Environmental Toxicology

Smithers Viscient’s environmental testing laboratories offer a variety of ecotoxicology programs with aquatic (freshwater and marine) and terrestrial species. Specific areas of expertise include: aquatic macrophyte and algal growth, plant vegetative vigour, seedling emergence and germination, earthworm acute and chronic, beneficial insect studies, fish and invertebrate acute studies, early life-stage and life-cycle exposures, in both aquatic and sediment environments, as well as customised studies to meet your regulatory testing needs.

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 Viscient has demonstrated experience with over 150 species and is well-recognised for its work with aquatic invertebrates, terrestrial and aquatic arthropods, including bees, a variety of fish species and amphibians. Some stocks of test organisms have been continuously maintained in in-house cultures for over forty 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 Viscient the ideal choice in environmental toxicology testing.

Aquatic Toxicology

Senior research biologists at Smithers Viscient average over twenty years in professional experience with fish and invertebrate full life-cycle studies (including two generation studies), inhibition of shell deposition in molluscs, sediment testing, and static and flow-through testing. Our scientists regularly develop novel methodologies, exposure systems and culture techniques in order to provide customised testing strategies, at times in collaboration with the US EPA. Our staff are 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, invertebrates and plants:

- Acute Studies
- Subchronic Studies (Early Life Stage)
- Chronic Studies
- Endocrine Disruption Studies (Fish Short-term Reproductive Assay, (FSTRA), Amphibian Metamorphosis (AMA), Fish Partial Life Cycle (PLC), Fish Sexual Development Testing (FSDT), and Multi-Generational Studies)
- Microcosms
- Customised Studies

Smithers Viscient maintains 25 outdoor ponds (2.3 x 2.3m) for microcosms or aquatic plant exposures.
Environmental Toxicology

Terrestrial Toxicology

Smithers Viscient offers a full terrestrial toxicology testing program with studies routinely performed on test organisms including terrestrial plants, plant metabolism, beneficial arthropods, birds, terrestrial insects and invertebrates, earthworms and soil microflora. Smithers Viscient’s 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 Viscient has the expertise to design unique, customised studies to meet your specific testing needs. Smithers Viscient’s Wareham laboratory maintains two freestanding greenhouses with a growing area of over 100 m². Smithers Viscient was one of the first laboratories to introduce reproduction tests with the red manure worm. In addition, we developed an exposure system for honeybee research which closely simulates natural organism behaviour observed within the hive by allowing for direct and continuous contact between the test organisms (worker bees) and a queen bee.

Field and Semi-field Capabilities

Non-target arthropods

- Honey bee and other pollinator field and semi-field studies
- Invertebrate exposure and residue levels
- Arthropod, pollen, nectar, plant tissue and soil residue assessments

Sediment Toxicology

Smithers Viscient 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 Viscient has vast experience in sediment water chironomid studies using either spiked sediment or spiked water. Smithers Viscient can also customise studies to meet specific objectives: bioaccumulation exposures with oligochaetes, polychaetes and clams; Sediment Toxicity Identification Evaluations (TIE); outdoor sediment exposures/microcosms.

Avian Toxicology

The Smithers Viscient team offers depth of experience in avian laboratory studies, field studies and consultation in support of product development and registration, while professionally addressing our clients’ individual testing and research requirements.

Laboratory Capabilities

- Standard avian regulatory guideline studies with mallard ducks, bobwhite quail, Japanese quail, canary, zebra finch, and other species
- Customised study designs for product registration: up/down, staged and approximate LD studies
- Endocrine disruption testing and research
- Two generation avian studies
- Product efficacy
- Microbial product testing in avian species
- Microbial and chemical testing with honey bees and non-target insects

Other studies

- Non target plant (terrestrial and aquatic) effects
- Run off