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Stephanitis pyrioides (Scott) (Heteroptera Tingidae): a lace bug new to Italy

Abstract - *Stephanitis pyrioides* (Scott) is recorded for the first time from Italy (Tuscany). Adults were found attacking plants of *Rhododendron* spp. (azaleas and rhododendrons) in Lucca at the Botanical Gardens in the autumn 2004. The winter was passed in the egg stage. Details on the morphology of the species are given in order to separate it from other congeneric species present in Italy: *S. pyri* F. and *S. takeyai* Drake & Maa. Remarks are made on its taxonomy, geographical distribution, host plants, life cycle and damage.

Riassunto - Stephanitis pyrioides *(Scott) (Heteroptera Tingidae): tingide nuovo per l'Italia.*

Viene segnalato per la prima volta in Italia il reperimento di *Stephanitis pyrioides* (Scott) su piante di *Rhododendron* spp. presso l'Orto Botanico di Lucca nell'ottobre 2004. Sono descritti i caratteri morfologici distintivi nei confronti di altre specie congeneri presenti in Italia. Sono riportate notizie e osservazioni su stato sistematico, geonemia, piante ospiti, biologia e dannosità della specie.

Key words: Tingidae, *Stephanitis*, Azalea lace bug, *Rhododendron* spp.

INTRODUCTION

During the course of researches on insects associated to the Ericaceae present in the collection of the Botanical Gardens in Lucca, in October 2004 numerous adult Tingids of the *Stephanitis* genus were found on specimens of *Rhododendron* spp., together with the Aleyrodid *Pealius azaleae* (Baker et Moles) and the Thrips *Heliotrhips haemorrhoidalis* (Bouché). Clearly, these Tingids could not be identified as the common *pyri* F. species. Instead, they belonged to a species already well-known for damaging rhododendrons and azaleas but that is new for Italian fauna: *S. pyrioides* (Scott) (Fig. 1a, b). After *S. takeyai* Drake & Maa (Colombo & Limonta, 2001), this is the second tingid species that, in the space of only a few years, has come to be added to the only species of *Stephanitis* known to Italian fauna: namely, *S. pyri* F. (Faraci & Rizzotti Vlach,1995; Péricart & Golub, 1996).

In Europe, Ericaceae can also host other species of *Stephanitis*: *S. rhododendri* Horvath, originating in the USA and not reported in Italy, that lives on rhododendrons and azaleas, and *S. takeyai* originally described from Japan and recently introduced into Italy (Colombo & Limonta, 2001) on *Pieris japonica. S. takeyai* has been reported as being associated with *Rhododendron* spp. only in North America (Bailey, 1950; Wheeler, 1977).

TAXONOMY, GEOGRAPHICAL DITRIBUTION AND HOST PLANTS

The species first described by Scott (1874) as *Tingis pyrioides*, was then transferred to the genus *Stephanitis* Stål by Oshanin (1908). One species has been synonymized with *S. pyrioides*: *S. azaleae* Horvath, 1905 (Péricart & Golub, 1996).

S. pyrioides, originating from Japan, is widespread in Asia (Japan, China, Taiwan, Korea). Imported in USA in 1910, it is now present in the Americas (Argentine, USA) and in Australia. In Europe, it is sporadically present in Germany, Holland, England and Georgia (Péricart, 1983; Péricart & Golub, 1996).

S. pyrioides is associated with Ericaceae of the *Rhododendron* genus (Péricart, 1983). Drake & Ruhoff (1965) also indicate *Kalmia latifolia* L. and *Pieris ovalifolia* D. Don.

At Lucca, the plants most damaged were azaleas: *R. obtusum* Planch, and ornamental old cultivars that could not be identified at a systematic level. Among the rhododendrons, *R. brachycarpum* D. Don. was attacked more seriously than the other species, while the following Ericaceae were found to be immune*:* *Leucothoe catesbaei* Gray, *Vaccinium arctostaphylos* L., *Pieris floribunda* Benth. et Hook., *Pieris polita* Smith et Jeffrey.

MORPHOLOGICAL NOTES

S. pyrioides can be easily separated from the two congeneric species present in Italy, *S. pyri* and *S. takeyai*, and from *S. chlorophana* (Fieber), a mediterranean species only known at present from Spain and Morroco, mainly on the basis of pronotal characters. In the genus *Stephanitis* exists also some male genitalic characters that may be useful (see Péricart, 1983).

