

# THE RAINBOW TIMES

Volume 11/Number 2



*Melanotaenia trifasciata*, Moorehead River  
photo by Gary Lange

**The Rainbowfish Study Group, Inc.**

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## FROM THE EDITOR . . .

Kevin Hosmer  
dlhosmer@aol.com  
May, 1998

I have greatly enjoyed corresponding and meeting many RSG members as a result of being editor of the Rainbow Times for the past 2+ years. I signed on for two years worth of issues. This is the ninth issue since May, 1996. I am somewhat surprised that it remained on schedule. Many thanks to those that contributed articles during my tenure.

Robert Lumahan will be the new Rainbow Times editor. For those of you who do not know him - he is a pleasant and enthusiastic young man that I'm certain you will enjoy interacting with. Robert actually volunteered to relieve me of the editorial responsibilities. Please support him with article submissions. His address is given on the front inside cover.

This month's issue covers a spectrum of topics. There are a couple of articles featuring specific rainbowfish species, the conclusion of a general article that should be helpful for rainbow novices, articles dealing with live food, suggestions for assistance with aquatic plants and something else you will hopefully find amusing.

### **Please note your expiration code on your address label!**

Expiration Code 1101 is **overdue** and will be removed from our mailing list.

Expiration Code 1102 is due **now**.

Please mail your membership dues immediately to ensure uninterrupted receipt of the Rainbow Times.

## CHAIRMAN'S REPORT . . .

Gary Lange

This is Kevin Hosmer's final issue as editor of The Rainbow Times. I hope that you will join me in thanking him for job well done. Through his hard work we have continued to have a great magazine. The last few years haven't been easy trying to obtain articles, I think there may have even been some threats employed to fill the pages of our newsletter! Those of you that have been writing, I hope that you'll continue in the future. Our future editor, Bob Lumahan, could use your articles and artwork.

**Falls Fish Festival '98 Update** - If you haven't heard the RSG will be holding their annual meeting again this year in conjunction with the NY/Penn Council's workshop & show. The show will be held September 18<sup>th</sup>-20<sup>th</sup> in Niagara Falls, NY. This is the fourth time in eight years that we've attended as a club. The last time this show was held in Niagara Falls it was an overwhelming hit. Lots of interesting hobbyists from all over the East Coast were in attendance. If you haven't attended one it would be a great opportunity to rub elbows not only with bow-heads but also other aquarists. Now for the particulars.

Who: Dorothy Reimer on plants, Dr. Gene Lucas of Betta fame, Dr. Paul Loiselle (cichlids), Dr. Wayne Leibel (cichlids), Gary Lange - (rainbowfish), Stephen Smith (coldwater fishkeeping). Besides the clubs that make up the Penn State Council, The Aquatic Gardners Assoc., FAAS, The RSG and The North American Fish Breeders Guild will be present.

Where: At the Fallsside Resort at 716-285-2541. A two person room can be reserved for \$69 or \$79 for four people. Be sure to ask for the Falls Fish Convention special room rates. There is a \$49 convention package cost if received before September 3<sup>rd</sup>. This will include all speakers, Saturday banquet, Sunday awards breakfast, surprise momento and door prizes only for those who pre-register. Speakers alone are \$18 but does not include the lecture after Saturday's banquet.

For more information, contact any of the following:

NY/PENN Council's website: <http://members.aol.com/nypennfish/file.html>  
Don Zilliox at e-mail: [wnyzman@aol.com](mailto:wnyzman@aol.com)

Bill Duzen (Registration)  
9396 Elmwood Street  
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Hamburg, NY 14075  
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### **Fresh Water Aquatic Plants**

While visiting some of the pet/fish stores in my area, I've noticed that my questions on specific aquatic plants are usually "check the book section" or the answers are less than convincing. Hence, I turned to my trusty computer and for the past few days I have been "Surfing the Net" looking for information on freshwater aquatic plants.

As it turns out, there is a significant amount of information available on numerous web sites for both beginning and veteran aquarists. Whether you're interested in basic information about aquatic plants or would like to do some serious "Aquascaping", shown below are a few sites that have useful information and or a nice display of planted tank images.

#### **Aquatic Concepts**

[www.cco.caltech.edu/~aquaria/AquaticConcepts/](http://www.cco.caltech.edu/~aquaria/AquaticConcepts/)

If you only have time to view one site about aquatic plants, then this is it! George and Karla Booth have created an excellent site with tons of information and a lot of color images. They even have some nice images of full grown Rainbowfish in heavily planted tanks! After seeing the Rainbowfish images, I did some checking, and found that George and Karla are members of the RSG.

#### **Tropica Plants (in Denmark)**

[www.tropica.dk/](http://www.tropica.dk/)

The folks at Tropica have done an excellent job on this site. You will find some really nice images of both planted aquariums and individual plants. In addition to the images, there is specific information on 70+ different aquatic plants. The information provided includes: plant family name, country of origin, height, width, light and temperature requirements, hardness and pH tolerance, plus a rating on how easy the plant is to grow and maintain.

Also, be sure to check out the page on "The Birth and Evolution of an Aquarium". This is an on-going pictorial progression of a planted aquarium that was started by Tropica's webmaster, Ole Pedersen, an inexperienced aquarist. From the pictures I have seen to date (16 weeks worth) he is doing an outstanding job.

Tropica markets plants throughout the world except in the USA. However, that may change later this year, subject to negotiations with the U.S. Department of Agriculture.

**All Aquatic Plants**

[www.malloftheworld.com/aquarium/](http://www.malloftheworld.com/aquarium/)

Dan Quackenbush sells aquatic plants via mail order from this web site. The site also contains a very informative 3 part guide for people that would like to learn a simple, inexpensive method to grow lush plants in their tropical fish tank. The guide was originally published in two parts for the "Freshwater and Marine Aquarium" magazine. Dan has updated it with additional information for the web site. There are also a number of links to customer sites with images of their planted tanks.

