

THE DANISH INGOLF-EXPEDITION.

VOLUME III.

2.

CRUSTACEA MALACOSTRACA. I.

BY

H. J. HANSEN.

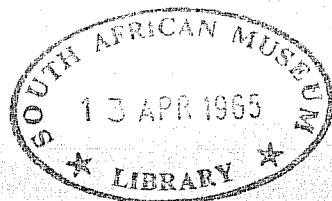
WITH 5 PLATES AND 4 FIGURES IN THE TEXT, 1 CHART, AND A LIST OF THE STATIONS.

TRANSLATED BY DR. H. M. KYLE.

COPENHAGEN.

PRINTED BY BIANCO LUNO.

1908.



INVESTIGACIONES
PESQUERAS
INSTITUTO
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Biblioteca
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("Michael Sars", Ad. Jensen), several specimens, and $61^{\circ} 15' N. L.$, $9^{\circ} 35' W. L.$, ca. 500 fm., several specimens ("Thor" 1904).

Distribution. The geographical and bathymetric distribution of this species and of its "var. *abyssorum* A. Milne-Edw." are fully dealt with in the above-mentioned work on the Decapoda of the "Travailleur" and "Talisman". It will be sufficient to give here a short extract from this as also a few critical remarks etc.

The most northerly point in the eastern part of the Atlantic from which the species had previously been taken is south-west of Ireland, 315—1000 fm. (Pocock), and in the western part of the same ocean "off Nova Scotia", $42^{\circ} 41' N. L.$ South of these points the species has been taken by different expeditions at various places in the Atlantic, thus off Portugal, at the Azores, Canary Islands, off Sierra Leone, in the Sargasso Sea, at the Antilles, at Tristan d'Acunha and at Patagonia at $47^{\circ} 48\frac{1}{2}' S. L.$ In the Arabian Sea and Bay of Bengal it has often been taken (Alcock); in the Pacific it has been found at Papua, Banda, Yokohama, Valparaiso (Henderson), off the northern part of South America, Galapagos Islands and the Gulf of California (Faxon). It has twice been taken in 250 fm. (Smith) and downwards at the most different depths to 2221 fm. (Smith). A. Milne-Edwards & Bouvier write ("Travailleur" and "Talisman", p. 192): "Cette espèce, qui s'accommode également des mers tropicales, des mers tempérées et des mers froides..." But this observation is not correct. When the French authors wrote this account, its southern limit was a little below $48^{\circ} S. L.$, its northern about $51^{\circ} N. L.$; the northern limit has been moved by the "Ingolf" almost to $63^{\circ} N. L.$, nevertheless it is incorrect to speak of its being an inhabitant of tropical, temperate and cold seas. It is really a deep-water species, which seldom occurs in shallower water than 300 fm. and even at this depth the differences between the temperatures of the different parts of its area of distribution are much less than in depths between 0 and 100 fm.; for example, the lowest temperature at which it was taken by the "Ingolf" was 4.2° .

Remarks. A comparison of my specimens with some of *P. pilosimanus* and of its variety *abyssorum* A. M.-Edw. received by the Museum has shown that the "Ingolfs" specimens belong to the main species and not to the variety; a study of the descriptions given by the French authors led to the same result.

21. *Galathea intermedia* Lilljb.

1852. *Galathea intermedia* Lilljeborg, Öfv. K. Sv. Vet.-Akad. förhandl. för 1851, p. 21.
 1888. — — — — — Bonnier, Bull. Sc. de la France et de la Belgique, 3. Ser. T. 1, p. 44, Pl. X, figs. 1—2, Pl. XI, figs. 1—14.
 1894. — — — — — A. Milne-Edwards & Bouvier, Ann. d. Sc. Natur., Zool., Sér. 7, T. XVI, p. 252.
 1900. — — — — — A. Milne-Edwards & Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I, p. 277.

