Field Tests with Sex Attractants of *Diachrysia chrysitis* and *D. tutti* (Lepidoptera: Noctuidae) at Several Sites in Hungary

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Sex attractants for the sibling taxa *Diachrysia chrysitis* (L.) s. str. and *D. tutti* (Kost.) were field tested on 9 sites in Hungary. Catches with the two already described attractant blends, Z-5-10:Ac/Z-7-10:Ac in ratios 10:1 and 2:100, were similar to earlier results obtained in areas more to the west, *chrysitis* s. str. type males responding to the 10:1 while *tutti* type males to the 2:100 ratio. Substantial *chrysitis* s. str. catches were also obtained by the intermediate 1:1 blend. On all 9 sites the two taxa were co-occurring.

Mixtures of (*Z*)-5-decenyl and (*Z*)-7-decenyl acetates (Z-5-10:Ac; Z-7-10:Ac) in two distinct ratios attract males of two morphological variations of *Diachrysia chrysitis* (L.) s.l., corresponding to the two uncertain taxa *D. chrysitis* s. str. and *tutti* (Kost.) [1].

In extensive field tests covering the better part of Central Europe the two taxa co-occurred at all sites, except in special xerotherm localities, higher mountain regions, and some areas of Northern Germany, where only *chrysitis* s. str. was captured [1]. The present trapping study was initiated in Hungary in order to further clarify the geographic distribution of the two taxa on more eastern sites, and to compare their responses on these sites to the known sex attractant blends. Since according to Kostrowicki [2] *tutti* is more dominant in eastern localities, it was hoped that a site with only the taxon *tutti* present would also be discovered.

Field Trapping

Both synthetic compounds were obtained from S. Voerman (Wageningen, The Netherlands). For field tests the required amounts of the compounds were applied in hexane solutions to 1×1 cm pieces of red rubber tubing (commercial product, obtained from Borászati Szaküzlet, Budapest, Hungary). Triangular traps [3] manufactured from transparent polyethylene sheet containing different baits were set at a distance of 15–20 m from each other on lower branches of trees or bushes, at ca. 1 m from the ground. Moth captures were recorded, sticky layers were changed to new ones, and the position of traps was exchanged once or twice weekly. Baits were renewed at roughly monthly intervals.

Captured moths were separated according to the wing pattern scale as in an earlier study [1] (see also Fig. 1).

Fig. 1. Wing pattern scale of male *Diachrysia tutti* and *D. chrysitis* from [4].

Sites

Location of sites is represented on Fig. 2.

Short description of sites:

Aszód (Pest county, May 28–October 10, 1985): a hilly area. Traps were set up at the edge of a mixed oak forest. Elevation: *ca.* 200 m above sea level.

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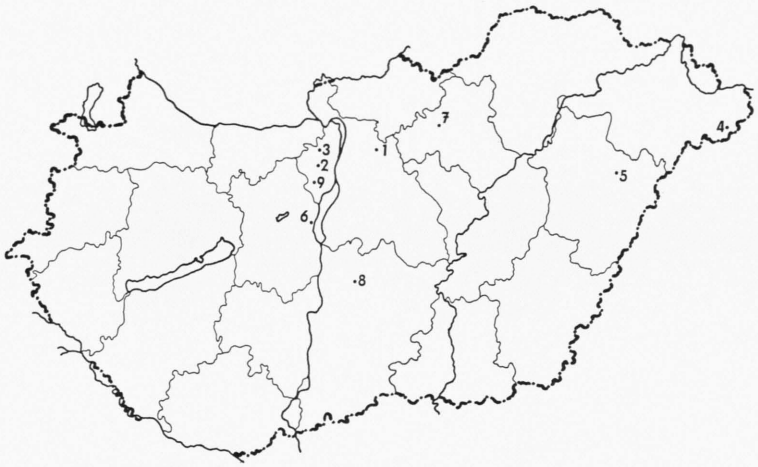

Fig. 2. Location of sites where sex attractant traps for catching male *D. chrysitis* and *tutti* were operated. 1 = Aszód, 2 = Budakeszi, 3 = Budapest, 4 = Csenger, 5 = Debrecen, 6 = Ercsi, 7 = Gyöngyössolymos, 8 = Szabadszállás, 9 = Törökbálint.

