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NOTES ON CARANGIN FISHES

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7. ON *DECAPTERUS SANCTAE-HELENAE* (CUVIER AND VALENCIENNES)

The Cleveland Museum of Natural History has recently presented the American Museum with fishes collected by its "Blossom" expedition (1923–1926) in warm waters of the Atlantic a good many years ago. Those of the genus *Decapterus*, representing *D. macarellus* (Cuvier and Valenciennes), and *D. sanctae-helenae*, are of particular interest to me as I had not previously examined specimens of the latter form.

This material, which has been preserved in formalin and later become somewhat dried, is not now in as good condition for study as one might wish. Body depths are subject to slight error, and no attempt has been made at comparative counts of fin-rays, but for most other characters, 14 specimens (six *macarellus* of 169 to 203 mm., eight *sanctae-helenae* of 193 to 230 mm., standard lengths) are reasonably satisfactory.

The expedition crossed the ocean to the Cape Verde Islands and landed at Dakar. Thence it crossed back to near the easterly point of Brazil, visited South Trinidad Island, and landed at Rio de Janeiro. From here it crossed to the eastern Atlantic once more, more or less along the thirtieth parallel of south latitude, and returned to the United States, stopping at St. Helena, Ascension, Fernando Noronha, and skirting north of the West Indies (Simmons, 1927, Natl. Geogr. Mag., vol. 52, chart, p. 5). Unfortunately, we have not been able to check now the localities where given specimens were taken, except that at least two of the *macarellus* and three of the *sanctae-helenae* studied are definitely

from St. Helena. As both forms considered are more or less pelagic, probably with wide ranges, in the eastern Atlantic at least, this is less important than it otherwise would be.

In the *D. macarellus*, scutes consistently occupy the hind half (only) of the posterior straight part of the lateral line, whereas in the *sanctae-helenae* they occupy about 60 per cent (in one of 193 mm.) to 70 or 80 per cent (average 78, seven specimens of 203 to 230 mm.). The scutes in *sanctae-helenae* are somewhat less weak than those in *macarellus*, and occupy more than half (with increasing size of fish, an increasing proportion) of the posterior straight part of the lateral line. This is the most tangible offhand character to separate the two forms.

In the *macarellus* the more or less correlated number of normal lateral-line scales varies from 107 to 112 (average 109); of scutes, from 21 to 28 (average 24). Scutes plus scales are 130 to 140 (average 133). In the *sanctae-helenae* of 193 mm. scale plus scute count is 95 + 27, total 122; whereas in those of 203 to 230 mm., scales vary from 70 to 82 (average 74), scutes from 33 to 38 (average 35), total 103 to 117 (average 109). As the two largest *macarellus* (of 187 and 203 mm.) have only 21 scutes, it is possible that these are reduced in number with size of fish, versus increased in *sanctae-helenae*. However, when scutes occupy more distance, normal scales must occupy less, naturally are fewer, and as scutes are larger than scales, the total is also less. It may prove impossible to differentiate really small fish of the two species on these characters.

The *sanctae-helenae* differ from the *macarellus* further in having a larger mouth, maxillary 2.6 to 2.9 in head (average 2.7), reaching almost or to under front margin of eye, versus 3 to 3.6 (average 3.2), reaching two-thirds to six-sevenths (average 78 per cent) of that distance.

As previously noted for *D. muroadsi* from the Oriental region (Nichols, 1942, Amer. Mus. Novitates, no. 1196, pp. 6–8), these *sanctae-helenae* show considerable individual variation, which sometimes gives two specimens a quite unlike appearance. It is probably school or population difference, and likely partly phylogenetic, partly ontogenetic, and not worth taxonomic recognition. Of three specimens almost identical in size (228–230 mm.), two from St. Helena, September 12, 1925, with adjacent field numbers (5056, 5057), very likely from the same school, are much alike, with depth about 5, contrasted with the third unusually long-

bodied individual, probably also from there some two weeks later, with depth 5.8.

