

## In Memoriam: Mario Benazzi (1902-1997)

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Professor Mario Benazzi a few years before passing away



Professor Mario Benazzi and his wife Giuseppina at the Libbie Hyman Memorial Symposium, Chicago, December 1970

Professor Mario Benazzi passed away in Pisa about three years ago, on the 16th December 1997 at the age of 95 years. He was born on August 29th 1902 in Cento a small town in the province of Ferrara, central Italy. At the time of his passing he was still lucid in mind and in a relatively good physical health although often confined to a wheelchair, and his pupils were hoping to celebrate his 100<sup>th</sup> birthday by organizing a special anniversary event in his honour in the new century. He had recovered from several more or less serious illnesses and fractures and above all he seemed to have coped well with the loss of his beloved wife Giuseppina who had passed away three

years earlier, on April 28th, 1994, but unfortunately, a new fall from the wheelchair caused him multiple fresh leg fractures and proved fatal. During the present commemoration I shall devote a few words also to Professor Giuseppina Benazzi-Lentati, who was his faithful companion both in work and personal contexts for about 70 years. She too was an eminent student of turbellarians, produced a large number of outstanding scientific works and attended some of our meetings.

Benazzi was the older son of a well-off cloth tradesman and was destined to succeed his father in the family business, but from the time of his youth he revealed a great passion for animal, plants and all natural phenomena. After repeated unsuccessful attempts to integrate him into

the cloth trade, his father was obliged to drop his own project, and allow Mario to follow his natural instinct. After lengthy reflection, Benazzi decided to attend the Natural Science course at the University of Bologna where he graduated in 1925 under the guidance of Professor Ercole Giacomini. In the same year, he was summoned by Professor Alfredo Corti, a pupil of Camillo Golgi, to fill the post of assistant professor of Comparative Anatomy and Physiology at the University of Torino. Giuseppina Lentati, three years his junior, being born on October 10th 1905 and curiously enough also the daughter of a well-off carpet dealer, was accepted as a student for her degree thesis into the same Institution at the same time. The two young naturalists immediately discovered many shared interests and a common way of thinking, and in 1931 they married, so becoming an inseparable pair, cemented by a profound connivance and a common passion for nature and biological research. Pina, as he liked to call her, was a tiny woman, fragile in appearance, but with a strong personality; she was the true guide of the family and mistress of the house.

After a brief stay in Sassari, Sardinia (1934-1936) and a longer stay in Siena, Tuscany (1936-1946), where the investigations into triclads began to gain the upper hand over other research projects, at the end of the second World war the Benazzis moved to Pisa where Mario was called to fill the chair of General Biology, Zoology and Genetics at the Faculty of Medicine. He also became the Director of the Institute of Zoology and Comparative Anatomy, where he uninterruptedly continued to work and guide a remarkable group of capable and affectionate students up to 1972 when both he and his wife retired. In the course of his academic career he was also elected fellow of the "Accademia Nazionale dei Lincei", President of the Italian Society of Zoology, Dean of the Faculty of Science and Emeritus Professor of the University of Pisa; he was also a Founding Fellow of various scientific societies including the Italian Group of Embryology (G.E.I.) and the Italian Association of Genetics (A.G.I.), and received several national and international awards, although he was always humble and did not devote much of his time to university political lobbying.

During their time in Pisa, Mario and Giuseppina Benazzi approached morphological, karyological, taxonomic, zoogeographical and evolutionary problems of planarians, and investigated in particular the cytogenetic aspects of the reproductive biology of these worms. Since the study of meiotic oocytes required the collection of abortive, or freshly laid cocoons very early in the morning (usually between 5 and 6 am), they adapted a small area of the Institute as a tiny apartment with two beds, a table, a gas-ring and a bathroom. The whole apartment corresponded to what is now my study. In fact, their physical requirements were very simple, and eating habits particularly frugal (Giuseppina rarely exceeded 40 kg in weight, and Mario was only slightly heavier), as they believed that such a diet was good for their health and could contribute

towards having a longer life. Nevertheless, Mario appreciated good cooking as he showed on numerous occasions of graduation or congress dinners, when he was either alone or seated at table at a far distance from Giuseppina. They practically lived permanently in the Institute except for some week-ends and summer holidays when they went to their house in Marina di Pisa or to their cottage in San Marcello Pistoiese on the Appennino mountains, where Mario devoted much of his time to his favourite readings on history, particularly on the origins and development of the Christian religion, and to listening to opera music, and Giuseppina enjoyed gardening. During the week all their fellows and students were able to meet and talk to them from dawn to late at night.

Shortly after moving to Pisa the Benazzis bought a villa in Marina di Pisa and some years later built an annexe in the garden consisting of a small apartment for their domestic staff on the ground floor, and on the first floor a library, a bathroom and a laboratory, inhabited, housed in crowded glass aquaria as well as in small tubes, by thousands of different planarians that they often collected, nourished and cared for personally. Here they continued to study until their deaths.

I met professor Benazzi for the first time at the beginning of the 60's when I was attending the Biology course. He was my Zoology teacher and I found his lessons fascinating and enthusiastically conducted, and at the same time clear, simple and permeated through and through with his immense naturalistic culture. As soon as I had passed his examination he asked me if I would like to prepare my degree thesis with him, an offer that I obviously accepted with great enthusiasm. Because of his heavy academic duties in those days, he sent me to his wife's laboratory for a short training session. She immediately involved me in her research projects and experiments and later guided me towards the attainment of my honours degree.

