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INVESTIGATION
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OUTREACH
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Outreach

Development of Indonesia's Outlying Areas

UNEARTHING NATURE



Until recently, scientific research in Indonesia tended to be dominated by foreign practitioners. Increasingly, however, our scientists are making their mark studying and discovering the infinite variety of Indonesia's rich flora and fauna. Last December, herpetologist (amphibian specialist) Djoko Tjahjono Iskandar announced his discovery of a 'scientific anomaly' in the jungles of West Sulawesi—a species of frog (*Limnonectes larvaepartus*) which gives birth to tadpoles, instead of laying eggs. In West Papua, ichthyologist (fish expert) Kadarusman successfully proved that the rainbow fish (*Melanotaenia*) originated not from Australia, but Indonesia. Botanist Charlie Danny Heatubun in Manokwari, Papua, managed to save an almost extinct species of palm tree (*Areca unipa*). *Tempo English* reports on these three outstanding scientists.

PAPUA'S RAINBOW FISH

Since 2007, Kadarusman has discovered 15 species of *ikan pelangi* (rainbow fish) endemic to Papua, challenging the consensus view that the fish originated in Australia.

Mohammad Bimantoro scoops up a handful of water from a pond on Jalan Aria Putra in Pamulang regency, Banten. In his hands sit several fish, each about 10 centimeters long and with hologram scales reflecting stripes of red, orange, purple, green, blue or yellow. “These are rainbow fish, or *melanotaenia*,” the 43-year-old told *Tempo* three weeks ago.

Bimantoro—affectionately called Bobby—has been cultivating the ornamental fish since 1992. He harvests seven different species. “Within a month, I’m able to produce 10,000 fish,” he said, adding that demand came from markets in Singapore, Hong Kong, Europe and the US.

Bobby once believed the rainbow fish originated in Australia. “That’s what my supplier told me,” he explained. Only last November, while attending an event titled *Know, Love, Save and Conserve the Rainbow Fish of Papua* in Depok, West Java, did he realize the rainbow fish were native to Papua. The event was held by the Center for Research and Development of Ornamental Fish.

The center’s chief, Anjang Bangun Prasetyo, 40,



KADARUSMAN.

said he once shared a similar view. “We discovered the true origins of the rainbow fish from Kadarusman’s research,” he said.

The 36-year-old Kadarusman, who works at the Sorong Fishery Academy in West Papua, has discovered 15 new species of rainbow fish. One of the new species, *melanotaenia fasinensis*—which he discovered in the Fasin River in South Sorong—has coloring much like the reds and oranges of sunset.

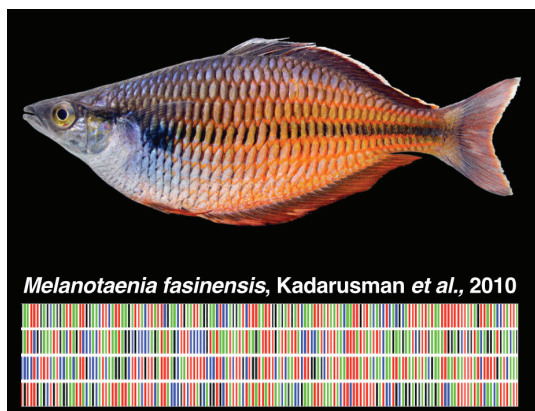
His 2011 discovery of *melanotaenia salawati*, which was detailed in an article published in the *Cybium*, an international journal of ichthyology, was also striking. The silver, neon-striped fish was found in the Doktor River at the western tip of the Salawati island, some 64 kilometers from Sorong.

Hailing from Gowa, South Sulawesi, Kadarusman’s fascination with fish began when observing his father sell *tembang* fish (*Brevoortia tyrannus*) to supplement their family income; Kadarusman was one of six children. “Imagine if he had owned a fish pond,” he remarked.

After graduating from Hasanuddin University in Makassar, South Sulawesi, Kadarusman entered the field of research. He was irked by the slew of foreigners publishing articles about the discovery of new species of plant and animal life in Indonesia that did not tell the whole story. “Like arowana,” he said, referring to a freshwater fish common in the rivers of Southeast Asia. “The world thinks this fish originates in Malaysia, not in Indonesia,” he said.

