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Chironomus vancouveri sp. n. from Canada

(Diptera, Chironomidae)

With 17 Figures

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Abstract. The Imago (♂♂, ♀♀), Larva, and Karyotype of *Chironomus vancouveri* sp. n. from Canada are described. The species belongs to the *Chironomus thummi* complex having the chromosome arm combinations AB, CD, EF, G.

Imago, male

Colour Thorax, abdomen and legs light brown.

Thorax Antepronotal and dorsocentral lobes well formed, light brown. Scutellum light in colour with setae on second part. Scutum and Postnotum light brown.

Abdomen Light brown with brownish middle spots.

Hypopygium (Fig. 1, 3, 5, 7) Gonostyli (Fig. 3) elongated, towards the end more slender. Gonocoxi (Fig. 1) in the middle part slightly concave. Anal field (Fig. 5) almost round, with long bristles. Anal point (Fig. 7) well developed, at the end narrow

Imago, female

Colour Brown.

Genitalia (Fig. 9, 10). Gonosternite VIII (Fig. 9) consists of two oval lobes with long setae and darkly coloured edges. Gonapophysis VIII well developed, with short setae. Vaginal apodeme (Fig. 10) well formed and penetrated. Seminal capsules ovoid, light sclerotized.

Larva

Red colour, up to 23–25 mm long, consists of 13 segments, the last one is modified. Tubuli ventrales on the 11. segment are of the same length. The larva belongs to the f. l. *plumosus*.

Submentum (Fig. 11): With dark teeth, the middle tooth subdivided into three sectioned, the second tooth is broader than the lateral ones. Lateral teeth on submentum are 6. Posterior part of gula dark.

Premandible With 2 teeth.

Mandible With 4 dark teeth. Seta subdentalis sharp. Seta interna dendriforme.

Epipharynx (Fig. 12) With short, blunt chaetulae. The aperture on the clypeus large, with thickned walls.

Antenna 5-segmented. Ring organ in the middle part of basal segment. Lauterborn organs large. Flagellum bipartite, reaching to the end of the last antennal segment.

Karyotype $2n = 8$. The species belongs to the *Chironomus thummi* complex, having the arm combinations AB, CD, EF, G. The centromeres of all the chromosomes are not clearly defined. The first and second chromosomes are metacentric; the third chromosome is between meta- und submetacentric; the fourth is acrocentric.

