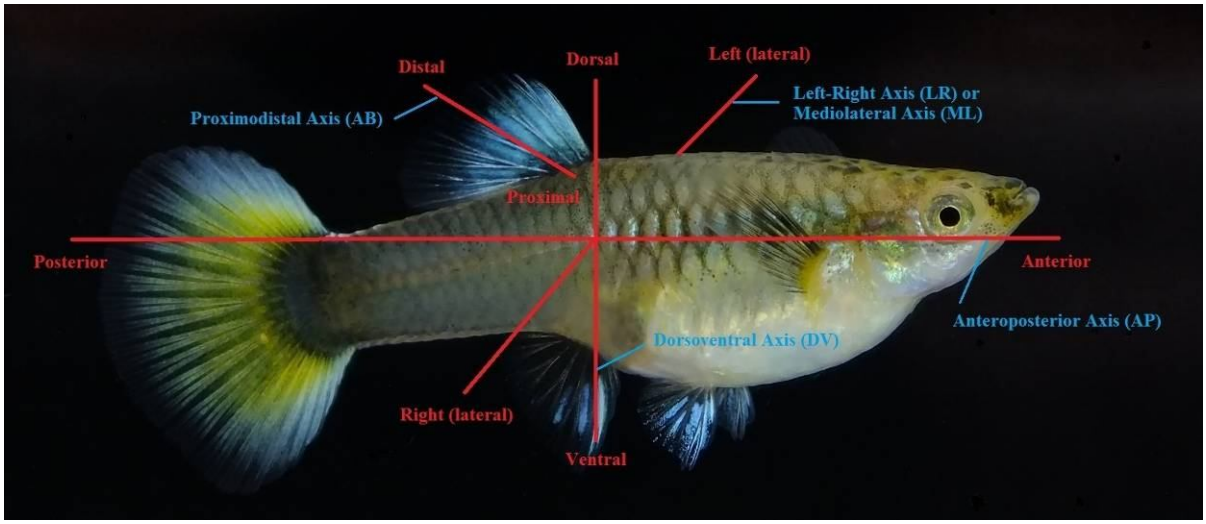
S1 Materials; Slide Specimen Photos

The Cellular Expression and Genetics of Purple Body (*Pb*) in the Ocular Media of the Guppy *Poecilia reticulata*

Alan S. Bias and Richard D. Squire

Axial Planes



Materials

Strain ID, Breeding Strain, Description & Source

D. Bias Panda Moscow. Based on breeder results this strain produces no Purple Body phenotypes; i.e. is a pure bred "green with orange spots" strain. The phenotypic expression is the product of several primary genes in co-expression (*YMw, XSsb and/or YSsb, pp*). Y-linked Moscow (*Mw*) produces blue iridophore anterior shoulder coloration, and autosomal recessive Pink (p, Luckmann 1990) produces light, often translucent white leucophore posterior peduncle coloration. In co-expression pattern is light anterior and dark posterior. Moscow (*Mo*) and Pink (*pi*) were described in the scientific literature (Kempkes 2007), although breeders had described both of them before that in hobbyist publications. Note: "*Mo*" is an earlier symbol for Mosaic (*Mo*, Khoo et al 1999) and therefore Kempkes' use of Mo for Moscow is invalid. We use the "*Mw*" symbol for Moscow following the usage by Shaddock (2010a, b). Kempkes' use of pi for pink is also invalid since Luckmann used p for pink in an earlier publication. In like fashion, the previous use of "*pk"* for pink by this senior author (following the usage by Shaddock 2010a, b) is also invalid. Sex-linked X and/or Y-linked Snakeskin body pattern (*Ssb* - Phang et al 1989) can be present in this strain. Stock maintained by Alan S. Bias, Lewisburg, WV, USA.

E. Bias Vienna Lower Swordtail (*Ls*). The Purple Gene has been maintained in a percentage of both males and females in homozygous & heterozygous fashion for over 60 generations. Homozygous Purple Body fish do not express the all-purple phenotype of the Roebuck Purple Delta. All males have green coloration as well. The lower sword gene (*Ls*) is Y linked in this strain, though crossing over to the X is periodic, resulting in X and/or Y-

linked Ls co-expression. It can be difficult to distinguish between homozygous and heterozygous Pb fish by phenotype alone. Stock maintained by Alan S. Bias, Lewisburg, WV, USA.

N. Feral Jemez (*P. reticulata* McCauley Springs, NM TC-2016). Feral population collected by Thomas Coggins, July, 2016, Jemez Mountains of Sandoval County, New Mexico, at an elevation of around 7350' (2240.28 meters). Self-sustaining population, the size of the habitable range is normally limited by temperature extremes to the first few pools near an issuing thermal source. Fish were predominantly heterozygous or homozygous for Pb, very few appeared non-Pb. They express a high degree of blue and black ornaments in the body. A small percentage of males express caudal ornaments. Females color and tail neutral. All collected fish had wild-type grey bodies.

O. Ginga Rubra (*P. reticulata wingei* [*Cumana´ Guppy]* x *P. reticulata*). Blond hybrid variant strain. Line-bred multi generations and generally fixed to type. Expresses unique peduncle pattern in the form of Zebrinus (*Ze,* Winge 1927) with color pigment overlaying structural iridophore barring. Both Pb and non-Pb present in study population. Known for increased reflective qualities of structural color and co-expression of color pigment types.

ID Number, Pb or non-Pb, Color / Strain, *Genotype*

13 Pb male (grey E) *Pb/Pb.*

17 Pb (grey E, litter mate – not actual male) *Pb/pb.*

18 Pb (grey E, related male – not actual male) *Pb/Pb.*

19 non-Pb (grey E, litter mate – not actual male) *pb/pb.*

22 non-Pb (grey) *pb/pb*.

23 Pb (grey) *Pb/pb*.

28 non-Pb (blond Ginga) *pb/pb*.

30 [Jemez Feral female] (grey) *Pb/-.*

31 [Jemez Feral female] (grey) *Pb/-.*

32 [Jemez Feral female] (grey) *Pb/-.*

33 Pb (blond) *Pb/-.* (blond, related female – not actual female).

34 [Jemez Feral female] (grey, litter mate – not actual female) *Pb/-.*

36 non-Pb (grey) *pb/pb.*

References

Kempkes M., 2007 New colour genes in the guppy, *Poecilia reticulata* (Peters, 1859). Bulletin of Fish Biology 9(1/2):93-97.

Khoo G., Lim T. M., Chan W. K., Phang V. P. E., 1999 Genetic basis of the variegated tail pattern in the guppy, *Poecilia reticulata*. Zoological Science 16(3):431-437.

Luckmann H., 1990 Die Grundfarbe des Pink-Guppys. DGLZ-Rundschau 17:4-8. Deutsche Gesellschaft für Lebengebärende Zahnkarpfen e.V., Editor; 1990. Available at: https://dglz.de/index.php/FileDownload/217-DGLZ-2-1990-pdf/. Accessed: February, 2017.

Phang V. P. E., Ng L. N., Fernando A. A., 1989 Inheritance of the snakeskin color pattern in the guppy, *Poecilia reticulata*. Journal of Heredity 80(5):393-399.

Shaddock P., 2010a The theory and practice of guppy breeding. Second edition. First Choice Books, Canada, 193 pp.

Shaddock P., 2010b Guppy color bible. First edition. First Choice Books, Canada, 192 pp.

Winge Ö., 1927 The location of eighteen genes in *Lebistes reticulatus*. Journal of Genetics 18(1):1-43.