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CERTAIN SCOPELIDS IN THE COLLECTION OF THE
MUSEUM OF COMPARATIVE ZOÖLOGY.

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WITH THREE PLATES.

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No. 14. — *Certain Scopelids in the Collection of the Museum of Comparative Zoölogy.* By CHARLES H. GILBERT.

FOR the privilege of examining the Scopelids of the Museum of Comparative Zoölogy and of reporting on the species which form the basis of the following descriptions, I am indebted to the authorities of the Museum and especially to Mr. Samuel Garman.

Diaphus nocturnus (POEY).

Plate 1.

Myctophum nocturnum Poey, Mem. Hist. Nat. de Cuba, 1860, 2, p. 426.

Collettia nocturna Jordan and Evermann, Fishes North America, 1896, 1, p. 567.

Lampanyctus lacerta Goode and Bean, Oceanic Ichthyology, 1896, p. 81, pl. 24, fig. 89.

Myctophum (Nyctophus) lacerta Brauer, Zool. Anz., 1904, 28, p. 392.

The species described by Poey as *Myctophum nocturnum* from Havana, Cuba, has not been identified by subsequent writers. Nothing has been certainly known of its characters and relationships except what can be drawn from the original description, and the latter unfortunately contains no account of the number and distribution of the photophores. By Jordan and Evermann, the species is placed provisionally in *Collettia* (= *Diaphus*), these authors remarking: "Probably a species of *Collettia*, and apparently related to *C. rafinesquei*, but this is not certain." As Brauer makes no mention of the species in his review of the genus *Myctophum*, apparently he has considered its affinities too uncertain for conjecture.

Among the Myctophids of the Museum of Comparative Zoölogy, are two lots received from Professor Poey and labeled *M. nocturnum*, apparently in Poey's own handwriting. They represent two very distinct species, for one of which, as it is apparently undescribed, the name *Diaphus garmani* is here proposed. The four specimens (No. 6873), constituting the type and cotypes, differ to such an extent from

Poey's description, that identification with *M. nocturnum* would be highly improbable. The other lot (No. 6871) consists of a single specimen which answers Poey's description closely and is here identified as the type of *M. nocturnum*. This conclusion is rendered the more probable as Poey is known to have sent many of his types to the Museum of Comparative Zoölogy. The specimen in hand is 69 mm. long to the base of the caudal fin, and must have been between 85 and 90 mm. in entire length. Poey's type is said to be 95 mm. long, but this discrepancy cannot be considered serious in view of Poey's known inaccuracy in details, consequent in part upon the fact that his descriptions were taken more or less from his drawings, instead of from the type specimens, as was indeed done in the case of *M. nocturnum*.

The type of *Diaphus nocturnus* has been compared directly with the type of *Lampanyctus lacerta* Goode and Bean, and the two found identical. *D. lacerta* was described from the Gulf of Mexico, and is well known from the Gulf Stream off the Eastern Coast of the United States. Other Myctophids from the Gulf Stream were also known to Poey, although he failed to describe them. Specimens of *Myctophum opalinum* and *M. remigerum* were collected by him at Havana and sent to the United States National Museum, where they still bear his manuscript names. As the latter have never appeared in print, it will be best not to give them currency.

Below is given a detailed description of *Diaphus nocturnus*, drawn from the type specimen:

Measurements in hundredths of length to base of caudal. Length of head 30.5; diameter of orbit, 9; length of snout, 5; length of maxillary, 22; greatest depth of body, 21; least depth of tail, 9; distance from tip of snout to front of dorsal, 50; to ventrals, 46; to front of anal, 65; to adipose fin, 81.

Dorsal with 14 rays, including all rudiments: anal, 15; ventrals with 8 fully developed rays and a short outer rudiment; pectorals, 12. Scales in lateral line, 38.

Head more compressed, the snout less blunt than in most species of this genus. Mouth large, oblique, maxillary very little widened posteriorly, its tip reaching posterior angle of cheeks. Posterior preopercular margin oblique. Inner teeth in jaws longer than the outer teeth; vomer toothless, the palatines and pterygoids provided with wide bands which cover the greater part of the roof of the mouth; tongue and basibranchials toothed. Gill-rakers of moderate length, strongly toothed, 6 + 1 + 13 in number on the outer arch.

Origin of the dorsal fin slightly in advance of the ventrals; origin of anal well behind last dorsal ray; adipose dorsal above last anal rays; both pectorals and ventrals broken so their length cannot be made out. Scales all fallen.

