NEW METHODS IN RESEARCH ON BARK-DWELLING THRIPS (*THYSANOPTERA*) IN OAK WOODS (SW SLOVAKIA)

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Dubovský, M., Masarovič, R., Fedor, P. J.: NOVÉ TRENDY VO VÝSKUME KORTICIKOLNÝCH STRAPIEK (*THYSANOPTERA*) V DUBOVÝCH LESOCH JUHOZÁPADNÉHO SLOVENSKA

Strapky obývajúce kôru drevín sú pomerne opomínanou súčasťou biocenotického konexu a predstavujú značne neznámu skupinu korticikolných článkonožcov. Okrem niekoľkých faunistických údajov zo Slovenska, prípadne ďalších európskych krajín (napr. Pelikán 1990, 1992, 1995, Zur Strassen 1986, Majzlan et Fedor 2003, Dubovský et Masarovič 2007) nebola dodnes zverejnená žiadna komplexná štúdia zaoberajúca sa taxocenózami korticikolných *Thysanoptera*. Strapky spolu s ostatnými článkonožcami boli sledované pomocou kmeňového fotoeklektora v troch dubových porastoch Martinského lesa (okres Senec). V súčasnosti sa v lokalite rozvinulo izolované refúgium rastlinného spoločenstva Aceri tatarici – Quercetum, Zólyomi, 1957 s určitou mierou lesníckeho manažmentu. Kmeňový fotoeklektor, ktorý funguje na princípe pozitívnej fototaxie a negatívnej geotropie, je vhodný na zber bezstavovcov žijúcich na kmeňoch stromov (Fedor *et al.* 2007). Celkovo bolo nazbieraných viac ako 53,000 článkonožcov z 23 systematických skupín, z ktorých 858 jedincov tvorili *Thysanoptera*. Z predbežných výsledkov štúdie vyplýva, že korticikolné strapky v podmienkach stredoeurópskeho nížinného dubového lesa preferujú južne orientované časti kmeňov a vyskytujú sa hlavne vo výške 1 m nad zemou. Populácie deklarujú typickú sezónnu dynamiku s maximom na konci mája. Výskum bol finančne podporený projektom VEGA 1/4339/07.

Kľúčové slová: *kmeňový fotoeklektor, lesy, kôra, korticikolné Thysanoptera*

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The paper presents preliminary data on activity of corticicolous thrips (*Thysanoptera*) and testing a new method of tree photoeclectors. In past this approach was used to sample arthropods by Nord et Lewis (1970). Since that time it has been used for monitoring of arboricolous arthropods mainly in tropical ecosystems (Adis 1988).

The first national check-list of *Thysanoptera* lists 151 species in Slovakia (Fedor *et al.* 2003). Amongst them 17 species may be considered as corticicolous (Masarovič 2007). Some sporadic data on bark-dwelling thrips in Slovakia were published within more complex research (e.g. Vidlička 1987, Majzlan et Fedor 2003). Several faunistic notes on this matter refer to Fedor *et al.* (2007b).

This paper refers to the area of Martinský les wood which is a rare isolated refuge of natural oak wood stands (*Aceri tatarici-Quercetum,* Zólyomi 1957) situated in lowland. With its relatively small size of 445.60 ha it is located in the vicinity of Senec (SW Slovakia) (48º16´ N, 17º22´ E; Databank of the fauna of Slovakia: 7770, 185 m a. s. l) and represents a unique locality with almost all the oak species occurring in Slovakia. Since 2004 it has been proposed as a special conservatory area.

Site A represents a 110 year old approx. 10 ha large seminatural oak forest (*Aceri tatarici –Quercetum* Zólyomi, 1957) covered particularly by *Quercus cerris, Quercus robur, Quercus fraineto, Quercus petraea agg., Ulmus minor,* with diverse undergrowth of *Acer campestre, Lithospermum purpurocaeruleum, Dictamnus albus. Ulmus minor, Cornus mas, Melica uniflora, Ligustrum vulgare*. Average perimeter of the studied trunks was 94.5 cm. Site B may be defined as the similar seminatural oak forest, 90 years of age and 8.71 ha of size. Average perimeter of the studied trunks was 95 cm. Site C represents a 20 year old, 9.74 ha large oak (*Quercus petrea*) monoculture with sporadic occurrence of *Robinia pseudoacacia* and with no undergrowth. Average perimeter of the studied tree trunks was 64 cm. All the sampling sites are in a close mutual contact.

