

# Master of koi breeding in the field pond

## Shozo Miyoshi challenges koi breeding in Shimanto, Kochi Prefecture

*Miyoshi Fish Farm has a reputation for koi breeding in the field ponds. After working many years in Sanuki, Kagawa Prefecture, they decided to leave their old place and start their business near the head waters of the Japan's last clear stream, Shimanto River. What drove them to move the new place? The second chapter of the farm's history has just begun.*



Shimanto River flows in torrents. A chinka-bashi bridge is seen in the upper left in this photo.



### Fallen in love with Shimanto

—Mr. Miyoshi, can you tell us why you decided to open up a new farm in Shimanto, leaving the old one in Kagawa Prefecture, where you had accomplished so much?

**Miyoshi:** In short, I fell in love with the water of the river, land and climate, and the people living there. Local cuisine made of food blessed with nature is so delicious. I have been thinking of

moving to this place for many years. In the future I would like to move to this place.

—Do you know why Shimanto River is called the last clear stream of Japan?

**Miyoshi:** Because this is the only river on which no large scale dam is built. The river water is listed in a selection of one hundred excellent clear streams. Its surrounding region is also



Local specialty dishes using wild eel, ayu and organic vegetables are served at Hotel Matsubagawa Onsen, Shimanto.



listed in a selection of one hundred unexplored regions in Japan. There is something special that many people of today have forgotten in their busy daily life. Shimanto is full of nostalgic scenery which makes me feel comforted and at peace.

—Great natural scenery can still be found in this area.

**Miyoshi:** I was surprised to see how people are making a living from the blessing of the river and care about its water. The town is going green with Shimanto Ordinance, which restricts the influx of untreated domestic wastewater. New construction work is also restricted.

—I can see that each local resident has an intense consciousness of the conservation of the clear stream.

**Miyoshi:** Exactly. I know that you saw that famous Chinka-bashi Bridge earlier. The bridge has no parapets so that it won't be washed away by

floods. There are 47 Chinka-bashi bridges on Shimanto River. They had been designed on the assumption of disappearing underwater when a flood occurs. I feel the people's broad-minded lifestyle through them. Those bridges are the symbol of Shimanto.

### Concept of building field ponds

—Did you build some new field ponds in Shimanto?

**Miyoshi:** No, we have moved our old field ponds into Shimanto in Kochi Prefecture and Shingu-machi 2 in Ehime Prefecture.

—You're very brave to do so. Isn't it tough to manage the ponds far away from the head office?

**Miyoshi:** Not at all. Caretakers are stationed at each pond, and I am trying to visit them as often as possible. I think nothing of visiting my favorite place. I heard that the new expressway that runs close to our field ponds will



Miyoshi's new field pond in Shingu-machi

come into service next year. I will be able to get there within an hour.

—I understand the management of your field ponds are perfect. But what is the main factor of complete movement of your field ponds?

**Miyoshi:** We decided it based on the concept of risk diversification and breeding koi in the drinkable water. However, the main driving force is the drastic change of environment in these years.

—Drastic change of environment?

**Miyoshi:** My father is a recording maniac. He has kept scrupulous records of the daily weather, water temperature, the amount of dissolved oxygen, the pH and the amount of feed he fed koi in the field ponds since 1975.

