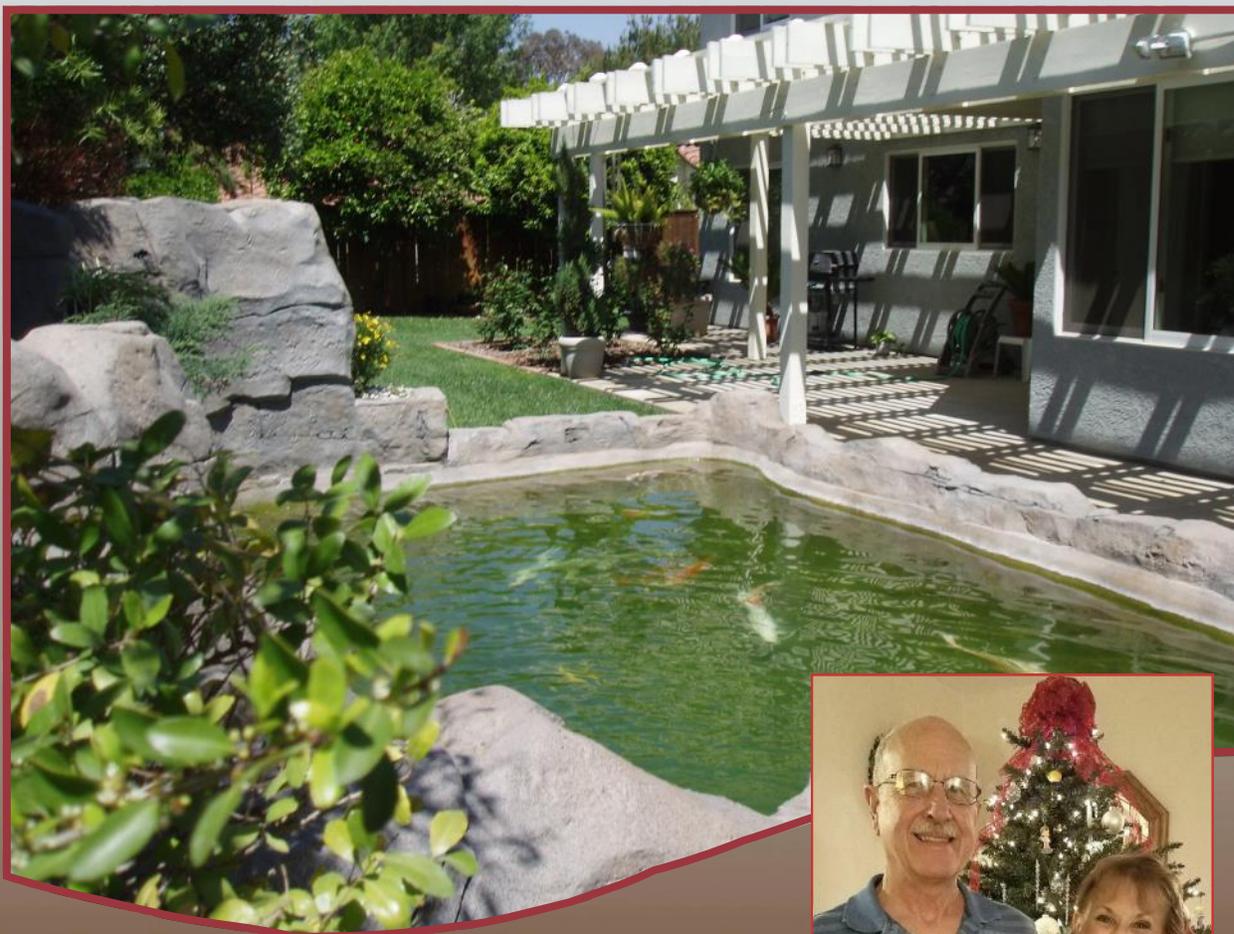


# *The Inland Koi Connection*



THE OFFICIAL  
NEWSLETTER  
OF IKS  
ISSUE 260  
JANUARY  
2019



**IKS General Meeting - 2-5pm**

**Sunday, January 27**

**5349 Jasper Lane**

**Riverside 92506**

**951.781.3887**

**Larry & Debby  
Leverett, hosts**

*The IKS Board generally meets on the first Sunday evening at 5:00 or 6:00 pm; they share hosting the meetings and providing simple refreshments. Members are welcome to attend, but should let the hosts know their intention to do so.*

The **December 2** Board meeting was hosted by the Kushners; 11 attended.

