

Occurrence of click beetle pest spp. (Coleoptera, Elateridae) in Europe as detected by pheromone traps: survey results of 1998-2006

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The implementation of IPM strategies against wireworms has been very difficult because of the shortage of reliable information on the key aspects of the species until few years ago. One of this key aspect is represented by the species distribution over the different European regions.

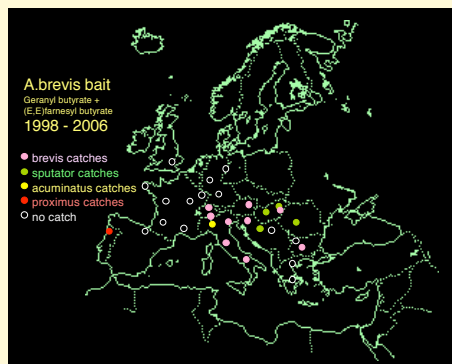
Knowing the species present allows to establish promptly oriented monitoring programs saving time and materials and a general prediction of damage risk for the sensitive crops based on the knowledge of biology and behaviour of the different *Agriotes* species. A reliable description of the distribution of the main *Agriotes* species (*A. brevis*, *A. lineatus*, *A. litigiosus*, *A. obscurus*, *A. proximus*, *A. rufipalpis*, *A. sordidus*, *A. sputator* and *A. ustulatus*) is currently possible because pheromone traps suitable for monitoring all the most important *Agriotes* species in Europe are available.

They proved to be effective to detect the presence of species also at very low population levels. First maps of species were presented at the last IOBC meeting on soil insects held in Innsbruck.

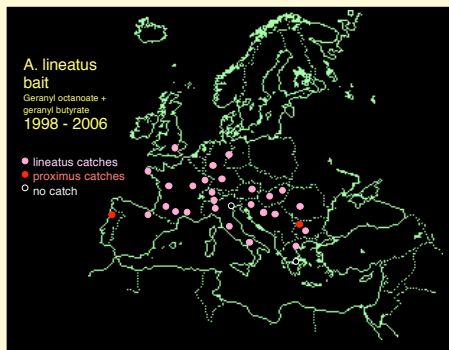
In this poster we present the updated distribution maps for these click beetle species, compiled from results of surveys using pheromone traps in many regions of Europe between 1998 - 2006.



The YF click beetle trap, which, baited with pheromone, has been optimized for capturing most click beetles.

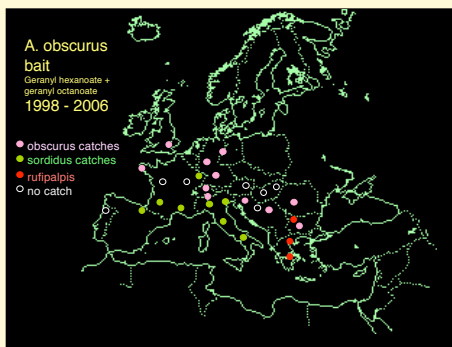


Traps captured large numbers of *A. brevis* in Italy at all sites tested. Presence of this species was detected also in Slovenia, Austria, Bulgaria (near Sofia) and Hungary. In Romania, Croatia and some sites in Hungary, the bait was catching *A. sputator* probably due to the geranyl butanoate content. It is of high interest that at a site with both *A. brevis* and *A. sputator* present (Bulgaria, Sofia) very few catches of *A. sputator* were recorded in brevis-baited traps. The presence of geranyl butanoate may explain also catches of *A. proximus* Schwarz in Portugal (where no *A. brevis* was caught). Catches of lower numbers of *A. acuminatus* Stephens in Piemonte (Italy) may also be attributable to the geranyl butanoate content of the bait. (see also discussion about *A. sputator*)



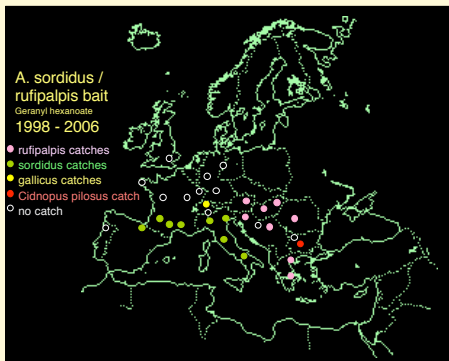
Large numbers of *A. lineatus* were captured at almost all sites in many countries. The lineatus bait was fairly specific all over Europe, with low catches of *A. sputator* and *A. obscurus* at some sites (these species share one component with the lineatus bait, resp. - not shown on figure). In Portugal at one site in England, instead of *A. lineatus*, catches of *A. proximus* were observed (which uses the same pheromone components - see respective paper on this conference).