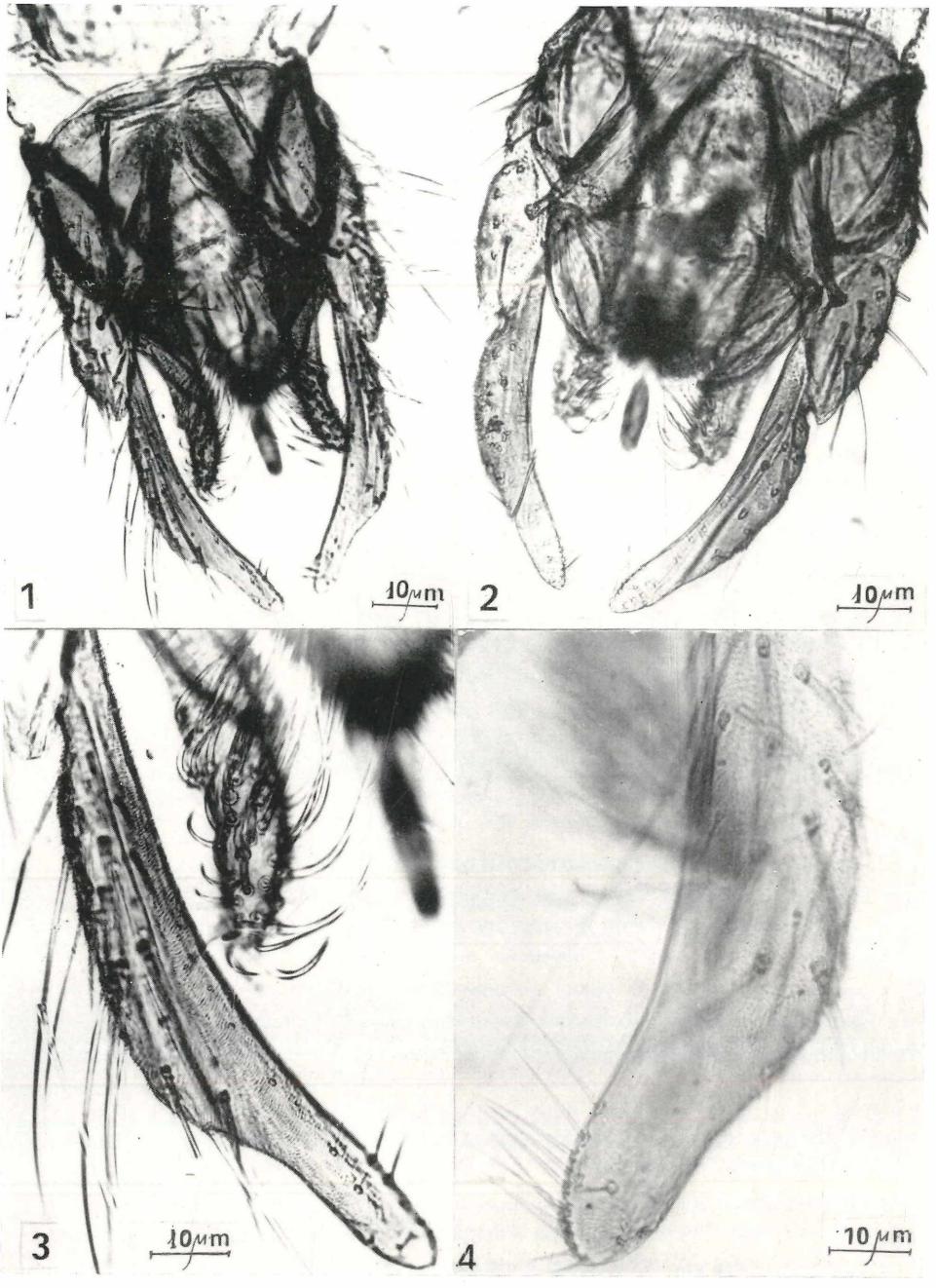


Fig. 1. Hypopygium of *Chironomus vancouveri* sp. n. – Fig. 2. Hypopygium of *Ch. plumosus* L. (Switzerland, Wohlensee). – Fig. 3. Gonostylus of *Ch. vancouveri* sp. n. – Fig. 4. Gonostylus of *Ch. plumosus* L. (Switzerland, Wohlensee).

