

Rasboras—Where do they come from?

With January's presentation "Rasboras: A Small Fish in A Big World", by Robert James Bradbury aka [Rob's Fish Tank](#), it could be useful for hobbyists interested in keeping these little fish to have a list of species and where they came from. It's a starting place for hobbyists to learn about the habitat and water chemistry these Southeast Asian fish need. The results of a query on Fishbase.org are shown in [Table 1](#). Approximately 60% of fish in the genera comprising the group of fishes commonly viewed as rasboras are less than four inches in length. Even the largest of the group is less than eight inches long, so many of these fish could be happy and healthy in a household aquarium.

There is a dearth of information from the scientists who described the species, but where recorded, the water hardness averages from 90 ppm to 180 ppm (min 35 ppm, max 268 ppm) and the pH averages between 6 and 7 (min 4.0, max 8.0). Some come from clear water, some from black water, some from swamps, some from lake banks, but they all come from areas where water plants or plant debris provide them cover and current provides them oxygenated water. Different species of these little zooplankton/insect eaters live in currents that vary from slow moving swamp water to tumbling mountain stream. Virtually all species live in the benthopelagic water column zone. Several species are from latitudes quite near the equator and therefore may need stable temperatures. Most rasbora are comfortable at temperatures between 22 °C and 26 °C.



Rasbora borapetensis (Wikipedia)



Boraras brigittae (Robert Bradbury?)

Most species have not been evaluated for conservation status, but of those evaluated very few are threatened or endangered. Loss of habitat, especially in the islands, to palm oil plantations, probably put many at risk. With only three or four exceptions, populations of rasbora are quite resilient, being able to double their numbers in 15 months. Human population pressure and natural disasters undoubtedly provide plenty of threats to survival for these fish (and everybody else on the planet).

With nearly a hundred species to choose from, between the genera *Rasbora*, *Microrasbora*, *Boraras*, *Trigonostigma*, *Trigonopoma*, hobbyists are sure to find something for their interest and skill level.

Table 1 Original habitat of species of the rasbora type of fishes

Year	Scientific Name	English Name	Distribution	Max. Length (cm)
1978	<i>Boraras brigittae</i>		Asia: southern Borneo, Indonesia . In schools.	3.5 TL
1904	<i>Boraras maculatus</i>	Dwarf Rasbora	Asia: Malay Peninsula to Sumatra, Indonesia benthopelagic; pH range: 5.0 – 6.0; Dh range: 5 – 12. Tropical; 24°C – 26°C. Inhabits quiet forest streams with slow-flowing acidic water. Feeds on worms and small crustaceans. One of the world's smallest cyprinid species.	2.5 SL
1991	<i>Boraras merah</i>		Asia: western and southern Borneo (Kalimantan in Indonesian)	2.0 SL
1993	<i>Boraras micros</i> (may/may not be considered rasbora)		Asia	1.3 SL
2011	<i>Boraras naevus</i> (may/may not be considered rasbora)		Asia: Thailand . Type locality, in a swampy area north of Surat Thani. The species is reported to have a wider distribution in the lower Tapi drainage, on the Gulf of Thailand slope of peninsular Thailand. It is suspected that most of its natural habitats (swamps) has been transformed into paddy fields. Additional populations, or another, similar species is known from the Andaman Sea slope of the Malay Peninsula near Trang. Pelagic. Etymology: <i>Boraras</i> : A name for a fish used in Borneo = "boraras merah"; <i>naevus</i> : From the Latin <i>naevus</i> , a spot, a mark on skin, a blemish, in allusion to the large sexually dichromatic blotch on the side of the body. A noun in apposition	1.3 SL
1991	<i>Boraras urophthalmoides</i>	Least Rasbora NEAR THREATENED	Asia. Lives in peats and bog wetlands. Occurs in marshes, swamps and ponds with dense growth of fine-leaved aquatic macrophytes. Does not seem to require large open areas. Probably browses on zooplankton in the vegetation. Never seen in markets, but known from the aquarium trade. Seldom seen in aquarium trade; used as aquarium bait in Ho Chi Minh City, Vietnam	4.0 TL

Year	Scientific Name	English Name	Distribution	Max. Length (cm)
1904	<i>Brevibora dorsiocellata</i> (<i>Rasbora dorsiocellata</i> not valid)	Eyespot Rasbora	Asia: Malay Peninsula and Indonesia ; benthopelagic; pH range: 6.0 – 6.5; Dh range: ? – 12. Tropical; 20°C – 25°C. Feeds on worms, crustaceans and insects	6.0 TL
1822	<i>Megarasbora elanga</i>	Bengala Barb	Asia: India, Bangladesh and Myanmar . Reported from Nepal and Pakistan. Found in the middle and lower reaches of rivers and ponds. Demersal.	
1913	<i>Metzia lineata</i> (<i>Rasborichthys altior</i> is invalid synonym)		Asia: Viet Nam, China and Taiwan . Introduced in other basins in China and spread to northern Laos	10.0 SL
2008	<i>Microrasbora microphthalmia</i>		Asia pH range: 6.8 - ?; depth range 0 - ? m (Ref. 75599). Tropical; 20°C - ?. Nanwan River in Yunnan, China . Occurs in small hill stream with sandy bottom and numerous cobblestones. Food items found in the intestines include zooplankton and phytoplankton. from the Greek micro (small), ophthalm from ophthalmos (eyes), in reference to its relative smaller eyes when compared to its congeners	2.6 SL
1918	<i>Microrasbora rubescens</i>	ENDANGERED	Asia Myanmar . Occurs in ponds, marshes, streams and pools.	3 SL
2000	<i>Rasbora amplistriga</i>		Asia: Mekong basin south of Khone Falls in Laos and Cambodia and coastal basins of south-eastern Thailand , Inhabits forest streams From the Latin amplus (broad, wide) and striga (stripe)	3.4 SL
2010	<i>Rasbora api</i>		Asia NW Sumatra, Indonesia <i>Rasbora trifasciata</i> -group	
1954	<i>Rasbora aprotaenia</i>		Asia northern Java	5.1 SL
1849	<i>Rasbora argyrotaenia</i>	Silver rasbora	Asia Mekong, Chao Phraya and Mae Khlong basins, Malay Peninsula to Borneo, Java and Sumatra in Indonesia ; pH range: 6.5 - 7.0; dH range: ? - 10. Tropical; 20°C - 26°C	12 TL
2010	<i>Rasbora armitagei</i>		Asia Sri Lanka	
2011	<i>Rasbora atranus</i>		Asia Borneo, Indonesia	
1987	<i>Rasbora atridorsalis</i>		Asia Mekong basin in Xishuangbanna (Yunnan) and in Laos	8.2 SL

