

Pharmacology and Pioneer Indian Women Scientists

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I consider it a great honour and privilege to write this editorial to the Journal Acta Scientific – Pharmacology (AS Pharmacology). Generally we know that pharmacology is the branch of pharmaceutical sciences, to be specific under the umbrella of life sciences, chemical sciences and medical sciences, dealing with the study of the selection of drug plants and also to know the ingredients of the compounds produced chemically for having medical benefit. The compound obtained can be defined as drug which can be used to get its effect on living organisms. Considering the fact that, science and technology plays key role towards the economic growth of India, Modern India focuses on its advancement and betterment. Science has become highly important and the science of present age is an extremely vast and it reflects the greatest advancement of the human mind through the ages. At the same time its misuse threatens greatly the civilized world which earlier science had helped to evolve. I am presenting here the ethos and culture with the scientific value of the earlier scientific works carried out by the top Indian women scientists.

A society would advance ahead of others if it has an all innovative scientific spirit having the new scientific inventions to make the best use of them. The scientific spirit is the bedrock of Nation's progress. In a traditional society like ours, we are yet to create an effective and vibrant scientific temperament to the young generation. As a result, our science education lacks fundamental strength. It is our fervent hope that all the college students understand the evolution of science and the arduous path of the scientist so that they would be inspired to be scientific in their outlook and be receptive to new inventions and innovations.

Women have made significant contributions from the earliest times.

In several early civilizations as well, we see that women have marked their presences in the field of medicine. In ancient Greece, women had the opportunity to study natural philosophy. In the first or second centuries AD, women made their contributions in the field of alchemy. First universities were established in the eleventh century, but women were not included in the university education. When it comes to providing liberalisation, Italy holds its position in the first place as women in Italy were more into the field of medicine. Elena Cornaro Piscopia from Italy (1646-1684) became the first woman in the world who not only received an academic degree from the University of Padua (founded in 1222), but also received Doctor of Philosophy (D.Phil.) degree in 1678. She is the second woman recipient of Doctor of Philosophy degree but in the field of science, she became the first woman in the world. She was the first female university Professor of Physics at a University in Europe.

Figure 1: Elena Cornaro Piscopia (1646-1684).

Figure 2: Laura Bassi (1711-1778).

Contributions of Indian women in the field of Science for over a century has been discussed in the following section.

Kadambini Ganguly (1861-1923)

She became the first woman who received her degree in 1886 as Medical Doctor.



Figure 3

She appeared for the entrance examination test conducted by the University of Calcutta, from Bethune school. She was the first candidate from her school to appear for the above mentioned examination. She cleared the examination in 1878 and created history by doing so as she became the first woman to successfully pass the examination. Her success led to the introduction of

Graduation and First Art (FA) courses in Bethune College in 1883. Chandramukhi Basu and Kadambini were the first two women candidates in the entire British Raj who completed their graduation. In 1886, she got eligible as the first Indian women physician to practice medicine, as she received Graduate of Bengal Medical College degree. In 1892, she left India and moved to United Kingdom to gather more knowledge in the field of medicine. She started working at Lady Dufferin Hospital, Calcutta after coming back to India for a short period of time, later she started practicing her own.

For the purpose of solidarity, she organized Women’s Conference in Calcutta and she served as the President in 1908. On 7th October 1923, she died just after coming back home from a regular medical call.

Her contributions in the field of her expertise will always make her alive.

Asima Chatterjee (1917-2006)

She became the first woman scientist who was awarded Doctor of Science Degree by the University of Calcutta (which is an Indian University) in 1944. In 1960, she was nominated and elected as a Fellow of the Indian National Science Academy (INSA). She is the recipient of several prestigious awards and positions which include Premchand Roychand Scholarship of the University of Calcutta, Khaira Professor of Chemistry (1962-1982, the most prestigious and coveted chairs of the University of Calcutta), the Shanti Swarup Bhatnagar award (1961), the C V Raman award, and the P.C. Ray award. In recognition of her contributions in the field of science, she received the Padma Bhushan in 1975, which is the third-highest civilian award of the Government of India. She was the first woman who was elected as the General President of Indian Science Congress in 1975. From 1982 to May 1990, she was nominated by the President of India and she served herself as a Member of the Rajya Sabha. Prof. Chatterjee also served ISNA Council for long time and also acted as one of the Vice-Presidents.

Her area of research includes medicinal chemistry, synthesis of natural products from plants.

Kamal Ranadive (1917-2001)

She is known for her research in the biomedical field. Her contribution in the cancer research field made her one of the

Figure 4

notable researcher in her specified area of research. She worked in the field of Cytology while carrying out her doctoral research at Indian Cancer Research Centre. She received Doctor of Philosophy degree in 1949 from the University of Bombay. After receiving her doctoral degree, she joined John Hopkins University, Baltimore, Maryland, USA to carry out her post-doctoral research. After returning she joined ICRC, Bombay and in 1960, for the first time, in India, tissue culture laboratory was established. She was the pioneer woman scientist in animal modelling of cancer development. Her research work focused on the relationship that existed between cancer and hormones and tumor virus. Finally she worked as the Director of the ICRC in acting capacity for a term of 1966-1970. Approximately 200 research papers in the field of cancer and leprosy were authored by her. Dr. Ranadive received the first Silver Jubilee Research Award in 1964 of ICMR, the G.J. Watumull Foundation Prize in microbiology in 1964 and finally she received the Padma Bhusha (India's third highest civilian award) for Medicine in 1982 by the Government of India.

**Figure 5**

The progress of research being conducted by Indian women scientists in chemical physical, biological, medical, pharmaceutical sciences and other allied disciplines are also commendable. Besides, it is also very pertinent to focus on the social and cultural issues of women scientists in the present society. Through this editorial we pay our respectful homage and tribute to these celebrated Indian women scientists who brought name and fame to Indian science. The women scientists will lead us in a proper and the most significant pathway to proceed in right directions in the 21st century. These women scientists changed the world through their talents and innovative ideas. They have made ground breaking discoveries that have contributed to the betterment of human kind. These women scientists are the role models for all girls who aspire to make a mark in the field of science and technology.