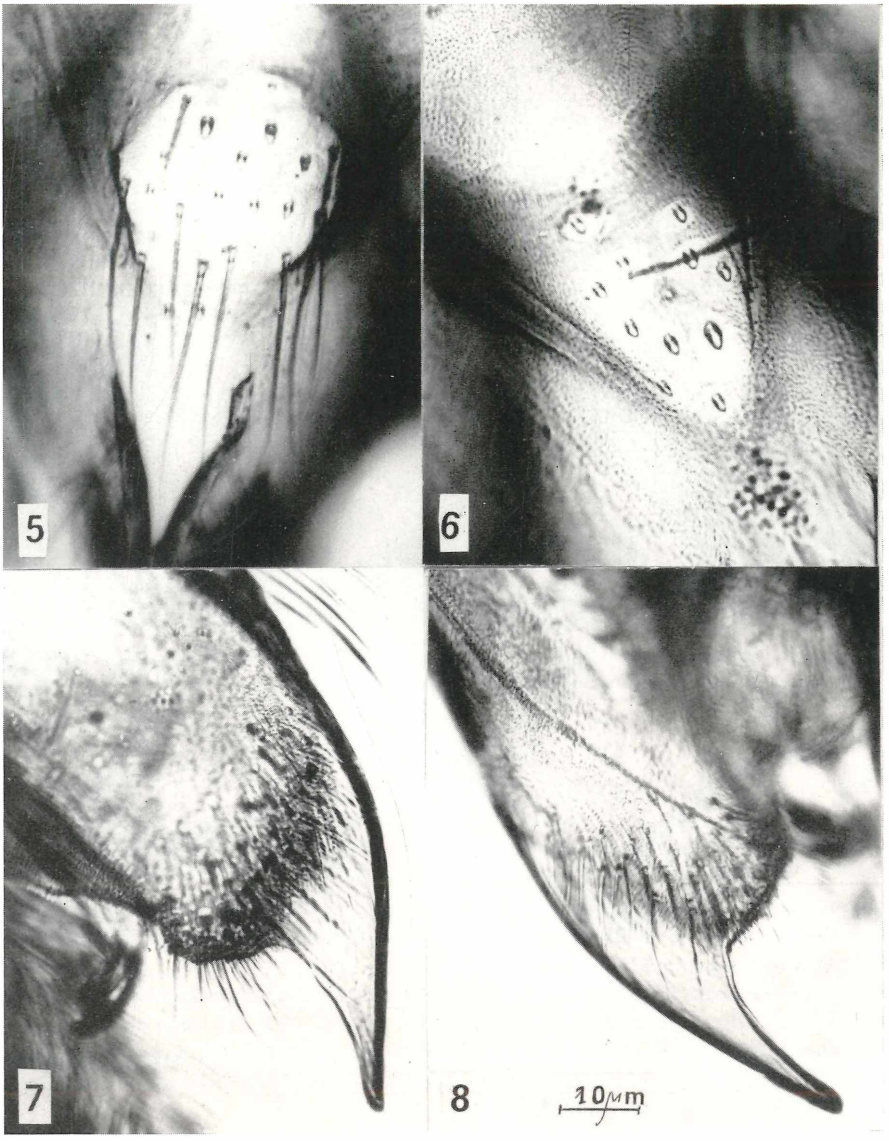


Fig. 5. Anal field of *Chironomus vancouveri* sp. n. — Fig. 6. Anal field of *Ch. plumosus* L. (Switzerland, Wohlensee). — Fig. 7. Anal point of *Ch. vancouveri* sp. n. — Fig. 8. Anal point of *Ch. plumosus* (Switzerland, Wohlensee).

The first chromosome (Fig. 14a): Arm A: identical with *Ch. plumosus* II (KEYL, 1962; MAXIMOVA, 1980; MICHAILOVA & FISCHER, in prep.). Arm B: different from *C. plumosus* II by a large inversion. Using the indication given by MAXIMOVA (1980), the chromosome of *Ch. vancouveri* has the following band pattern: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 22 21 20 19 18 17 16 23 24 25. The centromere region of this chromosome can be identified by a thin band.

The second chromosome (Fig. 14c): The band pattern of this chromosome is almost identical with that of *Ch. plumosus*, second group (MICHAILOVA & FISCHER, in prep.). In

