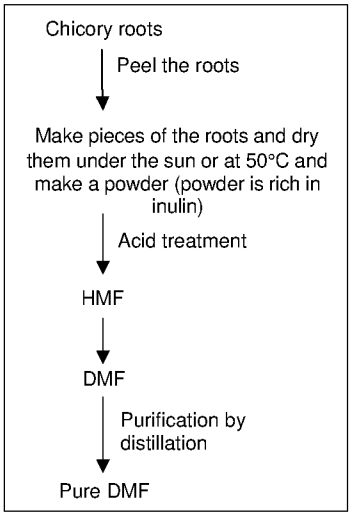

Figure 2. Procedure for preparation of DMF from chicory roots.

energy density, high volatility, is hydrophilic and can absorb water from the atomosphere. On the other hand, DMF has a 40% higher energy density, a higher boiling point and is not soluble in water.

Glucoseisomerase catalysed conversion of glucose to fructose leads to an equilibrium where fructose is about 42% and glucose is 50%. Separation of fructose from glucose adds to the cost of production of this sugar[2]. Chicory (*Cichorium intybus*) stores inulin, a β2-1 polymer of fructose in its roots[3]. The concentration of inulin-type fructans can be as high as 15–20% on fresh weight basis and 80% on dry weight basis[2,3]. A simple procedure for isolation of inulin from chicory roots has been developed in our laboratory[4]. The yield of chicory roots (dry biomass) varied from 10.6 to 16.5 t/ha. Inulin content in these roots was approximately 8–12 t, which can yield 5–7 t of DMF. According to Kuster[5], fructose and inulin are especially good starting materials for HMF production. Therefore we propose a simple procedure for preparation of DMF from chicory roots (Figure 2). However, toxicological impact of DMF needs to be looked into carefully.

1. Román-Leshkov, Y., Barret, C. J., Liu, Z. Y. and Dumesic, J. A., *Nature*, 2007, **447**, 982–986.
2. Gupta, A. K. and Kaur, N., *J. Sci. Ind. Res.*, 1997, **56**, 442–452.
3. Gupta, A. K., Mamata and Bhatia, I. S., *Phytochemistry*, 1985, **21**, 1249–1253.
4. Gupta, A. K., Kaur, N. and Kaur, N., *J. Sci. Ind. Res.*, 2003, **62**, 916–920.
5. Kuster, B. F. M., *Starch*, 1989, **42**, 314–322.

ANIL K. GUPTA*
NARINDER KAUR

Department of Biochemistry and Chemistry,
Punjab Agricultural University,
Ludhiana 141 004, India
**e-mail: anilkgupta@satyam.net.in*

Unintentional redundant retrospective studies

In India and Nepal, medical records data are easily available for researchers to take up retrospective studies (secondary data analysis). Unfortunately, the approach to access these data is not streamlined in most of the medical institutions. There is always a possibility that the medical records data would be analysed for retrospective studies with similar aims and objectives by two or more different groups of researchers. One group of researchers may not be aware that the same data are being analysed with similar aims and objectives by another group. The two different groups of researchers may be from the same or from different departments in the same institution. The results of such retrospective studies are often disseminated in the form of publications in reputed peer-reviewed scientific journals. At the postgraduate level, a dissertation or thesis is essentially an element of completion of the Master's degree course. The chances of the same data being analysed in a similar or different manner by postgraduate students of different departments cannot be ruled out. For example, a retrospective study on poisoning can be of interest to researchers from the departments of pharmacology, forensic medicine and toxicology, community medicine, and internal medicine. Similarly, important public health issues like suicide usually are studied by researchers from the departments of forensic medicine and toxicology, community medicine, and psychiatry. The true problem in an ethical sense, though not intentional, would arise much later on when the data are being published. The same data analysed in a similar manner would be published in different scientific journals by different authors. Such redundant studies turn out to become redundant publications, although unintended.

In medical institutions where the scope for prospective studies is limited, retrospective analysis of medical records data for dissertation/thesis should not be discouraged. However, care should be taken that it is not just for the sake of completion of the dissertation or thesis. It is time to revolutionize our attitude of doing a dissertation based on retrospective studies for the sake of completion of the course, though late than never. Moreover, every effort should be made to ensure that duplication of studies is avoided. Research and ethical committees are set up in most of the institutions and their approval is an essential part of any research undertaken. Usually not much attention is given to the conduct of retrospective studies. Moreover, prior to publishing a study, approval of the institutional ethical committee is usually not required for some journals. The bulk of unintentional redundant publications can be avoided at the grassroot level by streamlining the appropriate and effective measures/guidelines to gain access to medical records data in institutions. A computerized database should be maintained at the institutional level to avoid redundant or duplicate retrospective studies analysing medical records data.

RITESH G. MENEZES[1,*]
TANUJ KANCHAN[1]
STANY W. LOBO[2]
NISHANTH B. BHAT[3]
B. SURESH KUMAR SHETTY[1]
PRATEEK RASTOGI[1]

[1]*Department of Forensic Medicine and Toxicology,*
Kasturba Medical College,
Mangalore 575 001, India
[2]*Department of Anatomy and*
[3]*Department of Microbiology,*
Manipal College of Medical Sciences,
Pokhara 33201, Nepal
**e-mail: mangalore971@yahoo.co.in*