

# PRESS CLIPPING

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Knowing which fish have paired up reduces breeding costs, says Mr Kenny Yap (centre), managing director of Qian Hu, which has collaborated in the research with TLL. With him are Qian Hu division head Yap Kim Choon (left) and TLL lead researcher Alex Chang. ST PHOTO: ASHLEIGH SIM

## Discovery of arowanas' secrets boosts breeding

Molecular tools help uncover the breeding habits of expensive fish

By SHOBANA KESAVA

UNLIKE most of their scaly counterparts, Asian arowanas mate for life, local studies by ornamental fish farmers and scientists have found.

And when it comes to taking care of the brood, father knows best. The male carries the babies in its mouth for over six weeks before allowing them to swim free.

The secrets of the world's most expensive ornamental fish were uncovered using molecular tools at the Temasek Life Sciences Laboratory (TLL) and the fish of main-board-listed Qian Hu, during a five-year research project.

Their discoveries on breeding habits have led to a doubling in fish production.

"In the second year alone, it was a 50 per cent increase and each year since then, it's been a 20 to 30 per cent increase on the previous year's broods," said lead researcher at TLL, Mr Alex Chang.

Qian Hu managing director Kenny Yap said the group produces a third, or about 10,000 of the world's supply of this freshwater fish each year.

The studies were conducted on close to 230 adult fish which had their genetic fingerprints put under the microscope.

"Knowing which fish have paired up could reduce breeding costs, because we can bring smaller numbers of fish together in a single small pond," said Mr Yap. It can also guarantee customers who pay thousands of dollars for a fry complete information on the pedigree.

### Tracing the lineage and habits

■ DNA tests comparing fossils and present day arowana show the popular red and green arowana diverged from their prehistoric predecessors up to 30,000 years ago, when Kalimantan separated from the rest of its South-east Asian landmass.

■ The fish lack sexual dimorphism - they look the same whether male or female. They become fertile after three years and naturally spawn up to 80 marble-size eggs once a year. In-vitro fertilisation, using cryogenically frozen sperm and eggs harvested from the mother, could see many more fish produced.

■ They remain fertile for about 30 years

and generally mate for life.

■ Extremely protective, the father carries the brood in his mouth for 45 days till they are large enough to fend for themselves. The male fish starve during this time.

■ These top predators usually eat live amphibians, fish and insects. TLL and Qian Hu intend to optimise medicines and diet for these prized pets to increase their reproduction.

■ A five-month old, 15cm-long red Asian arowana, the most prized colour, can fetch sellers \$2,500. The largest known 40-year-old specimens reach 1m.

SHOBANA KESAVA

Traditional breeding methods have been hit-and-miss because farmers cannot tell one sex from another, let alone which fish have formed pairs. Breeding patterns are also hard to predict.

"Most are monogamous, with the odd few going astray or preferring complete celibacy, much like humans," said Mr Yap.

To achieve the most prized characteristics and increase the baby count, the next phase of the research will use "in-vitro" fertilisation. This will guarantee specific characteristics are carried by lineage.

"Within reason, we'll be able to give the buyers what they want - bigger fins, brighter colour, favoured shape of head," Mr Yap said. The company is investing another \$3 million over the next three years, on top of

the initial sum of \$1 million, to start a research centre in Sungei Tengah next year.

Mr Chang, Qian Hu's first formal scientific scholar, will head the facility, which will have 32 ponds. Two-thirds will be for breeding while a third will be for research.

Professor Peter Ng, director of the Tropical Marine Science Institute, said findings could change the conservation landscape for this species. "Of the red, green and silver arowana in the wild, the red is most endangered. There is a chance it is a separate species and if this is proven through the genetic tests, more must be done to protect them."

With Qian Hu's expected jump in arowana production, stocks in the wild could be replenished, said Mr Chang.

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