

Reminiscences of Prof DK Belsare's Past and Present Research Career: A Student's Tribute to an Outstanding Academician

Ayesha S Ali

Professor of Zoology and Biotechnology, Saifia College, Barkatullah University, Bhopal, 462001, India

ABSTRACT

These heartfelt feelings of gratitude by the author are for her doctoral supervisor, Prof DK Belsare PhD, D.Sc. FNASc, a distinguished international researcher, academician, teacher and overall a human being of phenomenal qualities. Prof Belsare started his academic and research journey in the late 1950s and continued it effortlessly till his death on 31st December, 2025, spanning almost seven decades. Dr Belsare worked on the endocrine system of fish, *Ophiocephalus punctatus*, where he reported a stalkless pituitary, thyroid gland (previously called blood sinus) and indirect blood supply through the hypothalamus for the first time and published these reports in reputed journals like Nature, American Journal of Morphology, American Journal of Experimental Biology, Zellforsch Anat and Anatomical Research, Current Science and many others. Similarly, the adrenergic receptors that regulate heartbeats in fish, *Gambusia affinis*, was also the first report, published in Current Science in 1965. With over 200 research publications, 50 books and attending dozens of international conferences, chairing them worldwide, Prof Belsare was an institution in himself. He leaves behind a legacy of intellect and wisdom, which was matchless. I am fortunate to be his student, who was lucky to meet him just before he left for his heavenly abode, at 92, still talking science.

KEY WORDS: PROF DEVIDAS K BELSARE, RENOWNED INTERNATIONAL RESEARCHER, DISTINGUISHED. PROFESSOR

INTRODUCTION

Prof. Dr DK Belsare, PhD, D.Sc. FNASc, started his research career in August 1958, when he got the Central Government's UGC fellowship under the supervision of Dr H. Swarup, a distinguished professor and academician of the pre-independence era. Dr Belsare worked on the

endocrine system of fish, *Ophiocephalus punctatus*, where he reported a stalkless pituitary, thyroid gland (previously called blood sinus) and indirect blood supply through the hypothalamus for the first time and published these reports in reputed journals like Nature in 1965, when access to the world's number one journal was limited, what to talk about publication in it.

His later publications were in top journals like American Journal of Morphology, American Journal of Experimental Biology, Lipids (Springer), Zellforschung und Anatomie, Anatomical Research, Current Science and many others. Similarly, the adrenergic receptors that regulate heartbeats in fish, *Gambusia affinis*, was also the first report, was published in Current Science in 1965.

Article Information: *Corresponding Author: profayeshaali@gmail.com

Received 10/01/2026 Accepted after revision 25/03/2026

Publication Date: 30th April 2026 Page Number- 01-06

This is an open access article under Creative Commons License, <https://creativecommons.org/licenses/by/4.0/>.

Available at: <https://mntrc.in/>

DOI: <http://dx.doi.org/10.21786/mntrc/3.1.1>

Prof. DK Belsare PhD DSc FNASc FZSI

Prof Belsare's studies on wildlife started in 1979 on the biology of Gaur, Tiger and several species of birds, reptiles and amphibians, where he published them in several books like Wildlife Management, Icon of Tiger, Tigers in Tigerland, Birds of South Asia, Vanishing Roar of Bengal Tiger, Vanishing Asian Wildlife, etc. For his wildlife research, he was awarded the highest Fellowship by the National Academy of Sciences (FNA Sc.) in 1980.

Prof Belsare served as technical advisor for wildlife Research Projects by the Government of Madhya Pradesh from 2010 to 2012. In 1967, in Delhi, there was an International Symposium on Endocrinology which was attended by many American and European scientists, where he presented a paper on endocrine glands like pituitary, thyroid and corpuscles of Stannius' role in reproductive mechanisms in fish. This was the first discovery in teleost fish species that explained why Gangetic carps like Rohu, Catla and Mrigal require monsoon rain environmental stimulus for egg-laying.

