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Current European distribution of *Stephanitis (Stephanitis) lauri* Rietschel, 2014 (Hemiptera: Tingidae) and first record for mainland PortugalThomas Cherpitel^{1,2} & Marie Filipe³¹ Groupe d'Étude des Invertébrés Armoricaux, Campus de Beaulieu, Bâtiment 25, 35042 Rennes Cedex (France).² e-mail: t.cherpitel@gretia.org. ORCID: 0009-0006-8327-3929³ e-mail: filipemarie@live.fr. ORCID: 0009-0008-5669-3930

Abstract: The first population in Portugal of the alien lace bug *Stephanitis (Stephanitis) lauri* Rietschel, 2014 (Hemiptera: Tingidae) has been detected. This is also the first observation on the Atlantic coast, far from its Mediterranean main area of distribution. This gives us the opportunity to present an overview of its known current distribution. The habitus of *S. lauri* and male paramere are illustrated.

Key words: Hemiptera, Heteroptera, Tingidae, *Stephanitis lauri*, *Laurus nobilis*, alien species, new records, distribution, Lisbon, Portugal.

Resumen: Distribución europea actual de *Stephanitis (Stephanitis) lauri* Rietschel, 2014 (Hemiptera: Tingidae) y primera cita para Portugal continental. Se ha detectado la primera población en Portugal del tinguído exótico *Stephanitis (Stephanitis) lauri* Rietschel, 2014 (Hemiptera: Tingidae). Se trata también de la primera observación en la costa atlántica, lejos de su principal área mediterránea de distribución. Esto nos ofrece la oportunidad de presentar una revisión de su actual distribución conocida. Se ilustran el habitus y el parámero del macho de *S. lauri*.

Palabras clave: Hemiptera, Heteroptera, Tingidae, *Stephanitis lauri*, *Laurus nobilis*, especie exótica, nuevas citas, distribución, Lisboa, Portugal.

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Introduction

Lace bugs (Hemiptera: Tingidae) comprise 2,600 species worldwide (Schuh & Weirauch, 2020). In the Iberian Peninsula have been recorded 101 species (Costas *et al.*, 2020; Riba-Flinch & Goula, 2021; Andrés Ares, 2022) but only 38 species currently appear to have been recorded in Portugal (Gil & Grosso-Silva, 2021; Aukema, 2024). There are nearly 90 species of *Stephanitis* Stål, 1873, mainly found in eastern Asia (Souma, 2022), but only three have been detected in Portugal so far: *Stephanitis (Stephanitis) chlorophana* (Fieber, 1861), *S. (S.) pyri* (Fabricius, 1775) (Péricart, 1983) and *S. (S.) takeyai* Drake & Maa, 1955 (Grosso-Silva *et al.*, 2020). This paper reports the discovery of *S. (S.) lauri* Rietschel, 2014 in Portugal and its current European distribution.

Materials and methods

The identification of the Portuguese specimens (imagos) was based on several documents, in particular Streito (2006), Rietschel (2014) and Balmes (2017).

A map of the distribution of *S. (S.) lauri* in Europe was produced using QGIS software (v. 3.34). For the sake of readability, only the first communal data are shown. The data were collected from GBIF (GBIF Secretariat, 2023)¹ and publications or reports dealing with this lace bug (Rietschel, 2013, 2014; Guerin & Jullien, 2018; Streito *et al.*, 2018; Abenaim *et al.*, 2020; Riba-Flinch & Goula, 2021). A total of 54 data were compiled, 31 from GBIF and 23 from the literature (Appendix 1). None of the literature data was available in GBIF.

Results and comments

Family Tingidae Laporte, 1832

Stephanitis (Stephanitis) lauri Rietschel, 2014

Material examined: Portugal: Lisbon district: Lisbon municipality: Penha de França (38.72441°, -9.11619°), 24/02/2024, 1♂ & 2♀♀, few larvae and exuviae, on *Laurus nobilis* L. (Lauraceae), Thomas Cherpitel & Marie Filipe leg. et col. The habitus of a female is shown in Fig. 1 and the male paramere is shown in Fig. 2.

