

Article II.—NOTES ON LANTERN FISHES FROM SOUTHERN SEAS, COLLECTED BY J. T. NICHOLS IN 1906.

BY CHARLES H. GILBERT.

***Myctophum antarcticum* (Günther).**

One specimen, 55 mm. in total length, 44 mm. to base of caudal fin; locality approximately 39° S. Lat., 79° W. Long., about 400 miles southwest of Valparaiso, Chile. The locality is thus near that of Lütken's larger specimen of *Scopelus colletti* (about 600 miles west of Cape Horn), from which he largely drew the description of the species. The present specimen agrees much more closely with Lütken's figure and description (*Spolia Atlantica*, *Scopelini*, pp. 249–250, fig. 7) than with Brauer's (*Deutsche Tiefsee-Expedition*, XV, pp. 168–170), but all descriptions are so seriously lacking in detail that it is impossible to determine whether Brauer was justified in ranging *M. colletti* in the synonymy of *M. antarcticum*, or whether the species is distinct.

The following notes on the distribution of photophores in our specimen will be useful for further comparisons.

Thoracics 5, the anterior not concealed as figured by Brauer, all the thoracics more posteriorly placed; thus the second is only slightly in advance of the line joining the suprapectoral with the lower subpectoral, the third is vertically beneath the upper subpectoral, the fourth is near the base of the ventral fins, and the fifth is crowded out at the side, distinctly elevated, its lower margin slightly above base of ventrals. First four pairs of thoracics equally spaced; photophores of the first pair closely approximated on median line, those of second, third and fourth pairs equally and more widely separated from their fellows. According to Brauer, the thoracics are all "auf gleicher Höhe"; Lütken finds the "sidste Par rykkede lidt mere ud fra hinanden."

The ventral photophores are also said by Brauer to be equally elevated, while according to Lütken, the first and fourth pairs are a little nearer each other than the others. In our specimen, those of the first pair lie immediately behind and mesad to the base of inner ventral ray, and are almost in contact with each other on the median line; the second and third pairs are much farther from the ventral line, about on the level of the outer ventral rays; those of the fourth pair again more closely approximated, at either side and slightly in advance of the vent.

Anal 15, in three distinct groups: the first includes the first 2 photophores, which lie nearer the base of the anal fin than do the others, and are separated by a wider space from those which follow; the middle group contains 9, arranged in a slight ~-shaped curve, the anterior and middle spots nearest the base of the fin, the posterior gently diverging; the third group contains the posterior 4, which lie in parallel lines behind the anal fin, and are distinctly nearer the median line than are

any of the middle group; they undoubtedly represent the postero-anals of other species. Precaudals 2, well separated from the anal series, in a horizontal line above rudimentary caudal rays.

Suprapectoral much smaller than the subpectorals, inserted in front of upper subpectoral and slightly below its level; the line joining suprapectoral and lower subpectoral passes through the second thoracic (not the third as in Brauer's figure).

Supraventral slightly nearer lateral line than base of ventral fin; a line joining supraventral and 5th thoracic passes almost directly through 4th thoracic also.

Supra-anals more angulated than shown in Brauer's figure, the 2nd a little lower than the 1st, the latter on a level with the supraventral; a line joining the second supra-anal and the upper subpectoral passes along the lower margin of the supraventral and the 1st supra-anal; 3rd supra-anals immediately below the lateral line, the line joining 2nd and 3rd supra-anal passing through the 4th ventral; space between 2nd and 3rd supra-anal but $\frac{2}{3}$ that between the 1st and 2nd, the 1st equidistant between the 2nd and the supraventral. A distinct photophore at base of adipose fin.

D. 13; A. 19; V. 8; Lat. 1. 39.

Myctophum affine (*Lütken*).

One specimen, from approximately 1° S., 118° W., typical of the species in all respects. The anal photophores are $8 + 6$ in number on each side, a number which occurs rarely about the Hawaiian Islands, but apparently grows more common south of the equator.

Myctophum humboldti *Risso*.

A single specimen, 42 mm. in total length, off the coast of Chile, approximately 39° S., 79° W.

