ZWEEC REVOLUTIONISES
identification and counting of planktonic algae

Algapro 21L, the online version for onsite phytoplankton monitoring

ZWEEC Analytics, a Singapore-based water technology company, has been developing technological solutions to address challenges in the water and environmental sectors. The company has launched Algapro 20S, an artificial intelligence (AI) identification and counting system of phytoplankton, to monitor water resources and prevent harmful algal blooms (HABs).

Phytoplankton, or planktonic algae, are the primary producer in water bodies, and their quantity, species, and distribution have an impact on the aquatic ecosystems. Regular phytoplankton monitoring is an important means to diagnose and maintain the aquatic ecosystem's health. It is critical for water authorities and utility organisations to ensure the water is safe for the communities.

ZWEEC's Algapro 20S is integrated with deep learning algorithms and advanced automatic systems, enabling automatic phytoplankton monitoring on a large scale and high frequency. Compared with the traditional manual methods of phytoplankton monitoring using the microscope, Algapro 20S shortens the time to process 15 units of samples to six hours. This, according to ZWEEC, represents four times increase in efficiency gains compared to traditional approaches.

Furthermore, Algapro achieves more than 80% accuracy on phytoplankton identification and counting, the company claimed. With Algapro 20S, ZWEEC is confident that large scale phytoplankton monitoring can take place "accurately, consistently, and efficiently" to protect water resources from phytoplankton contamination.

Algapro 20S has been adopted by the Yangtze River Authority to monitor China's waterways. Its deep learning algorithm has been programmed to identify about 30,000-labelled microscopic images of phytoplankton belonging to 40 common genera from the Yangtze River basin. During the training, the algorithm reached a detection accuracy of 97% for the test set. The comparing tests with human expert microscopic counting results using field samples showed the differences below 30% for both the total amount and percentage of recognised major genera.

The algorithm of Algapro is continuously developed to further enhancing its accuracy and efficiency. For instance, ZWEEC has collaborated with PUB, Singapore's national water agency, to expand the data size and genera numbers. ZWEEC has also developed an online version of the system, Algapro 21L, which enables onsite continuous monitoring of phytoplankton. Moving forward, ZWEEC will also expand the application of Algapro to monitor phytoplankton in other areas such as seawater. 〰️
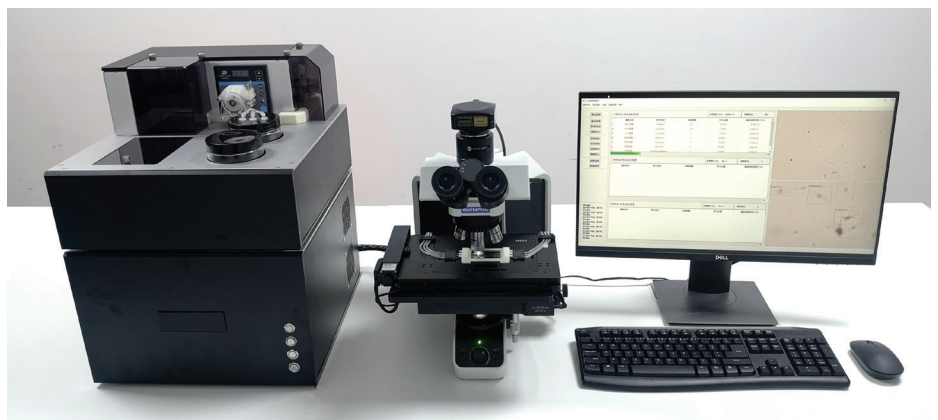
Algapro 20S, the lab version for automatic phytoplankton identification and counting