

Revision of the Genus *Symphysodon*

Revision of 168-year-old genus.

Posted: February 18, 2008, 4 p.m. EST

Systematics of the cichlid genus *Symphysodon* has been investigated and three species are recognized: *S. discus* Heckel, 1840 (synonym: *S. discus willischwartzi* Burgess, 1981); *S. Aequifasciatus* Pellegrin, 1904 (synonyms: *S. discus* var. *Aequifasciata* Pellegrin, 1904; *S. aequifasciata aequifasciata sensu* Schultz, 1960; *S. Discus Tarzoo – sic – Lyons*, 1960); and *S. Haraldi*, Schultz, 1960 (synonyms: *S. aequifasciata haraldi* Schultz, 1960; *S. aequifasciata axelrodi* Schultz, 1960).

The present revision is based on DNA sequences of partial mitochondrial control regions of 48 specimens of *Symphysodon* from 20 different locations in the central and lower Amazon basin, which revealed three genetically distinct clades of *Symphysodon*.

One of these genetic clusters is composed of specimens that morphologically are *S. Discus*, but also of *S. Haraldi* and natural hybrids of *S. discus* x *S. Haraldi*. This indicates that either the “discus” clade is composed, at least partially, of hybrids or, alternatively, that a “haraldi” phenotype evolved (or was retained) independently in this clade. The other two clades consist of *S. Aequifasciatus* and *S. haraldi*.

The definition of the three species is supported by extensive field studies over the last 40 years, investigating distributional patterns and documenting adaptation of each species to a distinct type of water characterised by unique chemical parameters.

In addition, *S. Discus* and *S. Aequifasciatus* display distinct colorations and colour patterns, with nine vertical bars on each flank. In *S. Discus*, the first, and particularly the fifth and ninth bars are prominent and/or wider, while all bars are typically of equal width in *S. Aequifasciatus*.

The latter species is also recognized by its rust-brown or red dots on the body, ranging from a few spots to a dense cover all over, rarely forming red spotted lines or being present in the anal fin region only.

Symphysodon haraldi displays a wide range of colors, color patterns and a larger number of vertical bars (eight up to 16), which may differ substantially in shape.

Except for hybrids of *S. discus* x *S. haraldi*, *S. Haraldi* does not resemble the other two species. A study of geographic distribution patterns of the three species was carried out throughout the central and lower Amazon basin: in the western Amazon in almost every tributary of the Solimões and the Marañon Rivers to Iquitos, and in the eastern part in most tributaries of the Amazon River down to its mouth.

The valid names of the three species are: *S. discus* – the Heckel discus; *S. aequifasciatus* – the green discus; and *S. haraldi* – the blue discus.

The “brown” or “common” discus of the aquarium trade is the same as the “blue” discus. In *S. Aequifasciatus*, a congruence of genetic and morphological (color) characters has been found, whereas some specimens that would phenotypically be assigned to *S. haraldi*, genetically group also with the *S. discus* clade. Only future studies using nuclear DNA markers will allow untangling the evolutionary history of the phenotypically heterogeneous *S. “discus”* clade.

From Bleher H., et al. “Revision of the Genus *Symphysodon* Heckel, 1840 (Teleostei: Perciformes: Cichlidae) based on molecular and morphological characters.” *Aqua: International Journal of Ichthyology*. 12: 4. 133-174. Reprinted with permission.