

## Research Article

**New data on *Pellaea stictica* Dallas (Heteroptera: Pentatomidae) in South America**Nuevos datos sobre *Pellaea stictica* Dallas (Heteroptera: Pentatomidae) en SudaméricaMariom A. Carvajal<sup>1</sup>, Catalina J. Vargas<sup>1</sup> and Eduardo I. Faúndez<sup>1\*</sup><sup>1</sup>Instituto de la Patagonia, Universidad de Magallanes, Av. Bulnes 01855 Punta Arenas, CHILE. \*E-mail: ed.faundez@gmail.com

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**Abstract.** New records are given for the pentatomid *Pellaea stictica* Dallas, 1851. The new records extend the distribution of the species in Perú towards the south. The presence of the species in Chile is confirmed by the collection of new material. The first exact locality record from Paraguay is provided. Additionally, the first teratological case in this species is described. The case belongs to a right antennal oligomery with atrophy and anarthrogenesis.

**Key words:** New records, Pentatominae, Chile, Paraguay, Perú, teratology.

**Resumen.** Se entregan nuevos registros para el pentatómido *Pellaea stictica* Dallas, 1851, los que extienden la distribución hacia el sur en Perú, se confirma su presencia en Chile con la recolección de nuevos ejemplares y se entregan los primeros registros específicos dentro de Paraguay. Adicionalmente, se describe el primer caso teratológico para esta especie, correspondiente a una oligoméria y atrofia antenal derecha con anartrogénesis.

**Palabras clave:** Nuevos registros, Pentatominae, Chile, Paraguay, Perú, teratología.

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## Introduction

Pentatomidae is a family of heteropterans that currently comprises about 4938 species classified in 939 genera (Faúndez *et al.* 2017a). The species in this group are known for being pests in crops that cause an economic impact in agriculture. The subfamily Asopinae, though, is known because several species are used as biological controls (Schefer and Panizzi 2000).

Pentatominae is the most numerous subfamily in Pentatomidae, comprising about 3576 species in 659 genera (Faúndez *et al.* 2017a). In addition, several species in this group are considered of high economic importance due to the damage they cause in crops for human consumption, high rates of invasion and even becoming domestic pests (Faúndez 2018).

*Pellaea stictica* Dallas, 1851 is a pentatomine with a broad distribution in the Americas (Henry 1984). This species has generalist feeding habits and has been cited in plants of the families Oleaceae y Solanaceae (Rider 2019). Additionally it has been observed forming big aggregations (Panizzi and Grazia 2001), which sometimes increase the economic impact

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caused by the species. In spite of this, records of this species are scarce in some areas, do not exist or have been mentioned in literature at the level of country (Faúndez and Rider 2014; González *et al.* 2016).

Teratology comprises the study of diverse malformations (Dallas 1926); being teratoses events that occur in an individual's ontology. However, there have been cases in which they occur in the phylogeny of a determined lineage (Ortuño and Ramos 2008). In Heteroptera, Balazuc (1951) and Štusak and Stehlík (1977, 1978, 1979, 1980, 1982), have provided the biggest contributions to the knowledge.

The objective of this work is to provide new distributional records and describe the first teratological case in this species.

## Materials and Methods

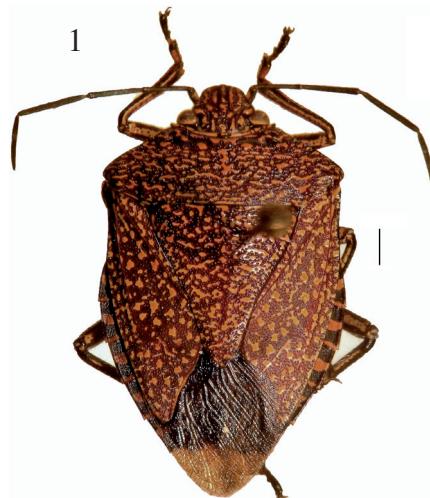
For the identification of the pentatomid we follow Faúndez and Rider (2014). For classification and terminology of the malformation Balazuc (1951) and Štusak and Stehlík (1978) are followed.

