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Host-plant Range and Relationships in the Italian Thrips Fauna

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On the basis of recent literature references, an approach to the host-plant range of the Italian Thysanoptera species is presented, and comments on the host-plant relationships and feeding activity are provided.

Keywords: Italian thrips fauna, phytophagy.

The Italian thrips fauna includes about 248 described species (Marullo and zur Strassen, 1995, 2002; Marullo and Ravazzi, 2001; De Marzo and Ravazzi, 2002), although these have different origins: about 170 are European species coming from Central and North Europe, 56 are Mediterranean and North-African, and 12 are introduced (Del Bene and Gargani, 2001; Marullo, 2002a). Relating to their host-plant range, data available in the literature are scanty. This is due particularly to the lack of precision in published records for several species, in failing to distinguish between "collecting places" and "host plants". Consequently, in several cases, there is confusion between the occasional hosts on which adults may at times be found, and the real host plants of a species on which larvae are able to develop. Even careful studies on the thrips associated with particular plants may fail to make this distinction. For example, Szénasi et al. (2002) studied the thrips fauna of *Stellaria media* in Hungary and, over several months, recorded very large number of *Aptinothrips rufus* Haliday and *Anaphothrips obscurus* (Müller) from these plants. However, both of these thrips probably breed only on particular species of *Gramineae,* although precise data on their preferred host species is lacking. Thus for these as well as for several other common and widely known thrips species, the specific plant host on which breeding occurs remains unknown. This failure to develop precise information about host-plant relationships creates problems at different levels, such as when attempting to recognise non-crop hosts of pest species and the tospoviruses they transmit, or when looking for patterns of host-plant exploitation that may have some evolutionary significance.

The aim of the present study is to provide an approach to the host-plant range of the Italian thrips fauna and to the relationships/associations between species and plants. Data are referred to literature references, which provide sufficient information to substantiate the possibility that the indicated host relationship is correct. Plant nomenclature is taken from Mabberley (2000).

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Results

Table 1 evaluates the published literature on the host plants and associations of the Italian Thysanoptera species. Records for 120 species, distributed in 44 plant families, are included where the references give sufficient information to substantiate the possibility that the indicated host relationship is correct. However, very few of these records include reference to the presence of larvae. Despite this, it seems possible to draw some comments. Relating to host-plant relationships, the majority of the Italian Thysanoptera is represented by phytophagous species with a variable degree of host specificity: very few are monophagous, as well as to only one host-plant species related. Some are polyphagous, but most are oligophagous. Polyphagous species include "indigenous species" such as *Thrips tabaci* or *Pezothrips kellyanus* that live on wild plants and crops, and have become pest species of economic importance. All the introduced species (i.e. *Heliothrips haemorrhoidalis* and *Frankliniella occidentalis*) have colonized parts of the Italian native flora, and are associated with crops; their polyphagy helps them to spread and to become pests.

Oligophagous species are related to different genera of one plant family. So, for example, species of *Aptinothrips, Chirothrips, Limothrips, Apterygothrips* and *Cephalothrips* are all host-specific for *Gramineae* (including wild and crop species). Furthermore, a species like *Liothrips oleae* can be considered host-specific for plants of family *Oleaceae.* Host-specific thrips species, related to plants of only one genus are, instead, *Thrips verbasci* on *Verbascum* spp., *Gynaikothrips ficorum* on *Ficus* spp., *Pezothrips dianthi* on *Dianthus* spp., and *Thrips simplex* on *Gladiolus* spp. *Monophagous* species, living on only one plant species are, for example, *Thrips sambuci* on *Sambucus nigra, Thrips urticae* on *Urtica dioica, Haplothrips leucanthemi* on *Crysanthemum leucanthemum.*

Data reported in *Table 1* also provide further information on feeding activity of the Italian thrips species including predatory and mycophagous species. Mycophages can feed on fungal hyphae or spores. These species colonize fungi living on dead twigs, or litter or bark of plant, or at base of grasses. They are all included in the sub-order Tubulifera; about 19 species feed on spores whereas about 14 suck hyphal contents (Marullo, 2002a). Unfortunately, not much is known about host-plant preferences of mycophages because only in a few cases have both fungus species and host-plant been identified. Generally, it is possible to assert that mycophagous species are probably mostly host-specific, although in most cases the fungus species involved has not been identified. Predatory thrips species feed on other thrips or small arthropods and some have specific host-plant sites for breeding. For example, *Aeolothrips albicinctus* and *A. cursor* are obligate predators at the base of grasses, whereas *A. melaleucus* and *A. versicolor* are obligate predators on the leaves of forest plants. Further *Aeolothrips* species can feed on pollen grains and thrips larvae (Kirk, 1984), and possibly such feeding activity leads to host-plant specificity.