Bark-dwelling thrips and other corticicolous arthropods were sampled by tree photoeclectors which are based on a principle of positive phototaxy, negative geotropism and outline orientation of arthropods (Majzlan et Fedor 2003). The traps (Figure 1) were constructed in accordance with Fedor *et al.* (2007 a). 12 of them were exposed at the height of 1 m, 3 traps of 2 m and 3 m and 1 trap at the height of 4 m above the ground during the vegetation period 2007. The material was collected in 3 week intervals. The collected thrips were analysed according to the standard methods used in thysanopterology and stored in Canada balsam on microscopic slides (Levis 1973, Sierka et Fedor 2004).

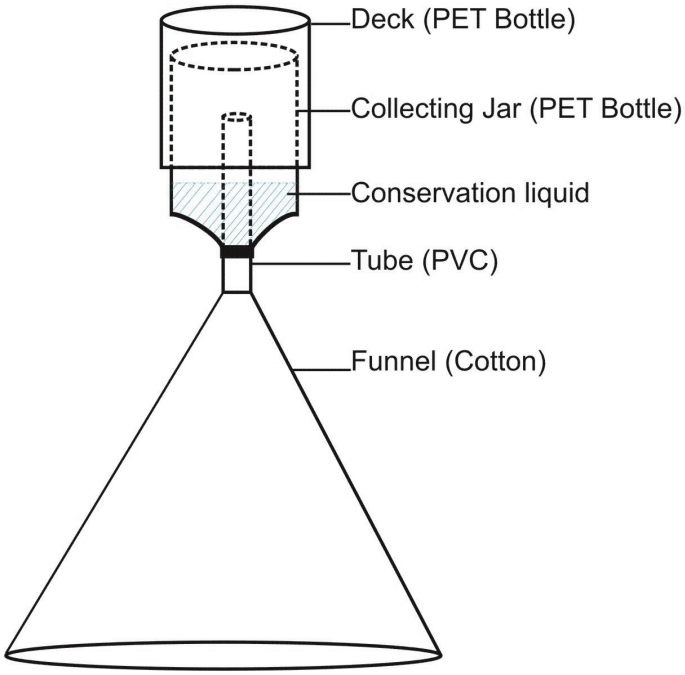

Figure 1 The tree photoeclector used to sample bark-dwelling thrips

In total 53, 927 arthropods being classified into 23 groups (*Acarina, Collembola, Hymenoptera, Auchenorhyncha, Diptera, Coleoptera, Thysanoptera, Araneae, Heteroptera, Lepidoptera, Sternorrhyncha, Dermaptera, Blattodea, Psocoptera, Diplopoda, Isopoda, Orthoptera, Chilopoda, Pseudoscorpionidea, Opilionidea, Neuroptera, Mecoptera, Raphidoptera*) (listed according to their dominance) were sampled in the tree photoeclectors.

Totally 858 specimens of *Thysanoptera* were collected. Such the quantity may be undisputedly considered as relatively high, especially when compared with the value from Finland (156 individuals of thrips from 40 trunk window traps) (Kettunen *et al.* 2005). However their research was focused on saproxilic species with traps installed on decaying trees.

Most of the collected thrips come from the 110 year old stand (314 individuals) (site A). The lower quantity refers to the site B (274 ind.) as well as site C (272 ind.). Despite we installed one more trap at the site A, there were only 19 specimens captured in. Average abundance of thrips in one trap during the whole period reached a similar value at all the sites (at site A 45, site B 46 and site C 45 thrips), however the research declares significant differences in quantity according to vertical distribution of *Thysanoptera* (57 ind. at the height of 1 m, 24 ind. at 2 m and 47 ind. at the height of 3m). The average number of thrips in one sample was approximately 6 specimens during the whole vegetation period.

