

First record of abnormal pigmentation in a wild common sole, *Solea solea* L., from the Aegean Sea

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Abstract: On 2 June 2010, an abnormally pigmented specimen of *Solea solea* L. with a total length of 222 mm was obtained near Tuzla, from the İzmir Bay of the Aegean Sea. This is the first record of abnormal pigmentation in the wild common sole from the Aegean Sea. The specimen fish is patterned with both hypermelanosis on the blind side and hypomelanosis on the ocular side. This kind of malpigmentation in any flatfish is not typical.

Key words: Abnormal pigmentation, common sole, *Solea solea*, Aegean Sea

A typical anomaly of flatfishes is malpigmentation, which is characterized by either a deficiency of pigment cells on portions of the ocular side (albinism, pseudoalbinism, or hypomelanism) or the presence of dark pigmentation on the normally light-colored underside of the fish, also called ambicoloration (1). Malpigmentation can fall into 3 groups: hypomelanosis (pseudoalbinism), characterized as a full or partial lack of pigmentation on the ocular side; hypermelanosis, characterized as abnormal pigmentation on the blind side; and ambicoloration, which means having ocular side pigmentation on both sides of the flatfish (2–5). Malpigmentation is an especially common problem in aquaculture, and reduced marketability due to malpigmentation is a well-known problem in the production of the common sole and other flatfish species (1,3,4,6–9).

Pigmentation abnormalities in heterosomates are extremely rare in nature (10). However, abnormal coloration in heterosomate fish, especially flounder,

halibut, and turbot in the Atlantic and Pacific oceans, has been documented by numerous authors (10–15). There is a unique record of ambicoloration and albinism in different specimens of wild common soles in Thau Basin, France, in the western Mediterranean (16). Furthermore, ambicolored flatfishes found along the coasts of Europe were *Scophthalmus maximus*, *Pleuronectes maximus*, *P. platessa*, and *P. flesus flesus*, and, very rarely, *S. rhombus*, *Monochirus hispidus*, and *P. limanda* (16).

On 2 June 2010, an abnormally pigmented female specimen of *Solea solea* L. (Figure 1) with a total length of 222 mm was obtained near Tuzla, from İzmir Bay (Figure 2). The specimen was caught using a trammel net with a mesh size of 40 mm over a sandy bottom at a depth of 20 m. The specimen was deposited in the fish collection of the Ege University Fisheries Faculty (ESFM-PIS/10-001).

Diagnostic characters were counted, including 74 dorsal fin rays, 62 anal fin rays, 8 pectoral fin

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Figure 1. Abnormal pigmentation in *Solea solea*, caught from Tuzla, İzmir Bay, Turkey, 222 mm in total length (horizontal bar is 1 cm).

rays, and 5–5 ventral fin rays. The sampled fish is patterned with both hypermelanosis on the blind side and hypomelanosis on the ocular side. This kind of malpigmentation has not been observed in any other heterosomate fish up to now. Paris and Quignard (16) recorded both pseudoalbinism (hypomelanosis) and hypermelanosis, but these malpigmentations were recorded separately on 3 different specimens of wild common sole.

Many studies have indicated that light intensity, feeding during larval stages, or neurological aspects

such as hormones (i.e. endocrine system) are involved in body color patterns, while genetic factors and environmental stressors are reported as possible hypotheses to explain ambicoloration (1,5,6,8,17–20). Moreover, environmental contamination of sediments due to anthropic and industrial activities could also contribute to the effect (15). Some of these factors have been studied in culture or laboratory conditions; however, there has been no research done on wild fish. Thus, further experimental research is essential to test this hypothesis.

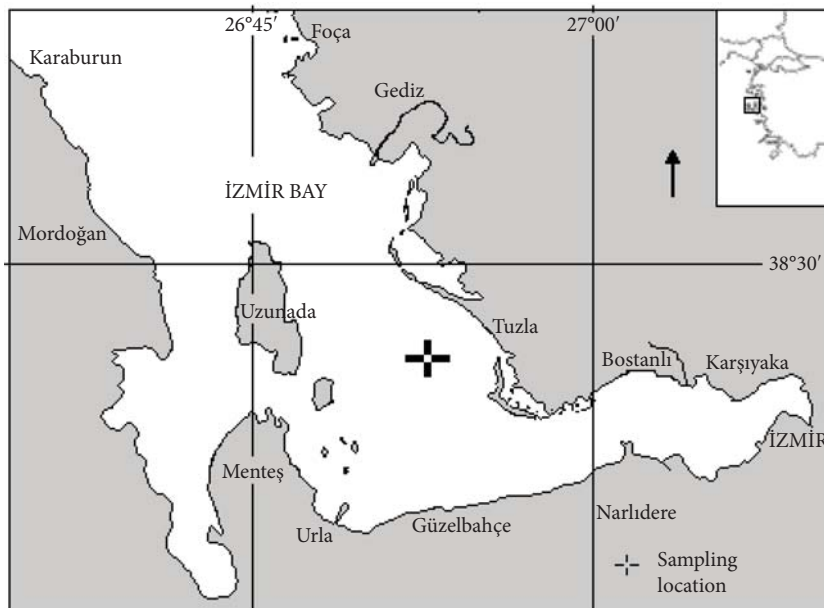


Figure 2. Map of the sampling location.

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