CHAPTER 1

INTRODUCTION
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The growth of scientific literature both in volume and variety has caused great concern to the librarians as well as the users. Price's [1] data indicated that the growth of literature was exponential, having the effect of doubling annual output at intervals of 10 to 15 years. The work of Price and others gave rise to the phenomenon known as the 'Information Explosion'.

Information is not only increasing exponentially but also the rate of growth varies from one discipline to the other. Literature in a particular discipline is not only widely scattered in a large number of periodicals, but also in respect to country and language. The multiplicity of journals, the constraint of limited financial resources and ever increasing needs of user community necessitated the librarians to develop a need based information resources and services to meet the requirements of users.

Thus, a clear understanding of the characteristics of subject literature is important in planning and designing of information systems relating to a particular field. The realisation that the structure and characteristics can be assessed by application of quantitative techniques to the recorded knowledge stimulated the development of a new field in Library and Information Science designated as 'Bibliometrics'.

Prichard [2] used the term 'Bibliometrics' in 1969 to describe all studies which seek to quantify the process of written communication. He defined bibliometrics as "the application of mathematics and statistical methods to books and other media of communication". The method is now adopted for a variety of purposes like evaluation of scientific output, selection of scientific journals and determination of various scientific indicators.

Citation analysis is the most popular technique used in bibliometrics. Citation studies are useful in elucidating the deployment of library services in research. Meaningful acquisition becomes possible when the quantum of citation from a particular journal(s) is assessed by the librarians. Citation analysis makes easy in weeding out redundant material, for better utilization of space and efficient reduction of expenditure.

The literature abounds with many studies, based on citations in journals and dissertations. Most of these studies are limited to individual fields like Medicine, Physiology, Microbiology, Anthropology, Phytopathology, Botany, Economics etc. Further in India, only a few studies are made in the fields of Botany and Zoology. Maheswarappa and Prakash [3] examined the literature use pattern by the researchers in Botany. Begum and Rajendra [4] analysed the Indian Zoological Science literature and studied the trends in authorship pattern and collaborative research. Maheswarappa and Savadatti [5] studied the authorship pattern and collaborative research in the field of Plant Breeding. Maheswarappa and Nagappa [6] analysed citations in Phytomorphology. Maheswarappa [7] conducted a bibliometric analysis in the field of Phytopathology. But so far no attempt has been made to analyse comprehensively the citations cited by researchers in Biological Sciences as a whole. Further, the assessment of requirement of literature for Biological research carried in a particular institution appears to be scarce. Therefore, the present study is undertaken
to analyse the citations cited in doctoral theses in Biological Sciences to help the selection of journals of extensive coverage of content.

1.1. NEED FOR THE STUDY

Sri Venkateswara University, Tirupati, established in the year 1954, is one of the oldest Universities of Andhra Pradesh. The research is going on in this University in almost all basic branches of Physical, Biological and Social Sciences, and Humanities. It has a constituent Library with a reasonably large collection of books and periodicals. This library is catering the needs of researchers to a great extent.

The exponential growth of scientific literature, interdisciplinary nature of research and trend towards specialisation have posed many problems both to the scientists and librarians. Further, emphasis on national and international information systems have signified the need for an analysis of literature used by scientists [8].

The extensive investigations and the abundance of literature being published contributed to immense escalation of cost for the libraries towards the acquisition of literature published. Further, due to the lack of adequate funds, the libraries are not in a position to acquire all the periodicals required for the researchers. Therefore, to maintain a reasonable collection of periodicals, atleast in broad fields, it is necessary for the librarians to know the characteristics of literature being used by researchers.

In this direction bibliometric analysis has now become a well established part of Information research. So far no such comprehensive study on the literature use pattern by researchers in Sri Venkateswara University has been made. Hence, with a view to provide some basic information about the characteristics of literature used by the biologists in Sri Venkateswara University, the present study namely “Bibliometric Study of Citations In Ph.D. theses In Biological Sciences” is undertaken.
1.2. DEFINITION OF BIOLOGICAL SCIENCES

McGraw-Hill Encyclopedia of Science and Technology [9] defines Biology (Biological Sciences) as follows:

"A division of natural sciences dealing with life. Biology is the science of living organisms in contrast to the physical sciences, which are concerned with inanimate matter. Biology is the broad general field of knowledge concerned with the study of all aspects of living organisms which can be approached by the methods of natural sciences. Because the field is so broad in scope, it has been divided into two main divisions, Botany and Zoology, each with a large number of specialised branches. No one worker can know the entire filed of biology thoroughly. Specialised subdivisions of biology pertaining to both plants and animals include taxonomy, morphology, embryology, physiology, cytology, genetics, evolution and ecology. The term biology embraces those principles of widest application to the origin, growth and development, structure, function, evolution and distribution of plants and animals".

Hence, in a nutshell Biological Sciences can be defined as that branch of knowledge which is concerned with the study of all aspects of living organisms.

1.3. OBJECTIVES

The objectives of the present study are:

1. to find out the various sources of information consulted by the researchers in Biological Sciences;
2. to study the distribution of citations by subject, country of origin and language;
3. to study the nature of authorship pattern in the literature of Biological Sciences and changes thereof as a function of time;
4. to determine the extent of collaboration in the literature of Biological Sciences;
5. to find out the core journals in Biological Sciences;
6. to examine the applicability of Bradford's Law of Scattering to the pattern of journal use by the researchers in Biological Sciences;
7. to test the exponentiality of the frequency distribution of aged data;
8. to find the obsolescence of literature used; and
9. to assess the availability of cited journal articles and journals in the Library of Sri Venkateswara University.

1.4. SCOPE AND LIMITATIONS OF THE STUDY

The present investigation is concerned with the analysis of citations cited in the Ph.D. theses accepted in the field of Biological Sciences for the award of doctoral degree by Sri Venkateswara University, Tirupati (India). Biological Sciences comprise of a number of subfields namely Botany, Zoology, Biochemistry, Embryology, Physiology, Cytology, Genetics etc. Botany, Zoology and Biochemistry are the only branches of Biological Sciences which offers post-graduate courses leading to doctoral degree in Sri Venkateswara University.

Departments of Botany and Zoology are the earliest faculties in Sri Venkateswara University and no other field of Biological Sciences has so large a number of theses that can be utilised for the study. Hence, the study is limited to the two major branches of Biological Sciences viz., Botany and Zoology. Two hundred (200) Ph.D. theses available in the Departmental Libraries of Botany and Zoology and in the Central Library of Sri Venkateswara University are utilised for the study. Citations which were appended to these theses, form the basis for the investigation.
1.5. ORGANISATION OF THE THESIS

The entire study is organised into five chapters.

Chapter I 'INTRODUCTION' presents the need and motivation, objectives, scope and limitations, and organisation of the study.

Chapter II 'REVIEW OF LITERATURE' highlights the importance of bibliometric studies, their origin and earlier studies carried out in bibliometrics.

Chapter III 'DATA AND METHODOLOGY' deals with the data used for the study and the methodology adopted for analysing the data.

Chapter IV 'RESULTS AND DISCUSSION' deals with the distribution of citations according to various bibliographic forms, country of origin, language, subject and number of authors. Ranking of cited journals, the applicability of Bradford's law of scattering to the cited data, the age distribution of cited data and the availability of cited material in Sri Venkateswara University Library are also discussed in this chapter.

Chapter V 'SUMMARY AND CONCLUSIONS' gives the summary of the study, conclusions and suggestions made.

REFERENCES


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