Biology: *S. (S.) lauri* feeds on the leaves of *Laurus nobilis* L., the only host plant known to date (Rietschel, 2013, 2014; Streito *et al.*, 2018; Abenaim *et al.*, 2020; Riba-Flinch & Goula, 2021). However, Abenaim *et al.* (2020) report the presence of a few isolated individuals on the leaves of *Cinnamomum camphora* (L.) J. Presl, another Lauraceae.

So far, all observations were made in anthropic contexts: private urban gardens, green spaces, botanical gardens, etc. (Rietschel, 2013; Streito *et al.*, 2018; Abenaim *et al.*, 2020; Riba-Flinch & Goula, 2021) (Fig. 3).

Distribution: *S. (S.) lauri* was discovered in Crete (Greece) in 2012 (Rietschel, 2013) and described in 2014 (Rietschel, 2014). When described, the species was considered to be endemic to Crete. Subsequently, the species was found in 2017 in Mediterranean France (Streito *et al.*, 2018), in 2020 in Italy (Abenaim *et al.*, 2020) and Spain (Riba-Flinch & Goula, 2021) and now in 2024 in Portugal (Fig. 4). The presence of larvae and the damage observed on the leaves of the three *L. nobilis* plants examined indicate that the species has been present for several months or even years and is established in the country (Figs. 5-6). It should be noted that this observation in Lisbon is also the first occurrence of the species on the European Atlantic coast.

The dynamics of *S. (S.) lauri* seem to show that it is an allochthonous and probably invasive species, as has already been mentioned (e.g. Streito *et al.*, 2018; Riba-Flinch & Goula, 2021). It is unlikely that entomologists or even gardeners have overlooked the damage this lace bug causes to Bay laurel leaves. The species also appears to be gradually spreading in Italy, as demonstrated by the observation in the province of Lazio in 2022 (<https://www.inaturalist.org/observations/119246889>), and in France, as shown by the record from the city of Toulouse (23/05/2022, Nicolas Romet leg., <https://openobs.mnhn.fr/openobs-hub/occurrences/4eebc75b-8f94-433d-bfd8-093c63b00879>).

Conclusions

Although probably Asian, the precise geographical origin of *S. (S.) lauri* remains unknown at this time, despite the work carried out by Rietschel (2013) prior to the description of the species (Rietschel,

¹ Some very recent data from iNaturalist.org and Observation.org were therefore not taken into account, as they had no impact on the general distribution of the species.

2014). The genus revision of the Japanese Lauraceae-feeding *Stephanitis* by Souma (2022) does not provide any new information on this subject. There are many cases of allochthonous species described outside their native range. With regard to heteropterans, two other examples can be cited: *Thaumastocoris peregrinus* Carpintero & Dellape, 2006 (Thaumastocoridae), described from Argentina but native to Australia (Noack *et al.*, 2011), and *Montandoniola confusa* Streito & Matocq, 2009 (Anthocoridae), described from Guadeloupe, but introduced for biological control purposes in many other countries (Pluot-Sigwalt *et al.*, 2009).

The presence of *S. (S.) lauri* in Portugal is added to the list of other allochthonous Tingidae detected in recent years in the country: *Corythucha ciliata* (Say, 1832) (Grosso-Silva & Aguiar, 2007; Kment, 2007), *S. (S.) takeyai* Drake & Maa, 1955 (Grosso-Silva *et al.*, 2020) and finally *Corythucha arcuata* (Say, 1832) (Gil & Grosso-Silva, 2021). Other alien lace bugs should be sought in Portugal: *Corythauma ayyari* (Drake, 1933) has been present in Spain for several years (Roca-Cusachs & Goula, 2014), especially in the neighbouring region of Extremadura since 2022 (Mori *et al.*, 2023), and *Stephanitis (Stephanitis) pyrioides* (Scott, 1874) has recently been detected in Galicia (Andrés Ares, 2022) and Catalonia (Riba-Flinch, 2023).