Year	Scientific Name	English Name	Distribution	Max. Length (cm)
1885	Rasbora aurotaenia	Pale rasbora	Asia Chao Phraya and Mekong basins . Reported from MaeKlong River; Occur near the surface of ponds, canals and streams. Often found in turbid waters. Probably feed mostly on exogenous insects and also on some algae. Spawning sites are found in rivers and ponds	15 SL
1954	Rasbora baliensis		Asia Bali . Only fish species endemic to Bali; apparently endemic to Lake Bratan, a crater lake at 1231 m above sea level.	3.5 SL
1853	Rasbora bankanensis		Asia Malay Peninsula and Indonesia . Possibly a complex of several species. Inhabits forest streams. Restricted in peat, found in marginal areas	6 SL
1937	Rasbora beauforti	Spotlight rasbora	Asia Kumai river, Borneo (type locality)	2 TL
1934	Rasbora borapetensis	Blackline rasbora	Asia Freshwater; benthopelagic; pH range: 6.5 - 7.0; dH range: ? - 12. Tropical; 22°C - 26°C. Mekong, Chao Phraya and Mekong basins; also northern Malay Peninsula	6 SL
1860	Rasbora borneensis		Asia known only from southern and western Borneo . In Kapuas Lakes Area, Kalimantan Barat in Indonesia , it is only collected in the Kapuas mainstream and it is reported to enter lakes during the wet season	8 SL
1951	Rasbora bunguranensis		Asia Natuna Besar Islands (Bungaran), Indonesia	8 SL
1903	Rasbora caudimaculata	Greater scissortail	Asia Malaysia, Indonesia and the lower Mekong basin . Inhabits forest creeks, usually over sandy substrate (Ref. 56749). Occurs near the surface of streams. Not a common species, with apparently localized populations. Feeds mainly on exogenous insects. Rarely seen in markets, but common in the aquarium trade	17 SL
1849	Rasbora caverii	Cauvery rasbora	Asia India and Sri Lanka . Found in small lowland forest streams and pools, large rivers and some estuarine waters. Also found in mountain streams. Occurs sympatrically with <i>R. daniconius</i>	10 TL

Year	Scientific Name	English Name	Distribution	Max. Length (cm)
1852	Rasbora cephalotaenia		Asia Malay Peninsula (Singapore and Johore) and Indonesia. Inhabits large streams and rivers with black water	13 TL
1937	Rasbora chrysaenia	Goldstripe rasbora	Asia Malaysia and Indonesia. Freshwater; benthopelagic. Tropical; 22°C - 24°C.	3.5 TL
1822	Rasbora daniconius, Rasbora daniconius daniconius	Slender rasbora	Asia Mekong, Chao Phraya and Salween basins, northern Malay Peninsula, westwards to the Indus and Sri Lanka. Occurs in a variety of habitats: ditches, ponds, canals, haors, streams, rivers and inundated fields. Inhabits mainly sandy streams and rivers. Found in medium to large rivers and brooks of the middle Mekong. In the Mekong basin, this species is usually associated with large, slow flowing rivers, usually with turbid waters. Sometimes forms large schools. Feeds mainly on aquatic insects and detritus. A surface feeder. Spawning sites are found in rivers and ponds. Mature adults probably breed during the rainy season. Hardy and adaptable in the aquarium. Freshwater; brackish; benthopelagic; pH range: ? - 7.0; dH range: 12 - ?; potamodromous. Tropical; 24°C - 26°C	15 TL
2008	Rasbora dies		Asia Tarakan Island in Kalimantan Timur, Indonesia. benthopelagic.	3.6 SL
1987	Rasbora dorsinotata		Asia Chao Phraya and Mekong basins. benthopelagic	4.3 SL
1850	Rasbora dusonensis	Rosefin rasbora	Asia Mekong and Chao Phraya basins; Malay Peninsula, Borneo, Sumatra. Occurs in a variety of habitats, but seems to prefer large rivers with slow current. Common along shores in large rivers. Found at or near the surface in clear waters of rivers and streams. Generally prefers a depth of about 5 m. Feeds mainly on exogenous insects, some small crustaceans and algae. benthopelagic; pH range: 5.3 - 5.7; dH range: 2 - 3. Tropical; 23°C - 26°C .	12 SL

