

SCIENTIFIC NOTE

Thrips (Thysanoptera: Thripidae, Phlaeothripidae) Damaging Peach in Paranapanema, São Paulo State, Brazil

SILVIA M.J. PINENT^{1,2}, FERNANDO MASCARO³, MARCOS BOTTON¹ AND LUIZA R. REDAELLI²¹Embrapa Uva e Vinho, Rua Livramento, 515, 95700-000, Bento Gonçalves, RS; ²Depto. Fitossanidade - UFRGS Av. Bento Gonçalves 7712, 90540-000 - Porto Alegre, RS; ³Sigma Agropesquisa, 18720-000, Paranapanema, SP*Neotropical Entomology* 37(4):486-488 (2008)Tripses (Thysanoptera: Thripidae, Phlaeothripidae) Danificando Pessegueiro *Prunus persica* (L.) Batsch (Rosaceae) em Paranapanema, SP

RESUMO - Objetivando identificar as espécies de tripses associadas ao pessegueiro e as injúrias causadas, pomares das cultivares Aurora e Tropic Beauty foram monitorados semanalmente, de maio a agosto de 2005, no Distrito de Holambra II, em Paranapanema, SP. Flores e frutos de cada seis plantas por hectare foram amostrados pela técnica da batida. Foram identificadas *Frankliniella occidentalis* (Pergande), *F. schultzei* (Trybom), *F. gardenia* (Moulton), *F. condei* John, *F. insularis* (Franklin) e *Thrips tabaci* Lindeman em Thripidae, e, *Haplothrips gowdeyi* (Franklin) em Phlaeothripidae. *F. occidentalis* foi dominante compondo 55,7% do total de espécimes amostrado. Injúrias leves e severas foram registradas nos frutos.

PALAVRAS-CHAVE: Rosaceae, tisanóptero, espécie-praga, hábito

ABSTRACT - Seeking to identify thrips species associated to peach and the injuries they cause, plants of Aurora and Tropic Beauty cultivars were weekly monitored, from May to August of 2005, in Holambra II district, in Paranapanema, SP. Flowers and fruits from six plants per hectare were sampled by the hitting technique. *Frankliniella occidentalis* (Pergande), *F. schultzei* (Trybom), *F. gardenia* (Moulton), *F. condei* John, *F. insularis* (Franklin) and *Thrips tabaci* Lindeman, in Thripidae, and *Haplothrips gowdeyi* (Franklin), in Phlaeothripidae were identified. *F. occidentalis* was dominant, comprising 55.7% of the total specimens sampled. Slight and severe injuries were registered in fruits.

KEY WORDS: Rosaceae, thysanopteran, pest species, habit

Peach, *Prunus persica* L. Batsch, is the eighth most produced fruit in the world, with about 15.4 millions of tons/year (FAO 2005). Peach represents one of the main temperate fruit tree cultivated in Brazil, where 213,545 tons were produced in the 2003-2004 season (Almeida & Duringan 2006). In São Paulo State this culture has a significant economic importance, mainly in the region of Avaré, Estância Turística de Paranapanema, with 43,636 tons (IBGE 2005).

Worldwide, some thrips species are pests of economic importance in stone fruits. In Brazil, *Haplothrips gowdeyi* (Franklin) and *Frankliniella condei* John were registered in nectarine, in Santa Catarina State (Hickel *et al.* 1997, 1998). Monteiro *et al.* (1999) reported *Frankliniella occidentalis* (Pergande) in leaves and fruits of peach trees in São Paulo State. This is the most important vector species of tomato spotted wilt virus (TSWV) (Moritz *et al.* 2004).

Thrips are minute insects measuring from 0.5 to 15 mm in length (Mound & Marullo 1996), bearing fringed wings and remarkable piercing and sucking mouth parts (Mound 2005). Most of them are phytophagous, but they might

also act as predators, pollinators, fungivorous and even as ectoparasitoids (Mound & Marullo 1996, Mound 2000, Izzo *et al.* 2002, Pinent *et al.* 2002). The identification of thrips species helps injury recognition, and thus the adoption of control measures.

In New Zealand, *Thrips obscuratus* (Crawford) is a key pest in orchards of stone fruits, and constitutes an endemic species of that country (Mound & Walker 1982). The feeding activity of phytophagous thrips may cause discoloring followed by silvering of plant tissues which is solely cosmetic damage. Nevertheless *T. obscuratus* is implicated in the mechanical transport of *Monilinia fructicola* (Winter) that causes the brown rot (Teulon & Penman 1996). In Chile, Ripa *et al.* (2001) registered the presence of *F. occidentalis* causing injuries in terminal buds of nectarine.

The present study aimed to identify thrips species associated to peach in Paranapanema, SP. and characterize the kind of damage they cause.