Apart from Europe, our baits were successful in capturing *A. lineatus* also in Canada, where this species had been introduced probably from England (Vernon and Tóth, unpublished).



Traps captured large numbers of *A. obscurus* especially in northern countries, or at sites with humid, cool climate, i.e. in the United Kingdom, Germany, Switzerland, Ticino in Italy, Bretagne in France, Slovenia, Croatia, and Romania (Fig 4). This bait was also very effective in Canada, where the species had been introduced probably from England (Vernon and Tóth, unpublished).

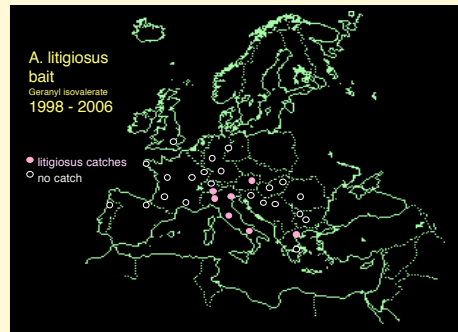
A. sordidus Illiger was caught in other parts of Italy, Spain and France, and *A. rufipalpis* Brullé in Bulgaria and Greece. The geranyl hexanoate content of the bait may be an explanation of this phenomenon, as this compound is a potent sex attractant for both spp.



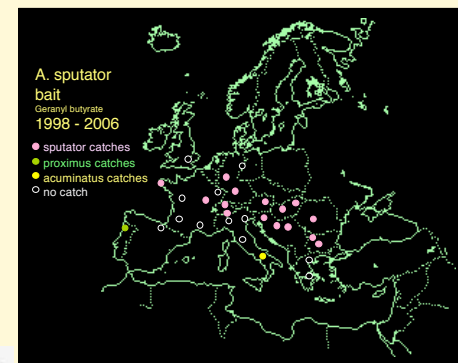
Traps captured high numbers *A. rufipalpis* in Greece, Romania and Hungary (several sites); the species was also present in Austria, Slovenia and Serbia.

A. sordidus was caught in large numbers in Italy, southern France and north Spain. It appears that *A. sordidus* is present only in the Western Mediterranean, while *A. rufipalpis* is widespread in the Eastern Mediterranean and Central Europe.

In Switzerland traps baited with geranyl hexanoate captured *A. gallicus* Lacordaire, in Bulgaria, although in low numbers, *Cidnopus pilosus* Leske. The pheromone composition of neither species has been known before. Neither of them is regarded as a pest



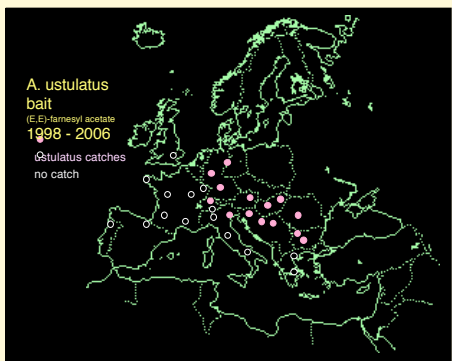
A. litigiosus was caught at all Italian test sites, in Austria and one site in Greece. At sites more to the north or to the west no catches were recorded. On a single occasion some specimens of *A. ustulatus* were captured in traps in Croatia (not shown in Figure); however, since this result was not repeated, probably it was a result of cross contamination with pheromone samples during handling of the traps.



Most beetles were caught in countries to the north and in Central Europe - United Kingdom, Germany, Switzerland, Croatia, Serbia, Romania, Bulgaria, Austria, Slovenia and Hungary. Our bait was excellent in capturing *A. sputator* also in Canada, where the species had been introduced from England (Vernon and Tóth, unpublished).

At one of the Italian sites we recorded catches of *A. acuminatus*. Probably geranyl butanoate is a sex attractant for this species, as it was also captured in traps with the *A. brevis* bait (which also contains this compound), also in Italy. The species is not regarded as an important agricultural pest.

In the tests in Portugal, where no *A. sputator* was caught, the traps regularly captured *A. proximus*. Geranyl butyrate is a component of the sex attractant of this species (see respective paper on this conference).



High captures were recorded in Germany, Switzerland, the northeastern part of Italy, Austria, Slovenia, Croatia, Serbia, Romania, Bulgaria and Hungary. No captures were recorded in the United Kingdom, Portugal, Spain, France, Greece, and other parts of Italy; the species seems to be missing in the Mediterranean.

