Fishes Killed by the 1950 Eruption of Mauna Loa III. Sternoptychidae1

JANET HAIG2

The extensive collection of fishes yielded by the Mauna Loa lava flow of 1950 included 45 hatchetfishes (Sternoptychidae) belonging to four species. They are of particular interest in view of the fact that two of these species have not hitherto been reported from the Hawaiian Islands, nor from anywhere in the central Pacific region. One species known from the Hawaiian Islands was not included in the collections.

Three of the hatchetfishes were cooked to the point where the flesh was falling off the bones, and were utterly unfit for detailed study, although still identifiable. A few more were in mediocre condition. The great majority, however, were in an excellent state of preservation, even retaining some of the thin deciduous scales which are usually lost in sternoptychids collected by the more conventional methods.

The five Hawaiian members of the family Sternoptychidae have all been described and figured elsewhere, some of them many times. For this reason it was considered unnecessary to include lengthy descriptions and detailed figures in this paper. Aside from original descriptions, the synonymies include references to Hawaiian localities only.

Sternoptychids are subject to great individual variation, the limits of which are still incompletely known, and data on this subject are useful in studies of the family. Measurements and counts for the lava flow material is therefore included in Table 1.

Particulars on the Mauna Loa lava flow and the collections appear in the first paper of this series (Gosline et al., 1954). The author is indebted to Dr. William A. Gosline for the opportunity to examine and report on this interesting collection, and to Dr. Leonard P. Schultz for supplying information on Polyipnus nuttingi.

KEY TO THE HAWAIIAN STERNOPTYCHIDAE

1. Eye normal; anal fin undivided ......... 2
   Eye telescopic; anal fin divided; dorsal fin preceded by a transparent blade ......... 3
2. An abrupt ventral constriction between trunk and postabdominal region, this space filled by a transparent intergumentary plate; dorsal fin preceded by a transparent blade. ........ Sternoptyx diaphana
   No abrupt ventral constriction between trunk and postabdominal region; dorsal fin preceded by a forked spine ........ Polyipnus nuttingi

3. Photophores forming a nearly continuous series; two posterior abdominal spines, directed downward .......... Argyropelecus aphins
4. A large posterior abdominal spine, serrated and directed backward, often with a second small spine above it; groups of photophores on postabdominal region separated by wide interspaces .......... Argyropelecus heathi
   Two posterior abdominal spines, directed downward, not serrated; groups of photophores on postabdominal region separated by narrow interspaces .......... Argyropelecus sladeni

Sternoptyx diaphana Hermann

Sternoptyx diaphana Hermann, 1781: 8, 33, pl. 1, figs. 1–2 (type locality, Jamaica).

Sternoptyx diaphana, Gilbert and Cramer, 1897: 416 ("Albatross" Sta. 3473, Kaiwi Channel, 313 fms.).


Sternoptyx diaphana, Jordan and Seale, 1906: 190 (listed only).

Sternoptyx diaphana, Jordan and Jordan, 1922: 9 (listed only).

Sternoptyx diaphana, Fowler, 1928: 35 (listed only).

Sternoptyx diaphana, Fowler, 1938: 265 (listed only).

MATERIAL EXAMINED: 14 specimens, 20.3 to 53.7 mm. in standard length, taken off the Mauna Loa lava flow, Hawaii, by Moore et al., June 3, 1950.

7 specimens, 29.7 to 45.3 mm. in standard length, taken off the Mauna Loa lava flow, Hawaii, by Y. Yamaguchi, June 6, 1950.

2 specimens, 24.2 and 30.5 mm. in standard length, taken off the Mauna Loa lava flow, Hawaii, by Gosline, Hayes, Keen, and Ellis, June 6, 1950.

Gilbert and Cramer (1897: 404) noted that they did not see the Sternoptyx listed from "Albatross" Sta. 3474 in U. S. Comm. Fish and Fisheries, Rpt. of the Commissioner for 1892 (1894: 18). Two small Sternoptyx diaphana from this station are in the fish collections of the Natural History Museum of Stanford University, and bear catalog number 5697, "Albatross" Sta. 3474 is in Kaiwi Channel, 21°12'N × 157°38'30"W, 375 fms.