Year	Scientific Name	English Name	Distribution	Max. Length (cm)
1851	Rasbora einthovenii	Brilliant rasbora	Asia Malay Peninsula and Indonesia . Inhabits forest streams. Feeds on worms, crustaceans and insects. benthopelagic; pH range: 6.0 - 6.5; dH range: ? - 5. Tropical; 22°C - 26°C	9 TL
1903	Rasbora elegans	Twospot rasbora	Asia Malay Peninsula, Singapore, Borneo and Sumatra . Inhabits forest streams. benthopelagic; pH range: 6.0 - 6.5; dH range: ? - 10. Tropical; 22°C - 25°C.	20 SL
1989	Rasbora ennealepis	VULNERABLE	Asia western Borneo . benthopelagic	4.5 SL
1895	Rasbora everetti		Asia Philippines	
1928	Rasbora gerlachi		Africa. Cameroon (Ref. 2801). However this is a doubtful type-locality since the species is described from an aquarium specimen and the genus Rasbora is an otherwise exclusive Asian genus . pelagic. Tropical	
1984	Rasbora hobelmani	Kottelat rasbora	Asia: eastern Myanmar, northern Thailand and the Mekong basin . Found from midwater to surface in pools of small upland streams. Feed on insects. Spawning sites are found in rivers and ponds. Mature adults probably breed during the rainy season	6 SL
1895	Rasbora hosii		Asia Kalimantan Barat , Indonesia. Prefers small creeks with flowing water, often over stony substrate	
1954	Rasbora hubbsi		Asia Northern Borneo . Found in fast flowing areas or near riffles. benthopelagic; pH range: 6.5 - ? ; dH range: 10 - ?. Tropical; 24°C - 28°C	5 TL
1916	Rasbora jacobsoni		Asia central Sumatra	3.5 TL
1996	Rasbora johannae		Asia Kalimantan, Indonesia . Found in small high gradient forest streams with gravel to cobble bottoms and with very little or no emergent aquatic vegetation. Its most common co-inhabitants were the balitorid <i>Nemacheilus spiniferus</i> and the cyprinid <i>Puntius binotatus</i>	3.8 SL
1991	Rasbora kalbarensis	Kalbar rasbora	Asia western Borneo . Common in forest streams and clear black waters	2.5 SL

Year	Scientific Name	English Name	Distribution	Max. Length (cm)
1851	Rasbora kalochroma	Clown rasbora	Asia Malay Peninsula and Indonesia (Borneo and Sumatra) . benthopelagic; dH range: 10 - ?. Tropical; 25°C - 28°C	10 TL
2010	Rasbora kluetensis		Asia Sumatra, Indonesia . of the <i>Rasbora trifasciata</i> -group	
1913	Rasbora kobonensis		Asia India. Found in hill streams	14.7 TL
1995	Rasbora kottelati		Asia northwestern Borneo (Malaysia and Brunei Darussalam) . Occurs in lowland streams and swamps, with tannin-stained, brownish to black, acidic freshwater of pH 4.1- 6.1	7.0 SL
1935	Rasbora labiosa (invalid: R. daniconius labiosa)		Asia India . Benthopelagic. Lives in rivers and streams	8.5 TL
2009	Rasbora lacrimula		Asia Mahakam drainage in Kalimantan Timur, Borneo, Indonesia	
1854	Rasbora lateristriata	Yellow rasbora	Asia benthopelagic; pH range: 6.0 - 6.5; dH range: 10 - ?. Tropical; 22°C - 24°C Indonesia (Sumatra to Sumbawa) . A single specimen found in Malum River, Tawi-Tawi, Philippines Found in the basin-wide tributary of the lower Mekong	12 TL
1997	Rasbora laticlavia		Asia Kalimantan, Indonesia Inhabits small to moderate-sized streams with a good pool riffle structure with pebbly to sandy substrate with many fallen tree trunks	11.2 SL
1855	Rasbora leptosoma	Copperstripe rasbora	Asia Sumatra, Indonesia	9.4 TL
1951	Rasbora macrophthalma		Asia Malay Archipelago . benthopelagic	
1931	Rasbora meinkenii		Asia Malay Archipelago	3.9 SL
2010	Rasbora naggsi		Asia: Sri Lanka	
1954	Rasbora nematotaenia		Asia Indonesia	
2010	Rasbora nodulosa		Asia Sumatra, Indonesia	
2005	Rasbora notura		Asia Terengganu drainage in Malaysia	7.2 SL
2005	Rasbora ornata	VULNERABLE	Asia India .	

Year	Scientific Name	English Name	Distribution	Max. Length (cm)
2009	Rasbora patrickyapi		Asia Katingan and Kahayan river basins of central Kalimantan, Borneo, Indonesia. Found in shallow, slow-flowing swampy areas next to the flowing blackwater streams. Occurs in lowland peat swamps and degraded heath forest with a substrate made of a mixture of peat and silica sand. Named for Patrick Yap Boon Hiang, a freshwater fish enthusiast and exporter, who has generously donated fish materials for the author's research	5.7 SL
1935	Rasbora paucisqualis	Largescaled rasbora	Asia Mekong basin and Malaysia. Inhabit pools in clear, swift, forest streams. Spawning sites are found in rivers and ponds. Mature adults probably breed during the rainy season. Not seen in markets, rarely in the aquarium trade	4 SL
1885	Rasbora paviana	Sidestripe rasbora	Asia: Mekong, Chao Phraya and Meklong basins; also from northern Malay Peninsula. Associated with clear, usually shallow and moderately flowing streams (Ref. 27732). Occur near the surface in small to medium-sized streams in upland areas. Individuals from high-gradient upland streams have a much darker stripe and often black tips on the caudal fin lobes. Feed probably on exogenous insects. Spawning sites are found in rivers and ponds. Mature adults probably breed during the rainy season. Not seen in the markets, but occasionally imported in the aquarium trade	12 SL
1880	Rasbora philippina	Mindanao rasbora	Asia: Mindanao, Philippines	6.5 SL
1822	Rasbora rasbora	Gangetic scissortail rasbora	Asia: Pakistan, India, Bangladesh, Myanmar and Thailand. brackish; benthopelagic; pH range: 6.0 - 6.5; dH range: 10 - ?. Tropical; 20°C - 25°C	13 TL
1915	Rasbora reticulata		Asia	6 TL
1997	Rasbora rubrodorsalis		Asia: Mekong, Chao Phraya and Meklong basins. Inhabits slow flowing waters, ditches and shallow ponds	3.3 SL