Prof Belsare was offered a National Foundation Science USA, fellowship by Dr. Browing to work on the problem of estimation of hormones, like FSH and LH, in mammals in his laboratory of the Dental College of Texas University, Texas, USA, using a gonad piece of two-day-old mice by inserting in eye of castrated mice and studying the hormonal level. After one year, he was offered a research associateship in Baylor College of Medicine, Houston, USA, to work on hypothalamic factors of releasing and inhibit growth hormones secreted by the mammalian pituitary gland. A group of scientists like Dr. Van Critchlove, Dr Roger Guillemin, and Dr. Andrew Schally were working on this problem for several years.

He was successful in removing anterior brain fibres by designing a "brain knife " (a small blade attached to a hypodermic injection needle) and also preparing hypothalamic islands in rats by removing forebrain by suction for estimating level of growth hormones. I was successful in keeping these rats in a CO₂-O₂ environment

in a chamber by injecting saline-sugar for one week and estimating growth hormone by radioimmunoassay.

In these rats, Andrew Schally and Roger Guillemin found the clue of somatomedin and somatostatin factors secreted by the hypothalamus, for which they got the Nobel Prize in 1974. Prof Belsare was not present at that time because he returned to India in 1972. Later on realised that time, when Dr Andrew Schally was offering him an Assistant Professorship.

In 1979 both Prof DK Belsare and his wife Dr SD Belsare got a United Nations Environmental Fellowship (UNEP) for training in a water management course. The Director of UNEP offered him a UNEP Professorship for lectures on tropical environment and water management for 10 years. He used to go to Germany every year for delivering lectures in universities of Germany, Holland, Poland and Czechoslovakia, etc. In April 1983, due to an increase in summer temperature, the water supplied to residents of Dresden City had a smell of rotten fish even after treatment. The experts from Holland and Russia could not solve this problem. The Chief Engineer, Mr Pugh and Prof Dr Uhlmann told Dr Belsare about this problem during his lecture on rapid sand filtration technology in tropical climate. He went along with them to see the raw water supply from the lake. At the very first site he saw the colonies of protozoa, which were the cause of the rotten fish smell to water.

Prof Belsare told them that this is probably due to Synura protozoan colonies. Dr Uhlmann examined these colonies under a microscope immediately, and he found that these colonies were of Synura. For two weeks, many experts tried to solve this problem, and they spent \$35,000 to remove this smell with activated charcoal.

Prof Belsare solved this problem by changing the pH of the raw water by adding lime, and the next day the smell disappeared. The Chief Engineer asked him about his fees for solving this problem, which he declined. He did not accept the fees because he was paid by the UNEP.

On December 3, 1984, more than 40 tons of methyl isocyanate gas leaked from a pesticide plant in Bhopal, India, immediately killing at least 3,800 people and causing significant morbidity and premature death of many thousands of people and animals. Engineer Tomazeuski from Poland sent Dr Belsare gifts of propolis for application to the affected people's burned skin. With the help of doctors of the rehabilitation centres in Bhopal, he was successful in curing skin burns and the report was sent to Tomazeuski. He invited him to deliver a lecture at the International Conference of Apimondia (Bee-Keepers Union) at Krakow, Poland in 1985. This conference was attended by 500 participants. Prof Belsares lecture was immediately translated into Spanish, French, German and Latin. It was appreciated by all of them with huge applaud. The Chairman of the Conference hugged DR Belsare and the business of Apipol Company increased with huge profit. This company appointed Dr Belsare as their expert for advice till 1993.

After Dr Belsare's retirement, the Environmental Planning and Coordination Organization (EPCO) of the Government of Madhya Pradesh appointed him as Director of this Institute for preparing detail report on environmental studies. Within one year, he prepared a thousand-page document, which still serves as guide for the Government Officers for training on environmental problems every year. After this, the Government appointed him as Advisor for projects funded by the German Government to prepare a document on Disaster Management and under this programme he used to visit almost all the states of India for delivering lectures before their officers to serve as a guide for action during disasters they have to face. Nearly 20 documents were prepared by him with Dr. Dubey, Director of the Disaster Management Institute, for the guidance of government officials of various states of India.