Occurrence. This species has not been brought home by the "Ingolf" but is present from two places at the Færoes, namely:

Thorshavn (A. Benzoni); 2 specimens.

North End of Naalso, 100 fm. (Th. Mortensen); 1 specimen.

Distribution. The two works cited of 1888 and 1900 give together an almost complete

ture of the distribution of the species. It occurs at the Shetlands (Norman), from there southwards along Great Britain and Ireland, on the Channel coasts, west coast of France and the Spanish peninsula, at the Azores, Canary Islands and Cape Verde Islands to 17° N. L.; it has also been taken in the Mediterranean at Marseilles (Gourret), at Syracuse (author) and Algiers (Lucas). It is also found at Holland (Hoek), in the Skager Rak, northern and the whole eastern part of the Kattegat down into the Sound (Meinert); at Norway it goes up to Lofoten (G. O. Sars), thus somewhat north of the Polar Circle.

A. Milne-Edwards & Bouvier write that it is specially common between 8 and 43 fm., but can go much deeper to 120 fm.; concerning its occurrence at Denmark Meinert says: "the depth as a rule is 6 fm." . . . "once it was taken in so shallow water as 2 fm."

22. *Galathea nexa* Embl.

- Galathea nexa* Embleton, Proc. Berwickshire Nat. Field Club¹.
853. — — Bell, Brit. Stalk-eyed Crust., p. 204, with fig.
859. — — *dispersa* Bell, Journ. Linn. Soc. Lond., Vol. III, p. 3.
888. — — *nexa* Bonnier, Bull. Sc. de la France et de la Belgique, Sér. 3, T. 1, p. 63, Pl. XII, figs. 6–8.
- — — *dispersa* Bonnier, l. c. p. 68, Pl. XIII, figs. 1–3.
889. — — — A. Milne-Edwards & Bouvier, Rés. Sc. de l'Hirondelle (Suppl.) et de la "Princesse Alice", fasc. XIII, p. 72.
900. — — — A. Milne-Edwards & Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I, p. 278, Pl. XXIX, figs. 2–3.

Occurrence. It has only once been taken by the "Ingolf".

North-West of the Færoes: St. 1: 62° 30' N. L., 8° 21' W. L., 132 fm., temp. 7.2°; 1 spec.

I have seen some specimens from the southern half of the west coast of Iceland, namely, Faxaflói, Reykjavik and Grindavik, as also from the Vestmanna Islands on the south coast. It has been seen a number of times at the Færoes, sometimes in the bays, sometimes further off the coast, once 10–4 fm., otherwise from 8–9½ fm. down to 100 fm.

Distribution. Like the previous species it goes (cf. the French authors cited) southward along Great Britain, France, the Spanish peninsula to the Azores and the Canary Islands (A. Milne-Edwards & Bouvier). It has been taken at several places in the Mediterranean: the Ægean Sea, Adriatic, Marseilles, Villafranca and has been found by the author at Syracuse. I have seen specimens in various places in the North Sea; it has also been taken in the Kattegat and northern part of the Sound; on the west coast of Norway it goes up to West Finmark (Nordgaard). In Dijnphna-Toget mentioned having seen a specimen from the Kara Sea; my determination was correct, but as the species neither before nor since has been taken in an arctic sea I must suppose that an error from the expedition in the statement of locality occurred in one way or another.

Remarks. It appears from the synonymy list that like Adensamer² I unite the two species *nexa* and *G. dispersa* under one. Bonnier has described a specimen of *G. dispersa* in which the third

¹ I have not been able to complete this reference with data and page.