Table 1

Host-plant range and associations of the Italian thrips fauna

Host-plant family	Host genus	Host association	Thrips species	Reference
Arecaceae (Palmae)	*Chamaerops*	on fungal spores at leaf bases	*Priesneriella mavromoustakisi* (J. C. Crawford)	Ravazzi, 1998
Amaranthaceae	*Amaranthus*	on flowers	*Frankliniella occidentalis* (Perg.)	Marullo, 1991a
Anacardiaceae	*Pistacia*	on flowers	*Aeolothrips gloriosus* Bagnall, *Ceratothrips pallidivestis* (Pr.) *Oxythrips ajugae* Uzel *Thrips major* Uzel *Thrips minutissimus* L. *Haplothrips andresi* Pr.	Vesmanis, 1985
Apiaceae	*Eryngium*	on flowers on leaves	*Aeolothrips collaris* Pr. *Oxythrips ulmifoliorum* (Haliday) *Haplothrips eryngii* Bagn. *Haplothrips hispanicus* Pr.	zur Strassen, 1987
Araceae	*Spathyphyllum*	on leaves	*Bradinothrips musae* (Hood)	Monteiro et al., 1999
Araliaceae	*Hedera* *Hedera*	on flowers on leaves	*Aeolothrips gloriosus* Bagnall *Thrips flavus* Schrank *Thrips major* Uzel *Haplothrips andresi* Pr.	Vesmanis, 1986
Balsaminaceae	*Impatiens*	on leaves	*Echinothrips americanus* Morgan	Marullo and Pollini, 1999
Betulaceae	*Alnus*	on leaves	*Aeolothrips melaleucus* Haliday *Aeolothrips versicolor* Uzel *Neohydatothrips gracilicornis* (Williams) *Thrips alni* Uzel *Thrips major* Uzel *Liothrips pragensis* Uzel *Haplothrips subtilissimus* (Haliday)	Marullo, 1994

Table 1 (cont.)

Host-plant family	Host genus	Host association	Thrips species	Reference
Boraginaceae	*Echium*	on flowers	*Aeolothrips propinquus* Bagnall	zur Strassen, 1987
	Heliotropium	on flowers	*Frankliniella occidentalis* (Perg.)	Marullo, 1991a
Brassicaceae	*Alyssum*	on flowers	*Tenothrips frici* (Uzel),	
			Thrips meridionalis Pr.	
			Thrips tabaci Lind.	
	Brassica	on flowers	*Aeolothrips collaris* Pr.	
			Aeolothrips ericae Bagn.	Vesmanis, 1985
	Dyplotaxis	on flowers	*Aeolothrips intermedius* Bagnall	Marullo, 1995
	Lobularia	on flowers	*Thrips brevicornis* Pr.	
			Thrips major Uzel	
			Thrips tabaci Lind.	
			Haplothrips hispanicus Pr.	
			Isoneurothrips australis Bagn.	
	Solanum	on flowers	*Frankliniella occidentalis* (Perg.)	Marullo, 1991a
			Heliothrips haemorrhoidalis (Bouche)	Marullo, 2003
Caprifoliaceae	*Lonicera*	on flowers	*Pezothrips kellyanus* (Bagn.)	Marullo, 2002b
	Sambucus	on flowers	*Thrips sambuci* Heeger	
	Viburnum	on flowers	*Thrips flavus* Schrank	
			Thrips major Uzel	zur Strassen, 1987
			Cephalothrips coxalis Bagn.	
			Haplothrips andresi Pr.	
			Heliothrips haemorrhoidalis (Bouche)	Marullo, 2003
Caryophyllaceae	*Dianthus*	on flowers	*Pezothrips dianthi* (Pr.)	Marullo, 1998
			Thrips annulatus (Karny)	zur Strassen, 1987
Chenopodiaceae	*Chenopodium*	on flowers	*Frankliniella occidentalis* (Perg.)	Marullo, 1991a
	Atriplex	on flowers	*Haplothrips (Trybomiella) mateolanus*	De Marzo and Ravazzi, 2002
Cistaceae	*Cistus*	on flowers	*Odontothrips ramadei* Brn.	zur Strassen, 2000

Table 1 (cont.)

