MULTz - A NON-STICKY TRAP DESIGN SUITABLE FOR THE MONITORING OF SOME JEWEL BEETLES IN EUROPE INCLUDING EAB

Zoltán Imrei¹, Zsófia Lohonyai^{1,2}, Gábor Bozsik¹, Denis Demidko³, Lidiya Seraya⁴, Eszter Matula¹, József Vuts⁵, Philip 🐚 Gould⁵, József Fail², Michael Birkett⁵, Yuri Baranchikov³, Peter Silk⁶, Michael Domingue⁷, Miklós Tóth¹



p=0.0061

- ¹ Plant Protection Institute, CAR HAS, H-1525, P.O. Box 102, Budapest, Hungary
- ² SZIU, Faculty of Horticultural Science, H-1118, Ménesi str. 44., Budapest, Hungary
- ³ Sukachev Institute of Forest FRC KSC, Russian Academy of Sciences, Krasnoyarsk, Russia
- ⁴ Institute of Phytopathology, B. Vyazemy, Moscow District, Russia
- ⁵ Biointeractions and Crop Protection Department, Rothamsted Research, Harpenden, UK,
- ⁶ Canadian Forest Service, Natural Resources Canada, Fredericton, Canada
- ⁷ Department of Entomology, Kansas State University, Manhattan KS, US e-mail: ztimrei@gmail.com

A light, easy to handle and maintain non-sticky trap type could facilitate monitoring and detection of Agrilus planipennis Fairmaire (EAB) (Buprestidae, Coleoptera) and other jewel beetle populations. Sticky materialfree jewel beetle catches are highly advantageous because there is no need to clean them with chemicals before determining to species.

We carried out a series of trapping experiments in an ash (Fraxinus pennsylvanica Marshall) forest belt, an oak forest (Quercus petraea [Matt.] Liebl.) to test our latest experimental non-sticky trap designs.





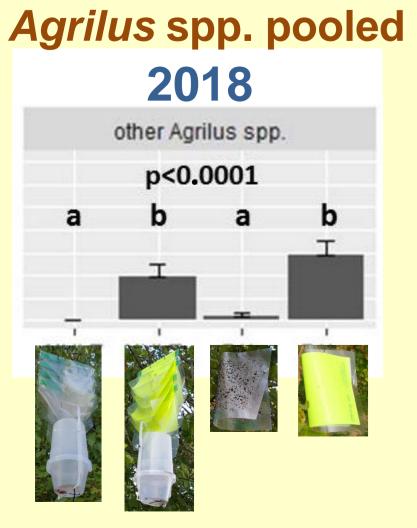


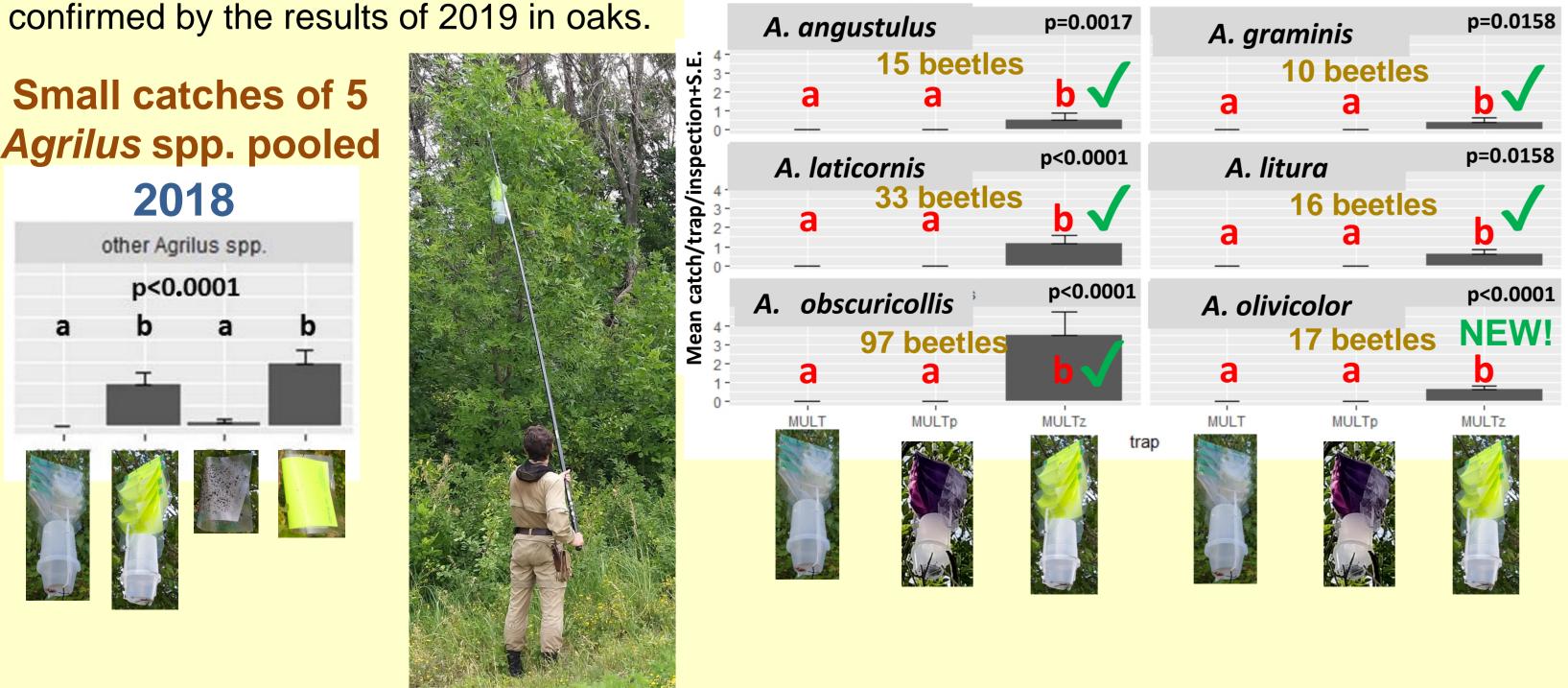
Our first results suggested that the light green MULTz trap design may be suitable for catching a multitude of buprestid species in Europe, including the ash-related A. planipennis and A. convexicollis Redtenbacher, some of the European oak-related Agrilus species and the cypress jewel beetle, Ovalisia festiva (Linnaeus).

