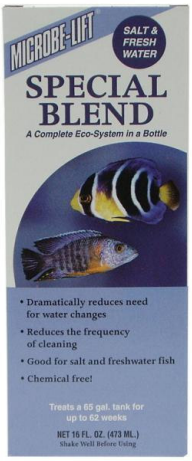
Testing
MICROBE-LIFT/Ammonia Remover
and
MICROBE-LIFT/Special Blend
in Ornamental Fish Transshipment

Our tests have shown that MICROBE-LIFT/AMMONIA REMOVER and MICROBE-LIFT/Special Blend far outperform a competitor's product and control bag without additives!



Introduction
Exporters and transshippers of ornamental fish have always faced several problems concerning fish health and well-being as fish are shipped around the globe in plastic bags charged with oxygen.

During transport, the water in these closed containers may become oxygen-depleted, and may accumulate excessive carbon dioxide and consequently undergo a reduction in pH. Metabolic activity may also lead to elevated ammonia levels in the water, which is damaging to fish health, or become lethal in extreme cases.

A densely-packed shipping container increases these risks but reduces the cost of transportation - a critical cost in the delivery of live stock at competitive prices. The shipper has to strike the ideal balance of conditions under which the fish can be shipped cost-effectively, without unnecessary risk of injury or mortality.

We have tested MICROBE-LIFT/Ammonia Remover's ability to reduce the ammonia level under transshipment conditions in comparison with other products. In our test, MICROBE-LIFT/Ammonia Remover and MICROBE-LIFT/Special Blend have shown significantly better performance than a competitor product (Product K) and the control bag without any additives.

MICROBE-LIFT/Ammonia Remover and MICROBE-LIFT/Special Blend
MICROBE-LIFT/Ammonia Remover contains a patented molecule ClorAm-X®, previously found in Product K which was commonly used amongst transshippers. MICROBE-LIFT/Ammonia Remover is able to detoxify ammonia, chlorine and chloramines from water for the use in all types of fish and aquatic invertebrate culture.

MICROBE-LIFT/Ammonia Remover can be used (1) when conditioning new water for aquariums, tanks, ponds, and live-haul containers, (2) after or during water additions, (3) before adding new plants, invertebrates, fishes or amphibians to an existing aquarium, tank, or pond, and (4) to live-haul containers, during transportation of live fishes, amphibians, or aquatic invertebrates, to control and eliminate ammonia in the shipping. MICROBE-LIFT/Ammonia Remover is safe for use in food fish.

MICROBE-LIFT/Special Blend contains a mix of proprietary bacterial strains that help to degrade organic waste, lowers ammonia levels and biologically reduces nitrates, hence reducing the need for water changes in aquariums. It allows new tanks to cycle immediately and is 100% chemical free and provides a complete eco-system in a bottle.

Test Setup
The test was conducted on 25 April 2009 using four bags each containing 55 unpurged Dwarf Gouramis (*Colisa lalia)* in approximately 1.8 liters of water prepared as follows:

- Bag #1: MICROBE-LIFT/Ammonia Remover; dosage 1 ml
- Bag #2: MICROBE-LIFT/Special Blend; dosage 1 ml
- Bag #3: Product K, dosage 1 ml
- Bag #4: No additives (Control)

The bags were kept for 48 hours after which water samples were taken and compared.

Preparation of test bags

Test results

Water quality

Water samples from test bags

Sample tanks with new water

In order to compare the water quality after 48 hours, a sample was taken from each bag (see pictures above). The sample from the control bag was very dark due to the feces of the unpurged fish. Fish activity in the bag was very limited. The water quality was similar in the bag where Product K was used.

In both bags where MICROBE-LIFT/Ammonia Remover and MICROBE-LIFT Special Blend were applied, the water was found to be clear with only little traces of feces. There was significantly more fish activity as compared to the control and Product K bag.

Fish activity

ML/SB sample

ML/AR sample

Product K sample

Control sample

After taking the water sample, the fish were put in water tanks with fresh water. The fish in the ML/AR and Special Blend tanks resumed normal activity quickly while the fish in the Product K bag required an additional eight hours to regain full activity. The fish in the control sample failed to fully reactivate. Most fishes remained on the surface gasping for air or remained at the bottom of the tank.

The fish were fed after 53 hours. The fish in the ML/AR and ML/SB group immediately started feeding while the Product K fishes started feeding 30 minutes later. The fish in the control bag did not feed.

After 72 hours the fishes were examined again. All the fishes in the control tank had dies while the fishes in the other tanks were active, showed no signs of stress and fed normally.

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Fish mortality (after 72 hrs)

Additive name	Mortality rate in % (# dead fish)
MICROBE-LIFT/Ammonia Remover	2% (1/55)
MICROBE-LIFT/Special Blend	0% (0/55)
Product K	7% (4/55)
Control (no additive)	100% (55/55)

The results of the fish mortality analysis indicate that the MICROBE-LIFT/Ammonia remover and MICROBE-LIFT/Special Blend products have significantly increased the survival rate of the fishes. In the Product bag, there was a mortality rate of 7% which is higher than that for the MICROBE-LIFT products but still lower than the rate of the control group.

Due to a malfunction of the ammonia measurement device, we were unable to accurately measure the ammonia levels. However the 100% mortality rate of the control group provides a clear indication that the fishes died from ammonia poisoning with ammonia levels above 3mg/L.

Both MICROBE-LIFT products were able to reduce the ammonia levels, thereby reducing fish stress and mortality rate to a minimum.

Summary

As evident from the test, water quality in the bags with MICROBE-LIFT/Ammonia Remover and MICROBE-LIFT/Special Blend was of a significantly higher quality, while water quality from Product K was similar to that of the control bag.

MICROBE-LIFT/ Ammonia Remover and MICROBE-LIFT/ Special Blend also allow higher fish activity and lower mortality, clearly indicating better performance than Product K.

Both MICROBE-LIFT products and Product K were able to reduce ammonia levels since all fish in the control sample died of ammonia poisoning. Another test using purged fish may be required to accurately test the ammonia level.

INTERESTED IN DOING YOUR OWN TEST?

WE ARE GLAD TO PROVIDE YOU WITH SAMPLES AND TECHNICAL SUPPORT.

PLEASE CONTACT US AT ECOLOGICAL ASIA.

WE ARE ALWAYS GLAD TO HEAR FROM YOU.

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