The variations in number and position of photophores reported by Brauer (Deutsche Tiefsee Expedition, XV, 1906, p. 193, figs. 108-111) on the basis of the Valdivia material, seem excessive for a single species. The figures apparently represent 4 of the 10 specimens secured by the expedition, although closer indication of their locality has been omitted. I have compared our single specimen with 4 of those reported on by Lütken (*Spolia Atlantica: Scopelini*, 1892, p. 254, fig. 12) from the vicinity of Cape Horn and find agreement in all important respects, without more variation than is commonly found in other species of the genus. In all, the antero-anals are distinctly arched, the line joining the 2nd and 3rd supra-anals passes immediately in front of the 4th ventral, the supraventral and the first 2 supra-anals are approximately in the same straight line and equally spaced, the 1st supra-anal is over or very slightly in advance of the 2nd ventral, and the precaudals are obliquely inserted on the base of the lower caudal

lobe. In our specimen, the anals are $9 + 6$ on one side, $8 + 7$ on the other, the posterolateral is above the last antero-anal in each case, hence more anterior in position on one side than on the other; the posteroanals are in pairs and opposite, the odd one on the side with 7 being anterior in position, obviously corresponding to the posterior odd anteroanal of the opposite side. First three pairs of thoracics are equally spaced and form two series regularly diverging backwards; space between 3rd and 4th thoracics much shorter than the preceding interspaces, the 4th pair closely approximated; 4th interspace a trifle longer than 3rd, those of the 5th pair again farther apart, at base of outer ventral rays. First pair of ventrals mesad to base of inner ventral rays, succeeding pairs somewhat farther separated and equally so, the distances between the pairs equal.

***Dasyscopelus spinosus* (Steindachner).**

A single specimen, 44 mm. long, from approximately 1° S., 118° W. The anal series of photophores are $7 + 7$ in number, the anterior group gently arched; the precaudals are a little more widely spaced than the anal series, the posterior a little higher than the anterior; the supra-anals are in a straight oblique line; the long pectorals reach to the vent; the series of scales which cover the anal photophores have already developed the row of stronger spines so characteristic of adults.

***Rhinoscopelus tenuiculus* (Garman).**

Twelve specimens, 35 to 50 mm. long, were taken Nov. 27 and 28, 1906, approximately at 1° S., 118° W., nearly midway between the Galapagos and the Marquesas Islands, and one specimen to the north of this point, at approximately 8° N., 119° W. But two specimens had been placed on record hitherto, the type from the vicinity of Panama and a second specimen from $10^{\circ} 57' 35''$ W., southeast of the Hawaiian Islands.

In his preliminary review of the Myctophids of the Valdivia Expedition (Zool. Anz., 1904, 28, p. 390), Brauer has arranged this species in the synonymy of *R. coccoi*, and in his final report (Die Tiefsee Fische, 1906, 194 and 196), he identifies it with *Myctophum hians* Richardson. Neither position is correct. As has been shown by the writer (Mem. Mus. Comp. Zool., 1908, 26, p. 222), *tenuiculus*, while closely allied to *coccoi*, is well distinguished by the reduced number of ventral rays, the shorter anal and the differing proportions of head and body. In *R. tenuiculus*, the ventrals contain but 7 rays, while in *coccoi* there are invariably 8. This distinction holds in the two specimens of *tenuiculus* previously reported on, the thirteen speci-

mens of the present collection, and in six specimens from near the Galapagos Islands, to which we have had access. Of *coccoi*, we have examined seven specimens of the Lütken material, five of these from the mid-Atlantic and two from the Indian Ocean; and nineteen specimens from the western Atlantic off Cape Hatteras. All have 8 ventral rays, and the anal rays vary from 20 to 23, as follows: 20 in 3 specimens, 21 in 15 specimens, 22 in 6 specimens, 23 in 2 specimens. In *tenuiculus*, the number of anal rays varies from 18 to 20, as follows: 18 in 7 specimens, 19 in 13 specimens, 20 in 1 specimen.

The antero-anal photophores agree in the two species, ranging in our material from 5 to 7, with 6 the prevailing number and 7 rare. In correspondence with the longer anal fin in *coccoi*, the postero-anals are more numerous in that species and more of them are located in advance of the last anal ray. Thus in *coccoi*, the postero-anals are 11 in 8 specimens, 12 in 11 specimens, 13 in 7 specimens; the numbers in advance of last anal ray are 5 in 3 specimens, 6 in 16 specimens, 7 in 7 specimens. In *tenuiculus*, the postero-anals are 10 in 4 specimens, 11 in 11 specimens, 12 in 4 specimens, and those in advance of last anal ray are 4 in 11 specimens, 5 in 8 specimens.

While it is recognized that the number of specimens at our disposal is not adequate to discover the total range of variation in the two species, it is proper to call attention to the fact that Brauer's material extended over the known range of both species. It is possible therefore, that the extreme variation assigned by Brauer may be due in part to his failure to differentiate the two forms.

Centrobranchus andreæ (Lütken).

