

Xiphophorus cortezi



Female (++)



Male (Sc, Cam)



Female (Cam/Cb)



Male (++)

Strain code: cortezi

Phenotypes scored: Macromelanophore patterns: carbomaculatus (Cam), atromaculatus (At), or wild type (+), and spotted caudal (Sc); tail spot patterns: tail yellow (Ty), caudal blotch (Cb), and wild type (+).

Introduction:

This species displays a single zigzag, horizontal stripe; and especially in some males, long, narrow vertical bars appear along the flanks. The sword is upturned with dark melanophores along the ventral margin. The grave spot is well developed and anterior to the caudal fin (Rauchenberger et al., 1990).

The *X. cortezi* stock was introduced into the Stock Center in 1982. Several phenotypes are segregating in this stock. The different phenotypes include two autosomal macromelanophore patterns, atromaculatus (At) and carbomaculatus (Cam). The At pattern is distinguished from Cam by the number, size and general location of the macromelanophores. The At pattern comprises smaller and more numerous spots located

on the dorsal fin and dorsal flank of the body, just below the dorsal fin. The spots in the Cam phenotype are less numerous and larger (usually no more than two or three) and are more predominant on parts of the body, but may be present on the dorsal fin as well. The Cam phenotype masks At, therefore, it is important to never mate At fish with Cam fish, (Rauchenberger et al., 1990; Kallman, 1971).

Along with the two autosomal macromelanophore patterns, there is also an autosomal tail pigment pattern, caudal blotch (Cb). This pattern is maintained in a heterozygous state by crossing Cb fish with wild type individuals. There are also two Y-linked pigment patterns: tail-yellow (Ty) and spot-caudal (Sc). Some Sc males have developed melanosis and small melanomas. A P-factor for early maturation is linked to the X-chromosome and one for late maturation on the Y. In natural populations there are also Y-chromosomes with an early P-factor.

Sex determination / sexing:

Sex determination for this stock is XX / XY (Kallman, 1971). The fish are sexed at around 2-3 months of age. Males begin sexual maturation at around six months. If raised at low densities, males can mature as early as four months of age. *X. cortezi* fish are set up in matings as early as possible, depending on time of sexual maturation.

Scoring:

All phenotypes are scored on mature fish. Cam, At and + fish can be distinguished with the naked eye. Cb should always be scored using the dissecting microscope using a white background. Ty is fixed in this stock and can be scored under the scope with a white background. The pattern develops with age in mature males. Sc males do not always express the pattern, because of the varying degrees of penetrance. Penetrance does appear to increase with age.

Stock maintenance:

A mating scheme has been established that preserves all alleles of this stock. Typically 6 matings are set up each generation, 2 for each of the macromelanophore patterns Cam, At and +. In these matings one fish should be Cam, At or + and the other fish should be +. For each of these matings, one fish should express Cb and the other should be +. This generates either + fish or heterozygous fish, Cb/+. All males will inherit Ty. Finally, at least 2 of the matings should use males that express Sc. A typical mating plan may look as follows;

Cam/+, Cb/+ female	(x)	+/+, +/+, Ty, Sc male
+/+, Cb/+ female	(x)	Cam/+, +/+, Ty male
At/+, +/+ female	(x)	+/+, Cb/+, Ty, Sc male
At/+, Cb/+ female	(x)	+/+, +/+, Ty male

+/+, Cb/+ female	(x)	+/+, +/+, Ty male
+/+, +/+ female	(x)	+/+, Cb/+, Ty, Sc male.

Notice that only three of the matings contain Sc males. Duplicate matings for each phenotype ensures there will be enough fish with all the patterns and none of the alleles will be lost in the successive generation. If matings do not produce offspring after three months, the matings must be artificially inseminated and males checked for sperm, since timing is essential in maintaining this difficult stock.

Stock source:

Prof. Klaus Kallman, the New York Aquarium, 11/92, 6/93, 7/93.