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**First record of the alien lace bug *Stephanitis pyrioides* in Greece
and note on *Corythucha ciliata* from Portugal
(Heteroptera: Tingidae)**

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Abstract: The faunistic records of two alien lace bug species (Heteroptera: Tingidae) are reported: *Stephanitis (Stephanitis) pyrioides* (SCOTT 1874) is recorded from Greece for the first time. The first published record, generally unknown, of *Corythucha ciliata* (SAY 1832) from Portugal is cited and an additional record from this country as well as records from Croatia, France, and Italy are given.

Key words: Heteroptera, Tingidae, *Corythucha*, *Stephanitis*, Croatia, France, Greece, Italy, Portugal, faunistics, alien species.

Introduction

Invasions of alien animal species, causing injury to natural zoocenoses and ecosystems or economically important losses to cultivated crops, are one of the important topics of recent ecological research. Among the phytophagous true bug family Tingidae, so far five alien species were introduced to Europe: *Stephanitis pyrioides* (SCOTT 1874) (originally from Eastern Asia), *S. rhododendri* HORVÁTH 1905 (from Nearctic region), *S. takeyai* DRAKE & MAA 1955 (from Japan), *Corythucha arcuata* (SAY 1832) and *C. ciliata* (SAY 1832) (both from Nearctic region) (PÉRICART 1983, PÉRICART & GOLUB 1996, BERNARDINELLI 2000). In this paper, supplementary distributional records are added to the actual knowledge of the invaded area.

Material

The material examined is deposited in the following collections:

- PKPC.....Collection of Petr Kment (deposited in National Museum, Praha, Czech Republic);
MMBCMoravian Museum (Brno, Czech Republic);
ZMOCCollection of Zdeněk Malinka (Opava, Czech Republic).

Results

Stephanitis (Stephanitis) pyrioides (SCOTT 1874)

Material examined: Greece: Athens centr., Kifisiá (Elatis 6), 60 m a.s.l., lamp dome, 17.vii.1999, 1♂, S. Drosopoulos lgt., P. Kment det. (PKPC); Fokís district, Delfi, on *Rhododendron* sp., 3.vi.1995, 3♂♂ 3♀♀ (1 pair in copula), P. Lauterer lgt., P. Kment det. (MMBC, PKPC).

Distribution: *Stephanitis pyrioides* (syn. *S. azaleae* HORVÁTH 1905) is native to eastern Asia (Bhutan, China, India, Japan, Korea, Nepal, Russian Far East, Ryukyu Islands, Taiwan) (DRAKE & RUHOFF 1956, TAKEYA 1963, LEE 1967, PÉRICART 1983, PÉRICART & GOLUB 1996). It was introduced to Australia (Canberra, New South Wales, Queensland; collected already in 1924) (DRAKE 1961, CASSIS & GROSS 1995), Argentina (collected in April 1924 in Ituzaingó) (BLANCHARD 1926), Brazil (discovered in 1996 in São Paulo) (BERGMANN et al. 1997), the USA (first records from 1910) (HORVÁTH 1912, DICKERSON & WEISS 1917, FROESCHNER 1988), and Georgia (Caucasus) (found in 1936) (PÉRICART 1983). In Europe, this species was introduced for the first time to the Netherlands in 1904 (FOKKER 1905, HORVÁTH 1912) and later again in 1995 and 1998 with the host plant. However, the possibility of breeding in the Netherlands remains a question (AUKEMA et al. 1997, AUKEMA & HERMES 2006). It was also listed from England (STICHEL 1960, DRAKE & RUHOFF 1956) and Germany (DRAKE & RUHOFF 1956), but no exact records from these countries were ever reported. SOUTHWOOD & LESTON (1959) did not list this species from Great Britain and it is not included in the recent checklist of German Heteroptera (HOFFMANN & MELBER 2003) either. The record from Morocco (GOMEZ-MENOR 1954) was based on misidentification of *S. chlorophana* (FIEBER 1861) (see PÉRICART 1983). In October 2004, *S. pyrioides* was found in the Botanical Garden in Lucca, Italy (DEL BENE & PLUOT SIGWALT 2005); in this locality, the oviposition were observed. **New species for Greece.**