² Long after this text was written I see that Appellöf (Nov. 1906) likewise unites them.

maxilliped, to judge from his figure, differs considerably from any of my numerous specimens, which come from many localities, and I entertain grave doubts as to whether Bonnier's figure mentioned is all correct in the differences it is intended to show from the figure of the same maxilliped in his *nexa*. The third maxilliped of some of my specimens agree tolerably well with his figure of *G. nexa*, while in the other specimens it is more or less halfway between his figures of *nexa* and *dispersa*. A. Milne-Edwards & Bouvier (1899) give an account of the differences between *G. nexa* and *G. dispersa*; but a study of my material has given the result that all my smaller specimens belong to *G. dispersa*, whereas some of the largest — in the spines and hairs on the chelæ and also in other respects — approach more or less near to *G. nexa*, without ever having however the form of rostrum described by the French authors. The two largest specimens I have seen are males (from the Færoes); the one the scutum is 20.2 mm. in the other only 16.3 mm. long. A. Milne-Edwards & Bouvier have only seen a single specimen (♂) of *G. nexa*, Bonnier likewise only one (♂) and both were large. Judging from my material and a comparison of it with descriptions given by these authors I must conclude that *G. nexa* was based on age-characters in single, large and well-marked males of *G. dispersa*. But this name is much younger than *nexa*, the latter must be used for the species as now understood.

23. *Munida bamffica* Penn.

Pl. II, fig. 3 a.

177. *Astacus bamffius* Pennant, Brit. Zool., Vol. IV, p. 17, Pl. XIII, fig. 25.
 1882 *Munida rugosa* G. O. Sars, Vid. Selsk. Forh. Christ. for 1882, no. 18, Tab. I, Fig. 5.
 — — *Rondeletii* G. O. Sars, Vid. Selsk. Forh. Christ. for 1882, p. 43, Tab. I, Fig. 4.
 1894 — *bamffica* A. Milne-Edwards & Bouvier, Rés. des Comp. Sc. de l'Hirondelle, fasc. VII, p. 83, Pl. VII, figs. 1—7.
 1899 — — A. Milne-Edwards & Bouvier, Rés. Sc. de l'Hirondelle (Suppl.) et de la "Princesse Alice", fasc. XIII, p. 75, Pl. IV, figs. 6—16.
 1900 — — A. Milne-Edwards & Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I, p. 299, Pl. XXIX, fig. 17.

Occurrence. The "Ingolf" has taken this species at 5 stations.

West of Iceland: St. 98: 65° 38' N. L., 26° 27' W. L., 138 fm., temp. 5.9°; 3 spec.

— — — — 87: 65° 02' — 23° 56' — 110 — — ? ; 2 —

— — — — 9: 64° 18' — 27° 00' — 295 — — 5.8°; 1 —

— — — — 85: 63° 21' — 25° 21' — 170 — — ? ; 4 —

South of Iceland: — 54: 63° 08' — 15° 40' — 691 — — 3.9°; 5 —

Further, it has been taken at 63° 15' N. L., 22° 23' W. L., 115—173 fm. ("Thor" 1903) and three near the Færoes, namely: 8—10 miles N. of the Færoes, 5 specimens; 12 miles east of the most westerly island, 150 fm., 3 specimens; and 61° 9' N. L., 7° 54' W. L., 180 fm., temp. 8.4°, 1 specimen.

Distribution. It is impossible at present to treat this subject fully at all points, as the authors cited above have wrongly included *M. tenuimana* G. O. Sars as a synonym under *M. bamffica*, and it is very probable that several of their localities, as also of the following authors (Caullery,

Adensamer, Senna), for the last-named species really refer to the former, though it should be added that we can by no means conclude that the specimens referred by A. Milne-Edwards & Bouvier to *M. bamffica* var. *tenuimana* really belong even to *M. tenuimana* Sars (see below).

M. bamffica is known from the Shetlands and from there along the coasts of Great Britain and Ireland (various authors), on the west coast of France and according to A. Milne-Edwards & Bouvier it goes further south to Madeira and past Cape Boyador to 25° 41' N. L. It is widely distributed in the Mediterranean: the Cyclades (Adensamer), and common in the Adriatic and further west. In North Europe, it has been taken at Bohuslän (Goës), also along the whole west coast of Norway, on the east coast at Vadso in Varanger Fjord (G. O. Sars), in the west part of the Murman Sea, finally at 73° 34' N. L., 17° 20' E. L. (Birula).