A larger proportion of the lateral line being subject to invasion by scutes in *sanctae-helenae* is a basic difference between it and *macarellus*, to which certain other characters are corollary. In this respect it resembles *D. muroadsi* (Temminck and Schlegel) examined (Nichols, *supra cit.*). These two forms are very close. A tangible difference in material of over 200 to 270 mm. examined is a smaller number of scutes in *muroadsi* (29 to 33, average 31), occupying a smaller part (67 to 71, average 69 per cent) of the straight part of the lateral line. In species of this genus where the teeth are very small, I have found them too variable to be a reliable criterion, but teeth are noticeable in the jaws of the three *sanctae-helenae* over 225 mm., and none were noticeable in four *muroadsi* of 220 to 270 mm. It would be my judgment to recognize *muroadsi* only as a geographic race of *sanctae-helenae*.

Decapterus sanctae-helenae and *macarellus* have been confused recently, very likely more as a matter of nomenclature than of the two fishes as here understood. However, it is possible that Trewavas (1945, Ann. Mag. Nat. Hist., ser. 11, vol. 12, pp. 623–625) had both from St. Helena and compared them, overlooking other differences than proportional ones in paired fins, which on the basis of her nine specimens examined seemed to be a sex character. The seven "Blossom" *sanctae-helenae* over 200 mm. and five *macarellus* over 170 mm. show a comparable difference in length of pectoral: 1.1 to 1.2 (average 1.13) in the head for the former; 1.3 to 1.4 (average 1.38) for the latter. It is normal in the Caranginae for the pectoral to be proportionately much longer and more falcate in larger individuals, though less so in *Decapterus* than some other genera, and this is not a very good character for differentiating forms. A single "Blossom" *sanctae-helenae* of 193 mm. has the pectoral 1.6; a *macarellus* of 169 mm., 1.8.

These two forms, though certainly related, differ in obvious characters which have been found reliable in differentiating species of *Decapterus*. But the interesting suggestion that such characters are to some extent, or in some cases, matters of sex is worth looking into when appropriate material comes to hand.

The various species of *Decapterus* around the world form a series: from those shorter bodied, more compressed, with stronger and more extensive scutes, larger mouths and stronger teeth, seemingly more littoral and with less extensive ranges to those

which are longer bodied, less compressed, with weaker, less extensive scutes, smaller mouths, and teeth very small or absent. It is logical to look on this as their line of evolution, though there is no proof which end (or the middle) of the series is actually more primitive, and also to consider *macarellus* its terminal member. *D. macarellus* is circumtropical, and of it I recognize at least three races: *D. m. macarellus* from the Atlantic, scarcely distinguishable from *D. m. pinnulatus* of the Hawaiian Islands, and *D. m. macrosoma* of the East Indies, more different from these two.

Fishes of this genus are particularly abundant in the Oriental region (East Indies to Japan), and five species, covering practically the entire length of the series, are recognized from there (Nichols, 1942, pp. 1–8). Terminal *macarellus* and a basal species, *punctatus*, occur in the West Indian fauna, and I know only the subterminal *scombrinus*, related to *sanctae-helenae*, from eastern Pacific waters.

It looks as though the Orient had been an evolutionary and distribution center for *Decapterus*. Four species are listed by Barnard as having occurred in South Africa (1927, Marine fishes of South Africa, pp. 533–536), and, though a warm water genus, it presumably rounds the Cape of Good Hope. He uses tooth and gill-raker characters, which I have not found satisfactory, to differentiate the species, but there is every reason to suppose his *muroadsi* from Delagoa Bay, even if not identical with *muroadsi* of Japan, is at least conspecific with it and with *sanctae-helenae*.

8. ON *CARANX GUARA* AND *CARANX GEORGIANUS*

Fishes of the genus *Caranx* allied to *C. guara* (*Scomber guara* Bonnaterre, 1788, America, which equals *Scomber dentex* Bloch and Schneider, 1801, Brazil, *Caranx dentex* of authors), have been independently described in different parts of the world. Such are *Caranx georgianus* Cuvier and Valenciennes, 1833, Australia; *C. chilensis* Gay, 1850, Juan Fernandez; perhaps *C. platessa* Cuvier and Valenciennes, 1833, East Indian seas.

