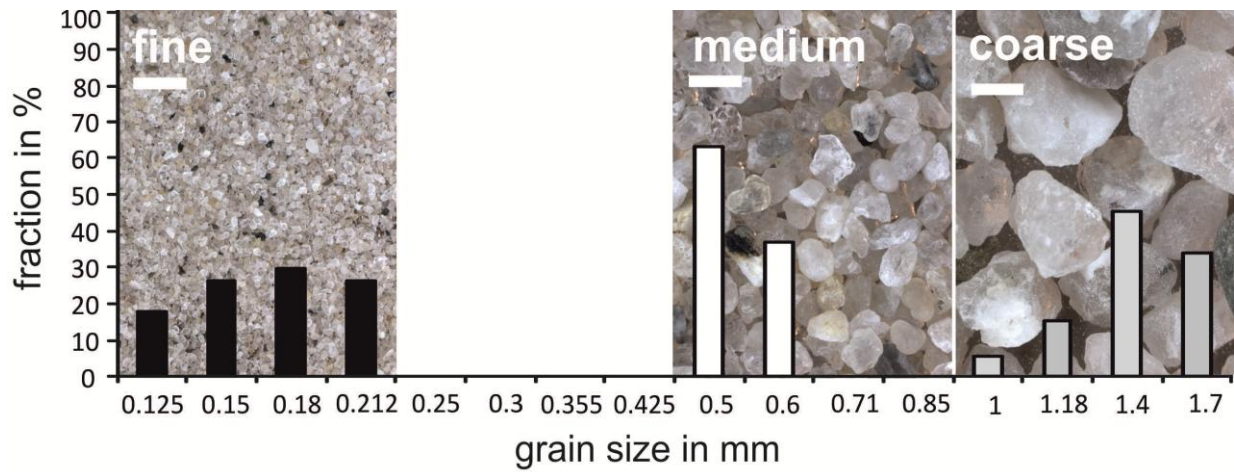
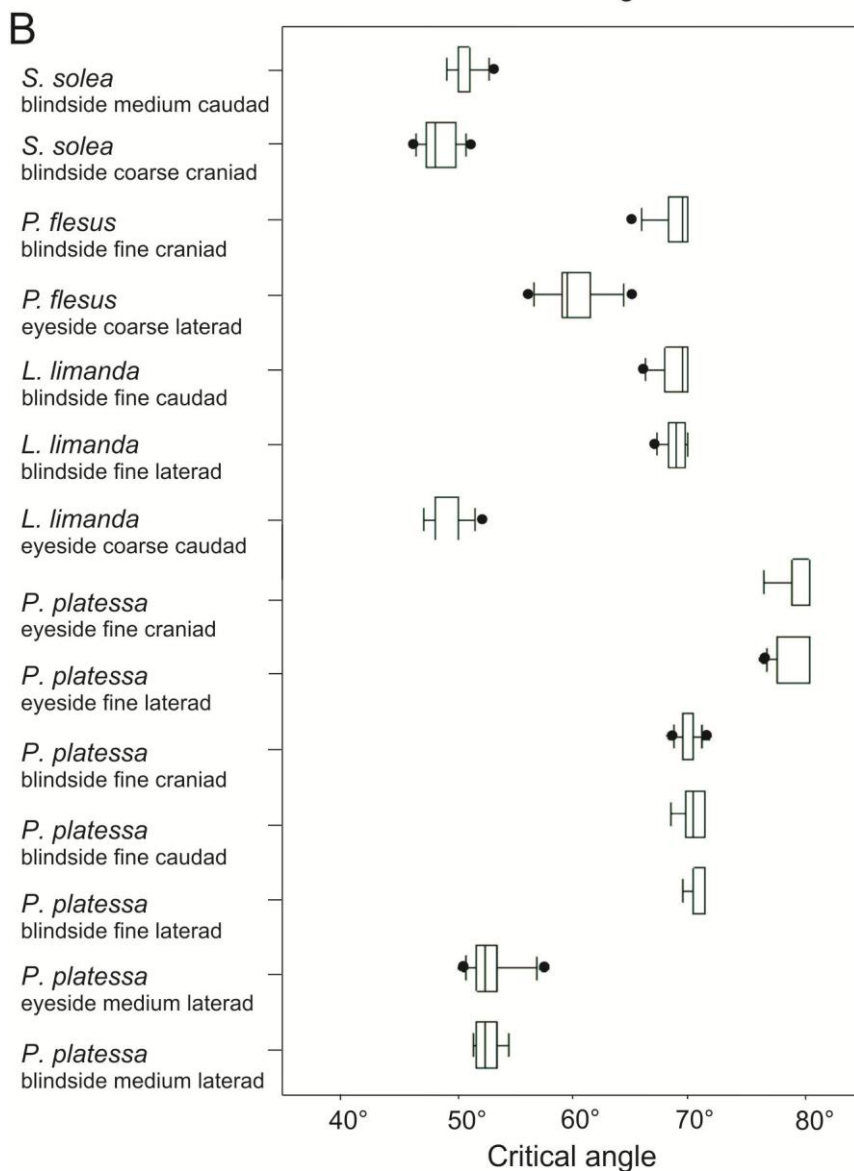
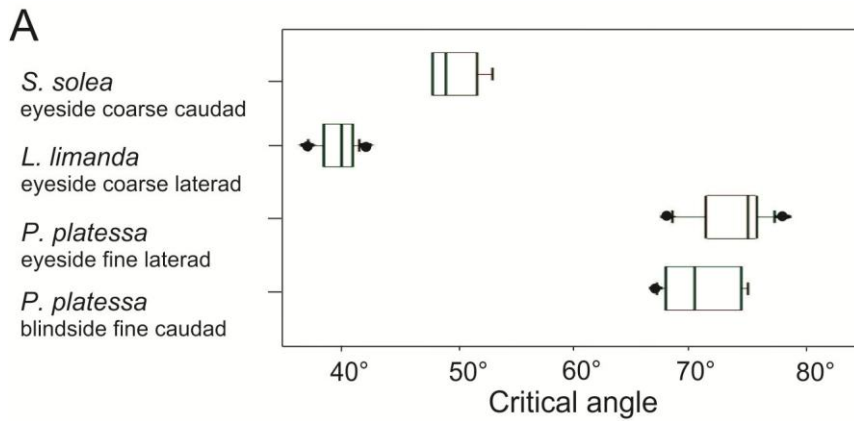


