

14. Mesothorax small and shining; abdomen shining black..... *humilis*, Sm., ♀. (T.)  
 Mesothorax dull ..... 15.
15. Larger; mesothorax greener; abdomen dark brown, with a sericeous surface..... *inclinans*, Sm., ♀. (T.)  
 Smaller; mesothorax bluer; abdomen shining black. (Tasmania.) ..... *limatus*, Sm., ♀. (T.)

There are three Tasmanian species, *H. familiaris* (Erichs.), *H. orbatus*, Sm., and *H. cognatus*, Sm., which I have not examined. The last, according to Smith, is probably the male of *H. globosus*, Sm.

The presence of ordinary-looking small *Halicti* in the most remote regions is rather remarkable. The following are from New Zealand and Christmas Island (Indian Ocean). The latter locality does not belong to the Australian region, but it is so near to it that its species are of interest in the present connexion.

*Halictus Smithii*, D. T. (*familiaris*, Sm.), ♀ (T.). New Zealand.—Ordinary-looking small black species; hind spur simple; stigma fulvous; first r. n. meets second t. c.; basal nervure very strongly bent.

*H. sordidus*, Sm., ♀ (T.). New Zealand.—Ordinary small species; head and thorax black, abdomen *very* dark reddish brown; first r. n. joins second s. m. a short distance before its end.

*H. Binghami*, W. F. Kirby, ♀ (T.). Christmas Island.—Ordinary-looking small black species; hind spur with very few spines; area large, with fine raised lines, like the veining of a fern-leaf; second and third abdominal segments with basal hair-bands; third s. m. rather large, but its outer side with only a single gentle curve.

*H. Andrewsii*, W. F. Kirby, ♀ (T.). Christmas Island.—Smaller than *Binghami*; yellowish green, with red legs; venation of *Chloralictus*; hind spur with few long saw-like teeth.

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XXXI.—On *Munidopsis* polymorpha, Koelbel, a Cave-dwelling Marine Crustacean from the Canary Islands. By W. T. CALMAN, D.Sc.

THE British Museum (Natural History) has lately received from Mr. Fairfax Prevost some specimens of a Galatheid Crustacean collected by him in a cave on the island of  
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Lanzarote. They belong to the species described by Dr. Koelbel under the name *Munidopsis polymorpha* from specimens collected in the same locality by Prof. Simony\*. Koelbel's account of the species and of its remarkable habitat appears to have been overlooked by subsequent writers on the Galatheidæ †, and it may be worth while therefore to draw attention to it again.

The cave in which these Crustacea are found forms part of an extensive system of caverns known collectively as the "Cueva de los Verdes" ‡, ramifying through the lava-beds in the northern part of the island. In one of the chambers, at a distance of about half a kilometre from the sea, there is a pond or small lake of salt water, which communicates with the sea by subterranean channels, the water in it rising and falling with the tide §. The size of the pond is given by Prof. Simony as about 40 metres in length by 15 to 20 metres in breadth, with a depth of 2 to 8 metres. The cavern is dimly lighted by an aperture in the roof. Mr. Prevost found in the water no vegetable or animal life other than the *Munidopsis*, which is sometimes present in large numbers. The animals are described as being of a "pale reddish yellow" colour when alive, and Prof. Simony adds that they "erscheinen vermöge der Wirkung complementärer Farben fast weiss." This remark is explained by Mr. Prevost's statement that in the dim light of the cave the water appears of a beautiful blue colour.

As regards the characters of the species, I am unable to add anything of importance to Koelbel's excellent and minute description. The great variation which he found in the shape of the rostrum and the armature of the carapace, and which is alluded to in the specific name, is well exhibited in the series of specimens examined by me. The exact position of the species in relation to the very numerous species of *Munidopsis* described since Koelbel's paper was written is not easy

\* Koelbel, "Beitr. z. Kennt. d. Crustaceen d. Canarischen Inseln," Ann. naturhist. Hofmuseums, Wien, vii. (3) p. 109, pl. x. figs. 3-16 (1892).

† The species is omitted from Dr. Benedict's list of the Galatheidæ, Proc. U.S. Nat. Mus. xxvi. pp. 300-334 (1902), although the reference duly appeared in the 'Zoological Record' for 1892.

‡ For a general account of the caves see Hartung, "Die geologischen Verhältnisse der Inseln Lanzarote und Fuertaventura," Neue Denkschr. allg. Schweiz. Ges. ges. Naturwiss. xv. (4) p. 81 (1857), where, however, the pond is not mentioned.