The question of how many actually differentiable species are involved has sometimes been raised. In 1935 Templeton Crocker collected specimens from Masafuera, Juan Fernandez, and San Felix Islands which were obviously *C. chilensis* Gay, and as obviously not *C. guara* of the Atlantic with which I was familiar,

hence my opinion that *guara* was confined to the Atlantic. In 1936 Fowler (Hong Kong Nat., vol. 7, nos. 3–4, p. 286) listed *C. guara* from Chinese waters, and in 1945 Nichols (Lingnan Sci. Jour., vol. 21, nos. 1–4) says, "*Caranx guara* is a name the writer uses for an Atlantic fish, considering its representative in the western Pacific a different species."

More recently, in examining photographs of casts of different species of *Caranx* kindly sent by Miss Margaret Titcomb of the Bernice P. Bishop Museum, Honolulu, I was struck by the close resemblance of *Caranx cheilio* Snyder, 1904 (Bull. U. S. Fish Comm., vol. 22, p. 524, pl. 8, fig. 14, Honolulu) to *C. guara*. There is no significant difference in figures or descriptions of it from the Atlantic fish, of which it must at most be a recognizable race. The scutes of its lateral line are given as 38, a higher number, but there is room for considerable personal equation in counting them in this species, and the figure does not show this difference. Faunally the fish from the China coast is likely to be the same as that from the central Pacific. Fowler was presumably right in calling it *guara*, and there is no good evidence to hand for recognizing *cheilio* as a different species.

I have also compared our specimens of *C. chilensis* with descriptions and figures of *C. georgianus* from Australia without finding any significant difference, and conclude that these two are at least conspecific.

Caranx guara and *georgianus* (as above) are closely related, their differences in technical characters being slight and inconstant. They have small, thick-lipped mouths, with a single row of teeth; numerous, long gill-rakers, 22 to 27 on the lower limb of the arch; dorsal and anal fins scarcely elevated in front, with a considerable basal sheath, 25 to 27, and 21 to 23 soft rays, respectively; breast fully scaled; curve of lateral line (chord) appreciably longer than the straight part, small scutes occupying no more than about the posterior three-fourths of the latter.

Caranx guara has the thicker lips, a smaller eye, the lower jaw shorter than the upper (instead of the two approximately equal), particularly so under a conspicuously projecting snout in large individuals. Over 150 mm. (standard length) it becomes deeper and more compressed, with profile slanting down from the back to a more pointed head, a very different looking fish from *georgianus*, which probably also becomes deep bodied, with lower jaw slightly the shorter, but at a larger size (Ogilby, 1893, Edible

fishes . . . of New South Wales, pl. 24). Specimens from Bermuda of 88 mm. (standard) have depth 3.2; of 108 mm., 3.1; of 132 mm., 3; of 284 mm., 2.8; whereas a *chilensis* of 235 mm. from San Felix has it 3.6.

There is considerable variation within each of these two species as recognized, very likely some of it geographic, justifying the recognition of subspecies. Although the scanty material examined does not prove this, one may for convenience recognize *cheilio* as a subspecies of *guara* and *chilensis* as a subspecies of *georgianus*. *Cheilio* may be *platessa*, but this is uncertain, though it probably has sometimes been so identified by authors. There is nothing in Weber and de Beaufort, East Indies, or Day, India, identifiable as a form of *guara*, the quite different *liolepis* there seemingly being most like it. A single 160-mm. specimen from Madeira to hand is slightly different from specimens examined from Bermuda, deeper bodied (depth 2.6), with fewer scutes (24 versus 27 to 29) and fewer gill-rakers (22).

It is interesting that this superspecies divides according to north and south latitudes rather than by oceans. It may be subtropical rather than truly tropical (which might account for its absence in India and the East Indies) and hence not cross readily from one hemisphere to the other. Or it may be that *C. georgianus* inhabits seas more temperate than those where *guara* is found. Barnard (1927, Fishes of South Africa, p. 547) records it from South Africa as *Caranx dentex*, and, whereas he considers this determination somewhat uncertain, if his description is actually based on a South African specimen it would be *C. guara*.