Year	Scientific Name	English Name	Distribution	Max. Length (cm)
1916	Rasbora ruttieni		Asia: Borneo	4.3 SL
1951	Rasbora sarawakensis		Asia: Sarawak, Malaysia and Indonesia. Prefers moderately fast flowing waters in small forest streams	3.8 SL
1916	Rasbora semilineata		Asia: northern Borneo	3.7 SL
2000	Rasbora septentrionalis		Asia: Mekong basin in Laos and Yunnan. This is one of the northernmost ranging species of <i>Rasbora</i> . Reaches up to at least 5.7 cm SL <i>septentrionalis</i> : From the Latin septentrionalis (from northern areas)	5.7 SL
1954	Rasbora spilotaenia		Asia: Sumatra	7.8 SL
1927	Rasbora steineri	Chinese rasbora	Asia: Laos, Viet Nam and southeastern China. benthopelagic; pH range: 6.0 - 6.5; dH range: 10 - 15. Tropical; 22°C - 24°C	10 TL
1989	Rasbora subtilis		Asia: known only from Kapuas in western Borneo, Indonesia. In Kalimantan Lakes Area in Kalimantan Barat, Indonesia, it is common along lake shores and in shallow, open areas	4 TL
1852	Rasbora sumatrana		Asia benthopelagic. Tropical; 23°C – 25°C. Mekong, Chao Phraya and Mae Khlong basins, southeast Thailand, southwest Cambodia, Malay Peninsula, Sumatra and western Borneo. Inhabits streams and creeks with moderate to swift, relatively cold and well-oxygenated water. Lives in hill streams to lowland peats. Found in medium to large rivers and brooks of the middle Mekong. Occurs in running waters of lower Mekong	13 TL
1916	Rasbora tawarensis	VULNERABLE	Asia: Endemic to Lake Tawar, Aceh, Sumatra. Resilience: medium, population doubling time 1.4 - 4.4 years	12 TL
1924	Rasbora taytayensis		Asia: Taytay, Palawan, Philippines.	5 TL
1934	Rasbora tobana		Asia: Lake Toba, Sumatra, Indonesia	
1922	Rasbora tornieri	Yellowtail rasbora	Asia: Indochina, Malaysia and Indonesia. Occur in streams, canals and ditches in lowland floodplains. Usually found right at the water surface and is easily recognized by the broad black margin on the bright yellow caudal fin. Feed on exogenous insects. Spawning sites are found in	17 SL

Year	Scientific Name	English Name	Distribution	Max. Length (cm)
			rivers and ponds. Mature adults probably breed during the rainy season. Occasionally seen in fish markets. benthopelagic; non-migratory. Resilience: medium, population doubling time 1.4 - 4.4 years	
1905	Rasbora trifasciata		Asia: Borneo	5.9 SL
1870	Rasbora trilineata	Three-lined rasbora	Asia: Mekong and Chao Phraya basins; Malay Peninsula, Sumatra, Borneo. Spread around the world through the aquarium fish trade. Found in lakes, swamps, slow flowing areas of rivers, usually in open areas. Seems to prefer habitats in forest. A common resident of surface waters in streams, canals, ditches and occasionally of reservoirs in lowland areas. Inhabits medium to large rivers, flooded fields and brooks of the middle Mekong. Feeds mostly on exogenous insects, also takes worms and crustaceans. Not seen in markets, but popular in aquarium trade. benthopelagic; pH range: 6.0 - 8.0; dH range: 5 - 12. Tropical; 23°C - 25°C	13 TL
2010	Rasbora truncata		Asia: Sumatra, Indonesia.	
1954	Rasbora tubbi		Asia: northern Borneo	10.3 SL
1995	Rasbora tuberculata		Asia: Indonesia and Malaysia. Inhabits clear, slow to swift water in a small creek in a hilly area, flowing through a succession of riffles over large boulders and deeper pools	2.7 SL
2013	Rasbora vietnamensis		Asia: Phu Quoc Island, Vietnam. Inhabits lower reaches of rivers, streams with strong current in mountain areas, lakes, and ponds	3.9 TL
1905	Rasbora volzii		Asia: Sarawak, Malaysia and Western Borneo, Indonesia.	12.6 TL
1999	Rasbora vulcanus		Asia: Indonesia.	
1904	Rasbora vulgaris		Asia.	
1991	Rasbora wilpita	Wilpita rasbora ENDANGERED	Asia: known only from Wilpita, Sri Lanka. Inhabits shallow, slow-flowing, heavily shaded streams.	7.2 SL
1856	Rasborichthys helfrichii		Asia: Sumatra and Borneo.. Found in lakes, rivers and streams. Freshwater; demersal. Tropical	9.4 SL

Year	Scientific Name	English Name	Distribution	Max. Length (cm)
1930	Rasboroides vaterifloris	Pearly rasbora LOWER RISK: CONSERVATION DEPENDENT	Asia: found only in the middle catchment area of Kalu to Nilwala basins, Sri Lanka . Occurs in shallow, cool, clear, quiet, heavily shaded forest streams, usually with a silty substrate and often in areas with a large amount of leaf debris in the water. Feeds on terrestrial insects (Diptera and Coleoptera) and detritus. Males slimmer and brightly colored than females. benthopelagic; pH range: 6.0 - 6.0; dH range: 5 - 8. Tropical; 25°C - 29°C	
1930	Rasboroides vaterifloris	Pearly rasbora	Asia found only in the middle catchment area of Kalu to Nilwala basins, Sri Lanka . Occurs in shallow, cool, clear, quiet, heavily shaded forest streams, usually with a silty substrate and often in areas with a large amount of leaf debris in the water. Feeds on terrestrial insects (Diptera and Coleoptera, see Ref. 6469) and detritus. Males slimmer and brightly colored than females	4 TL
1987	Rasbosoma spilocerca	Dwarf Scissortail rasbora	Asia: Mekong basin . Occurs near the surface in shallow marshes, swamps and inundated field. Inhabits swamps with clear water. Usually found in shallow layers of open water above beds of fine-leaved aquatic macrophytes and submerged grasses. Feeds on zooplankton and some insects. Probably too small to be marketed. Rarely seen in the aquarium trade	2.6 SL
1991	Trigonopoma gracile		Asia: Indonesia and Malaysia . Common in forest streams and clear black water. Benthopelagic; pH range: 6.5 – 7.0; Dh range: 10 - ?. Tropical; 22°C – 24°C	5.5 SL

