



Duckweed Growth Inhibition Test: An Educational
Tool
for High-schools and Universities

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Ecotoxicological and toxicity testing are comprehensive activities, covering a wide range of different educational subjects. A variety of aspects of biology, physics, chemistry, mathematics and environmental and social sciences are taken up by the duckweed growth inhibition test. Particularly, but not exclusively, for students from non-English countries, language and text-understanding could also be important educative factors addressed by the performing duckweed test based on English standards.

The duckweed growth inhibition test is a bio test system very easy to handle, merging all the educational aspects mentioned above into one single project. As the environmental sample or substance to be tested may vary greatly, a connection to the students' real environment can easily be created and thus their motivation increased. By using a test evaluation based on a computerised image processing system, vital aspects of engineering technology and computer sciences are also included. The direct link between technology and biology creates better understanding of the environment. And real options of enhancing living conditions lead to a general motivation to include these aspects in education.

This wide range of covered aspects makes the whole test system an excellent educational tool for high schools and universities, while at the same time the technology can still be employed for profound scientific purposes, using state-of-the-art measurement technology for bio tests.

The following items cover just some of the many educational aspects of the duckweed growth inhibition test: Additional information can be provided on specific request.

1. This test is a bio test, standardised in many international countries (ISO, OECD), including the USA (ASTM, Standard methods, US-EPA). Learn about the need for standardised bio tests and their importance for environmental safety!
2. Standards use a very specific, well-defined language. Learn about scientific language! Understand the importance of standardised tests and language!
3. The higher plant test over 7 days needs specific light and temperature conditions. Learn about physics of temperature and light and methods to measure them!
4. Plants need nutrients to grow. Discover vital substances! Learn how to calculate and prepare nutrition solutions!
5. Duckweed is an exponentially growing plant. Learn how to detect exponential growth and how to handle the mathematics behind it, including logarithms!
6. This is a toxicity test for finding substances harmful to plants. Learn what toxicity means! Select substances or environmental samples that could be toxic for duckweed! Make decisions about the focus of your project, e. g. why heavy metals, petrol or outdated pharmaceuticals should not be dumped into the water! Identify contaminated soils or sediments!
7. The raw data acquired in the test must be transformed to final toxicity values by multi-step calculation. Become skilled at the application of EXCEL or other spreadsheet programs! Find out how toxicity can be

- quantified! Learn basic facts about statistics (average values, standard deviations ...)!
8. Effect concentrations (EC-values) must be extracted from dose-response curves. Learn how this is done by using graphs or regression.
 9. EC values are the basis of risk assessment. Learn what risk is and how it is managed in our society. Learn how different people perceive objectively existing risks differently and how a society decides about the importance of specific risks.
 10. The most comprehensive analysis with the highest sensitivity of the duckweed test can be performed using the LemnaTec Scanalyzer image analysis system. Learn more about digital cameras, databases and image processing! Get to know reasons why automated analysis is more accurate than visual count alone!

The duckweed growth inhibition test for educational purposes is already used at several universities and high schools in Germany. Many students have successfully taken part in national and international science contests by using duckweed testing as their test platform.

LemnaTec strongly recommends using the most recently developed, state-of-the-art standard for duckweed testing: ISO 20079, the duckweed growth inhibition test. It includes an easy to handle test medium for best results, a list of plant suppliers and more useful material. Like other standard tests, it is fully compatible with the LemnaTec Scanalyzer image analysis system.

For further information please do not hesitate to contact

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