Between May and August of 2005, thrips were collected weekly in ten flowers and ten fruits from six plants per hectare at each five of the plots by hitting flowers and

fruits on a tray. Dislodged thrips were collected with a fine paintbrush, mounted in microscope slides as proposed by Mound & Kibby (1998) and identified. Peach cultivars sampled were 'Aurora' and 'Tropic Beauty' and the orchards were located at Holambra II district, Paranapanema, SP (23°45'71''S 48°89'28''W). Injuries were visually evaluated and categorized from slight to severe according to their intensity (Fig. 1). The reference slides are available at the BIOECOLAB/UFRGS collection.

Seven thrips species were identified: *Frankliniella schultzei* (Trybom), *F. occidentalis*, *F. gardenia* (Moulton), *F. condei*, *F. insularis* (Franklin), *Thrips tabaci* Lindeman, belonging to Thripidae, and *H. gowdeyi*, to Phlaeothripidae. Thripidae encompasses the majority of species considered as pests; meanwhile, approximately 50% of the Phlaeothripidae feed exclusively on fungi. From a total of 115 individuals, *F. occidentalis* was the most abundant (55.7%). This species is native from California and Mexico, but currently it has been found widely distributed in the Neotropical region. In Brazil, it has been registered since 1993 and nowadays may be found in flowers of ornamental plants and in fruits and leaves of peach trees causing damage (Monteiro *et al.* 1999). Recently the species was registered by Pinent *et al.* (2007) in grapevine, persimmon tree, and strawberry plants in Rio Grande do Sul. In peach trees *F. occidentalis* caused fruit deformation, besides scarring fruit surface (Fig. 1A-B). *F. schultzei* (25.2%) is a South American native thrips that is widely disperse in tropical countries, including those in Africa and Australia. It feeds on flowers and leaves of many plants, and is implicated in TSWV spread also causing brown

spots and fruit deformations (Fig. 1A-C). In some regions of Australia, it is considered an important predator of mite eggs in cotton culture (Wilson *et al.* 1996). In Brazil it is known as a predator of *Polyphagotarsonemus latus* (Banks) e *Tetranychus urticae* Koch mites (Monteiro *et al.* 1999). *F. insularis* (7.0%) is a Barbados native species and widely distributed in tropical countries, including Brazil. It feeds on Leguminosae plants (Mound & Marullo 1996). In Rio Grande do Sul, it was registered in flowers of spontaneously growth plants of Asteraceae, Lamiaceae, Fabaceae and Verbenaceae (Pinent *et al.* 2003, 2005). *T. tabaci* (7.0%) may be found in leaves of asparagus, and of chive and garlic, and in flowers and leaves of soybean, generally causing considerable economic damages. Just four species from this Holarctic genus occur in Brazil (Monteiro *et al.* 2001). Mound (2005) pointed out that this species is losing its pest status, either by the diminishing of its populations or by the weakening of its role as tospovirus vector. *F. gardenia* (2.6%) was described from Mexico and it is known as the species with the most yellow body dwelling in flowers (Mound & Marullo 1996). In the southeast region of São Paulo State, it was found in citrus, damaging flower buds (Monteiro *et al.* 1999). *H. gowdeyi* (1.7%) has probably an African origin, being widely distributed on the tropics. It is recognized as a flower thrips in Caribbean regions. Accordingly to Hickel (2004) it was collected feeding on the ovary of nectarine flowers. Pinent *et al.* (2007) registered it in strawberry plants in Rio Grande do Sul. *F. condei* (0.9%) was described from specimens collected in Ribeirão Preto, SP, in a Bromeliaceae species (Monteiro *et al.* 2001). Hickel & Ducroquet (1998),



Fig. 1. Peach fruits, *P. persica*, injured by thrips. A. Deformations and browning considered as severe injury; B. Peach fruit with severe injury caused by thrips feeding; C. Severe scarring in peach fruit caused by thrips feeding; D. Peach fruit with slight injury caused by thrips feeding; E. Thrips larva on young peach fruit.

in Santa Catarina State, found this thrips causing flowers and young fruit dropping as well as deformations in the surface of nectarine fruits.

The highest infestations were registered for *F. occidentalis* and *F. schultzei*, with more severe damage in fruits, suggesting that threshold levels should be determined. To *F. insularis*, *T. tabaci*, *F. gardenia*, *H. gowdeyi* and *F. condei* slightly injuries were attributed (Fig. 1D). The larvae identification was not possible because different thrips species were found frequently on same flowers indicating that these peach is a host (Fig. 1E).

Acknowledgments

To the peach growers Johanes H. M. Meulman and Henrique J. M. Kievitsbosch for allowing the use of their orchards; to Sigma Agropesquisa for the photographs; to Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) for the financial support and concession of a Post Doc fellowship to the first author (Process nº 155196/2006-5) and a Productivity fellowship to the second and fourth authors.