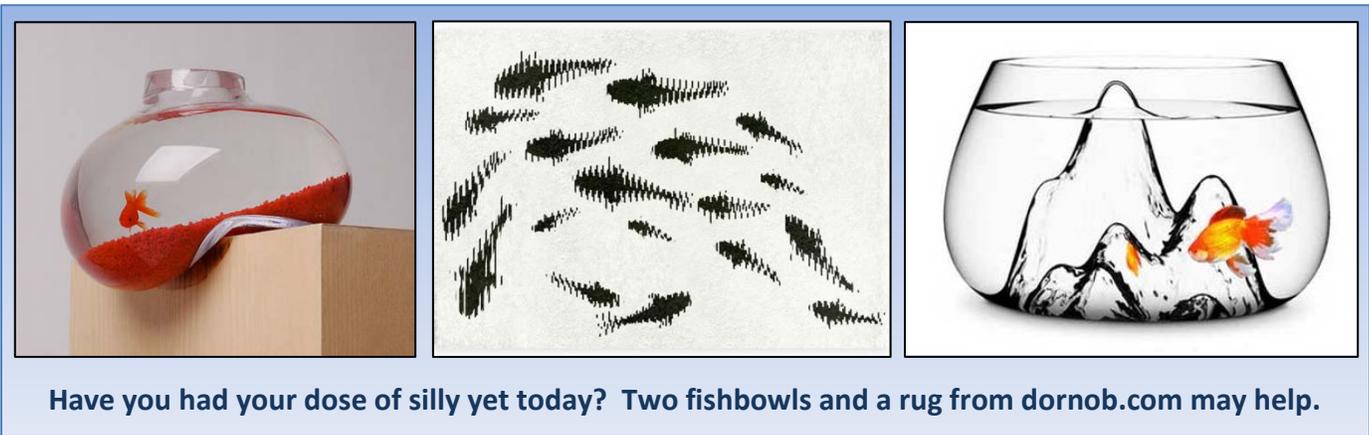
Year	Scientific Name	English Name	Distribution	Max. Length (cm)
1916	<i>Trigonopoma pauciperforatum</i>	Redstripe Rasbora	Asia: Thailand, Cambodia, Malay Peninsula to Indonesia . benthopelagic; pH range: 5.0 – 6.0; dH range: 5 – 12. Tropical; 23°C – 25°C. Found in peats and secondary peat forest streams. Common in forest streams and clear black waters. Occurs at midwater levels to surface in shallow sluggish and standing waters, marshes and swamps, usually under forest canopies. Appears to prefer soft acidic water that is often tannin-stained. Found in small openings of generally dense vegetation. Feeds on zooplankton and some insects. Not seen in markets, but popular in aquarium trade	7.0 TL
1967	<i>Trigonostigma espei</i> (Rasbora espei not valid)	Lambchop Rasbora	Asia: Thailand and Cambodia . Occurs in ponds, pools, marshes and swamps with heavy growth of submerged aquatic plants. benthopelagic; pH range: 6.0 - 6.5; dH range: ? - 12. Tropical; 23°C - 28°C	2.5 SL
1956	<i>Trigonostigma hengeli</i>	Glowlight Rasbora	Asia: Sumatra and Borneo, Indonesia . Benthopelagic; Ph range: 6.0 – 6.0; Dh range: 5 – 12. Tropical; 23°C – 28°C	3.0 SL
1904	<i>Trigonostigma heteromorpha</i>	Harlequin Rasbora	Asia: Thailand (Narathiwat southwards) to Sumatra, Indonesia . Inhabits forest streams. Found in primary peat swamps in larger than 100 fish. Feeds on worms, crustaceans and insects. Eggs spawned at the underside of broad leaves and similar structures. Aquarium keeping: in groups of 5 or more individuals; minimum aquarium size 60 cm. Previously known as “Rasbora” but revised as separated genus by Kottelat & Witte (1999) . benthopelagic; Ph range: 5.0 – 7.0; Dh range: 5 – 12. Tropical; 22°C – 25°C	5.0 SL
1958	<i>Trigonostigma somphongsi</i>	CRITICALLY ENDANGERED	Asia: Mae Khlong basin, Thailand . Benthopelagic; pH range: 6.0 – 6.5; dH range: 8 - ?. Tropical; 22°C – 26°C . Etymology: <i>Trigonostigma</i> : Greek, tres, tria = three + Greek, gonias= angle, corner + Greek stigma = signal	10.5 TL

Rasbora are native to Southeast Asia, with some species coming from India and China as well. The map below, from www.nationsonline.org, shows the country and city names of SE Asia today. (Dash line added by COAST)



Figure 1 Modern day political boundaries of Southeast Asia and India.
Most rasbora come from Laos, Thailand, Cambodia, Malaysia, and Indonesia.

The second map ([Figure 2](#)), from the [Field Museum](#), shows where the land-sea boundaries were when water level was 120 meters lower than today, which was present about 6% of the time during the last 250,000 years.



