

Telomeres in the polytene genome of *Bactrocera zonata* and *Zeugodacus tau* (Diptera: Tephritidae) detected by the C-banding technique

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INTRODUCTION & AIM

Tephritid fruit flies *Bactrocera zonata* and *Zeugodacus tau* are significant polyphagous pest. Both species infest a wide number of fruits and vegetables in tropical, sub-tropical and temperate regions. Their polytene genome elucidates chromosome structure, gene activity and serving as tools for identification that can be crucial for adopting novel control strategies. Telomeres of polytene chromosome are repetitive sequences of non-coding DNA that cover the chromosome tips and protect them from nucleolytic degradation. To elucidate the scenarios, we study the salivary gland polytene genome of *B. zonata* and *Z. tau* larva through C-banding technique in CBR lab, IFRB, AERE, Dhaka.

- Study the polytene genome of *B. zonata* and *Z. tau*
- Elucidate the telomeres and their banding morphology of *B. zonata* and *Z. tau* through C-banding

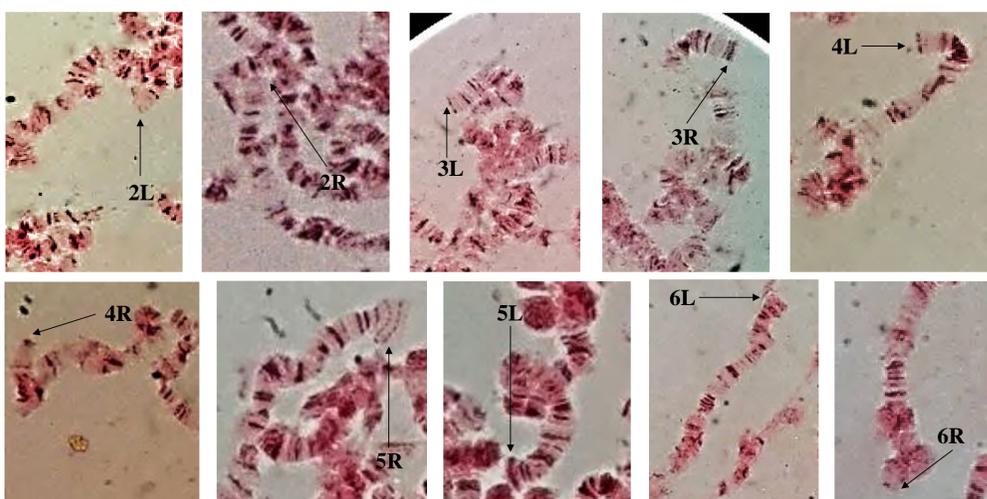
METHOD

Third instar larval salivary glands of *B. zonata* and *Z. tau* were dissected and polytene chromosomes were observed with modified procedures of Yesmin *et al.* 2021; Selivon and Perondini 1997.

