*(Continued from page 6)*

ternatively an even more accurate method may need to be used which relies on electronic monitoring of the curret at particular voltages and this technique can measure in the ppb (i.e., parts per billion .001ppm).

Why all this talk of accuracy of Calcium levels? It is fairly simple, if you are going to relate the depletion of calcium in the water to the growth rate of fry it needs to be know accurately. You do not know where the cut-off is for the fish being able to absorb calcium from the water. A bone calcium test may be the best way in the end. Admittedly this kills the fish, but at least you know what is happening in the tank at that time.

Secondly there is the consideration of controls. Two tanks do not have the same water chemistry even if they are filled with the same water to start with. This poses a problem because it would be unknown if the effect was water chemistry related or Calcium. Secondly there is the problem of sinks and sources, what if something was precipitating the calcium from the water. I would presume that many of the organic acids in solution would form insoluble precipitates with Ca. And there is also the problem of external sources of calcium, e.g., food, water for water changes etc.

I think that any scientist that tried to test this theory about Calcium levels would rapidly find themselves in difficult experimental water with a single rather shaky leg to stand on.

*Note 1:- Peter Hughes explains EDTA*

EDTA is a bit of a wonder reagent in biology. It stands for Ethylenediaminetetraacetic acid, you understand now why it is referred to as EDTA.

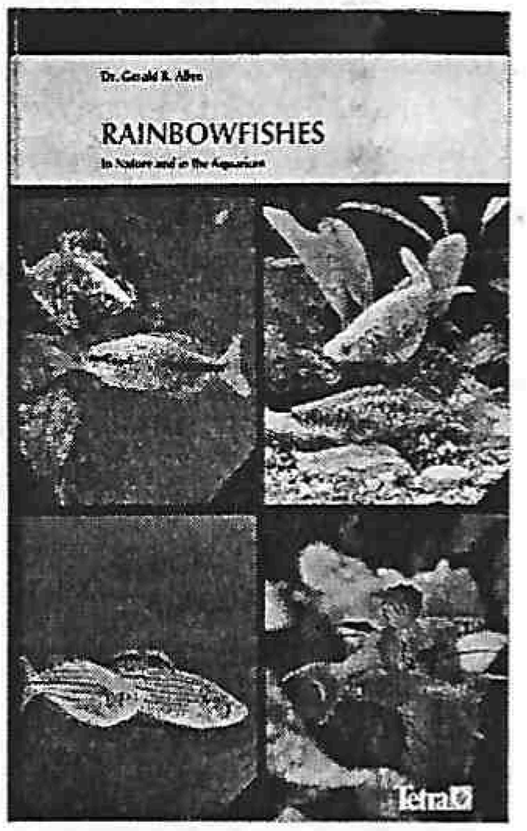
Basically it wraps di and tri valent metals up in a cage and prevents their rapid oxidation. All the iron fertilisers that are used in Aquariums use this chemical (or a couple of similar ones) to slow the oxidation of iron in water.

In a hardness test it is used to remove the Ca/Mg from a dye which changes colour when metals are bound and unbound. The indicator with Ca tests is eriochrome blackT and changes from Red to blue with the removal of the bound calcium. The amount of EDTA needed to change the colour is directly proportional to the concentration of Ca in the water, that is the colour does not change until all of the Ca is bound with EDTA.

(EDTA = chelated iron)

## RAINBOWFISHES - In nature and in the aquarium

*- review Bruce Hansen*




*"Rainbowfishes - In nature and in the Aquarium"* by Dr. Gerald R. Allen has just been published by Tetra. It is a hard cover book containing 180 pages with full colour photographs. Recommended retail price is $45.00

The long-awaited successor to Gerry Allen's previous book on this group has caught up on most of the many new discoveries, especially those from our mysterious near neighbour to the north.

This is intended to be, and succeeds as the definitive authority on Rainbowfishes by the world's acknowledged expert in this field. The information is comprehensive and easily read and is accompanied by numerous colour photos by the author and several of the best fish photographers known - including Günther Schmida, Neil Armstrong, Rudie Kuiter, Heiko Bleher and H.J. Richter. Most of these are new views and many are "action shots" showing behavioural characteristics that add much interest.

The first 40 pages cover the general aspects of such topics as evolution, classification, aquarium care, breeding and health. The fishes themselves are grouped into 3 sections - Rainbowfishes of Australia, Rainbowfishes of New Guinea, Blue-eyes of Australia and New Guinea. Each species is fully covered with distribution maps, general features, aquarium care, breeding, distribution and habitat, and conservation status provided together with a colour photo and in most cases a habitat shot.

For most of us here in Australia, many of the beautiful PNG species are likely to stay "dream subjects" unless the import restrictions change. However it is wonderful to finally see them all together under the one cover instead of in a mental collation from the various ANGFA Conferences and publications over the years. For this we thank you Gerry!

Although overall this is a top effort I'm sure Tetra need to be taken to task for the many errors they allowed, especially in the photo captions. Hopefully any reprints will not need a page and a half of corrections.