

## ARTIGO / ARTÍCULO / ARTICLE

### First record of the painted bug *Bagrada hilaris* (Burmeister, 1835) (Heteroptera: Pentatomidae) in South America.

Eduardo I. Faúndez<sup>1,2</sup>, Alfredo Lüer<sup>3</sup>, Álvaro G. Cuevas<sup>4</sup>,  
David A. Rider<sup>1</sup> & Priscila Valdebenito<sup>5</sup>

<sup>1</sup> Entomology Department, North Dakota State University, Dept. 7650, P.O. Box 6050; Fargo, ND (USA).  
e-mail: ed.faundez@gmail.com

<sup>2</sup> Departamento de Zoología Médica, Centro de Estudios en Biodiversidad (CEBCh), Magallanes, 1979, Osorno (CHILE).

<sup>3</sup> Panguilemo 261, Quilicura, Santiago (CHILE).

<sup>4</sup> Universidad Católica de Temuco, Facultad de Recursos Naturales, Escuela de Ciencias Ambientales, Rudecindo Ortega 02950, Edificio Cincuentenario, Campus San Juan Pablo II. Temuco (CHILE).

<sup>5</sup> Departamento de Medio Ambiente, I. Municipalidad de Quilicura, Covadonga 520, Santiago (CHILE).

---

**Abstract:** The painted bug *Bagrada hilaris* (Burmeister, 1835) (Heteroptera: Pentatomidae) is recorded for the first time from South America. Specimens were collected in Quilicura, Metropolitan Region of Chile. The large amounts of observed and collected specimens, as well as the biological observations, suggest that the species is well established. Identification tips are given to identify a species and it is also compared with another Chilean pentatomoids.

**Key words:** Heteroptera, Pentatomidae, *Bagrada hilaris*, new record, invasive species, pest, South America.

**Resumen:** Primer registro de la chinche pintada *Bagrada hilaris* (Burmeister, 1835) (Heteroptera: Pentatomidae) en Sudamérica. Se registra por primera vez en Sudamérica a la chinche pintada *Bagrada hilaris* (Burmeister, 1835) (Heteroptera: Pentatomidae), con ejemplares procedentes de Quilicura en la Región Metropolitana de Chile. La gran cantidad de ejemplares colectados y avistados, junto con observaciones biológicas, sugieren que esta especie se encuentra plenamente establecida. Se proveen detalles para la identificación de la especie y también se compara con otros pentatomoides chilenos.

**Palabras clave:** Heteroptera, Pentatomidae, *Bagrada hilaris*, nuevo registro, especie invasiva, plaga, Sudamérica.

---

**Recibido:** 5 de octubre de 2016  
**Aceptado:** 8 de octubre de 2016

**Publicado on-line:** 11 de octubre de 2016

## Introduction

---

The Pentatomidae is a family of heteropterans currently comprising 4937 species classified in 938 genera (Rider et al., 2016). In South America, many species in this family are well known because of their economic importance (Faúndez & Carvajal, 2011). Members of the subfamily Asopinae are predaceous and considered beneficial in suppressing pest populations; whereas, members of the other subfamilies are primarily phytophages with several species attacking various crops (Schaefer & Panizzi, 2000). The Pentatominae is the largest subfamily of Pentatomidae containing 3475 species classified in 659 genera (Rider et al., 2016). Several pentatomines have a high economic impact because they damage plants commonly consumed by humans (Faúndez & Carvajal, 2016).

The painted bug or bagrada bug, *Bagrada hilaris* (Burmeister, 1835) (Figs. 1, 2, 5) is a member of the Pentatominae and, more specifically, of the tribe Strachiini (Rider, 2016). This species was originally

described from India, where it is a pest in oilseeds and several vegetables (Schaefer & Panizzi, 2000). Actually, it is one of the most invasive pentatomids and has been recorded in Asia, Africa, Europe, and North America. This species has been recorded on more than 15 families of plants (Rider, 2016), although it seems to prefer members of the Brassicaceae. It is considered a major pest on cabbages (*Brassica oleracea* L.) (Palumbo et al., 2016). The purpose of this contribution is to report the first occurrence of *B. hilaris* in South America.

