

The identity of the insect *hippurus* in Aelian's *De natura animalium*

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ABSTRACT. It is postulated that the insect *hippurus* mentioned in AELIAN'S work is a mayfly belonging to the genus *Oligoneuriella*. This interpretation is possible on the basis of the knowledge of feeding of trout and the history of fly fishing.

KEY WORDS: Ephemeroptera, Oligoneuriidae, *Oligoneuriella*, Aelian, *hippurus*, fly fishing history, Greece.

INTRODUCTION

The heritage of the ancient writers is a rich source of information for students of a broad range of subjects, including natural history. Unfortunately, a systematic general drop in interest in these writings accompanies the tremendous civilisation development of mankind in the 20th century.

In AELIAN'S (170-230 AD) *De natura animalium* XV.1 there is an exceptionally interesting passage on fly fishing in Macedonia by the river Astraeus. Artificial flies were used when fish preyed on an insect called *hippurus*. A few attempts, or rather guesses, have been made by some modern authors to determine its identity. However, these attempts do not take into account all the available information contained in AELIAN'S writings. The knowledge of the biology of insects, the food of salmonids, as well as the history of fly fishing, render possible a new interpretation of *hippurus*.

RESULTS

Information about *hippurus* and previous attempts at identification

Aelian provides us with the following information about the insect:

- it is quite unlike the flies elsewhere;
- fish (presumably trout) often eat it;
- it flies by the river;
- it does not look like a wasp or a bumble-bee, but possesses distinct features of each;
- it has the audacity of a fly;
- it's size is of a bumble-bee;
- it's colour is of a wasp;
- buzz like a honey-bee;
- it settles on the stream and seeks food;
- it isn't used as bait, because it is too fragile ("if the human hand touches them it destroys the natural bloom; their wings wither and the fish refuse to eat them").

Other ancient authors didn't use the name *hippurus*. The name hasn't raised much interest among philologists and it isn't explained in Greek dictionaries. Also students of natural history haven't paid much attention to the insect, though already KIRBY (1826: 426) and LACORDAIRE (1838: 40) took note of it.

Previous attempts to identify the insects were based on limited information. In the angling literature in 1900 ROZWADOWSKI, on the basis of the name *hippos* (horse), concluded that the flies were the adults of a horsefly (in Polish *bąk koński*) (Diptera: Tabanidae, possibly Hypodermatidae). Another interpretation, concerning the horsefly *Theriopectes tricolor* (Tabanidae), has been recorded by HERD (N.d.), but no arguments have been presented.

The wasp-like appearance of the insect stimulated other authors. BEAVIS (1988: 239) records an interpretation of a soldier-fly (Diptera: Stratiomyidae). Similarly SCHOLFIELD in his translation of AELIAN'S work states that the insect belongs to the genus *Stratiomys* (Stratiomyidae). HERD (N.d.) records an interpretation of a drone fly, possibly *Episyrphus balteatus* (Diptera: Syrphidae).

The next attempt was a dragonfly (Odonata) (BEAVIS 1988). This was based on the habit of eating other insects (HERD N.d.), though Aelian didn't indicate such behaviour clearly. Finally MAGEE (1995) assumed that the insect was a mayfly, but he didn't present any arguments in favour of this interpretation.

A new interpretation

From AELIAN'S description it is clear that *hippurus* cannot refer to terrestrial insects. They don't fly regularly over water nor settle on it in large numbers (they may only fall in by accident). The fragility of *hippurus*, and the fact that it was not common "elsewhere" (which may be interpreted as being far from water) also lend support to this view. Hence, this implies that *hippurus* is an adult of an aquatic insect. Additionally it must be an insect appearing regularly in large numbers, otherwise it wouldn't have attracted the attention of the ancient angler.

The *Stratiomys* flies are very characteristic and their overall appearance is similar to that of wasps. Some species of Stratiomyidae thrive in water (mainly in still water) in the

larval stage. However mountain trout streams aren't their typical habitats. In general, adults behave like terrestrial insects and rarely fall prey to fish. To my knowledge nowhere in the European literature on the feeding of salmonids has the role of Stratiomyidae (and Tabanidae) been reported as other than negligible (at times single insects, usually larvae, have been found in fish stomachs). This is also the conclusion drawn from my fish food studies conducted on salmonids in various parts of Europe, including the Mediterranean region (Italy, Slovenia and Greece).

