SMITHERS
ACCURATE DATA • ON TIME • HIGH TOUCH

Ecotoxicology Testing

Smithers offers a complete suite of ecotoxicology programs for freshwater, marine and terrestrial species, providing testing for agrochemicals, pharmaceuticals, and industrial chemicals in all regions using OECD, EPA, and custom study designs to fulfill regulatory authority requirements.

Our scientists are knowledgeable in testing problematic (e.g., hydrolytically unstable, highly sorptive, volatile, low solubility) materials and analytically confirming exposure levels in low parts per trillion (ppt) range in a variety of sediment, soil and aquatic matrices.

Smithers has demonstrated experience with over 150 species and is well-recognized for its work with aquatic invertebrates, aquatic macrophytes, terrestrial and aquatic arthropods, including bees, a variety of fish species and amphibians. Some stocks of test organisms have been continuously maintained in-house cultures for nearly fifty years.

We have the experience and capabilities to provide a wide variety of tests to meet guideline requirements. Our expertise, dedicated staff and experience with unique testing methodologies make Smithers the ideal choice in environmental toxicology testing.

Laboratory Capabilities

- *Smithers performs tests with honey bees and non-target insects using biological and synthetic pesticides*
- *Customized study designs for product registration: up/down, staged and approximate lethal dose studies*
- *Endocrine disruption testing and research*
- *Product efficacy*
- *Feeding equivalency studies with channel catfish*
- *Screening studies*

ENVIRONMENTAL TESTING

Ecotoxicology Testing

Aquatic Ecotoxicology

Research biologists at Smithers average over twenty years of professional experience with fish and invertebrate full life-cycle studies, including two-generation studies, inhibition of shell deposition in molluscs, algal studies, sediment testing, and static and flow-through testing. Our scientists develop novel methodologies, exposure systems and culture techniques to provide customized testing strategies. Our staff is experienced in measuring unique or non-standard endpoints as well as designing innovative techniques to accommodate poorly soluble, highly reactive and/or highly volatile test substances.

We offer the following aquatic toxicology testing services with fish, microorganisms, invertebrates and plants:

- *Acute Studies*
- *Subchronic Studies (Early Life Stage)*
- *Chronic Studies*
- *Complex study designs to support pesticide Endocrine Disruption Studies:*
  - *Fish Short-term Reproductive Assay (FSTRA)*
  - *Amphibian Metamorphosis Assay (AMA)*
  - *Larval Amphibian Growth and Development Assay (LAGDA)*
  - *Fish Partial Life Cycle (PLC)*
  - *Fish Sexual Development Testing (FSDT)*
  - *Medaka Extended One Generation Reproductive Test (MEOGRT)*
  - *Fish Full-Life Cycle (FFLC) Tests*
- *Mesocosms/Microcosms*
- *GMO Catfish Studies*
- *Customized Studies*

Smithers has the ability to design outdoor ponds of various sizes based on testing needs.

Sediment Toxicology

Smithers has conducted sediment toxicity and spiked bioassays since 1987. We routinely perform whole sediment acute and chronic studies with invertebrates in both fresh and salt water. In addition, Smithers has vast experience in sediment water chironomid studies using either spiked sediment or spiked water. Smithers can also customize studies to meet specific objectives: bioaccumulation exposures with oligochaetes, polychaetes and clams; Sediment Toxicity Identification Evaluations (TIE); outdoor sediment exposures/microcosms.

Terrestrial Toxicology

Smithers offers a full terrestrial toxicology testing program with studies routinely performed on test organisms including terrestrial plants, beneficial arthropods, terrestrial insects and invertebrates, earthworms and soil microflora. Smithers state-of-the-art chemistry instrumentation and environmental fate laboratories enable staff to incorporate analytical chemistry and residue analysis that is particularly beneficial in the higher-tier tests.

Smithers has the expertise to design unique, customized studies to meet your specific testing needs. Our laboratories maintain freestanding greenhouses with a growing area of over 100m². Smithers was among the first laboratories to introduce reproduction tests with the red manure worm.

Pollinator Testing

Smithers provides a full portfolio of laboratory tests to evaluate the risk of pesticides to bees. A complete suite of contact and oral, larval and adult, honey bee and bumblebee tests are available to our clients worldwide. Full diet analysis is provided by the in-house analytical support team.

In addition, we developed an exposure system for honeybee research, which closely simulates natural organism behavior observed within the hive by allowing for direct and continuous contact between the test organisms (worker bees) and a queen bee.

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