

Table of Measurements.

Current number of specimen.....	22,468.	
	Milli- metres.	100ths of length.
Length to origin of middle caudal rays.....	610	.....
Body:		
Greatest height.....		19
Greatest width.....		10
Height at ventrals.....		18½
Least height of tail.....		9
Head:		
Greatest length.....		22½
Greatest width.....		8½
Width of interorbital area.....		4½
Length of snout.....		5½
Length of operculum.....		8½
Length of upper jaw.....		8½
Length of mandible.....		11
Distance from snout to orbit.....		5½
Diameter of eye.....		5½
Dorsal (spinous):		
Distance from snout.....		65
Length of base.....		15½
Length of longest ray.....		6
Anal:		
Distance from snout.....		68½
Length of base.....		18½
Length of longest ray.....		6½
Caudal:		
Length of middle rays.....		6½
Length of external rays.....		14
Pectoral:		
Distance from snout.....		27
Length.....		10
Ventral:		
Distance from snout.....		48
Length.....		6½
Branchiostegals.....	VI	.....
Dorsal.....	22	.....
Anal.....	25	.....
Caudal.....	19	.....
Pectoral.....	12	.....
Ventral.....	1, 9	.....
Number of scales in lateral line.....	65	.....
Number of transverse rows above lateral line.....	7	.....
Number of transverse rows below lateral line from origin of ventral.....	11	.....
Number of caecal appendages.....	15	.....
Vent:		
Distance from snout.....		65

WASHINGTON, April 25, 1879.

ON THE SPECIES OF *ASTROSCOPUS* OF THE EASTERN UNITED STATES.

By TARLETON H. BEAN.

The family *Uranoscopidae* of Gill has two representatives on the east coast of the United States, *Astroscopus y-gracum* (C. & V.) Gill, and *A. anoplus* (C. & V.) Brevoort. The former was described from the Caribbean Sea, and is now for the first time recorded in our waters. *A. anoplus* was founded upon young individuals sent by Professor LeConte, and the immaturity of the specimens has led to considerable confusion in the diagnoses of genera. Cuvier and Valenciennes supposed the species to be scaleless. Drs. Gill and Günther both employed this as one of the characters separating it from *Uranoscopus*, the latter in 1860\* assigning the *U. anoplus* of Cuvier and Valenciennes to his new genus,

\* Cat. Fish. Brit. Mus. ii, 1860, p. 229.

*Agnus*, with the distinguishing characters of a naked body and the absence of a filament in the mouth. Dr. Gill, in 1861,\* used the same characters in transferring the same species from *Uranoscopus* to *Astroscopus* of Brevoort, adding some particulars as to the mauling of the head and the armature of the preoperculum. The species, in fact, is covered with scales, which in the young are inconspicuous, but in the adult may be readily counted. The genus *Astroscopus*, however, is well separated from *Uranoscopus*, and may be thus defined:

ASTROSCOPUS Brevoert.

*Uranoscopus* sp. CUV. & VAL., Hist. Nat. Poiss., viii, 1831, p. 493.

*Astroscopus* BREVOORT, Proc. Phila. Acad. Nat. Sci., Jan. 1860, p. 20.—GILL, op. cit., 1861, p. 113.

*Agnus* GÜNTHER, Cat. Fish. Brit. Mus., ii, 1860, p. 229.

*Upsclonphorus* GILL, op. et loc. cit.

Head above with its crown covered with a bony plate, from the middle of the anterior margin of which arises a y-shaped apophysis, the limbs of which extend to the orbits. Postocular region covered only with skin.

Preoperculum with two blunt processes † generally radiating from the angle of its anterior limb, one of which is directed downwards and forwards. Humeral spine inconspicuous. Lower jaw entire beneath. Lips furnished with numerous filaments. No spines before the ventrals.‡ No intralabial filament. Head and belly without scales; the rest of the body covered with small scales. Two dorsal fins; the first composed of four short spines, the second about equal to the anal.

1. *Astroscopus y-græcum* (Cuv. & Val.) Gill.

*Uranoscopus y-græcum* CUV. & VAL., Hist. Nat. Poiss., iii, 1829, p. 308.—GÜNTHER, Cat. Fish. Brit. Mus., ii, 1860, p. 229.

