

CUPPEN J G M, KOESE B & SIERDSEMA H 2006. Distribution and habitat of *Graphoderus bilineatus* in the Netherlands (Coleoptera: Dytiscidae). *Nederlandse faunistische Mededelingen* **24** 29-40.

DIJK G van 2006. De brede geelgerande waterroofkever *Dytiscus latissimus* na 38 jaar weer in Nederland opgedoken (Coleoptera: Dytiscidae). *Nederlandse faunistische Mededelingen* **24** 1-6.

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### THE EFFECT OF A SPATE ON ELMID POPULATIONS

The life-cycles of *Elmis aenea* (Müller), *Esolus parallelepipedus* (Müller), both with six larval instars, *Oulimnius tuberculatus* (Müller), with five instars, and *Limnius volckmari* (Panzer), with seven, are described quantitatively. Each cycle took about a year from egg hatch, mainly in June or July, to pupation on the bank, and then a further years before adults were mature enough to lay eggs. Mortality rates, studied over 63 months, were fairly constant, the only exception being high adult mortality during a severe spate. The loss of adults during the spate in October 1967 impacted most upon the *Elmis* and *Oulimnius*, less on the *Esolus*, and barely at all on *Limnius*, which staged a rapid recovery. Larvae of all four species were unaffected by the spate, and the differences can largely be related to the habitats occupied by each species and stage. Life tables established differences in the highest mortality levels – 36% for the *Elmis* in early life-stages, 41% in the *Oulimnius* and 51% for the *Limnius* from overwintering to pupation, also 41% for the *Oulimnius* during adult maturation, also 41% for the *Esolus* from pupation to the peak of immature adult numbers.

ELLIOT J M 2006. Critical periods in the life cycle and the effects of a severe spate vary markedly between four species of elm mid beetles in a small stream. *Freshwater Biology* **51** 1527-1542.

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### WHEN YOU FLY DEPENDS ON A SUN-DIAL

Flights in 99 taxa (78 water beetles and 21 water bugs) fly predominantly in mid-morning, or around noon, or at (nightfall, with four different kinds of activity based on characterising peaks in mid-morning (a), in the evening (b), at both of these (c), and around noon and again in the evening (d). The proportion of dark-reflecting surfaces resembling water polarotactically is maximal at the lowest (dawn and dusk) and highest (noon) angles of solar elevation - and for bright reflectors the resemblance is maximal at dawn and dusk under clear or partly cloudy skies. The optimal flight times of water-seeking insects can be explained by a polarisation sundial in combination with the right air temperature. This is an excellent paper and it is therefore a pity that the authors do not refer to the foundation work at Rothamsted by Trevor Lewis and Roy Taylor (1965) as there they would have found much data on aquatic and terrestrial insects that might usefully be reinvestigated to see if the two groups differ in a way consistent with their theory. The author for correspondence is Gábor Horváth.

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