§ A sample of the water brought home by Mr. Prevost has been analysed by Mr. A. J. Robertson, B.Sc., of University College, Dundee, who kindly informs me that it has a salinity of 35.39 per mille, which is probably about the same as that of the sea outside.

to determine. Milne-Edwards and Bouvier\*, in their arrangement of the "Galathéens non flagellés," attach primary importance to the shape of the antero-lateral angle of the carapace. This angle is stated to be spiniform in the genera *Galacantha*, *Munidopsis*, and *Galathodes*, while it is "obtus, ou formant un lobe saillant, parfois aigu," in *Elasmonotus* and *Orophorhynchus*. Later writers are in agreement that the division of genera is here carried too far, and Faxon†, Alcock‡, and Benedict§ recognize only the two genera *Galacantha* and *Munidopsis*, the latter including *Galathodes*, *Elasmonotus*, and *Orophorhynchus*, which by Alcock are ranked as subgenera. The great variation in the shape of the antero-lateral angles in the present species seems to support this view, since they are sometimes spiniform as in *Munidopsis* (s. str.), sometimes rounded as in *Elasmonotus* and *Orophorhynchus*. Apart from this character and the occasional absence of the rostrum, however, the species appears to find its most natural place among the forms composing the subgenus *Munidopsis*, with which it agrees in having the rostrum (when it is present) styliform in shape, the chelipeds of the male longer than the ambulatory legs, the eye-stalks not prolonged into spines, and the lateral borders of the carapace not subcristiform. From all the species of this group it is distinguished by, among other characters, the great reduction of the rostrum, which, at most, does not exceed twice the length of the eye-stalks.

Of the 102 species of *Munidopsis* (s. lat.) enumerated by Dr. Benedict, 21 are recorded from depths less than 300 fathoms, and of these only 2 are found in less than 100 fathoms, viz. *M. Tanneri*, Faxon, from 85 fath. in the Gulf of Panama, and *M. polita* (S. I. Smith), from 79 fath. off N.E. America ||.

As in all the other species of the genus, the eyes of *M. polymorpha* are very small and entirely without pigment and the cornea is not faceted externally. The eye-stalks are short, obtusely conical, and rounded at the apex; they are very slightly movable. In these characters and in the small number and large size of its eggs *M. polymorpha*

\* "Considérations générales sur la famille des Galathéidés," Ann. Sci. Nat. (8) xvi. p. 260 (1894).

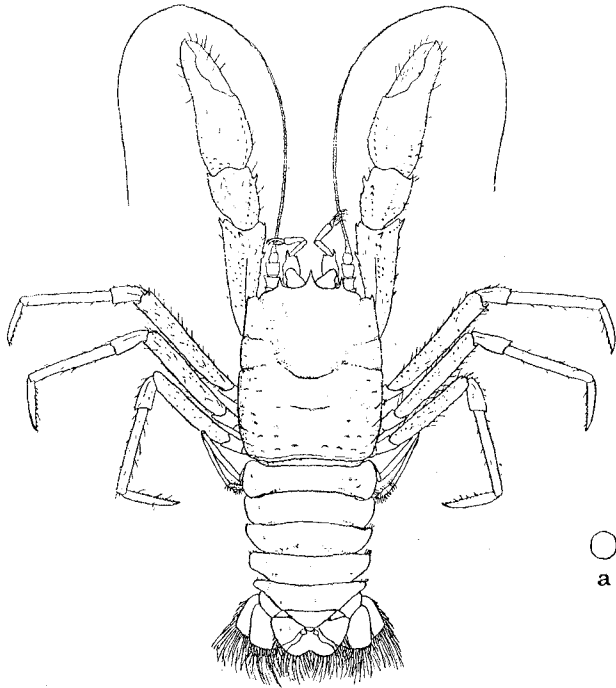
† Mem. Mus. Comp. Zool. Harvard, xviii. pp. 81-83 (1895).

‡ Cat. Indian Deep-Sea Crust. Macrura and Anomala, p. 248 (1901).

§ Proc. U.S. Nat. Mus. xxvi. p. 244 (1902).

|| *Munidopsis tridentata* (Esmark), which occurs in the deeper parts of the Norwegian fjords, may perhaps extend into depths of less than 100 fathoms; but I cannot find any definite statement on the subject.

differs markedly from all the littoral and shallow-water species of Galatheidæ, which have well-developed eyes and numerous small eggs.



*Munidopsis polymorpha*, Koelbel, female,  $\times 3$ .  
a. One of the eggs, on same scale.

I have been unable to find any record of a marine animal living under conditions similar to those described for *M. polymorpha*. Many littoral forms are known to haunt caves on the sea-coast, but none of these show special adaptations to this habitat and none are specially related to abyssal forms. It would be of great interest to ascertain whether the species or any related forms occur on the shore or in shallow water in the neighbourhood of Lanzarote. In view, however, of the exclusively deep-sea habitat of the other species of the genus this is unlikely. It seems more probable that the present inhabitants of the cave are the descendants of some deep-water species which, having been carried \* into the fissures by

\* Chun has given an interesting account of the way in which animals

which the cave communicates with the sea, found there an environment suitable, at least in the absence of light, to its habits.

