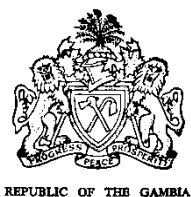


Identification of the Sole Resources of The Gambia



Gambia-Senegal Sustainable Fisheries Program (Ba Nafaa)

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The Sole Resources

Proper identification of the species is critical for resource management. There are four major families of flatfish with representative species found in the Gambian nearshore waters: Soleidae, Cynoglossidae, Psettodidae and Paralichthyidae. The species below have been confirmed through literature review, and through discussions with local fishermen, processors and the Gambian Department of Fisheries. Many of them are similar in appearance and can be easily misidentified. This short publication is a review of the species and their identifying characteristics.

Soleidae Family (Sole)

Black sole, *Synaptura cadenati* (also called tiger sole)

Thickback sole, *Microchirus variegatus*

Wedge sole, *Dicologlossa cuneata*

Sand sole, *Pegusa lascaris*

Oscillated wedge sole, *Dicologlossa hexophthalma* (palpal)

Cynoglossidae Family (Tongue sole)

Bengal tongue sole, *Cynoglossus cynoglossus*

Red sole, *Cynoglossus senegalensis*

Psettodidae Family (Turbot)

Spiny turbot, *Psettodes belcheri* (trippo)

Paralichthyidae (Sand dabs)

Smooth Flounder *Citarichthys stampfilii*

Soleidae Family (Sole)

The sole fish, Soleidae, (or true sole) are strongly compressed and elongate flatfish with eyes on the right side of the body. Their single lateral line is straight. The dorsal and anal fins are completely separate from, adjacent to or fused with the caudal fin.

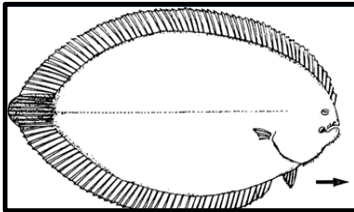


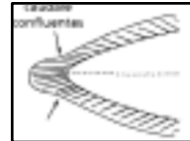
Figure 1. True sole, (Line drawing from the FAO Identification Sheet).



Figure 2. Black or tiger sole, *Synaptura cadenati* Photo by G. Gabis, close up from Bellemans et al., (1988).

THE BLACK SOLE.

The black sole is characterized by the small white spots on the body. There is no break between the dorsal, anal and caudal fin.



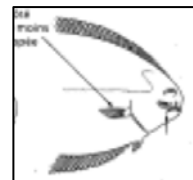
Detail dorsal, anal and caudal fin



Figure 3. Thickback sole, *Microchirus variegates*. Picture From FISHBASE, close up from Bellemans et al., (1988).

THICKBACK SOLE.

The thickback sole is distinguished by the small pectoral fin (on eyed side (small on blind side)). Anterior nostril on eyed side with backward pointing tube reaching to front border of lower eye.



Detail front border of lower eye

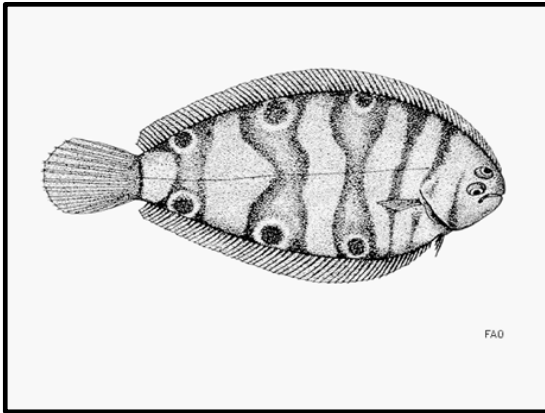


Figure 4. The wedge sole, *Dicologlossa cuneata* Line drawing From FISHBASE, closeup from Bellemans et al., 1988)

THE WEDGE SOLE.

The Wedge Sole is brownish grey with small dark spots. The pectoral fins are blackish with a pale margin. The anterior nostril is small.



Detail

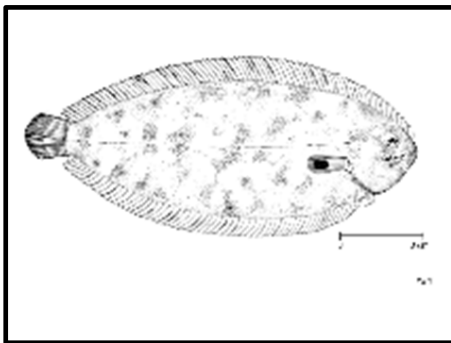
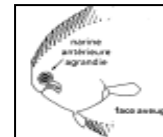


Figure 5. The Sand Sole, *Pegusa lascaris*. Line drawings from Schneider, 1990 and Bellemans et al., 1988

THE SAND SOLE.

The sand sole is brownish yellow or reddish brown with obscure pale blotches and specks. Last ray of dorsal and anal fins joined by a low membrane to the base of the caudal fin. Supratemporal lateral line forms an arch. Anterior nostril on blind side prominent forming a large round rosette, its diameter equal to eye.



Detail

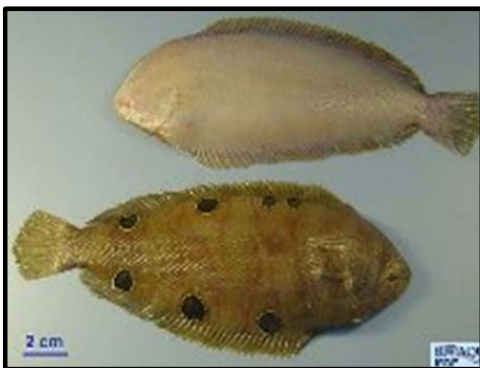
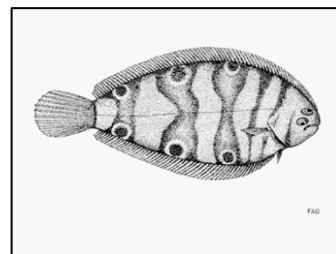


Figure 6. Oscillated wedge sole , *Dicologlossa hexophthalma*, (Called Palpal).