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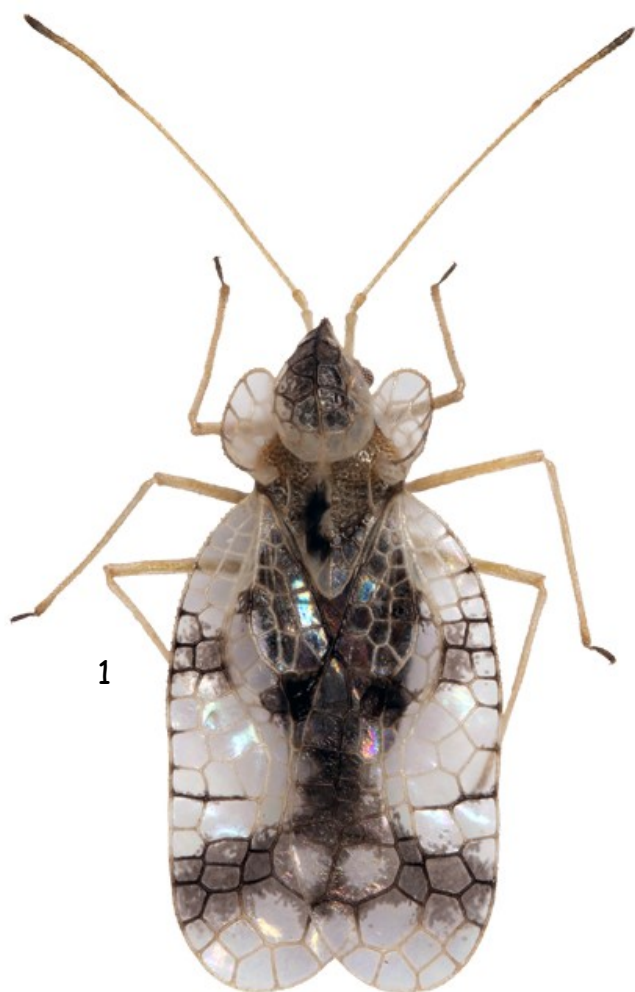
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Appendix 1. - Compilation of data on *Stephanitis (S.) lauri* Rietschel, 2014.

Countries	Regions	Years	Data amount	Source
Greece	Crete	2012	1	Rietschel, 2013, 2014
		2013	1	Streito <i>et al.</i> , 2018
France	Provence-Alps-French Riviera	2017	5	Streito <i>et al.</i> , 2018
		2018	6	Guerin & Jullien, 2018
	2017, 2018, 2019, 2020, 2021, 2022, 2023	22	GBIF Secretariat, 2023: PatriNat (OFB-MNHN-CNRS-IRD), iNaturalist.org	
	Occitania	2021, 2022, 2023	4	GBIF Secretariat, 2023: iNaturalist.org, PatriNat (OFB-MNHN-CNRS-IRD)
Italy	Liguria	2020	1	Abenaim <i>et al.</i> , 2020
		2020	1	GBIF Secretariat, 2023: iNaturalist.org
	Toscana	2020	1	Abenaim <i>et al.</i> , 2020
		2022	1	GBIF Secretariat, 2023: iNaturalist.org
	Lazio	2022	1	GBIF Secretariat, 2023: iNaturalist.org
Spain	Catalonia	2020	7	Riba-Flinch & Goula, 2021
		2023	2	GBIF Secretariat, 2023: iNaturalist.org, Observation.org
Portugal	Lisbon	2024	1	Present work

Figs. 1-2.- *Stephanitis (S.) lauri* Rietschel, 2014 caught at Penha de França (Lisbon).

1.- Habitus of a female. Scale: 3.5 mm. (Photo: Nicolas Romet).

2.- Right male paramere. Scale 0.28 mm.

Fig. 3.- Urban ornamental flowerbed at Penha de França (Lisbon).