Distribution of photophores. — A minute round antorbital under the anterior margin of the orbital expansion of the frontal. A somewhat larger suborbital below the anterior portion of the orbit, round and surrounded by black pigment, rather smaller than the photophores on the body.

Suprapectoral near lateral line, but not in contact with it; the usual white glandular body is attached to it below. Upper infrapectoral in front of lower pectoral rays; the lower infrapectoral rather less than halfway from the upper to the first thoracic.

Thoracics, 5, the fourth elevated, but little behind the third, on a level with upper half of pectoral base; fifth thoracic in front of outer half of ventral base, the first, second, and third near the median line, forming two lines gently diverging backwards. The first thoracic interspace is nearly twice the second, which is a little longer than the fourth.

Supraventral a little nearer base of ventral fin than lateral line, vertically above middle of ventral base.

Ventral photophores, 5, the first three pairs forming two strongly diverging lines, the fourth and fifth pairs near the median line, the interspaces all about equal.

Supra-anals angulated, the upper in contact with the lateral line, a little in advance of anal fin; the middle spot below and slightly behind the upper, its distance from the upper nearly twice its distance from the lower, the lower halfway between the middle supra-anal and the fifth ventral.

Antero-anals, 7, the first pair nearest the anal base, the first six pairs forming two very gently diverging straight lines, the seventh a very little elevated above the line of the others, all of them equally spaced.

Posterolateral in contact with lateral line, over the middle of the space between the two anal groups, above or nearly above the last anal ray.

Postero-anals, 5, about equally separated from antero-anals and from precaudals.

Precaudals, 4, the first three close together and equally spaced forming a gentle curve at base of rudimentary caudal rays, the fourth more widely separated, near lateral line, but not in contact with it.

In the figure of *Lampanyctus lacerta* given by Goode and Bean (*loc. cit.*) the relative position of the ventral photophores is incorrectly shown; the last antero-anal should be a little elevated instead of in line with the others, and the fourth precaudal should be more widely separated from the third. In addition to the minute antorbital spot, present in the type of *D. nocturnus* and in all specimens of the species which have come under my observation, there develops in connection with it in some specimens a larger luminous body, which does not, however, extend far out on the snout. The black septum across the photophores is less developed in this species than in any other of the genus, being very slender, and usually incomplete in the middle.

Diaphus garmani, sp. nov.

Plate 2.

Type. — Coll. Museum of Comparative Zoölogy, No. 6873, Cuba, Dr. Felipe Poey.

Most nearly related to *D. splendidus* Brauer (Zool. Anz., 1904, 28, pp. 392 and 399, fig. 7), differing in the greater depth, the more highly arched head and snout, and in the entirely separate antorbital photophores, the upper a minute round dot above the nostrils, the lower oblong or ovate. The supraventrals are also lower, scarcely nearer the lateral line than the ventral fins.

Measurements in hundredths of total length to base of caudal : Length of head, 27; diameter of eye, 7.5; length of snout, 5; greatest depth of head, 22; length of maxillary, 20; depth at front of dorsal, 24; least depth of caudal peduncle, 10; distance from snout to front of dorsal, 42; to ventrals, 43; to front of anal, 62; to adipose fin, 81. Length of type 51 mm.

Dorsal with 14 rays, including all rudiments, the last ray forked to the base; anal, 15; pectoral, 12; ventral with 8 developed rays and an outer slender rudiment. Lateral line, 34.

Head high and compressed, the upper profile forming a high even curve from snout to occiput. Eye small, the orbit low, the interorbital area arching high above the orbit when the head is seen in profile. Cheeks produced backwards, the margin of preopercle oblique, the maxillary reaching its angle.

Vomer toothless; palatines and pterygoids with broad bands of minute teeth which cover the greater part of the roof of the mouth; similar teeth on the tongue and basibranchials. Gill-rakers slender, 7 + 1 + 14 on the outer arch.

Origin of dorsal over or slightly in advance of the ventrals; origin of anal under last dorsal ray; adipose dorsal inserted over last anal ray.

Scales of lateral line a little enlarged; three series of scales between lateral line and base of dorsal fin.

General color dark brown, or blackish, with bright reflections from the scales. Basal portions of vertical fins finely speckled with black.

Photophores. — A minute dorsal antorbital under the anterior edge of the supraorbital rim; a larger ventral antorbital is wholly detached from it and extends but little below the anterior part of the orbit.