*Astroscopus y-græcum* GILL, Proc. Acad. Nat. Sci. Phila., xii, 1860, p. 21.

*Upsclonphorus y-græcum* GILL, op. cit., xiii, 1861, p. 113.

There are now two specimens of this species in the National Museum, one (No. 18044) taken in the Saint John's River, Florida, by Prof. S. F. Baird, April 2, 1877; the other (No. 18029) collected in the Matanzas River Inlet, Florida, by Mr. Joseph C. Willetts, in February, 1877. In a collection of color-sketches of fishes made for Prof. Louis Agassiz, and now lent by the Museum of Comparative Zoölogy to the National Museum, are illustrations of *A. y-græcum* from Hampton Roads, Va., Charleston, S. C., and Pensacola, Fla.

DESCRIPTION.—The greatest height of the body (.26) equals twice the length of the operculum (.13). Its greatest width (.24) equals the height at the ventrals (.24), and the distance of the ventrals from the snout (.24). The least height of the tail (.10) is contained 10 times in the total length, and equals the distance between the eyes (.10). The length of the caudal peduncle (.08) equals that of the last anal ray (.08), and is contained  $12\frac{1}{2}$  times in the total length.

\* Proc. Phila. Acad. Nat. Sci., 1861, p. 113.

† More marked in *A. anoplus* than in *A. y-græcum*.

‡ These are present in *Uranoscopus scaber* and *U. asper*, and probably in all species of *Uranoscopus*. I am not aware that this has been previously mentioned.

The greatest length of the head (.37) slightly exceeds the distance of the spinous dorsal from the snout (.36). The length of the postocular depression (.11) equals more than 3 times the length of the snout (.03½), and is contained about 9 times in the total length. The width of this depression (.07½) equals about  $\frac{2}{3}$  of its length. The greatest width of the head (.28) equals 4 times the length of the second dorsal spine (.07). The jaws are shorter than in *A. anoplus*. The length of the upper (.15½) equals half the length of the anal base (.31), and is contained 6½ times in the total length (less than 6 times in *A. anoplus*). The length of the mandible (.21) is contained 4½ times in the total length. The maxilla extends to a perpendicular, drawn at a distance behind the eye equal to the short diameter of the eye, and the mandible ends in the same vertical. The long diameter of the eye (.03) equals half the length of the last ray of the second dorsal (.06).

The distance of the spinous dorsal from the snout (.36) is a little less than the greatest length of the head (.37). The length of its base (.11) is contained 9 times in the total length, and equals the length of the postocular depression. The spines are all longer than in *A. anoplus*. The length of the first (.07½) is nearly  $\frac{1}{2}$  the length of the upper jaw, and slightly exceeds that of the second (.07), which equals  $\frac{1}{3}$  of the length of the mandible. The last spine (.02½) is  $\frac{1}{3}$  as long as the first. The length of the base of the second dorsal (.30) is contained 3½ times in the total length, and equals 3 times the distance between the eyes. Its longest ray (.19½) equals somewhat more than half the length of the head (much less than half in *A. anoplus*). The length of the last ray (.06) equals the distance from the snout to the orbit (.06).

The distance of the anal from the snout (.57) equals nearly 3 times the length of the longest dorsal ray. Its length of base (.31) is almost equal to that of the second dorsal. The first ray (.04) is half as long as the last (.08); the longest (.14½) is contained nearly 4 times in the distance from the snout to the origin of the anal, and nearly 7 times in the total length.

The length of the middle caudal rays (.25) equals  $\frac{1}{4}$  of the total length. The length of the external rays (.23) equals that of the ventral (.23).

The distance of the pectoral from the snout (.35½) equals 5 times the length of the second dorsal spine. Its length (.30½) equals 5 times that of the last dorsal ray. It extends to the fourth anal ray.

The distance of the ventral from the snout (.24) does not greatly exceed its length (.23), and is equal to the height of the body at the ventrals (.24). The ventral extends to about the origin of the spinous dorsal. The vent is under the anterior rays of the second dorsal.

Radial formula: B. VI; D. IV, 14; A. 13; P. 19-20; V. 6. L. lat. ca. 80.

COLOR.—*Astroscopus y-gracum* has, on the upper parts, numerous white spots, some of which are as long as the short diameter of the eye.

NOTE—In the tables of measurements the unit of length is the length of body to the origin of the middle caudal rays.

