

## COENAGRION JOHANSSONI (WALLENGREN) IN LITHUANIA (ZYGOPTERA: COENAGRIONIDAE)

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**Abstract** — A new (second) locality of *C. johanssoni* in Lithuania is brought on record; it is one of its southernmost localities in Europe. The habitat and the zone of activity are described and discussed in the contexts of the species range and protection against wind.

### Locality and observations

During studies carried out in E Lithuania (June-August 2001) many small lakes and pools were investigated in the search of *C. johanssoni* but it occurred only at one of these.

— Akutė Lake (next to Petrežeris Lake), 2.2 km NNE of Januliškis, 55°10'59" N 25°51'43" E, the Girutiškis Reserve (Girutiškio Rezervatas), the Labanoras Regional Park, the Švenčionys district. It is a small (170×145 m) dystrophic lake with brownish water, located in a very large partly open *Sphagnum* peat bog with many lakes and pools. The lake is surrounded by a low, light pine peaty forest with mainly *Ledum palustre*, *Betula nana*, also locally *Chamaedaphne calyculata*, *Vaccinium uliginosum*. On 6 July *C. johanssoni* was fairly numerous to numerous but distributed only locally

there (e.g. 24 ♂, 1 ♀, 5 tandems in section B (see below) at 14:40-50). It occurred mainly in two appropriate sections of the shore:

- (A) 15-17 m long, in the end of a bay; before a *Sphagnum* shore there is a 0.3-2 m broad zone of water with floating *Sphagnum* (depth a few to more than 20 cm), fairly loosely and loosely overgrown by *Scheuchzeria palustris*, with a small addition of *Chamaedaphne calyculata* and *Andromeda polifolia* (Fig. 2A);
- (B) 80-100 m long; before a narrow *Sphagnum* mat there is a flooded zone (0.5-2 m broad, depth a few-25 cm), with flooded dense or loose *Sphagnum*; this zone is overgrown mainly by *Carex limosa*: more loosely at the side of the land, densely (as a 'wall' up to 40 cm high) at the side of the open water table (Figs 1, 2B), additionally *Rhynchospora alba* and rare *Ch. calyculata*.

Single males and tandems were spotted in some other small places of the shore (mainly with *C. limosa*).

Akutė Lake seemed to be the centre of occurrence of *johanssoni* in the investigated S part of the



Fig. 1. The shore zone of Akutė Lake with a belt of *Carex limosa*.

reserve. Probably: (a) the rare individuals present 20-30 m from the lake, at small shallow depressions of the peat bog (a few cm of water with flooded living or partly decomposed *Sphagnum* and with loose *Scheuchzeria palustris* and *Rhynchospora alba*), (b) a male observed at neighbouring (60 m) Petrežeris Lake, (c) as well as 2 males recorded on 4 July at another small lake placed in the same peat bog 550 m apart, also originated from Akutė Lake.

Although the activity of the species was concentrated in the shore zone, the males flying away into the adjacent low forest were observed fairly frequently. The individuals spotted there up to 6 m from the shores clearly penetrated low *Ledum palustre*, *Betula nana* and *Vaccinium uliginosum*. This could be interpreted as looking for prey but looking for females should not be excluded.

The main zone of activity was not directly adjacent to the open water table. In the section with *Scheuchzeria*, *C. johanssoni* preferred its narrow, the innermost belt (retreated from the open water) but reached half of breadth of flooded vegetation and, in opposite direction, the edges of the adjacent forest (Fig. 2A). In section B the activity was mostly confined to the inner belt of flooded *Sphagnum*, fairly loosely and loosely overgrown by *limosa*. This belt was located between the *limosa* outer 'wall' and the *Sphagnum* mat (Fig. 2B). Only sometimes, especially in places with lower 'wall', males or tandems visited the outer (lake) side of the 'wall' but returned fast to their preferred zone.

The activity of males was of a penetrating type. They flew mostly between loose or fairly loose plants (*S. palustris*, *C. limosa*), at the level of their middle and upper parts, at a height of a few to 30

cm (mostly 10-20 cm). Due to the low flight between plants and concentration of activity in the zone retreated or partly separated from the open water table, small individuals of *johanssoni* were protected to some degree against the wind going from the lake. Only sporadic presence of *johanssoni* (allochthonous) at another lake in this peat bog (controlled on 4 July) probably resulted from its location in a totally open windswept bog and too poor and low vegetation along shores, which did not provide a wind shield.

No aggression between males was observed. In some cases, 2 males,

flying in opposite directions, stopped for a moment hovering face to face and then they both flew further in the same direction or returned.