**The Aquatic Gardeners Association**

[www.cco.caltech.edu/~aquaria/AGA/](http://www.cco.caltech.edu/~aquaria/AGA/)

The Aquatic Gardeners Association (AGA) is an international organization of aquatic plant enthusiasts. Membership (\$15 per yr.) in AGF entitles you to a bi-monthly journal called The Aquatic Gardener (TAG). The journal is devoted primarily to aquarium plants and contains articles on experiences with specific plants, the use of various substrates, nutrients, CO2, lighting, and other mechanics of aquatic gardening. The web site also includes an online edition of TAG with links to sample illustrated articles and color images.

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If you have questions or have a favorite web site that you would like to see featured in this column, please contact Jim Marsh via e-mail at: [jim.marsh@bull.com](mailto:jim.marsh@bull.com)

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[ichman@hotmail.com](mailto:ichman@hotmail.com)  
  
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7 am - 10 pm, **PST** only

**Wanted**

*G. maculosus*  
*M. misoolensis*  
*M. monticola*  
*M. trifasciata*, Goyder River      females or mops

## Retail Review . . .

Kevin Hosmer  
dlhosmer@aol.com

3/98

Nippon Goldfish Company  
3109 Geary Boulevard  
San Francisco, CA 94118

telephone: 415-668-2203  
www.nippongoldfish.com

Prior to a recent trip to the San Francisco area, I contacted two RSG members: Robert Lumahan & Kim Goodwin. One store was recommended by both of them - The Nippon Goldfish Company. This was not a promising name for a rainbowfish enthusiast. I was not disappointed by the recommendation.

I was surprised by the large number of rainbowfish species for sale - especially when considered as a percentage of the total number of aquariums within the store. Available species included *M. praecox*, *M. boesmani* (2 sizes, large size was males only), *G. incisus* (males only), *M. lacustris*, *P. tenellus*, *P. signifer*, *P. furcatus*, *M. parkinsoni*, *M. trifasciata* (Coen River) *B. geayi* (Madagascar rainbow). There was also a "display only" aquarium containing *M. maccullochi*, *C. bleheri*, and *M. papuae* (perhaps) in addition to some of the aforementioned species.

Store owner Steve Murata was very accommodating - providing a tour and an enthusiastic discussion regarding rainbowfish from the business perspective. Steve was knowledgeable about rainbowfish and readily admits to having to become educated from local enthusiasts, seminars and even from contacting RSG chairman Gary Lange. He described some of the difficulties in finding reliable sources for variety and healthy rainbowfish stock. Steve purchases primarily from Florida fish farms (vs. Asia) and also obtains species from Hawaii and local bay area breeders.

The aquariums were reasonably clean, new shipments were marked as such and often with an "on hold" sign. The store was not overly congested and there was adequate space to maneuver. The recommendations mentioned the extensive selection of aquaria-related equipment that monopolized the entire second floor - where I spent very little time. I was under a time restraint and do not recall enough details to critique that department.

The Nippon Goldfish Company is located on a primary street that was easy to find and clearly marked. Parking could be more accessible but is probably typical of San Francisco. The store was approximately 1/2 hour drive from the airport - traffic was moving smoothly.

## Keeping and Breeding *Pseudomugil mellis*

by John K. Boylan

*Pseudomugil mellis* is a small, 2 - 3 cm, blue-eyed rainbowfish from eastern Australia. This species is limited in range to the area surrounding the city of Brisbane. Originally *P. mellis* was thought to be a sub-species of *P. signifer*. However after review *P. mellis* was elevated to species status in 1982.

*P. mellis* is often referred to as the "honey blue-eye", with good reason. Provided with the correct water conditions the male develops a honey-gold ground color. If you really get the conditions right the male will darken to almost a mahogany brown shade. The unpaired fins and caudal develop black inner margins with white outer margins. Naturally as the name implies the iris is blue in color. A very pretty little package indeed. But this begs the question what are the correct water conditions. The answer to this, I believe, goes hand in hand with their lack of availability. This species needs soft, slightly acid water conditions to show its best color and breed. Now most of the rainbow hobbyists I know keep their rainbows in hard, alkaline water, with crushed coral or shell grit in the tank. *P. mellis* will live in these water conditions, but all you will have is a small silvery fish, with faint black margins on its unpaired fins, and no egg production. I speak from experience on this. Most of the rainbow species I have kept are somewhat forgiving about water conditions but *P. mellis* is a stubborn little critter that requires that you meet its specific water conditions. Females are typical for the genus and are silver-gray in color.

Another aspect that must be addressed is temperature. The literature I have seen indicates that *P. mellis* breeds at temperatures of 28-29°C. I tried breeding my fish at this temperature and did indeed get a number of eggs. However these eggs tended to fungus before hatching and the fry that did hatch seemed weak. In September 1997 I got lucky. The Rainbow Study Group was having a convention in the San Francisco Bay area and I was delighted to find that I would be having Bruce Hansen as a houseguest for several days. To call him an expert in keeping, breeding, and collecting rainbowfish, particularly blue-eyes is being modest. In the course of our discussions Bruce described the climate for *P. mellis* as being similar in many aspects with the bay area. He also guessed that as he kept his *P. mellis* outdoors in small ponds, through the winter, they probably would do fine out here in the bay area. It seems that in Bruce's personal experience *P. mellis* was quite tolerant of cool (16-19 °C) water temperatures. As I had not had great success following the literature suggestions I decided to go with cooler temperatures. Out came the heater and egg and fry viability increased. The breeding males did lose a little color in the cooler water but at least I was getting fry. In fact I found that with two males and three females in a 10 gallon tank I would find 6-15 eggs per day. *P. mellis* appear to be an egg eater so leaving the spawning mops in for a week or so never proved beneficial. I almost always found the same number of newly laid



eggs. But this may be different in a heavily planted tank as opposed to a tank set up with 1 or 2 mops just for spawning.

