

Yang Yi – a Tribute to a Great Colleague

By Jim Diana

I sadly note the death of our dear friend and colleague, Dr. Yang Yi. He passed away at 2:41 a.m. on 31 July 2009 at Chengdu Huaxi Hospital, at the age of 46.

Yang Yi was an accomplished scholar, an excellent researcher, and an innovator in the field of aquaculture, especially in applying simple techniques to gain efficiency for small-scale farmers with limited incomes.

Yang Yi was born on 19 June 1963 in Chengdu, China, eldest of three boys born to Yang Chu and Peng Xuejing. He was raised in several locations throughout Sichuan Province and spent much of his formative years living with his grandparents, Yang Zhengqing and Hu Bingxian. His son, Yang Tongyun (Tony) is ten years old. His wife, Liu Yun, and son currently live in Chengdu.

Yang Yi was a bright young man and also a good athlete. At an early age, he was placed in a program to advance his volleyball skills. Later, he decided to focus more on academics. He received his B.Sc. in Genetics from Sichuan University, China in 1985, and his M.Sc. and D. Tech. Sc. degrees in Aquaculture from the Asian Institute of Technology, Thailand in 1992 and 1997, respectively.

One of the more interesting and engaging parts of collaborative research funded through USAID has been the opportunity for participants to work with and get to know collaborators from various countries. The relatively long time period during which we have been studying in certain regions has allowed many of the CRSP researchers to develop close friendships and very strong academic ties. This certainly has been the case for me, both with Kwei Lin, who was Michigan's original host-country principal investigator in Southeast Asia, and with Yang Yi. Yang Yi was a true product of the CRSP: his doctoral work was funded by CRSP projects, he served for years as a research investigator with the CRSP, and his most recent position was as host-country principal investigator for the CRSP.

I first became associated with Yang Yi in the early 1990s, when he was a graduate student at the Asian Institute of Technology. He had moved to Thailand from his home country, China, in order to attend graduate school, and was working on a master's degree. AIT funding provided him an opportunity to conduct his graduate work on sex reversal of tilapia. He completed his master's degree in 1992 under the supervision of David Little.

In 1992, Yang Yi began a doctor of technical science program at AIT under supervision of Kwei Lin, and also became funded as the research associate for the CRSP project. At the time, Kwei was the host-country PI at AIT. Kwei and I had been working for some time on projects combining cage and pond culture, with cage culture of pellet-feeding fish in the middle of a pond and open water culture of tilapia, based on the waste products from the cage-culture system. Kwei had developed a system for walking catfish in the cage and tilapia in the pond, and even expanded it to some degree to local aquaculture extension organizations. This combination really piqued Yang Yi's interest and became the focus of much of his research career.

Yang Yi's dissertation work focused on co-culture of tilapia in cages and ponds. His basic premise was that one could grow large tilapia in cages using pellets, grow small tilapia in the open water using waste products to stimulate phytoplankton and zooplankton for tilapia consumption, and balance the two systems so the young fish from the ponds could be stocked in the cages for the grow-out to a large size. The system developed by Yang Yi is highly productive and integrated (see Sidebar), using feed for all nutrient inputs and capturing as much of the nutrients in tilapia as possible.

My first prolonged exposure to Yang Yi was when he came to the University of Michigan in 1996-97 to complete a year of study abroad in our graduate program. He decided to focus on two main goals while at our university: to learn to write and speak English more effectively, and to learn more about statistics, experimental design, and modeling. He took coursework to help with these goals and also worked on writing his dissertation and publications from his dissertation during his time at UM. I had the pleasure of working regularly with Yang Yi during this time, helping him develop his writing skills. I did not realize then what a great investment this would be, because Yang Yi would then spend the next 12 years researching and writing excellent scholarly papers. He was an avid writer and published prolifically, mainly on results of the CRSP experiments. The limited time I dedicated to his program in 1996 has been reciprocated dramatically many times over.

Upon the completion of his doctorate, Yang Yi became a seconded faculty member at AIT, funded as a post-doctoral researcher by University of Michigan and the Aquaculture CRSP. He eventually became the host-country PI when Kwei Lin retired from AIT in 2002, and advanced through the academic system at AIT, becoming assistant professor in 1999, associate professor in 2003, and chair of the Department of Aquaculture and Aquatic Resources Management in 2005. Yang Yi became an important faculty member at AIT, helping a very productive aquaculture training program produce a large and significant cohort of students who have returned to establish aquaculture programs throughout Asia. During his time at AIT he advised 4 Ph.D. and 14 M.Sc students. Thanks in part to the involvement of devoted faculty like Yang Yi, the program at AIT at the time was one of the strongest aquaculture programs in the world, and certainly the strongest in training Asian students.