Pictures were taken with a high resolution digital camera Ricoh 550®, adapted to a stereoscopic microscope Celestron 44202®.

The examined material has been deposited in the arthropod collection of Instituto de la Patagonia, Universidad de Magallanes, Chile. All measurements are provided in millimeters.

## Results and Discussion

*Pellaea stictica* (Fig. 1) has a wide distribution in the New World where it has been recorded for Argentina, Brazil, Colombia, Ecuador, Guyana, Mexico, Panama (Kirkaldy 1909; Henry 1984), Honduras (Arismendi and Thomas 2003), Nicaragua (Maes 1994), Costa Rica, Paraguay, Peru, Venezuela, United States (Henry 1984) and recently Chile (Faúndez and Rider 2014). Grazia *et al.* (2016) mentioned it from Uruguay without further records and they missed Chile in the distribution; therefore the record is doubtful. In the case of Peru, Henry (1984) provides records without specifying exact locality. However, González *et al.* (2016) provide the first records in this country from the locality of Piura, located in the north, and Juarez *et al.* (2017) extended the distribution up to Lima. In the same way,



**Figure 1.** Specimen of *Pellaea stictica* from Paraguay, habitus. Scale bar: 1 mm.

Henry (1984) mentions the presence of *P. stictica* in Paraguay; however, without an exact locality. In this work we provide the first records that extend the distribution of this species in Peru, towards the south, filling the distributional gap between this country and the existent records in Paraguay and confirming the presence of this species in Chile with new recent collections; as follows:

**Material examined.** CHILE: Región de Arica y Parinacota, Putre, 22-II-2017, A. Veas leg. 2♂♂, 1♀; Visviri, 27-XII-2016, A. Veas leg. 1♀. PARAGUAY: Departamento de Cordillera, Caacupé, I-83, E. G. Riley leg. 1♂, 1♀; 10 km S. de Asunción, 7-II-1990, J. Burgos leg. 1♀; PERÚ: Arequipa, 29-II-1990, J.E. Hass leg. 1♂, 2♀♀.

The presence of this species in localities that fill the distributional gap in the Pacific coast in conjunction with its confirmation in the Chilean Region of Arica and Parinacota is a situation worth mentioning.

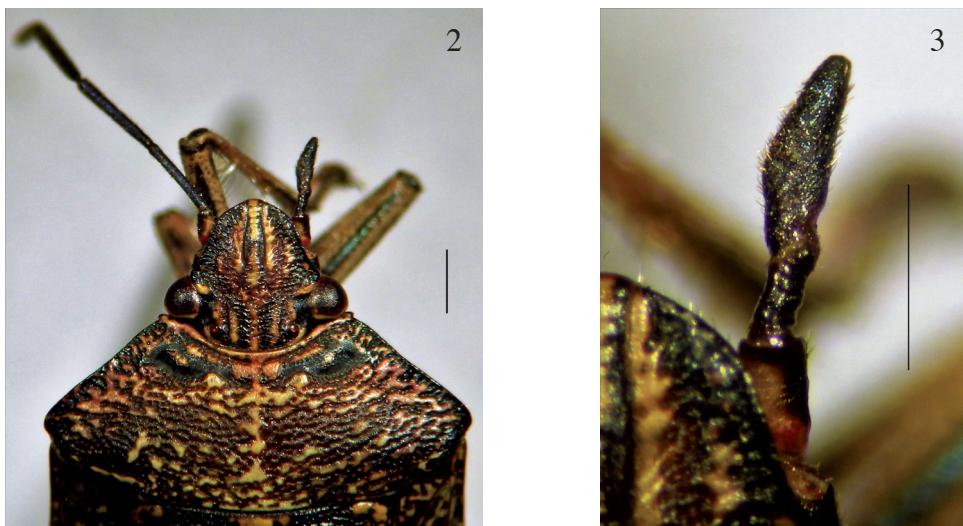
Since Faúndez and Rider (2017a) confirmed the presence of the invasive bug *Halyomorpha halys* (Stål, 1855) for the first time in the southern hemisphere, specifically in Chile, there has been a constant alarm because of the known economic importance of this species. Faúndez and Rider (2014) mention there are similarities between this *H. halys* and *P. stictica*. In this case, where both species cohabit, to avoid an increase in the alarm for the invasive bug is important to know how to differentiate them. Faúndez and Rider (2014) also mention the main differences between these species which are the shape of the head, being as long as wide in *P. stictica* while more elongated in *H. halys*; and the presence of a small tubercle in the base of the abdomen in *P. stictica*, absent in *H. halys*.