In case you want to try your hand with *P. mellis* let me give you some of the parameters that have worked in my tanks. I keep my five adult fish in a 10 gallon tank. The water is filtered through peat moss which keeps the water at a pH of 6.5. I also dust the tank bottom with peat moss to cut down on reflections. Total hardness is 30 ppm. The tank is unheated and the water temperature varies between 19-22°C. On rare warm days the temperature will reach 24-25°C. The tank is placed in a low traffic area of my fish room to avoid unnecessary distractions, as *P. mellis* tends to be rather nervous. Two floating synthetic mops are used as spawning sites and placed at opposite ends of the tank. The tank is also situated so that it received indirect natural sunlight. Water changes of 25% are done on a weekly basis.

*P. mellis* are undemanding regarding food requirements. About the only concession you will need to make is providing food small enough for them to eat. I try to vary their diet between baby brine shrimp, daphnia, and small mosquito larva. However baby brine shrimp does account for the bulk of their diet. Feedings are done a minimum of twice per day if breeding is intended, more if time and schedule allow. The fish can survive on once a day feedings but will produce few, if any, eggs.

I try to harvest eggs from the mops on a daily basis. The eggs are placed into a petri dish with pure RO water (pH 7, 0 ppm) with a drop of fungicide added. The eggs are held at a temperature of 24-25°C until they hatch in about 12 days. Newly hatched fry are transferred to a 2 1/2 gallon tank with water the same parameters as the parents tank, except for temperature which is 25°C. This tank contains a sponge filter and some floating plants. After a number of attempts to raise fry on infusoria with little success I switched to A.P.R. My fry survival rate increased through the roof. I now feed A.P.R. for the first 5-7 days after hatching and then slowly begin to add baby brine shrimp to their diet. Once all of the fry are eating brine shrimp, look for the orange bellies. As with the adults feedings twice or more per day are necessary to achieve optimal growth and vigor. I am very careful when doing water changes with the fry and usually do their first water change at one month of age when I transfer the fry to a larger tank.

Although *P. mellis* does not possess the bright reds and blues of some of its larger cousins it makes ample and effective use of colors it does have. To see two males sparring, in breeding color, under natural lighting is truly a spectacular site. For the rainbowfish keeper who can afford to spend a little extra time and effort on a species this is your fish.

## Care and Breeding: *Pseudomugil paskai*

by Cary Hostrawser

This small and delicate blue-eye has yet to establish much of a presence in the hobby. This species is very similar to *Pseudomugil gertrudae* but has an elongated and pointed second dorsal and anal fin. The coloration is slightly different from my collections of *gertrudae*, but the *gertrudae* is known from many locations and the *paskai* is only known from a few streams of the upper Fly River system near Kiunga. They share the same shy behavior and prefer a planted tank. This allows the fish to move to cover should they feel threatened. Providing this cover will make them a little more bold and bring out their full color.

Mine have lived on a diet of almost entirely live food. They will accept flake and frozen foods but do not thrive on it. They seem rather picky about their diet and if preferred foods are not offered, they will eat only small amounts. But then again, I may just spoil my fish too much. My *gertrudae* exhibit many of the same tendencies. This is where the similarity ends. While my *gertrudae* are quite accepting of a wide range of water conditions and spawn with regularity, the *paskai* are very demanding.

A steady diet of live foods, provided in the form of baby brine shrimp, did induce some spawning activity. The spawning site was an acrylic yarn mop suspended from a styrofoam block and draping all the way to the gravel. Most of the eggs were found near the bottom of the mop. None of the eggs were fertile. At first I thought it was the age of the young group I had received. It later became evident that this was not the case. Touching base with my source that helped to bring these rare gems into the country provided part of the clue I needed. They require soft water to produce fertile eggs. Now this is easy enough, I have an RO unit and can basically provide water in any range. But what really is soft water? I've always hated when someone gives me, "Oh, my water's hard." or "It needs soft water." There doesn't seem to be any middle ground there and it's too subjective for any real meaning. So I started out trying to find out what is soft water to the *paskai*. At 75 ppm general hardness and 3 degrees carbonate hardness I began to get fertile eggs. Not a lot mind you but some, maybe about 20%. But it was enough to get me started. These eggs took a startling long time to develop and hatch. I was beginning to think something was wrong when they began hatching almost three weeks after being laid. This was at a temperature of 84°F.

Raising up my dozen small fish, I felt fairly confident I had ensured my collection. On my next go around I planned to start passing some of these little beauties around - hopefully to other people with soft water. As these young grew, the awful truth began to unfold. All the largest fish were developing

males characteristics and not many smaller ones were left. In the end it turned out I had eleven males and one female. With all the headache of mixing up special water for so few fish, I felt this was one species that was definitely going to give us trouble in the hobby.

I should give a little back ground on how these fish came into my hands at this point. They were originally sent over from Europe and attempts were made to spawn the fish by a very competent breeder. When that person had no luck he put them into the hands of another. He had them for a period of time with no luck. Knowing that I'm willing to give just about anything a shot, they were passed on to me at one of the RSG conventions. The group had started out as a dozen. When I received them there were only four fish, if my memory serves me correctly.

I gave a couple of more shots with this species only to get the same results. At the most recent RSG convention in San Francisco, it was brought to my attention that somebody in the area had received another collection from a different source and was getting both sexes. I really had to find out what John was doing differently. When I finally met him and found out how easy it was I could of kicked myself. At high temperatures you get mostly males. All I needed to do was drop the temperature and I should be on my way. I did pick up some stock from him, as I was down to just one female at this point.

