
Summary and Conclusion

The analysis of mitotic chromosomes of four species investigated *Simulium (N.) praelargum* “IIL-1.2”, *Simulium (N.) praelargum* ‘IL’, *Simulium (M.) dattai*, and *Simulium (G.) williei* revealed the closeness between two cytoforms of *Simulium (N.) praelargum* “IIL-1.2” and *Simulium (N.) praelargum* “IL”. The data further justified the taxonomic status of *Simulium (M.) dattai* and *Simulium (G.) williei* belonging to two separate subgenus. The metrical study of the mitotic chromosomes seemed to be one of the important criteria for the taxonomical study of the species.

In addition to mitotic data, the positions of major cytological landmarks and different banding patterns have elucidated the relationship between different taxa. *Simulium (N.) praelargum* “IIL-1.2” and *Simulium (N.) praelargum* “IL” being the cytoform of the same species. *Simulium (M.) dattai* and *Simulium (G.) williei* being two separate species. The relationship of *Simulium (N.) praelargum* “IIL-1.2” and *Simulium (N.) praelargum* “IL” has been exclusively compared with *Simulium (N.) praelargum*-st and their closeness in the banding pattern except in those portions of the polytene chromosomes where inversion has taken place justifies their

taxonomic status of being two separate cytoforms of the same species. The difference in the inversion of the cytoforms, described as cytoform A and B from Thailand, cytoform C from Peninsular Malaysia, and cytoform D from Indonesia (Java) of the *feuerborni* group with the cytoforms of the *S. praelargum* from Darjeeling advocates the relationship between these species and the marked differences in the inversions justifies the close relationship of the species from Darjeeling with that of species from Thailand, Malaysian peninsula, and Indonesia.

The polytene chromosomal similarities between *Simulium* (*M.*) *dattai* and *S. (M.) ghoomense* from Darjeeling are comparable to each other to some extent at the subgenus level. Due to unavailability of standard map of subgenus *Montisimulium* as yet, no authentic relational conclusion could be drawn between *Simulium dattai* and *Simulium ghoomense* with that of the other species such as *S. inflatum*, *S. jasegulemum*, *S. alizadei*, *S. octofiliatum*, *S. bartangum*, *S. obichingoum*, *S. montium*, *S. quattuordecimfilum*, and *S. vantshum* from other parts of the world.

This was the first chromosomal map of *Simulium* (*G.*) *willieii* form *Gombakense* species group although subgenus *Gomphostilbia* being the dominant population across the Oriental region, no standard maps of polytene chromosome of *Gombakense* species group is available yet. However standard maps of polytene chromosome of *Ceylonicum* species group belonging to subgenus *Gomphostilbia* is

available. The comparison of *Simulium* (*G.*) *williei* with that of standard map of *Ceylonicum* species group has been made. The comparison revealed similarities in some sections of polytene chromosomes between these two species group. The complete polytene chromosome map of *Simulium* (*G.*) *williei* therefore, will be of prime importance for the establishment of standard maps in *Gombakense* species group that will allow to draw the inter relationships between the subgenus and other species group across the world.

The diversity of species of *Simulium* belonging to different subgenus and species group has been studied in the context of polytene chromosomes. The diversity of species within the subgenus *Nevermannia*, species group *feuerborni* has been successfully made with the specimens naturally available from the local stream of Darjeeling. The description of polytene chromosome map of the *Simulium dattai* under subgenus *Montisimulium* has established a foundation stone to create a species group within this species which otherwise is absent till date.

Description of *Simulium* (*G.*) *williei* under the subgenus *Gomphostilbia* within *Gombakense* species group has been for the first time has been proposed.

From the investigations made on the basis of polytene chromosomes the diversity of Simulium fauna from the Darjeeling Hill has been ascertained.