

## CATCHING DRAGONFLIES IN TRAPS (ANISOPTERA)

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Yellow and white plastic bowls of 18 cm diameter, filled with water containing ethyl glycol plus a detergent, attracted 171 immature adults 101 ♂, 70 ♀ of *Aeshna cyanea* and of 6 *Sympetrum* spp. in a pine plantation in Poznan, Poland, during a 14 days warm spell (late Sept.-early Oct.). Yellow traps were 1.8 times more effective than white ones. Dragonflies were trapped when attacking Diptera or Hymenoptera alighting on the water surface. Only mature odonate individuals were able to escape and avoid drowning. It is suggested that trapping could be adopted as a supplementary technique in assessing the anisopteran fauna in areas with low vegetation.

### INTRODUCTION

Dragonflies are a group of predatory insects for which it is relatively difficult to construct and use any kind of traps or mechanical trapping devices.

Some authors (e.g. UBUKATA, 1983) in their field studies used models of dragonflies supposed to attract live, flying individuals. SAWKIEWICZ (1989), during his trip to China, observed a method of attracting flying dragonflies to a living dragonfly tied with thread to a branch. In this way it was possible to collect a large number of individuals of various species, but only males, which is a significant shortcoming of the method. On the other hand there is no information in the literature about the utilization of any kind of trap to catch dragonflies.

In 1987, during studies conducted with Dr P. Stachowiak on the parasitic and predatory insect fauna of pine plantations, the author found adult dragonflies in traps located in one of the test plots.

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in September and beginning of October.

In total 171 adults were caught during 14 days, referable to *Aeshna cyanea*, *Sympetrum flaveolum*, *S. vulgatum*, *S. danae*, *S. sanguineum*, *S. depressiusculum* and *S. pedemontanum* (cf. Tab. I). All individuals caught were immature. It should be emphasised that they were trapped during warm sunny weather which came after a long cool and rainy period, therefore all insects were very active.

Lincoln's index calculated for the most numerous Anisoptera in the test area and in surrounding stands was as follows:

*S. flaveolum* — 21.0 and 4.0 ind./ha

*S. vulgatum* — 18.4 and 2.6 ind./ha

*S. danae* — 14.9 and 1.3 ind./ha

*S. sanguineum* — 2.9 and 0.2 ind./ha

Dragonflies caught in yellow traps were almost 1.8 times as numerous as those caught in white traps. With both trap colors the majority of dragonflies were trapped in bowls placed directly on the ground and only few specimens were found in traps suspended above the ground. This may have been influenced by the circumstance that each trap above the ground was suspended from a support on three plastic threads. In all, 101 males and 70 females were found in the traps.

As far as the effect of the orientation of tree rows on the trap efficiency was concerned it was found that the ratio between the number of dragonflies caught in traps placed in rows oriented N-S and the number caught in E-W rows was 3:1. The difference most likely was connected with exposure of traps to sun-light. Bowls in N-S rows were exposed to sun-light almost during the entire day, while those in E-W rows were shaded during the period of highest insect activity.

In order to determine the periods of dragonfly activity in pine plantation, and explain the causes for their being caught in the bowls designed for trapping of other insects, detailed observations were conducted over three consecutive sunny days. It was discovered that dragonflies in the northern part of the plantation (E-W rows) began to be active at approx. 07.30 h. About 10.00-10.30 their activity decreased, to increase again at about 15.00 h, when the rows were again completely in full sun-light. The decrease of dragonfly activity in this part of the plantation was partially caused by their moving to the section with N-S rows. About 17.00-17.30 dragonflies completely ceased to be active in the northern part of the plantation.

In the section with N-S rows, dragonflies began to be active a little later, i.e. at about 8.30 h. They continued so without an interruption till about 16.30-17.00. The maximum in their activity occurred during 11.00-13.30.

During their active period the dragonflies frequently sat on a bowl's rim or on a branch or a plant in the nearest neighbourhood of a trap. In the moment when the water surface was touched by a dipteran or a hymenopteran a dragonfly would attack it probably not seeing the water at all, and as a result of such action it would fall into the water itself and drown in a short period of time. When an attacking dragonfly was a sexually mature, strong insect it would usually free

itself from the trap by swimming to the rim of a bowl and crawling out.

Immature individuals, few days after hatching, were not strong enough to crawl out of the trap. It seems that in case of using containers with smoother walls also the mature insects would remain in the traps.

## DISCUSSION

On the basis of these observations it may be concluded that the main factor making a trap attractive to dragonflies is the number of insects floating on the water surface. This in turn depends on the trap's color.

The trapping described above may be of use as a supplementary method in assessing the composition of the odonate fauna in areas with low vegetation. When traps are suspended above the ground or high up in tree canopy dragonflies are trapped only sporadically. This is probably due to the very small number of individuals penetrating the crown zone of old stands (ŁABĘDZKI, 1989). In the latter case, the material gathered is qualitatively and quantitatively inadequate.

It seems that future studies on traps for dragonflies should consider the use of living insects as a bait. These should behave atypically, thus becoming an easy prey for dragonflies.

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