- **November 18 meeting** at the *Malls' in Temecula*: We had a turnout of 72, including several of our newest members. We were pleased to see the *Hunters* after Rachel's back surgery, and *Steve & Lily Rhodes*, who we haven't seen in a long time; *Brian & Shelly DeLeon* were our guests. Great food as usual! The Koi Races were well received: *Deanna Fales* was the only better on the wining koi in one race and had a \$32 return.
- **Membership** is up to 95, with 23 new members in 2018; 28 paid dues at the November meeting. Renewals were due January 1.
- **Meeting Dates**: *January 27* meeting will be hosted by *Larry & Debby Leverett* in Riverside; *Orville Hanson* will discuss how to remove DOC from pond water and adding Japanese elements to your pond. •Hosts are needed for February forward.; call Ed Kushner to volunteer.
- **Koi Rescue**: •Ed has about twenty 4-6" and five 20" koi left in QT; *Vicki Grunewald* took three. •Ed found 15' diameter pools, 4' deep, for \$262; we need one for Auction quarantine. •More rescues coming.
- **Koi Auction**: Scheduled for June 1, if no other koi dates conflict. Nick Milfeld and Larry Leverett will be co-chairs. •Besides rescued koi, members may also bring fish, with a limit of five per member.
- **Norco HS Pond Project**: Norco students are working on the bottom drain and framed their pond with railroad ties; when the ties are all in place Larry and *Eric Triplet* can start work on building a waterfall. *Theo* has cut PVC pipe and drilled the holes, as the school does not have an adequate drill press; the students will do the gluing and attach the end caps.
- **New Business**: Larry proposed we contact Tim Graham (website is "Yard and Garden Guru") and see if he is willing to mention IKS or include a link to us. Brenda volunteered to contact Tim. [<https://yardandgardenguru.com>].
- **Next Board meeting**: **Sunday, February 10, at 5pm**, at the Broomfields' in Claremont. Future Board dates are:  
 March 10 Board Meeting ~ hosted by Larry & Debby Leverett  
 April 7 Board Meeting ~ hosted by Brenda Aker  
 May 5 Board Meeting ~ hosted by Theo & Jeanne Zoetemelk  
 sThe Board was adjourned at 6:35pm.

**BOARD OF DIRECTORS 2019**

- President: **Linda Kushner** ~  
 951.520.0092 ~ lindakushner@inlandkoiociety.org
- Vice President: **Ed Kushner** ~ *Meeting Sites & Speakers*  
*Web Liaison ~ Koi Re-Homing ~ Pond Tour Co-Chair*  
 951.520.0092 ~ edkushner@inlandkoiociety.org
- Secretary: **Monica Dirac** ~  
 909.887.7497 ~ monicadirac@aol.com
- Treasurer: **Nick Milfeld** ~ *Membership*  
 951.780.7395 ~ nickmilfeld@inlandkoiociety.org
- Newsletter Editor: **Peggy Milfeld**  
 951.780.7395 ~ peggymilfeld@inlandkoiociety.org
- 
- Director: **Brenda Aker** ~  
 c 951.316.0263 ~ BrendaAker@inlandkoiociety.org
- Director: **Ed Broomfield** ~ *Koi Health Advisor*  
 c 909.519.7026 ~ EdBroomfield@inlandkoiociety.org
- Director: **Deanna Fales** ~ *Raffles*  
 951.279.0181 ~ DeannaFales@inlandkoiociety.org
- Director: **Rob Fales** ~ *Pond Tour Co-Chair*  
 951.279.0181 ~ robfales@inlandkoiociety.org
- Director: **Larry Leverett** ~ *Properties Manager*  
 951.781-3887 ~ larryleverett@inlandkoiociety.org
- Director: **Theo Zoetemelk** ~ *Buffet & Banquet Supplies*  
 951.735.9896 ~ theozoetemelk@inlandkoiociety.org
- Director: **POSITION OPEN**

**IKS HELP LINE**

- Koi Health ~ K.O.I. Rep.: **Spike Cover** ~ 949.855.2371
- AKCA Representative ~ **Mac McClain** 951.398.7048  
 macmcclain@inlandkoiociety.org
- Librarians: Books & Videos listed on IKS website  
**Jim & Tess Poyle** ~ 951.797.3007
- Database: **Orville Hanson** ~ 951.682.3107
- Web Master: **Alecia Everett** ~ ikswebmaster@yahoo.com
- Badges: **Jack Marrin** ~ 909.792.3603 ~  
 jackmarrin@inlandkoiociety.org
- Sunshine: **Francine Hoffman** ~ 951.781.8209
- *When calling our volunteers, you might get a recorded message. Please suggest a time when you're home to receive a return call, or when you would like to call back.*
  - *Remember that phone advice is given based on your input; the ultimate responsibility for treatment remains with you.*
  - *You can call our Librarians to request information on a particular topic and they will bring it for you to the next meeting, or make other arrangements to get it.*



We can't say what the weather will be for our January meeting, but if it's anything akin to what's projected for this mid-month, we're prepared to stay indoors. **Larry & Debby Leverett** are the only members we know who have a clean enough and empty enough garage to host a sit-down audience of 50 to 60 people; in fact, I think their record was closer to 70! That means, of course, that we'll still all need to bring our chairs, along with something for the buffet lunch. It's a time for great soups and chili and other comfort foods. *Yumm!*

Most of us have been to the Leveretts' before, but for our new members I'll share some history. Larry & Debby have been IKS members for over 20 years and are committed to koi. Larry served two terms as president, and was then elected Chairman of the AKCA, our parent organization, and he was a dynamic and energizing force in the association. At that time, Larry's pond was a recycled fiberglass spa but, in all the years since, they haven't been able to come up with a photo of it! It was one of five ponds featured in the first IKS pond tour in 1997, and Larry was notorious for being the national leader with a 375-gallon pond! But that pond grew some of the biggest koi in the club, eight or nine jumbos rubbing shoulders as sardines, and was joked that if one wanted to turn around, it had to ask the others to hold still.