In spite of his long-term involvement in Thailand at AIT, Yang Yi had always desired to return to his native China. In August 2007, he was hired as a professor at Shanghai Ocean University, as well as director of the Sichuan Aquacultural Engineering and Technology Research Center in Chengdu. The research center is a part of Tongwei Group, the major feed producer for China, as well as an important aquaculture production and green technology company. Although his tenure at Shanghai Ocean University was short, he had already begun advising 2 PhD and 6 MS students.

Yang Yi was a great friend to many of us on the CRSP over the years. For example, when the World Aquaculture Society met in Beijing in 2002, Yang Yi organized several adventures for those of us visiting from out of country. I remember a trip to the Peking Opera, and another to eat Peking duck. The trip to the opera involved over 50 people, who traveled on a bus to the venue. He was thrilled to show others his native country and his culture. He repeated this several times for me, making travel arrangements, introducing me to his parents and other family, and treating me like family. I have always been impressed with his willingness to work so hard to make people happy.

Yang Yi earned a number of honors during his academic career. He was the president of the Asian Fisheries Society and had been since 2007. He consulted internationally in Egypt, Mali, Indonesia, and many other countries. He published broadly in the major journals in our field and took his research through the full circle of development, data collection, modeling, implementation, and publication.

Yang Yi was a great example of all the things collaborative research can do. It allowed him to develop his graduate program, which led him to an academic career focused on aquaculture, and eventually to becoming an expert in the field and president of a major society. Members of the CRSP should take great pride in his achievements, as he gave back even more to the field of aquaculture than he received from CRSP funding. Aquaculture has grown dramatically since the CRSP was initiated in 1982, and in large part, this growth has been due to the development of remarkable scientists like Yang Yi.

While I know it will happen, I cannot really imagine working on the CRSP projects without Yang Yi's presence. He was a great friend, colleague, and an inspiration to me. He will always be remembered by his aquaculture family, and he will be missed. God bless him and his family as we learn to go on without him.

Sidebar

The aquaculture system that Yang Yi named a cage-cum-pond system strives to reclaim as many applied nutrients in the fish crop as possible, while remaining simple and inexpensive so small scale farmers can adopt it. Such a system works well to intensively grow tilapia as efficiently as possible, reclaiming as much of the nutrients applied to the ponds as possible. His cage culture system was a rousing success; the optimum design used two cages (each 2 m³), with 50 tilapia/m³ in each cage, stocked at 120 g, and growing to over 500 g in 3 months. Total production of tilapia in cages was about 19 tons per hectare of pond per year, with a market size of about 450-500 g. Stocked tilapia (at 5 g) in the open pond resulted in a total net yield of about 6 tons per hectare per year of fish at 120 g. These could either be used to stock the cages or grown slightly longer for local consumption. For the pond overall, the feed conversion ratio was about 1.22. Of the nutrients applied, 21% of the nitrogen and 28% of the phosphorus was recovered in fish. Listed below are the publications resulting from the cage-cum-pond research of Yang Yi.

Yang Yi. 1999. Modeling growth of Nile tilapia (*Oreochromis niloticus*) in a cage-cum-pond integrated culture system. *Aquacultural Engineering* 21:113–133.

Yang Yi and C.K. Lin. 2001. Effects of biomass of caged Nile tilapia (*Oreochromis niloticus*) and aeration on the growth and yields in an integrated cage-cum-pond system. *Aquaculture* 195:253–267.

Yang Yi, C.K. Lin, and J.S. Diana. 1996. Influence of Nile tilapia (*Oreochromis niloticus*) stocking density in cages on their growth and yield in cages and in ponds containing the cages. *Aquaculture* 146:205-215.

Yang Yi, C.K. Lin, and J.S. Diana. 2003. Hybrid catfish (*Clarias macrocephalus* x *C. gariepinus*) and Nile tilapia (*Oreochromis niloticus*) culture in an integrated pen-cum-pond system: growth performance and nutrient budgets. *Aquaculture* 217:395-408.