Suprapectoral above opercular angle, slightly nearer lateral line than base of pectoral, without attached luminous gland. Upper infrapectoral in front of lower pectoral rays; lower infrapectoral halfway between upper and first thoracic.

Thoracics, 5, the fourth elevated, a little behind the vertical from the third, the fifth in front of outer ventral rays. First thoracic interspace longest, the second and fourth about equal.

Supraventral over the posterior half of ventral base, midway between lateral line and ventral fin.

Ventral photophores, 5, the first three pairs forming strongly diverging lines, the first interspace a little shorter than the second, the third pair a little in advance of the vertical from the fourth; fourth and fifth pairs near median line, as usual.

Supra-anals not angulated, or with the middle very slightly in advance of a line joining the other two, the upper in contact with the lateral line; lower interspace much shorter than upper.

Antero-anals, 7, the first elevated above and a little anterior to the second; the second to the sixth nearly parallel with anal base, the seventh again elevated, but less so than the first, inserted well behind a line joining sixth with posterolateral.

Posterolateral in contact with the lateral line, but little behind seventh antero-anal, well in advance of last anal ray.

Postero-anals, 5. Precaudals, 4, the first three evenly spaced, forming a curve, the fourth more distant, but little below lateral line.

Three cotypes from the same locality show no variation in the number and distribution of the photophores.

The species is named for Mr. Samuel Garman of the Museum of Comparative Zoölogy.

Myctophum pristilepis (GILBERT and CRAMER).

Plate 3.

Dasyscopelus pristilepis Gilbert and Cramer, Proc. U. S. Nat. Mus., 1897, **19**, p. 412, pl. 39, fig. 1. Gilbert, Bull. U. S. Fish Com., 1905, **23**, pt. 2, p. 600.

A specimen, 75 mm. long, collected near the Island of Mauritius by Mr. Nicholas Pike, extends the range of this species from the Hawaiian Islands to the western shores of the Indian Ocean.

The specimen is somewhat larger than those hitherto reported and exhibits the noticeable increase in the size of the eye which in this group accompanies growth. A specimen from the Hawaiian Islands 30 mm. long to base of caudal has the eye 12 hundredths of this length; another from the same locality 52 mm. long has the eye 13 hundredths; in the Mauritian specimen 67 mm. long to base of caudal the eye is 13.5 hundredths. In smaller examples, the diameter of the eye is less than the postocular length of the head; in adults, it exceeds the postocular length and is 48 hundredths of the total length of the head.

In the young of this species, the scales have entire margins, a specimen 35 mm. long showing no trace of marginal spines on the scales of the lateral line and on such others as are present. In the Mauritian

specimen, the scales of the lateral line are entire or very weakly armed except in the middle where they are not concealed by the overlapping scales, but other scales of the body bear short strong spines.

The anal photophores are $7 + 4$, the number most frequent in this species. The two precaudals are near lower edge of caudal peduncle, not more widely separated than the postero-anals, but somewhat obliquely placed, the second a little higher than the first. The supra-anals form an oblique line, very weakly angulated, the lower very slightly in advance of the line joining the other two, the lower interspace about half the upper. A minute antorbital photophore in its usual dorsal position under the anterior frontal rim is evident in the young, but becomes obscure and apparently functionless in adults. A larger antorbital photophore persists at lower anterior orbital margin, well below the nostrils. The Mauritian specimen is a male with well developed supracaudal luminous organ, consisting of four shining scales which overlap little or not at all.

The species differs from *M. asperum* Richardson, according to the original description and figure (Voyage "Erebus" and "Terror," Ichth., p. 41, pl. 27, figs. 13, 15), in the larger eye, shorter snout, the fewer anal photophores, and in the relative position of the supra-anals and the precaudals, the former being strongly angulated and the latter widely separated in *M. asperum*. The relation of *M. pristilepis* with *M. opalinum* Goode and Bean is much closer. The two agree in general outlines and proportions, and in the arrangement of the photophores. In *M. opalinum*, the scales also are rough, a character which hitherto has not been noticed, and which separates *M. opalinum* widely from *M. affine*, with which Brauer unites it. This statement is based on an examination of the types of *M. opalinum* in the United States National Museum. *M. opalinum* has a much smaller eye and a somewhat longer snout than *M. pristilepis*, and more numerous anal photophores, which vary from $8 + 5$ to $9 + 6$. Even the lowest number known in *M. opalinum* is thus beyond the known range of *M. pristilepis*, which is from $6 + 4$ and $7 + 3$ to $7 + 5$ and $8 + 4$. In all the respects in which *M. opalinum* is known to differ from *M. pristilepis*, it approaches *M. asperum*.