Ash (*Fraxinus*) related Oak (Quercus) related Agrilus obscuricollis 2018 Agrilus graminis 2018 Total catch: 1.2 Agrilus convexicollis **52** beetles 68 beetles 1 P<0.0001 p < 0.0001^{0.8} **Total catch:** 26 beetles p<0.0001 Agrilus laticornis Agrilus angustulus 30 beetles 31 beetles p<0.0001^{0.6} p=0.0022Oak (Quercus) related

Small catches of 5

The trap performance in 2018 was





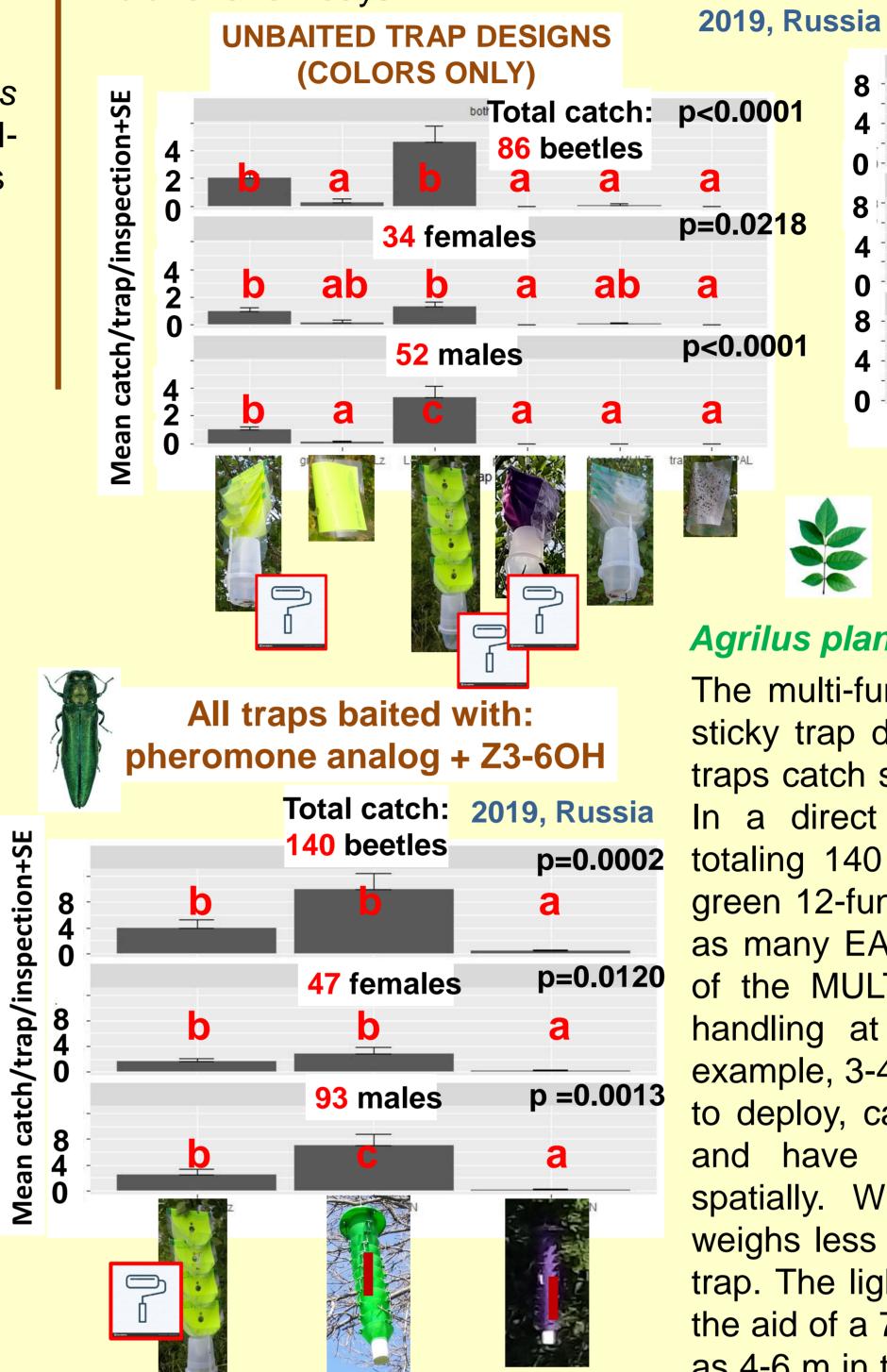
2019

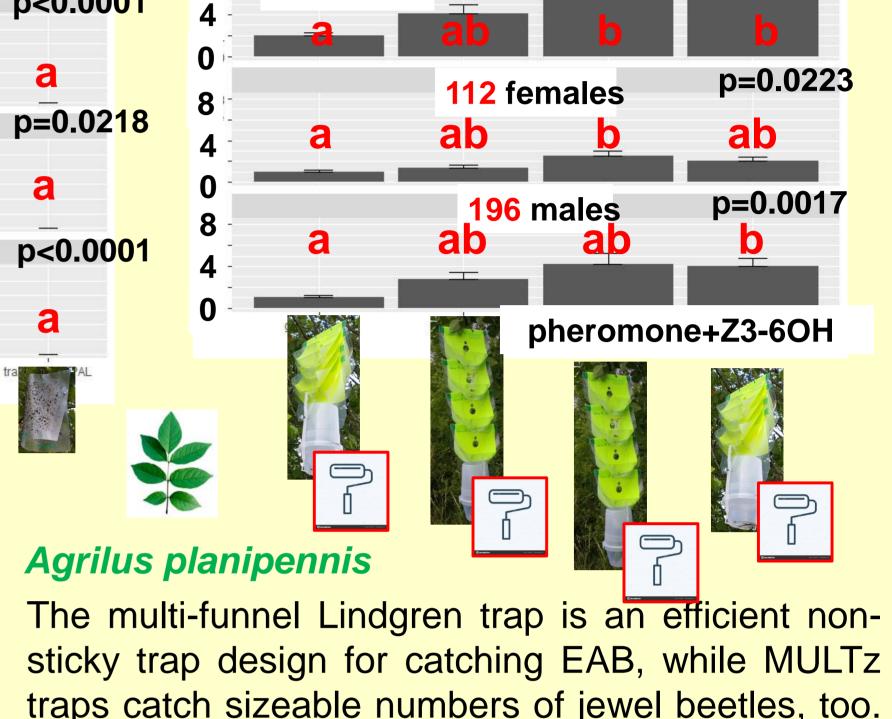
Trap handling with a pole

Both the sticky and multi-funnel traps were suspended by a piece of wire attached to an "R"-shaped rigid metal wire hook (about 80 g), suitable for hanging on the higher branches of trees. A 20 cmlong rigid wire hook was fixed at right angles to the end of a 7 m-long pole (carbon-fibre telescopic fishing stick). With this pole, we were able to easily hang the traps at a height of about 4 - 5 m, where the population density of flying jewel beetles was expected to be greater.