Some of Prof. Belsare's lectures during Dr Har Swarup's Centenary Function at Ujjain, India, dated 9th December 2022:

Dr Har Swarup was an outstanding personality, a good teacher and research guide and above all a good human. I have the honor of being his first student for doing research in fish endocrinology and obtaining my Ph.D and D.Sc. degrees under his guidance and reporting first discoveries of thyroid gland, indirect blood supply to pituitary and germ cells in fish and publishing in world's famous scientific journals like Nature, Current Science, American Journal of Morphology, American J. Experimental Biology, Oxford University Journal, European Journal of Endocrinology, German Journal of Anatomical Records and others. My discovery of the thyroid gland in air-breathing fish was widely applauded by the Zoologists gathered in the First All India Congress of Zoology, Jabalpur in 1959 during my first presentation, as a Research Scholar.

Dr Swarup has an outstanding academic career, securing the First Merit Position in Ajmer School Board's examination and the First Merit Position in B.Sc. and M.Sc. examinations of Agra University. He was successful in the production of Triploidy in fish by simple methods of cold and hot shock treatments to gravid female and male fish, *Gasterosteus aculeatus* in 1957 for his D.Sc. degree of Oxford University (U.K.).

Triploidy is usually not produced in animals, but since then in many fish species like Nile tilapia (Hussain et al., 1994), rainbow trout (Hansen, 2003), yellow perch (Max and Sucumaran 2007), *Clarias macrophogalus* (Parven and Gallardo, 2014), Turbot (Piffer, 2003), Shelfish (Prieret et al., 2009) triploidy was produced using Dr. Swarup's technology for production of sterile fishes for aquaculture and fisheries management.

This technology is now routinely applied to several species of salmon and African catfish (*Clarias gariepinus*) for high growth rate, high stocking-density capacities, high consumer acceptability and high resistance to poor water quality and oxygen depletion. Triploid fishes ($3n$) have two sets of chromosomes of maternal origin ($2n$) and one set of chromosomes of paternal origin ($1n$). This is direct evidence of Darwin's theory of Origin of Species. This technology explains the Synteny phenomenon of genomes cut and

pasted in the course of evolution, which Darwin could not explain at that time!

I learned the style of teaching and research from Dr Swarup, which helped me to deliver lectures before international scientists for several hours and explore new areas of biological research, like molecular epigenetics of animals and humans, regarding environmental stress effects, behavioral stress science and molecular horology of Indian Hindu mythology like Bhrgu Sanhita etc. After my retirement from university service, I published 28 books of scientific fiction and am planning more books to write during the coming years. I feel that Dr H. Swarup is with me and I always imagine that he is guiding me.

When he was the honorary wildlife warden of Madhya Pradesh Tiger Reserves, he would discuss the life of tigers in these protected areas with me. I used to store them and write in my notebooks that helped me to write books like (1) Tigers in Tigerlands, (2) Management and Biology of Indian Wildlife, (3) Introduction to Biodiversity, (4) Tiger, the Icon of India, (5) Birds of South Asia (6) Vanishing Asian Wildlife, published by Amazon.com (Columbia U.S.A.), RoseDog Publisher (Pittsburgh, U.S.A) and Lambard Pub. Germany.

My latest book on Inheritance of Acquired Characters of Modern Life Style, published by Amazon.com Company in August 2022 explains the consequences of smoking, alcoholic habits and drug addicts and religious mad people's criminal actions and their children becoming terrorists and criminals, forensic psychiatry is my latest thinking, which I inherited from Dr Swarup's original way of thinking. I plan to complete the list of 50 books for the benefit of people before I leave this planet forever. I hope you will remember me whenever you remember Dr Har Swarup!