Our club was small when they joined, and Larry was committed to promoting and growing it; he was instrumental in organizing the first pond tour, for which he was chairman. He got us involved

with the Riverside Community Flower Show: each year we set up a display pond at the show to promote the club and our tour or auction. He did water plant seminars for them, always takes top awards for something, and is the only guy we know who, for want of a knife for a koi autopsy, will bite the head off! *Go ahead. Ask.*



In 2007, with their house being remodeled, they removed the spa. Larry built the present 4,000-gallon concrete pond with an *AKCA Guide to Pond Construction* in his hip pocket: he did everything "by the book." Two 4-inch bottom drains and a 3-inch skimmer gravity flow to a 300-gallon vortex with a micro-screen pre filter. There are two 1/4 hp *W<sup>m</sup>Lim* pumps that push half the water to a 300-gallon sand and gravel filter; the other half moves through an 82 watt UV light. The water goes through a 300-gallon moving bed bio filter with an air pump, which keeps the bio media moving at all times. From these filters, the water flows to two waterfalls and back to the pond.

In 2012, Larry rebuilt a 400-gallon quarantine tank by his orchid house, a rockscaped corner with waterfalls; it's at your left as you enter the garden gate. It has a 1/8 hp pump, a Bio Force 2000 filter, and a 40 watt UV light.

**Orville Hanson** will be our speaker, discussing how to remove dissolved organic carbons (DOC), and how to add a Japanese look to your pond. Orville has been keeping koi for 30 years, after becoming interested in them during numerous trips to Japan. After retiring from the Department of Defense, where he analyzed the performance of combat systems for the Navy, he became active in the Inland Koi Society. He has applied his engineer's training and knowledge to compare the many koi pond filtration systems and their components, which he has shared with us in the past. ☺

- 6'x6'x3.5'
- 375 gallons
- Century 2-speed pump (1/8 - 3/4 hp)
- 2.1" PVC pipe
- 40-watt uv runs 24/7
- Pond mounted under raised rock edging

**DIRECTIONS FROM THE 91 FWY:**

- Exit off Fwy 91 at Central Ave and go east.
- Left on Fairview, past 2 stop signs to Cornwall.
- Forced right on Cornwall, quick left on Shoemaker.
- Forced right on Jasper, and **5349 Jasper Lane** is the second house on the right.

**DIRECTIONS FROM THE 215 FWY:**

- Exit off I-215 on Alessandro and head west.
- Right on Fairview and continue as stated above.



**MAP NOT TO SCALE**

## Inland Koi Society Club Membership Renewal Time

If you set aside your November newsletter without returning the pre-printed Renewal Form that was enclosed, please look for it now and send it in...or bring it to the January meeting. No longer in the newsletter? Maybe it's with your unpaid bills...?

Listed are the 38 RENEWALS received to date, as well as new members. I would really like to publish the 2018 Directory before the March meeting, and those whose dues have not been received would be deleted. Please don't let that be you! **Thank you!**

Atkiss, Paul & Cheryl  
Broomfield, Ed & Louise  
Brown, Ed & Trina  
Chandler, Don & Brenda  
Coby, Tony

Cover, Spike & Ginger  
Fales, Rob & Deanna  
Frady, Mike & Carolyn  
Grunewald, Vicki  
Halterman, Perry & Janice

Hamilton, Carole  
Hanson, Orville  
Henry, Bob & Bonnie  
Hoffman, Francine  
Hunter, Phil & Rachel

Hurley, Steve & Patricia  
Lei, William & Donise  
MacLaren, Ed & Lynn  
Mall, Jerry & Pat  
Milfeld, Nick & Peggy

Mouw, John & Cricket  
Murakami, Ken & Donna  
Nyrady, Steve & Laura  
Parks, Gary & Janet  
Poyle, Jim & Tess

Rein, Lloyd & Joy  
Rhodes, Steve & Lily  
Richardson, Wayne  
Ross, Tom & Zuma  
Rowland, Audrey

Simmons, Bob & Vickie  
Thompson, Denny & Carole  
Walters, Bob & Martha  
Watson, Alvin & Darlene  
Wolf, Larry & Dorothy

Wright, Tom & Tee  
Yelenich, Ron & Jessica  
Zoetemelk, Theo & Jeanne

### NEW MEMBERS:

Stevens, Wally (10/28/18)  
Austin, Janice (11/18/18)  
Trubs, Mike (11/18/18)

### HONORARY MEMBERS:

Houston, Kelly  
Pierce, Al & Tamsie  
Svelan, John

[44 to date]



**Norco HS Pond:  
the finished dig**

Bordered by railroad ties, the digging is done. Marking is for a bottom drain; there will be a skimmer at the near end, a waterfall at the far end. A liner has been donated. Kids still need to pour a 3' walk on one side and make space for the equipment.

### WELCOME TO OUR NEWEST MEMBERS!

Write these folks into your Directory, seek them out at meetings, and make them welcome! More than fellow members, make them friends!

