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NOTES ON A NEW SPECIES OF FLATFISH FROM OFF THE  
COAST OF NEW ENGLAND



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About April 18, 1912, the Bureau of Fisheries received from Mr. John R. Neal, of Boston, three specimens of flounders taken in an otter trawl on one of the offshore banks of New England. An examination of these specimens and comparison with known American and European flatfish indicated that they were a hitherto undescribed species.

On May 22, 11 additional specimens were received from Mr. Neal, by request, and examination supported the view that they were new to science.

Something over 15 years ago the writer was told by a Georges Banks fisherman that occasionally flounders were taken on Georges Banks that were known to the fishermen as "lemon sole," owing to their prevailing yellow coloration. The identity of this fish was never definitely determined, but it was thought that it was probably the "rusty dab" (*Limanda ferruginea*). Mr. B. A. Bean, Assistant Curator of Fishes, United States National Museum, recently informed the writer that a number of years ago the Museum received from Mr. Eugene Blackford, of Fulton Market, New York, a number of large flounders taken in deep water off the New England coast which were then decided to be a deep-water form of *Pseudopleuronectes americanus*.

While the differences between this form and *P. americanus* are not very great, they appear to be collectively constant, although many of the characters individually approach *P. americanus* very closely. In fact, some of them, especially those exhibited by single specimens of each form examined, may disappear in an examination of larger series, particularly of fish of similar sizes, as the gillrakers and teeth of most fishes vary in number and character with the age of the fish. All of the differences, even, may be found to intergrade, but on the principle that a binomial name should represent what is known rather than what is not, it is believed that what is shown in the following descriptions and tables entitles this fish to be considered a distinct species until complete intergradation shall have been proved. Should such an intergradation be discovered, the name will only be lengthened to a trinomial and will still bear the terminal attributive signifying "worthy."

The most conspicuous differential characteristics of this species consist of a somewhat shorter head, a larger number of vertical fin rays, the coloration, and the large size

attained; which, taken with its deep-water habitat and different spawning season from that of *P. americanus*, seem sufficiently distinctive.

***Pseudopleuronectes dignabilis* Kendall, new species.**

Head, 4.5 in length without caudal; depth, 2.2; eye, 6.5; snout, 5.4 in head; dorsal, 68; anal, 50; scales, 85.

Body broadly elliptical, dextral, its greatest depth about in a line between the twenty-seventh dorsal and eleventh anal rays; lateral line nearly straight; distance from the posterior end of the dorsal to base of upper caudal ray equal to distance from posterior end of anal to base of lower caudal ray, about 2.66 in head and less than the width of the narrowest part of the caudal peduncle, immediately back of the vertical fins, which is about 1.75 in head; scales on right side strongly ctenoid but entirely smooth on left; scales extending nearly to tips of most of the rays of all of the fins on right side; first 15 and last 6 dorsal, and first 5 and last 6 anal rays without scales; fortieth dorsal ray about equaling twenty-sixth anal ray in length, the longest ray in each fin about 1.9 in head; pectoral moderate, 1.60 in head; ventral short, about 2.60 in head; head comparatively short, almost entirely scaled on right side and wholly naked on left; mouth small, lips thick, the lower with a sort of thick triangular projection at its symphysis, turned somewhat to the right; close set incisor teeth in both jaws, mostly on the blind side; gape much less than the length of upper jaw (maxillary and premaxillary); upper jaw 4, mandible about 2.70, in head; preorbital in widest part about 7.40, snout (consisting of preorbital and premaxillary widths) about 4.20 in head; eye moderate and prominent; interorbital almost flat and scaly, more than  $\frac{1}{2}$  eye, about 10.20 in head.

Color: generally light yellowish-brown with irregular wash of lemon yellow; center of each scale bluish-gray, the brown forming a broad margin; some variously sized blotches of darker brown, the brown covering the scales, but their margins still darker; faint whitish blotches, with an approach to regularity of arrangement, appearing on margins of body dorsally and ventrally near bases of the vertical fins, one on each side of the caudal peduncle, and some somewhat alternately along each side of lateral line; margins of preopercle and opercle, also branchiostegals and some of the fin-rays, lemon yellow.

Type, a female 22 inches long (no. 73918, U. S. National Museum) from Georges Bank. (*Dignabilis*, worthy.)

TABLE OF RANGES AND AVERAGES OF PROPORTIONAL MEASUREMENTS AND COUNTS OF 8 COTYPES.