Apart from *C. johanssoni*, the most numerous at the lake were: *Enallagma cyathigerum* (Charp.), *Leucorrhinia albifrons* (Burm.) and *Libellula quadrimaculata* L. Additionally, were recorded: *Lestes sponsa* (Hans.), *Coenagrion hastulatum* (Charp.), *C. lunulatum* (Charp.), *C. puella* (L.), *C. pulchellum* (Vander L.), *Nehalennia speciosa* (Charp.), *Aeshna subarctica elisabethae* Djak., *A. juncea* (L.), *A. grandis* (L.), *Cordulia aenea* (L.), *Sympetrum danae* (Sulz.) and *Leucorrhinia dubia* (Vander L.). *E. cyathigerum*, unlike *C. johanssoni*,

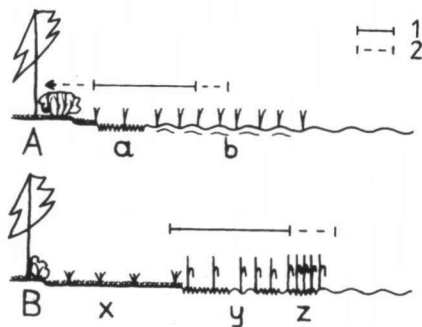


Fig. 2. The zones (1 = main, 2 = marginal) of activity of *C. johanssoni* in the sections A and B (of the shore) of Akutė Lake: (a) partly flooded *Sphagnum*; — (b) shallow water with floating *Sphagnum* (a and b with *Scheuchzeria palustris*); — x = *Sphagnum* mat; — y = flooded *Sphagnum* with *Carex limosa*; — z = *C. limosa* 'wall'.

flew over the open water table and the outer part of the zone of *limosa*.

### Discussion

*C. johanssoni* is a northern Eurasian species occurring from Korea and easternmost Siberia to Scandinavia (BELYSHEV, 1973; TSUDA, 2000). In Europe it occurs mainly in northern Russia and Fennoscandia, reaching southwards the northern part of the Smolensk region (Russia), N Belarus, Latvia and Lithuania (e.g. MAUERSBERGER, 2000; MELANDER, 1927; PISANENKO, 1985; SPURIS, 1964; STANIONYTĖ, 1993a, 1993b; VALLE, 1952; RADKEVICH, 1928 in WNUKOWSKY, 1937). *C. johanssoni* was recorded from Lithuania for the first time (only larvae) by STANIONYTĖ (1962, 1963) from Vilnius and its surroundings but the author gave the species with a question mark, since its identification was uncertain. The same data were repeated (called Vilnius) in a synthesis published many years later (STANIONYTĖ, 1993b). In the meantime, SPURIS (1964) checked these larvae and postulated they are referable not to *C. johanssoni* but probably to *C. armatum*. As a result, *C. johanssoni* has been with certainty known only from a locality discovered by J. Alekna in the northern part of the country (Biržai, 1 ♂, 1934; STANIONYTĖ, 1993a, 1993b). Thus, the new locality, located ca 130 km SE of Biržai, is only the second in Lithuania (Fig. 3) and one of the southernmost localities in the European part of the species range. The extremely rare records in Lithuania are in contrast with the situation in central and northern Latvia, where the localities of *johanssoni* are more numerous (cf. SPURIS, 1964). In Siberia, *C. johanssoni* inhabits many kinds of waterbodies, in S Primorye it is even qualified as one of the least demanding species (BELYSHEV, 1966, 1973). In Europe, not far from the southern limits of the range (in Latvia), the spectrum of its habitats is significantly narrower. It consists mainly of small lakes, located in forests or in a large peat bog, and bounded by a *Sphagnum* belt. These lakes are characterized also by a relatively low content of nutrients and by a relatively rich and diverse vegetation (SPURIS, 1964). *C. johanssoni* is the most stenotopic in the southwesternmost borderland of the range – in Lithuania. There it occurs only in the habitat with the most severe conditions: a small lake, very poor in nutrients and vegetation, in a large relict *Sphagnum* bog. In small forest lakes,

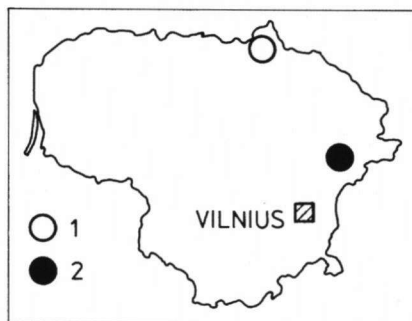


Fig. 3. Localities of *C. johanssoni* in Lithuania: (1) the locality from 1934 (STANIONYTĖ, 1993a, 1993b); – (2) the new locality.

bounded by *Sphagnum* or other vegetation, the species was not encountered. To a large degree a similarly reduced habitat spectrum in the European westernmost borderland of the range, in comparison with the Siberian centre, was also noticed in *Aeshna crenata* (BERNARD, 2002).

The high sensitivity of *C. johanssoni* to wind was emphasized by BELYSHEV (1966). As in Lithuania, the individuals in S Primorye: (a) do not fly over open waterbodies and are restricted to these that are protected against wind by dense shrubs, (b) fly low between vegetation, and (c) they often visit by-lake shrub or forest vegetation.

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