It is possible that this case may have some bearing on the general question of the origin of the subterranean fauna. It has been stated, more especially with regard to the Crustacea, that the subterranean forms are allied, not to the surface-living freshwater species, but to marine and, in some cases, deep-sea forms. Some of the cases formerly adduced in support of this view have been disposed of by subsequent criticism \*, but a few forms still remain which appear to be distinctly of a marine type. Among these the Isopod *Cruregens*, described by Prof. Chilton from wells in New Zealand, belongs to an otherwise exclusively marine family, the Anthuridæ. The same may be said of Dr. Benedict's *Cirolanides* † and the *Cirolana cubensis* recently described by Mr. Hay ‡, both belonging to the Cirolanidæ, while in some other cases an affinity with freshwater forms seems to have been assumed rather than demonstrated. Among the other groups of subterranean animals the most striking case in point is that of the two fishes *Lucifuga subterraneus* and *Stygicola dentatus* § found in caves in the island of Cuba, to which Mr. Boulenger has kindly directed my attention. These belong to the Brotulidæ, a family which has no other representatives in fresh water, the great majority of the genera coming from deep water, although some are shallow-water or shore fishes. The nearest allies of the cave-fishes are stated to be the genera *Brotula* and *Ogilbia* from shallow water and *Bassozetus* and *Aphyonus* from 1000-2000 fathoms ||.

In all these cases the cave-dwelling animals, though living in fresh water, are probably descended from forms which have penetrated into the reservoirs of subterranean water by

of the abyssal plankton are sometimes brought to the surface by the strong tidal currents in the neighbourhood of the Canaries (SB. Akad. Wiss. Berlin, 1889, (2) p. 550).

\* Cf. Chilton, "The Subterranean Crustacea of New Zealand," Trans. Linn. Soc., 2nd ser. Zool. vi. (2) p. 255 (1894).

† Proc. U.S. Nat. Mus. xviii. p. 615 (1896).

‡ Proc. U.S. Nat. Mus. xxvi. p. 430 (1903).

§ Poey, 'Memorias sobre la Historia Natural de la Isla de Cuba. . .,' ii. (1856-1858) pp. 96 & 102, pls. ix. & x.; and 'Repertorio fisico-natural de la Isla de Cuba,' i. (1865-1866) p. 113, Gill, Proc. Acad. Philadelphia, p. 252 (1863).

|| See Lane, "The Ovarian Structure of the Blind Fishes *Lucifuga* and *Stygicola*," Biol. Bull. vi. p. 38 (1904).

fissures opening under the sea. In the caves of Lanzarote the communication with the sea is more direct, and, partly perhaps on account of the minimal rainfall, the water is salt. The entrance of marine forms would therefore be comparatively easy, there being no outflow of fresh water from the submarine fissures as is generally the case.

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XXXII.—*Barbus eutaenia* and *B. holotaenia*, new Names for *Barbus Kessleri*, Günther nec Steindachner. By G. A. BOULENGER, F.R.S.

IN accordance with the nomenclature in the British Museum 'Catalogue of Fishes,' I have hitherto designated as *Barbus Kessleri*, Sdr., a little fish common in West Africa, from Cameroon to the Congo. On recently receiving a small collection made by Dr. Ansoerge in Angola, I have discovered that a curious inversion of names has taken place in Dr. Günther's 'Catalogue' (vii. p. 107), where specimens from Fluilla, Angola, and "River Ogome" [read Ogowe] are described as *B. Kessleri*, Steindachner, whilst the true *B. Kessleri* is described on the same page as a new species, *B. caudimacula*, from specimens from "Polungo Alto" [read Golungo Alto]. The name *B. caudimacula*, Gthr., is a synonym of *B. Kessleri*, and as no name is available for *B. Kessleri*, Gthr., from Angola, I propose that of *B. eutaenia*, in allusion to the sharply defined black lateral band passing through the eye and extending on the caudal fin. In *B. eutaenia* the origin of the dorsal fin is a little behind the vertical of the first ventral ray, whilst in *B. Kessleri* the two exactly correspond. Dr. Günther has pointed out in 1896 (Ann. & Mag. Nat. Hist. xvii. p. 277) that specimens from the Ogowe have the barbels longer than those from Angola. As stated in my description in 'Poissons du Bassin du Congo,' p. 225, the posterior barbels are always considerably longer than the eye in the Ogowe-Congo specimens, which differ besides from *B. eutaenia* in having the spine of the dorsal fin weaker, sometimes without serration, the origin of the dorsal fin opposite to that of the ventrals, and a black spot at the end of the dorsal fin. I propose the name *Barbus holotaenia* for this species.