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Scientific Note

Ambicolored specimens of the flounder *Paralichthys orbignyanus* (Pleuronectiformes: Paralichthyidae)

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Two ambicolored specimens of *Paralichthys orbignyanus* were reported for the estuarine area of the arroyo Pando (Uruguay). One of the specimens showed an almost fully coloration on the blind side, excepting the cephalic region, while the other one was partially pigmented. This is the first record of ambicoloration in *P. orbignyanus*.

Dois espécimes anficoloridos de *Paralichthys orbignyanus* foram coletados na área estuarina do arroyo Pando (Uruguai). Ambos apresentam pigmentação completa no lado oculado. Um deles, no entanto, exibe coloração em quase toda a extensão do lado cego, com exceção da região cefálica. O outro exemplar tem pigmentação desde a nadadeira caudal até a metade do corpo. Este é o primeiro registro desta anomalia na espécie *P. orbignyanus.*

Key words: Río de la Plata, Flatfish, Abnormal pigmentation.

Ambicoloration is an abnormality described in flatfishes, in which pigment is developed on the blind side of the body, as well as on the ocular side. In ambicolorate flatfish, larval melanophores on the ocular side are replaced during ontogenetic development by differentiated adult pigment cells, as well as in the blind side. This abnormality has high frequencies on hatchery-reared individuals and is probably of little or no adaptive significance in natural environments (Bolker & Hill, 2000).

Since 1934 most cases of ambicoloration have been recorded in northern Atlantic and Pacific oceans (Venizelos & Benetti, 1999; Bolker & Hill, 2000). More recently, Díaz de Astarloa (1995, 1998) and Chaves *et al.* (2002) have reported this abnormality for *Paralichthys patagonicus*, *Paralichthys isosceles*, *Xystreurys rasile*, and *Symphurus tessellatus* from the southwest Atlantic. Nevertheless, ambicoloration has never been reported for *Paralichthys orbignyanus*, despite a case of reversal in the Río de la Plata described by Díaz de Astarloa (1997), where eyes and coloration appear on the side that is normally eyeless and unpigmented.

Paralichthys orbignyanus is a commercially important left-eyed flatfish species in Uruguayan, Argentinean and southern Brazilian inner continental shelfs (Díaz de Astarloa & Munroe, 1998). It is an euryhaline and eurytherm species, occurring mostly on shallow waters (1-45 m) with muddy bottoms from Rio de Janeiro in Brazil to San Matías Gulf in Argentina (Wasielesky *et al*., 1998; Cousseau *et al.*, 2001; Díaz de Astarloa, 1999, 2002; Sampaio & Bianchini, 2002). In Uruguay it inhabits in coastal lagoons (Pintos *et al*., 1988) and in other euryhaline systems, such as the mouth of the arroyo Pando where juveniles of *P. orbignyanus* use this protected areas and shallower waters as nursery grounds since there are low risks of mortality. These estuarine environments are also used as feeding areas for adults due to food availability.

Of 81 specimens of *P. orbignyanus* collected with a shrimp net in the arroyo Pando, two showed ambicoloration. One specimen of 34.9 cm TL was almost fully ambicolored except for the right side of the head and a small unpigmented area on the mid dorsal of body (Fig. 1). The other specimen of 19.1 cm TL was partially pigmented on the blind side from the caudal fin to mid part of body.

Ambicoloration is frequently accompanied by some morphological variation (Norman, 1934; Deubler & Fahy, 1958; Eisler, 1963; Díaz de Astarloa, 1995, 1998). No noticeable variation on morphological or meristic characters (Table 1) was found for the ambicolored *P. orbignyanus*. Cycloid scales were found on both sides of the ambicolored specimen corresponding with those of flatfishes of normal pigmentation.

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Table 1. Comparative measurements made upon typical *Paralichthys orbignyanus* (n = 19) and one ambicolourate specimen (34.9 cm TL) of the same species. Total length (TL) is expressed in cm. All other measurements as percentages of TL.

	Ambicoloured *P. orbignyanus*	Typical *P. orbignyanus*
Total length	34.9	8 - 46.8
Head length	22.1	19.5 - 22.5
Eye diameter	2.9	2.6 - 6.1
Interorbital width	1.8	0.47 - 2.7
Pectoral-fin length	8.1	7.9 - 11.8
Dorsal-fin rays	78	68 - 77
Anal-fin rays	58	52 - 59
Pectoral-fin rays	10	10 - 11
Gill rakers of the first arch	4 + 15	4 - 5 + 14 - 17

Fig. 1. Blind side of an ambicoloured specimen of *Paralichthys orbignyanus* caught in the arroyo Pando, Uruguay (ZVCP 6458 - SL 271 mm).

Light intensity, feeding during larval stages, neurological aspects specially referred to hormones involved in body colour patterns and environmental stressors are reported as possible hypotheses to explain ambicoloration (Venizelos & Benetti, 1999; Bolker & Hill, 2000). None of them could be discarded for the study area. Moreover, environmental contamination of sediments originated in anthropic and industrial activities (Kurucz *et al*., 2003) could also contribute to the effect. However, further experimental research is required to test this hypothesis.

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