From the abundance dynamics point of view thrips declare a one-peak curve with the maximum in the period of May 11 – June 2, 2007 (Figure 2). According to our research *Thysanoptera* definitely prefer southern part of bark (Figure 3) most probably due to its highest sun exposition.

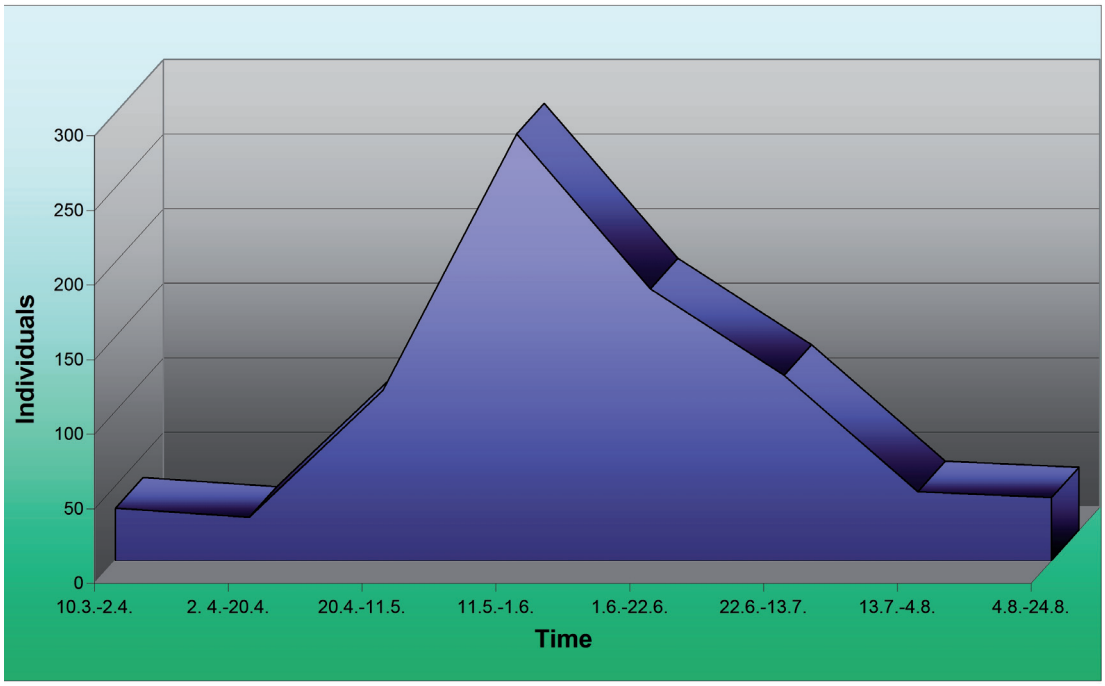

Figure 2 Abundance dynamics of thrips during the vegetation season 2007

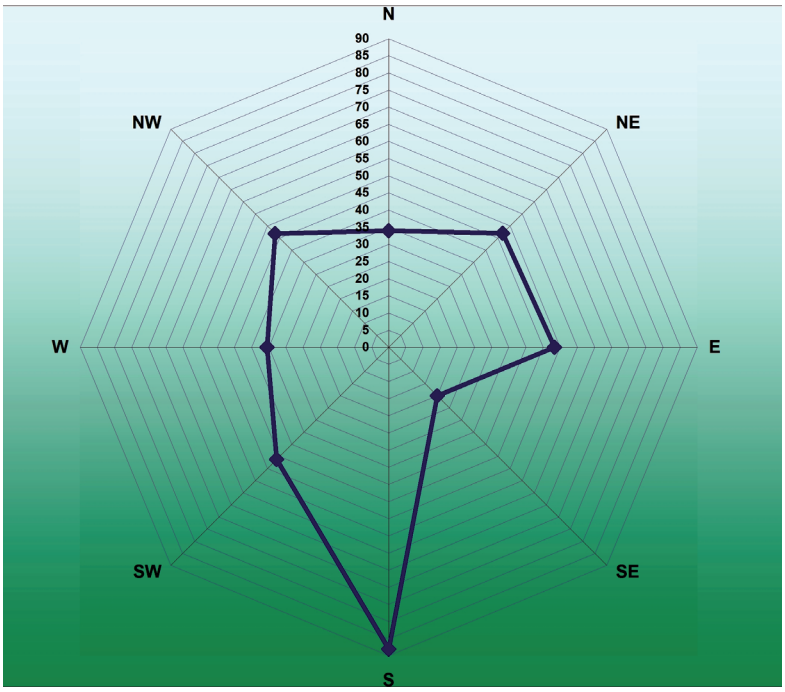

Figure 3 Preference of cardinal directions by thrips during the vegetation season 2007

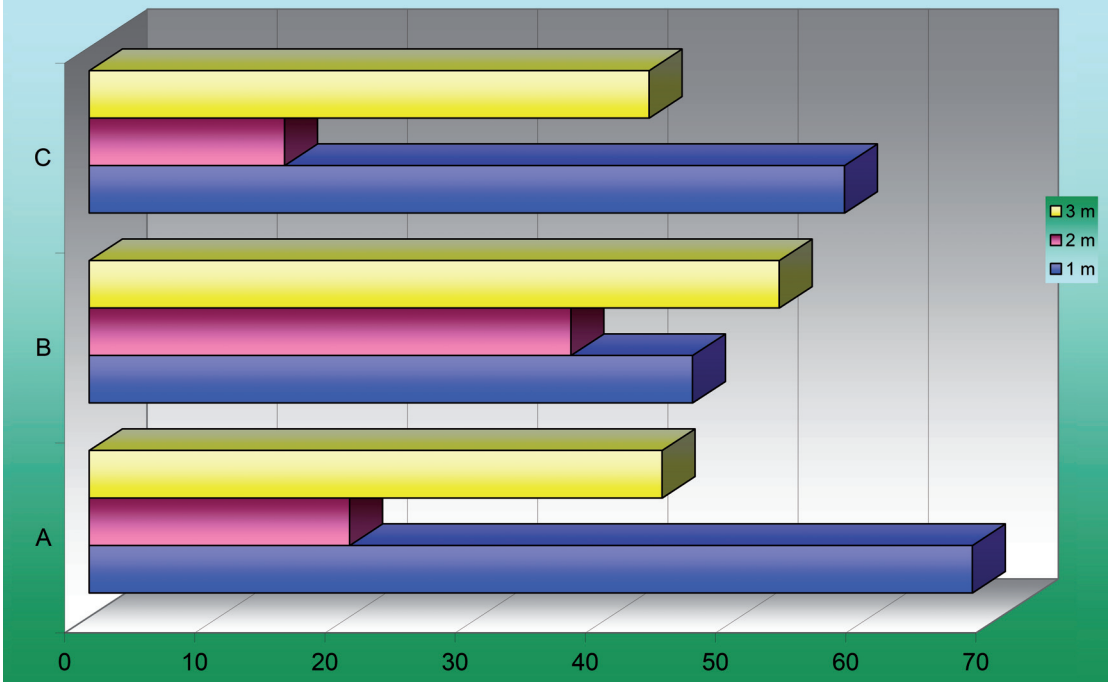

Figure 4 Average abundance of thrips in vertical stratiphication during the vegetation season 2007

In accordance with vertical stratiphication of corticicolous communities of *Thysanoptera* (Figure 4) most of the specimens were recorded at the height of 1 m at the site A (68 ind.) and C (58 ind.) and at the height of 3 m at the site B (53 ind.). The lowest abundance refers to the height of 2 m what hints at low equitability and proportionality in vertical distribution. According to Vidlička (1987) or Majzlan et Fedor (2003) thrips were more abundant in traps installed approx. at 1 m than in higher photoeclectors. This actually corresponds with Speight (2005) that many external bark insects are not evenly distributed over the whole trunks and very often tend to be concentrated in certain regions.

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