OSCILLATED WEDGE SOLE:

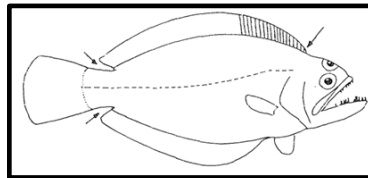
The oscillated wedge sole is brown with several dark spots on dorsal surface.



Picture and drawing from FISHBASE.

Psettodidae Family (Turbot)

The Psettodidae possess large mouths with large teeth. The dorsal fin does not extend forward onto head; eyes can be on either side of the head.

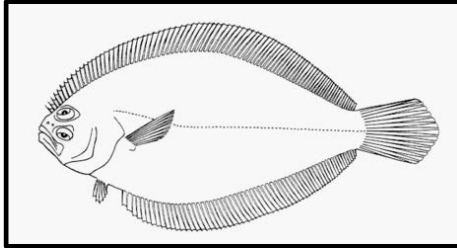


THE SPINY TURBOT has large teeth and spiny rays in the dorsal fin.

Figure 7. Spiny turbot, *Psettodes belcheri* (Photo: K. Castro).

Paralichthyidae (Sand dabs)

Paralichthyidae are characterized by: eyes on the left side; presence of pectoral fins on both sides with branched rays..

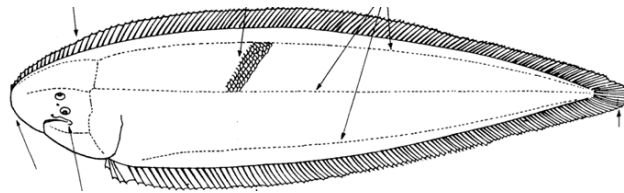


THE SMOOTH FLOUNDER.
The smooth flounder has several dark spots on body. Lateral line is almost straight without upward curve over pectoral fin. Face is concave. Possesses two rows of teeth in lower jaw.

Figure 8. Smooth Flounder *Citarichthys stampfilii* (Photo: G. Gabis; Drawing: FISHBASE)

Cynoglossidae Family (Tongue sole)

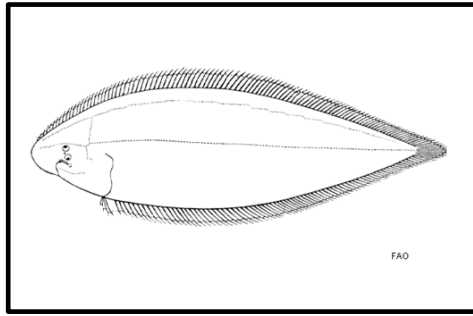
Although similar to the sole fish, tongue sole (*Cynoglossidae*) can be distinguished by the presence of a continuous fin around the body that joins the dorsal, caudal and anal fin, absence of pectoral fins and eyes on the left side of the body. They generally are relatively small with a curved mouth (may have rostral hook) that can be terminal or located in an inferior position. The tongue soles are remarkably similar in taxonomy making them difficult to identify. The primary characteristic could be the number of scales between the lateral lines, the number of dorsal or anal rays or the presence/absence of a lateral line on the eyed or blind side. The *Cynoglossidae* are the only flatfishes that possess many lateral lines. The multiple lateral lines may reflect an adaptation to a turbid environment. Line drawing from the FAO Identification Sheet.



THE RED SOLE

The red sole has two lateral lines on the eyed side, 1 on blind side. There are 15-20 rows of scales between the lateral lines.

Figure 9. Red sole, *Cynoglossus senegalensis* (Photo by G. Gabis).



THE BENGAL SOLE

The Bengal Tongue Sole is best characterized by the fleshy ridge present on the lower jaw on eyed side. No dark blotches on body.

Figure 10. Bengal sole, *Cynoglossus cynoglossus* (Drawing from FISHBASE).

There may even be additional species that have yet to be identified in the Gambian waters. Since they may be important in the artisanal and commercial fisheries, it is important to gather as much knowledge about the life history characteristics to achieve sustainable harvesting strategies. The following table lists some of the known (or suggested) characteristics of each species (From FISHBASE).

Table 1. Species life history characteristics (m=male, f=female; TL=total length; k = growth coefficient, L^∞ = length infinity or asymptotic length; M = natural mortality).

Scientific Name	Common Name	Sex	Max Length (cm)	Common Length (cm)	k	L^∞	M
<i>Cynoglossus senegalensis</i>	Senegalese or red sole	M	66 TL	25 TL	0.097 0.34*	82.10	
<i>Cynoglossus cynoglossus</i>	Bengal tongue sole	M	20 TL	12.5 TL			
<i>Microchirus variegates</i>	Thickback Sole	M	35 SL	14 TL	0.4	17.5 cm	
		F				20.7 cm	
<i>Pegusa lascaris</i>	Sand Sole	M	40 SL	30	0.451	25.5	
		F			0.379	cm	
<i>Dicologlossa cuneata</i>	Wedge Sole	M	30 SL	20 TL	0.380	23.8	0.5
		F			0.470	24.7	0.5
<i>Dicologlossa hexophthalma</i>	Ocellated wedge sole	M	20 TL				
<i>Synaptura cadenati</i>	Guinean or Black sole		35 TL				
<i>Citharichthys stampflii</i>	Smooth flounder	M	16 TL				
<i>Psettodes belcheri</i>	Spiny turbot	M	80 TL	45 TL			

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