Host-plant family	Host genus	Host association	Thrips species	Reference
Cyperaceae	*Carex*	on fungal spores at base	*Bolothrips dentipes* (Reuter)	zur Strassen, 1987
	Cyperus sp	on leaves and shoots	*Apterygothrips caricis*	Marullo and Ravazzi, 2001
Compositae	*Achyllea*	on flowers	*Thrips nigropilosus* Uzel	zur Strassen, 1987
	Calendula	on flowers	*Aeolothrips collaris* Pr.	
			Aeolothrips ericae Bagn.	
			Thrips major Uzel	Vesmanis, 1985
(Asteraceae)	*Centaurea*	on flowers	*Ceratothrips hispanicus* (Bagnall)	
	Helichrysum	on flowers	*Ceratothrips discolor* (Karny)	zur Strassen, 1987
	Chrysanthemum	on flowers	*Frankliniella occidentalis* (Perg.),	
			Haplothrips leucanthemi (Schrank)	Marullo, 1998
	Helianthus	on flowers	*Microcephalothrips abdominalis* (D. L. Craw.)	Strapazzon, 1999
Cupressaceae	*Cupressus*	on leaves	*Oxythrips ajugae* Uzel	Vesmanis, 1985
	Juniperus	on leaves	*Liothrips pragensis* Uzel	zur Strassen, 1987
			Ankothrips niezabitowskii (Schille)	Ravazzi 1998
Ericaceae	*Arbutus*	on leaves	*Thrips major* Uzel,	
			Oxythrips ajugae Uzel,	
			Haplothrips andresi Pr.	
	Erica	on flowers	*Aeolothrips ericae* Bagn.	
			Frankliniella intonsa (Trybom)	Vesmanis, 1986
			Ceratothrips ericae (Haliday)	
			Cestothrips karnyi (Bagn.)	
			Thrips major Uzel	
			Haplothrips distinguendus (Uzel)	
			Haplothrips andresi Pr.	
Fabaceae	*Calicotoma, Cytisus*	on flowers	*Aeolothrips collaris* Pr.	
			Aeolothrips ericae Bagn.	
			Aeolothrips melisi Pr.	

Table 1 (cont.)

Host-plant family	Host genus	Host association	Thrips species	Reference
(Leguminosae)	*Genista, Medicago*	on flowers	*Odontothrips citisi* Morison	
			Odontothrips confusus Pr.	
			Odontothrips ignobilis Bagn.	Vesmanis, 1985
	Melilotus, Ononis	on flowers	*Odontothrips loti* (Haliday)	
			Odontothrips meliloti Pr.	
	Galega	on flowers	*Kakothrips robustus* (Uzel)	
	Vicia	on flowers	*Frankliniella intonsa* (Trybom)	
			Frankliniella pallida (Uzel)	
		on leaves	*Neohydatothrips gracilicornis* (Williams)	
	Lotus, Trifolium	on leaves	*Sericothrips bicornis* (Karny)	zur Strassen, 1987
Fagaceae	*Quercus*	on leaves	*Dendrothrips degeeri* Uzel	
			Thrips major Uzel	Vesmanis, 1986
			Haplothrips andresi Pr.	
			Drepanothrips reuteri Uzel	
			Oxythrips uncinatus Pr.	
			Liothrips pragensis Uzel	
			Hoplothrips germanae Bournier	
			Hoplothrips pedicularius (Haliday)	
			Phlaeothrips pillichianus Pr.	Marullo, 1994
		fungi feeders on dead	*Allothrips pillichellus* (Pr.)	
			Bacillothrips longiceps (O. M. Reuter)	
		branches or leaf litter	*Bactothrips buffai* (Karny)	
			Compsothrips albosignatus (O. M. Reuter)	
			Cryptothrips nigripes (O. M. Reuter)	
			Megalothrips delmasi Bournier	
			Megathrips inermis Pr.	
			Megathrips lativentris (Heeger)	Marullo, 1999
			Amphibolothrips knechteli Pr.	Ravazzi, 1998
	Castanea	on dead leaves	*Hoplandrothrips ellisi* Bagn.	Vesmanis, 1986

Table 1 (cont.)