The dragonfly adults should also be rejected. They are an extremely rare item in the diet of salmonids in running waters and they usually don't alight on the water in places where these fish thrive.

AELIAN'S description seems to point to a mayfly, which is a fragile insect in the adult stage. It could be a member of the family Heptageniidae (for example, some species have bands on their body, superficially resembling the bands on the wasp's abdomen), but these insects don't appear in large numbers. The genus *Oligoneuriella* (Ephemeroptera: Oligoneuriidae) seems to fit AELIAN'S description best. The body of the adult is about 15 mm long. The nuptial flight occurs at sunset in summer and consists of quick (the word "audacity" may refer to this behaviour) movements over water. It usually emerges in large numbers, at times resembling a snowstorm. The ancient Macedonians might have interpreted settling on the water to lay eggs as taking food. In general this mayfly is an important item in fish diet. In fact it is consumed in large numbers by trout in the river Aaos in Northwest Greece and in one fish I found even 40 adults (CIOS 1997).

This genus is widely present in the Balkans. BAUERNFEIND (2003) records *Oligoneuriella rhenana* from Greece, IKONOMOV (1962) - *O. poecile* sp. n. from Former Yugoslav Republic of Macedonia, VIDINOVA (2003) - *O. polonica* MOL. from Bulgaria, while PUTHZ (1980) - *O. rhenana* (IMHOFF) and *O. mikulskii* SOWA from the region. However, Greek mayfly fauna is still poorly known. Hence indicating the species depends on progress in further research.

My interpretation is supported by information from the 19th and the beginning of 20th century on the great importance of *O. rhenana* to fly anglers. PIETRUSKI (1847) mentioned that in the river Stryj in Eastern Carpathians (today in Ukraine) trout and grayling were commonly caught with an imitation of an insect made of the hair of a bear. Later DZIEDZIELEWICZ (1877), a well-known Polish entomologist, when describing the habits of *O. rhenana* in this river, wrote that anglers took advantage of the emergence of the insects and caught the fish at the water surface. This clearly points to fly fishing, since angling with flies of bear hair appears to be a reasonable method during the emergence of this large mayfly. These insects were important to fly anglers also in the rivers Poprad and Dunajec in Southern Poland (STASIAK 1913a, 1913b, CIOS 2004), Germany (STÖLZLE & SALOMON 1990) and France (DE BOISSET 1939).

It should be remembered that in the past mayflies, as well as many other insects, were called differently than today, at times greatly complicating research on the history of ento-

mology. For example the name *farfalla*, currently used with respect to butterflies, was used by TARGIONI-TOZZETTI (1741) to describe mayflies.

Unfortunately the name of the stream – Astraeus – is of no help. It isn't known today and presents a problem to researchers of ancient Greece (PAPAZOGLOU 1988). Determining its location might be hampered by changes in the physical geography during the Holocene in Northern Greece, having strong impact on the landscape and rendering difficult identification of several sites mentioned in historic sources (BINTLIFF 1976).

CONCLUSION

Determination of the insect *hippurus* is possible by combining the knowledge on entomology, feeding of the trout and the history of fly fishing. Previous attempts were based on limited information, usually only entomological, which is insufficient in this case. For the same reason the insect has been overlooked in modern literature on the history of mayflies in Europe (e.g. FRANCISSSEN & MOL 1984). Attention of researchers was drawn only to the *ephemeron* in AELIAN'S writings, which concerns a different insect.

Solving the identity of the insect sheds more light on the development of angling in Europe. Almost all of the oldest references to fly fishing (see BRAEKMAN 1980, GESNER 1558) clearly indicate that this art developed in close connection with observations of insects and fish feeding on them. BARNES in her Treatise published in 1496 even instructed the angler to study the stomach contents of big fish to determine the most successful bait. Hence angling also played an important role in the development of entomology in historic times. In fact a large part of knowledge on mayflies until the 18th century was obtained through assistance of fishermen, as evidenced in many writings.

Fly fishing evolved as an art of imitating insects eaten by fish in the largest numbers on the water surface. This implies that aquatic insects with a mass-emergence played the most important role. It is highly probable that on the continent the mayfly *Oligoneuriella* (it isn't present on the British Isles) played a crucial role in this respect.

Finally, should this interpretation be correct, than AELIAN'S *hippurus* would appear to be the second oldest original reference to a mayfly in European literature. ARISTOTLE'S *ephemeron* retains the primacy.

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