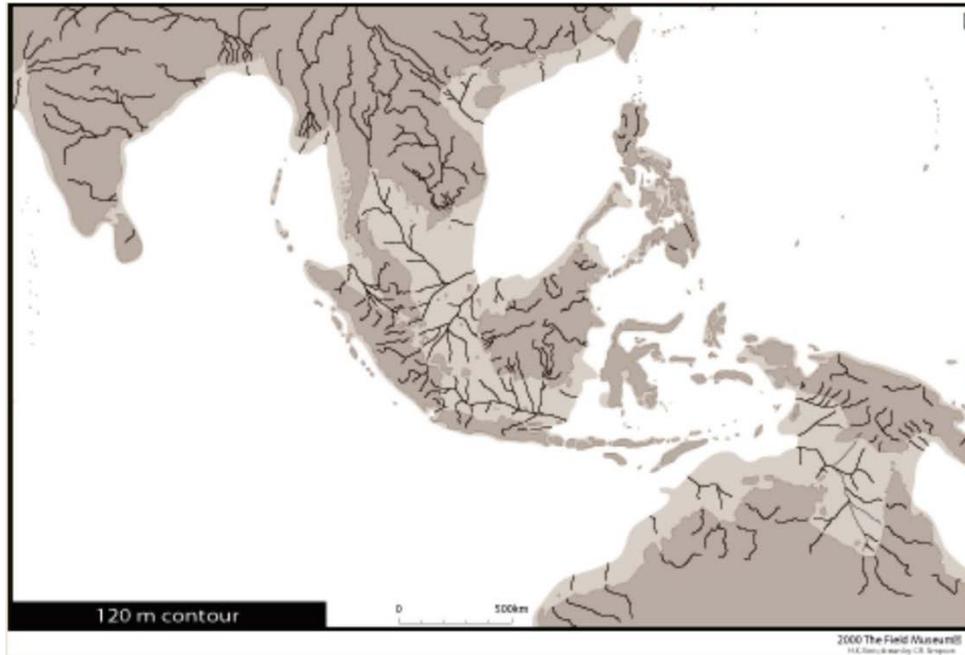


Figure 2. Land area (light grey) exposed with the water level 120 meter below current level. Water level was 120 meters lower for brief periods from 17,000 to 250,000 years ago, forming a rich network of rivers and forests between what are islands in Southeast Asia today. ([Field Museum](#))

For 54% to 80% of the last 17,000 and 250,000 years respectively, the ocean level has been about 20 meters below today’s level, as shown in [Figure 3](#).

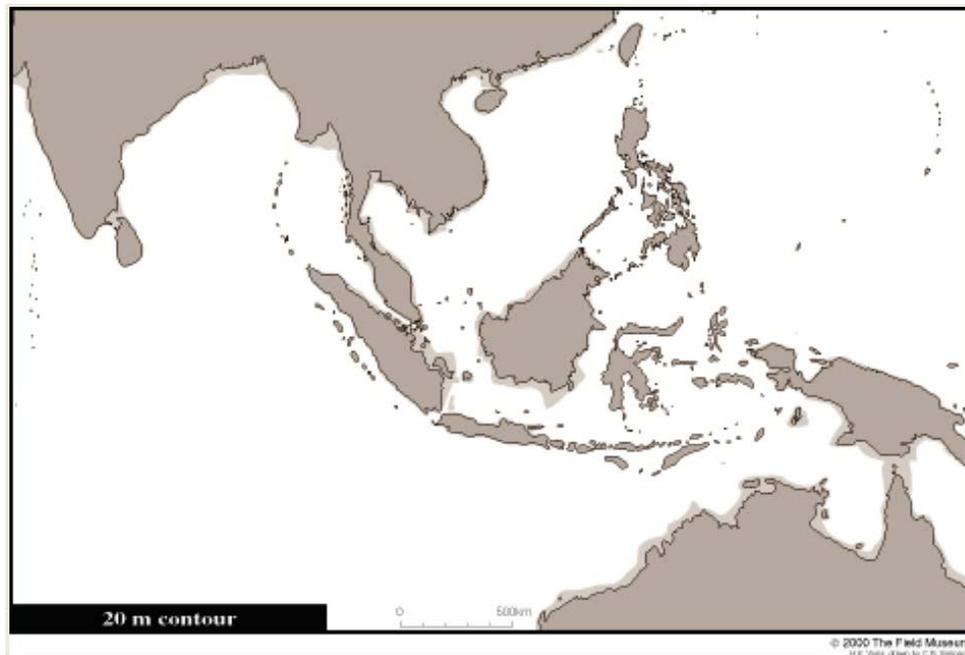


Figure 3. Land area (light grey) exposed with the water level 20 meter below current level. Water level was 20 meters lower than now for the majority of the time from 17,000 to 250,000 years ago, showing land area has been fairly stable for the last quarter million years and has remained similar to the boundaries of islands in Southeast Asia today. ([Field Museum](#))