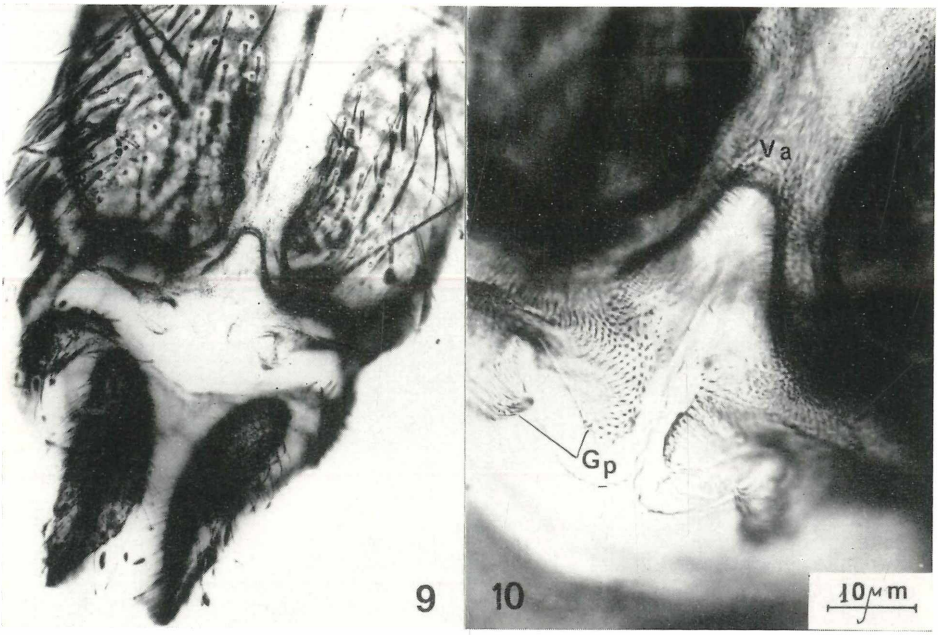


Fig. 9. Female genitalia of *Chironomus vancouveri* sp. n. — Fig. 10. Female genitalia of *Ch. vancouveri* sp. n.: gonapophysis (Gp.); vaginal apodeme (Va).

comparing with a band pattern of *Ch. plumosus*, given by MAXIMOVA (1980) this chromosome has the following sequences: 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1. Different from this chromosome of *Ch. plumosus* by thinner bands (Fig. 14c, d), especially well expressed in the centromere region. The differences in the thickness of the bands are well expressed in the hybrid *(Ch. vancouveri* x *Ch. plumosus)* (Fig. 15) (MICHAILOVA & FISCHER, 1984).

The third chromosome (Fig. 14e). Arm E: different from *Ch. plumosus* by a homozygous inversion. This difference becomes striking in the hybrid (Fig. 16). Arm F: identical with *Ch. plumosus*. The band pattern of this chromosome is: 1 2 3 8 7 6 5 4 9 10 11 12 13 14 15 16 17 18 19 20 21 22. The centromere region of this chromosome is more slender than that of *Ch. plumosus* (Fig. 14e, f).

The fourth chromosome (Fig. 14g). The homologues in the middle part of this chromosome are almost unpaired. Nucleolus at one end; Balbiani ring near the other end. Similar to the *Ch. plumosus*, but the bands are thinner and not well expressed after the Balbiani ring (Fig. 14g, h).

Inversion polymorphism has not been observed.

Taxonomic remarks.

Larva and Imago (♂♂, ♀♀) of *Chironomus vancouveri* sp. n. are very similar to *Chironomus plumosus* L. The larva differs from *Ch. plumosus* in morphology of epipharynx, the shape of the aperture of the clypeus (Fig. 12, 13) and in the size of the middle tooth of the submentum. The imago of *Ch. vancouveri* differs from that of *Ch. plumosus* by a shape of both the male and female genitalia, by having more slender gonostyli, while the gonostyli of *Ch. plumosus* are broader (Fig. 3, 4); by the shape of the anal field (Fig. 5, 6) and by the shape of the anal point (Fig. 7, 8). The Karyotype is very similar to that of *Ch. plumosus*. The chromosomes of both species are distinguished by homozygous inver-