The species has been found rarely in so shallow water as 13 fm., at England (Bate, teste A. M.-Edw. & Bouv.) and in the Mediterranean; in the Mediterranean it has been taken several times in 30 to 40 fm., but both to the north and south it is most common in depths between 100 and 300 fm.; the greatest depth I can mention with certainty for it is 691 fm. ("Ingolf"), as it cannot be determined whether the depth 750 fm. from the Gulf of Gascogne (Caullery) applies to this or the following species.

Remarks¹. In 1882 Sars gave three species for Norway. Of these *M. Rondeletii* Bell is certainly identical with *M. bamffica* Penn. (= *M. rugosa* Fabr.; Sars). Sars states of *M. Rondeletii* that he has seen "three specimens all of relatively very considerable size"; I have also seen two very large males from Norway which agree well with Sars' descriptions and figures of this "species", but I think nevertheless that the species is only based on characters which are found in very large males or are untrustworthy for other reasons. The eyes are strikingly small, but I cannot say with Sars that the circle of setæ at the eye is wanting, as my specimens show at places a row of short bristles which seem to have been torn or broken. The lack of a pair of spines on the 4th abdominal segment (not 3rd, as Sars states) is too unimportant and also, according to A. Milne-Edwards & Bouvier, not maintainable as a character even within *M. bamffica* and the reduced dimension of the eyes seems to me an age-character. My view is also strengthened by the fact that Sars seems to have only 3 very large, but no smaller, specimens of the "species". — *M. tenuimana* G. O. Sars is on the other hand a well-founded species, and on describing it later the chief differences between it and *M. bamffica* will be mentioned. It is therefore incorrect of A. Milne-Edwards & Bouvier — followed by several others — in their various publications to include *M. tenuimana* Sars as a variety connected with the principal form by transitional stages, and it cannot be determined whether they have seen the real *M. tenuimana* or not. The specimen figured by these authors in 1900 (Pl. XXIX, fig. 18) must certainly be a true *M. bamffica*, to judge from the lack of submedian spines on the hind margin of the scutum and the form of this.

All the specimens from the "Ingolf" are small to almost medium-sized; the largest, from St. 54, is a male 53 mm. long, and there is a female 40 mm. long from the same station which had numerous eggs and a number of newly hatched zoëæ attached to the abdominal legs.

¹ Years after I had written the text here I received Dr. Appellöf's work (in Nov. 1906). This author rightly maintains *M. tenuimana* G. O. S. without having observed its best character however; on the other hand he retains *M. rugosa* G. O. S. as distinct from *M. bamffica* (= *M. Rondeletii* Bell). Without being able to follow him in this I may refer to his account; I may add that I have thought it best to make no changes whatsoever in my own account.

24. *Munida tenuimana* G. O. Sars

(Pl. II, fig. 4a; Pl. III, fig. 1a).

1872. *Munida tenuimana*, G. O. Sars, Vid. Selsk. Forh. Christiania, f. 1871, p. 257.

1882. — — — — — f. 1882, no. 18, p. 44, Tab. 1, Fig. 6.

Occurrence. The "Ingolf" has taken this species at a number of localities.

Davis Straits: St. 35: 65° 16' N. L., 55° 05' W. L., 362 fm., temp. 3.6°; 1 spec.

— — — 27: 64° 54' — 55° 10' — 393 — — 3.8°; 4 —

— — — 25: 63° 30' — 54° 25' — 582 — — 3.3°; 1 —

West of Iceland: St. 16: 65° 43' N. L., 26° 58' W. L., 250 fm., temp. 6.1°; 1 spec.