	Range.	Average.
Total length .....	14 $\frac{3}{4}$ to 23 $\frac{1}{2}$ inches.	A little over 20 inches.
Head .....	<i>In length without caudal:</i>	<i>In length without caudal:</i>
Depth .....	4.87 to 4.26	About 4.50.
	2.36 to 2.08	2.20.
	<i>In head:</i>	<i>In head:</i>
Eye .....	6.58 to 5.70	About 6.10.
Snout .....	5.00 to 4.86	4.90.
Maxillary .....	4.48 to 3.81	4.20.
Mandible .....	3.14 to 2.63	2.80.
Gape .....	7.64 to 6.60	7.00.
Interorbital .....	11.50 to 9.00	10.00.
Preorbital .....	10.45 to 7.22	8.16.
Longest dorsal ray .....	2.00 to 1.71	1.90.
Longest anal ray .....	2.00 to 1.71	1.90.
Pectoral .....	1.94 to 1.60	1.80.
Ventral .....	2.90 to 2.40	2.70.
Distance from dorsal to caudal .....	3.31 to 2.45	2.90.
Distance from anal to caudal .....	3.31 to 2.45	2.90.
Width caudal peduncle .....	2.10 to 1.71	1.90.
	<i>Number:</i>	<i>Number:</i>
Scales .....		About 85 in series above lateral line.
Dorsal rays .....	68 to 73	71.
Anal rays .....	51 to 54	52.

TABLE OF RANGES AND AVERAGES OF PROPORTIONAL MEASUREMENTS OF 3 SPECIMENS FIRST RECEIVED.

	Range.	Average.
Total length.....	16 to 21 inches.	About 19.70 inches.
Head.....	<i>In length without caudal:</i> 4.99 to 4.65	<i>In length without caudal:</i> About 4.81.
Depth.....	<i>In head:</i> 2.25 to 2.09	<i>In head without caudal:</i> About 2.19.
Eye.....	6.66 to 5.80	6.18.
Snout.....	5.43 to 5.00	5.21.
Maxillary.....	4.86 to 4.73	4.45.
Mandible.....	2.56 to 2.42	2.48.
Gape.....	7.30 to 6.66	6.97.
Interorbital.....	10.42 to 10.00	10.21.
Preorbital.....	7.25 to 6.25	<i>In head:</i> About 6.61.
Longest dorsal ray.....	1.77 to 1.52	1.65.
Longest anal ray.....	1.77 to 1.52	1.65.
Pectoral.....	1.61 to 1.43	1.54.
Ventral.....	2.50 to 2.14	2.30.
Distance dorsal to caudal.....	3.44 to 1.92	2.59.
Distance anal to caudal.....	3.44 to 1.92	2.59.
Width caudal peduncle.....	1.81 to 1.65	1.70.
Scales.....	<i>Number:</i>	<i>About 85.</i>
Dorsal rays.....		72.
Anal rays.....	52 to 54	53.

The ranges and averages of dorsal and anal fin rays of 11 specimens of *Pseudopleuronectes dignabilis* compared with 11 specimens of *P. americanus* appear as follows, the specimens of *dignabilis* being the type and cotypes previously tabulated and those of *americanus*, representing localities from Cape Cod to Chesapeake Bay, being selected for their size:

Name.	Dorsal rays.		Anal rays.	
	Range.	Average.	Range.	Average.
<i>P. dignabilis</i> .....	68 to 73	70.6	50 to 54	52.3
<i>P. americanus</i> .....	61 to 67	64.7	46 to 50	48

The gillrakers of one specimen of *P. dignabilis* were 4+8 and of one *P. americanus* 3+7, the latter the smaller specimen.

The teeth in the upper jaw of *P. dignabilis* consisted of 2 on the right side separated by a short gap from an irregular row of 17 on the left side. In a smaller *P. americanus* there was only 1 on the right side and 19 in a regular row on the left. The lower jaw of *P. dignabilis* had no teeth on the right side and 17 on the left. *P. americanus* had 2 on the right side and 17 on the left. The upper pharyngeals of each species have 3 rows of teeth each. In *P. dignabilis* the row next the mouth consists of 7 short, blunt teeth, the middle row of 5 somewhat hooked and sharper teeth and the inner row of 7 still sharper and more strongly hooked teeth. *P. americanus* has 7 teeth in the row next to the mouth and 6 in each of the other rows and all are equally strongly hooked, longer and sharper than in the other species. In both species there are 2 irregular rows of teeth in the lower pharyngeals, short and blunt in *P. dignabilis* and somewhat longer and sharper in *P. americanus*.

