THE SPHYRAENIDAE OF THE INDIAN COASTS

I. Sphyraenella chrysotaenia (Klunzinger), 1884 and Sphyraena qenie Klunzinger, 1870

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Abstract

Sphyraenella chrysotaenia (Klunzinger) and Sphyraena qenie Klunzinger are recorded and described for the first time from Indian waters. Juveniles and adults of the former species occur at Visakhapatnam; adults were collected also from Porto Novo and Ernakulam. Adults of *S. qenie* were collected from Visakhapatnam and Ernakulam.

S. chrysotaenia can be distinguished from the related species S. flavicauda and from S. obtusata by: (1) Deeper body; (2) Longer pectorals and ventrals; (3) Second dorsal spine being longer than first; (4) Distance from tip of depressed first dorsal to origin of second dorsal being less than snout length; (5) Elongated last rays of second dorsal and anal.

S. qenie is distinguished by: (1) Absence of gill rakers; (2) Both dorsal fins and all or most anal rays being dark; (3) Maxilla reaching to vertical line through front of eye; (4) Absence of preopercular flap.

INTRODUCTION

THE warm water circumglobal fishes of the family Sphyraenidae commonly called barracuda or sea pike are well known because of their ferocious nature and predatory habits; there has, however, been considerable confusion in regard to the systematics of this family because many of the descriptions are inadequate or have been based on insufficient material. The fact that some of the types cannot be located has made re-examination of types or comparison of new material difficult. Further, as Smith (1956) has pointed out, not enough attention has been paid to changes in body proportions that take place with growth.

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It was felt that a study of Indian Sphyraenids should prove useful because, with the mechanisation of fishing methods and greater coverage of the Indian seas by our fishermen, these fishes are being caught in larger numbers than they have been hitherto. Their flesh is delicate and well flavoured (Smith, 1956) and they are also preferred as bait in the long line fishery for tuna along the west coast of India. It may incidentally be mentioned that the type locality of *Sphyraena jello* Cuvier, 1829, is Visakhapatnam. The description of this species was based on the "jellow" of Russel (1803). It has been generally assumed that this particular species is the most common one in Indian waters; the present authors have yet to obtain a specime.1 of this species from the type locality.

In recent years, Schultz (1953) has provided a useful, albeit tentative, key to the Sphyraenids, and Smith (1956) has made an significant contribution by distinguishing six distinct genera in the Indo-West Pacific; this latter classification is adopted here, although a little later, Williams (1958) again used the all-embracing genus name *Sphyraena* Rose, 1793. These publications pinpoint the need for a world-wide revision of this extensively distributed family. The present contribution records and describes two species *Sphyraenal Chrysotaenia* (Klunzinger), 1884 and *Sphyraena qenie* Klunzinger, 1870 for the first time from Indian waters.

MATERIAL AND METHODS

Juveniles of S. chrysotaenia (below 120 mm.) were collected from shore seines during March-May 1966 at Visakhapatnam. Larger specimens (above 154 mm.) of this species and of S. qenie were collected from boat seines and trawlers at Visakhapatnam, Porto Novo and Ernakulam during April and May, 1966. In taking linear measurements, total length was measured from tip of snout to longest caudal ray; standard length from tip of snout to mid-base of caudal fin; head length from (a) tip of chin to hindmost point of operculum for comparison with Smith's data, and (b) tip of snout to hindmost point of operculum for comparison with the data of Schultz; eye diameter horizontally, of part not covered by adipose lid.

Order: MUGILIFORMESSub-order: SPHYRAENOIDEIFamily: SPHYRAENIDAE

Sphyraenella chrysotaenia (Klunzinger), 1884 (Fig. 1 a).

Sphyraena chrysotaenia Klunzinger, 1884, pp. 128–129, Pl. 9, Fig. 3, (type locality: Red Sea); Ben-Tuvia, 1963, p. 115; Williams, 1958, pp. 97–99, Pl. 1 A.

