The **guppy** (*Poecilia reticulata*), also known as millionfish and rainbow fish,[[3]](https://en.wikipedia.org/wiki/Guppy#cite_note-3) is one of the world's most widely distributed [tropical fish](https://en.wikipedia.org/wiki/Tropical_fish) and one of the most popular [freshwater aquarium fish species](https://en.wikipedia.org/wiki/List_of_freshwater_aquarium_fish_species). It is a member of the family [Poeciliidae](https://en.wikipedia.org/wiki/Poeciliidae) and, like almost all American members of the family, is [live-bearing](https://en.wikipedia.org/wiki/Live-bearing_aquarium_fish).[[4]](https://en.wikipedia.org/wiki/Guppy#cite_note-4) Guppies originate from northeast South America, but have been introduced to many environments and are now found all over the world. They are highly adaptable and thrive in many different environmental and ecological conditions.[[5]](https://en.wikipedia.org/wiki/Guppy#cite_note-Magurran2005-5) Male guppies, which are smaller than females, have ornamental caudal and dorsal [fins](https://en.wikipedia.org/wiki/Fish_fin). Wild guppies generally feed on a variety of food sources, including [benthic](https://en.wikipedia.org/wiki/Benthic_zone) [algae](https://en.wikipedia.org/wiki/Algae) and aquatic insect [larvae](https://en.wikipedia.org/wiki/Larva).[[6]](https://en.wikipedia.org/wiki/Guppy#cite_note-Dussault1981-6) Guppies are used as a [model organism](https://en.wikipedia.org/wiki/Model_organism) in the fields of [ecology](https://en.wikipedia.org/wiki/Ecology), [evolution](https://en.wikipedia.org/wiki/Evolution), and behavioral.

Taxonomy

Guppies were first described in Venezuela as Poecilia reticulata by [Wilhelm Peters](https://en.wikipedia.org/wiki/Wilhelm_Peters) in 1859 and as Lebistes poecilioides in Barbados by [De Filippi](https://en.wikipedia.org/wiki/Filippo_de_Filippi) in 1861. It was named Girardinus guppii by [Albert Günther](https://en.wikipedia.org/wiki/Albert_G%C3%BCnther) in honor of [Robert John Lechmere Guppy](https://en.wikipedia.org/wiki/Robert_John_Lechmere_Guppy), who sent specimens of the species from Trinidad to the [Natural History Museum](https://en.wikipedia.org/wiki/Natural_History_Museum,_London) in London.[[7]](https://en.wikipedia.org/wiki/Guppy#cite_note-Gunther1866-7) It was reclassified as Lebistes reticulatus by [Regan](https://en.wikipedia.org/wiki/Charles_Tate_Regan) in 1913. Then in 1963, Rosen and Bailey brought it back to its original name, Poecilia reticulata. While the taxonomy of the species was frequently changed and resulted in many synonyms, "guppy" remains the common name even as Girardinus guppii is now considered a [junior synonym](https://en.wikipedia.org/wiki/Junior_synonym) of Poecilia reticulata.

Distribution and habitat

Guppies are native to [Antigua and Barbuda](https://en.wikipedia.org/wiki/Antigua_and_Barbuda), [Barbados](https://en.wikipedia.org/wiki/Barbados), [Suriname](https://en.wikipedia.org/wiki/Suriname), [Guyana](https://en.wikipedia.org/wiki/Guyana), [Trinidad and Tobago](https://en.wikipedia.org/wiki/Trinidad_and_Tobago), and [Venezuela](https://en.wikipedia.org/wiki/Venezuela).[[8]](https://en.wikipedia.org/wiki/Guppy#cite_note-8)[[9]](https://en.wikipedia.org/wiki/Guppy#cite_note-9) However, guppies have been introduced to many different countries on every continent except Antarctica. Sometimes this has occurred accidentally, but most often as a means of [mosquito](https://en.wikipedia.org/wiki/Mosquito) control. The guppies were expected to eat the mosquito [larvae](https://en.wikipedia.org/wiki/Larva) and help slow the spread of [malaria](https://en.wikipedia.org/wiki/Malaria), but in many cases, these guppies have had a [negative impact](https://en.wikipedia.org/wiki/Invasive_species) on native fish populations.[[10]](https://en.wikipedia.org/wiki/Guppy#cite_note-10) Field studies reveal that guppies have colonized almost every freshwater body accessible to them in their natural ranges, especially in the streams located near the coastal fringes of mainland South America. Although not typically found there, guppies also have tolerance to [brackish water](https://en.wikipedia.org/wiki/Brackish_water) and have colonized some brackish environments.[[5]](https://en.wikipedia.org/wiki/Guppy#cite_note-Magurran2005-5) They tend to be more abundant in smaller streams and pools than in large, deep, or fast-flowing rivers.[[11]](https://en.wikipedia.org/wiki/Guppy#cite_note-MagurranPhillip_2001-11) They also are capable of being acclimated to full saltwater as well as being used to cycle saltwater aquariums like their molly cousins.