The lateral line in *P. dignabilis* as in *P. americanus* sometimes has a small curve above the pectoral fin.

The first 3 specimens received consisted of 2 males and 1 female, the latter being the largest. Of the 11 specimens of the second lot, only the smallest two were males. Thus the males seem to run considerably smaller than the females. All of the males have the scales of the left as well as of the right side ctenoid. One female, however, was found to have some strongly ctenoid scales on the left side.

Individuals vary considerably in color, the males usually being darker and the colors more strongly pronounced than in the females. The spots and blotches show, as a rule, but faintly in fresh specimens, but appear more distinctly after preservation, especially if formalin is first used. The color of the 21¼-inch female of the first lot when first received was light, irregular yellowish-brown generally, the

brown extending on some of the vertical fin rays; centers of scales bluish gray with brown margins; faint blotches of darker brown, covering the scales in the blotch but still most intense on the edge of each scale; yellowish tinge in large poorly defined blotches; dorsal fin rays pink with orange posterior edge, this color extending on membrane, but the tips of the rays white; on the 26th ray the scales begin to be brown, becoming more intense posteriorly with the orange yellow more defined on base of fin at the posterior third; last 8 rays pink and very little yellowish; anal colored as dorsal; scales on caudal brown margined, membranes and rays somewhat tinged with yellow except near terminal margin, where it is bluish translucent and tips of rays white; pectoral membrane bluish translucent; scales of rays brown-edged and few at base tinged with yellowish; ventral membrane pink with light-brown-edged scales on rays; jaws pink, tinged with yellowish brown; preopercle and opercle same as on body; chin and gular region pink; branchiostegals orange, as is margin of opercle, the upper one the most intensely colored; iris golden and upper ocular membrane bluish gray, tinged or dappled irregularly with yellowish brown; under or left side of head, jaws and all except cheek (which is white) pink; fins all pink; body white; belly pink.

The 21¼-inch male was generally colored much as in the female but somewhat darker and not so pink underneath, with orange and ferruginous blotches smaller and more distinct; belly orange; fins all dark; outer terminal half of caudal slatey; ventral of right side light rusty yellowish; left side white; a number of light gray-white blotches on head and body, made up of groups of scales, but each scale having a narrow brown margin; these blotches mostly more definitely spot-like than the darker ones, arranged along body irregularly, but most numerous and approaching alternate regularity on opposite side of the lateral line; large whitish blotch-like area under pectoral; another on side of abdomen and others regularly arranged as follows: 5 along dorsal margin of body, 1 opposite base of seventeenth, twenty-fifth, thirty-fifth, forty-sixth, and sixtieth dorsal ray, respectively; 4 along ventral margin of body, 1 opposite ninth, seventeenth, twenty-ninth, and forty-fifth ray, respectively; 1 on each side of caudal peduncle, and 1 each at bases of fifth and sixth rays from upper and lower margin of caudal, respectively.

The first 3 fish received were nearly ripe; the others, excepting the 2 small males, which appeared to be immature, were spent, thus indicating that the spawning season is between April 15 and May 15. The height of the spawning season of *P. americanus* at Woods Hole is in February, and is earlier farther north.

The stomachs of the fish were gorged with hydroids, among which were a few small crabs and other invertebrates.

The locality from which the first lot was obtained was not definitely known. Regarding this lot Mr. Neal wrote:

"Referring to the flatfish, a sample of which we sent you, our trawlers have taken these fish on all parts of Georges Bank and on grounds east of Nantucket, the latter much smaller and less plentiful than on Georges.

"Fishing on Georges in water from 20 to 25 fathoms we have landed up to 15,000 pounds, or about 30 per cent of the total catch per trip.

"In water from 40 to 70 fathoms the percentage drops to about 5.

"We give the actual fishing of the steamer *Spray*, May 1, 1911, to April 29, 1912, total catch 3,292,744 pounds, out of which were 120,000 pounds of these flatfish.

