

STUDIES ON MORPHOLOGY AND KARYOTYPE OF *CHIRONOMUS AUSTIN* (CHIRONOMIDAE: DIPTERA) FROM AURANGABAD DISTRICT (M.S) INDIA

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ABSTRACT

The chironomidae is widely distributed group of aquatic and semi aquatic insects. These flies of the family Chironomidae, commonly referred non-biting midges are the holometabolous insects, with life cycle completed in the form of egg, larva, pupa and adult. During the present study the morphology of larva, pupa and adult of *Chironomus austin* was studied. The study reveals that the greatest part of their life cycle is in larval form. Larva is dark red in colour with 13-15 segments. The larvae are elongated with 20-23 mm length and having sclerotised head capsule, narrow, cylindrical body with one or two pairs of ventral tubule. The adult male is brownish in colour and smaller than the female. The antennae are hairy and plumose type. *Chironomus austin* is having thummi-type cytocomplex with the arm combination AB, CD, EF and G (2n=8).

KEYWORDS: Aurangabad, *Chironomus austin*, Karyotype, Morphology

INTRODUCTION

The Chironomidae is a large and diverse family of insects. They are nonbiting midge. The ecological amplitude related to several morphological and behavioral adaptations found in the family of chironomidae. MacDonald and Taylor (2006) and Armitage et al (1995). They are similar to the mosquitoes. There are 20,000 species known world-wide. Chironomids are a widely distributed and abundant group of species. The majority of the species do not differ in their external morphology at the larval stage. Species identification within this family can be done with the help of Karyotype. Study of the salivary gland chromosome Keyl (1962), Michailova (1989), Kiknadze et al (1991), Kiknadze et al (1998). Chironomidae generally possess good quality polytene chromosome and these can be used to provide additional characters for study of both taxonomy and phylogeny. It is most diverse group of aquatic insects including different environmental conditions and often makes up about one third of the micro invertebrate fauna of fresh water streams and rivers. Epler (2001) The Kham River originates from Durgadi hill area near Aurangabad and flows towards Paithan. While passing through the urban area of Aurangabad it carries untreated domestic and industrial sewage of Aurangabad city which is highly polluted and eutrophic. The larvae were collected from Kham River.

MATERIAL AND METHOD

The kham river located at (19⁰, 53¹, 59N, 70,20E). Larvae were collected with the help of a net. Larvae were kept in 10% KOH for 8-12 hours. After clearing the larva passed in distilled water (5 min) then glacial acetic acid (10 min) 2-propanol (15 min) were mounted directly into Canada balsam, methodology is suggested by Epler (2001), papp and Darvas (2000) and Donald and Mary (1983). Photograph of specimen taken through Olympus Camera in Magnus MLTr microscope at 10x, 40x, and 100 x magnifications (According to necessity). After isolating the salivary glands, the head

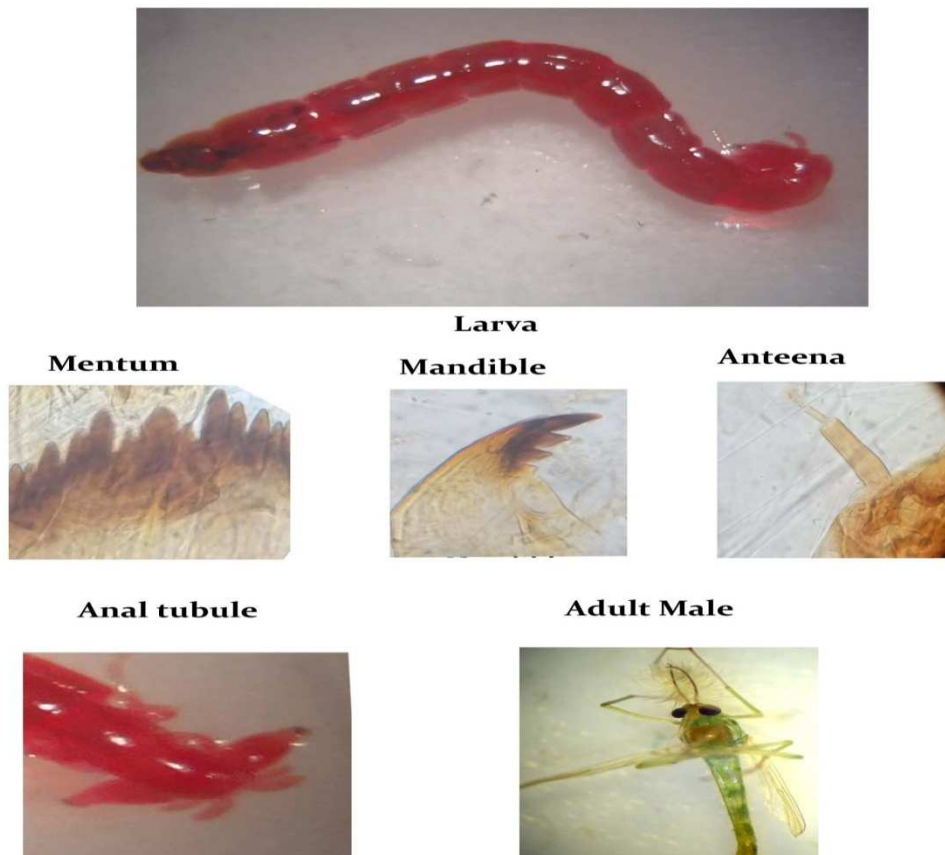
capsule and the larval body were preserved in 70% ethanol and treated with 10% KOH. Permanent slides were made for identification in Canada balsam. The larvae, pupa, adults were identified using standard keys suggested by Epler (2001), Seather (2000), Donald and Marry (1985). The salivary gland chromosomes of *Chironomus austin* were studied by using and catalogue based on the method suggested by Martin (1979). Polytene chromosome preparations were made by the squash procedure using 1.6% orcein in lactic acid: propionic acid: water (2:2:1). All squashes with well spread polytene chromosomes were preserved as permanent slides and microphotographs of polytene chromosomes were prepared (Dyomin shobanov 1990, Keyl 1962, Martin 1979). All measurements analyzed through Magnus Pro software and all are in millimeter.