In respect of the given information, the first teratologic case in *P. stictica* is described.

#### Oligomery and atrophy in the right antennae, with anarthrogenesis (Figs. 2, 3)

**Studied material.** PERÚ: Lima Prov. Santa Eularia, Distr. 26-II-1981, M.E. Irwin leg. 1♂

The specimen presents a reduction in size and segments in the right antenna (Fig. 2). The left antenna appears to be normal. The first antennal segment of the malformed antennae is slightly deformed and smaller than its left counterpart (Fig.3). The second antennal



**Figures 2-3.** Teratological specimen of *Pella stictica*. 2. Head and pronotum, 3. Detail of the right antenna. Scale bar: 1 mm.

segment is completely atrophied, notoriously smaller compared to the normal antenna (Fig. 3). The third antennal segment along with being smaller than the one in the normal antenna, has an oval shape and pilosity similar to the apical segment of the normal antenna (Fig. 3). The intersegmental membrane between the antennal segments II and III of the malformed antenna is partially sclerotized and in an inclined position instead of straight as it should be normally. In addition, this membrane appears to be semifused laterally, which produces anarthrogenesis because of the avoidance of movement of the antennae (Fig. 3).

**Table 1.** Measurements of the antennae of the teratological specimen of *Pellaea stictica*.

Antenommere	I	II	III	IV	V	VI
Left antenna	0,51	1,38	1,85	2,05	1,90	7,69
Right antenna	0,47	0,51	1,00	-	-	1,98

Antennal anomalies are among the most common among heteropterans (Balazuc 1951). Štusak and Stehlík (1978) explain how the cause of these teratoses might be the regeneration for losing segments in previous nymphal stages, injuries or diseases. On the other hand, in more rare cases endogenous causes might be suspected (Faúndez and Lüer 2015). We believe that in this case the oligomery might be caused by the loss of an important part of the antenna in an early nymphal stage. In this way, to preserve the proportions, the rest of the antennal segments changed in respect to the normal antenna; and the third segment would have adopted the pilosity and shape of the terminal segment. This, according to Štusak and Stehlík (1978), occurs to not lose some of the sensorial functions of the last antennal segment.

The high degree of atrophy of the malformed antenna suggests an important trauma, which could have been associated with a disease or injury. This is the first teratological case in this species. Previously, the known recorded malformations in south american pentatomoids were a compound antennal and pronotal malformation in the pentatomid *Oenopiella punctaria* (Stål, 1859) (Faúndez and Lüer 2015), a simple antennal oligomery in the pentatomid *Piezodorus guildinii* (Westwood, 1837) (Juarez and Faúndez 2018), an antennal binary heterodinamic esquistomely and abdominal atrophy in the pentatomid *Loxa deducta* (Walker, 1867) (Faúndez et al. 2017b); a simple tarsal oligometry in the pentatomid *Alcaeorrhynchus grandis* (Dallas, 1851) (Faúndez et al. 2018); a cephalic atrophy in *Copeocoris truncaticornis* (Stål, 1865) (Faúndez and Rider 2017b) and an antennal atrophy in the acanthosomatid *Ditomotarsus hyadesi* Signoret, 1885 (Faúndez and Carvajal 2011). In this way, at the global level, the recent cases described from South America begin to illustrate the tendency of other better studied zones in this subject, with a prevalence in exogenous teratoses in appendices like legs and antennae.

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