Table of Measurements.

Species, *Astroscoptes y-gracum*.

Current number of specimen .....	18,029.		18,044.		Aver- ages.
	Locality .....		Locality .....		
	Matanzas River Inlet, Florida.		Saint John's River, Florida.		
	Milli- metres.	100ths of length.	Milli- metres.	100ths of length.	100ths of length.
Extreme length .....	318		165		
Length to origin of middle caudal rays .....	253		131		
Body:					
Greatest height .....		24½		28	26
Greatest width .....		24		24½	24
Height at ventrals .....		24		24½	24
Least height of tail .....		10		10½	10
Length of caudal peduncle .....		7½		8	8
Head:					
Greatest length .....		37		37½	37
Length of occipital depression .....		12		10½	11
Width of occipital depression .....		6½		8½	7½
Greatest width .....		27½		28	28
Width of interorbital area .....		10		9½	10
Length of snout .....		3½		3½	3½
Length of operculum .....		12½		13	13
Length of maxillary .....		15		16	15½
Length of mandible .....		21		21½	21
Distance from snout to orbit .....		6		6	6
Diameter of orbit .....		2½		3½	3
Dorsal (spinous):					
Distance from snout .....		35		37	36
Length of base .....		10½		11	11
Length of first spine .....		7½		7½	7½
Length of second spine .....		7		7	7
Length of last spine .....		2		3	2½
Dorsal (soft):					
Length of base .....		30		30½	30
Length of first ray .....		7		7	7
Length of longest ray .....		18		21	19½
Length of last ray .....		6		6	6
Anal:					
Distance from snout .....		58½		55	57
Length of base .....		31½		30	31
Length of first ray .....		4		4	4
Length of longest ray .....		14		15	14½
Length of last ray .....		8½		7	8
Caudal:					
Length of middle rays .....		24½		26	25
Length of external rays .....		23½		22	23
Pectoral:					
Distance from snout .....		35		36	35½
Length .....		32		29	30½
Ventral:					
Distance from snout .....		25		23	24
Length .....		22½		23	23
Branchiostegals .....		VI		VI	
Dorsal .....		IV, 14		IV, 14	
Anal .....		13		13	
Caudal .....		16			
Pectoral .....		20		19	
Ventral .....		6		6	
Number of scales in lateral line .....		ca. 80			

2. *Astroscoptes anoplus* (C. & V.) Brevoort.

*Uranoscopus anoplus* CUV. & VAL., Hist. Nat. Poiss., viii, 1851, p. 493, (described from young specimens sent by Prof. LeConte): DEKAY, Nat. Hist. N. Y., Fishes, 1842, p. 37, pl. xxii, fig. 65: STORER, Syn. Fishes N. A., 1843, p. 46 ("South Carolina, LeConte"); Mem. Amer. Acad., ii, p. 298.

*Astroscoptes anoplus* GILL ex BREVOORT MSS., Proc. Acad. Nat. Sci. Phila., xii, Jan. 1860, p. 20; xiii, May, 1861, p. 114; Cat. Fishes E. Coast N. A., 1861, p. 43; Rep. U. S. Com. Fish., 1873, p. 798: YARROW, Proc. Acad. Nat. Sci. Phila., 1877, p. 207: JORDAN & GILBERT, Proc. U. S. Nat. Mus., i, 1879, p. 372.

*Agnus anoplus* GÜNTHER, Cat. Fish. Brit. Mus., ii, 1860, p. 229.

*Astroscopus guttatus* ABBOTT, Proc. Acad. Nat. Sci. Phila., xii, 1860, p. 335, pl. vii; GILL, Cat. Fish. E. Coast N. A., Jan. 1861, p. 43.

*Upsclonphorus guttatus* GILL, Proc. Acad. Nat. Sci. Phila., xiii, 1861, p. 113.

The U. S. National Museum has specimens of *A. anoplus* from Tompkinsville, N. Y., Norfolk, Va., and from an unknown locality. The list is as follows:

19761	Young....	Tompkinsville, N. Y. .	Charles Copley.
4622 a	Adult.....	Norfolk, Va .....	
4622 b	...do .....	.....do .....	
7304	(7 specs.)..	United States?.....	