## Material and methods

Specimens were observed and collected in Estero las Cruces, north of Quilicura (33°20'22"S - 70°43'44"W) (Fig. 3), Metropolitan Region, Chile. Quilicura is situated in a semi-arid Mediterranean climate (Di Castri & Hajek, 1976). This area has an irregular precipitation regime, the rains coming primarily during the fall and winter. On the other hand, summers are hot and dry, sometimes surpassing 30°C (DGA, 2008). The sampling site (Fig. 4) is characterized by low vegetation with a high presence of introduced plants from the families Asteraceae, Brassicaceae, and Fabaceae. The area has livestock activity, and there are signs of overgrazing. Although it is a highly disturbed area, there are many native birds that are using the habitat (Cuevas, unpublished data).

The area of sampling (Fig. 4) was elaborated with ArcGis 10.1, exported to a KMZ file and visualized in Google Earth®. Photos were taken with a digital camera and laboratory photos with a camera adapted to a stereoscopic microscope. In classification and nomenclature, we follow Rider (2016).

## Results and discussion

*Bagrada hilaris* specimens have been observed in large aggregations, and they were causing extensive damage to the host *Brassica rapa* L. Many life stages were observed, including nymphal instars III through V (Fig. 2), gravid females, and mating adults (Fig. 1).

**Material examined:** 1♀, 3 nymphs. CHILE, Provincia de Santiago, Quilicura, Estero las Cruces, 33°20'25"S -70°43'44"W, 28-IX-2016, P. Valdebenito leg.; 21♂♂, 22♀♀, 42 nymphs, same locality, 1-X-2016, A. Lüer leg. Specimens are deposited in the following collections: Museo Nacional de Historia Natural, Sección Entomología, Santiago, Chile; Instituto de Entomología, Universidad Metropolitana de Ciencias de la Educación, Santiago, Chile; Departamento de Medio Ambiente, Ilustre Municipalidad de Quilicura; Heteroptera Reference Collection, Centro de Estudios en Biodiversidad, Punta Arenas, Chile; David A. Rider Collection, Fargo ND, USA.

The locality where the specimens have been observed is close to an international airport and to the Pan-American road. Therefore we believe it is possible that this species may have arrived initially by land or by air transport. The aggregations and general behavior of the specimens match with similar observations reported from other areas (Palumbo et al., 2016). In southwestern United States this species was first discovered in southern California in June of 2008. By 2010, it had already spread to Arizona (Palumbo & Natwick, 2010) and New Mexico (Bundy et al., 2012), showing a high invasive behavior. It is interesting to note that even though it is early spring at the collection site, there already are relatively large numbers of individuals present (it apparently has a high reproductive rate), and they are quite active. It is probable that this population established itself at least a few months prior to their discovery, and may very well occur at other undiscovered locations. Accordingly, the population levels may continue to increase during the summer months, and the specimens may start to disperse rapidly.

This species has a high potential to become a major pest in Chile. It had been recorded attacking many of the commodities grown in Chile (e.g. cabbages, potatoes, atriplex, etc.). In addition,

the presence of this species may affect Chilean crops indirectly. For example, some fields or regions may be subject to a quarantine if specimens are found nearby. Thus, it is very important to make plans and to start a control program, including the survey of surrounding localities as soon as possible. At the same time, it may be worth starting a preventive inspection program on products going to other South American countries. However, these control measures should consider also the native birds in the area, avoiding any side unwanted harm to these.

In Chile, the most recent catalog of Pentatominae (Faúndez & Carvajal, 2011) listed 18 species. More recently, through a few faunistic additions and the description of new taxa, this number increased to 26 (Faúndez *et al.*, 2013; Faúndez & Rider, 2014a, b, 2016). Only two of these, *Nezara viridula* (Linnaeus, 1758) and *Loxa deducta* Walker, 1867, are introduced species. The dorsal color pattern of *B. hilaris* will easily separate it from the other Chilean pentatomines (e.g., none of the other species are black in coloration with ivory and reddish stripes). It might be (i.e., at a first view) confused with the asopine *Comperocoris roehneri* (Philippi, 1862), which is metallic blue with orange calluses (Fig. 6), and without contiguous paraclypei. It might also be confused with the acanthosomatid, *Hyperbius geniculatus* (Signoret, 1864) (Fig. 7), which have only two tarsal segments, they lack an ivory stripe on the scutellum, do not have contiguous paraclypei, and they do not have any red pattern on the dorsum. Elsewhere it is sometimes confused with the Harlequin bug, *Murgantia histrionica* (Hahn, 1834) (Pentatomidae) (Fig. 8), which is not present in Chile. *Bagrada hilaris* can be differentiated quickly from *M. histrionica* by the dorsal color pattern, its smaller size, and by having contiguous paraclypei.

