

## S3 Materials Full Description and Sources

### The Cellular Expression and Genetics of an Established Polymorphism in *Poecilia reticulata*; "Purple Body, (*Pb*)" is an Autosomal Dominant Gene

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## Materials

### Strain ID, Breeding Strain, Description & Source

**A.** Roebuck IFGA Purple Delta. Based on prior sib-crosses, the strain produces no "green with orange spots"; i.e. is pure bred for the Purple Body gene and as will be shown below some other gene(s) as well. Stock courtesy of Charles Linz, Denton, MD, USA.

**B.** Shubel IFGA Green Delta. Based on breeder conversation and cross results by the senior author, this strain does not produce any Purple Body phenotypes; i.e. is a pure breeding "green with orange spots" strain. Stock courtesy of Stephen Kwartler, Sebring FL, USA.

**C.** Bias Ginga Sulphureus. Based on prior breeding's this strain produces approximately 75% homozygous & heterozygous Purple phenotypes, and 25% non-PB offspring; i.e. "green with orange spots". The Zebrinus (*Ze*, Winge 1927) pattern is present in peduncle with xantho-erythrophore spotting overlay on iridophore barring. Stock maintained by Alan S. Bias, Lewisburg, WV, USA.

**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 violet-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 (*pl*) were described in the scientific literature (Kempkes 2007), although breeders had described both of them before that in hobbyist publications. **Note:** "*Mo*" prior notation for Mosaic (*Mo*, Khoo and Phang 1999). 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 crossover 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.

**F.** Magoschitz Vienna Emerald Green Double sword (*Ds*). Based on breeder conversation and breeding results, this strain does not produce any Purple Body fish; i.e. is a pure bred “green with orange spots” strain. The double sword gene (*Ds*) may be X and/or Y linked depending upon the strain. Stock courtesy of Hermann Ernst Magoschitz, Schwarzenbruck, Bavaria, Germany.

**G.** Bias Red Double sword (*Ds*). Sires have been predominantly non-Pb. Based on prior breeding’s this strain produces a percentage of Purple phenotypes from inclusion of Pb females. This strain is a recent creation with X-linked carotenoid orange color pigment and X-linked *Ds* in cis combination. The majority of females are heterozygous for this linkage. As a result approximately half of male offspring are Y-link Vienna Lowersword with no X-link orange color pigment or *Ds*. Stock courtesy of Alan S. Bias, Lewisburg, WV, USA.

**H.** Mosseau IFGA Purple Delta. Based on breeder conversation and results this strain produces no “green with orange spots”; i.e. is homozygous for the Purple Body Gene. Stock from Gary and Tim Mosseau, Sterling Heights, MI.

**I.** Mosseau IFGA Green Delta. Based on breeder conversation and results, this strain does not produce any Purple Body fish; i.e. is a pure bred “green with orange spots” strain. Stock from Gary and Tim Mosseau, Sterling Heights, MI.

**J.** Anderson IFGA Green Delta. Based on breeder conversation and results strain produces no Purple gene; i.e. is homozygous for the “green with orange spots” phenotype. Stock courtesy of Tom Anderson, Winter Haven, FL.

**K.** Anderson IFGA Purple Delta. Based on breeder conversation and results this strain produces no “green with orange spots”; i.e. is homozygous for the Purple Body gene). Stock courtesy of Tom Anderson, Winter Haven, FL.

**L.** Feral Pingtung (*P. reticulata* Pingtung, Taiwan BG-2016). Feral population collected by Carl Groenewegen and Alan S. Bias 3.22.2016, Pingtung County, Taiwan. GPS collection coordinates: 22°36'41.0"N+120°35'56.9"E. Some members of the population are homozygous for Pb, and a high percentage of others appeared to be heterozygous Pb. They express a high degree of orange ornament spotting in broken series and also same patterns connected in linear extensions. A small percentage of males express dorsal coloration and / or caudal ornaments. Females color and tail neutral. All collected were wild-type grey body, though blond (*bb*, Goodrich 1944) has been produced in captive reared offspring.

**M.** Feral Warm Springs (*P. reticulata* Kelly Warm Springs, ID TC-2016). Feral population collected by Thomas Coggins, Sept., 2016, Kelly Warms Spring, Teton County, Idaho, USA. A high percentage of population is heterozygous or homozygous for Pb, other individuals appeared non-Pb. They express a high degree of orange ornaments in body and yellow in caudal. A percentage of males express dorsal coloration and / or caudal ornaments. Females color and tail neutral. All collected fish were wild-type grey body, though blond (*b*) has been produced in captive reared offspring.

**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.

## References

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