Host plants: *Stephanitis pyrioides* develops on various species of azaleas and rhododendrons (e.g., *Rhododendron amoenum*, *R. amurasaki*, *R. benigeri*, *R. brachycarpum*, *R. calendulaceum*, *R. hinodegeri*, *R. hatsugeri*, *R. indicum*, *R. kaempheri*, *R. ledifolium album*, *R. maximum*, *R. molle*, *R. mucronatum*, *R. mucronulatum*, *R. obtusum*, *R. ponticum*, *R. shirogeri*, *R. shibori*, *R. schlippenbachii*, *R. yedoense*, *R. yedoense poukhanense*, *R. yodogawa*) (Ericaceae) (DICKERSON & WEISS 1917, DRAKE & RUHOFF 1956, MEAD 1967, PÉRICART 1984, BUNTIN et al. 1996, BERGMANN et al. 1997) as well as their hybrids and cultivars (e.g., BUNTIN et al. 1996, KLINGEMAN 2000c, NEAL & DOUGLASS 1988, SCHULTZ 1993). It feeds also on other Ericaceae, *Kalmia latifolia* and *K. angustifolia* (DRAKE & RUHOFF 1956, MEAD 1967), *Pieris ovalifolia* (DRAKE & RUHOFF 1956) and *Lyonia neziki* (TAKEYA 1963). STREITO (2006) reported a finding on *Platanus* sp. (Platanaceae) from the Chinese province Hunan, where it co-occurred with *Corythucha ciliata*.

Bionomics: Recently, various aspects of biology and ecology of *S. pyrioides* were studied in several papers – life cycle (BAILEY 1951, BRAMAN et al. 1992, CASEY & RAUPP 1999b, COFFELT & SCHULTZ 1988, DEL BENE & PLUOT-SIGWALT 2005, HWANG et al. 1998, NALEPA & BAKER 1994, NEAL & BENTZ 1997, NEAL & DOUGLASS 1988), hybridisation (NEAL & OLIVER 1991), parasitoids (BRAMAN et al. 1992), ecology (BENTZ 2003; BRAMAN et al. 2000; SHREWSBURY et al. 2002, 2004; SHREWSBURY & RAUPP

2000; STEWART et al. 2002; TRUMBULE & DENNO 1995), host plant acceptance and resistance (BALSDON et al. 1995; BRAMAN & PENDLEY 1992; CHAPPELL & ROBACKER 2006; SCHULTZ 1993; WANG et al. 1998, 1999), feeding injury of the host plant (BUNTIN et al. 1996; KLINGEMAN et al. 2000a, 2000b, 2000c, 2001a), pest management (BRAMAN et al. 2000, CASEY & RAUPP 1999a, KLINGEMAN et al. 2001b, NAKASUGA 1994, TRUMBULE & DENNO 1995, TRUMBULE et al. 1995).

Note: *Stephanitis pyrioides* is most similar to another alien species – *S. takeyai*, living on *Pieris japonica* (Ericaceae). Among the native European species, it is most similar to *S. chlorophana*. For identification of adults see MEAD (1967), DEL BENE & PLUOT-SIGWALT (2005) and STREITO (2006). For the descriptions of larval instars see DICKERSON & WEISS (1917), MAA (1957), PÉRICART (1984), and BERGMANN et al. (1997).

***Corythucha ciliata* (SAY 1832)**

Material examined: Croatia: Dalmatia, Makarska, city harbour, on *Platanus* sp., 5.ix.2004, 5♂♂ 1♀, P. Kment lgt. & det. (PKPC); Dalmatia, Pelješac peninsula, Orebić, Perna camping, 24.-30.viii.2001, 2♂♂ 3♀♀, M. Omesová lgt., P. Kment det. (PKPC). France: Alpes-Maritimes, Menton – centre, on *Platanus* sp., 1.ix.1996, 1♀, I. Malenovský lgt., P. Kment det. (PKPC); Alpes-Maritimes, Nice env., under bark of *Platanus* sp., 29.xi.1991, 2 spec., Z. Malinka lgt., P. Kment det. (ZMOC); Auvergne, Vichy, city, *Platanus* sp., 9.viii.2004, 1♀, L. Juříčková lgt., P. Kment det. (PKPC); Landes, Bayonne env., St.-Martin-de-Seignanx, under bark, 9.xii.1991, 13 spec., Z. Malinka & Kadlec lgt., P. Kment det. (ZMOC). Italy: Lazio, Roma prov., Tenuta di Castelporzano (41°44'N 12°22'E), *Platanus acerifolia* at castle, under bark, 10.iv.2003, 3♂♂ 7♀♀, P. Kment lgt. & det. (PKPC). Portugal: Coimbra prov., Coimbra, botanical garden, 27.ix.2000, 1♂, J. Rudolfová lgt., P. Kment det. (PKPC).