I've also found a few more tricks in getting fertile eggs out of this species. My water really wasn't soft enough before. I now run it at 30 ppm hardness which is made up almost entirely by adding calcium chloride. About 5% of my tap water is added for trace elements. There is no measurable carbonate hardness and the pH is kept at about 6.5 and a temperature of 74°F. This is really much softer in total dissolved solids than my previous mix. It is total dissolved solids that the fish care about - not general hardness. Why would fish care how much soap it takes to make suds. I also feed black worms twice a week because they have a much higher protein content than baby brine. I now get a much higher percentage of fertile eggs and greater numbers of eggs. As to hatching and raising the fry, I now keep them at 72°F. I am expecting to get a reasonable percentage of females now and the young ones I have appear to be proving this.

I do have to point out a few real problems caused by hatching the eggs this way. They now take three to four weeks to hatch. The tendency is to think these eggs aren't fertile and I just have to pull the mop and take a look. I've damaged and killed many well developed eggs doing this. The *paskai* egg is very fragile when it gets near hatch time. The act of pulling the mop out and examining it will damage these eggs. I know because I've done it too many times now. My best advice is to just leave it alone. If you pull the mop frequently from the parents you can easily tell if you have fertile eggs. The fertile eggs will have a

slight yellowish tinge of color, while infertile one will be very clear. If you must check the mop after moving it to a hatching container, do not do so within two weeks of the expected hatch time. If you do, you may never see those fry hatching out and swimming to the top.

If you've had the patience to leave those eggs alone and get them to hatch, you'll need some APR (artificial plankton & rotifers) or other suitable microfood for about one week. The fry should begin to eat baby brine shrimp at that point. Keep the temperature in the low seventies for at least a month. We really don't know when sex is differentiated in fishes but the general theory goes that it's fixed by 1 month of age. The idea of temperature effects on sex is a new one to the rainbow side of the hobby. We've dealt with the idea that pH can effect some species but could it be that we just saw lower pH's in tanks with higher temperatures due to an increase in biological wastes and a reduced pH associated with it? Maybe time will give us that answer but this is one species that points to temperature effecting the sex ratio.

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| Florissant, MO 63033 | (314) 837-6181                       |
|                      | (7-10pm CST weekday & most weekends) |

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| <i>M. boesmani</i> Ekk-will strain    |           | \$10/mop        |
| <i>M. herbertaxelrodi</i>             |           | \$10/mop        |
| <i>M. irianjaya</i>                   |           | \$15/mop        |
| <i>M. lacustris</i>                   |           | \$10/mop        |
| <i>M. parkinsoni</i> yellow, new type |           | \$10/mop        |
| <i>M. splendida</i> "Utchee Creek"    |           | \$15/mop        |
| <i>M. trifasciata</i> "Canoe Creek"   |           | \$15/mop        |
| <i>M. trifasciata</i> "Coen River"    | \$10/pair |                 |
| <i>M. trifasciata</i> "Pappin Creek"  |           | \$15/mop        |
| <i>M. trifasciata</i> "Wonga Creek"   |           | \$15/mop        |
| <i>P. signifer</i> "Ross River"       |           | \$15/dozen eggs |

Shipping is \$4/box for eggs. Please no orders over 3 species at a time OR list plenty of alternates as the bows don't all get amorous at the same time. Mops have at least 24 eggs in them will attempt to have 4 dozen eggs/mop.

5/28/98

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# **Spirulina and Lipid Loading of Artemia Nauplii**

by Lou Veiga

Gary Lange has asked me to write on how to enrich newly hatched brine shrimp to achieve better growth in rainbowfish fry. I don't claim to keep any scientific records to prove any of my observations. However, I do see very good growth in fry using the method described below. I was able to raise up about 100 *M. praecox* to an average inch and one-half size in four months, which, for me, is a "personal best" rainbowfish growth rate.

To a one-gallon glass jar, filled 3/4ths full of regular tap water I add 5 tablespoons of sea salt mix and about 1/4 of Epsom salt. Aerate the water vigorously but without an airstone, just air blown through the line and a stiff section of plastic tubing. I add about two teaspoons or less of Artemia cysts. In a 70°F. room I place a 60 watt bulb about 2 inches from the jar for light and to warm the jar. You should see a good hatch in 16 to 20 hours.

After hatching, remove the airline from the jar and let the nauplii settle for about 5 minutes. The shells will rise to the top of the jar and separate from the hatched, swimming shrimp. Siphon and collect the whole hatch into a fine mesh net, collecting as few shells as possible, and discard the hatch water. Have another jar of salt water, identically mixed as the first batch but without any cysts or Epsom salt, ready to receive the hatched shrimp. Rinse the shrimp lightly under fresh water, feed some if you like to your fish, and the rest introduce into the new jar of brine water.

At this point you can either wait 6 hours or proceed, depending on how long your cysts took to hatch. Nauplii begin feeding sometime after six hours of hatching, so you may need to wait to begin feeding the shrimp. At the appropriate time, add about half as much (by volume, about a teaspoon) of Spirulina algae powder as the volume of nauplii in the jar to a small container with water and shake vigorously (or place the Spirulina and water into a small blender). Pour the algae water into the brine shrimp jar.

About six hours later add the same amount of Sander's Docosa Gold as the Spirulina powder, shaking or blending in water as before, and pouring it into the shrimp jar. The Docosa Gold is a high lipid powder that replaces the live algae for shrimp and bivalve larvae. Lipids are shown to improve growth in fry.

Wait four hours or so, then collect a portion of the now "loaded" nauplii into a brine shrimp net. Do not rinse, but feed directly to your larval fishes.

By continuing to add more Spirulina and lipid powder daily to your shrimp jar in proportion to the remaining shrimp, and keeping up the aeration to the jar. In

a cool room (70°F), you should be able to feed your fishes this enriched food for at least three days.

This is as good and convenient a larval food as I have found. It is recommended as a second stage feed, after weaning from artificial plankton and rotifer (A.P.R.).

Where to purchase the Spirulina and Docosa Gold:

Sanders Brine Shrimp Company  
1-801-393-5027

I am not affiliated or related in any way with Sanders; I'm just a breeder getting good results using their products. I hope this or a similar scheme will produce improved results in your fishes, too.

