

SHORT COMMUNICATIONS

**ON THE REASONS FOR A SHARP CURVE IN THE WESTERN  
BOUNDARY OF THE RANGES OF SOME EASTERN  
DRAGONFLY SPECIES IN THE NORTH OF WESTERN SIBERIA**

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Recently, the authors discovered the eastern Siberian spp., *Coenagrion hylas* (Trybom), *Somatochlora graeseri* Sel. and *Leucorrhinia orientalis* Sel. in the N of the Urals, i.e. almost 1500 km W of their range boundary as proposed earlier. This phenomenon can be explained by the ease with which dragonflies disperse on the forest-tundra open space, rich in surface waters.

INTRODUCTION

Recent investigations in the extreme north of north-western Siberia (HARITONOV, 1974, 1978) revealed the presence of a number of species such as *Somatochlora graeseri* Selys, *Leucorrhinia orientalis* Selys and *Coenagrion hylas* (Trybom) near the polar circle. Here, they reach west to the foothills of the Urals, whereas southward they are absent from the entire west-Siberian plain, to reappear east of the Yenisey river. On the plain west of this river they are unknown, but more to the south, in the mountains and spurs of the Altai, a number of eastern species reach the west part of the Yenisey basin. Their occurrence here can be explained by the fact that the mountains in the south of western Siberia are geologically part of the middle Siberian elevation and, throughout history, have preserved a number of common faunal elements. From the territory of both the Altai and the Kuznetsk plateau such transyenisean species are known as *Macromia sibirica* Djak., *Nihonogomphus ruptus* Selys, *Gomphus epophthalmus* Selys, *Coenagrion ecornutum* Selys and, of course the three species discussed in this paper.

## DISCUSSION

Even if the southern projection in the species ranges can be fully explained, the sharp boundary projection in the north still seems a paradoxical fact, because the landscapes there are much younger than those in the south and were glaciated for a much longer time, and, owing to this circumstance, became suitable for colonisation by Siberian species of dragonflies much later only. Therefore, their presence here is not obvious for historical reasons, but should be accounted for by present-day ecological conditions.

In our opinion, the considerable extension of the dragonflies to the west in the conditions of the extreme north is depending on two ecological factors: the existence of strong eastern winds, and the absence of dense forested areas. Thus, in the tundra and forest-tundra there is always a slight drift of dragonflies from lakes; in long distance transportation, we think that the numerous lakes found in the north contribute a lot to success, ensuring favourable conditions for reproduction in the receptor areas.

Further south, in the taiga zone, things are somewhat different. Here the efficiency of wind action is weakened by the forest, which hinders the

drift of dragonflies from lakes, and the winds themselves are weaker and rarer than those in the north. Finally, water reservoirs suitable for larval development are fewer here too. All this provides obstacles to passive dispersal of dragonflies. In addition, it must be assumed that migration of dragonflies in the northern forest-tundra, where surface waters are numerous and closely apposed, occurs with great ease if compared to the southern

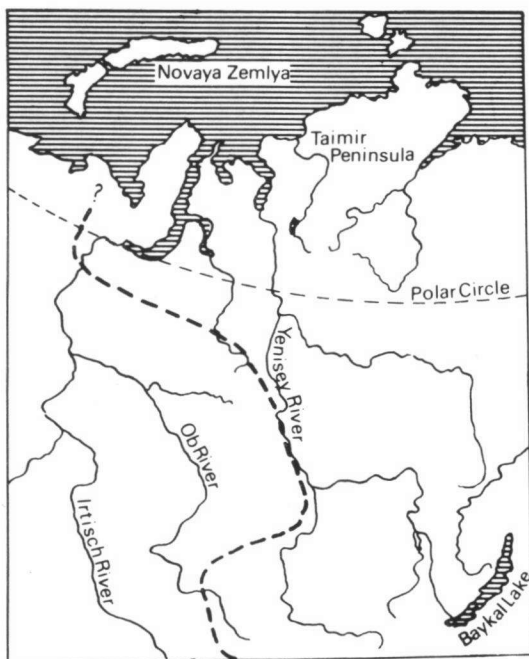


Fig. 1. Map of western Siberia, showing the western range boundary (dashed) of *Coenagrion hylas* (Trybom), *Somatochlora graeseri* Sel., and *Leucorrhinia orientalis* Sel.

taiga, which is to be considered an almost unsurmountable barrier to dragonfly dispersal.

In the forest-steppe, south of Siberia, the distribution pattern of dragonflies is different. The occurrence of western species is restricted to the east to the small forested areas rich in water and coinciding with the direction of prevalent winds. These areas, typical for western species, form wedges which grow narrower from west to east. This is seen, for example, in *Aeshna grandis* (L.), *Calopteryx splendens* (Harr.), *Platycnemis pennipes* (Pall.), *Nehalennia speciosa* (Charp.), and some other species extending to the east as far as the Yenisey valley or even as far as Lake Baikal.

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