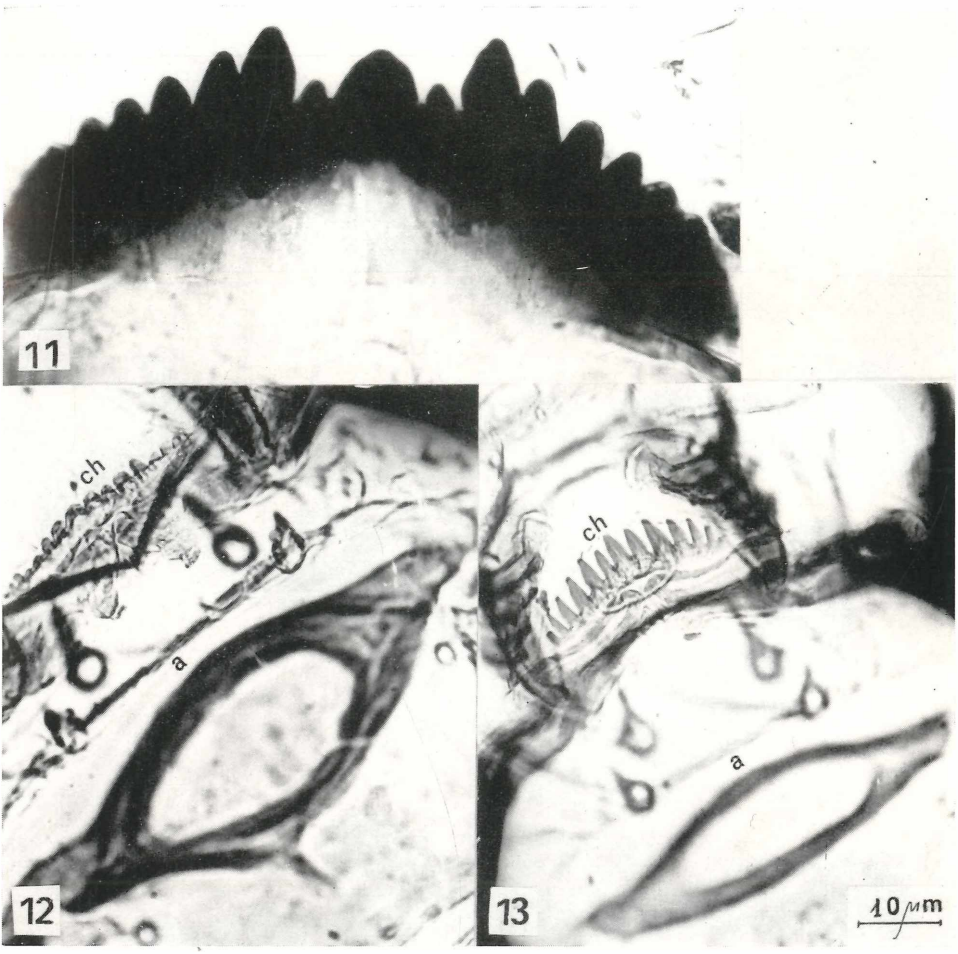