Distribution: *Corythucha ciliata* is a species of Nearctic origin, native in the USA (from Maine and Florida to Colorado) and Canada (Ontario, Quebec) (DRAKE & RUHOFF 1956, PÉRICART 1983, FROESCHNER 1988). In 1964, it was unintentionally introduced to Padua in northern Italy (SERVADEI 1966). Subsequently, it was found in Croatia in 1970 (MACELJSKI & BALARIN 1972a), in Slovenia in 1972 (MACELJSKI & BALARIN 1972b), in Serbia in 1973 (TOMIĆ & MIHAJLOVIĆ 1974), in France in 1974-1976 (D'AGUILAR et al. 1977), in Switzerland in 1975 (PÉRICART 1983, HOFFMANN 1978, HEISS 1995), in Hungary in 1976 (JASINKA & BOZSITS 1977), in Spain in 1980 (GIL SOTRES & MANSILLA VAZQUEZ 1981, RIBES 1980), in Austria in 1982 (MILDNER 1983, HEISS 1995), in Germany in 1984 (HOPP 1984), in Bulgaria in 1987 (JOSIFOV 1990), in Greece in 1988 (TZANATAKIS 1988), in Portugal in 1994 (HOFFMANN 1996), in the Czech Republic in 1995 (STEHLÍK 1977), and in England in 2006 (MALUMPHY & REID 2006). It is also known from Slovakia (STEHLÍK 1997, KMENT & BRYJA 2001) and Montenegro (PROTIĆ 1998). In 1996, the occurrence of *C. ciliata* in Krasnodar region of south-western Russia was confirmed (VOIGT 2001, KALINKIN et al. 2002). Outside Europe, it was also introduced to Chile (PRADO 1990), Korea (CHUNG et al. 1996), Japan (TOKIHIRA et al. 2003), and southern China (Hunan province) (STREITO 2006). *Corythucha ciliata* currently reaches its northernmost limit in Europe in northern France (HOFFMANN 2001), northern Germany (Hesse – BURGHARDT 1999, North Rhine – HOFFMANN 2003) and Bohemia (Czech Republic) (K. Hradil, pers. comm.). The record from Portugal was omitted in Palaearctic catalogue by PÉRICART & GOLUB (1996) as well as in other papers dealing with this invasive species. **C o n f i r m e d o c c u r r e n c e i n P o r t u g a l .**

Host plants: In North America, *C. ciliata* is trophically bound primarily to

various species of plane-trees (*Platanus occidentalis*, *P. wrighti*, *P. racemosa*) (Platanaceae), but it was also found (probably accidentally) on other trees and shrubs – *Fraxinus* spp. (Oleaceae), *Carya ovata* (Juglandaceae), *Broussonetia papyrifera* (Moraceae), *Chamaedaphne* sp. (Ericaceae), *Quercus laurifolia* (Fagaceae), and *Liquidambar styraciflua* (Hamamelidaceae) (DRAKE & RUHOFF 1956, FROESCHNER 1988, STEHLÍK 1997, HALBERT & MEEKER 1998). In Europe, it lives on *Platanus occidentalis*, *P. × hispanica* (= *P. × acerifolia*) and native *P. orientalis* (MACELJSKI & BALARIN 1972b, HEISS 1995, KALINKIN et al. 2002). Various aspects of the European populations were studied in several papers (see e.g., MACELJSKI & BALARIN 1972b, PÉRICART 1977, STEHLÍK 1997, KALINKIN et al. 2002, ÖSZI et al. 2005).

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Zusammenfassung

Über faunistische Nachweise zweier Tingidae-Arten [*Stephanitis pyrioides* (SCOTT 1874) und *Corythucha ciliata* (SAY 1832)] wird berichtet. Für *Stephanitis* (*Stephanitis*) *pyrioides* (SCOTT 1874) ist es ein Erstnachweis für Griechenland, für *Corythucha ciliata* (SAY 1832) eine Bestätigung für Portugal. Zusätzlich Fundangaben aus Kroatien, Frankreich und Italien runden das Verbreitungsbild ab.

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