Guppies exhibit [sexual dimorphism](https://en.wikipedia.org/wiki/Sexual_dimorphism). While wild-type females are grey in body color, males have splashes, spots, or stripes that can be any of a wide variety of colors.[[12]](https://en.wikipedia.org/wiki/Guppy#cite_note-12) The size of guppies vary, but males are typically 1.5–3.5 cm (0.6–1.4 in) long, while females are 3–6 cm (1.2–2.4 in) long.

A variety of guppy strains are produced by breeders through [selective breeding](https://en.wikipedia.org/wiki/Selective_breeding), characterized by different colors, patterns, shapes, and sizes of fins, such as snakeskin and grass varieties. Many domestic strains have morphological traits that are very distinct from the wild-type antecedents. Males and females of many domestic strains usually have larger body size and are much more lavishly ornamented than their wild-type antecedents.[[13]](https://en.wikipedia.org/wiki/Guppy#cite_note-13)

Guppies have 23 pairs of [chromosomes](https://en.wikipedia.org/wiki/Chromosome), including one pair of [sex chromosomes](https://en.wikipedia.org/wiki/Sex_chromosomes), the same number as humans. The genes responsible for male guppies' ornamentations are [Y-chromosome linked](https://en.wikipedia.org/wiki/Y_linkage) and are [heritable](https://en.wikipedia.org/wiki/Heritability).

Two generations of guppies per year occur in the wild. Guppies are well developed and capable of independent existence without further parental care by the time they are born. Young guppies [school](https://en.wikipedia.org/wiki/Shoaling_and_schooling) together and perform [antipredator tactics](https://en.wikipedia.org/wiki/Antipredator_adaptation). Brood size is extremely variable, yet some consistent differences exist among populations depending on the predation level and other factors.[[5]](https://en.wikipedia.org/wiki/Guppy#cite_note-Magurran2005-5) Females of matching body sizes tend to produce more numerous but smaller-sized offspring in high-predation conditions. Female guppies first produce offspring at 10–20 weeks of age, and they continue to reproduce until 20–34 months of age. Male guppies mature in 7 weeks or less.[[5]](https://en.wikipedia.org/wiki/Guppy#cite_note-Magurran2005-5) Total lifespan of guppies in the wild varies greatly, but it is typically around 2 years.[[16]](https://en.wikipedia.org/wiki/Guppy#cite_note-Reznick2006-16) Variations in such [life historic characteristics](https://en.wikipedia.org/wiki/Life_history_theory) of guppies are observed in different populations, indicating that different [evolutionary pressures](https://en.wikipedia.org/wiki/Evolutionary_pressure) exist.

### Maturity

Guppies' body sizes are positively correlated with age, and their size at maturation varies highly depending on the predation risk of the occupied environments. Male and female guppies from high-predation regions mature faster and start reproducing earlier, and they devote more resources to reproduction than those from low-predation regions.[[17]](https://en.wikipedia.org/wiki/Guppy#cite_note-Reznick1996-17) Females from high-predation regions reproduce more frequently and produce more offspring per litter, indicating that they are more [fecund](https://en.wikipedia.org/wiki/Fecundity) than low-predation females. Female guppies' reproductive success is also related to age. Older females produce offspring with reduced size and at increased interbreed intervals.

### Senescence

One major factor that affects wild guppies' [senescence](https://en.wikipedia.org/wiki/Senescence) patterns is the mortality rate caused by predation. Guppies from high-predation environments suffer high extrinsic mortality rate because they are more likely to be killed by predators. Female guppies from high-predation environments experience a significant increase in mortality at 6 months of age, while those from low-predation environments do not suffer increased mortality until 16 months. However, guppies from high-predation environments were found to have longer lifespans because their reproductive lifespans are longer. No significant difference is seen in post reproductive lifespans.

### Population regulations

In addition to senescence pattern, resource availability and density also matter in regulation of guppy populations. Guppies reduce their fecundity and reproductive allocation in response to scarce food. When food is abundant, they increase brood size.[[19]](https://en.wikipedia.org/wiki/Guppy#cite_note-Reznick1983-19) Differential reproductive allocation can be the cause of seasonality of life-history characteristics in some guppy populations. For example, during the wet season from May to December, guppies in the [Northern Range](https://en.wikipedia.org/wiki/Northern_Range) of Trinidad reduce their investment in reproduction regardless of predation level, possibly in response to decreased food resources.[[20]](https://en.wikipedia.org/wiki/Guppy#cite_note-Reznick1989-20) Population density also matters in simpler environments because higher [intraspecific competition](https://en.wikipedia.org/wiki/Intraspecific_competition) causes a decrease in reproductive rate and [somatic](https://en.wikipedia.org/wiki/Somatic_(biology)) growth rate, and a corresponding increase in [juvenile](https://en.wikipedia.org/wiki/Juvenile_(organism)) mortality rate due to cannibalism. It was confirmed that in low-predation environments, guppy populations are in part regulated by density.