The four species share two common characters: – lateral (outer) margins of pronotum and of hemelytra without hairs; – hemelytra with two brownish transverse bands more or less distinct. They can be distinguished as indicated below:

1. Median carina of the pronotum triseriate (three rows of tall areolae) ..... *pyri*
– Median carina of the pronotum biseriate (two rows of areolae) with brown patches (more or less accentuated) in the middle.....2
2. Lateral carinae low but complete .....*chlorophana*
– Lateral carinae short (vestigial) present only posteriorly 3
3. Hood (of the pronotum) hyaline (colorless) (except reticulation); anterior half of the pronotum dark only anteriorly .....*pyrioides*
– Hood entirely dark or black; pronotum black except apex of the posterior lobe .....*takeyai*

Note: the specimens of *pyrioides* are somewhat lighter (less dark) than *takeyai*

LIFE CYCLE

The bio-ethology of *S. pyrioides* was studied particularly in the Nord-Eastern USA (Dickerson & Weiss, 1917). Here the species completes 3 generations per year, the average length of each being about one month. The winter is passed in the egg stage and in May the first nymphs appear. They complete their pre-imaginal development through 5 stages, each 3-6 days long. The adults of the 1st generation emerge at the end of June; those of the 2nd gene-

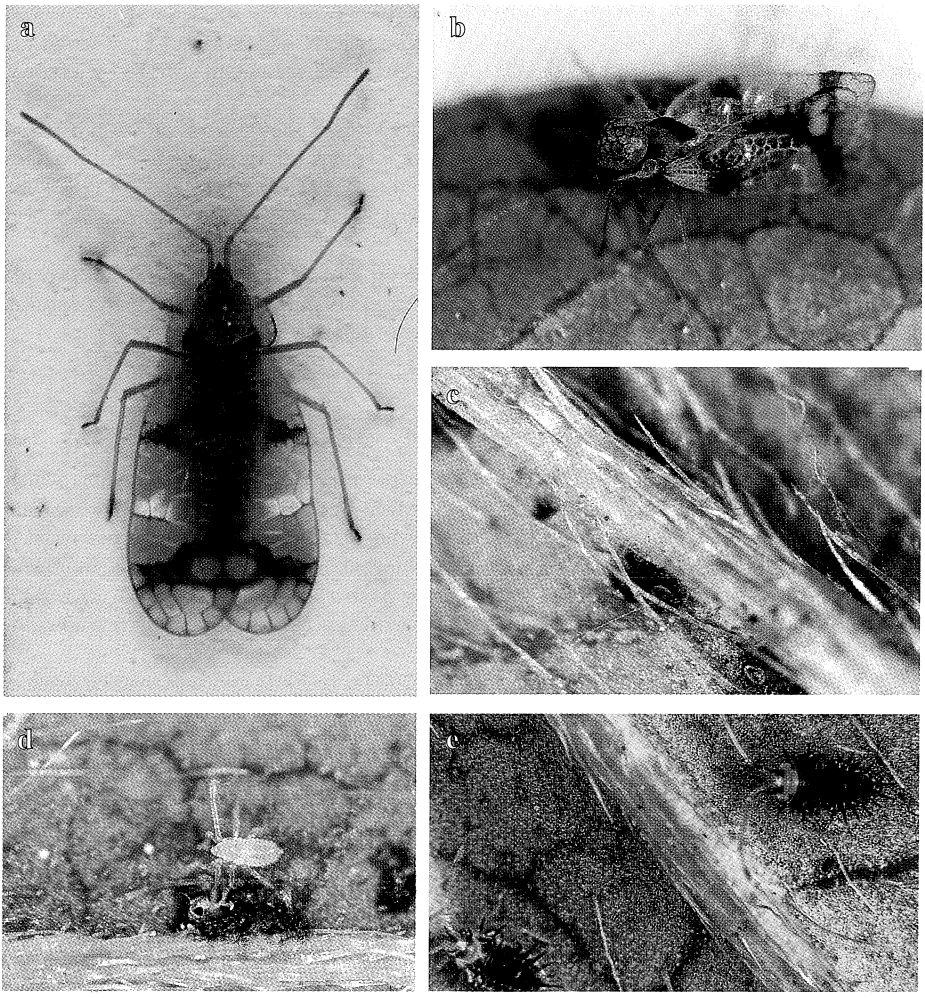

Fig. 1 - *Stephanitis pyrioides* (Scott): adult (a, b); detail of the lower surface of an azalea leaf with two eggs inserted close to the midrib (c); 1st instar nymph (d); 4th instar nymph (e).

ration, at the end of July-beginning of August; those of the 3rd, in late September. However, due to the overlapping of the cycles, it is possible to find nymphs and adults feeding together from June to October.

Among the natural enemies of the lace bug, the Mirid *Stethoconus japonicus* Schumacher, a native – as is *S. pyrioides* – of Japan, is the most promising one in the biocontrol of the pest both in Japan and in the USA (Henry *et al.,* 1986).

At Lucca, adults of *S. pyrioides* (Fig. 1b) were present in colonies on the underside of the

leaves of azaleas and rhododendrons at the end of October (when the species was discovered) and in November. For the entire winter, in the leaves sampled, eggs (Fig.1c) were found inserted obliquely along the midrib on the lower surface with the operculum covered by a brown crust of excrement.