**10/9/2018 ~ Margaret (Peggy) Carlson** ~ Referred by Ed Brown  
23648 Hillview Road ~ San Bernardino CA 92404  
909.804.8362 ~ carlsoncasinoparties@gmail.com

**10/15/2018 ~ Karim Toursarkissian** ~ Referred by Ed Brown  
40601 Normandy Road ~ Beaumont CA 92223  
909.363.5828 ~ DRT0125@me.com

**10/28/2018 ~ Wally Stevens** ~ Referred by KCSD  
2323 Maxon Street ~ Oceanside CA 92054  
760.521.7238 ~ no email

**11/18/2018 ~ Janice Austin** ~ Referred by Ed Brown  
11831 Peach Tree Circle ~ Yucaipa CA 92399  
909.855.2646 (H) ~ JCA.YUC@gmail.com

**11/18/2018 ~ Mike Trubs** ~ Referred by Ed Brown  
527 Tivoli Court ~ Hemet CA 92543  
714.363.2563 (H) ~ Trubs13mdo@gmail.com

**New Members:** Our Member Directory includes photos of members. If you won't be able to attend meetings for a while, please send me a selfie so you can at least be included in the April 2019 update, and we'll be able to recognize you when we do meet!

Email photos to Peggy at [peggymilfeld@inlandkoi.org](mailto:peggymilfeld@inlandkoi.org)

### Norco High School Pond Project

Most of you know that, over the last few months, IKS has partnered with the Norco High School to build a koi pond, with the students providing grunt work, members and suppliers donating materials, and last year's unused scholarship funds covering some incidentals.

On Thursday, January 10, Theo Zoetemelk, Tom Wright, Eric Triplett, Dianna Fales and Larry Leverett met at the Norco campus to go over the next phase of construction for the students.

The kids are doing the construction, with guidance from us on how to properly build their koi pond. In the past few months, they have been digging the pond — about 10' x 12' or 14' — and building four 55-gallon barrel filters, complete with up-flow and air-grid plumbing designed by Burt Ballou, with templates from Theo. Theo has been instructing the students on drilling holes and gluing PVC pipe.

At present, they are getting ready to install the bottom drain and skimmer, and to connect those two to an in ground vortex. They will also pour a concrete pad at the far end for the waterfall and barrel filters.

It is slow going, but part of the deal with the school is that the students do all of the work so they learn and we just guide them. We have some dealers and members donating some parts along with the club donation. The kids are as excited as their teacher was with the whole proposal, and the IKS members involved are enjoying the growing relationship with both.

We have documented all the steps and will be putting together a step-by-step guide for other clubs across the United States to use to help other high schools that want to build koi ponds.

~Larry Leverett

**Thanksgiving at the Malls...** is the traditional close to our year. We love the trek into the hills of Temecula, if only for the wonderful hospitality and beautiful setting we find there. Our hosts, **Jerry & Pat Mall**, go out of their way to make us welcome.

Our dining hall is the polished cement-floored, fully finished garage, set with linen-dressed tables and centerpieces on each, with seating for all 72 of us. There's even a table in the lower garage, and even the five resident cars are decked out in Fall colors. Jerry directs the "valet parking" venue, finding spaces for every vehicle along one of several drives, supervising and greeting everybody, usually from the comfort of his golf cart. He might even offer rides for the weak-kneed!

Presiding over the kitchen is Pat, while a couple of the early-arriving ladies help arrange our feast offerings on the counters in a logical progression for a buffet: plates and appetizers, then all the salads, sauces, veggies and miscellaneous other sides. The central island is reserved for main dishes — the bird and ham, dressings and gravy. The outside wall has a sink surrounded by more counters, with a window looking east over the valley below; there you dish up the mashed potatoes and yams and wish you had another plate! And there's not a tempting dessert in sight — unless, of course, you already know about the little utility room on the far side of the garage, where the long counter overflows with cakes and pies, cookies and other surprises. I think some in the know use it as a happy hour room, sneaking snacks before dinner is served!

Presiding over this meeting is the last act of the term for our President. **Linda Kushner** greeted everyone and excused tables for lunch once the kitchen was ready. It gets a little crowded while everyone is standing in line for the buffet, but the air is filled with friendly chatter. Some wisely waited at table until the line was reasonably shortened, and others used the time to turn in their renewal forms or continue exploring.

After lunch, Jerry talked a bit about the pond and property. There are 20 acres here and it's a lot of work to maintain it all. Besides the house and surrounds, there are 1800 avocado trees and 600 citrus. A few years ago Jerry replaced many trees with new improved strains; in one year he harvested 100,000 pounds of avocados. Something Jerry didn't share this time was the *Blizzard of 2014*: On December 30, 2014, a mini hurricane blew through the area, bringing eight inches of snow. They

were actually snowed-in until the third day! High winds tore the tops off eucalyptus and avocado trees, and it took five weeks to pick up the debris and clean up the trees. An area nearby had 18 inches!

The Malls started building their home in 2000, and moved in in 2004. The pond was started when the house was almost finished: the builder researched designs and filtration with Inland Koi, and then built it. It's a spray-on liner over concrete — 12,000 gallons, sparkling clear, with 30 koi; all but one are females and the largest is 30-35 pounds. Two of Jerry's koi have "disappeared" and he's seen a photo of them in someone else's pond; surprisingly perhaps, for whoever has them, they are gone "with my blessing."

