Semi-chemical-baited traps for scarab pests damaging fruits and blossoms

Miklós Tóth1, Erzsébet Voigt1, Zoltán Imrei1, István Szarukán1, Dénes Schmera1, József Vuts1, Krisztina Harmince2, Mitko Subchev4 and Ivan Sivcev5

1 Plant Protection Institute, Hungarian Academy of Sciences, Budapest, POB 192, H-1523 Budapest, e-mail: sivcevi@phyto.btk.led.hu; tel. (+36-1) 381-9631
2 Research Institute for Forestry and Ornamentals, Budapest, Park u. 2, H-1222, Hungary
3 Debrecen University, Centre for Agricultural Science, Debrecen, Béke tér 116., H-4002, Debrecen
4 Zoology Institute, Hungarian Academy of Sciences, Sofia, Red Cox Draszdokhíd 1, RO-3000, Bulgaria; Institute for Plant Prot. & Ecosystems, POB 5370, S-1080 Rep. of Tbilisi and Ermis Gora

There are several scarab pests in Europe which may cause significant damages to orchard, vineyards or ornamental plants. In case of several of these species damage caused by adult beetles is more important than larval damages. Based on the study of the chemical communication of several such scarab pests, our laboratory developed semi-chemical-baited traps for the capture of the adult beetles.

Anomala spp.

Traps developed for Anomala vitis/A. dubia (Coleoptera, Scarabaeidae, Rutelinae) contain (E)-2-undecan-1-ol which is a powerful male attractant for both species (Tóth et al., 1994). Traps for A. solida are baited with the sex attractant (E)-2,7,11- tricosatrien-1-ol (Tóth et al., 2005). The adults of A. vitis feed on the reproductive parts of flowers and may cause significant damage to blossoming orchard trees and many other plants. Also, severe damage on ripening strawberries and similar berry fruits have been reported in redbud years.

Epicometis (Tropinota) hirta

A synthetic floral attractant has been developed and optimized for catching Epicometis (Tropinota) hirta (Coleoptera, Scarabaeidae, Cetoniinae), as the mixture of cinnamon alcohol and (-)-2-nonen-1-ol which is a powerful male attractant for both species (Tóth et al., 2005). Traps for E. hirta are baited with the sex attractant (-)-2-nonen-1-ol anethol (Tóth et al., 2005). A synthetic floral attractant has also been optimized, which attracts Epicometis solida (Col. Scarabaeidae). These are known flower devastators and may cause in drought years also severe fruit damage to ripening fruits (i.e. peaches).

Cetonia a. aurata, Potosia cuprea and Oxythyrea funesta

A multi-component floral attractant (Jasminum nudiflorum, 3,5-dimethyl cyclopentane and 1,3,5-pentatrien-1-ol) has been optimized, which attracts Cetonia a. aurata. Potosia cuprea and Oxythyrea funesta (Coleoptera, Scarabaeidae) has been optimized, which attracts Cetonia a. aurata. Potosia cuprea and Oxythyrea funesta (Coleoptera, Scarabaeidae) (Tóth et al., 2005). These are known flower devastators and may cause in drought years also severe fruit damage to ripening fruits (i.e. peaches).

References


Mass trapping

Pheromone trapping experiments to control A. vites and A. dubia resulted in keeping the fruit damage levels below the economic threshold in peach orchards (Voigt and Fahle, 2000, 2002, 2003). Mass trapping for C. aurata (strawberries) or C. aurota and E. hirta in peach trees was capable of inducing fruit damages to an acceptable level (Sivcev et al., 2005, Voigt et al., 2005).

A possible explanation of the surprisingly successful mass trapping trials for both rutelins and cetonins may be that in contrast to the widely used pheromone traps for moth spp., in this case, since the traps are baited with chemical cues, the adults are captured in or near the traps. Moreover, A. vitis feed on the reproductive parts of flowers and may cause significant damage to blossoming orchard trees and many other plants. Also, severe damage on ripening strawberries and similar berry fruits have been reported in redbud years.

Important role of Anomala spp. in Europe.

In case of cucurbit species varying colour preferences were observed. Traps combining both the chemical attractants plus the most favourable visual cues (preferred colour) were most efficient in capturing the respective target species (Tóth et al., 2005).

Fig. Catch of beetles in traps of different colour, with or without chemical bait. Red: yellow, Syrphus scorpioides yellow, Tropinota hirta, Yellow. (After Tóth et al., 2005)