Sphyraena aureoflamma Seale, 1909 (Philippines).

Sphyraenella chrysotacnia: Smith, 1956, p. 39, Pl. I, Fig. 2 (Pinda, Malindi).

D V + I 9, A II 8-9, P 13-14, V I 5, Ll. 86-87, Tr. between second dorsal and anal about 7 + 1 + 8 - 9. About 22-25 predorsal scales, scaling to almost above hind margin of preopercle.

In percentage of standard length: total length $113 \cdot 0-115 \cdot 5$, fork length $102 \cdot 9-107 \cdot 6$, depth $15 \cdot 4-18 \cdot 4$, head $33 \cdot 0-35 \cdot 2$, eye $5 \cdot 6-6 \cdot 7$, inter-orbital $5 \cdot 6-6 \cdot 7$, snout $13 \cdot 5-15 \cdot 2$, post-orbital $12 \cdot 2-13 \cdot 7$, pectoral $12 \cdot 3-14 \cdot 4$, ventral $10 \cdot 5-12 \cdot 7$, peduncle depth $7 \cdot 7-9 \cdot 7$, base first dorsal $9 \cdot 2-10 \cdot 6$, base second dorsal $9 \cdot 2-10 \cdot 1$, base anal $8 \cdot 2-9 \cdot 7$, first dorsal spine $10 \cdot 3-13 \cdot 3$, second dorsal spine $11 \cdot 2-13 \cdot 9$, height soft dorsal $10 \cdot 2-13 \cdot 3$; snout tip to: pectoral origin $32 \cdot 0-34 \cdot 7$, ventral origin $36 \cdot 2-39 \cdot 1$, first dorsal origin $42 \cdot 3-44 \cdot 5$, second dorsal origin $65 \cdot 6-69 \cdot 3$, anal origin $68 \cdot 6-72 \cdot 8$.



FIG. 1. (a) Sphyraenella chrysotaenia (Klunzinger), 1884, Visakhapatnam, 244 mm.; (b) Sphyraena genie Klunzinger, 1870, Ernakulam, 460 mm. Anal fin entirely pigmented.

A distinct skinny flap at the angle of preopercle. Maxilla ends distinctly in front of eye, below posterior nostril. Two gill rakers, first at angle of the two arms of first gill arch and the second on lower arm; 7-8 spinose tubercles on upper arm; on lower arm 3-4 spinose tubercles between the two gill rakers and 8-11 spinose tubercles in front of second gill raker. The spines on the tubercles are of varying size. Lower jaw the longer with short conical

prominence in front. Tongue broadly rounded, anteriorly covered with small asperities; inside of mouth yellowish. Origin of first dorsal approximately one-sixth to one-fifth in front of tip of pectoral and distinctly behind origin of ventral. Second spine only slightly longer than first. Height of second dorsal less than that of first dorsal; last ray distinctly larger than the preceding two to three rays, projects behind other rays when fin is folded back. Distance from dip of depressed first dorsal to origin of second dorsal shorter than snout (longer in the related S. flavicauda Ruppell, 1835). Anal origin below second to fourth ray of second dorsal, its base shorter than those of first and second dorsals; last ray distinctly longer than the preceding two to three rays and projects behind others when fin is folded back. Origin of ventrals slightly in front of middle of pectorals. Pectoral tip extends to between third and fourth spine, or to fourth spine of first dorsal. Inter-orbital flattened; two longitudinal ridges on head starting from above hind margin of eye and extending forward, gradually converging toward snout but diverging slightly at anterior end above snout.

