

#### ON DRAGONFLIES THAT TOUCH THE WATER IN FLIGHT

With reference to M. VAN NOORDWIJK's 1980, *Notul. odonatol.* 1:105) comment on P. CRUCITTI (1980, *ibid.*: 89-90), I wish to add some field data and considerations. I have seen tandems of *B. irene* forming just above the waters where males had spent much time in flight apparently seeking for females (cf. also A. HEIMER, 1968, *Annls.Soc.ent.Fr.* [NS]4: 891-900). Thus it seems that also in this species, as in most Odonata, males and females meet at the oviposition habitat. *B. irene* females do not necessarily insert eggs into floating vegetation, but they can also utilize the moss growing on stones of the river banks, and oviposit from a height of almost 50 cm above the water and 1-1.5 m far from its edge. I also recorded the water-touching behaviour in flying males of *Onychogomphus uncatatus* and *Aeshna mixta*. These can touch the water repeatedly and at any time during the period they are seen at the water. On the basis of these observations it is possible to give a tentative reply to two of Van Noordwijk's questions: this behaviour may occur during the whole period a dragonfly is present at water, and not only the species that oviposit in open water behave in this way.

Also I wish to outline that there is no evidence of hygroreceptors on the abdomen of Odonata,

and that the search of a suitable habitat is not necessarily more successful if based on tactile stimuli than if based on visual ones. Sometimes the contact with the substrate may prove fatal, e.g. if the dragonfly will touch an oil surface (C.H. KENNEDY, 1917, *Proc.U.S.natn.Mus.* 52: 483-635). The opinion that the males touch the water in flight to make sure that the shining surface is water, seems to imply that they are aware that water is a suitable habitat for oviposition. I am doubtful about this, as evidence about learning capability in dragonflies is lacking so far, and as it would seem improbable that learning would be involved in the rather urgent need of a correct choice of the reproductive habitat. But, in any way, a proper choice of the oviposition habitat by the male is no guarantee for successful oviposition, as inseminated females can end up at oviposition sites unsuitable for larval growth, though previously dragged by their mates to optimal habitats. I think that the choice of a suitable habitat for oviposition is primarily a function of the female, while secondarily males are adapted to select the same habitat as females in order to maximize the chances of utilizing their sperm. I find that other opinions about the possible function of this water-touching behaviour, expressed by previous authors (cf. R. HUTCHINSON, 1976, *Cordulia* 2: 11-14) are to be considered with some interest.

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