There are two complete systems here, Nexus bead filters, UVs and more, in a beautiful pump room, and they work hard to keep up with the fish waste. Jerry used to feed his koi grow food for eight months, using 10 pounds of food a week, and then let them hibernate for four months. This year he weaned them off that heavy diet, feeding them "when I get around to it," not regularly. Whether or not it's the change in diet, this is the first year he didn't have to pull any of the fish to give them shots for one thing or another.

After lunch, **Nick** handled Elections, but it didn't take long; the ballot was approved almost unanimously. I do encourage any who can to find even a small way to serve the club. **Mac McClain** was also with us, bringing news from AKCA as our representative. He finally received the certificates of recognition for the 2018 Koi Person of the Year — **Spike Cover**, who was not present — and the Koi of the Year — an 18-inch *Doitsu Showa* belonging to **Peggy Milfeld**.

Last bits of business before the games included recognizing November and December birthdays, drawing names for the centerpieces, and a few announcements. Pat snuck off to the kitchen — I hope with helpers — and had leftovers packaged and empty dishes ready to go home. Such a lovely hostess! Finally...Larry and helpers set up the Koi Races track. In six heats, the six koi were urged on with enthusiasm, but the highlight came when **Deanna Fales** was the only backer on the winning fish, and she pocketed \$32!

So, 2018 is over for us, and we look forward to a new year. **Ed Kushner** will work over the holidays to fill next year's meeting calendar, and he'll be looking for hosts. If you're ready to have the club over, contact him or note your preferred month on your renewal form. And set aside Saturday, June 1, for our Koi Auction & Used Equipment Sale — we'll need lots of workers! With that...we'll see you in January at **Larry & Debby Leverett**'s... and if it rains, we'll gather in the garage again! ☺



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**REGARDING PAGE 7 ARTICLE: KHV TESTING**

K.O.I. asked one of our leading KHV researchers, Ling Jin, to write this white paper explaining KHV testing. It explains how to detect infection and what each test accomplishes. This is valuable information, and we want to get it into the hands of every koi hobbyist. ~Karen Pattist, K.O.I.

[For space, I have sacrificed the extensive list of REFERENCES and removed all internal references to them to make it easier to read. I will send the complete PDF file to anyone who requests it. ~Ed.]

*We've had a message from Spike Cover requesting some help:*

You know that KCSD's annual koi show is March 2-3 at the Del Mar Fair Grounds. Once again, that club has graciously offered K.O.I. display space to promote our organization. In the past I have manned the display myself and it's been fun.

However, I've got a bit of a health problem that MAY keep me from doing that this year. Right now it seems that I'll be able to attend and contingency plans won't need to be implemented. But, since this is a *big* show and they are always *so good* to offer us space, K.O.I. would certainly like to have a presence there.

So I'm wondering: if I can't make it, would any of you CKKs and/or KOI members be willing to help out? Here's what that would likely entail:

- Someone would need to pick up the display (not a lot of it) from me, take it to the show Saturday morning (March 2) and set it up. I live in Mission Viejo, right off the I-5 freeway near the I-5 and I-405 intersection. *And/or...*
- Take a turn monitoring the display. If we get four volunteers, each could do 3-4 hours Saturday or 2.5-3 hours Sunday. If we can get more than four volunteers, we could have multiple folks manning the display at the same time. *And/or...*
- Take the display down and bring the stuff back to me.
- I have all the "goodies" and can tell you what you'd need to do while monitoring the display. It wouldn't be difficult. Plus it's kinda fun!
- If you just want to transport and/or set up the display, that would also be helpful.

If you have the time and the inclination to help, please let me know. Again, I'll likely be able to do this myself and this is only a contingency plan, just in case I need to play "sickie" on those two days.

Thanks in advance,

Spike Cover ~ 949.855.2371 ~ [scover1@cox.net](mailto:scover1@cox.net)

**If you're not havin' FUN, you're not doin' it right!**

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Thank you to Dain Corrales of **NIJIKAWA USA** and Iva Gaglione of **ULTRA BALANCE** for so graciously supplying INLAND KOI SOCIETY with a nutritional food supply for the **KOI REHOMING PROGRAM**



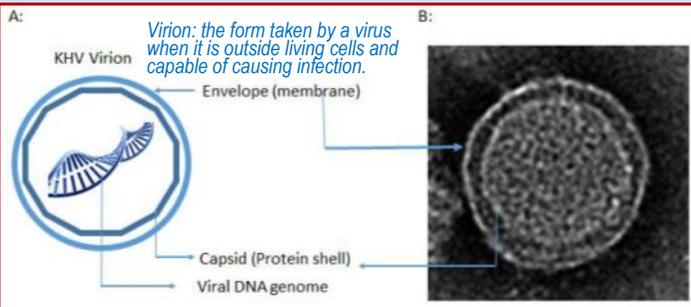
This mini-review on KHV latent infection is written for the koi hobbyist and koi breeders to better understanding of latent KHV infection diagnosis. Different diagnostic methods are described for screening KHV latent and active infections. ~ L.J / K.O.I.