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|-------------------|------------------------|
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| <i>G. species</i> , Lake Klye               |                    | \$35/mop         |
| <i>I. wernerii</i>                          | adults / juveniles | call for pricing |
| <i>M. affinis</i> , Emas Lakes              |                    | \$25/mop         |
| <i>M. arfakensis</i>                        |                    | \$30/mop         |
| <i>M. eachamensis</i> , Lake Euromoo        |                    | \$25/mop         |
| <i>M. eachamensis</i> , Mabo Crater         |                    | \$25/mop         |
| <i>M. exquisita</i> , Waterfall Creek       |                    | \$25/mop         |
| <i>M. goldiei</i>                           |                    | \$25/mop         |
| <i>M. nigrans</i> , Scotts Creek            |                    | \$25/mop         |
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| <i>M. trifasciata</i> , Moorhead            |                    | \$25/mop         |
| <i>M. trifasciata</i> , Upper Coen River F3 |                    | \$15/mop         |
| <i>P. furcatus</i>                          |                    | \$20/mop         |
| <i>P. gertrudae</i>                         | adults / juveniles | call for pricing |

Will consider all trades. Prices do not include shipping. Typical shipping costs are \$3.00 for mops - up to 4 mops. Live fish shipping costs vary with size & quantity. Please call for actual costs. Mops contain at least one dozen eggs. Most fish are much more prolific; mops frequently have over 50 eggs. Species subject to availability.

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# RAINBOWS and BLUE-EYES: Fish From "DOWN UNDER"

PART II (Continued from previous issue)

by Kim Goodwin

## AVAILABLE SPECIES

I certainly cannot describe every rainbow and blue-eye species you might encounter. There are at least 68 described species of rainbows and blue-eyes<sup>4</sup>, with several currently undescribed species and more waiting to be discovered. However, I can briefly discuss what I think are the most attractive species in each of the major genera.

The genus *Glossolepis* includes some of the largest New Guinea rainbows. *G. incisus* and *G. wanamensis* males can grow up to about 6" SL. These two species have perhaps the most noticeable sexual dimorphism among rainbows. *G. incisus* is called the red rainbow because adult males vary from a deep rust-red (when they're sulking) to a brilliant tomato color (when they're in a spawning mood or being fed). *G. wanamensis* males are mostly green, varying from an almost emerald color with some orange and yellow highlights in the anterior region to nearly black on the fins. They have very elongated dorsal and anal fins, which are particularly stunning, when the males display at one another. Older males of both species get very tall bodies. The females of both species are basically silver with an olive tint. *G. wanamensis* females have slightly elongated anal fins.

The genus *Chilatherina* is also limited to New Guinea. Many members of this genus are not brightly colored; one exception is *Chilatherina bleheri* (Bleher's Rainbow). Female *bleheri* are plain silver with slight yellowish highlights, but the adult males have an attractive red posterior and yellow or red fins. Older males develop tall bodies and grow to about 6".

The genus *Melanotaenia* is by far the largest rainbowfish genus, with members in both Australia and New Guinea. The genus includes several "dwarf" (2-3") rainbow species, namely *M. pygmaea*, *M. maccullochi*, and *M. praecox*, as well as many larger fish. All three dwarf species prefer neutral or slightly acidic water. There are several populations of *M. maccullochi* (MacCulloch's Rainbow) in Australia and New Guinea. While all of them share a yellowish body with dark brown or black horizontal stripes, fish from Queensland have red fins and less intense body striping. *M. praecox* (the "dwarf neon rainbow") has been described as the aquarium fish of the century because of its small size, metallic blue body, and blood-red fins. It was difficult to acquire until recently - adult pairs were selling for \$60 to \$100 as little as a year ago. The fish is more readily available now, but most of the specimens I have seen lately are

mediocre. Good males have strongly colored blood-red fins and tall bodies. I've noticed that my *praecox* tend to be shy and skittish when kept by themselves, but they behave like any other rainbow when kept with one or more compatible species.

The *Melanotaenia* species most commonly available in stores is *M. boesmani* from New Guinea. You Cal fans will appreciate this fish because of its spectacular coloring. The anterior half of the body is grayish-blue or deep purplish blue, while the posterior is yellow or yellow-orange. Generally, there are one to three dark blue vertical markings between the blue and yellow areas. The dorsal and anal fins are blue and yellow with a frost-white edge. In females, the coloring is less intense and the blue and yellow zones are much less defined. Males develop taller bodies, though this is not as pronounced as in *C. bleheri* and the *Glossolepis* species.

My two other favorites among the larger *Melanotaenia* are *M. lacustris* (the Turquoise Rainbow) and *M. herbertaxelrodi* (the Lake Tebera Rainbow, or "Herbie"). Good specimens of either fish are almost impossible to find in stores. Male and female *lacustris* should be a brilliant turquoise color on the upper half of the body, with a dark mid-lateral stripe and much paler (almost white) lower half. Good *herbertaxelrodi* specimens are a vibrant, pulsating orange-yellow with tomato-red fins and a dark mid-lateral stripe. Excited males will "flash," turning the scales on top of the head to a powder blue color.

The last fish I will mention are the blue-eyes of the genus *Pseudomugil*. These are small, delicate-looking fish with slightly upturned mouths. *P. furcatus* grows to about 2". Males have a yellowish body with a bright orange-yellow chest. The first dorsal ray is quite elongated, and each of the fins is marked with broad black stripes near the base positioned high on the body, making it look like the fish is flapping yellow wings to fly through the water in a comical fashion. The females have silver bodies with a touch of yellow along the belly. They also have much less elaborate finnage. *P. gertrudae* is similar in size and body shape. The body is whitish with slightly dark edges on the scales. Males have large dorsal and anal fins covered with small dark spots. The first dorsal is long and pointed, while the second dorsal and anal fins are broad and rounded. The pectoral fins have a yellow stripe along the top edge, just as in *P. furcatus*. The females, as in *P. furcatus*, are less brightly colored and have smaller fins. Please note that blue-eyes are more finicky than the larger rainbows. I do not recommend them for beginners.