Thank you all for patiently listening to my lecture. Prof Belsare's present research before his sad demise in December 2025, despite not having a laboratory to work in, but he used his experience and expertise to discover new technologies and write books after consulting literature. I was lucky to visit him in Nagpur, India a few days before he left for his heavenly abode; I remember he wanted to attend an international conference, contemplating a research paper, talking even in his ICU with his artificial life support system! What a man, lived a life of his science, till the end.

Prof Belsare has written 30 scientific books so far, most of them published by Amazon Publishers, USA. He has published over 200 research papers, many of them in European and American journals, and now uses these technologies for the livelihood of farmers of small holdings to prevent suicide due to debt and rural water supply of pure drinking water. Such a project of 320 crores of rupees, which was prepared by Dr Belsare is now running in Maharashtra state by the NGO, Maharashtra Gram Darshan Amaravati. Till his last breath, Prof Belsare was studying the technology of epigenetics (Science of inherited acquired characters through genes) for writing books and reporting causes of diseases and terrorism by human online predators who do sexual assaults on teenagers.

Biodata of Prof Dr D.K. Belsare

Position: Director, Maharashtra Gram Darpan, Amaravati (Maharashtra, India). Hon Director, Dr Belsare Institute of Fisheries Research and Training, Morshi, Amravati MS, India.

Educational Qualifications: M.Sc., PhD, D.Sc. Date of Birth: 26 March 1933.

Distinguished Fellowship: FNASc. in 1980, F.Z.S.I in 1985 (for Wildlife & Fisheries research).

Positions held: Lecturer 1961-64, School of Studies in Zoology, Vikram University, Ujjain and Lecturer 1964-68 Nagpur University.

Reader 1968-76 Nagpur University

Professor 1976-93 Bhopal University (Barkatullah University).

Post-doctoral Fellow 1968-70, Texas University, Houston USA, Research Associate 1970-72. Baylor College of Medicine, Houston USA

Experience: Teaching post-graduate classes for 30 years, Research for 50 years and over 50 lectures on Ecosystem Management for Sustainable Development (Water & Wildlife) delivered at Technical University Dresden sponsored by UNEP from 1980 to 1988 for participants from developing countries.

Significant Contributions

- He has made significant contributions to Wildlife & Biodiversity Conservation in the tropical region with reference to the Indian sub-continent. He was awarded a Visiting Fellowship of the United Nations Environmental Programme for delivering lectures on wildlife management and environment from 1980 to 1988 in various universities of Europe. During this programme, he delivered 20 lectures on tropical wildlife and water management before the participants in the Ecosystem Management Programme sponsored by UNEP, held at Technical University Dresden (Germany). His gene pool fragmentation hypothesis is accepted as a cause of isolation of certain mammalian species like the Asiatic lion & tiger, which are on the brink of extinction.
- This theory holds good for races of other species like Barasingha and Wild Buffalo, of which different races are widely isolated. His concept of adequate living space for the tiger to save from extinction proposed in 1992 was widely appreciated, and now conservationists like well known Tiger Expert Mr. Sawarkar (2004) is saying the same thing.
- Dr Belsare published three reviews on the ecology of surface water of the tropics in 1982. This is a useful contribution for water treatment problems in tropical countries including India.
- Dr Belsare is the first scientist of India (1979) to spread the message of environmental awareness & wildlife protection for the benefit of the common man and their importance in human welfare and survival.

He organized seminar/symposia/workshop from 1980 to 1985 for general awareness among the people and presented papers on wildlife conservation for ecological services.

- Other contributions on Environmental Subjects
- As Professor & Head 20 years
- Research Associate, Baylor College of Medicine USA. 3 years (1968-71)
- UNEP Fellow, Germany 1979
- UNEP Visiting Professor European Universities 9 years
- Advisor Apipol Company Krakow Poland 5 years
- Director (R & D) Environmental Planning & Coordination Organization Bhopal 1995:
- Advisory Board Member: ENVIS-Node DMI Bhopal 2003-present
- Member of Technical Committee Wildlife Research, Govt of Madhya Pradesh 2006:
- Publications over 200 research papers in Scientific Journals
- Organiser of International Symposia : India 3 Bhopal
- Malaysia 1 Kaulalumpur 1983 USA 1 Columbus Ohio, 1992,
- USA 1 Chicago 2019, Uzbekistan (Tashkand) 2020 Oct.