He now resides in West Papua, where experts estimate some 50 percent of Indonesia’s biodiversity is held. Unfortunately, he says, there are few local

DNA BARCODE OF PAPUAN RAINBOW FISH.



Melanotaenia fasinensis, Kadarusman et al., 2010

PAPUAN
RAINBOW FISH
IN AN AQUARIUM
AT DEPOK, WEST
JAVA.



researchers and academics working in the province. “I thought to myself, there’s got to be someone to start this.”

Initially, as a young scientist he was more interested in studying mangrove crabs. “The southern part of Papua, near Bintuni Bay, holds the world’s largest mangrove forest,” he explained. He sent over 100 emails to professors around the world, hoping to find a mentor. Only Laurent Pouyoud, a researcher at the Institute of Research for Development (IRD) in France, responded.

To correspond with Pouyoud, Kadarusman attached a modem atop a 10-meter pole to get a reliable Internet signal. “But even this method only works when it doesn’t rain,” he noted.

In early 2005, the two met in Jakarta. This meeting changed the course of both their lives. Laurent offered to help search for rainbow fish instead, which can be found in the waters of Papua, Papua New Guinea and Australia.

Though various studies suggested the fish originated in Australia, Kadarusman says such a claim was unproven. “They [researchers] simply look at their [the fish’s] outer appearances. Morphologically, for example, I resemble the Indonesian boxer Chris John. But genetically we’re different, because our parents aren’t the same,” he explained.

Kadarusman and Pouyoud agreed to research the origins of the rainbow fish while at the same time searching for new species. In 2006, they toured Europe to raise money for the endeavor. The French government, the IRD and several companies concerned with protecting biodiversity decided to help.

A year later the two launched ‘Expedition Rainbow’. As many as 20 researchers, technicians and representatives of institutions like the Maritime Affairs and Fisheries Ministry and West Papua’s Fishery Service came along. They explored every lake and river in West Papua, including those in Raja Ampat, South Sorong, Manokwari and the

Bintuni Bay. They boarded ferries, rowboats and even tramped on foot all day long.

In Salawati, Raja Ampat, the team experienced a stroke of bad luck. They had set off by river at 7pm, when the rainbow fish were asleep and easier to catch. Returning to camp, however, they got lost in the marsh, and suddenly dozens of young crocodiles began swimming toward them. Pouyoud, who is also an expert on crocodiles, told the team to start making loud noises. The tactic worked, and the team escaped unharmed.

The expedition ended at Kurumoi Lake in Teluk Bintuni regency. To get there, the team drove for two days and two nights before hiking for another day by foot. Kadarusman said members of the team fainted after supplies ran out, and in order to survive, the team was forced to eat honey and salt. “For hydration, we took water from the river,” he said.

At Kuromi Lake, the team was accused of conspiring to steal fish. Some years before, a helicopter full of foreigners had landed near the lake and left with scores of rainbow fish, locals said. Only after a lengthy explanation was the team permitted to take fish from the river to analyze.

All the hard work paid off, with the discovery of about six new species of rainbow fish that were later proven to be native to Papua. Afterwards, the team received funding for three future expeditions that would take them to the northern reaches of Cenderawasih Bay, Wondana Bay, Nabire, Yapen and Waropen.

In 2011, molecular testing proved the oldest melanotaenia originated in Kaimana, at the southern tip of West Papua. “It’s our theory. Probably, technological progress in the next 50 to 100 years will challenge [the theory],” he said. The fish can also be found in Australia, as the two nations were once one joined in a single landmass.

Kadarusman’s fame as a researcher is currently on the rise. He has received many awards since his expedition concluded, among them the 2011 Schutzenberger Award in science from the AFIDES Institute in Paris. Recently, in February, the Maritime Affairs and Fisheries Minister Susi Pudjiastuti awarded him the title of ‘Explorer and Discoverer of New Fish Species Endemic to Papua’.

The scope of Kadarusman’s research has since expanded to include all animal species native to Papua. Two expeditions, Lengguru I and Lengguru II, followed Expedition Rainbow, and led to the discovery of at least 50 new species of frogs, bats, birds and even spiders. The number of new rainbow fish species, meanwhile, stands at 15. “Hopefully, we’ll be able to carry out Lengguru III sometime in the next two years,” Kadarusman said.

■ SYARI FANI, BUNGA PADMA PUTRI