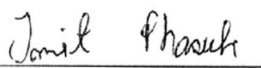



Jumnongjit Phasuk 2006: Lotic Diptera of Khao Yai National Park, Thailand, with Emphasis on the Diversity, Taxonomy, and Ecology of Black Flies (Simuliidae). Doctor of Philosophy (Entomology), Major Field: Entomology, Department of Entomology. Thesis Advisor: Associate Professor Jariya Chanpaisaeng, Ph.D. 241 pages.
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Eleven families of lotic Diptera were collected from 20 streams of Khao Yai National Park during 2000-2001. A total of 22 species of black flies (Simuliidae), including one species newly recorded from Thailand (*Simulium novemarticulatum*) and six undescribed species were recorded. All species belong to the genus *Simulium* Latreille s.l. and three subgenera, *Gomphostilbia* Enderlein (12 spp.), *Nevermannia* Enderlein (1 sp.) and *Simulium* Latreille s.str. (9 spp.). Species identity was based on morphological characters of mature larvae and pupae, larval salivary gland chromosomes, and the rearing of pupae to obtain adults. The larva and pupa of *S. novemarticulatum* are characterized for the first time. Ten other families, including members of the suborder Nematocera: Tipulidae, Blephariceridae, Psychodidae, Dixidae, Ceratopogonidae, and Chironomidae and suborder Brachycera: Tabanidae, Athericidae, Ephydriidae, and Muscidae, were found in the present study.

The larvae of 12 species of *Simulium* in the subgenus *Gomphostilbia* were analyzed chromosomally. All larvae had a chromosomal complement of $n = 3$. Positions of landmarks in the IIS arm, specifically the positions of the bulge and the ring of Balbiani, permitted the identification of most species, including some that were morphologically indistinguishable. Species with the IIS landmarks in similar positions differed in larval morphology. The combination of chromosomal landmarks in the IIS arm and selected structural features, especially the form of the cuticular setae on the larval abdomen and the configuration of the postgenal cleft and gill histoblast, permitted accurate identification of all 12 species in this study.

Species richness and abundance for seventeen species of larval black fly were analyzed for correlation with environment factors. The species accumulation curve, sampling intensity (6) and inventory completion index (98) show that sampling has been effective and close to completion. Drought and altitude were the main factors affecting simuliid larvae abundance, species richness and Fisher's α . Abundance, species richness and Fisher's α were not associated with water temperatures, pH and stream size. Sites with an open canopy had significantly higher abundance than those with a closed canopy. Simuliid abundance was significantly higher in streams subject to human disturbance.


Student's signature

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Thesis Advisor's signature