

times the elusive nature of the notebook precludes such an exercise, as illustrated by the following conversation between a former student and his advisor.

'Where is your lab notebook?'

'Sir, it is in my room. I will bring it next week.' After a week, on being reminded gently, the student replied, 'It is in my friend's room in the hostel.'

'Please ask him to give me the notebook.'

'It is in a box containing many textbooks and notebooks. My friend may not be able to identify it.'

'Ask him to bring all the notebooks. I will search for it.'

'Actually, all the data are not in the lab notebook. Some of them are in sheets of paper. I will copy the data into the notebook and then bring it.'

Taking a course on 'experiment methods in chemical engineering' and reading material on how laboratory notebooks should be maintained¹ had apparently been ineffective, thereby vindicating Gibbon's view (cited in Feynman²): 'The power of instruction is seldom of much efficacy, except in those happy dispositions where it is almost superfluous'. On a more optimistic note, we could perhaps follow Hilbert's suggestion that all the important topics should be taught several times.

1. Skoog, D. A., West, D. M., Holler, F. J. and Crouch, S. R., *Fundamentals of Analytical Chemistry*, Thomson Asia, Singapore, 2004, pp. 51–52.
2. Feynman, R. P., Leighton, R. B. and Sands, M., *The Feynman Lectures on Physics: Mainly Mechanics, Radiation, and Heat*, Addison-Wesley, Menlo Park, 1963, p. 5.

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Algal diversity as a renewable feedstock for biodiesel

Algae have received global attention as a renewable resource of biodiesel and may play an important role as a component contributing to the economic growth of the northeastern (NE) region of India. A variety of blue-green and green algae are found in the wetlands of various districts of Assam, however, they have hitherto remained untapped. There is ample scope for commercial culture of freshwater microalgae to exploit them as a biodiesel feedstock and as a resource for other economically important chemicals such as antioxidants and omega-three fatty acids. Exploitation of algal diversity in the NE region and its sustainable use as a feedstock for biodiesel through biotechnological interventions is the need of the hour to ensure future energy security. The Defence Research Laboratory in Assam (a laboratory of DRDO), is playing a vital role in this regard. To utilize the algal resource effectively for production of biodiesel and bringing it to a commercial scale, research needs to be undertaken to screen the biodiesel potential of existing strains of species native to this region and, assessment of field cultivation with a view to establishing open-

pond cultivation augmenting biofuel production. The isolation and purification to obtain pure strains of microalgae have already been started and are being done successfully in this laboratory. At present, the laboratory is maintaining the pure cultures of few algal strains, namely those of *Ankistrodesmus* spp., *Scenedesmus* spp., *Euglena* sp., *Chlorella* sp., *Chlorococcum* spp. and *Navicula* sp. The strains were obtained by employing tedious isolation procedures involving enrichment of natural waters and agar plating in BG₁₁ and WC media followed by dilution of mixed cultures¹. All the strains except that of *Navicula* can be grown on these two media. For the isolation of this diatom strain, D medium containing soil extract has been used¹. Further work of isolation and biochemical studies are in progress. All these strains are known to accumulate high intracellular lipid content as their storage product, which can also be augmented through manipulation of cultural conditions^{2–4}. Thus the strains can be successfully exploited for obtaining algal oil and its biochemical conversion to biodiesel. The rationale behind this type of study is to attract proper

attention towards sustainable utilization of natural wetlands for obtaining indigenous strains, with a view to exploring their expected role in the development of energy security in the country.

1. Anderson, R. A., In *Algal Culturing Techniques*, Elsevier Academic Press, USA, 2005.
2. Amotz, A. B., Tornabene, T. G. and Thomas, W. H., *J. Phycol.*, 1985, **21**, 72–81.
3. Piorreck, M., Baasch, K. and Peter, P., *Phytochemistry*, 1984, **23**, 207–216.
4. Wright, D. C., Berg, L. R. and Patterson, G. W., *Phytochemistry*, 1980, **19**, 783–785.

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