Agrilus planipennis

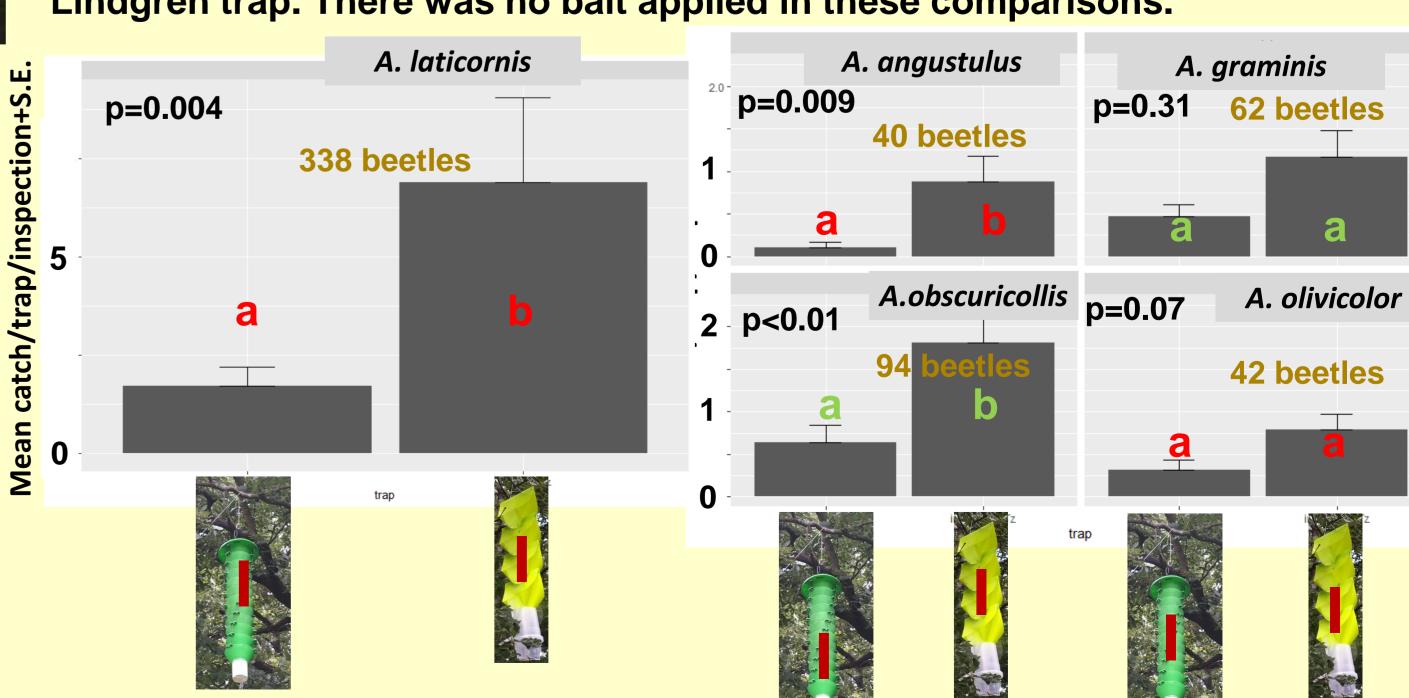
In all colors of MULT trap types, all over the EAB experiments fresh ash leaves were placed to retain beetles in the catch container. Most beetles were alive when removed from the traps suitable to be used for other experiments. For monitoring purposes we need the beetles dead the use of an insecticide spray is recommended, so the beetles caught are intact and in a good condition for determination compared to sticky or fluid based traps where the beetle bodies are often broken or fall apart when kept in the fluid for a few days. **UNBAITED** vs pheromone+Z3-6OH





sticky trap design for catching EAB, while MULTz traps catch sizeable numbers of jewel beetles, too. In a direct comparison of the two trap types, p=0.0002 totaling 140 EAB over the experiment in Russia, green 12-funnel Lindgren traps caught about twice as many EAB. The lower absolute catch numbers of the MULTz traps are compensated by easier handling at a much lower estimated cost. For example, 3-4 MULTz traps would still cost a fraction to deploy, catch a higher total number of beetles, and have the advantage of being dispersed spatially. What is more, the MULTz trap type weighs less than one third of a 12-funnel Lindgren trap. The lighter MULTz trap is easy to place (with the aid of a 7 meter long pole) on branches as high as 4-6 m in the canopy (without the use of ropes or climbers). It is also suitable to catch jewel beetles

alive, ensuring specimen quality. paint **Unbaited MULTz** incorporated A. angustulus A. graminis p=0.001 A. laticornis p<0.001 p=0.001design 61 beetles 49 beetles 345 beetles A.obscuricollis A. olivicolor 2 p<0.001 125 beetles p<0.001 47 beetles The 2020 new MULTz design with the green paint incorporated in the plastic performed better than the earlier MULTz traps or the 12-funnel green Lindgren trap. There was no bait applied in these comparisons. A. laticornis A. angustulus



Acknowledgement: Field work of YB, DD and LS was supported by RFBR (grant 17-04-01486). Presented online at the Cooperation in crisis preparedness for Agrilus planipennis

in the European Union WEB Workshop 2, Tallinn, 14-16 September, 2020