On leaves kept in a thermostatic chamber (at 12:12 h L:D photoperiod and 15:25°C thermoperiod) eggs hatched (Fig.1d) in about two weeks; nymphs (Fig.1e) fed clustered together in groups, dispersing only with difficulty on healthy leaves. The specimens successfully completed their pre-imaginal development. The adults also demonstrated very slow movements, and moved around for short distances.

The pre-imaginal development time, calculated on 50 specimens, lasted an average of 26.16±5.19 days. The longevity of the males was of 15.36±10.52 days; that of the females was of 20.42±11,09 days. The sex ratio was 1:2 in favour of females.

DAMAGE

Damage is that typical of Tingids (Fig. 2a) and it is caused by nymphs and adults which colonise the lower surface of the leaves where they feed by piercing the tissues, sucking the contents of palisade and mesophyll cells. Correspondingly, the upper page becomes mottled with small, decoloured spots (Fig. 2c) which, if feeding continues, converge until the entire leaf take a pale-speckled appearance (Fig. 2b). The lower page takes on a rusty colour marked by brown spots of the insect's excrements (Fig. 2d). In extreme cases, the leaf may dry up completely and drop off.

Research in North America (Klingemann *et al.*, 2000 a, b; 2001) indicates that the damage is appreciable when the injured leaf area exceeds 2%, and that the tolerance threshold is 14% canopy area injury. The damage caused by nymphs at 20°C is only a small fraction (0.43 cm^2), compared to that of adults (6.35 cm^2). Furthermore, direct relationships do not seem to exist between high doses of nitrogen fertilisers and leaf damage (Casey & Raupp, 1999).

CONCLUSIONS

The importance of observed damage and the preliminary results on the biological cycle let us suppose that also in Italy *S. pyrioides* completes several generations/year and can propagate with a population density and damage similar to those of other countries, in particular the USA. At the moment, no entomophagous insect has been isolated on the infested plants, even if investigations are under way to find natural enemies capable of controlling the new introduced Tingid. The mirid species *Stethoconus pyri* (Mella) [often identified as *S. cyrtopeltis* (Flor)] and the anthocorid species of the genus *Orius* Wolff, all well-known predators of the indigenous lace bug *Stephanitis pyri* (Grandi, 1951), could be also adapted to *S. pyrioides* and thus could reduce the severity of damage to an innocuous level.

The damage present in this first breeding-ground in Tuscany is enough to require treatments with insecticides, for the purpose of circumscribing and eradicating the infestation. In any case, a thorough monitoring of azaleas and rhododendrons, in both gardens and nurseries in the various regions of Italy, is to be hoped for, in order to check the diffusion of this new pest.

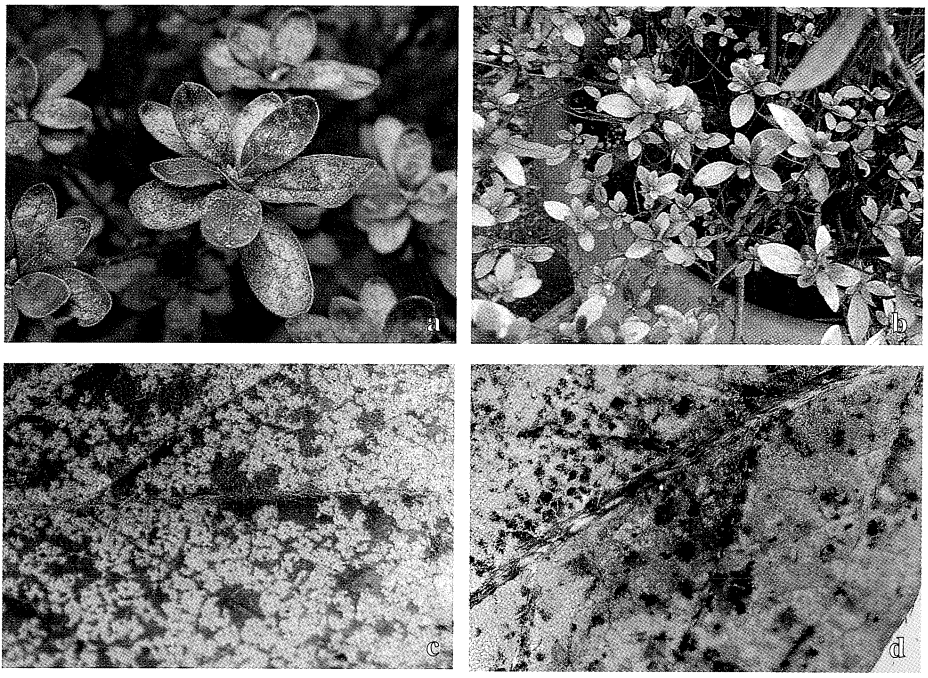

Fig. 2 - Azaleas damaged by *Stephanitis pyrioides* (Scott): detail of the infested leaves (a, b); upper (c); lower surface (d).

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