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NOTES ON THE CHROMOSOMES OF THE PEACH FRUIT MOTH, *CARPOSINA NIPONENSIS* WALSINGHAM (Carposinidae, Lepidoptera)

By Kazuo Saitoh and Masateru Yamada

Department of Biology, Hirosaki University, Hirosaki
and
Entomology Section, Aomori Apple Experiment Station, Kuroishi

The peach fruit moth, *Carposina niponensis* Walsingham (Momo-shinkuiga), is a serious pest of both peach and apple fruits in Japan. From the standpoint of forecasting the outbreak of destructive insects in apple orchards, Tsugawa et al. (1964) dealt with the development of gonads in hibernating generation of this species reporting that spermatocyte divisions began with the termination of hibernation. Nothing has, however, been known on the chromosomes of this species.

We wish to report in this paper the chromosome cytology of this species, in comparison with caryotypes of some species belonging to the Tortricidae. The present study is one of contributions to the chromosomes of moths of agricultural importance.

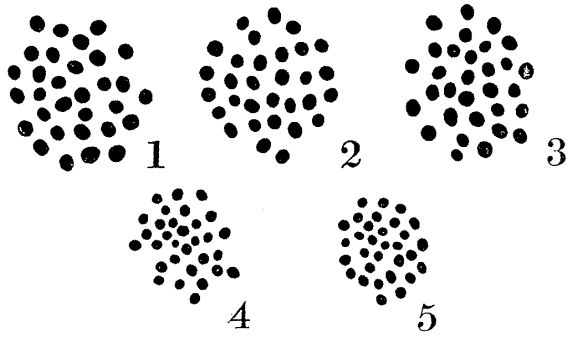
Materials and Methods

Sample insects used for the present study were collected in Kuroishi City. Larval, prepupal, and pupal testes were fixed with Allen-Bouin's mixture. Slides were made according to the ordinary paraffin method and stained with Heidenhain's iron hematoxylin with a counterstain of light green. Chromosome counts were carried out with clear-cut metaphase spermatocytes, and the chromosomes were drawn with the aid of an Abbe's drawing apparatus at table level, use being made of a 100 objective and a K 20 ocular.

The fixation of testicular materials and the preparation of slides were performed by the junior author (M. Y.). The senior author (K. S.) is responsible for the chromosome study and the preparation of this manuscript.

Observations

Counts were made in 26 primary spermatocytes from four larval testes and 10 from a single prepupal testis. In addition, 31 primary and 4 secondary spermatocytes from four pupal testes were also studied. Thus, the bivalent chromosomes were studied in a total of 67 primary spermatocytes. The dot-shaped chromosomes, 31 in n, were observed in every metaphase plate, showing a circular arrangement (Figs. 1–5). It was found that the haploid set of chromosomes of this species contained no peculiar chromosome.



Figs. 1–5. Spermatocyte chromosomes of the peach fruit moth, *Carposina niponensis*. ca. 3000 ×. n, 31 in each. 1, 2, 3: First division. 4, 5: Second division.

Remarks

Because of a systematic kinship, it is interesting to compare the caryotype of the peach fruit moth with those of some species of Tortricidae so far studied. The Makino's comprehensive review book of the chromosome numbers in animals (Makino 1956) mentioned that the haploid number n, 30, was established for two species of the Tortricidae, *Homona magnanima* and *Cacoecia ceracivorana*. This haploid number was found to occur also in four other species of tortricid moths injurious to apple trees (Saitoh 1960, 1966). Table 1 sets out, for comparison, the haploid numbers (n) established for these species. Thus, the similarity in n-number was generalized for all the six species of the Tortricidae so far cytologically studied.

Table 1. *Chromosome numbers of the peach fruit moth and four species of the Tortricidae found on apple trees.*

Species	Chromosome numbers (n)
Carposinidae	
Carposina niponensis	31 ♂ (I, II)
Tortricidae	
Archips fuscocupreana	30 ♂ (I, II) ; Saitoh, 1966
Archips breviplicana	30 ♂ (I, II) ; Saitoh 1960, 1966
Adoxophyes orana	30 ♂ (I, II) ; Saitoh 1960, 1966
Pandemis heparana	30 ♂ (I, II) ; Saitoh, 1966

I : Primary spermatocyte. II : Secondary spermatocyte.

Shibata (1930) noted the occurrence of one large chromosome in the haploid set in *Homona magnanima*, and the fact was supplemented with the additional data from the four tortricid species listed in the table (Saitoh 1960, 1966). The present investigation revealed that no such a characteristic chromosome was present in the haploid complement of chromosomes in the peach fruit moth. It is of impor-

tance that there is a caryotypic character available for the distinction of the peach fruit moth from some tortricid moths. However, further cytological studies with other species of both families are desirable for understanding of cytotaxonomic and evolutionary relations between these two groups of moths.

Résumé

The chromosomes of the peach fruit moth, *Carposina niponensis* Walsingham (Carposinidae), were studied in spermatocytes. The chromosome number, 31 in n, was established in this species.

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要　　約

モモシンクイガの染色体を固定材料で調べた．老熟幼虫，前蛹および蛹の精母細胞で観察したが，第Ⅰ，第Ⅱ分裂中期の極面観でそれぞれ31ケの染色体が認められ，何れも点状である．なお，数種のハマキガに認められるような特に大型の染色体はない．

この報告は“青森県の昆虫に関する調査（弘前大学動物形態学研究室）”の第11報である．