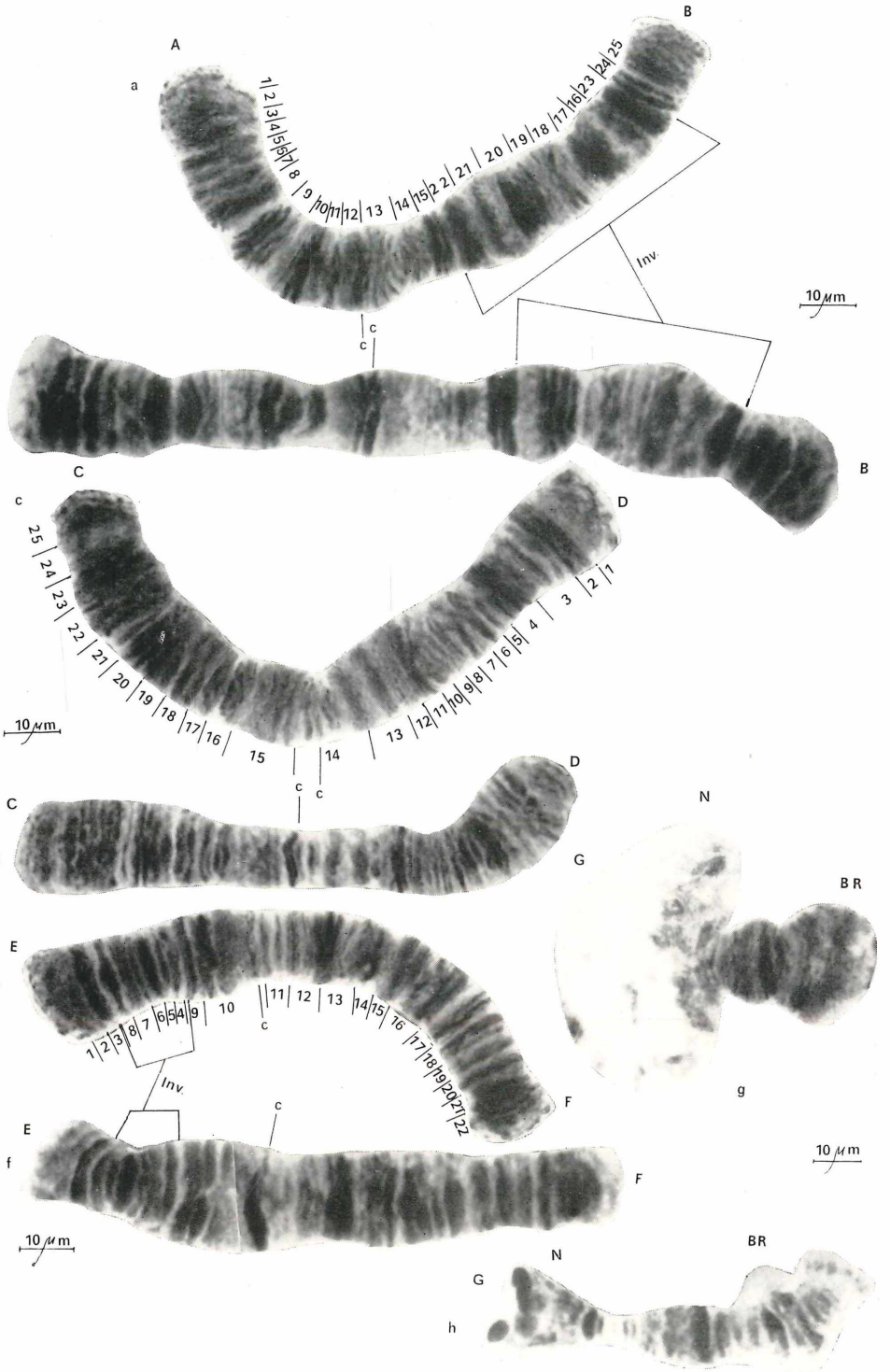