**Introduction**

**Cyprinid herpesvirus 3 (CyHV-3)**, commonly known as koi herpesvirus (KHV), is a highly contagious pathogen of *Cyprinus carpio*, including common carp and koi. KHV belongs to *Cyprinivirus* genus from the *Alloherpesviridae* family in the order of *Herpesvirales*. KHV infection is characterized by white mottling of gills, gill hemorrhage, sunken eyes, and pale patches along with blisters on skin in koi. Fry are more susceptible to KHV and may have 70-100% mortality upon exposure.

**Similar to** other members of *Herpesviridae* within the order of *Herpesvirales*, KHV can also establish life-long latency in symptomatic or asymptomatic recovered koi. During latency, the KHV genome is the only component of the virion (Fig. 1) hidden in the latently infected cells, i.e., there is no capsid or envelope present in the cells.

**KHV latency** can often be reactivated under stress conditions, such as heat stress, poor water quality, shipping or injury. Infectious virions can be produced from KHV reactivation, which can cause disease and transmit to naïve fish. Outbreaks of KHV often occur in the spring and summer months when water temperatures rise suddenly, or during transportation. Latent infections can sometimes also be experimentally reactivated by raising tank water temperature by 1°C per day from 14°C to 23°C (or 57.2°F to 73.4°F). In general, koi with KHV latency can live healthy lives and may experience KHV reactivation without showing clinical signs. However, KHV carrier (latently infected) koi could die from KHV reactivation under certain stress conditions.



**Figure 1.** Structure of KHV virion.  
 A: Schematic of KHV virion, which consists of viral genome encapsidated by capsid and viral envelope (similar to cellular membrane).  
 B: Herpesvirus virion taken by Transmission Electron Microscope, which shows capsid & envelope. Viral genome is inside the capsid.

**Active and Latent KHV infection:**

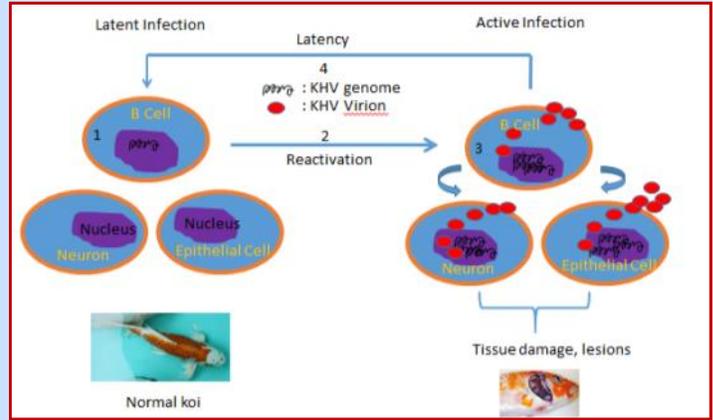
**Active KHV** infections occur when KHV virions are produced and cause damage to tissues (Fig. 2). Acute infections normally last 1-2 weeks. Following the acute infection, koi either survive or die. The survival rate of adult koi is higher than that of fry, which may have over 70% mortality. Some infected adult koi may show no signs of KHV infection. However, all exposed koi will become latently infected by KHV, no matter whether clinical signs are observed or not. The latently infected koi can live the same normal life as an un-infected koi and produce no KHV virions (Fig. 1). Koi with KHV latency are difficult to differentiate from KHV-free koi. During KHV latency, only the viral genome is maintained in the latently infected lymphocytes, which can be sampled from blood (Fig. 2). Upon exposure to KHV, koi also produce antibodies specific to KHV. The antibodies are normally detectable within 2-3 weeks to 12 months following initial infection.

**Detection of Active KHV infection:**

**PCR test:** Detection of KHV during active infection can be done by detecting the viral genome in the infected tissues. Many tissues, such

as gills, spleen, kidney and brain, are susceptible to KHV during acute infection, and can be used for KHV genome detection. During acute infection, viruses are shed in the skin and fecal materials, which can also be used for KHV diagnosis.

**Virus isolation:** Virus isolation is a traditional method used for detection of infectious virion in the infected fish. The best sample for virus isolation is the tissues showing lesions. This method takes several days to perform and is not commonly requested by clients or clinician.



**Figure 2.** Latency and Reactivation cycle of KHV infection in latently infected koi.

- 1: KHV genome resides in the B cell nucleus during latent infection.
- 2: Stressors, such as heat, injury and poor water quality, trigger KHV reactivation.
- 3: KHV virions (including viral genomes) are made during KHV reactivation and spread to permissive tissues, such as gills and brain, and cause tissue damages.
- 4: KHV infection is controlled by the host immune system; KHV resumes latency and hides in the B cells again.

**Detection of Latent KHV Infection:**

**PCR:** During latent infection, only the viral genome is present in some of the lymphocytes. To determine if a koi is a KHV carrier, white blood cells from the peripheral blood can be sampled and tested by PCR using KHV specific primers. Testing WBC for KHV latency is available at Oregon Veterinary Diagnostic Lab (OVDL) via special request.

**ELISA:** Latent infection can also be determined by detection of KHV specific antibodies using ELISA. If the koi has anti-KHV antibodies in the blood, it will strongly suggest the koi has been exposed to KHV and the koi is a carrier. The ELISA test for KHV is available at UC Davis.