Teeth.—On lower jaw an anterior median caniniform tooth directed backward followed, on each half of lower jaw, by a single series of conical teeth gradually increasing in size up to about 2/3 the length of lower jaw and then again decreasing in size. The anterior median tooth fits into a pit at anterior end of upper jaw. On upper jaw on each side, two teeth anteriorly (sometimes three) the second one larger. These are on the vomer. Behind them after an interval, is a series of palatine teeth, of which the anterior one or two are smaller than succeeding two teeth which are the largest in the series; behind these latter again, they gradually decrease in size. It is not unusual to find a dissimilarity in the number of teeth on the two sides of each jaw, or between one specimen and another. A tooth may be broken or even missing; edge of maxilla beset with a single row of fine villiform teeth.

Colour.—Greyish-brown with greenish tinge above, becoming lig er on sides, silvery-white below. First dorsal without yellow colour, edge darkgrey, pigmentation gradually decreasing downwards. Second dorsal yellowish, the colour decreasing downwards; anterodorsal edge dark grey, faint grey pigmentation over rest of fin. Anal yellowish, dark grey pigmentation only at edge of anterior rays. Caudal yellowish, edge dark grey and faint grey pigmentation over rest of fin. Upper half of pectorals yellowish, lower half lighter, lower edge unpigmented; grey pigmentation along upper edge gradually decreasing downwards. Ventrals unpigmented, iris yellowish, scales small, cycloid. Previous records of S. chrysotaenia are from Red Sea (type locality), East Africa and E. Mediterranean (Ben-Tuvia, 1963).

Note.—The Indian specimens conform to the description of S. chrysotaenia given by. Smith (1956)—Table I, except that second dorsal spine is only slightly longer than the first and the narrow stripe from eye to caudal is not seen. The number of scales below lateral line is slightly less and the head and eye distinctly larger than in African specimens.

This species resembles Sphyraenella flavicauda (Ruppell) 1835, but can be distinguished from the latter by its deeper body, longer second dorsal spine, longer pectorals and ventrals and by first dorsal origin being clearly in advance of pectoral tip (Smith, 1956). Gunther (1860) states that in S. flavicauda the origin of first dorsal fin is just above extremity of pectoral and behind the root of ventrals. From available literature, it would appear that S. chrysotaenia can probably be distinguished from S. obtusata Cuvier, 1829 in that the last ray in second dorsal and anal fins are not elongated in the latter species, which also shows a few broad bands (about 8) on the body dorso-laterally (vide Figs. in Day, 1878; Blegvad, 1944).

Sphyraena qenie Klunzinger, 1870 (Fig. 1 b)

Sphyraena qenie Klunzinger, 1870, p. 823 (type locality: Red Sea); Schultz, 1953, p. 285 (Bikini); Williams, 1958, pp. 114–119, Pl. 2 B.

Sphyraena kenie (new name) Klunzinger, 1884, p. 129, Pl, 9, Figs. 2, 2 a.

Sphyraena tessera Smith, 1956, p. 43 (Assumption Island).

D V + I 9, A I 9, P 13-15, V I 5, Ll. 133-136, Tr. between second dorsal and anal 12 - 14 + 1 + 14 - 15.

In percentage of standard length: total length $117 \cdot 0-118 \cdot 3$, fork length $105 \cdot 5-106 \cdot 5$, depth $13 \cdot 0-15 \cdot 2$, head $32 \cdot 2-33 \cdot 6$, eye $4 \cdot 6-5 \cdot 3$, inter-orbital $6 \cdot 3-6 \cdot 8$, snout $13 \cdot 5-14 \cdot 9$, post-orbital $11 \cdot 6-12 \cdot 4$, pectoral $11 \cdot 1-12 \cdot 5$, ventral $7 \cdot 4-8 \cdot 6$, peduncle depth $6 \cdot 8-7 \cdot 2$, height first dorsal $7 \cdot 6-8 \cdot 6$, height second dorsal $8 \cdot 5-9 \cdot 4$, base first dorsal $9 \cdot 7-10 \cdot 5$, base second dorsal $8 \cdot 3-9 \cdot 3$, base anal $6 \cdot 8-7 \cdot 8$; snout tip to: first dorsal origin $40 \cdot 5-43 \cdot 4$, second dorsal origin $68 \cdot 8-72 \cdot 2$, anal origin $72 \cdot 0-75 \cdot 0$, pectoral origin $30 \cdot 3-31 \cdot 7$, ventral origin $37 \cdot 9-38 \cdot 8$.