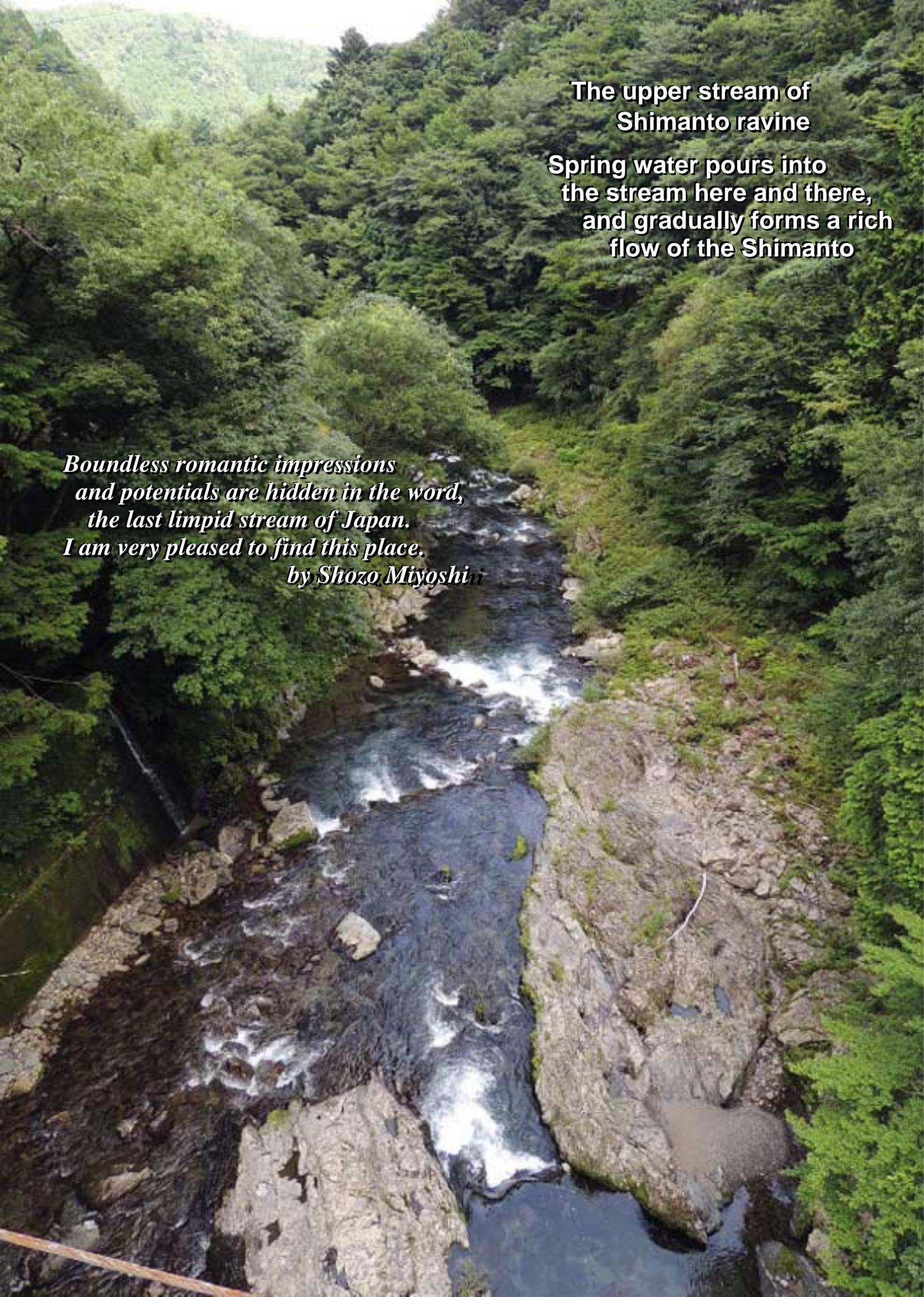
According to his record, the water temperatures in the field pond had hardly gone above 30°C until the end of the Showa era in 1988. Between



1993 and 1998, the temperature went above about 20 days per year, and since 1998 the number of days ex-



Miyoshi's new fields ponds in Shimanto

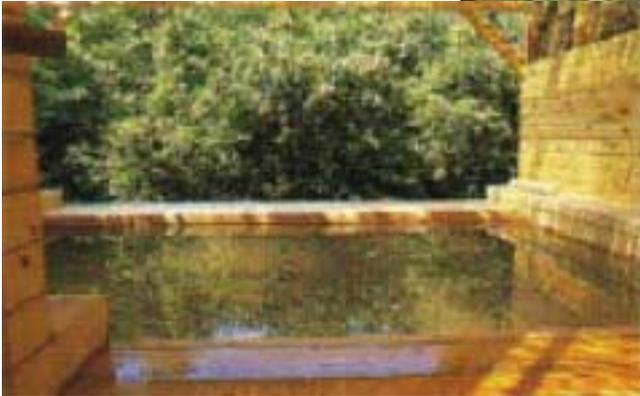


The upper stream of  
Shimanto ravine

Spring water pours into  
the stream here and there,  
and gradually forms a rich  
flow of the Shimanto

*Boundless romantic impressions  
and potentials are hidden in the word,  
the last limpid stream of Japan.  
I am very pleased to find this place.  
by Shozo Miyoshini*

Hotel Matsubagawa Onsen stands near Miyoshi's Shimanto new pond. The hotel, surrounded with a branch of Shimanto River and beautiful hardwood, is known as a hidden hot spa.



ceeded 30 days per year. As a result, some subtropical water-weeds began to thrive in the filed ponds.

Last year the number of days when the water temperature went above 30°C was 46 days. The speed of temperature increase threatens me. And the koi lost their appetite. We add some garlic powder or squid oil in their paste feed in order to lure them with flavors.

We have also changed the ratio of ingredients of the feed from high protein to high starch and glucose. But that's nothing than a Band-Aid solution. When I think of the situations five or ten years ahead, they look gloomy.

To my surprise, the temperature in the field ponds in Shimanto remains between 25 and 28°C despite the scorching summer heat. That of spring water is 16°C, so we can easily control the pond water temperature by adding a certain amount of spring water.

—Your koi may be feeling

like spending at a retreat in a summer resort. By the way, you previously said that one of the reasons of this moving is to disperse risks. Can you tell us a specific example?

**Miyoshi:** Well, we learned a lot how dangerous to put all facilities together in one place from last year's great earthquake. We decided to separate the field ponds and build them on high grounds above sea level.

—I see. You also considered a counter measures against Tsunami, right?