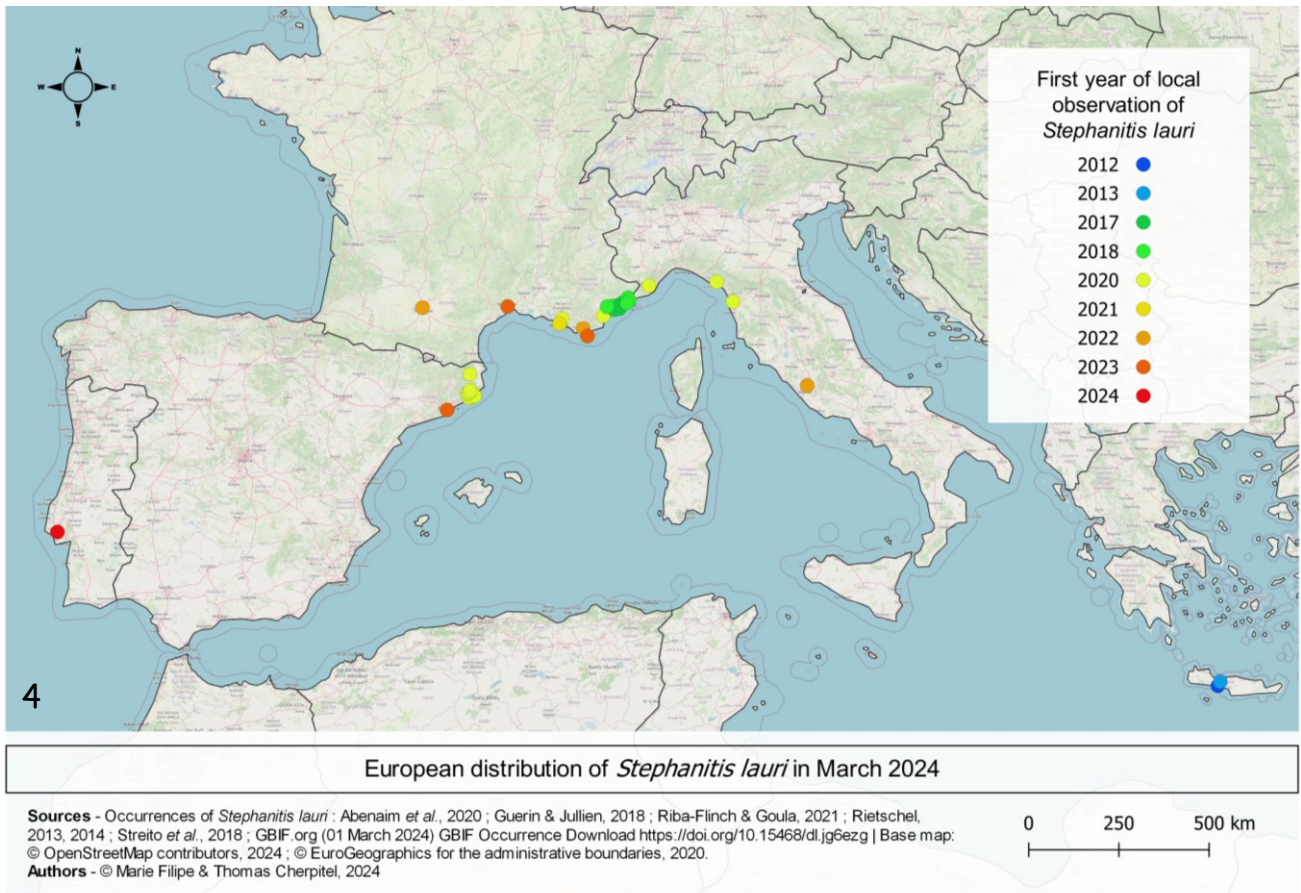


Fig. 4. - European distribution of *Stephanitis (S.) lauri* in March 2024.



Fig. 5. - Characteristic discoloration of Bay laurel leaves observed at Penha de França (Lisbon).

Fig. 6. - Characteristic discoloration of a Bay laurel leaf (top) and other signs of presence and larvae of *Stephanitis (S.) lauri* (bottom) collected at Penha de França (Lisbon).

