DRAGONFLIES CAPTURED BY ORNITHOLOGICAL "MIST NETS" (ANISOPTERA)

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Abstract — 135 specimens of 9 anisopteran spp. were captured by ornithological mist nets in 2 northern Italian localities. In spite of their low capture efficiency, these nets might give indications about the composition and relative abundance of local populations and the hourly activity of certain spp.

Introduction

Adult dragonflies are predators that almost exclusively hunt in flight, basing their action on sight capabilities. Since their olfaction is not probably used in prey searching (but cf. STEINER, 1948), it has not been possible so far to set up specialized traps to lure them by attractive odours. The only valid tool to collect dragonflies is the entomological net, if necessary combined with visual lures (SIMMONS, 1976; UCHIDA, 1976; SAWKIEWICZ, 1989). Occasionally dragonflies are caught with unusual systems: some species may be attracted by light (BICK, 1949), other ones by trapped insects,

thus falling themselves into the traps (ŁABEDZKI, 1989); AUBERT (1962; 1964) and KAISER (1964) got several specimens from fixed nets intended to catch migrant insects at Col de Bretolet, Valais, Switzerland and UTZERI (1988) reported a specimen of *Anax parthenope* entangled in ornithological nets.

In the present note we report on dragonflies captured by systems of vertical ornithological nets at two northern Italian localities: Val Campotto, Argenta, Ferrara, and Valle Averto, Laguna Inferiore, Venezia.

The nets

In both places, nylon four-shelved 15x15 mm-meshed "mist-nets" were used, set up in fixed transects from July 30 to August 29, 1987, at Val Campotto and from July 30 to September 2, 1987, at Valle Averto. The work aimed at investigating the migration of reed-bed passerines, in connection with the "EURING Acroproject" (cf. KOSKIMIES & SAUROLA, 1985), which is yearly carried out in Italy following the standardized methods described by BERTHOLD & SCHLENKER (1975: capture surface of the nets extending between 30 and 230 cm above the ground, hourly inspecting of nets, etc.

There were four net placements in total: at Val Campotto, a 500 m transect crossed a pure reed-bed (Phragmitetum) for 300 m and was bordered by both a reed-bed and a willow bushland by the two sides for the next 200 m; another 150 m transect was placed between a reed-bed and a poplar plantation. At Valle Averto, a 170 m transect was set inside a reed-bed and a 50 m one among rushes and a few *Phragmites*. Canals conveying either fresh (Val Campotto) or slightly brackish (Valle Averto) water were not farther than 150 m from the nets.

Dragonflies were collected from the meshes, in which they got entangled either after hitting them in flight or after attempting to perch on them. The capture times were recorded for each individuals during hourly inspections of the nets.

The dragonflies

At Val campotto, 104 specimens belonging to 7 species were collected and at Valle Averto 31 referable to 6 species (Tab. I), which correspond to average capture rates of 0.52 and 0.40 individuals per day per 100 m of net, respectively.

Table I — List of the species and number of specimens collected at Val Campotto and Valle Averto

Species	Val Campotto ♂	♀	%	Valle Averto ♂	♀	%
Anax imperator	1	3	*4*	1		*3*
A. parthenope	22	28	*48*			
Aeshna isosceles	3		*3*			
A. mixta	8	6	*13*		1	*3*
A. affinis				1	2	*10*
Orthetrum albistylum	3	13	*15*	3	11	*45*
O. cancellatum		2	*2*	3	4	*23*
Sympetrum depressiusculum	3	10	*13*			
Crocothemis erythraea		2	*2*	4	1	*16*

Figures 1 and 2 show the individual numbers of some aeshnid and libellulid species respectively, fallen in nets in five different periods of the day. Some specimens, of which the times when found in nets were not recorded, have been excluded from these charts.

Discussion

Only anisopterans were obtained from the nets, probably because these were much too heavy and wide-meshed to catch zygopterans. Also, damselflies generally fly slowly, frequently changing their direction to avoid obstacles, while dragonflies, which are faster and more active fliers, can more easily run up against a net and get entangled.