Key role of scale morphology in flatfishes (Pleuronectiformes) in the ability to keep sand

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S1. Light microscopy images and distribution of grain sizes of the used sediments. Grain sizes (Wentworth classes): fine, coarse (here: medium), and very coarse sand (here: coarse) according to ISO 565 and ISO 3310 (R20/3 and R 40/3). The scale bars are 1 mm.



S2. Box plot of CSAs of the three sediment types (fine, medium, and coarse) on original skin and resin replicas of the skin of the eye side and blind side of *S. solea*, *P. flesus*, *L. limanda*, and *P. platessa* in three directions: cranial, caudal and lateral. (A) Original skin. (B) Resin replicas of the the skin. The median is presented by a vertical line, the boxes indicate the upper and lower quartile. Minimum and maximum values and outliers are presented by error bars and dots.

	fine		medium		coarse	
	ES	BS	ES	BS	ES	BS
<i>S. solea</i>						
craniad x caudad	-	-	-	-	5.384 *	6.672 *
craniad x laterad	-	-	-	-	6.453 *	5.165 *
caudad x laterad	-	-	-	-	1.069	1.507
H	-	-	-	-	24.168	24.623
<i>P. flesus</i>						
craniad x caudad	-	-	5.522 *	6.803 *	4.956 *	5.208 *
craniad x laterad	-	-	4.683 *	3.402 *	5.124 *	4.998*
caudad x laterad	-	-	0.840	3.402 *	0.168	0.210
H	-	-	18.619	23.249	16.997	17.491
<i>L. limanda</i>						
craniad x caudad	-	-	6.836 *	6.288 *	4.658 *	6.014 *
craniad x laterad	-	-	5.000 *	4.685 *	7.179 *	5.822 *
caudad x laterad	-	-	1.836	1.603	2.521	0.192
H	-	-	25.523	21.454	26.843	23.506
<i>P. platessa</i>						
craniad x caudad	3.699 *	4.850 *	6.233 *	6.096 *	4.631 *	5.740 *
craniad x laterad	6.658 *	5.137 *	5.603 *	5.740 *	7.206 *	6.096 *
caudad x laterad	2.959	0.288	0.630	0.356	2.576	0.356
H	24.422	17.846	23.712	23.487	26.761	23.533

S3. Table: Direction-dependent difference of CSAs of sediments (fine, medium, coarse) on the eye (ES) and blind sides (BS) of the examined flatfish species. H and q-values of Kruskal-Wallis One Way ANOVA on ranks (2 DF, $P \leq 0.001$) and a subsequent pairwise multiple comparison Tukey test ($P < 0.05$). Asterisks indicate significant differences.

	craniad		caudad		laterad	
	ES	BS	ES	BS	ES	BS
<i>S. solea</i>						
fine x medium	0.000	0.000	0.000	0.000	0.000	0.000
fine x coarse	5.918 *	5.918 *	5.918 *	5.918 *	5.918 *	5.918 *
medium x coarse	5.918 *	5.918 *	5.918 *	5.918 *	5.918 *	5.918 *
H	33.243	33.261	33.261	33.225	33.213	33.188
<i>P. flesus</i>						
fine x medium	0.000	3.402 *	3.402 *	3.444 *	3.402 *	3.402 *
fine x coarse	5.103 *	6.803 *	6.803 *	6.761 *	6.803 *	6.803 *
medium x coarse	5.103 *	3.402 *	3.402 *	3.318 *	3.402 *	3.402 *
H	24.658	24.029	24.076	23.820	24.067	24.061
<i>L. limanda</i>						
fine x medium	0.986	4.124 *	3.946 *	3.946 *	3.946 *	3.946 *
fine x coarse	6.412 *	7.713 *	7.891 *	7.891 *	7.891 *	7.891 *
medium x coarse	5.425 *	3.589 *	3.946 *	3.946 *	3.946 *	3.946 *
H	29.764	30.986	32.420	32.381	32.442	32.381
<i>P. platessa</i>						
fine x medium	3.946 *	3.946 *	3.946 *	4.137 *	3.973 *	4.274 *
fine x coarse	7.891 *	7.891 *	7.891 *	7.699 *	7.864 *	7.562 *
medium x coarse	3.946 *	3.946 *	3.946 *	3.562 *	3.891 *	3.288
H	32.355	32.093	31.300	29.772	31.056	28.861

S4, Table: Grain-size-dependent difference of CSAs of sediments on the eye side (ES) and blind side (BS) of the examined flatfish species. H and q-values of Kruskal-Wallis One Way ANOVA on ranks (2 DF, $P \leq 0.001$) and a subsequent pairwise multiple comparison Tukey test ($P < 0.05$). Asterisks indicate significant differences.