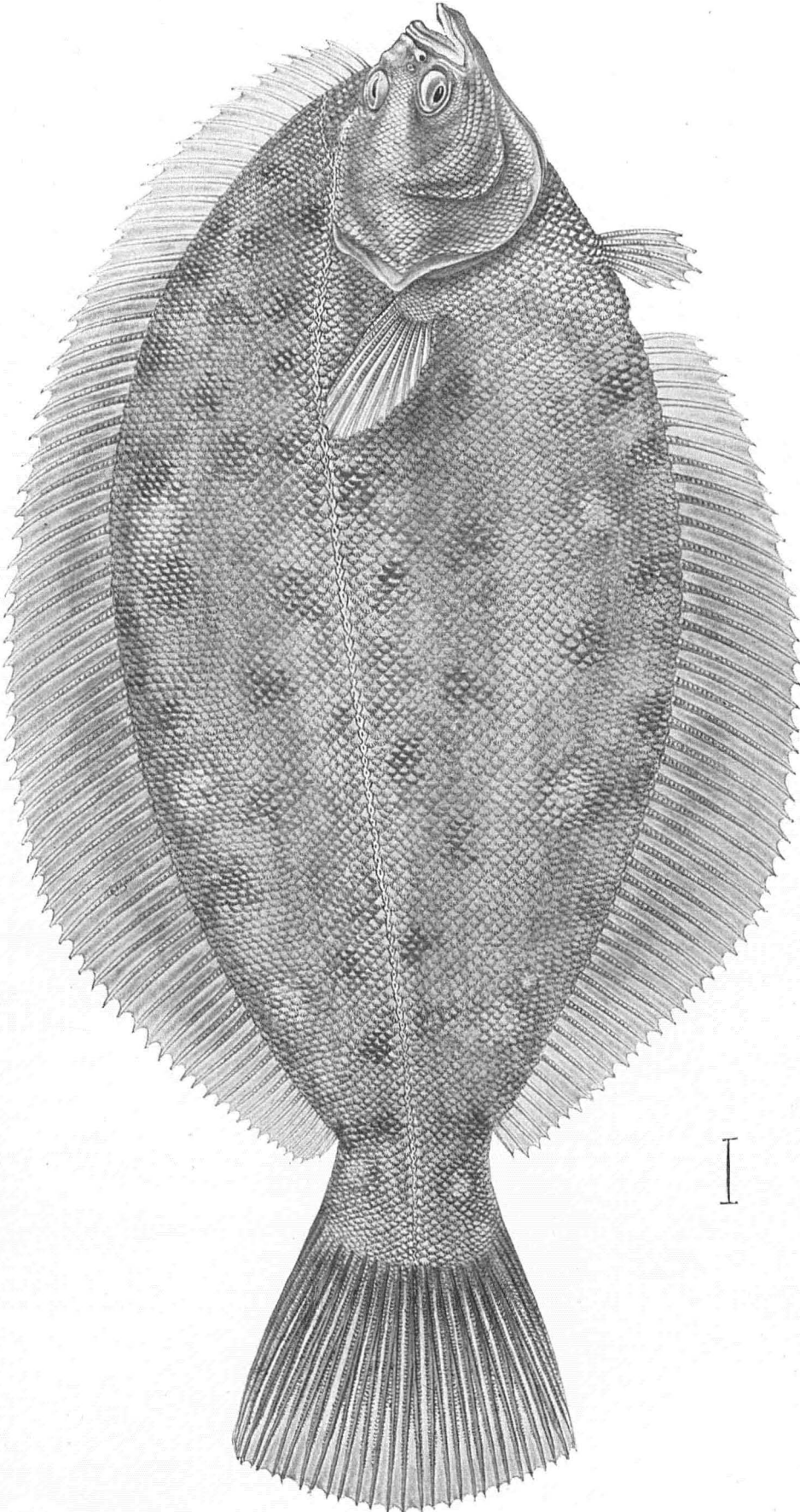
"These fish appear to be on the grounds as above stated at all seasons of the year in about the same quantities."

Regarding the second lot Mr. Neal wrote:

"These fish were caught on Georges Bank in latitude from 41° 15' to 42° north and longitude 67° to 68° 30' west, from 15 to 35 fathoms of water, most plentiful in 20 fathoms. These fish were caught by the steamer *Ripple*, which had about 10,000 pounds, or about 25 per cent of the total catch for this trip."

The fish is thick and firm meated, and the flesh is flaky and, when cooked, moist and of delicious flavor.

In size attained, numbers caught, and delectability, considered economically and gastronomically it is surely a "worthy" fish.



Lemon flounder, *Pseudopleuronectes digenabitis* Kendall.

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