## References

- Bundy, S.C.; Grasswitz, R.T. & Sutherland, C. 2012. First report of the invasive stink bug *Bagrada hilaris* (Burmeister) (Heteroptera: Pentatomidae) from New Mexico, with notes on its biology. *Southwestern Entomologist*, **37**: 411-414.
- Di Castri, F. & Hajec, E. 1976. *Bioclimatología de Chile*. Vicerrectoría Académica-Universidad Católica de Chile. Santiago, 128 pp.
- DGA (Dirección General de Aguas). 2008. *Resumen ejecutivo plan director para la gestión de los recursos hídricos cuenca del río Maipo. Fase II actualización del modelo de operación del sistema y formulación del plan*. Luis Arrau del Canto, Consultores en Ingeniería Hidráulica y de riego. S.I.T. N° 133.
- Faúndez, E.I. & Carvajal, M.A. 2011. Catalog of Chilean Pentatominae Leach, 1815 (Hemiptera: Heteroptera: Pentatomidae). *Zootaxa*, **2835**: 53-60.
- Faúndez, E.I. & Carvajal, M.A. 2016. Description of the 5th instar nymph of *Oenopiella punctaria* (Stål, 1859) (Hemiptera: Heteroptera: Pentatomidae), with new distributional records from Southern Patagonia. *Zootaxa*, **4067**(2): 246-250.
- Faúndez, E.I.; Carvajal, M.A. & Rider, D.A. 2013. Sinopsis del género *Chinavia* Orian, 1965 (Heteroptera: Pentatomidae) en Chile. *Boletín de Biodiversidad de Chile*, **8**: 26-36.
- Faúndez, E.I. & Rider, D.A. 2014a. *Thestral incognitus*, a new genus and new species of Pentatomidae from Chile (Heteroptera: Pentatomidae: Pentatominae: Carpocorini). *Zootaxa*, **3884**(4): 394-400.
- Faúndez, E.I. & Rider, D.A. 2014b. Nuevos registros de Pentatominae Leach, 1815 (Hemiptera: Heteroptera: Pentatomidae) en Chile. *Boletín de la Sociedad Entomológica Aragonesa*, **55**: 159-162.
- Faúndez, E.I. & Rider, D.A. 2016. Notas sobre el complejo de *Acledra* (*Acledra*) *albocostata* (Spinola, 1852) (Hemiptera: Heteroptera: Pentatomidae: Pentatominae). *Arquivos Entomológicos*, **15**: 383-389.
- Palumbo J.C. & Natwick, E.T. 2010. *The bagrada bug (Hemiptera: Pentatomidae): a new invasive pest of cole crops in Arizona and California*. Plant Health Progr. doi: 10.1094/PHP-2010-0621-01-BR

Palumbo, J.C.; Perring, T.M.; Millar, J.G. & Reed, D.A. 2016. Biology, ecology and management of an invasive stink bug, *Bagrada hilaris*, in North America. *Annual Review of Entomology*, **61**: 453-473.

Rider, D.A. 2016. *Pentatomoidea Home page*. Accessed online from: <http://www.ndsu.nodak.edu/ndsu/rider/Pentatomoidea/index.htm> (last visit, October, 2016).

Rider, D.A.; Schwertner, C.F. & Faúndez, E.I. 2016. *The classification of the Pentatomidae (Hemiptera: Heteroptera): Past, present, and future*. XXV International Congress of Entomology, ICE. Orlando, Fl., USA. doi: 10.1603/ICE.2016.94105

Schaefer, C.W. & Panizzi, A.R. 2000. *Heteroptera of Economic Importance*. CRC press, Boca Raton, Florida, USA, 856 pp.



**Fig. 1.-** Mating pair of *Bagrada hilaris* in Quilicura.

**Fig. 2.-** Nymph of *B. hilaris* in Quilicura.

**Fig. 3.-** Habitat in which specimens were collected.

**Fig. 4.-** Area sampled (in yellow).



Fig. 5. - *Bagrada hilaris*, habitus.

Fig. 6. - *Comperocoris roehneri*, habitus.

Fig. 7. - *Hyperbius geniculatus*, habitus.

Fig. 8. - *Murgantia histrionica*, habitus.