Water quality of California cities—Anaheim

City: ANAHEIM						
Report: 2011						
Samples: 2010						
Chemical	MCL (Max Contaminant Level)	Health Goal	Ground-water Average	Water District Average	Range of Detections	Typical Source of Contaminant
Radionuclides						
Alpha Radiation (pCi/L)	15	0	8.9	5.6	3.8-13	Erosion of Natural Deposits
Uranium (pCi/L)	20	0.43	8.4	3.3	2.9-12	Erosion of Natural Deposits
Aluminum (ppm)	1	0.6	Not Detect-ible (ND)	0.17	ND – 0.34	Water Treatment Chemical
Arsenic (ppb)	10	0.004	<2	2.3	ND – 3.2	Erosion of Natural Deposits
Barium (ppm)	1	2	ND	0.11	ND – 0.14	Erosion of Natural Deposits
Fluoride (ppm)	2	1	0.43	0.8	0.25 – 1.0	Erosion of Natural Deposits
Nitrate as NO3 (ppm)	45	45	13	ND	4.1 – 22	Fertilizers, Septic Tanks
Nitrate+Nitrite as N (ppm)	10	10	3.0	ND	0.9 – 5.0	Fertilizers, Septic Tanks
Chloride (ppm)	500	n/a	83	93	33 – 117	Erosion of Natural Deposits
Specific Conductance (µmho/cm)	1,600	n/a	896	970	460 – 1100	Erosion of Natural Deposits
Sulfate (ppm)	500	n/a	139	230	76 – 270	Erosion of Natural Deposits
Total Dissolved Solids (ppm)	1,000	n/a	550	590	354 – 680	Erosion of Natural Deposits
Bicarbonate (as HCO3) (ppm)	Not Regu-lated (NR)	n/a	231	n/a	160 – 265	Erosion of Natural Deposits
Calcium (ppm)	NR	n/a	98	66	51 – 113	Erosion of Natural Deposits
Magnesium (ppm)	NR	n/a	18	27	13 - 28	Erosion of Natural Deposits
pH (pH units)	NR	n/a	7.9	7.9	7.4 - 8.1	Erosion of Natural Deposits
Sodium (ppm)	NR	n/a	66	95	39 - 100	Erosion of Natural Deposits
Total Alkalinity (ppm as CaCO3)	NR	n/a	190	110	67 – 217	Erosion of Natural Deposits
Total Hardness (grains/gal)	NR	n/a	19	16	5.4 – 22	Erosion of Natural Deposits
Total Hardness (ppm as CaCO3)	NR	n/a	322	270	92 – 373	Erosion of Natural Deposits
Total Organic Carbon (ppm)	NR	n/a	0.41	2.2	ND – 2.4	Natural, Man-made Sources
Disinfection Byproducts						
	MCL			Average Amount	Range of Detections	Typical Source of Contaminant
Total Trihalomethanes (ppb)	80			27	1.2 – 78	Byproducts of Chlorine Disinfection
Haloacetic Acids (ppb)	60			8.7	ND – 24	Byproducts of Chlorine Disinfection
Chlorine Residual (ppm)	(4 / 4)			1.0	0.1 – 2.7	Disinfectant Added for Treatment
Lead, Copper at Residential Taps						
	Action Level (AL)	Health Goal		90th Percentile Value	Sites Ex-ceeding AL/ No. of Sites	Typical Source of Contaminant
Lead (ppb)	15	0.2		ND<5	0 / 57	Corrosion of Household Plumbing
Copper (ppm)	1.3	0.3		0.23	0 / 57	Corrosion of Household Plumbing

The plan is to feature data from water quality reports of various SoCal cities each month. Anaheim leads it off.

Two views about “Carnivorous Fish Attack”

MEDIA VIEW

Published: Dec 27, 2013, 9:16 AM EST Associated Press

BUENOS AIRES, Argentina — An attack by a school of carnivorous fish has injured 70 people bathing in an Argentine river, including seven children who lost parts of their fingers or toes.

Director of lifeguards Federico Cornier ... blamed the attack on palometas, "a type of piranha, big, voracious and with sharp teeth that can really bite."

Paramedic Alberto Manino said some children he treated lost entire digits. He told the Todo Noticias channel that city beaches were closed, but it was so hot that **within a half-hour, many people went back to the water.**



A man is treated after he was bit by a palometa, a type of piranha, while wading in the Parana River in Rosario, Argentina, Wednesday, Dec. 25, 2013. (AP Photo/La Capital, Silvina Salinas)

<http://www.weather.com/news/science/nature/argentina-70-injured-carnivorous-fish-attack-20131226>

ICHTHYOLOGIST'S VIEW

From LSU Ichthyology <http://lsuichthyology.blogspot.com/2013/12/piranha-frenzy-or-just-media-frenzy.html> : Friday, December 27, 2013

Piranha Frenzy or just Media Frenzy?

Piranhas did not "attack" 70+ people in Argentina on Christmas day in a feeding frenzy (**see update below**); the only frenzy here is the news media's desire to report this story (ABC, Fox, Discovery, BBC, etc. have all reported it). From what I can gather, several people, one a young girl, were bitten in the Parana River near Rosario,

Argentina. Some people may have lost parts of (and perhaps entire) digits according to some of the reports. The Parana River does have piranhas but none at the scene said it was piranhas, but rather 'palometas.' Piranhas in a feeding frenzy can consume animals as large as humans in seconds, but they are very picky about their food source and reports of human attacks are few ([see paper here](#))*. Most people who lose a finger to a piranha have lost it after mishandling it on a hook or in a net out of the water. Piranhas in a frenzy will take off more than your finger tip. Several news agencies report the fishes are "palometas" and show images or mention a common species of jack; however, all jacks are marine so they wouldn't be in the freshwaters of the Parana River. *Pygocentrus palometa* was described as a Venezuelan piranha species that is likely not a valid species (see [Catalog of Fishes](#)), and not known from Argentina. My guess is a few people were bitten by other biting tetras common to the area (*Hoplias?*); these bites may have scared lots of other people out of the water.

[UPDATE: I do think these were piranha bites now, having talked to some fellow ichthyologists. These were probably defensive bites from one of the local species they call palometas - *Serrasalmus maculatus*, *S. spilopleura*, or *Pygocentrus nattereri*]

Given the high temperatures of the day perhaps more people were bathing than usual and if the area is dammed, as much of the Parana is, the fish may have felt trapped, especially if breeding. These fishes were likely biting as a defense from the many people in the crowded water. If piranhas want to eat something, they will do so quite thoroughly, they won't peck. They will bite to protect themselves and that is not what I would call an "attack."

How this became an international media story is another mystery, but the name of the river likely caused some to guess that piranhas were the culprits. That, and some good pics of people with bloody toes.