DESCRIPTION.—The shape of the body is similar to that of *Uranoscopus scaber*. Its greatest height (.29), which is at the origin of the spinous dorsal, is contained 4 times in its length in the young and  $3\frac{1}{4}$  times in the adult. The greatest width of body (.24 $\frac{1}{2}$ ) is nearly  $\frac{1}{4}$  of the length, and equals the length of the ventral (.24 $\frac{1}{2}$ ). The height at the ventrals (.27) equals three times the distance from the snout to the centre of the eye (.09). The least height of the tail (.11) equals the width of the interorbital area (.11), and is contained 9 times in the total length.

The length of the head (.39) equals 3 times the length of the operculum (.13). There are two postocular depressions, whose length (.07 $\frac{1}{2}$ ) equals their width (.07 $\frac{1}{2}$ ), or slightly less than twice the length of the snout (.04). The greatest width of the head (.31) equals nearly 3 times the least height of the tail. The length of the upper jaw (.17) is contained nearly 6 times, and of the mandible (.23)  $4\frac{1}{3}$  times in the total length. The long diameter of the eye (.03 $\frac{1}{2}$ ) equals  $\frac{1}{4}$  the length of the longest anal ray (.14), and  $\frac{1}{11}$  of the length of the head.

The distance of the spinous dorsal from the snout is about  $\frac{3}{8}$  of the total length. The length of its base (.12) equals twice the length of its first spine (.06). The spines are all shorter than in *A. y-gracum*. The second spine equals the first, and 3 times the last (.02). The length of the base of the second dorsal (.30) equals 6 times the length of its last ray (.05). The first ray equals the first spine in length. The longest ray (.16 $\frac{1}{2}$ ) is contained 6 times in the total length.

The distance of the anal from the snout (.60) equals twice the length of the second dorsal base (.30), and nearly twice the length of the anal base (.31). The first anal ray (.04) equals the snout in length. The longest (.14) slightly exceeds in length the operculum, while the last (.07 $\frac{1}{3}$ ) about equals the length of the postocular depression.

The length of the middle caudal rays (.23 $\frac{1}{2}$ ) is usually a little less than that of the ventral (.24 $\frac{1}{2}$ ).

The distance of the pectoral from the snout (.36) equals 3 times the length of the base of the spinous dorsal. The length of the pectoral (.29) exceeds the length of the ventral (.24 $\frac{1}{2}$ ) by about  $\frac{1}{6}$  of the length of the latter, and is contained nearly  $3\frac{1}{2}$  times in the total length. It extends to the 5th anal ray.

The distance of the ventral from the snout ( $.25\frac{1}{2}$ ) slightly exceeds its length. The ventral extends to a vertical through the anterior part of the first dorsal.

Radial formula: B. VI; D. IV-V, 13-14; A. 12-13; C. 16-18; V. 6. L. lat. ca. 113.

The lateral line begins about the middle of the operculum, ascends backward to near the upper outline of the body, under the anterior half of the first dorsal, follows the upper outline close to the bases of the rays as far as the end of the second dorsal, from which point it curves downward to the origin of the middle caudal rays, and thence follows the origin of the bases of the lower caudal rays.

COLOR.—*Astroscopus anoplus* is minutely spotted with white on the upper parts.

NOTE.—In the measurement tables the unit of comparison is the length to the origin of the middle caudal rays.

Table of Measurements.

Species, *Astroscopus anoplus*.

