SWAMP Surface Water Ambient Monitoring Program

SWAMP Newsletter

Sound science for informed water quality management

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SWAMP Toxicity Test Species Highlight

Midge larvae – Chironomus dilutus

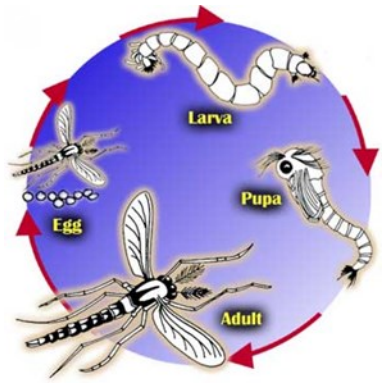

Figure 1. *Life cycle of midges-Chironomidae. These flies alternate between a long aquatic larval stage and a short flying adult stage. The aquatic larval stages are used in toxicity testing. Endpoints include growth, survival, emergence, and reproduction.*

- Midges are members of the family Chironomidae, the "non-biting" flies
- Their larval stages are among the most numerous invertebrates present in aquatic ecosystems around the world
- They function as important primary consumers, eating benthic algae and breaking down detritus in benthic habitats
- They are a key food source for fish
- The 10-day larval growth and survival test with *C. dilutus* was added to the Stream Pollution Trends monitoring program (SPoT) in 2015
- Though tolerant of organically enriched environments and low dissolved oxygen, larval chironomids are sensitive to human-induced contaminants
- Acute and chronic toxicity test protocols have been developed with *C. dilutus* larvae for water and sediment monitoring
- They have been shown to be particularly sensitive to several pesticides in current use
- Chironomids are the most sensitive species to newer classes of pesticides such as imidacloprid (a neonicotinoid), and fipronil and its degradates
- Use of both of these classes of pesticides is increasing in California

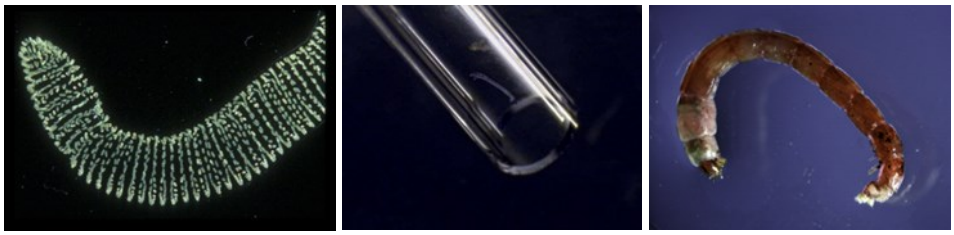

Figure 2. *Larval stages of Chironomus dilutus. Left: Egg case containing hundreds of eggs. Middle: Newly hatched first instar. Right: Developing fourth instar after ~ 10 days. Photos by Doug Hardesty, USGS, Columbia*

⇒ SWAMP Toxicity Testing: Organism Choices and Modified Methods Reveal Additional Information