**Serum Neutralization (SN assay):** Similar to ELISA, antibodies produced post-KHV infection can be tested against KHV in the tissue culture. If protection against KHV infection in KF-1 cells is found, it suggests anti-KHV antibodies are present in the blood and the koi is a carrier. The SN for KHV can be requested at UGA and OVDL. *Note:* KHV latent infections cannot be detected by PCR testing of gill snips, vent swabs or fecal examination unless the latent viral DNA has been reactivated and produces infective virions. Detection of the KHV genome in the gill snips, gill swabs or vent swabs suggests an active infection of KHV.

**Visible KHV:**



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AT A REASONABLE PRICE!

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2000 KOI on display from 3" to 30"

Specializing in hard to find varieties

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# K.O.I. News!

Koi Organisation International  
Current Accurate Useful



## What New Year's Resolutions should YOU be making as a Koi Keeper?

<https://koiorganisationinternational.org/koi-articles/koi-keepers-new-years-resolutions>

## Enter our Monthly Contests, win a MUG!



### New chance to win each month!

<http://koiorganisationinternational.org/fun-koi-contest>

If you don't have a K.O.I. Guide – GET ONE by becoming a Member.

<https://koiorganisationinternational.org/product/membership-koi-guide>

## K.O.I. funds KHV research at OSU

Better infection control at Koi Shows

## How can you help your KOI CLUB to be Successful?

The "Big Three" of a successful club:

- Learning about koi
- Socializing with other koi folks
- Minimizing conflict

Read the Article to Learn More:

<https://koiorganisationinternational.org/koi-articles/fixing-your-club>



## Let Your Club Know about K.O.I.

Give Your Club a Presentation on K.O.I.

Get a FREE Individual Membership

We will provide the presentation and tech help

For details, Contact: [pattist@snet.net](mailto:pattist@snet.net)

## On the KOI website



### KHV White Paper

by Dr. Ling Jin

<http://koiorganisationinternational.org/koi-articles/khv-testing>

## NEW Blog Posts! (Over 650 Available!)

[Humor? – You Just Don't Get It!](#)

[Vegetative Filters by Syd Mitchell](#)

[Research Study about Wild Carp](#)

[Azomite – a New Feed Additive](#)

[New Book – the Genetics of Color](#)

[A New Study about Carp Edema Virus \(CEV\)](#)



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- . FOR FRESH OR SALT WATER FISH



- . HIGH IN PROTEIN FOR RAPID GROWTH
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# KOI SHOW



**The KOI CLUB of SAN DIEGO**

**Invites You to Their  
32nd Annual Koi Show**

**March 2 & 3, 2019  
Del Mar Fairgrounds  
Activity Center**

**Exhibit Hours**

**Saturday: 9am - 4pm  
Sunday: 9am - 2pm**

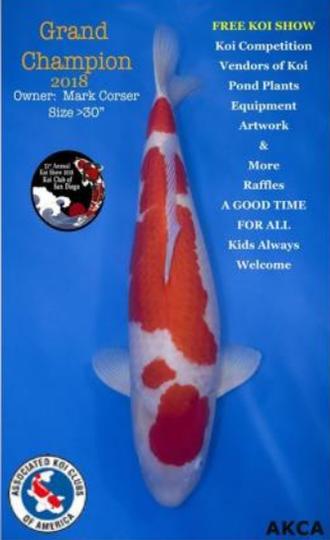
Show Chairman – Matt Rhoades  
show@koicsd.org

Entrant Chairman – Jack Chapman  
entrant@koicsd.org

Vendor Chairman – Greg Ruth  
vendor@koicsd.org

For more information on the show,  
please check out our website at  
[koiclubofsandiego.org](http://koiclubofsandiego.org)

**Grand Champion 2018**  
Owner: Mark Corser  
Size >30"



**FREE KOI SHOW**  
Koi Competition  
Vendors of Koi  
Pond Plants  
Equipment  
Artwork  
&  
More  
Raffles  
A GOOD TIME  
FOR ALL  
Kids Always  
Welcome

Major Sponsors of the KCSD 2019 Koi Show







**45th Annual Koi Show**  
**ZNA SoCal Chapter**

## Gardena Civic Center

March 16 – 17, 2019

Open To The Public | No Admission Fee

- Beautiful Fish
- Entertainment
- Koi & Pond Products
- Auction

Saturday 10am - 5 pm  
Entertainment | Koi Judging  
Awards Banquet

Sunday 10am - 3pm  
Judges' Commentaries  
Koi Auction 12:30 pm

For More Information:  
Alan Stein: [alandds@earthlink.net](mailto:alandds@earthlink.net)  
Chai Taevanitcharoen: [tatekoi@aol.com](mailto:tatekoi@aol.com)  
Or go to: [znasocal.org](http://znasocal.org)

Co Sponsored By:




Gardena Civic Center | 1700 West 162nd Street | Gardena, CA 90247

J A N	21	<b>Total Lunar Eclipse ~ Blood Moon / Starts about 10:36 pm EST Sunday, Jan. 20; total eclipse phase starts about 12:41 am Jan. 21. <i>Workday tomorrow!</i></b>
	14	<b>IKS AUCTION MEETING ~ 3pm / Hosted by Ed Kushner, 1556 Vandagriff Way, Corona 92883 ~ 951.520.0092</b>
	27	<b>IKS POTLUCK MEETING ~ 2-5pm / Hosts: Larry &amp; Debby Leverett, 5349 Jasper Lane, Riverside 92506 / Info, call Debby at 951.781.3887</b>
F E B	3	<b>Super Bowl LIII ~ at Atlanta, GA</b> 
	10	<b>IKS BOARD MEETING ~5pm / Host: Ed &amp; Louise Broomfield, 427 Lee Ave, Claremont / Interested members welcome, please call 909.519.7026</b>
	14	<b>Valentines Day</b> 
	18	<b>Presidents' Day</b> 
	24	<b>IKS POTLUCK MEETING ~ 2-5pm / Host: TBA</b>
M A R C H	1-2	<b>Pechanga Wine Festival &amp; Chocolate Decadence ~ Friday, 7-10pm; Saturday, 1-5pm / starting at \$35 / info &amp; tickets at <a href="http://www.pechanga.com/entertain">www.pechanga.com/entertain</a></b>
	2-3	<b>32nd KCSD Koi Show ~ Activity Center, Del Mar Show Grounds, San Diego / Saturday 9am-4pm; 5pm Awards Banquet / Sunday 9am-2pm / Free + parking</b>
	10	<b>IKS BOARD MEETING ~5pm / Hosts: Larry &amp; Debby Leverett, 5349 Jasper Lane, Riverside 92506 / Interested Members welcome, call 951.781.3887 ~ <i>Daylight Savings: spring forward!</i></b>
	16-17	<b>ZNA SoCal 45th Annual Koi Show ~ Gardena Civic Center / Saturday 10am-5pm, Banquet / Sunday 10am-3pm / Auction / Free; open to public. Info: <a href="mailto:alandds@earthlink.net">alandds@earthlink.net</a> or <a href="http://znasocal.org">znasocal.org</a></b>
A P R I L	24	<b>IKS POTLUCK MEETING ~ 2-5pm / Host: TBA</b>
	1	<b>April Fools' Day</b> 
	13-14	<b>Riverside Flower Show &amp; Garden Tour ~ Elks Club, 6166 Brockton Ave. / <u>Friday</u>: IKS <i>Set-up</i> 4pm; <u>Saturday</u>: Gardens 10am-4pm; Show 1-6pm / <u>Sunday</u>: Gardens &amp; Show 10am-4pm</b>
	6-7	<b>ZNA NorCal Show ~ Wyndham Garden San Jose-Silicon Valley Hotel / Info: <a href="http://nishikigoi.org/Events">nishikigoi.org/Events</a></b>
	7	<b>IKS BOARD MEETING ~5pm / Host: Brenda Aker</b>
21	<b>Easter Sunday</b> <i>Christ Is Risen</i>	
28	<b>IKS POTLUCK MEETING ~ 2-5pm / Hosts: TBA / <i>Voting for Koi of the Year &amp; Koi Person of the Year</i></b>	

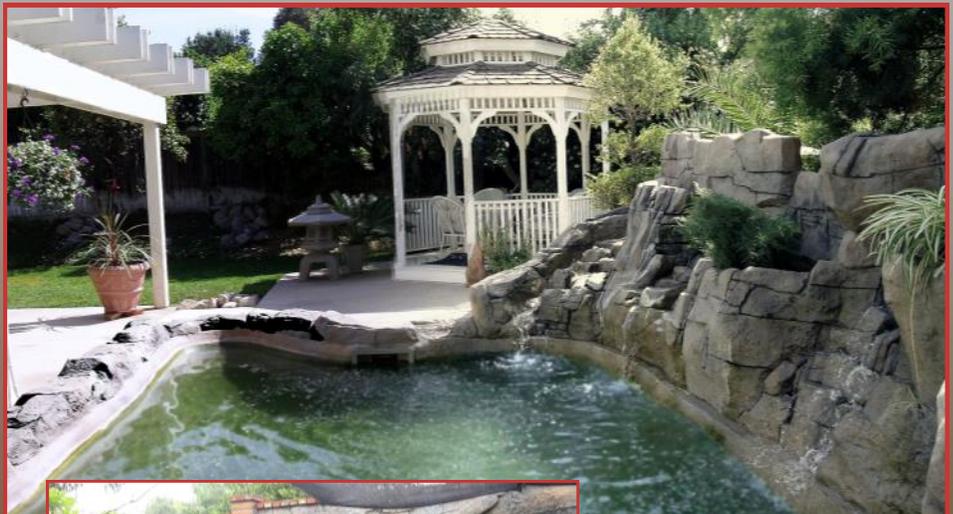


**INLAND KOI SOCIETY**  
5198 ARLINGTON AVE., #146  
RIVERSIDE, CA 92504

**Return Service Requested**



**Larry's other hobby ~ orchids**



**Left: Just inside the gate and to the left is the QT, built into the corner wall and shaded along with the orchid house....**

**Visit our website: [www.inlandkoi.org](http://www.inlandkoi.org)**