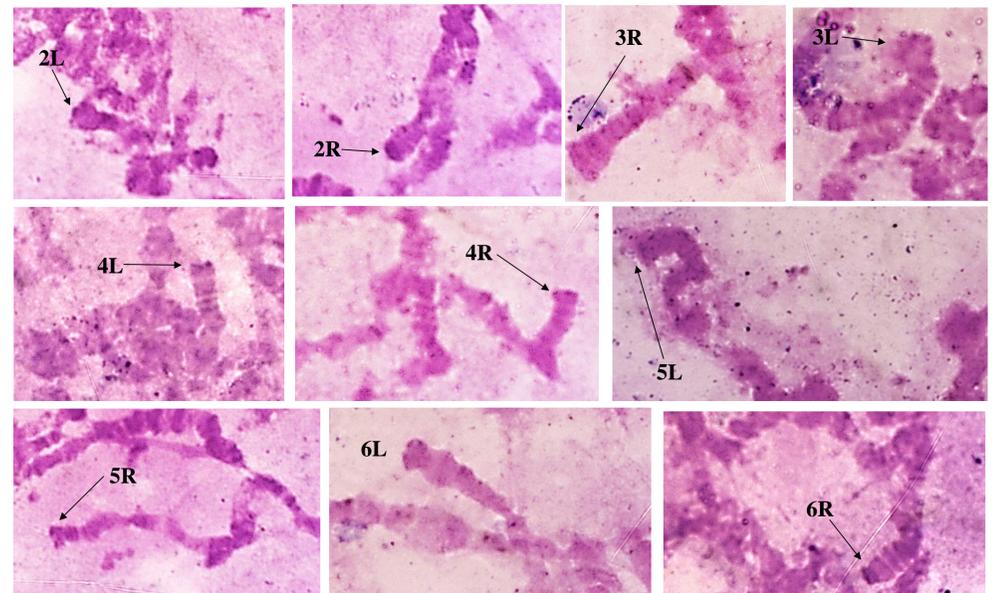
RESULTS

1. *B. zonata* and *Z. tau* polytene genome consist of 5 chromosomes (2-6) in salivary glands cell.
2. Chromosome 2 is the longest & 6 is the smallest corresponding to mitotic metaphase karyotype; long arm refers as Left (L) and short arm as right (R).
3. In *B. zonata*, telomere of 2L is slight swollen and hump structure with heterochromatic and euchromatic capped while it is rounded and heterochromatic in 2R; 3L have dotted banded and 3R is rounded heterochromatic cover; 4L and 4R are rectangular with densely heterochromatic capped; 5L expanded with dotted heterochromatic and 5R end rounded but engulf by highly heterochromatic cover; 6L tip rhomboid and heterochromatic while 6R rounded and mantled with euchromatic cover.
4. In *Z. tau*, telomere of 2L convex and euchromatic while 2R straight and heterochromatic; 3L end densely heterochromatic, 3R flattened and composed of dotted heterochromatic wrap; 4L and 4R tips straight ended with highly heterochromatic capped; 5L and 5R have long euchromatic area in their telomeres, 5L ended with heterochromatic envelope while 5R euchromatic ended; 6L appears with dotted heterochromatic capped and 6R have larger euchromatic cover in its telomeric end.

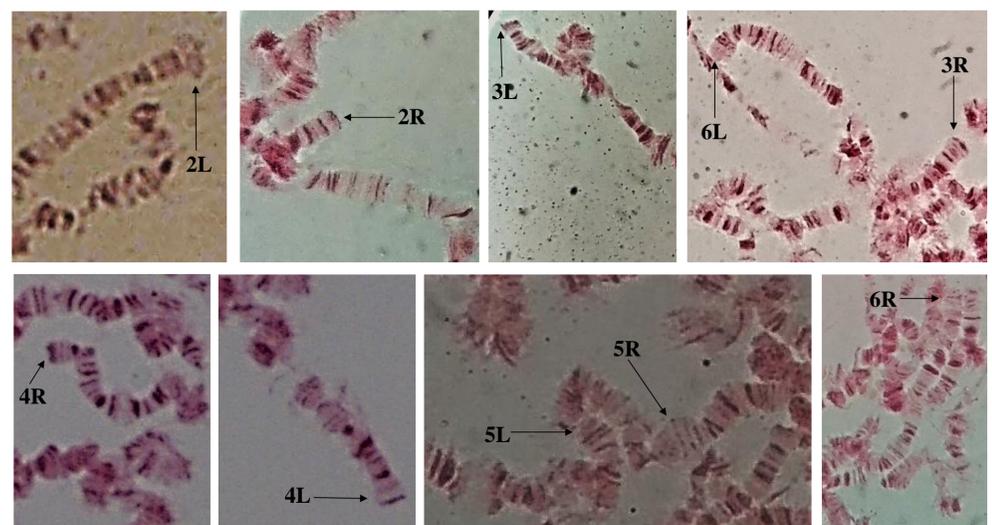
Telomers of polytene chromosome of *B. zonata* by Aceto-orcein method



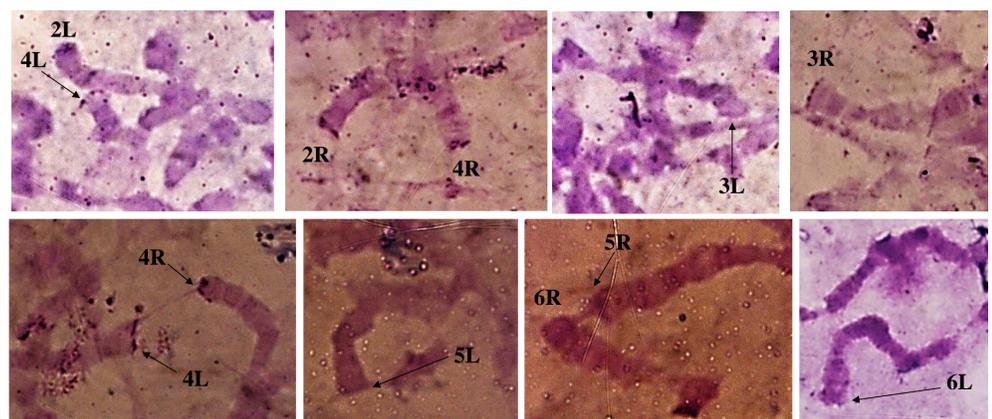
Telomers of polytene chromosome of *B. zonata* by C-banding technique



Telomers of polytene chromosome of *Z. tau* by Aceto-orcein method



Telomers of polytene chromosome of *Z. tau* by C-banding technique



FUNCTIONS OF TELOMERE

1. Telomeres are crucial for preventing degradation and/or inappropriate recombination of polytene chromosome and insects in different order adopted various strategies to maintain these events.
2. In fruit fly species it help to detect chromosomal recombination in hybridization process for establishing modern genetical control method.

CONCLUSION

Telomeres of *B. zonata* and *Z. tau* are significant to attain insight into structure, locate intense gene activity sites, it's organization and evolutionary linked of these pest's polytene genome that compacted its genetic control activities.

REFERENCES

1. Yesmin *et al.* 2021. Proceedings MDPI, **68**, x: 1-9. <https://doi.org/10.3390/IECE-10528>

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