Budakeszi (Pest county, July 27–August 6, 1986): commercial vineyard on platoo of *ca.* 250 m elevation above sea level.

Budapest (May 17–June 5, 1985): hilly backyard garden area, with small plots of different kinds of vegetables and randomly spaced fruit trees. A mixed oak forest was in the vicinity, at about 100 m. Elevation: *ca.* 250 m above sea level.

Csenger (Szabolcs-Szatmár county, August 6–14, 1986): shrubby vegetation on the river flats along the river Tisza. Elevation: *ca.* 100 m above sea level.

Debrecen (Hajdú-Bihar county, August 13–23, 1986): flat backyard garden area with various vegetables. Elevation: *ca.* 100 m above sea level.

Ercsi (Fejér county, May 17–October 14, 1985; two attractant blends; July 27–August 6, 1986; three attractant blends): alfalfa field on the flats beside the Danube. Elevation: *ca.* 100 m above sea level.

Gyöngyössolymos (Heves county, May 28–October 10, 1985): at the southern slopes of the Mátra mountains. Traps were set up in shrubby vegetation bordering an oak forest, pear orchard and vineyards. Elevation: *ca.* 250 m above sea level.

Szabadszállás (Bács-Kiskun county, June 3–October 3, 1985): sandy, arid plain, with some vineyards, patches of original *Juniperus/Populus* vegetation were nearby. Elevation: *ca.* 120 m above sea level.

Törökbálint (Pest county, May 21–June 15, 1985): Traps were set up in the shrubby vegetation bordering a peach orchard in the hills. A mixed oak forest was also nearby. Elevation: *ca.* 200 m above sea level.

On sites where only the two ratios 10:1 and 2:100 were tested, one trap of each ratio was operated. On sites where apart from these two the intermediate 1:1 ratio was also tested, treatments were replicated 3 times.

Results

On all sites where only the two attractant ratios 10:1 and 2:100 Z-5-10:Ac/Z-7-10:Ac were tested, significant amounts of males were caught by both blends (Fig. 3). The blend 10:1 predominantly captured wing pattern type 4–5 (= *chrysitis* s.str.), while the blend 2:100 mostly wing pattern type 1–2 (= *tutti*) males. However, considerable percentages of wing pattern type 3 males also were caught by both blends. On all sites similar numbers were caught by the two blends, with the possible exception of Szabadszállás, where only 5 males were caught at the 10:1 blend, and 17 at the 2:100 blend. This low total number caught on this site was possibly due to the xerotherm biotop.

On 5 more sites an intermediate ratio of 1:1 was also tested, beside the above two blends (Fig. 4). In these tests the 10:1 and 2:100 ratio blends behaved in a similar way as before, attracting predominantly males of wing pattern type 4–5, or 1–2, respectively. Captures of the intermediate 1:1 ratio closely re-