— — — 97: 65° 28' — 27° 39' — 450 — — 5.5°; 32 —

— — — 89: 64° 45' — 27° 20' — 310 — — 8.4°; 11 —

— — — 90: 64° 45' — 29° 06' — 568 — — 4.4°; 13 —

— — — 9: 64° 18' — 27° 00' — 295 — — 5.8°; 34 —

South-West of Iceland: St. 73: 62° 58' N. L., 23° 28' W. L., 486 fm., temp. 5.5°; 11 spec.

— — — 84: 62° 58' — 25° 24' — 633 — — 4.8°; 13 —

— — — 69: 62° 40' — 22° 17' — 589 — — 3.9°; 4 —

— — — 74: 62° 17' — 24° 36' — 695 — — 4.2°; 1 —

— — — 81: 61° 44' — 27° 00' — 485 — — 6.1°; 7 —

— — — 78: 60° 37' — 27° 52' — 799 — — 4.5°; 104 —

South-East of Iceland: — 52: 63° 57' — 13° 32' — 420 — — 7.9°; 1 chela.

I have also seen specimens from 64° 42' N. L., 27° 43' W. L., 426 fm., temp. 6° (Wandel); 62° 12.5' N. L., 20° 06' W. L., 271 fm. ("Thor" 1903); 62° 57' N. L., 19° 58' W. L., 509 fm. ("Thor" 1903); from the two following localities lying south-west of the Færoes ("Michael Sars" 1902): 61° 8' N. L., 9° 33'—9° 46' W. L., 425—460 fm., 1 specimen, and 59° 28' N. L., 8° 1' W. L., 580—687 fm., 5 specimens; lastly, it has been twice taken in 1904 ("Thor") near the first-named of the "Michael Sars" stations.

Distribution. The species was taken by Sars in the deep Norwegian fjords lying between about 60° and 68° 12' N. L., in depths between 300 fm. and 672 fm. In the Skager Rak it has been taken by Joh. Petersen in 210, 265 and 300 fathoms. From these data with those of the "Ingolf" etc. we see that the species is commonest in depths between 300 and 600 fm., the extreme limits being 210 fm. and 800 fm.; the bottom-temperatures were between 3.3° and 8.4°. It certainly goes tolerably far southwards in the deeper water of the Atlantic off southern Europe and perhaps northern Africa, but future investigations must determine more precisely how far it has been confused with *M. bamffica*.

Remarks. The largest specimen, a female from the Skager Rak, is 87 mm. long to the tip of the rostrum; the largest "Ingolf" specimen is an egg-bearing female from St. 27; if the rostrum were complete it would measure ca. 74 mm.; the largest of the more than a hundred specimens from St. 78 is a male 64 mm. long. As can be seen, my material is very large and I have found it very easy to separate every single specimen that was at least about 20 mm. long from the previous species with perfect certainty. The best character is given by the sternum of the thorax, which has hitherto been overlooked. In both species the sternum is divided into 4 segments by raised cross-lines furnished

with marginal hairs. In *M. bamffica* it is further as if covered with scales almost everywhere, which is due to the presence of numerous large and small, slightly arched tubercles, the convex anterior or outer margin of which is well marked off and provided with hairs (fig. 3 a); in a specimen of only 13 mm. total length, rostrum included, this sculpture is weakly developed. In *M. tenuimana* the sternum is very shiny and without the scale-formation as in *M. bamffica*; there are some rows of bristles on a part of the first sternal segment but the scale-like tubercles are rudimentary, and as a rule the second, third and fourth segments are smooth, with altogether extremely few short rows of hairs chiefly out towards the lateral margins; sometimes also we meet with a small number of such rows scattered over the surface of the segments, but the scale-formation, i. e. the raised seemingly imbricate areas, are never developed (fig. 4 a). In *M. tenuimana* the submedian spines on the hind margin of the scutum are not only always present, they are large and directed strongly outwards; the spines on the 2nd—4th abdominal segments are large, very prominent and, especially the submedian, considerably larger and more prominent than in any specimen of *M. bamffica*. In *M. tenuimana* the bristles on the base of the upper margins of the eyes are short to very short, but cannot ever be said to be quite wanting. The lateral margins of the scutum are less convex than in *M. bamffica*, the more slender chela are laid stress on by Sars in the choice of the specific name. — After examining my large material I am quite certain of the independence of the species *M. tenuimana*.