## SPAWNING RAINBOWS AND BLUE-EYES

Rainbows reach sexual maturity well before they reach their full size. The larger rainbows can be spawned by the time they reach 3" or so. When the



males are about 2 1/2" SL, they'll be almost fully colored up and will start displaying at each other and chasing each other in tight little circles. The males are probably ready to breed at this point, but I would wait until the slower growing females reach 3" or so.

The key to successful spawning is food. I maintain my adult rainbows and blue-eyes on about 60% frozen bloodworms and mosquito larvae, 15% live brine shrimp, 5% other frozen or live foods and 20% spirulina and flake food. When I want to spawn the fish, I feed nothing but bloodworms and glassworms for a week or so. Although adult brine shrimp may enhance the color of the fish, it does not seem to encourage egg production as well as the fattier insect larvae do. Feed the bloodworms and white mosquito larvae until the females look decidedly plump. Be patient about this because skinny females are not ready to spawn and may get beaten up or killed by overeager males.

When the females are looking chubby, I move a pair or trio (one male and two females) to a separate spawning tank. This can be anywhere from 10 to 30 gallons, depending on the size of the fish. Position the tank where it will get a little bit of morning sunlight. Cover the back and sides of a clean tank with some kind of dark material and scatter a thin layer of dark gravel on the bottom. Cleanliness is important, because the eggs will be attacked by fungus in a dirty tank. Add a cycled sponge filter and a clump on snail-free Java moss weighted down by a small rock. To avoid getting hybrid fry by accident, use only moss that hasn't been in a tank with any other adult rainbows for a couple of weeks. Fill the spawning tank with 1/2 maintenance tank water and 1/2 new water. I keep the spawning tank at the same temperature and pH as the maintenance tank. Although my own fish are picky about their surroundings, some people are able to spawn their rainbows in bare tanks with nothing but a few yarn spawning mops and cycled sponge filter. You might try that method first, because it's easier to keep a bare tank clean and spawning mops can be pre-soaked in methylene blue to discourage egg fungus.

When the sun shines on the spawning tank the next morning, the male will start his mating dance. If you've never seen it, it's well worth watching. A male rainbow will hover over his chosen mop or clump of moss, flaring his fins, showing off his brightest colors and shimmying in place. He will "flash," showing a streak of brilliant color along the top of his head from the mouth to just above his eyes. (The color of the flash varies by species. Turquoise rainbows will flash a peach-pink color, while herbies will show a bright powder-blue) Rather than flashing, a male threadfin or blue-eye will repeatedly snap his dorsal fin erect. If no female comes to visit him, the male will try to herd one over to his chosen spot, nudging her side. Once he has coaxed her to his nest, both fish will hover side by side, dropping and fertilizing the 1 to 2 millimeter clear eggs. Female rainbows will deposit anywhere from 10 to 50

eggs each day, depending on the species, size and condition of the fish. Female blue-eyes only deposit a few eggs at a time.

## RAISING FRY

Almost all rainbows will happily eat their own eggs and fry, so after a few days of spawning I either remove the parents and return them to the maintenance tank to fatten up again, or remove the clump of Java moss to a bare 5 or 10 gallon tank filled with clean water. I sometimes pick the individual eggs from the java moss and put them in shallow hatching trays, but this takes a fair amount of patience and you will probably miss half the eggs. The eggs will develop in about a week at 80F. You may want to add a few drops of methylene blue or use chlorinated water to help inhibit fungus growth, though it won't stop it entirely. If you can, remove any eggs that turn white or grow fungus -- healthy eggs are clear and eventually develop dark eye spots. Keep the eggs in only an inch or two of water to maximize the oxygen content of the water and make it easier for the hatching fry to reach the surface; fry that can't fill the swim bladders properly will grow up swimming at an awkward 45 degree angle. Adding some oyster shell grit or other soluble source of calcium to the hatching and rearing tank seems to increase the survival and growth rate of eggs and fry. You can buy shell grit in any bird store.

The 3 to 5 millimeter fry will hatch out over several days. Keep the water fairly shallow for several weeks and use only very gentle aeration. The fry are fairly delicate at this size and can easily be killed by sudden temperature or pH changes. For the first month or so, I carefully siphon waste off the bottom with a bit of airline tubing, then slowly add new water (from the bottom of the tank, not dripped or poured on the surface) via an IV or a piece of airline tubing constricted with a clothespin.

Feeding such tiny fry is a challenge. You will need to start them out on infusoria, green water, vinegar eels, Liquifry egglayer, or one of the powdered commercial fry foods. (Sera Micron, Tetra Baby Egglayer or OSI Micro Food) Rainbow fry will not eat food that falls to the bottom, so microworms are not really suitable. The smallest species seem unable to eat vinegar eels or the Tetra baby food right away, but they do well if started on Sera Micron or OSI Micro Food (also known as APR) for about a week. After that, the fry will really stuff themselves on vinegar eels; perhaps the wriggling movement stimulates their appetites. Rainbow fry initially grow very slowly, so it may be several weeks before they can take newly hatched brine shrimp. Once they reach that size, though, I always feel like I'm home free. Any losses will usually be minimal after that point and the growth rate seems to increase. Once they're about half an inch long, I feed Hikari Micropellets until the fish can take adult brine shrimp or mosquito larvae.

As you grow out the fry, provide them with as much space as possible. When you start noticing a real disparity in size, you might want to separate your larger and smaller fry, since the larger ones will start to eat the smaller one. Females tend to grow more slowly, so separating the fry should help prevent a skewed sex ratio, too. Males of the larger species will start to show a little bit of color when they're about an inch long.

