

Dragonflies and Man¹

Christopher Hassall

It is impossible to ignore the presence of a group of organisms so biologically fascinating and aesthetically striking as the dragonflies and damselflies. This has resulted in their inclusion within the folklore of cultures wherever they occur, although different traditions are divided over whether they represent good or evil. In the East dragonflies are revered as beautiful, noble creatures. So strong is this sentiment that the dragonfly became a national symbol of Japan. After a 7th century Japanese emperor observed a dragonfly killing a gadfly by which he had just been bitten, a haiku was written which renamed central Japan *Akitsu-shima* ("Land of the Dragonflies") in honour of the creature. Dragonflies feature widely in eastern medicine, art, poetry (particularly haiku) and even cuisine, where they traditionally feature as a staple part of the Balinese diet when other food sources are rare.

The West, on the other hand, has been far more suspicious of the dragonfly. This is immediately evident in some of the colloquial names for the insects: "horse stinger" (UK and Australia), "devil's darning needle" (USA), "troll's spindle" (Sweden) and "eye poker" (Norway). The various legends which give rise to these monikers involve a range of fallacious "old wives tales". The Native Americans are alone among western peoples in considering the dragonfly to be a positive entity, associating it with renewal, swiftness and purity of water.

Interestingly, this final belief in the dragonfly as an indicator of water quality has been confirmed and exploited by modern environmental science. Studies of mankind's effects on freshwaters have revealed that the dragonfly and damselflies are particularly sensitive to these impacts, making them ideal "ecological indicators". Indeed, the monitoring of river quality in Europe involves a survey of the invertebrate communities, including a range of dragonfly species, inhabiting those bodies of water in order to make inferences about the state of the river.

For all the distrust of dragonflies in the west, there is no doubt that they perform valuable ecological services. Among other tasks in the ecosystem, dragonflies consume vectors of disease, such as mosquitoes, as well as preying on biting and stinging insects, throughout both the aquatic and terrestrial stages of their life cycles. They, in turn, provide a major food source for fish, thus forming a link between the smaller invertebrates in aquatic systems and the larger vertebrate predators.

The ancient nature of the order Odonata (which comprises dragonflies and damselflies) is remarkable compared to other orders of animals. The earliest fossil Odonata have been found in sediments from the Lower Permian which date back 250 million years. This is 10-15 million years before the first dinosaur and considerably older than the oldest representative of the primate order (in which *Homo sapiens* is found), which has only recently been pushed back to 85 million years ago.

It has been proposed that groups of organisms such as the Odonata that have such extensive and ostensibly stable evolutionary histories should be resilient to modern global change. Evolutionary time can be likened to a hurdles race: the Odonata have persisted through many trials and tribulations, including four major extinction events (one of which claimed the dinosaurs) and countless less severe oscillations of climate and geology. Each of these represents a hurdle over which an organism must leap to survive. However, clearing each hurdle requires certain adaptations and those adaptations will be inherited by successive generations of that species, enabling it to clear similar hurdles in the future. By this reasoning, the modern Odonata should possess a battery of adaptations that leaves them prepared for almost anything Nature could throw at them.

¹ This essay was submitted as part of the Royal Entomological Society's essay competition in 2009. If you wish to cite the essay, the appropriate citation is Hassall, C. (2009) Dragonflies and man, *Antenna*, 33 (2), 98-99.

Unfortunately it is at this point where the tale becomes less positive for, although the Odonata are extremely flexible in terms of adapting to changes in environmental conditions, there is evidence that the modern phase of climate change is unprecedented in their evolutionary history. This, therefore, represents a new hurdle which some or all of the Odonata may fail to clear. Added to this is the synergistic impact of other detrimental, anthropogenic factors such as the pollution of water bodies, the draining of marshes and fens and even the well-intentioned (though ultimately destructive) “amelioration” of water bodies through dredging and introduction of damaging plant and fish species. Thus, while humans have a tendency to view dragonflies in a negative light, it is in fact the dragonflies that suffer from their interaction with man.

With popular naturalism beginning to show a greater appreciation for the invertebrate world as well as the more traditional cute and cuddly vertebrates, we can only hope that the public will be inspired to help in the conservation of these creatures. For surely there can be few groups of organisms more appropriate as flagship species for the conservation of our wetlands than the dragonflies.