A lot of six small specimens in the Stanford collections, with catalog number 4928, is labelled "Albatross" Sta. 2937 & 2808, Hawaiian Islands." There is also a label in the bottle stating "Bottle broken during earthquake." "Albatross" Sta. 2937 is in Kaiwi Channel, 21°14'06"N × 157°42'42"W, 47 fms. Sta. 2808 is in the open Pacific and not in the vicinity of the Hawaiian Islands. These two lots and their labels evidently became mixed as a result of the 1906 earthquake damage; and there is a possibility that the Sta. 2937 label was placed with the fishes by error, since it is unlikely that any of these specimens were captured at 47 fms. depth.

Sternoptyx diaphana has been reported from many parts of the Atlantic, Indian, and Pacific oceans. Some of the records may apply to S. obtusa Garman, but it is questionable whether the latter should be retained as a distinct species. All the Hawaiian material examined is of the "diaphana" type with steeply inclined profile and large eye.

Polyipnus nuttingi Gilbert


Polyipnus nuttingi, Jordan and Seale, 1906: 190 (listed only).

Polyipnus nuttingi, Jordan, 1921: 646 (off SW shore of Hawaii, killed by a lava flow from Mauna Loa).

Polyipnus nuttingi, Jordan and Jordan, 1922: 9 (listed only).

Polyipnus nuttingi, Fowler, 1928: 35 (Alika, District of Kauai, Hawaii; duplicate of the specimen reported by Jordan, 1921).

Polyipnus nuttingi, Schultz, 1938: 142, 145 ("Albatross" Sta. 4102, USNM 51593, probably by error; see discussion, below).

Polyipnus nuttingi, Fowler, 1938: 265 (listed only).


Polyipnus nuttingi is not represented in the present collection, but is included here for the sake of completeness.

In Schultz (1938: 145), in the synonymy of Polyipnus nuttingi, appears the following entry: "Polyipnus spinosus (non Günther) GILBERT AND CRAMER, U. S. Nat. Mus., vol. 19, p. 416, 1897 (U. S. N. M. no. 51593, 33 specimens, 34 to 70 mm., Albatross station 4102, between Maui and Molokai Islands, Hawaii, 122 to 132 fathoms, July 25, 1902)." This is obviously an error, as Gilbert and Cramer (1897) made no reference to specimens from "Albatross" Sta. 4102. An inquiry to Dr. Schultz brought the reply that this record (in Schultz, 1938: 145) belongs in his preceding paragraph with U. S. N. M. 51593 (reference to Gilbert, 1905) and that the following paragraph ("U. S. N. M. no. 47770, one specimen, 41 mm., Albatross station 3476, latitude 21°09'N, longitude 157° 53'W, December 6, 1891") is the reference that should go with Gilbert and Cramer.

Gilbert (1905), however, made no reference to Polyipnus nuttingi from "Albatross" Sta. 4102, nor did any author subsequently until the publication of Schultz's paper. Dr. Schultz (in litt.) informs the writer that in the U. S. National Museum catalog, opposite no. 51593, "4102" is written in the "original number" column. At the time he wrote his paper Dr. Schultz assumed that this was an "Albatross" station number, but he now believes that this may be incorrect as the number 4102 was entered in different ink than the original entry and must have been added later. These specimens with catalog number 51593 are all contained in a single jar, with the original label in Gilbert's handwriting "Polyipnus nuttingi co-types," but without any "Albatross" station numbers.

Gilbert made his identifications at Stanford University and retained specimens from Stas. 3867, 4090, and 4121, as well as Sta. 4077 which was not included in his 1905 report. This material is still at Stanford, and was recorded by Böhlke (1953: 17) and seen by the present writer.

Dr. Schultz concludes that the remaining specimens, from Stas. 3920, 4089, 4091, 4097, and 4134, were wrapped by Gilbert in a single package with one label and sent back to the U. S. National Museum. Apparently, then, number "4102" was applied in the U. S. National Museum catalog to an aggregate of 33 specimens from several stations and does not represent an "Albatross" station number.

Schultz (1938: 142) gave the locality "south of Minamitori Shima, Marcus Islands" for this species, in addition to the Hawaiian Islands. Being unable to locate this reference in the earlier literature, the present writer consulted Dr. Schultz, who replied (in litt.) that he is unable to verify the Marcus Island locality and that for the present it should be considered an error. Matsubara's (1950) statement that the species occurs in Japan was probably based on Schultz's record. Norman (1939: 20) reported it from the Zanzibar area, basing his identification on Schultz's revision of the genus.