25. *Munida microphthalma* A. M.-Edw.

1880. *Munida microphthalma* A. Milne-Edwards, Bull. Mus. Comp. Zool. Vol. VIII, no 1, p. 51.
 1897. — — A. Milne-Edwards & Bouvier, Mem. Mus. Comp. Zool. Vol. XIX, p. 32.
 Pl. II, figs. 9—13.
 1900. — — A. Milne-Edwards & Bouvier, Exp. Scient. du Travailleur et du Talisman,
 Crust. Déc., I, p. 292.

Occurrence. This species has not been brought home by the "Ingolf", but it was taken by "Thor" in 1903 at the following locality.

South of Iceland: 62° 10' N. L., 19° 36' W. L., 1080—1144 fm., 2 spec.

Distribution. The most northerly place in the Atlantic at which this species had previously been taken was 45° 39' N. L. in the Bay of Biscay ("Talisman"). It was founded on specimens taken in the West Indies by the "Blake"; the "Challenger" took it near Ascension and north of Kermadec Islands in the Pacific. With some uncertainty a specimen taken by the "Albatross" at Cocos Islands in 184 fm. was ascribed to it, and the French authors cited consider it most probable that *M. microps* Alcock of the Indian Ocean is a variety of the same species, but in 1901 Alcock maintains his *M. microps* as an independent species "very closely related to *M. microphthalma* A. M.-Edw." The greatest depth at which even the main form is known to have been taken is 804 fm., so that the depth given by the "Thor" is not a little larger.

26. *Galacantha rostrata* A. M.-Edw.

1880. *Galacantha rostrata* A. Milne-Edwards, Bull. Mus. Comp. Zool. Vol. VIII, no 1, p. 52.
 1894. — — S. I. Smith, Bull. Mus. Comp. Zool. Vol. X, p. 21, Pl. IX, figs. 2—2 a.

1897. *Galacantha rostrata* A. Milne-Edwards & Bouvier, Mem. Mus. Comp. Zool. Vol. XIX, p. 60, Pl. IV, figs. 21—24.

1900. — — A. Milne-Edwards & Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I, p. 308, Pl. VI, fig. 9.

Occurrence. The "Ingolf" has been so fortunate as to take this beautiful species at one station.

West of Iceland (halfway between Iceland and Greenland): St. 11: 64° 34' N. L., 31° 12' W. L., 1300 fm., temp. 16°, 2 specimens.

Distribution. On the American side of the Atlantic this species has been taken at Bequia, Antilles (1591 fm.) and from there northwards to 40° 17' N. L. It was also taken by the "Talisman" off northern Africa at about 30° N. L.; these specimens were described by A. Milne-Edwards as *G. Talismani*, under which name a specimen from Banda (ca. 130° E. L.) was included by Henderson in the "Challenger" Anomura, p. 167, Pl. XX, fig. 1; later, Milne-Edwards & Bouvier included *G. Talismani* as synonym and also considered the Banda specimen as belonging to *G. rostrata*. Henderson (l. c. p. 167, Pl. XIX, fig. 6) also describes a *G. bellis* and considers it different from *G. rostrata*, but it is taken as variety by the French authors. Faxon (Mem. Mus. Comp. Zool. Vol. XVIII, p. 78, Pl. B, figs. 1, 1 a) and however in 1895 already both disputed the correctness of considering *G. bellis* as a species and referred seven specimens taken at three stations west of Columbia or north of the Galapagos Islands to *G. rostrata*. He adds, it is true, that his specimens "differ constantly from the typical West Indian form in the following particulars", but these seem to be small. In 1901, Alcock (Descrip. Catal. Fishes, p. 274) gives *G. rostrata* as having been taken in the Arabian Sea and Bengal Bay in depths from 1022 to 1520 fm. To sum up, during the last ten years authors have come more and more to the conclusion, that the specimens taken in the different seas belong to *G. rostrata* and that this shows some variation in the length of the spines and in the sculpture. I think that A. Milne-Edwards & Bouvier are quite right when they say (1900), that "*G. rostrata* est une espèce cosmopolite répandue indistinctement dans les profondeurs de toutes les mers chaudes ou tempérées". The "Ingolf" has also shown that the species occurs at ca. 64½° N. L. between Iceland and Greenland; the surface water here belongs to purely arctic regions, but in deep water at 1300 fm., where the species was taken, the temperature and other conditions of the sea are certainly nearly identical with those found at similar depths between the tropics. *G. rostrata* has only been taken in depths between 1022 fm. (Arabian Sea) and 1591 fm. (Antilles).

