Active collection followed by laboratory rearing and ii. Entomological collection surveying on main national collections. Historical records of *M. strigata* comprehend Arauco, Eastern Island, Valparaíso Province, unspecified exact location of collect (Rehn 1933, Moroni & Camousseight 1976).

During June 2015 we found native cockroach nymphs beneath dead leaves material from *Puya chilensis* (Bromeliaceae) in Córdova Ravine Natural Sanctuary ("Quebrada de Córdova", 33°26'S – 71°39'W) in El Tabo County, San Antonio Province, Valparaíso Region, Chile (Fig. 1). According to the National System of Protected Wild Areas (SNASPE) this ravine is classified among priority sites type III (CONAF 1996). "Quebrada de Córdova" is an east-west direction ravine with sclerophyllous relictual forest (Perez & Villagrán 1985) where is possible find several Chilean Matorral endemic plant species classified as "rare at national level" (CONAF 1989), the climate is Mediterranean with marine influence (Perez & Villagrán 1985).

We made active collection at three points from east to west

the "Quebrada" during June 2015 and captured various immature stages of unidentified *Moluchia* sp. Due to the fact that the only available key is focused on male adults, in order to identify specimens we reared these collected cockroaches under laboratory conditions (12/12 hrs. 20°C and 50% RH) in plastic boxes (660 cc), with leaves of *P. chilensis* feeding on dog food pellet, bee pollen granules (Goldenhills®) and sliced carrots *ad libitum*. Finally, in August 2015 we obtained imagoes, we made identification according to Rehn's key corresponding these cockroaches to *M. strigata* (Figure 2).

During 2014 to August 2015, we made a comprehensive revision of native specimens deposited in main Chilean entomological collections (MCCN, IEUMCE, MEUC, MZUC, CEUTAL and SAG). According to label data from specimens identified as *M. strigata*, we were able to determine the presence of imagoes from; Valparaíso Region: Recreo collected in October 1968, Casablanca found in November 2000 and Maule Region: Vilches Alto trapped in December 1999 and Vichuquén collected in October 1992.

Summarizing, based on evidence gathered from field collection, laboratory rearing and entomological collections survey, we can suggest that *M. strigata* share the same microhabitat with other native cockroach (*Phidon* Rehn 1933 genus). We also found in *P. chilensis* (Bromeliaceae) litter during our field collections. We propose that there must be a strong connection between *Moluchia* cockroaches and Chilean Bromeliaceae species as it is reported for other Chilean cockroach family *Epilampra hualpensis* Uribe 1978 (Blaberidae) (Uribe 1977). Furthermore, several tropical species have been described associated to bromeliads (Bell *et al*. 2007, Frank & Lounibos 2010, Roth & Willis 1960, Rocha e Silva Albuquerque & Lopes 1976). Complementarily, based on the observation of captive *M. strigata* cockroaches feeding on pollen, it is possible to suggest a florivorous role of this neotropical lineage. Furthermore, considering temporal data obtained from specimens of this cockroach species we found in entomological collections. We propose that *M. strigata* phenology follow a similar seasonality as other neotropical cockroach species, meaning: A reproductive peak around early spring (Bell *et al*. 2007), where most native flora is blooming. Therefore, the strength association between these insects and floral resources it is reinforced.

Future work must be developed in order to reveal the extent of this species distribution in central Chile and evaluate if collection localities belongs to a continuum distribution zone between Valparaiso Region to Maule Region (approximately 366 km away) or alternatively *M. strigata* records may correspond to fragmented patches within remaining Mediterranean Matorral, this considering the current impact of habitat homogenization activities in Central Chile such as forestry, agriculture and housing (Andrade & Hidalgo 1996). Furthermore, detailed active collection studies have to be made in order to assess conservation status for this and other Chilean native cockroach species. A couple of specimens collected for this work were deposited in the entomological collection of the Museo Nacional de Historia Natural, Santiago, Chile (MCCN).