Unfortunately, it does sound like some people were hurt, I hope they recover quickly. However, the news media should be accountable for the many errors in this sensationalized story.

Posted at 3:11 PM by Prosanta Chakrabarty, Assistant Professor/Curator of Fishes at Louisiana State University Museum of Natural Science

*"These predaceous fishes, however, do occasionally injure bathers and swimmers in lakes and rivers. The characteristic profile of most injuries is a single bite per victim, generally related to the fish defending its brood."

Piranha Attacks on Humans in Southeast Brazil: Epidemiology, Natural History, and Clinical Treatment, With Description of a Bite Outbreak, by Vidal Haddad, Ivan Sazima, from *Wilderness & Environmental Medicine* - December 2003 (Vol. 14, Issue 4, Pages 249-254, DOI: 10.1580/1080-6032(2003)14[249:PAOHIS]2.0.CO;2)

Causes of Hemorrhaging in Fins and Skin

Whenever I see patches of blood on the body or in the fins of fish, I automatically think "disease or parasite". Or more specifically, hard to treat and contagious disease or parasite. And there are several such things that can cause visible hemorrhaging:

- Monogeneans are parasitic flatworms or flukes
 - These parasites have a direct life cycle that infest the external surfaces of almost any species. Severe infections can cause erratic swimming behavior, "flashing," increased respiratory activity, scattered hemorrhages with epithelial ulceration, and frayed fins.

- Systemic, Gram-positive, rapidly growing bacteria
 - The most common bacteria in this group that cause disease in fish are *Streptococcus* spp.; other Gram-positive genera that are closely related to *Streptococcus* and cause disease in fish include *Lactococcus*, *Enterococcus*, and *Vagococcus*. Clinical signs are similar to those involving systemic Gram-negative infections such as skin discolorations, exophthalmos, ascites, skin ulcerations, and hemorrhages (Barker, 2001; Yanong and Francis-Floyd, 2006).
- Saprolegniasis
 - Fish infected with saprolegniasis will have fluffy, cottony lesions distributed in tufts that are initially superficial and appear white, tan, or gray in color. Extensive superficial infections and deep focal infections can cause loss of osmoregulation via necrosis and hemorrhage of the skin, leading to death in the severely affected fish.
- *Streptococcus iniae*
 - *Streptococcus iniae* is a zoonotic pathogen of fish that causes serious clinical disease in humans. This bacteria is a Gram-positive, nonmotile cocci that causes clinical signs of abdominal distention, petechial hemorrhage of the dermis, exophthalmia, and death in freshwater and marine species of fish (Perera et al., 1994; Eldar et al., 1995; Perl et al., 1999).
- KHV herpes virus
 - The skin can also be affected with ulcerations, hemorrhages, sloughing of scales, and increased or decreased mucus production
- Spring viremia of carp (SVC)
 - Clinical signs include lethargy, loss of equilibrium, swimming at the surface or edge of ponds, darkening and hemorrhages of the skin
- Viral Hemorrhagic Septicemia VHS
 - In the acute phase, there is high mortality; fish are dark and lethargic, with hemorrhages and erythema of the fins.
- Ulcer-forming and systemic infections caused by Gram-negative bacteria
 - This is the most common group of bacterial pathogens that affect fish and includes bacteria in the genera *Aeromonas*, *Vibrio*, *Edwardsiella*, *Pseudomonas*, *Flavobacterium*, and others (Noga, 1996; Barker, 2001; Palmeiro and Roberts, 2009). Clinical signs of ulcer-forming and systemic infections caused by Gram-negative bacteria include the following: lethargy, anorexia, abnormal swimming patterns/spinning, hemorrhagic lesions on the skin, ulcerative skin lesions, abdominal distension/ascites, abnormal position in the water column, exophthalmia (“pop eye”), gill necrosis, and mortality (Noga, 1996; Barker, 2001; Palmeiro and Roberts, 2009).
- Motile aeromonad septicemia (MAS)
 - Motile aeromonads are the most common bacterial pathogens of fish and may result in a syndrome called MAS. MAS is most commonly caused by ubiquitous aquatic bacteria of the *A. hydrophila* complex, including *A. hydrophila*, *Aeromonas sobria*, and *Aeromonas caviae*. *A. hydrophila* is the most common isolate and is more commonly isolated from freshwater fish than from marine fish. MAS is almost always secondary to an underlying stressor. Common clinical

signs include cutaneous hemorrhages and ulcers, visceral hemorrhages, edema, dropsy/ascites, and exophthalmia (Noga, 1996; Barker, 2001; Palmeiro and Roberts, 2009).

(Did you remember when reading this list that almost no research has been done on tropical aquarium fish?)

However, the cause of hemorrhaging may be something much simpler to correct, although harder to isolate as a cause: malnutrition. A deficiency in any of the following nutrients can result in bloody fins or skin:

Vitamin	Reqt/kg food	Sign of deficiency
A	4000 IU	Skin depigmentation, exophthalmia, twisted opercula, hemorrhagic fins and skin
Thiamine	0.5 mg	Nervousness, skin depigmentation, subcutaneous hemorrhage
Riboflavin	7 mg	Emaciation, photophobia, nervousness, hemorrhagic fins and skin, kidney necrosis
Niacin	Required	Skin hemorrhage, mortality
Pantothenic acid	30 mg	Poor growth, lethargy, exophthalmia, skin hemorrhage

The requirement per kilogram of food comes from studies of koi, which typically need 2%–3% of their body weight per day in dry feed for normal maintenance and growth.

Above information on disease, parasites, and vitamins comes from The Fundamentals of Ornamental Fish Health

Vitamins exposed to air, as they are in opened fish food bags, do not have a long shelf life. If you're feeding food from freebies of the year before last, maybe it's time you change up to the fresh stuff and add in some vitamin-loaded live food or some veggies that the individual species likes.