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Sexual Dimorphism in Number of Rostral Teeth of the Sawfish, *Pristis perotteti* Müller and Henle, 1841

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ABSTRACT

Rostral tooth counts were made of 211 sawfish (*Pristis perotteti*) from the Lake Nicaragua-Rio San Juan System. The number of teeth is established early in development and it changes only on accidental loss of teeth, which are not replaced. The average number on the left side is equal to that on the right, but in individuals, either side may have as many as three more teeth than the other. Female tooth counts average 15.94 per side and range from 14 to 18, while males average 18.00 with a range of 16 to 20. Within litters, this dimorphism is also evident, but somewhat less overlap occurs between sexes. On the basis of only three males and three females, *P. pectinatus* does not appear to exhibit the same dimorphism.

INTRODUCTION

The two species of sawfish that occur along the western Atlantic Coast are usually separated on the basis of rostral tooth counts of 20 or fewer for *Pristis perotteti* and 24 to 32 for *P. pectinatus* (as in Bigelow and Schroeder, 1953). Baughman (1943) reported that fishermen on the Texas coast regard this species difference as a sexual dimorphism, but he did not indicate which sex was ascribed to each species. Miles (1947) reported both *P. perotteti* and *P. pectinatus* present in the estuary of the Magdalena River in Colombia and likewise reported the belief that the difference in rostral tooth numbers represented sexual dimorphism, without identifying the sexes. This view is clearly untenable, since both sexes occur in both species, and since several easily observed morphological characters other than tooth counts separate the two species (Bigelow and Schroeder, 1953). Nevertheless, only isolated bits of information are on record concerning tooth counts of either species.

Apart from general statements regarding

tooth numbers, the only report regarding sawfish tooth counts known to me is a brief reference by Hubbs and Hubbs (1945). They reported that, of 84 specimens of three species of the genus *Pristis*, 48 (57%) had from one to three more teeth on one side than the other. The count was higher on the left in 20 and on the right in 28, although the difference was not statistically reliable. They noted the need for large series of counts for a single species at one locality.

A life history study of *Pristis perotteti* now in progress in the Lake Nicaragua-Rio San Juan System of Nicaragua and Costa Rica has made possible taking tooth counts of 211 individuals of *P. perotteti*. These included 172 fetuses ranging from 18 to 79 cm in total length and 39 from 137 to 397 cm taken on baited hooks or in seines, including immature as well as sexually mature individuals. Of the total, 115 were females and 96 males.

RESULTS

No differences in tooth numbers were noted related to stage of life history. The number of rostral teeth is apparently fixed from early development. One or more teeth are frequently lost accidentally after birth. The vacant sockets heal but the teeth are not replaced. These observations agree with those of Slaughter and Springer (1968).

The teeth can readily be counted in embryos as small as 18 cm in total length, and with magnification and special techniques they can be counted at a considerably earlier stage. There was usually no difficulty in identifying the location of lost teeth, which were always included in the counts. The few individuals that had lost a portion of the rostrum including an undetermined number of teeth were not used.

No differences were noted between tooth counts of sawfish taken at the mouth of the Rio San Juan and in Lake Nicaragua. It has been shown conclusively (Thorson, 1971) that the sharks (*Carcharhinus leucas*) in the same freshwater system move freely between the lake and the sea. There is little doubt that the

sawfish do likewise and that they are the same species throughout the system.

The average number of teeth on the left side (16.85) was virtually identical with that of the right (16.80). However, the teeth were not necessarily paired, even in the embryonic stages, and the left and right sides of a single rostrum might differ by as much as three teeth. Of the 211 specimens, 119 (56.4%) had unequal numbers of teeth on the two sides. This is almost identical with the 57% reported by Hubbs and Hubbs (1945). The count was higher on the left side in 57 specimens and on the right in 62, a smaller difference than that reported by Hubbs and Hubbs, and not statistically reliable (χ^2 at one degree of freedom = 0.1343; $P = 0.29$). In 96 of the 119 specimens with unequal tooth counts, the two sides differed by one tooth, in 21 they differed by two teeth, and in two they differed by three. Of the latter, one was a female with a count of 14/17 and the other was a male with 16/19. No sex-related pattern was demonstrable in any aspect of the bilateral asymmetry.

Early in the study it was noted that the highest tooth counts usually proved to be from males and the lowest from females (first observed by research associate Donald E. Watson, now at University of Lagos, Nigeria). A total of 230 individual side counts of females and 192 of males were tabulated (Fig. 1). Females ranged from 14 to 18, with an average of 15.94, while males ranged from 16 to 20, with an average of 18.00. There is clearly a sexual difference, but since the ranges overlap, only the highest counts of males (19 and 20) and the lowest counts of females (14 and 15) can be used with any confidence as an indicator of sex, on the basis of the rostrum alone.

Observations were made on 28 litters of young that included at least one male and one female. Although within a litter, side counts of teeth tended to show less overlap between sexes than indicated in Figure 1, for the species as a whole, the sexes were not completely separable on this basis. In nine litters, all males had higher tooth counts than all females; in 14, the lowest male count was equal to the highest female count (they overlapped by one); and in five, the male and female counts overlapped by two. In 25 lit-

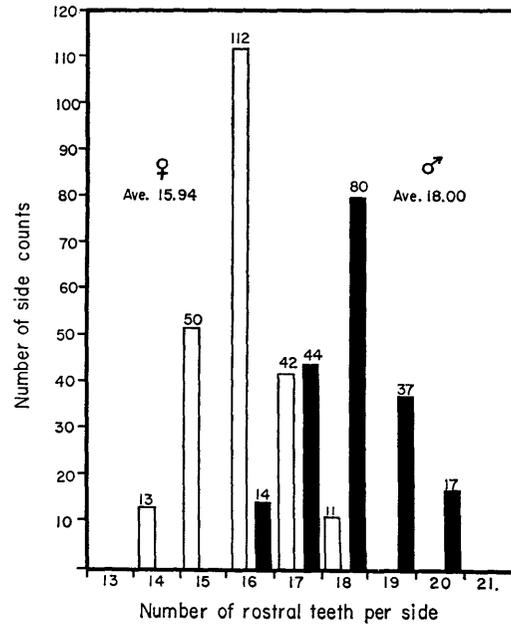


FIGURE 1.—Frequency distribution of rostral tooth counts of female (white bars) and male (black bars) *Pristis perotteti*.

ters, total tooth counts (left plus right) of all males were higher than those of all females, while in only three did the highest total count of the females equal the lowest of the males. In none did a female total count exceed that of any male of the same litter.

In only two instances were tooth counts of both the female and her litter taken. One female with a tooth count of 16/15 had one female offspring (15/14) and two males (17/17 and 17/18). The other female (16/17) had two female young (16/16 and 14/15) and two males (17/17 and 19/18). Interpretation is impossible without information on the male parent.

Three male and three female *Pristis pectinatus* were taken at the mouth of the Rio San Juan at Barra del Colorado, Costa Rica. No sexual dimorphism was apparent in this species, although the sample size was too small to allow me to draw a firm conclusion. The six female side counts ranged from 26 to 28, while the six male counts ranged from 25 to 29. The sides of each rostrum varied by as much as two teeth. Four more rostra from specimens of unknown sex also had from 26 to 29 teeth on each side.

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