Preopercle without skinny flap. Maxilla reaches to a vertical line through front of eye. No gill rakers. Surface of outer gill arch spinose. Lower jaw the longer with a distinct conical tip. Surface of tongue and inside of mouth dusky. Vertical line through first dorsal origin passes in

TABLE I

Comparison of Sphyraenclla chrysotaenia (Klunzinger) from Bay of Bengal and Africa and S. flavicauda (Ruppell) from Africa

	Channeter	S. chrysotaenia	S. chrysotaenia	S. flavicauda	S. chrysotaenia		
] . No	. Character	Bay of Bengal	Africa (after S	E. Africa (after Williams, 1959)			
(a) Meristic characters							
1. 2. 3. 4. 5. 6. 7. 8.	First dorsalSecond dorsalAnalPectoralVentralLateral line poresL. tr. between soft dorsaland analPre-dorsal scales	V I+9 II+8-9 13-14 I+5 86-87 7+1+8-9 22-25	V I+9 II+8 2, 12 85-87 7+1+10 25	V I+9 II+8-9 2, 10, 1 80-88 6+1+8 20	V I i8 II i8 ii, 11–13 85–96		
		••	••	***	e: e		
		(b) Body pro	portions				
in perc	centage of standard length:		-				
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17.	Total lengthFork lengthDepthHeadEyeInter-orbitalSnoutPostor bitalPectoralVentralPeduncle depthBase first dorsalBase analFirst dorsal spineSecond dorsal spineHeight soft dorsal	$\begin{array}{c} 113 \cdot 0 - 115 \cdot 5 \\ 102 \cdot 9 - 107 \cdot 6 \\ 15 \cdot 4 - 18 \cdot 4 \\ 33 \cdot 0 - 35 \cdot 2 \\ 5 \cdot 6 - 6 \cdot 7 \\ 5 \cdot 6 - 6 \cdot 7 \\ 13 \cdot 5 - 15 \cdot 2 \\ 12 \cdot 2 - 13 \cdot 7 \\ 12 \cdot 3 - 14 \cdot 4 \\ 10 \cdot 5 - 12 \cdot 7 \\ 7 \cdot 7 - 9 \cdot 7 \\ 9 \cdot 2 - 10 \cdot 6 \\ 9 \cdot 2 - 10 \cdot 1 \\ 8 \cdot 2 - 9 \cdot 7 \\ 10 \cdot 3 - 13 \cdot 3 \\ 11 \cdot 2 - 13 \cdot 9 \\ 10 \cdot 2 - 13 \cdot 3 \end{array}$	$114 \cdot 0 - 118 \cdot 0$ $17 \cdot 0$ $33 \cdot 0$ $5 \cdot 8 - 6 \cdot 0$ $5 \cdot 5$ $14 \cdot 0$ $11 \cdot 0 - 11 \cdot 5$ $12 \cdot 6 - 13 \cdot 0$ $12 \cdot 3$ $8 \cdot 0 - 8 \cdot 5$ $10 \cdot 0$ $10 \cdot 0$ $9 \cdot 3$ $10 \cdot 0$ $13 \cdot 5 - 15 \cdot 0$ $10 \cdot 0 - 11 \cdot 0$	$ \begin{array}{c} 116.0\\\\ 13.0-14.5\\ 33.3\\ 6.0-6.4\\ 5.0-6.4\\ 14.0-14.5\\ 11.5-12.8\\ 11.0\\ 9.0\\ 5.5-6.0\\ 9.0\\ 9.0\\ 9.0\\ 9.0\\ 8.5-9.8\\ 7.0-8.5\\ 10.5-11.5 \end{array} $	$ \begin{array}{c} 13 \cdot 2 - 16 \cdot 6 \\ \\ $		
5nout 18. 19. 20. 21. 22.	tip to origin of:PectoralVentralFirst dorsalSecond dorsalAnal	$32 \cdot 0 - 34 \cdot 7$ $36 \cdot 2 - 39 \cdot 1$ $42 \cdot 3 - 44 \cdot 5$ $65 \cdot 6 - 69 \cdot 3$ $68 \cdot 6 - 72 \cdot 8$	$30 \cdot 0 - 31 \cdot 0 38 \cdot 0 - 40 \cdot 0 42 \cdot 0 68 \cdot 0 70 \cdot 0$	$32 \cdot 0 \\ 37 \cdot 0 \\ 43 \cdot 0 - 45 \cdot 0 \\ 69 \cdot 0 - 71 \cdot 0 \\ 71 \cdot 0 - 72 \cdot 0$	 		