RESULTS AND DISCUSSIONS

Chironomus austin (Beck Beck 1970).

Morphology

Plate-1



Morphology of *Chironomus Austin*

Larva is dark red in colour with 13-15 segments. The total length of larva 20-23mm. The type of larva is thummi-type. The ventral tubule is one or two pair and posterior side is longer than anterior tubule. Head is darkly pigmented. Mentum trifid median tooth and 12 lateral teeth. A pair of mandible present. Premandible apically bifid with at most one additional small tooth near center. Anteromedian margin of ventromental plate with fine teeth. Pectin epipharyngis with several inner teeth interspersed among normal teeth, antenna appearing somewhat elongate and

retractile. Mentum with 1st and 2nd lateral teeth mostly fused. Premandible with both teeth equally long, inner tooth about half as wide as the outer teeth. The adult of *Chironomus* larva called as midge fly. The Adult male is brownish in colour. Frontal tubercle twice as long as basal width. Thorax light brown in colour mesonotal vittae, scutellum and sternum medium brown to ochraceous postnotum almost black. Legs darker at apices of tibiae of tarsal segment brown. Eyes generally ovoid to reniform elongated dorsoventrally separated in both sexes. Adult male size is small than the female. The antenna is hairy and plumose type. Abdomen with simple pregenital segment stouter in female than in male setation of tergites and sternites highly variable in size and numbers. Wing narrow and broad. These characters observed during present study. Jon Martin June (2012) studied morphology and cytology of *Chironomus austin* in North American species of the Genus *Chironomus*. They observed characters like a brownish ochraceous species. Superior volsella closest to an E-type.

COMPARISION OF TEST SPECIES TO KEYS

Striated ventromental plates are present; no beard present beneath ventromental plates.....Chironominae

Ventromental plates separated medially by at least the width of the 3 median tooth/teeth of the mentum.....Chironominae.

Median tooth of mentum, pectin epipharyngis a broad multitoothed comb.1or 2 pairs of ventral tubules.....*Chironomus*

Mandible with at least 4 inner teeth.....*Chironomus*

Mandible with basal row of rapidly arranged striae front clypeal apotome with 1 median labral sclerite anterior to it.....*Chironomus*

Karyotype



Plate-2 Karyotype of *Chironomus Austini* Chromosome AB-I, Chromosome CD-II, Chromosome EF-III, Chromosome G-IV

Arm combination AB, CD, EF & G. Chromosome AB, CD, EF is met centric where as chromosome G is telocentric. The chromosome- 'I' is long elongated and characterized by maximum amount of dark and small amount of light band. Chromosome- 'II' contains mix band. i, e dark and light band. It also contains nuclear organization region and some swelling in the end portion. The chromosome-'III' contains one balbiani ring and small in size. Chromosome- 'IV' is unpaired and found in terminal position. This species also reported by Beck Beck (1970). Identification of specimen was carried out with the help of Keys suggested by Epler (2001) and Donald and Mary (1983), Seat her et al (2000), Cranston (2005). Taxonomic features of *Chironomus* genus described by Cranston (2005). Generic Occurrence of *chironomus* sp. in agro ecosystem of Penang Malaysia reported by Al-shami (2008)

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