Argyropelecus heathi Gilbert

Argyropelecus heathi Gilbert, 1905: 601, pl. 72, fig. 1 (type locality, "Albatross" Sta. 4107, Kawai Channel, between Oahu and Molokai, 350–355 fms.).

Argyropelecus heathi, Jordan and Seale, 1906: 190 (listed only).

Argyropelecus heathi, Jordan and Jordan, 1922: 9 (listed only).

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**TABLE 1**

**MEASUREMENTS** and Counts of Hawaiian Sternoptychidae

<table>
<thead>
<tr>
<th>S. diaphana</th>
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<th>A. heathi</th>
<th>A. slenderi</th>
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*Measurements are given in thousandths of the standard length. They reflect the great intraspecific variation occurring in fishes of this family, even within a restricted geographical area, and point up the fact that caution must be used when one attempts to separate species on the basis of proportional differences.*

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Argyropelecus hemigymnus, Schulz, 1938: 146, 148 (listed from Hawaiian Islands). Hawaiian records not A. hemigymnus Cocco.

Argyropelecus beatii, Fowler, 1938: 265 (listed only).

MATERIAL EXAMINED: 3 specimens, 20.3 to 27.6 mm. in standard length, taken off the Mauna Loa lava flow, Hawaii, by Y. Yamaguchi, June 6, 1950.

1 specimen, 30.3 mm. in standard length, taken off the Mauna Loa lava flow, Hawaii, by Gosline, Hayes, Keen, and Ellis, June 6, 1950.

The only previously known specimen of this species in addition to the holotype was recorded by Fowler (1928). This specimen, which was killed by the Mauna Loa lava flow of 1919, was presented by the collector to the Bernice P. Bishop Museum and thus was not among the fishes reported by Jordan (1921) from that lava flow collection.

Although not reported in the literature from any area outside of the Hawaiian Islands, the species is also known from the eastern Pacific on the basis of records as yet unpublished.

The reasons for retaining Argyropelecus beatii as a separate species from A. hemigymnus Cocco will be discussed in a forthcoming paper by Dr. Rolf L. Bolin and the present writer.

Argyropelecus sladeni Regan

Argyropelecus sladeni Regan, 1908: 218 (type locality, Salomon, Chagos Archipelago, Indian Ocean, 400—500 fms.).

MATERIAL EXAMINED: 1 specimen, 64.4 mm. in standard length, taken off the Mauna Loa lava flow, Hawaii, by Hayes and Burke, June 2, 1950.

3 fragmented specimens, taken off the Mauna Loa lava flow, Hawaii, by Moore et al., June 3, 1950.

10 specimens, 47.4 to 75.9 mm. in standard length, plus 1 fragmented specimen, taken off the Mauna Loa lava flow, Hawaii, by Y. Yamaguchi, June 6, 1950.

Opinion differs among various authors as to the status of several closely related Argyropelecus species, of which A. sladeni is one (Norman, 1930: 301, 304, text fig. 13; Parr, 1937: 46, 50, text figs. 18, 19; Schultz, 1938: 147, 153). Until collections from all parts of the world are compared, this problem cannot be resolved. However, the Hawaiian specimens are of the relatively slender-bodied type with long upper preopercular spine and long dorsal blade, and fall within the limits of A. sladeni as interpreted by all of the three authors cited above. It seems best to assign them to this species for the present.

A. sladeni, as presently defined, is known from the Atlantic, Antarctic, Indian, and east and west Pacific oceans. It has not previously been reported from the Hawaiian Islands or anywhere in the central Pacific area.

RELATIONSHIPS

Aside from those pertaining to the Hawaiian Islands, there are no published records of hatchetfishes from the central Pacific region. Nevertheless it is probable that future collecting will add several more species to the five now known from this area. In view of the fact that most sternopychids are very widely distributed, occurring in several of the great oceans, it would be difficult to make a general statement as to the relationships of the central Pacific sternopychid fauna or to predict which species would be most likely to be found there in the future.

REFERENCES