front of tips of pectorals and behind base of pelvics (cf. Schultz, 1953: "only a trifle behind....," p. 286). Anal inserted below about middle of second dorsal, ventrals inserted nearer to origin of anal than to tip of lower jaw.

Teeth.—A median caniniform tooth on the lower jaw directed obliquely backwards. Behind this on either side there is a single row of teeth gradually increasing in size posteriorly. On the upper jaw on each side, anteriorly there are two prominent curved caniniform teeth; behind these there is a distinct gap, following which are well-developed conical teeth, about seven on each side on palatine. Teeth on upper jaw larger than those on lower jaw. Edge of maxilla beset with a series of fine villiform teeth; these are absent on pre-maxillae. The median caniniform tooth on lower jaw fits into conical pit in the middle of anterior side of upper jaw. Dorsally this pit opens on anterior side of snout by a small aperture, so that when mouth is closed the tip of the median tooth can be felt on snout.

Colour.—Dorsal side including dorsal side of lower jaw projecting in front of snout, a deep slate colour. Extending downward dorso-laterally are prominent bands which are very broadly 'V'-shaped with apex directed forward. In anterior half of body the apex is below lateral line, in the posterior half the apex lies on lateral line. The upper arms of these 'V'-shaped bands are as dark as dorsal side of body. Their lower arms turn lighter and fade away on ventro-lateral side of body. Between the upper arms of the bands and particularly on operculum and the middle of base of caudal are golden-yellow patches. Ventral side is uniformly silvery-white. Dorsals are of the same slate colour as the dorsal side of body, their upper thirds being darker than body. In the specimen from Ernakulam measuring 460 mm., the entire anal is dark grey except for the base which is unpigmented. Pigmentation increases gradually from above base to edge. Pectorals uniformly dark. Outer half of the proximal part of ventrals grey, rest pale yellow.

Anal of the above specimen resembles that of the type from Red Sea figured by Klunzinger (1884). In the second specimen from Ernakulam measuring 426 mm., bases of the two dorsals, particularly that of second dorsal, are lighter. Unpigmented part of base of anal is broader. Last two anal rays unpigmented except for a few dark grey pigment dots in the form of an irregular elongated blotch along middle of last ray and membrane connecting it to penultimate ray. The three specimens from Visakhapatnam measuring 370, 377 and 379 mm. resemble the second specimen from Ernakulam with sparsely pigmented last two anal rays.