A few years later, around the end of 60's, I was Assistant Professor of comparative anatomy and I revealed my intentions to dedicate my energies to ultra-structural investigations on triclad oogenesis. When I told Benazzi of my wishes, although he realised that this new experimental approach would progressively exclude both himself and his wife from my research, he wished me well and introduced me to a well-known electron microscopist working at the Institute of Pathological Anatomy in Pisa, Professor Vittorio Marinozzi and later to Professor Giulio Lanzavecchia in Milan. So thanks to Professor Benazzi I was able to embark on the line of research that led me to the Chair of full Professor within about ten years.

In the following years, even when the Benazzis were retired, I often went to visit them in Marina di Pisa to talk about both my and their research, and my family developments, and always I nurtured a filial feeling of love and gratitude towards them, as indeed did all those who had been "brought up", initiated and encouraged along the scientific pathway by Professor Benazzi before me.

Coming now to the scientific work of Professor Benazzi and trying to briefly summarize his main topics of interest and significant results, first of all it must be underlined that he made about 300 publications in total, among them several text books, divulgative articles, obituaries and so on, in addition to scientific papers. All those of you who knew Mario Benazzi personally or indirectly through his papers, know that he was a devoted scholar of planarians, but perhaps only a few, except those studying or working in Pisa, know that he concentrated his attention on these turbellarians only after he moved to Tuscany, especially to Pisa, in the second half of the 40's. In previous years he alternated his occasional investigations into planarians with those into mammals, newts, insects and marine animals (the last investigated during his repeated stays at the famous Stazione Zoologica in Naples). In particular, when he was in Turin and Sassari, he was definable as a comparative anatomist, specialist in histophysiology of the thyroid, pituitary gland and female reproductive apparatus of vertebrates. Only after he gained the Chair of Zoology (in 1940, when he was in Siena) and then taught General Biology and Genetics for the scholars of medicine (from 1946 in Pisa), did he modify his scientific inclinations and goals, directing them to his better known specialities, the systematics, cytogenetics and evolution of freshwater triclads. It is noteworthy in this regard that among his first 87 papers published up to 1940, only 13 concerned triclads and they were initially produced at a rate of one every two years, while among the other 220 scientific papers, more than 190 concerned planarians. Equally noteworthy is that about 70 papers were published after he retired and that the last two were published in 1997, one a few months before, and the other just a few days after his death (23, 24).

His first paper on planarians was published in 1928 and concerned the reproductive biology of *Polycelis cornuta* (1), the second in 1930 dealt with some zoogeographical aspects of *Planaria alpina* (2), the third in 1932 ecological considerations on *Planaria subtentaculata* (3). In 1938 a comprehensive paper on the freshwater triclads of Sardinia (4) and a monograph on the reproduction of planarians (5) were published. Then, starting from 1941, a series of papers on the maternal heredity of body pigmentation was published (6; 7; 8), which some years later, thanks to the careful cytological experiments and observations carried out by his wife and his pupil Glauco Lepori and the brilliant insight of the latter, culminated with the discovery of pseudogamy in planarians (9; 10; 11; 12). In the same period Benazzi initiated a cytogenetic approach to the systematics and microspeciation events of freshwater triclads, and a karyological study of their reproductive biology that carried on together with his wife. These research lines culminated in a number of outstanding papers among which the following deserve to be cited: a review paper on the genetic influence on planarian reproduction published in 1963 by University California Press (13), a work on the nature and role of neoblasts in 1966 (14), which stimulated me to undertake

an ultrastructural and karyological approach to the cellular aspects of regeneration, a comprehensive paper on fissioning in planarians from a genetic standpoint presented at the Libbie Hyman memorial symposium held in Chicago, December 1970 and published by Mc Graw-Hill in 1974 (16), and one on the genetic and physiological control of fissioning and sexuality (15). Moreover, Benazzi and his wife wrote a number of monographs that remain milestones for every student of Turbellaria, among which I would like to remember one by Benazzi-Lentati on gametogenesis and egg fertilization in planarians published in 1970 in the International Review of Cytology (17), a very outstanding one on the cytogenetics of Platyhelminthes published in 1976 (18), one on speciation events in Turbellaria (19) and another on developmental biology of planaria (20), both published in 1982 by Alan R. Liss, and a final two, one on sexual differentiation and behaviour (21), and one on asexual propagation and reproductive strategies of Triclads (22) published a few years ago for the multivolume treatise on the reproductive biology of invertebrates by John Wiley and Sons.

To conclude, I would like to remember that a number of foreign, other than Italian, turbellarian specialists, as well as zoologists, cytogeneticists and students of other natural sciences went to Pisa and later to Marina di Pisa to collaborate or simply to meet Professor Benazzi. Among them I would like to remember the late Ian Ball, the President of the organizing committee of this Congress Jaume Baguna, Nicole Goubault and Elisabeth De Vries. I am sure that each one of them, as well as all other people who had the fortune to meet him, appreciated his calm character, naive curiosity, sincere friendship and profound honesty and will maintain a pleasant memory of him.

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