## ACQUIRING RAINBOWS

Most stores don't offer rainbows very often, either because they can't get good specimens or because people don't want to pay for these somewhat expensive fish. You can sometimes find good *M. boesemani* and *G. incisus*. (at around \$10 for a half-grown fish) Mediocre specimens of *M. praecox* are fairly common for about \$7 apiece but good specimens are harder to find and will cost you a little more. *M. lacustris* and *M. herbertaxelrodi* are occasionally available, but I've only seen good ones in stores once or twice. (and I go to a lot of stores) Expect to pay more for *M. lacustris* and herbies than for *M. boesemani* and *G. incisus*. *P. furcatus* and *P. gertrudae* are rarely available even in stores that specialize in rainbows, but they will also be about \$20 a pair.

Unfortunately, most of the rainbows available in stores seem to be from wholesalers who are careless about fish identification, so the fish you've seen are probably hybrids or otherwise misidentified. *M. trifasciata* and *M. splendida*, for example, have so many sub-species and/or populations that it's difficult even for a dedicated hobbyist to keep them straight, so most of those available are crosses among different populations. Other fish are actually hybrids of two or more species, such as *Glossolepis wanamensis* and *G. multisquamatus* crosses, which are probably the result of mix-ups with similar looking females. Finally, there are fish someone has deliberately crossed, such as an unattractive pinkish fish I've seen in several stores called a "Red *Boesemani*," which appears to be a cross between *Glossolepis incisus* and something else, but is definitely not a *boesemani*. Some rainbows of dubious origin may still be attractive and there's no reason not to enjoy them in your tank. However, if you're not 100% positive that you have a pure species from a known population, please don't sell the fish to someone else or spawn them and pass along a possible hybrid offspring.

Sounds discouraging, doesn't it? Never fear, there are ways to get really good rainbows. One way is to find a store with an owner or employee who is really "into" rainbows and knows a lot about them. Ask that person to find you some uncrossed fish of good quality, rather than the poor stuff they get from the wholesalers. Another way is to get your fish from a Rainbowfish Study Group member. (either from one of us locally, or via the national fish-and-egg listing

you'll get if you join) Finally, you can attend the SFAS / Rainbowfish Study Group conference this September 20-21. You can learn all about rainbows and blue-eyes on Saturday, then buy the fish of your dreams at the auction on Sunday.

Wherever you buy them, make sure the fish are active and healthy. Healthy fish will race across the tank and leap after a morsel of food. They will hold their fins partially erect; fins are only fully erect when the fish are displaying. Never buy a rainbow that looks at all thin or scrawny - these should be robust, solid fish. Also, don't worry too much if they're a bit pale, since fish in bags or in bare store tanks are always a little stressed.

I hope I've convinced you to give rainbows a try. Take the time to find good, healthy stock of pure strain, set up a well-planted tank, feed live food, and you will soon have one of the best-looking tanks in town.

**Ed. Note:** Reprinted from The Golden Gate Aquarist - publication of the San Francisco Aquarium Society, Spring 1997 issue.

|                                          |                      |
|------------------------------------------|----------------------|
| <hr/> <hr/>                              |                      |
| Cary Hostrawser                          | caryho@ix.netcom.com |
| 12920 Zachary Cr N                       |                      |
| Dayton, MN 55327                         | (612) 422-9446       |
| <b>Available</b>                         |                      |
| <i>I. werneri</i>                        | \$15/mop             |
| <i>M. affinis</i> , Emas Lakes           | \$15/mop             |
| <i>M. arfakensis</i>                     | \$15/mop             |
| <i>M. misoolensis</i> , Batanta          | \$15/mop             |
| <i>M. papuae</i>                         | \$15/mop             |
| <i>M. parkinsoni</i>                     | \$15/mop             |
| <i>M. praecox</i>                        | \$15/mop             |
| <i>M. splendida rubrostriata</i>         | \$15/mop             |
| <i>M. trifasciata</i> , Upper Coen River | \$15/mop             |
| <i>P. furcatus</i>                       | \$15/dozen eggs      |
| <i>P. gertrudae</i> , Giddy River        | \$15/dozen eggs      |
| <i>P. gertrudae</i> , Goanna Lagoons     | \$15/dozen eggs      |

Availability dependent upon the amorous intentions of the fish. Please contact me before ordering. Shipping runs \$5 for up to three mops. Please return the container or send a container with the order. One replacement mop will be provided for the cost of shipping should the mop fail. Fish shipped at buyer's risk, you choose your preferred method.

3/21/98

## E-mail Survey: Special Delivery

assembled by Kevin Hosmer

*The Rainbow Times*, Issue 1102's e-mail question: Have you had a particularly negative, positive or humorous experience shipping/receiving rainbowfish?

My intention was to assemble an article that would give the novice some guidance when shipping or receiving rainbowfish. It was not possible to anticipate the responses.

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I have shipped bows in traditional fish bags and I have had mixed success. When I first started having loses, I thought I had put too many fish in the bag, so I started putting only two to a bag. This did improve things a little but I still had some loses. I also had to start using much larger boxes. Larger boxes for me were hard to find.

I bought some Kordon breathable bags after I saw them at a West Coast Killifish Show in San Francisco. I started to ship my killies in these bags without ever having any loses to date. When the fish arrived at their destination, I received feedback that the fish did not look stressed at all. They were not washed out and in full color. So I started using these bags for shipping bows. I bought all three sizes: small, medium and large. I shipped some (*P. furcata*) in the largest bag without double bagging it and the bags broke in the mail. So then I put two bows in the medium bags and one bow in the small bag. I double bagged all of them in the largest bag. This was a success. I haven't had any loses yet. If you have never used these bags before, the key is not put any air in the bag. With no air in the bag the fish does not get sloshed from side to side while in the mail.