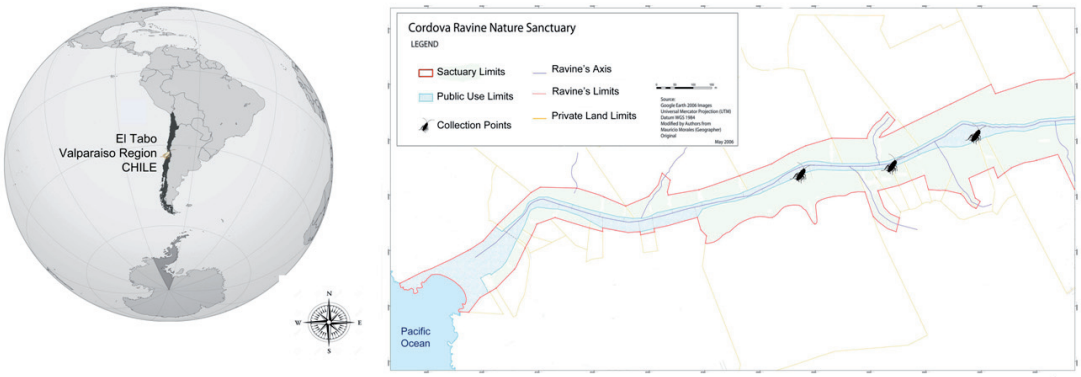

Figure 1. Collection Points Location for *M. strigata* in Quebrada de Córdova Natural Sanctuary. Left side of the panel show globe highlightin El Tabo, Valparaiso Region, Chile. Right side of panel detail collection points along East-West axis of ravine at the field site. Upper left show legend for Natural Sanctuary map.

Figura 1. Ubicación de las colectas de *M. strigata* en Quebrada de Córdova. Lado izquierdo muestra globo terráqueo con detalle de ubicación del sitio de muestreo, lado derecho detalla puntos de colecta en el eje Este-Oeste a lo largo de la quebrada. Legenda del mapa esta ubicada en esquina superior izquierda del mismo.

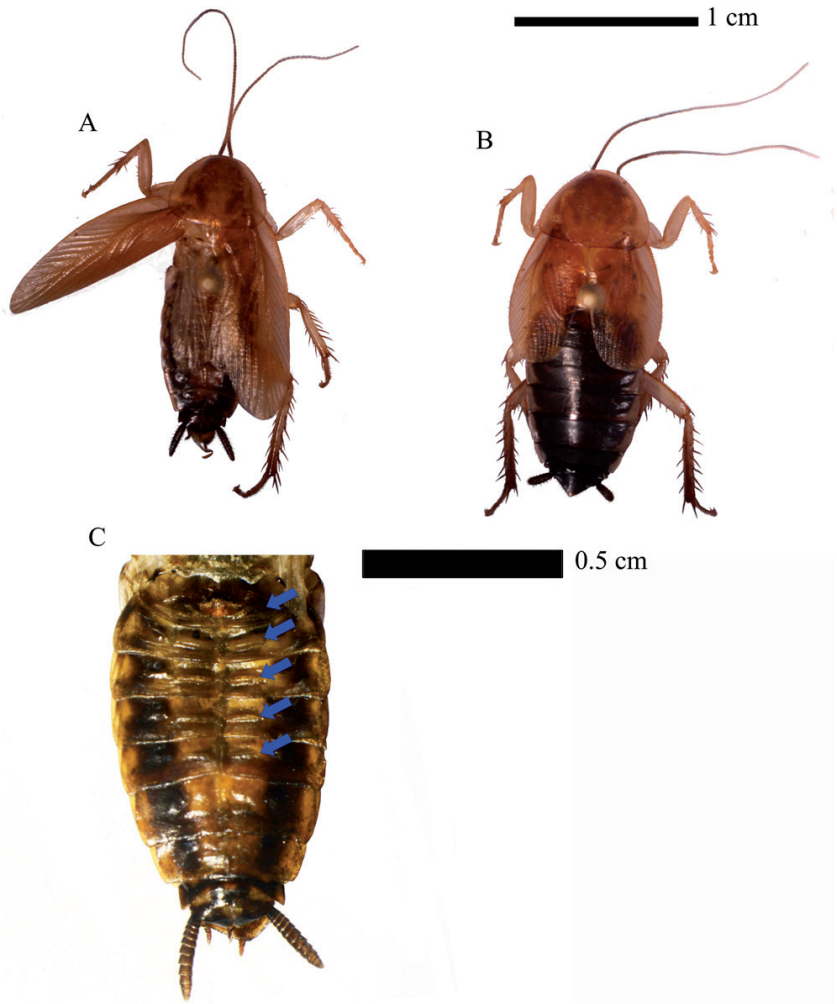

Figure 2. Dorsal views *M. strigata*, (A) correspond to a male and (B) to female adults. 1 cm scale. (C) Detail of male's abdomen (wings removed), tergal specialization is indicated with blue arrows, 0.5 cm scale.

Figure 2. Vistas dorsales de *M. strigata*, (A) macho y (B) hembra. Escala corresponde a 1 cm. (C) Detalle del abdomen del macho (las alas fueron removidas), la especialización tergal está señalada con flechas azules, Escala corresponde a 0,5 cm

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