Studies on the Scorpaenoid Fishes of Japan. II. Statistical Observations on *Sebastodes inermis* (C. et V.)*

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The splitting of a species of scorpaenoid fish, *Sebastodes inermis* (C. & V.), into four, viz., *S. inermis*, *S. ventricosus* T. & S., *S. gntheri* J. & St., and *S. tokionis* J. & St., has been adopted by several authors. On the other hand, the reduction of these four to two, namely, *S. inermis* and *S. tokionis*, was done by Jordan and Hubbs⁷⁾; and even the amalgamation of all these four to one, *S. inermis*, was suggested by Tanaka.¹⁶⁾

The paramount importance of an exact method of attacking the problem and an abundant supply of the material to work with is obvious. The author is greatly indebted to Dr. A. Terao and to Dr. M. Tauti for their kind guidance in applying a method, which is quite distinct from the hitherto used, to his material. He is also much obliged to the staff of the Tysen Fisheries Experimental Station for a loan of specimens from Huzan to supplement his collection of the fishes from Simonoseki, Misaki, Tôky Bay, Bsy, Rikuty and Hakodate.

In passing, it may be mentioned that the specimens amounting to 198 in number were found to vary from one to seven years in age and to cover the entire range of the variations recorded by the former authors, including some intermediate forms between any two of the above-mentioned four. Osteological examinations did not reveal any point which would go to distinguish the four species. Nor were my results consistent with the view that the specimens at my disposal are referable to the two, *S. inermis* and *S. tokionis*.

It would not be sufficient to leave the argument at this stage of documentation. Still, one would insist that the four-fold splitting of the species is tenable. It is evident that one should weigh the relative value of the deviations and ascertain presence or absence of incipient tendency of divergence against the whole set of the samples if one would settle the question conclusively. It may be remarked parenthetically that the ordinary procedure

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Fig. 1. Showing dimension (in cm) of body parts in relation to body length of *Sebastes inermis*. A, length of head; B, length of maxillary; C, diameter of orbit; D, depth of body. Individuals marked with $\square$, one year old; $\times$, two years; $\triangle$, three years; $\bullet$, four years; $\circ$, five years; $\ominus$, six years; $\oplus$, seven years.

of ichthyology falls short of exactness in giving the variations of various parts of body since such items as diameter of orbit, length of maxillary, etc. are referred to head length which is again defined in terms of reverse ratio to body length. Consequently the net measurement of all the body parts utilized for taxonomy, viz., length of head, length of maxillary, diameter of orbit, depth of body, length of the longest dorsal spine, length of second

Locality	Longest dorsal spine in head																				
	1.7 -1.80			1.80-1.90			1.90-2.00			2.00-2.10			2.10-2.20			2.20-2.30			2.30-2.40		
	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V
A						1			2		1		1					2			1
B	2			8	7	2	11	9	3	8	5	5	2	4	4			1			
C															1						
D						1	2	4	6		8	6	2	3	3		4	2			
E	1	1		1		2	1	1	3	1		3			5						
F					1									1							
G				1			1	2													
H				5	1		2	2		4					4	1					
I	1																1				1

Locality	Second anal spine in head																																			
	2.00-2.10			2.10-2.20			2.20-2.30			2.30-2.40			2.40-2.50			2.50-2.60			2.60-2.70			2.70-2.80			2.80-2.90			2.90-3.00			3.00-3.10			3.10-3.20		
	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V			
A																			1	1														1		
B																																				
C																																				
D																																				
E																																				
F																																				
G																																				
H																																				
I																																				

Locality	Pectoral in head																					
	1.00-1.05			1.05-1.10			1.10-1.15			1.15-1.20			1.20-1.25			1.25-1.30			1.30-1.35			
	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V	
A B C D E F G H I		1	1									1			1						1	
							8		1	15	10	4	7	11		1	4	2				
	1				1	8	1	2	3	1		8	5						1			1
	2					1	2		1		1	4		1				1				1
	2			2	1	1	7	1		2	1	3				1	1					

Locality	Number of scales on lateral line																													
	39			40			41			42			43			44			45			46			47			48		
	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V
A															1															
B									1	1		1																		
C					2	2	4	4		2	6	1	4	2	2	8	7	5	8	2	3	2	1	1	2	1	1			
D									1																					
E			1																											
F				3	1				2	1	3	5	1	6	3	1	2	3	3	3	4		2							
G		1								1																				
H		1								1																			1	
I			1	1		2	2					1	3	1		5	1	1	1		1	1	1				1			

Locality	Number of soft rays of dorsal fin												Number of soft rays of anal fin												
	13			14			15			16			6			7			8			9			
	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V	III	IV	V	
A			2		1	1																			
B					3	1																			
C	4	2	1	20	14	11	6	9	3	1			1						1	3	3	27	22	12	1
D					1																				
E					2	13	14	2	4	2									1	3	9	4	2	11	14
F	2	3	1		2	2	8			4				1	1				3		4	1	2	9	
G			1		2	1													2	1					
H					12	3	4	1	1										9		4	4	3	1	
I																									

anal spine, length of pectoral fin, and number of scales of lateral line, are plotted in Figs. 1~2 in reference to the body length. Table 1 tabulates the data of 3 to 5 year-old individuals which constitute the majority of the material.

It is to be seen in the figures and tables that the whole material belong to one category which should go as a species. If any splitting could be admitted, it would lead to recognition of any single individual as representing each distinct species. It goes without saying that erection of several species would appear more plausible in case of fewer number of specimens examined.

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