Myctophum humboldti (Risso).

A specimen (No. 6870, M. C. Z.) collected by D. D. Roulet, "on a voyage from China" answers sufficiently well to the current descriptions of this Mediterranean species, but these descriptions are so lacking in detail that the identification cannot be considered reliable. Nor is it

possible to determine its relationships to *Myctophum boops* Richardson, from the Pacific Ocean, a species which has usually been considered identical with *M. humboldti*, but apparently without direct comparison. In spite of the doubtful locality of the specimen in hand, it seems advisable to place on record a more detailed account of its characters. It differs from typical *M. humboldti* in having on each side $8 + 6$, instead of $8 + 8$ anal photophores, but the variation in *M. humboldti* may well include this formula. It must be considered very doubtful, however, whether any species will include all the variations which have been attributed to *M. humboldti*.

Measurements in hundredths of length without caudal (107 mm.): Length of head, 26.5; diameter of eye, 9; length of snout, 4.5; length of maxillary, 16.5; interorbital width, 8; depth of body, 21; least depth of tail, 7; distance from snout to dorsal, 43; to adipose fin, 78; to ventrals, 45; to anal, 62.

Dorsal with 12 rays, including all rudiments; anal, 20; pectoral, 14; ventral with 8 fully developed rays and no evident rudiment. Lateral line, 41. Gill-rakers, $6 + 1 + 16$, on outer arch.

The scales are mostly lost, but a few along the course of the lateral line indicate that these are much deeper than the others.

The ventrals are inserted under the front of the dorsal; the anal fin is entirely behind the dorsal; the adipose fin is well in advance of the last anal ray. The fins are all broken, so no indication can be given of the length of the rays.

The mouth and gill cavity are black, this color including the gill-arches and the gill-rakers, but not the gill-filaments or the pseudobranchiae.

Photophores. — A small dorsal antorbital organ, obscure in this specimen; a more evident lower antorbital, which seems to be persistent in adults.

Suprapectoral distinctly nearer upper pectoral rays than lateral line. Upper infrapectoral on base of lower pectoral rays and below; lower infrapectoral somewhat below the line joining the upper with the first thoracic, its distance from the former less than two-thirds its distance from the latter; the vertical from the lower infrapectoral passes immediately before the second thoracic. Upper pectoral interspace slightly longer than the lower.

Thoracic photophores peculiar in having the first three pairs forming rather widely diverging lines, the fourth pair less widely separated, about as in the second pair, the fifth pair very widely divergent, opposite and partly external to the outer ventral rays; second and fourth interspaces equal, the third shorter, two-thirds the first.

Supraventrals vertically above the fifth thoracic, a little nearer the latter than the lateral line, distinctly above the line of the two lower supra-anals.

First pair of ventral photophores nearer median line than are the inner ventral rays, which are unusually far apart; first three pairs of ventrals form-

ing diverging lines, the fourth again less widely separated; fourth pair wholly in advance of vent. First ventral interspace longer than the second, the third the shortest.

Upper supra-anal just below the lateral line, vertically above vent or a little anterior; middle supra-anal vertically above fourth ventral, or a trifle anterior; lower supra-anal in advance of and slightly below the middle supra-anal, nearly over the second ventral. Upper supra-anal interspace less than two-thirds the lower.

Antero-anals, 8, forming a strongly curved line, the concavity downwards; first pair very closely approximating anal base, second and third widely diverging, the others again gradually approaching the anal base; last antero-anal opposite base of the fourteenth anal ray.

Posterolateral vertically above last antero-anal, immediately below lateral line.

Postero-anals, 6, the first opposite the base of the seventeenth anal ray; interval between last anal and first precaudal equalling that between first and fifth postero-anals.

Precaudals, 2, obliquely placed, the distance between them only slightly greater than that separating the postero-anals.

A short luminous body on back of tail, less than half as long as diameter of eye, with no trace of overlapping scales in the present condition of the specimen.

EXPLANATION OF PLATES.

PLATE 1.

Diaphus nocturnus (Poey).

PLATE 2.

Diaphus garmani Gilbert.

PLATE 3.

Myctophum pristilepis (Gilbert & Cramer).



Gilbert, Charles H. 1906. "Certain scopelids in the collection of the Museum of Comparative Zoology." *Bulletin of the Museum of Comparative Zoology at Harvard College* 46, 253–263.

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