A fine specimen, 50 mm. long to base of caudal fin, was taken by Captain W. L. Josselyn, southwest of Tahite, 24° S., 152° W. Both Lütken and Brauer have failed to note the obsolete lateral line and the undeveloped gill-rakers in this species, characters in which it agrees with *C. charocephalus*, and which differentiate these two species sharply from all other known forms including *Rhinoscopelus coccoi*. Lütken's description was based on material which included two distinct species, the specimens I have been privileged to examine not being typical of *andreæ*. Having no material for comparison, I accept provisionally Brauer's identification of *C. gracilicaudus* with *andreæ*.

Our specimen has the 3 supra-anals in an almost straight line, the first only a trifle advanced, the line passing just cephalad of the fourth ventral; supra-anals 6 + 11, three of the posterior series overlapping the anal fin; back of caudal peduncle with 8 conspicuous phosphorescent scales, not at all confluent.

Scales somewhat irregularly arranged, the mid-lateral series enlarged, wholly lacking the longitudinal ridge which in *R. coccoi* marks externally the position of the tube of the lateral line. Scales from the mid-lateral series when detached and examined under a lens appear wholly wanting in tube or pore; examined superficially, an occasional lighter spot along the series may simulate a pore.

Outer gill-arch with 4 or 5 low tubercles on horizontal limb, wholly lacking the long slender gill-rakers present in *Rhinoscopelus coccoi*. That this is indicative of different food habits in the two genera is made additionally probable by the extreme development of the teeth in *C. andreae*. The jaws and the palatines are not specialized in this respect, but the pterygoid has a broad tooth-bearing surface covered with strong conical teeth in several rows. The pharyngeals are even more developed, the upper pharyngeals forming salient masses at the back and sides of the pharynx, extending laterally in front of the posterior gill arches, which are somewhat displaced thereby.

Lampanyctus nicholsi sp. nov.

Type 57 mm. long, taken by Mr. J. T. Nichols, Oct. 15, 1906, at approximately 47° S., 60° W., a short distance north of the Falkland Islands.

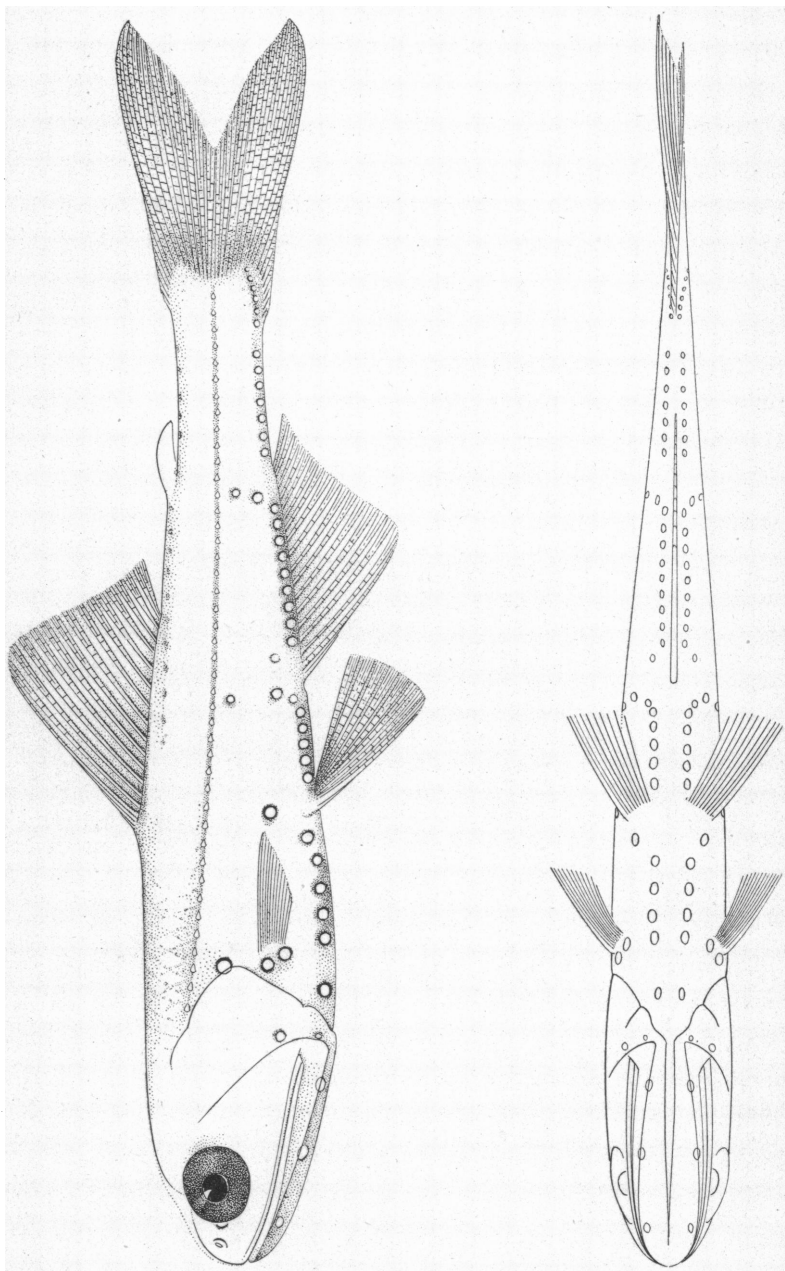
Not closely related to any known species, being sharply distinguished by the insertion of both subpectorals on the level of the base of the pectoral fin, by the presence of 6 thoracic and 5 ventral photophores, none of which is elevated, and by the presence of 6 precaudals sharply set off from the postero-anals.