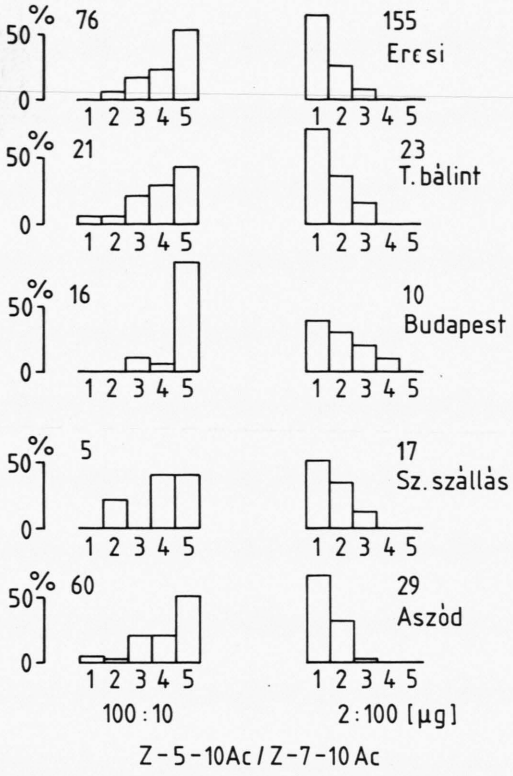

Fig. 3. Percentage captures of male *D. chrysitis* and *tutti* according to wing pattern scale 1–5 in traps baited with 10:1 or 2:100 ratios of Z-5-10:Ac and Z-7-10:Ac on different sites in Hungary. Numbers above each diagram show total number of males caught on that site by the respective blend ratio.

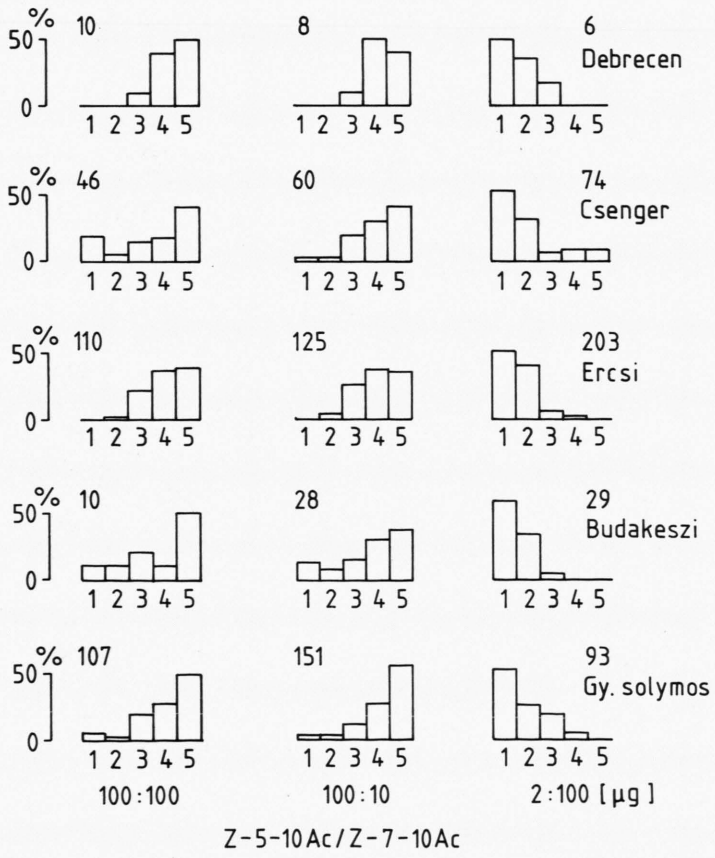

Fig. 4. Percentage captures of male *D. chrysitis* and *tutti* according to wing pattern scale 1–5 in traps baited with 10:1, 1:1 or 2:100 of Z-5-10:Ac and Z-7-10:Ac on different sites in Hungary. Numbers above each diagram show total number of males caught on that site by the respective blend ratio.

sembled those of the 10:1 blend both as regards to distribution of wing pattern types (mainly 4–5), and to total numbers caught on each respective site. Again, on all sites more or less similar numbers were caught by all of the three different blends.

Concluding Remarks

Since both *chrysitis* s. str. and *tutti* type males were captured on all sites, and in a more or less similar abundance, in this study we failed to locate a site where only *tutti* type males (wing pattern type 1–2) were present.

Catches by the two already described attractant blends (ratios 10:1 and 2:100) in this study closely resembled earlier results obtained in areas more to the west [1]. In this study much more substantial catches were obtained by the intermediate 1:1 blend, as reported before [1]. However, in some further unpublished tests in Germany E. Priesner (pers. comm.) also observed larger catches in this intermediate blend ratio.

Comparison of catch rates and wing pattern types on the 5 test sites (Fig. 4) suggests that the local *chrysitis* s. str. males were equally responsive to a 10:1 and a 1:1 ratio of the two attractant components.

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