L. Patrick  
Dayton, Ohio

I don't have any unusual experiences with shipping rainbows, although I had a mail carrier apologize for tipping the box over. I missed the mail carrier when he stopped by the house. He left a notice to pick the box up on the next business day . . . Monday! I put the kids in the car and traveled up and down the streets of our neighborhood to find him in his delivery truck. After finally finding him, he was concerned about the box containing live fish. He kept apologizing for allowing the box to tip over in the truck. I explained that the only harm was likely an unintended back flip for a few of the fish, but otherwise no problem. He couldn't understand that there was no top or bottom and insisted on keeping the box upright.

M. Florez  
Pittsburgh, PA

I spent the American summer of '97 collecting fish in Australia as part of my graduate studies. Most of the fish I collected remained in Australia in museums and whatnot. However, I did bring a few fish back to undertake morphological and genetic studies on some inland Australian rainbows (*fluviatilis* and *tatei*). The specimens for genetic work needed to be kept cold (approximately -70°C), hence they needed to travel on dry ice. I was a little worried as to how long my dry ice would last as they only let you carry 5 pounds as carry on baggage and I wasn't sure if customs would want to look through it or not (potentially defrosting things) or worse still hang on to it. When I entered Australia I declared something to customs and ended up having ALL my baggage searched right down to video cassettes in boxes and they x-rayed my seine nets that were still in their original packing. So, I filled in my little customs form which just says I had something to declare. As I went through customs I was directed the appropriate way, the guy at the desk asked me "do you have any fruit and vegetables" to which I replied no. He asked "what do you have then", I said "dead fish" and he goes "ok, on you go then" much to my surprise and that was it.

P. Unmack  
Tempe, AZ

I once had a hassle taking a styro box of fish down to Melbourne from Brisbane a couple of years ago when I was going down to visit Neil Armstrong. I had conscientiously double bagged them and even had a box liner in the form of a garbage bag (liner).

I had arrived early (at the airport) to send the fish and the clerk at the freight office slit open the box and decided that they were inadequately packed and told me to take them away. I tried to rearrange my flight time to later in the day to give me time to repack them but as it was an "apex" fare (cheap one paid a month ahead). I couldn't change. So I left the box at the lost baggage counter for my daughter to collect and take home later.

In fact I almost missed my flight with all the travelling to and from the two sections of the airport and trying to change the ticket etc. Finally I got to Melbourne and on arrival at Neil's home there was a call from the airport. Apparently when my daughter went to collect the box the boss of the freight section was there, inspected the packing and pronounced them to be perfectly OK, sealed the box, phoned me, sent it down on the next flight, then out to Neil's house by taxi and all at the Airline's expense. The best part was they were originally going to charge me \$20 freight and that was forgotten in all the mix-up!

B. Hansen  
Brisbane, Australia

## RSG STORE

Send requests for items to:

Gary Lange, 2590 Cheshire, Florissant, MO 63033

- Poster: Blue-eyes and Australian Rainbowfishes  
Unsigned copies are \$10 and signed copies are \$15.

Shipping & Mailing Tube for posters:

|         |                |            |            |            |               |
|---------|----------------|------------|------------|------------|---------------|
| U.S.:   | 1 @ \$2.70     | 2 @ \$2.95 | 3 @ \$3.20 | 4 @ \$3.65 | 5-18 @ \$4.00 |
| Canada: | 1 @ \$2.65     | 2 @ \$2.80 | 3 @ \$3.20 | 4 @ \$3.40 | 5-7 @ \$4.30  |
|         | (surface mail) |            |            |            | 8-12 @ \$5.10 |

- T-shirts

This is a Karen Randall design depicting *P. furcata* and *M. praecox* (the neon rainbow). "Rainbowfish Study Group" proudly arches in rainbow colors over the top of artwork while "Living Color" balances below. A quality shirt was used in the process - Fruit of the Loom "Best", a 50/50 cotton/polyester blend. There really isn't any shrinkage. As with all shirts with a silkscreen design it should be washed in cold water and drip-dried. L & XL: \$12. XXL: \$13.

Shipping & Mailer for T-shirts:

|         |            |              |              |
|---------|------------|--------------|--------------|
| U.S.:   | 1 @ \$3.00 | 2-3 @ \$3.60 | 4-5 @ \$4.60 |
| Canada: | 1 @ \$3.00 | 2 @ \$3.30   | 3 @ \$4.50   |

Combination: 1 Poster & 1 T-shirt

Shipping & Mailer for Combinations:

|         |            |            |            |
|---------|------------|------------|------------|
| U.S.:   | 1 @ \$3.00 | 2 @ \$4.00 | 3 @ \$5.00 |
| Canada: | 1 @ \$4.07 | 2 @ \$5.67 |            |

- Best of RSG

This is a compilation of the best articles originally published in the Rainbow Times - encompassing (approximately) the first 7 years of publication.

RSG book with shipping

|          |           |         |
|----------|-----------|---------|
| U.S.     | book rate | \$14.50 |
| Canada   | surface   | \$15.00 |
|          | air       | \$16.00 |
| Overseas | surface   | \$16.00 |
|          | air       | \$19.00 |

Payable in U.S. funds only, checks payable to the Rainbowfish Study Group.

If you would like to order larger quantities of any item(s), we'll check UPS rates. If you have any questions you can call me, Gary Lange, in the evenings (6-10 CST & most weekends until 10 pm CST) at (314) 837-6181 or E-mail at [GWLANGE@STLNET.COM](mailto:GWLANGE@STLNET.COM)

## Welcome New RSG Members

(available next issue)

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### FISH AND EGG LISTINGS

Send fish and egg listings to: Robert Lumahan  
2374 Forest Oaks Drive  
Chula Vista, CA 91915  
(619) 482-7363  
[lumahan@ix.netcom.com](mailto:lumahan@ix.netcom.com)

Space permitting, your listing will run for two issues unless you specify otherwise. The standard for listing a mop is at least 24 eggs in the mop. Most rainbowfish usually produce more than that. If not, price should be specified per dozen eggs.

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