**Miyoshi:** We also have to crank up for a fight against torrential rainfall. To build new field pond in Shimanto I tried to make the pond walls acute and



Part of the records of the field pond in Kagawa Prefecture which keep scrupulous data of water temperature, dissolved oxygen and some others, starting in around 1975.

## Process of the construction of the Miyoshi Fish Farm's field ponds in Shimanto



A wilderness before reclamation (Photo taken in October, 2011)



Construction starts. (Photo taken in February, 2012)



The land gets a lot of sun even in winter.



The field pond is near completion.

solid by heaping up soil about 20 cm thick and pressing it with a roller again and again. The overflow pipe is double in diameter. The drainage pipe, connected with a valve, makes it easy to drain the pond water.

—Sounds like all possible measures have been taken against natural disasters.

**Miyoshi:** No, there is no 100 percent safe place in Japan today. All we can do is to do our best in building our pond without compromising with ourselves. Regarding to the other concept, breeding koi in water we can use for our drinking, now we don't have to worry about the quality of our new ponds in Shimanto and Shingu-machi. The acknowledged clear water can save us a lot of time and labor, such as measuring the temperatures and dissolved oxygen three times a day.

—Could you tell us the total area of your new ponds?

**Miyoshi:** Sure. There are six 2-tan ponds in Shimanto, and one 1.5 tan pond in Shingu-machi. So the total area of the seven ponds is 1 cho and 3.5 tans. At present the water temperature is set at 27 or 28°C.

—Why do you think the temperatures 27 or 28°C are best?

**Miyoshi:** That is the upper limit where koi can maintain their appetite. That is actually the average water temperature between 1975 and 1985. We will find out the best temperature for koi as we undergo experiences in these new places. The

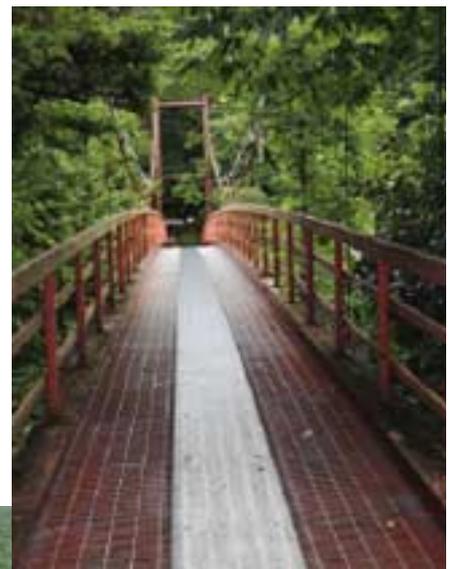
main reason we reduced the size of our field ponds is the idea of probiotics.

### Creating the surroundings of the field ponds probiotics

—Probiotics are microbes that exercise good influences on the human body, right?

**Miyoshi:** The word probiotics was coined through the criticism of the side effects of antibiotics and outbreak of resistant bacteria. I first took notice of them when BSE became a problem.

—BSE became a major social problem in early 2000. Probiotics have been a subject close to your heart since then? What kind of relation is there between BSE and probiotics?



The red suspension bridge near Matsubagawa Onsen



The beautiful views from the suspension bridge



The first field pond in Shimanto

**Miyoshi:** At that time I saw a TV program featuring a young ranch owner in Hokkaido. He said he was trying to activate cattle's intestinal bacteria so that they wouldn't easily become sick. I felt as if I was grabbed by my heart.

It was the first time I heard the word probiotics, but I had intuition that this is it. I had difficulty in finding papers on probiotics in those days, so I started to research the relation between

intestinal bacteria and the human body. As a result, I learned that not only lactic acid bacilli but also natto bacilli are beneficial.

—It is widely believed that natto is good for our health, but the point is natto bacilli. Are they part of probiotics?

**Miyoshi:** Yes, they are. If we take both lactic acid bacilli and natto bacilli our resistance to diseases can be



View from the high land near the field pond. New highway is under construction now. When it is completed, a great time reduction to reach the pond is expected.

Clear spring water comes from the surrounding mountains



A secret agent is sprinkled over the pond in order to make the field probiotic.

greatly enhanced. When pathogenic organisms are going to intrude into our body, our brain orders immune cells to fight against them. If the organism has taken in sufficient probiotics, its immune cells can react swiftly and prevent the disease from developing.

—So with probiotics, we can practice “prevention is better than cure”, right?

**Miyoshi:** Exactly. Probiotics are based on preventive medicine and harmless. We have been attending to

our research of probiotics for Nishikigoi, and worked out a recipe of paste feed for koi, using natto bacilli, lactic acid bacilli and oligosaccharide as main ingredients. After being ingested through the mouth, the feed works to maintain koi’s health condition. Even their excrements can purify the water. We have enjoyed the benefits of probiotics. However, we stopped feeding our koi in Shimanto with probiotic feed, and instead we are trying to extend the efficacy of probiotics in an entire pond.

#### Cooperators

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