Host-plant family	Host genus	Host association	Thrips species	Reference
Geraniaceae	*Geranium*	on flowers	*Frankliniella occidentalis* (Perg.)	Marullo, 1998
Graminaceae	*Ampelodesma*	on leaves	*Aptinothrips rufus* Haliday	
			Limothrips consimilis Pr.	
			Thrips minutissimus L.	
			Thrips nigropilosus Uzel	
		on fungal spores	*Amphibolothrips grassii* Buffa	
			Bolothrips insularis (Bagn.)	
		at base	*Bolothrips italicus* Mound	
			Hoplothrips pedicularius (Haliday)	
			Pseudocryptothrips meridionalis Pr.	
			Sophionothrips terminalis (Bagn.)	Vesmanis, 1986
	Tordylium	on flowers	*Rhipidothrips gratiosus* Uzel	Vesmanis 1985
	Agropyron, Arundo	on leaves	*Chirothrips manicatus* Haliday	
			Limothrips cerealium Haliday	
	Dactylis	on leaves	*Chirothrips aculeatus* Bagn.	
			Chirothrips pallidicornis Pr.	
			Limothrips consimilis Pr.	
	Hordeum	on leaves	*Limothrips angulicornis* Jabl.	zur Strassen, 1987
		on flowers	*Sitothrips arabicus* Pr.	
			Frankliniella tenuicornis (Uzel)	Marullo et al., 1996
	Triticum	on leaves/flowers	*Limothrips cerealium* Haliday	
			Limothrips denticornis Haliday	
Iridaceae	*Gladiolus*	on flowers/leaves	*Thrips simplex* (Morison)	Marullo, 1998
	Iris	on flowers	*Iridothrips iridis* (Watson)	Ravazzi, 1998
Labiateae	*Calamintha,*			
	Clinopodium	on flowers	*Aeolothrips collaris* Pr.,	
			Ceratothrips discolor (Karny)	
	Teucrium, Stachys		*Thrips atratus* (Haliday)	zur Strassen, 1987

Table 1 (cont.)

Host-plant family	Host genus	Host association	Thrips species	Reference
Lamiaceae	*Rosmarinus*	on flowers	*Aeolothrips collaris* Pr.	
			Aeolothrips ericae Bagn.	Marullo, 1995
			Thrips atratus (Haliday)	
			Thrips.flavus Schrank	
			Thrips tabaci Lind.	
			Tenothrips frici (Uzel),	
			Haplothrips andresi Pr.	Vesmanis, 1985
			Neoheegeria biroi Pr.	zur Strassen, 1987
Liliaceae	*Asphodelus*	on flowers	*Asphodelothrips croceicollis* (Karny)	zur Strassen, 1995
Myrtaceae	*Eucalyptus*	on leaves	*Oxythrips ajugae* Uzel	
			Thrips major Uzel	
			Thrips minutissimus L.	
			Thrips tabaci Lind.	Vesmanis, 1985
Moraceae	*Ficus*	on leaves	*Gynaikothrips ficorum* (Marchal)	Marullo, 1991b
			Heliothrips haemorrhoidalis (Bouche)	Marullo, 2003
Oleaceae	*Fraxinus*	on flowers	*Aeolothrips versicolor* Uzel	Marullo, 1995
		on leaves	*Dendrothrips deegeri* Uzel	Marullo, 1994
	Jasminum	on flowers	*Pezothrips kellyanus* (Bagn.)	Marullo, 2002b
	Olea	on leaves	*Liothrips oleae* (Costa)	Melis, 1961
Pinaceae	*Picea, Pinus*	on leaves	*Neohydatothrips gracilicornis* (Williams)	Marullo, 1990
Piperaceae	*Piper*	on flowers/leaves fruits	*Chaetanaphothrips orchidii* Moulton	Del Bene and Gargani, 2001
Pittosporaceae	*Pittosporum*	on flowers	*Pezothrips kellyanus* (Bagn.)	Marullo, 2002b

Table 1 (cont.)

