

Notes on the chromosomes of a springtail, *Tomocerus minutus* Tullberg (Collembola, Insecta)

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Knowledge of the chromosomes of the Apterygota has remained rather meagre, less progress having been made on the chromosome survey as compared with that in other groups of insects. So far as the literature shows, *Lepisma saccharina* L., a silverfish, is the only Japanese species of the Apterygota in which a chromosome study has been carried out (cf. Makino's list 1956). *Tomocerus minutus* Tullberg here dealt with is one of the common springtails of world-wide distribution. Uchida and Chiba (1958) have succeeded in laboratory breeding of this insect. In the course of the breeding experiments carried on by the junior author, there has been opportunity to observe the chromosomes of this insect.

Cordial thanks are due to Professor S. Makino, Hokkaido University, for his deep interest in the subject, and also to Professor H. Uchida Hirosaki University, under whose direction the breeding was carried out, for his valuable advice.

Method: Laboratory-reared late instar larvae of *Tomocerus minutus* Tullberg, about one year of age, were adopted as material for study.

To remove the body scales, larval bodies were rolled with care on a wet filter paper by the aid of a steel needle. The gonads were removed and placed on slides. An adequate amount of acetic dahlia solution was dropped on the gonads. The slides were left for about five minutes before the gonads were squashed.

In only one out of the larvae thus treated, was the investigation of the chromosomes possible. Judging from the structure of the gonad under examination the specimen here studied seems to be a female individual.

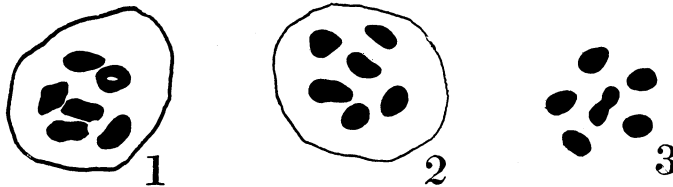
Results and Remarks

The chromosomes of six species of the Collembola have so far been studied by Claypole (1898), Lécaillon (1901), Tuzet and Manier (1956), and Willem (1900), but no species of the genus *Tomocerus* was examined by them. Recently, Saure and Brummer (1958) have observed in fixed materials the meiotic chromosomes of 15 species of Finnish springtails, in which four species of *Tomocerus* are included. The results of the present study will be given in the following by way of comparison with those of Saure and Brummer (1958).

Every cell of *Tomocerus minutus* under study showed at metaphase six

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chromosomes without any doubt. The same number of chromosomes was reported to occur in the four above noted Finnish species of *Tomocerus*. Out of the six chromosomes, five elements arrange themselves to form an outer circle around the remaining one. The chromosomes are of bivalent structure in the light of their



Figs. 1-3. Haploid chromosomes of *Tomocerus minutus*. $n=6$, \times ca. 2700.
1: Pro-metaphase-I. 2: Early metaphase-I. 3: Metaphase-I.

external appearance, as seen in Figure 1. The chromosomes shown in Figures 2 and 3 are those in process of the first division. Thus, it is possible to conclude that the haploid number of the chromosomes is six in *T. minutus*. Figure 3 shows six chromosomes at metaphase, one of which is dumbbell-shaped in outline. Saure and Brummer (1958) reported a trivalent chromosome to occur in the I-meiosis of the Finnish *Tomocerus*, such as *T. minor*, *T. vulgaris*, *T. longicornis* and *T. flavescens*. No such particular element was observed in the haploid complex of *T. minutus* at all.

By reference to Makino's list (1956), it is evident that the chromosome number is generally very much smaller in the Collembola than in the Thysanura. In comparison with the chromosomes of *Lepisma saccharina* L. (Itoh 1933), it is apparent that the chromosomes of *Tomocerus* are much smaller in size.

Résumé

The haploid chromosomes numbering six were observed in a laboratory-reared female of the springtail, *Tomocerus minutus* Tullberg in the squash material with acetic dahlia.

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