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The karyotype of *Chironomus acerbiphilus* Tokunaga, 1939 (Diptera: Chironomidae) from Poland

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The chromosome set of *Chironomus crassimanus* Strenzke, 1959 and pictures of its salivary gland chromosomes were presented by Keyl and Keyl (1959) and Keyl (1962). Keyl (1962) described the band sequence of chromosome AE compared with that of other *Chironomus* species. Later, Michailova (1989) described the chromosome markers of this species using material from Bulgaria. Martin (2006) indicated that the banding patterns of arms A and E of *Chironomus acerbiphilus* Tokunaga, 1939 are as in *C. crassimanus* and consequently suggested synonymy. Our study presents the karyotype of *Chironomus acerbiphilus* (= *C. crassimanus*) from Poland. This species is new for the Polish fauna.

The material was collected from an acid strip-mine lake (pH = 3) located in the Łuk Mużakowa Landscape Park (western Poland; 51°45'N, 14°46'E) . The chemical properties of the water were presented by Jędrczak (1992). Chironomid larvae were sampled from Lake No 54 which has an area of 20.2 ha and a maximum depth of 24 m. Fourteen specimens of IVth larval stage were analyzed cytotaxonomically. The salivary gland chromosomes were prepared according to Michailova (1989). The standardization of banding pattern in arms A, E and F follows Keyl (1962) and arm CD - Devai *et al.* (1989). The comparison of the band sequence of chromosome CD was done with *Chironomus piger* Strenzke, 1959. The band sequences of chromosome arms A, E, F, C and D are given in detail as a chromosome map.

The karyotype of *Chironomus acerbiphilus*

2n = 8, with chromosome arm combinations AE, BF, CD, and G. The species belongs to the "*pseudothummi* cytocomplex". The centromere regions of the chromosomes are expressed by large heterochromatin blocks, which are often conjugated. Chromosomes AE and CD are submetacentric, BF - metacentric and G - telocentric. One Balbiani ring (BR) is in chromosome G, a Nucleolar Organizer (NOR) is in chromosome AE.

Arm A (Fig. 1 a) has the following band sequence:1a-i-7-9-2d-k-3-12-10-2c-a-1k-6-5-4-13-14-15-16-19. The fixed homozygous inversion in section 7-1k distinguishes it from *Chironomus holomelas* Str. The band sequence 5 - 4-13-14-15-16-19 is the same in both species. The band sequence 2d-3, 12-10, 13-19 is very similar to that of *Chironomus pseudothummi* Strenzke, 1959 (Keyl 1962). The Nucleolar Organizer (NOR) is located in section 13-15.

Arm E (Fig. 1 a) has the band sequence:1-2-3-ae-10b-3f-10cg-13-11. It is the same as the band sequence of this arm of *Chironomus acidophilus* Keyl, 1960 (Keyl 1960), *C. aprilinus* Meigen, 1818 and *C. uliginosus* Keyl, 1960 (Keyl 1962) as well as of *C. frommeri* established by Atchley and Martin (1971) and *C. whitseli* analyzed by Sublette and Sublette (1974).

Arm F (Fig. 1 b) has the band sequence: 1-7-17-16-11-12-13-14-15-14b- 4 -5-6-9-8-1-2-3-10-18-19-20. It differs from that of *Chironomus uliginosus* by several inversion steps (the underlined sections are the sections involved in the inversions involved in different steps of the formation of the karyotype):
Chironomus uliginosus:
1-7-6-5-4-14b-15-10-3-2-1-8-9-14-13-12-11-16-17-18-19-20

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1-7-17-16-11-12-13-14-6-5-4-14b-15-10-3-2-1-8-9-18-19-20

1-7-17-16-11-12-13-14-6-5-4-14b-15-9-8-1-2-3-10-18-19-20

Chironomus acerbiphilus: 1-7-17-16-11-12-13-14-15-14b-4-5-6-9-8-1-2-3-10-18-19-20

The band sequence 18-20 is the same as that of *Chironomus aprilinus and C. holomelas* (Keyl 1962). In *Chironomus uliginosus* there is an active area in section 11 (Keyl 1962), which in the studied species has been transferred to the beginning of the chromosome arm F.