Measurements in hundredths of total length without caudal: length of head 31; diameter of eye 8.5; axial length of snout 5; length of maxillary 23.5; greatest depth of body 17; least depth of caudal peduncle 9; distance from tip of snout to origin of dorsal 44; length of base of dorsal 20; distance from snout to adipose dorsal 76; to insertion of ventrals 46; to front of anal 60; length of base of anal 20; length of pectoral 13; length of ventral 17.5; length of longest gill-raker 7; longest dorsal ray 25.

Dorsal 18, the first 3 rays shortened; anal 20, the first 2 shortened; ventral 9, the outer ray shortened, rudimentary; pectoral 13; lateral line 42; gill-rakers very long and numerous, 10 on vertical limb of outer arch, 22 on horizontal limb.

Head as well as trunk very slender; snout short, vertically rounded; maxillary very long, its middle under posterior margin of orbit, not widened posteriorly; preopercle very oblique, the vertical diameter of cheek but two-thirds its greatest oblique diameter.

Pectoral fin inserted low, its upper ray on level of lower line of orbit; the longest pectoral ray reaches base of ventral. Ventrals extending to base of second or third anal ray. First dorsal ray slightly in advance of vertical from base of ventrals, the last ray over the second or third of the anal. Front of adipose over last anal ray. The scales have all fallen.

Fig. 1. *Lamppanyctus nicholsi* sp. nov.

Photophores: a small antorbital between orbit and lower part of nostril; 3 branchiostegals; 2 under the preopercle, placed low, the upper on level of lower part of cheek, much larger than the lower, which is inserted on level of mandibular joint.

Suprapectoral a trifle nearer lateral line than base of upper pectoral ray; both infrapectorals on level of base of pectoral fin, the upper above and in advance of the lower, the two nearly in contact.

Thoracics 6, none elevated, the first and second pairs near the median line, the third and fourth gently diverging the fifth again slightly approximating, the sixth more widely diverging, on level with the outermost ventral rays; interspace between first and second pairs twice the width of succeeding interspaces, which are approximately equal.

Supraventral low, its distance from base of ventrals half its distance from lateral line.

Ventrals 5, closely and equally spaced, and on a level.

Supra-anals 3, the lowest continuous with the ventral series and only a trifle higher; the uppermost near the lateral line and vertically above the vent or the interval between vent and first anal ray; the middle one vertically below the upper, or below and slightly behind it, midway between upper and origin of anal fin. The supra-anals are slightly angulated, as the lowermost is below and slightly in advance of the middle one.

Antero-anals 10, separated by a wide interspace from the postero-anals; first antero-anal elevated, as in *L. braueri*, this being exceptional in the genus; it is on a level with the middle supra-anal, and lies in a straight line connecting upper supra-anal with second antero-anal; the second to the tenth antero-anals form a straight line parallel with base of anal fin, the tenth opposite base of 16th anal ray.

Posterolaterals 2, in an oblique line which passes behind the last antero-anal, the upper immediately below the lateral line.

Postero-anals 7, the two series forming straight parallel lines, wholly behind the anal fin, separated by wide spaces from the antero-anals and from the precaudals.

Precaudals 6, equally spaced and close-set, in a gently curved line above base of lower caudal rays, the anterior one opposite base of first rudimentary ray, the posterior one much nearer lower profile than lateral line.

Integument largely abraded in all specimens; the remaining patches seem to indicate the general color as dark slate; opercles jet-black. No traces remain of luminous scales. A series of very large chromatophores, one to each scale, occupies the second series of scales below base of dorsal, and extends from below middle of dorsal backward, converging to base of adipose fin, and from there in a double series to origin of upper caudal lobe.

In addition to the type, three specimens 60 to 65 mm. long, here designated as cotypes, were taken at the same locality as the type.

Named for the discoverer of the species, John Treadwell Nichols.