Mist nets do not seem to be very efficient to catch dragonflies, as evidenced by the very low capture rates. Nevertheless, if operative for long times in the same place, they might add to the knowledge of local faunas, particularly concerning the species that seldom perch, as e.g. aeshnids which are difficult to catch even by the entomological net. Fixed placed mist nets might also give indications on the relative abundance of some populations (Tab. I). If so, at Val Campotto reed-beds, *A. parthenope* should be the most abundant, followed by the moderately abundant *O. albistylum*, *A. mixta* and *S. depressiusculum* and by the relatively rare *A. imperator*, *A. isosceles*, *O. cancellatum* and *C. erythraea*, while at Valle Averto, *O. albistylum* was the only consistently represented species in our sample. Also, matching the samples obtained

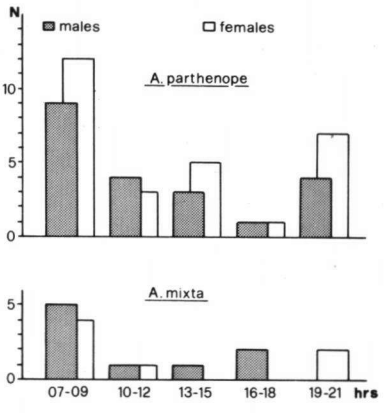

Fig. 1. Capture of aeshnids in both localities, shown as 3-h samples.

from the transects of different lengths in the two places, more numerous populations of *O. albistylum*, *O. cancellatum* and *C.erythraea* appear to dwell at Valle Averto than at Val Campotto ($\chi^2 = 5.82$, $p < 0.025$; $\chi^2 = 10.41$, $p < 0.005$ and $\chi^2 = 5,49$, $p < 0.025$, respectively). On the other hand, *A. parthenope*, *A. isosceles* and *S. depressiusculum* were not recorded from Valle Averto, while *A. affinis* was not represented from Val Campotto.

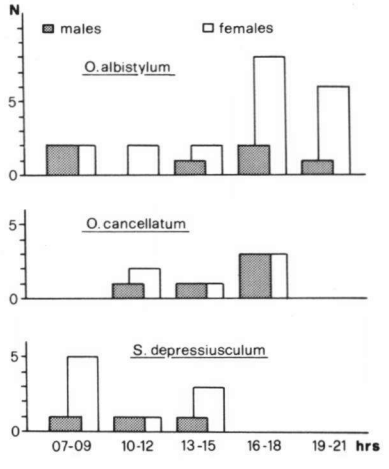

Fig. 2. Capture of libellulids in both localities, shown as 3-h samples.

The hourly capture frequencies give interesting suggestions about the activity times of certain species (Figs 1 and 2), probably reflecting morning and/or evening feeding far from the water, as opposed to reproductive crowding at the water in the central period of the day. *A. parthenope* is particularly active between 07-09 and between 19-21 h ($\chi^2 = 20.29$; $p < 0.005$), *A. mixta* and *S. depressiusculum* between 07-09 ($\chi^2 = 10.14$; $p < 0.05$ for the former) and *O. albistylum* between 16-21 (not significant) while *O. cancellatum* does not seem to fly earlier than 10 and later than 18 h. However, it cannot be excluded that a greater number of early and/or late captures might reflect a lower ability of the dragonflies to free themselves from the nets, due to relative hypothermy at these times.

In *O. albistylum*, females caught in nets overnumbered males ($\chi^2 = 9.6$; $p < 0.005$) (Tab. I; Fig. 2). This does not necessarily reflect female-biased sex ratios of the populations concerned, but rather the occurrence of a greater number of females in the reed-beds where the nets were set up. Also, since a greater number of females were caught in the evening, this might indicate that more females than males were active at these times. A greater number of females than of males fell into nets at various times of the day also in *A. parthenope* (Tab. I, Fig. 1), but the difference is not significant. This is probably because in some aeshnids the males frequently alternate in the dominance over territorial areas and often fly far from the water in the periods when not dominant (e.g. KAISER, 1974). These males were likely to fall into nets, also at times when reproductive activity occurred.

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