TABLE II

Comparison of Sphyraena qenie Klunzinger from India, E. Africa and Red Sea (type locality) and "S. tessera" Smith

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Red Sea*	Red Sea* Red Sea†		Visakhapatnam		Ernakulam		E. Africat	'S. tessera''
		type loca- lity	specimens 345-641 mm.	370 mm.	377 mm.	379 mm.	426 mm.	460 mm,	570-1150 mm.	(after Smith, 1956)
of St. length:										
Total length	••	••	118•4-121•9	117.4	117.0	117•7	118.3	117.9	112.2-118.6	120
Fork length	••	••	••	106.3	105.5	1 <b>0</b> 5•5	106•3	106.5	••	••
Depth	••	13	12.2-14.7	13.3	13.0	13.9	15•2	13•9	12.5-16.5	15
Head‡	••	29	28.1- 30.4	33.6	32.6	33.5	32.2	32•4	27.2- 29.4	27.5
Еуе	••	5	3.6- 4.3	5,3	4.9	4.6	4.7	4.8	3.5- 2.1	3•8
Snout	••	12•5	••	14.6	14.5	14-9	15.8	13-5	11.0- 11.4	12.3
Inter-orbital	• •	••	5.5- 5.9	6•6	6.8	6•8	6.3	<b>6</b> •5	4.6- 6.4	6.1
Post-orbital		10	10.9- 11.8	11.7	11.8	11.8	11.6	12•4	10.0-11.4	10.3
Pectoral	••	10.5	10.7-11.5	11.4	11•1	11.1	11.6	12.5	10.7-12.2	11.3
Ventral	••	10.5	8.0- 8.4	7.9	7•4	8.0	8.6	8.1	7.7- 8.4	8•0
Peduncle depth		6.5	<b>6</b> ·9- 7·4	6•9	6•8	6.8	7•2	<b>7</b> •0	5.8- 6.5	10.6
Base 1st dorsal	••	••	••	10.4	9•9	10.5	9•7	10•1		S•1
Base 2nd dorsal	••	••	••	8.8	9•3	9.0	8.3	<b>8</b> •8	•••	8.3
Base anal	••	••	••	6-9	7•4	6.8	7.7	7•8		7.2
Height 1st dersal		10.5	••	7•6	8•3	7.6	8.8	8 <b>·6</b>		8.7
Height 2nd dorsal	••	10.5	••	<b>8</b> •5	9•3	••	9.4	9.1		9.3
nout tip to: 1st dorsal origin	••	36	41.5- 42.7	42·2	43•4	43•4	41.6	<b>40</b> •5	35.0- 39.8	36.0
2nd dorsal origin		65	••	68.8	70.1	70•4	72.2	69•9		67
An <b>al ori</b> gin	••	6 <b>9</b>	••	72.0	72·0	72.0	75.0	74.6		71
Pectoral origin	••	28	••	31•7	31•3	31•3	31 <b>•3</b>	30•3	••	29
Pelvic origin	••	34	••	38•4	38.1	38.5	38•8	37•9	••	33

* From Klunzinger's data (1870, 1874) compiled by Smith (1956).

† After Williams (1959).

‡ Measured from tip of chin to hindmost point on operculum.

#### DISCUSSION

The five specimens from India conform to the type description and figure of *S. qenie* Klunzinger from Red Sea. The majority of body proportions of the five specimens agree very well with those of the specimens from East Africa and Klunzinger's four specimens from Red Sea deposited in the Vienna Museum (Williams, 1959)—vide Tables II and III. However, in Indian specimens the head and snout are longer and inter-orbital broader; in Red Sea specimens the eye is smaller; in East African specimens the peduncle depth is less than that of specimens from the other two localities, and first dorsal origin is comparatively more in front.

In regard to meristic characters, the number of lateral line pores is least in East African specimens (120–130); in Red Sea specimens it is 124–134, and in Indian specimens it is 133–136. The specimen from Ernakulam measuring 460 mm. resembles specimen figured by Klunzinger (1884) in that anal is completely pigmented. The other four specimens resemble the specimens from Bikini (Schultz, 1953), Red Sea and East Africa (Williams, 1959) in that last two anal rays are largely unpigmented.

Body proportions of Indian specimens agree in most respects with those of specimen (St. 1. 816 mm.) from Bikini (Schultz, 1953) Table III. In Indian specimens the head is longer and eye diameter greater. The latter is inbetween that of forms from Red Sea and Bikini. Schultz (1953) noted that his Bikini specimen differs from Red Sea specimen in that last two anal rays in the former are white, but he hesitated to create a new species on the basis of the few differences that he noted (p. 286) between the specimens from the two localities.