References

- Almeida, G.V.B. & J.F. Durigan. 2006. Relação entre as características químicas e o valor dos pêssegos comercializados pelo sistema Veiling Frutas Holambra em Paranapanema-SP. Rev. Bras. Frutic. 28: 218-221.
- FAO – Food and Agriculture Organization of the United Nations. Statistical databases. Disponível em <http://www.org/waicent/portal/statistics_en.asp>.
- Hickel, E.R. 2004. Pragas das frutas de clima temperado no Brasil. Guia para a identificação de pragas e danos. Viçosa, UFV/Epagri <http://www.mipfrutas.ufv.br/PragasFruteiras.htm>.
- Hickel, E.R. & J.P.H.J. Ducroquet. 1998. Tripes associados à floração da nectarina em Santa Catarina. An. Soc. Entomol. Brasil 27: 307-308.
- Hickel, E.R., J.P.H.J. Ducroquet & C.S. Matos. 1997. Controle de pragas na floração da nectarina. Agropec. Catarinense 10: 19-23.
- IBGE – Instituto Brasileiro de Geografia e Estatística. Sistema IBGE de Recuperação Automática – SIDRA. Produção Agrícola Municipal. Disponível em <http://www.sidra.ibge.gov.br/bda/acervo/acervo2.asp?e=v&p=PA&z=t&o=10>.
- Izzo, J.T., S.M.J. Pinent & L.A. Mound. 2002. *Aulacothrips dictyotus* (Heterothripidae), the first ectoparasitic thrips (Thysanoptera). Fla. Entomol. 85: 281-283.
- Monteiro, R.C., L. A. Mound & R.A. Zucchi. 1999. Thrips (Thysanoptera) as pest of plant production in Brazil. Rev. Bras. Entomol. 43: 163-161.
- Monteiro, R.C., L.A. Mound & R.A. Zucchi. 2001. Espécies de *Frankliniella* (Thysanoptera: Thripidae) de importância agrícola no Brasil. Neotrop. Entomol. 30: 65-72.
- Moritz, G., S. Kumm & L.A. Mound. 2004. Tospovirus transmission depends on thrips ontogeny. Virus Research 100: 143-149.
- Mound, L.A. 2000. The aquatic thrips *Organothrips indicus* Bhatti (Thysanoptera: Thripidae) in Queensland, and a new species, *O. wrighti*, from tropical Australia. Aust. J. entomol. 39: 10-14.
- Mound, L.A. 2005. Thysanoptera: Diversity and interactions. Annu. Rev. Entomol. 50: 247-269.
- Mound, L.A. & A. K. Walker. 1982. Terebrantia (Insecta: Thysanoptera). Fauna N.Z. 1: 1-113.
- Mound, L.A. & G. Kibby. 1998. Thysanoptera: An identification guide (second edition). Wallingford, CAB, 70p.
- Mound, L.A. & R. Marullo. 1996. The thrips of Central and South America: An introduction (Insecta: Thysanoptera). Florida: Memoirs on Entomology International. Florida, Associated Publishers, 6: 487p.
- Pinent, S.M.J., C.E. da C. Pinent, M. Botton & L.R. Redaelli. 2007. Thrips species (Thysanoptera) on strawberry, persimmon and grape in the Gaúcho Highlands, Rio Grande do Sul State, Southern Brazil. In D. Ullman, J. Moyer, R. Goldbach & G. Moritz. VIII International Symposium on Thysanoptera and Tospoviruses. September 11-15, 2005 Asilomar, Pacific Grove, California, 49p. J. Insect Sci. 7: 28, insectscience.org/7.28.
- Pinent, S.M.J., H.P. Romanowski, L.R. Redaelli & A. Cavalleri. 2005. Thysanoptera: Plantas visitadas e hospedeiras no Parque Estadual de Itapuã, Viamão, RS, Brasil. Iheringia, Ser. Zool. 95: 9-16.
- Pinent, S.M.J., H.P. Romanowski, L.R. Redaelli & L.A. Mound. 2003. Thrips species (Thysanoptera) collected at Parque Estadual de Itapuã, Viamão, RS, Brazil. Neotrop. Entomol. 32: 619-623.
- Pinent, S.M.J., L.A. Mound & T.J. Izzo. 2002. Ectoparasitism in thrips and its possible significance for tospovirus evolution. In Thrips and Tospoviruses: Proceedings of the 7th International Symposium on Thysanoptera. Reggio Calabria, Italy, 2-7 July 2001, CD-ROM, 273-276p.
- Ripa, R.S., F.A. Rodrigues & M.F.H. Espinoza. 2001. El thrips de California em nectarinos y uva de mesa. Boletín Inia 53: 100p.
- Teulon, D.A.J. & D.R. Penman. 1996. Thrips (Thysanoptera) Seasonal flight activity and infestation of stonefruit in Canterbury, New Zealand J. Econ. Entomol. 89: 722-734.
- Wilson, L.J., L.R. Bauer & G.H. Walter. 1996. Phytophagous thrips are predators of two spotted spider mites (Acari; Tetranychidae) on cotton in Australia. Bull. Entomol. Res. 86: 297-305.

Received 15/V/07. Accepted 29/IV/08.