Attended Conferences/symposia / seminar 162

Supervised Ph.D. 48, D.Sc. 2

- Gold Medals awarded: University Merit Gold Medal 1959
- Zoological Society Gold Medal 1985, 20th Century Gold Medal. 1998
- Zoological Conference Gold Medal 2000, Best Senior Scientist's Gold Medal 2006
- Lifetime Research: Hormones, Aquaculture, Water Research, Wildlife Biology & Management
- Biodiversity Conservation
- Consultancy: Development of an assessment system to evaluate the ecological status of rivers in the Hindu-Kush Himalayan (HKH) region, sponsored by the European Commission, IIT, Roorkee: submitted in April 2007
- This report contains 275 pages on macrobenthic invertebrates of the Hindukush Himalayan Region.
- Reproductive physiology of *Ophicephalus punctatus* with special reference to seasonal cycle and hormonal control: hypothalamo-hypophysial and thyroid gland The role of corpuscles of Stannius and interrenal tissue in the reproductive cycle is also demonstrated. Correlative changes in hepatic and serum cholesterol during annual ovarian cycle in *Heteropneustes fossilis*.
- Indirect supply of blood to pituitary in fish was reported as early as in 1965 (published in Nature, London) and therefore the pituitary hormonal flow is through this region (equivalent to median eminence in mammal)
- Developmental physiology: Development of germ cells and their migration to the genital ridge to form gonads was reported for the first time in Indian fish. Development of endocrine glands (pituitary, thyroid, interrenal tissue, corpuscle of Stannius) is also demonstrated in fish.

The physiologic aspects of functional status of endocrine glands. Stress physiology in Fish: Oxidative stress due to metal pollution, antioxidant mechanisms. Lipid peroxidation (LPO) as a biomarker of oxidative stress. Superoxide dismutase (SOD) level in tissues and blood to protect stress.

Nutritional physiology: Lipid content in major carps under different feed trials Serum electrolytes and histophysiological response to the interregional cells and corpuscles of *Stannius* of *Heteropneustes fossilis* in high calcium environment.

Role of urophysis in osmoregulation in fish
Macrobenthic invertebrates as biomarkers of environmental stress. This is used as rapid bioassay of water quality required for fish culture and aquaponics.

The latest work that Prof Belsare was supervising was in collaboration on the DNA analysis and microsatellites in Gangetic carps introduced in South Indian wetlands.

Conflict of interest: Author declares no conflict of interest.

Data Availability: All data sets are available with the author

REFERENCES

Books Published By Prof DK Belsare PhD DSc FNA Sc:

1. Tropical Fish Farming. Environmental Pub. Karad India, (1985)
2. Introduction to Biodiversity. APH Publ Delhi (2006),
3. Bee-keeping for Health and Livelihoods -Narendra Publishing House Delhi (2011),
4. Hydrology and Hydrobiology of Rivers and Streams of Indian Subcontinent Narendra Publishing House Delhi (2010),
5. Vanishing Roar of Bengal Tigers, RoseDog Pub. Pittsburg USA (2011).
6. India's Biodiversity and its Conservation (Lambert Academic Pub. Germany 1914),
7. Biology and Management of India's Wildlife (Himalayan Pub Mumbai, 2019),
8. Aquaculture Farming in Tropical Countries. (Himalayan Pub. Mumbai, 2019),
9. Text Book of Aquaculture (Himalayan Pub. Mumbai 2019),
10. Tiger-The Icon of Indian Sub-continent -Himalayan Pub Mumbai 2019),
11. Course book of Aquaponics. Himalayan Pub. Mumbai 2019),
12. Bioeconomy and Sustainable Development of Tropical Asia (Himalayan Pub. Mumbai 2019),
13. Living with Tigers in Tigerland, (Amazon Kindle Pub, USA, 2019),
14. Pollination of vegetation of forest counties and corridors of tiger (Amazon Kindle pub.2019, USA),
15. Text book of social bees and bee products (Amazon Kindle Pub 2019, USA),
16. Text book of fish, Fisheries and aquaculture (Amazon Kindle Pub.2019, USA),
17. Pollination of agriculture and forest crops (Amazon Kindle Pub 2019,USA),
18. Text book of biodiversity conservation (Amazon Kindle Pub.19USA).
19. Text Book of Bioeconomy, (Amazon Kindle Pub USA) 2020.
20. Spiritual beliefs to conserve sacred groves (Amazon Kindle pub USA)2021.
21. Agnihotra Homotherapy to combat viral and bacterial diseases in human (Amazon Kindle Pub USA).2021.
22. Text Book of Animal Ecology. (Amazon Kindle Pub, USA).2021.
23. Applied Biology for Income Generation (Amazon Kindle Pub USA)2021
24. Vanishing Asian Wildlife by Human Action (Amazon Kindle, USA)2021
25. Adaptive Designs of Animals for Survival (Amazon Kindle Pub, USA)2022.
26. Water Treatment Technologies, (Amazon Kindle Pub USA)2022.
27. Introduction of Classical and New Genetics. Amazon Kindle Pub. 2022
28. Inheritance of Aquired Characters of Modern Life Style Amazon Pub. 2022
29. Two books in Marathi

Prof DK Belsare's Collaborative Research Papers

1. With Dr Jan W. Dobrowolski, Professor, A.P.H. University of Krakow, Poland, Fellow of the World Academy of Arts and Science, Royal Academy of Pharmacy-Institute of Spain. Book on Water Treatment Technologies.2022. Publisher: Amazon.com. Columbia USA. pages 120.
2. Research; Bioremediation of wastewater by laser technology, beekeeping products. Krakow Poland
3. Eng. Ryzard Tomazeuski, Director, Apipol Company, Krakow Poland- On Modern Bee Keeping. Lectures and Books (published by Amazon.com USA) 1986-1988.
4. Dr. Uhrlish Berk-Former Professor, Konstanz University, Mühlingen, Germany. Book- Agnihotra Therapy to combat Communicable Diseases. Amazone Com Publ.Columbia USA. Research papers; - Corona Virus and Agnihotra Therapy.
5. With Dr. Uhlmann, Prof & Head, Department of Water Management, Technical University, Dresden (Germany). (a) Biomanipulation of Gorkish Reservoir in Germany. (b) Rapid sand filtration Technology for domestic water supply 1983-88.

6. With Dr. Wilfred Bassus, Professor, Institute of Forest Ecology, Tharandt, Germany. On Wildlife Management of Tropical Forests.1987-88
7. With Dr. Harbachek, Head Institute of Limnology, Praha, Czechoslovakia-Biomanipulation of Lake Purification of Temperate lakes.1987-88
8. With Dr. Ueck, Department of Anatomy, Humboldt University, Germany. On Pineal Gland in mammals. 1984.
9. With Dr. Henry Browning, Anatomy Department, Dental College, University of Texas, Houston, U.S.A. 1969-70.
10. With Dr. Van Critchlove, Dr. Andrew Schally (Nobel Laureate) and Dr. Roger Guillemin (Nobel Laureate), Baylor College of Medicine, Houston, U.S.A
11. With D. Gulati and Dr. Golterman, Institute of Limnology, Amsterdam, The Netherlands. On Limnology of Temperate lakes. 1984-86.
12. With Dr. Fernandis, Head of the Institute of Ecology, Kuala Lumpur, Malaysia, 1983. on Tropical Ecosystem. 1983.