Smith (1956), when he obtained a 1200 mm. specimen near Assumption Island (north of Madagascar) with last two anal rays white as in the Bikini specimen but differing from Klunzinger's Red Sea type in this respect and in having smaller eye diameter and pelvic origin nearer tip of mandible, created a new species *S. tessera* to include also the *S. genie* from Bikini. Williams (1959) has shown that *S. tessera* Smith, 1956, is a junior synonym of *S. genie* Klunzinger, 1870.

In comparison with "S. tessera" (Table II), in Indian specimens:

- 1. Base of first dorsal is lightly longer than that of second dorsal, whereas in S. tessera the bases are equal.
- 2. Pelvic origin is nearer anal origin as in Red Sea form, whereas in S. tessera pelvic origin is markedly nearer tip of mandible.

## TABLE III

## Body proportions of Sphyraena genie Klunzinger from different areas

From type fig. of Vienna- of Mun) matrix 12 four Red Sea Bikini Spec. Bikini Specimens	pinnis Temm, & Schl. Type fig.*
Klunz.*     Musy 345-641 mm.†     mm.†     mm.     Musy 690 mm.†	
In St. length: Head [‡] 3.7 3.28-3.61 3.6 3.40-3.66 3.1-3.2 3.55	4.5
Depth 7.6 6.80-8.13 7.1 6.00-7.93 6.5-7.5 8.31	7•4
Snout to 1st dorsal 2.7 2.34-2.40 2.7 2.35-2.85 2.3-2.4 2.46	2•9
Distance between dorsals 3.4 2.38-3.58 3.2 3.05-3.31 3.4-3.6 3.41	2.9
In head length: Eye 5.7 6.52-8.00 7.6 5.59-7.91 5.7-6.8 7.76	9•5
Snout 2.2 2.2 2.31-2.46 1.9-2.2 2.37	2.7
Inter-orbital 4.27-5.52 5.01-6.19	••
Post-orbital 2.8 2.29-2.60 2.4 2.53-2.77 2.4-2.7 2.58	2.0
Maxillary 2.0 1.82-2.10 2.1 2.15-2.30 2.0-2.1 2.83	2.5
Least depth of caudal 4.0 3.54-4.37 4.2 4.32-4.77 4.2-4.6 4.73	<b>4</b> •5
pecuacie       Pectoral $$ $2 \cdot 25 - 2 \cdot 65$ $$ $2 \cdot 34 - 2 \cdot 65$ $$	••
Ventral 3.15-3.62	••
Pectoral to ventral 5.7 3.28-4.08 4.1 3.81-5.00 3.7-4.2 3.28	3.8
In post-orbital: Eye 2.1 2.52-3.13 3.1 2.09-2.85 2.1-2.5 3.00	4.8
Pectoral to ventral 2.1 1.27-1.60 1.7 1.46-1.92 1.4-1.6 1.27	1.9
In depth: Pectoral to 1st dorsal 1.7 1.09-1.33 1.4 1.28-1.70 1.2-1.3 1.18	1.3
Ll. line pores 140 124-134 125 120- 30 133-136 125-127	••

* After Schultz et al. (1953).

† After Williams (1959).

‡ Length of head measured from tip of snout to hindmost point on operculum.

3. Head and eye are larger.

- 4. Peduncle depth is less.
- **B**2

- 5. Fins are placed further behind.
- 6. Lateral line pores are more in number (133-136) than in S. tessera (125).

The Indian specimens, in our opinion, bridge the gap between Klunzinger's material from Red Sea and Schultz's specimen from Bikini and Smith's "S. tessera" from near Assumption Island, and that all of them refer to S. genie Klunzinger, 1870.

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