Fig. 11. Submentum of *Chironomus vancouveri* sp. n. — Fig. 12. Epipharynx: chaetulae (ch); aperture (a) of *Ch. vancouveri* sp. n. — Fig. 13. Epipharynx of *Ch. plumosus*.

sions and by the thickness of the bands. The hybrid *Ch. plumosus* x *Ch. vancouveri* (MICHAILOVA & FISCHER, 1984) shows almost complete lack of synapsis even in case of identical or very similar handing patterns. This indicates the presence of gene differences not reflected in the banding patterns (Fig. 17), which represent the differences between the species.

Egg masses and larvae were collected from Deer Lake (Vancouver, Canada), VIII. 1981. Imagines (♂♂, ♀♀) reared from one and the same egg mass and hatched in laboratory condition, a single egg mass were hatched under laboratory conditions.

Holotype: Larva, reared from the egg masses (N 12): chromosome preparation with larval head capsula and hurd part of abdomen. Paratypes: (3 ♂♂, 2 ♀♀, 5 larvae, 20 Karyotype preparations) are preserved in the first author's collections in the Institute of Zoology, Bulgarian Academy of Sciences.


A
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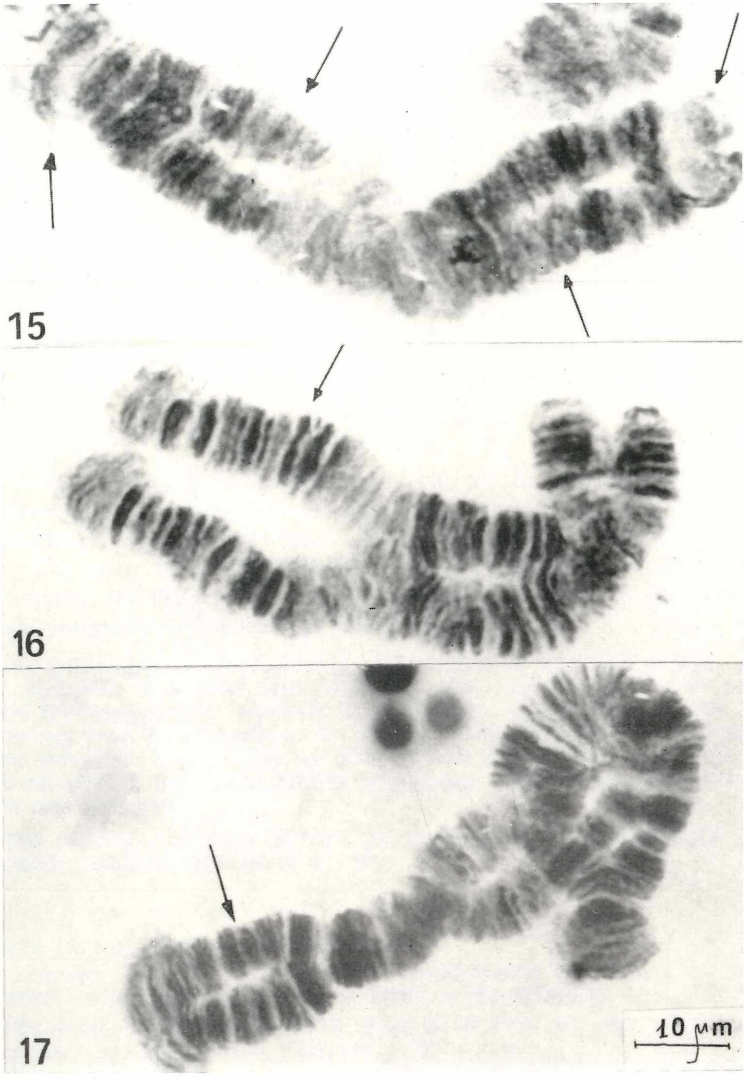

Fig. 15. II. chromosome of hybrid: *Ch. vancouveri* x *Ch. plumosus*. — Fig. 16. III. chromosome of hybrid: *Ch. vancouveri* x *Ch. plumosus*. — Fig. 17. I. chromosome of hybrid: *Ch. vancouveri* x *Ch. plumosus*.

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Fig. 14. a: I. chromosome of *Chironomus vancouveri* sp. n. (AB), b: I. chromosome of *Ch. plumosus* (AB), c: II. chromosome of *Ch. vancouveri* sp. n. (CD), d: II. chromosome of *Ch. plumosus* (CD), e: III. chromosome of *Ch. vancouveri* sp. n. (EF), f: III. chromosome of *Ch. plumosus* (EF), g: IV. chromosome of *Ch. vancouveri* sp. n. (G), h: IV. chromosome of *Ch. plumosus* (G). c — centromere region.

MICHAILOVA, P., FISCHER, J., (in prep.) Speciation within the *plumosus* group of the Genus *Chironomus* Mg. (Diptera, Chironomidae). – Z. Syst. u. Evolutionsforsch.

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