Current number of specimen.....	10,761.		"Guttatus," 4,622 a.		"Guttatus," 4,622 b.		Aver- ages.
	Tompkinsville, N. Y.		Norfolk, Va.		Norfolk, Va.		
Locality.....	Milli- metres.	100ths of length.	Milli- metres.	100ths of length.	Milli- metres.	100ths of length.	100ths of length.
Extreme length.....	112		273		275		
Length to origin of middle caudal rays.....	91		221		220		
Body:							
Height at first dorsal.....		25		31		31	29
Greatest width.....		23		25		25 $\frac{1}{2}$	24 $\frac{1}{2}$
Height at ventrals.....		26		28		27	27
Least height of tail.....		11		11		11	11
Length of caudal peduncle.....		7		11		11	
Head:							
Greatest length.....		38		39		39	39
Length of occipital depression.....		7		8		7 $\frac{1}{2}$	7 $\frac{1}{2}$
Width of occipital depression.....		7		8		7 $\frac{1}{2}$	7 $\frac{1}{2}$
Greatest width.....		30		31		32	31
Width of interorbital area.....		10		11		11 $\frac{1}{2}$	11
Length of snout.....		4		4		4	4
Length of operculum.....		13		13		13	13
Length of maxillary.....		17		17		16 $\frac{1}{2}$	17
Length of mandible.....		23		22		23	23
Distance from snout to centre of orbit.....		9		9		9	9
Diameter of orbit.....		4		3		3 $\frac{1}{2}$	3 $\frac{1}{2}$
Dorsal (spinous):							
Distance from snout.....		38		36		38	37
Length of base.....		11		12		12	12
Length of first spine.....		6		6		6	6
Length of second spine.....		6		6		*5 $\frac{1}{2}$	6
Length of last spine.....		2		1 $\frac{1}{2}$		1 $\frac{1}{2}$	2
Dorsal (soft):							
Length of base.....		31		30		30	30
Length of first ray.....		5		6		6 $\frac{1}{2}$	6
Length of longest ray.....		17		16		16 $\frac{1}{2}$	16 $\frac{1}{2}$
Length of last ray.....		5		5		5	5
Anal:							
Distance from snout.....		58		60		62	60
Length of base.....		29		33		30	31
Length of first ray.....		4		4		5	4
Length of longest ray.....		14		13		14	14
Length of last ray.....		6		8		8	7 $\frac{1}{2}$
Caudal:							
Length of middle rays.....		23		23		24 $\frac{1}{2}$	23 $\frac{1}{2}$

\* Broken.



Table of Measurements—Continued.

Current number of specimen.....	10,761.		"Guttatus," 4,622 a.		"Guttatus," 4,622 b.		Aver- ages.
Locality.....	Tompkinsville, N. Y.		Norfolk, Va.		Norfolk, Va.		
	Milli- metres.	100ths of length.	Milli- metres.	100ths of length.	Milli- metres.	100ths of length.	100ths of length.
Pectoral:							
Distance from snout.....		34		37		37	36
Length.....		29		28		29	29
Ventral:							
Distance from snout.....		24		27		25½	25½
Length.....		25		24		24½	24½
Branchiostegals.....	VI		VI		VI		
Dorsal.....	IV, 14		V, 13		V, 14		
Anal.....	12		13		13		
Caudal.....	16-17		18		18		
Pectoral.....	19		20		20		
Ventral.....	6		6		6		
Number of scales in lateral line.....			113+				

WASHINGTON, May 6, 1879.

**ON THE OCCURRENCE OF HIPPOGLOSSUS VULGARIS, FLEM., AT UNALASHKA AND ST. MICHAEL'S, ALASKA.**

**By TARLETON H. BEAN.**

No one has yet positively identified the halibut of the Pacific coast of North America with the *Hippoglossus vulgaris* of Fleming, so far as I can learn. Ayres, in 1854,\* writing of the species observed in the market of San Francisco, says: "The great *Hippoglossus vulgaris*, universally known as the 'halibut,' the fishermen have assured me is sometimes caught near the Farallon Islands. Most of those sold in our market, however, if not all, are brought from the coast further north." In volume 2 of the same Proceedings (1859, p. 30), he writes: "Another species, in which the eyes are on the right side, is occasionally taken near the Farallon Islands, opposite the mouth of the Bay, which I do not feel warranted in separating from *H. vulgaris*, without a direct comparison of the two. Its fin-rays are D. 102, A. 73, P. 16, V. 6, C. 4, 1, 7, 8, 1, 4.

"It appears to be seldom quite as large as *H. californicus*."

The number of anal rays in this enumeration is smaller than usual, but not improbable.

Lord† gives a graphic account of the Indian mode of fishing for halibut, and remarks as to the species: "I believe the species to be the *Pleuronectes hippoglossus* of Linnæus, but of this I am by no means perfectly clear, as I had only an opportunity of examining this single specimen, that I estimated as weighing over 300 lbs.; and it was quite impossible to investigate its specific character," &c.

\* Proc. Cal. Acad. Sci., i, 1854, 1st ed., p. 41, and 2d ed., p. 40.

† Naturalist in Vancouver Island and British Columbia, i, 1863, p. 149.