Host-plant family	Host genus	Host association	Thrips species	Reference
Poaceae (grasses)	*Arundo*	on leaves/flowers	*Aeolothrips collaris* Pr.	
			Aeolothrips gloriosus Bagn.	
			Anaphothrips obscurus (Müller)	
			Haplothrips andresi Pr.	Vesmanis, 1985
		on leaves	*Ankothrips mavromoustakisi* Pr.	Ravazzi, 1998
	Agropyron	from base of clusters	*Amphibothrips grassii* Buffa,	
			Aptinothrips mediterraneus Pr.	
			A.ptinothrips rufus Haliday	
			Chirothrips aculeatus Bagn.	
			Chirothrips manicatus Haliday	
			Limothrips consimilis Pr.	zur Strassen, 1987
		at base of grasses	*Aeolothrips albicinctus* Haliday	
			Aeolothrips cursor Pr.	Marullo, 1995
		at base of grasses	*Bolothrips bicolour* (Heeger)	
			Bolothrips.icarus (Uzel)	
		fungi feeders	*Compsothrips maroccanus* Pr.	Marullo, 1999
			Bolothrips cingulatus (Karny)	Ravazzi, 1998
Polygonaceae	*Rumex*	on leaves/ flowers	*Melanthrips acetosellae* John	Ravazzi, 1998
Ranuncolaceae	*Clematis*	on flowers	*Rubiothrips vitalbae* (Bagnall)	zur Strassen, 1987
Resedaceae	*Reseda*	on flowers	*Melanthrips ficalbii* Buffa	Marullo, 1991b
			Aeolothrips collaris Pr.	
			Melanthrips fuscus (Sulzer)	
			Thrips flavus Schrank	
			Thrips tabaci Lind.	Vesmanis, 1985

Table 1 (cont.)

Host-plant family	Host genus	Host association	Thrips species	Reference
Rosaceae	*Crataegus*	on flowers	*Orothrips priesneri* (Titsch.)	
			Aeolothrips intermedius Bagnall	Marullo, 1991b
			Melanthrips fuscus (Sulzer)	
	Fragaria	on flowers/fruits	*Frankliniella occidentalis* (Perg.)	Marullo, 1991a
	Prunus	on flowers/fruits	*Frankliniella occidentalis* (Perg.)	
			Taeniothrips inconsequens (Uzel)	
			Thrips meridionalis Pr.	
			Thrips major Uzel	
			Thrips tabaci Lind.	Marullo, 2003
	Rosa	on flowers	*Heliothrips haemorrhoidalis* (Bouche)	
Rutaceae	*Citrus*	on flowers/fruits	*Pezothrips kellyanus* (Bagnall)	Marullo, 2002b
			Heliothrips haemorrhoidalis (Bouche)	Marullo, 2003
Salicaceae	*Salix*	on flowers	*Aeolothrips melaleucus* Haliday	
		on leaves	*Hemianaphothrips articulosus* Pr.	
			Haplothrips subtilissimus (Haliday)	Marullo, 1994
Scrophulariaceae	*Verbascum*	on flowers	*Thrips verbasci* Priesner	zur Strassen, 1987
Tamaricaceae	*Tamarix*	on flowers	*Tamaricothrips tamaricis* (Bagnall)	Marullo, 1994
Ulmaceae	*Ulmus*	on leaves	*Oxythrips ulmifoliorum* (Haliday)	zur Strassen, 1987
			Haplothrips subtilissimus (Haliday)	Marullo, 1994
Umbelliferae	*Ferula*	on leaves	*Eryngyothrips ferulae* (Pr:)	Marullo et al., 1996
	Eryngium	on flowers	*Oxythrips ulmifoliorum* (Haliday)	zur Strassen, 1987
Vitaceae	*Vitis*	on flowers/grapes	*Frankliniella occidentalis* (Perg.)	
			Drepanothrips reuteri Uzel	Marullo, 2003

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