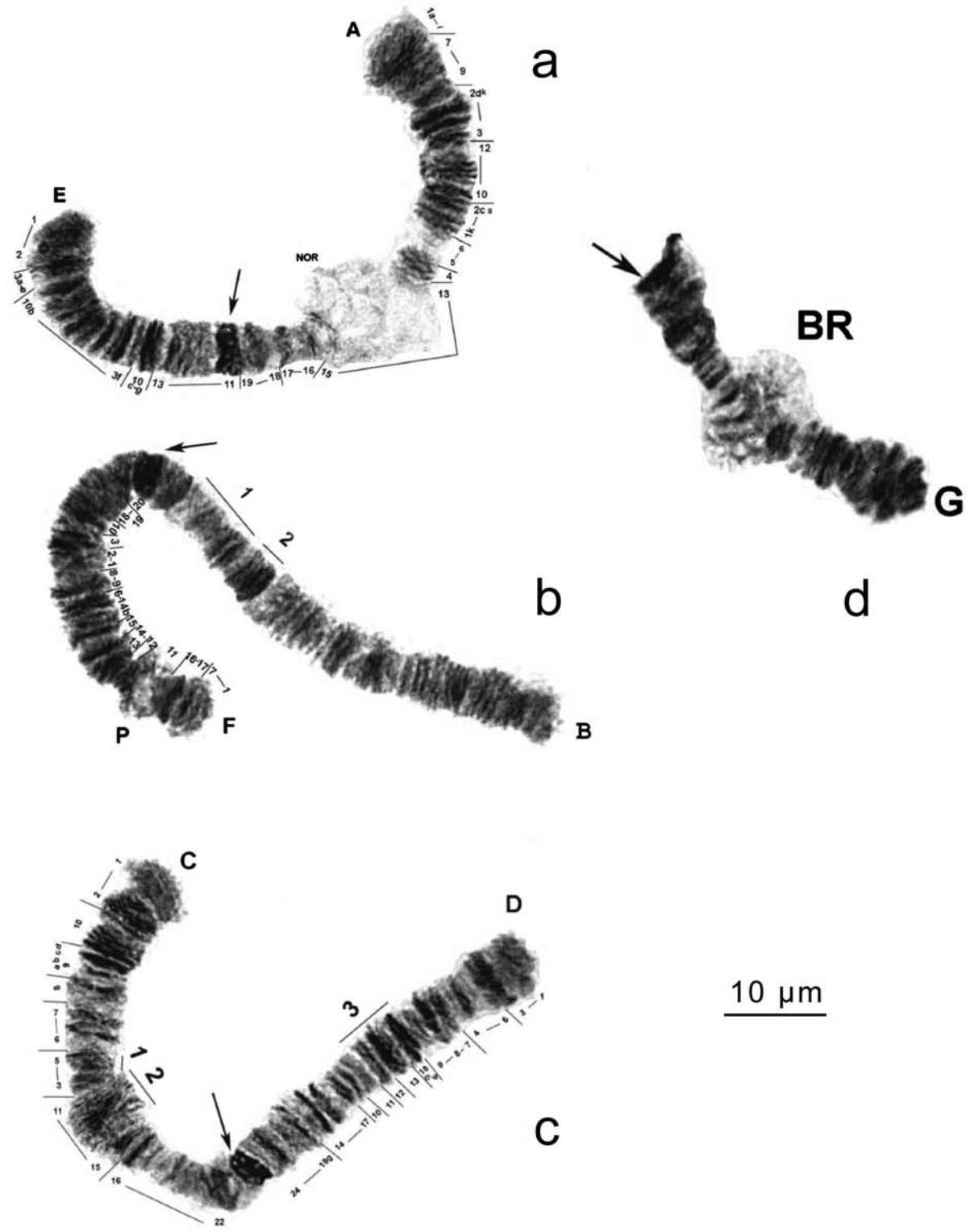

FIGURE 1. Salivary gland chromosomes of *Chironomus acerbiphilus*. a—AE chromosome, b—FB chromosome, c—CD chromosome, d—G chromosome, NOR—nucleolar organizer, P-puff, BR—Balbiani ring, arrow —centromere region.

Arm B (Fig. 1 b). Due to bad structure it is not possible to map the band sequences of this arm. Some bands in sections 1, 2 are basic for this arm (Wülker 1980)**.**

Arm C (Fig. 1 c). It differs from that of *Chironomus piger* by a one step fixed homozygous inversion.

Chironomus piger:

1-2-3-4-5-6-7-8-9abcd-10-11-12-13-14-15-16-17-18-19-20-22

Chironomus acerbiphilus:

1-2-10-9dcba-8-7-6-5-4-3-11-12-13-14-15-16-22- 24-21. (The section from 24 to 21 is transferred from arm D as has been established by Wülker (Martin 2006).

The basic pattern of the arm (sections 11-12) is located almost in the middle of the arm.

Arm D (Fig. 1 c).The band sequence of this arm differs from that of *Chironomus piger* by several homozygous inversions.

Chironomus piger:

1-2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18afg-19-24

1-2-3-4-5-6-7-8-9-18fa-17-16-15-14-13-12-11-10-18g-19-24

1-2-3-6-5-4-7-8-9-18fa-17-16-15-14-13-12-11-10-18g-19-24

1-2-3-6-5-4-7-8-9-18fa-10-11-12-13-14-15-16-17-18g-19-24

1-2-3-6-5-4-7-8-9-18fa-13-12-11-10-14-15-16-17-18g-19-24

Chironomus acerbiphilus:1-2-3-6-5-4-7-8-9-18fa-13-12-11-10-17-16-15-14-18g-19-20. The band sequence in section 21-24 is transferred to arm C as has been found by Wülker (Martin 2006). The basic pattern of the arm is located in the middle of the arm (3).

Arm G (Fig. 1 d).The Balbiani ring (BR) is located in the middle of the arm. The homologues are always conjugated.

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