Productivity and impact assessment of natural products chemistry research carried out in Sri Lanka

by

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A thesis submitted in fulfilment of the requirement for the degree of

DOCTOR OF PHILOSOPHY (Ph.D)

of the

UNIVERSITY OF COLOMBO

Sri Lanka

2005

Abstract

This thesis consists of an account of the research findings of Sri Lankan natural products chemistry researchers from 1992 to 2002 and an analysis of the productivity and impact of natural products research carried out in Sri Lanka from 1975 to 2002.

The first part consists of the analysis of scientific findings of natural products chemistry research carried out in Sri Lanka and the results of these studies. This aspect was done by reviewing the published information in peer reviewed local and international journals from 1992 – 2002. The second part is a bibliometric analysis carried out using the electronic database, the Science Citation Index Expanded (SCIE).

During the course of this study, five Universities (University of Peradeniya, University of Sri Jayawardenepura, University of Colombo, University of Kelaniya and University of Ruhuna) and three Research Institutes (Medical Research Institute, Institute of Fundamental Studies and Industrial Technology Institute) were identified to be predominantly engaged in research in natural products chemistry.

The important research findings in natural products chemistry for the period 1992–2002, revealed that during the ten year period, a substantial and significant amount of work has been done by Sri Lankan natural products chemistry researchers who had investigated over 280 plant and animal species and over 60 species of lower plants, bacteria, fungi and sponges. However, although very important discoveries have been made by these researchers during the course of their investigations, most of these research results have not progressed into any products of commercial value. Further, despite of the rich biodiversity and many research groups working on natural products

research in Sri Lanka, the research work has given rise only to compounds which though active under *in vitro* conditions have failed to give any drug leads. The lack of high resolution instrumentation needed for structure elucidation and confirmation together with the necessary expertise for their maintenance, lack of online library facilities such as databases and e-journals and a dearth of relevant bioassay facilities have been identified as the major obstacles for the progress of natural products chemistry research in Sri Lanka.

The absence of a clearly defined state policy for Intellectual Property. for Sri Lanka is identified as a major drawback specially with regard to research collaboration with foreign nationals.

With respect to the research impact component of this study, it was clear that although an institutionalized, formal mechanism for evaluation of research in Sri Lankan Universities and Research Institutes is not available, all these institutions have mechanisms for the assessment of the research productivity of their staff. The method of peer-review seems to be the preferred method for research evaluation in Sri Lankan institutions covered in this study although bibliometric indicators also play a significant role in this process.

The second component of the study which comprised initially of a bibliometric assay, involved primary data collection from the SCIE on publications of Sri Lankan scientists during the period 1975 to 1998 and the related citations. The citations slotted for a 5-year life time of these publications, showed that the citation rate (the average citations received for a publication over a five year lifetime) which was highest during 1975 to 1977 had declined progressively over the 23 year period of

study. This trend had almost entirely been due to the overriding trend in the rise and fall in the number of publications in natural products chemistry from the University of Peradeniya.

Results of the study on research collaboration that existed between researchers revealed that contrary to what has been observed by researchers engaged in international studies, the scientific impact resulting from "Intra-departmental collaboration"(researchers in the same department of an institution) was as strong as that from international collaboration.

The results of the institutional productivity study revealed that the conducive working arrangements and the stringent mechanisms for monitoring and evaluation of research at the Institute of Fundamental Studies, had resulted in a clearly visible rise in productivity of researchers engaged in natural products research in this institution while research productivity had declined sharply at the University of Peradeniya. Significantly, a situation analysis revealed how changes in the working conditions as well as the growing disparities in research environments within a network of research groups had resulted in a productivity transposition between two institutions within a set cultural landscape.