Remarks. Both my specimens are males; the larger is 58 mm. long to the tip of the rostrum. When they had just come from the water I noticed that they were reddish yellow in colour with pale eyes.

27. *Munidopsis curvirostra* Whiteaves.

(Pl. III, figs. 2 a—2 e).

Munidopsis curvirostra Whiteaves, Ann. Journ. Science 3 Ser. Vol. VIII, p. 212.

— — S. I. Smith, Bull. Mus. Comp. Zool. Vol. X, p. 21 (sine descript.) Pl. VIII, figs. 2, 3, 3 a.

— *longirostris* A. Milne-Edwards & Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I, p. 314, Pl. IV, fig. 1, Pl. XXX, figs. 6—10.

Occurrence. The "Ingolf" has taken this form at six stations.

Davis Straits: St. 35: 65° 16' N. L., 55° 05' W. L., 362 fm., temp. 3.6°; 20 spec.

— — - 28: 65° 14' — 55° 42' — 420 — — 3.5°; 75 —

— — - 27: 64° 54' — 55° 10' — 393 — — 3.8°; 3 —

South-West of Iceland: St. 76: 60° 50' N. L., 26° 50' W. L., 806 fm., temp. 4.1°; 1 spec.

South of Iceland: St. 67: 61° 30' N. L., 22° 30' W. L., 975 fm., temp. 3.0°; 1 spec.

— - - - 63: 62° 40' — 19° 05' — 800 — — 4.0°; 1 —

It has also been taken even further north in Davis Straits than any of the localities just mentioned, namely: 65° 36' N. L., 56° 24' W. L., 349 fm., temp. 3.2°, 5 specimens, (Wandel, 1889).

Distribution. The species was first observed in the Gulf of St. Lawrence, 180—220 fm. (Whiteaves); later, at a number of places off the east coast of the United States, between 39° and 40° N. L. in depths from 384 to 1230 fm. and at 33° 35¹/₃' N. L., 647 fm. Under the name *M. longirostris* A. M.-Edw. & Bouv. it is noted from the Newfoundland waters, 46° 05' N. L., 49° 02¹/₂' W. L., 674 fm., also from off the Sudan at about 30° N. L. in 1104 and 1175 fm. (A. Milne-Edwards & Bouvier). — The occurrence of this deep-water species right up to 65° 36' N. L. in the Davis Straits is one of the many indications that the bottom of the deep part of that sea belongs in zoogeographical regards to the Atlantic. It is not improbable further, that this species will prove to have a much greater distribution than is known at present.

Remarks. The spiny armature on the gastric area is extremely variable: as a rule there are three spines, namely, one on each side of the middle line and one unpaired somewhat further back (fig. 2 a). Sometimes not one but two unpaired spines occur (fig. 2 c), one behind the other; in one specimen the number of spines mounted to nine (fig. 2 d), namely, three in the median line and three on each side all well-developed except the posterior set of paired spines which were small. In contrast to this I have met with an adult specimen in which the spines, four altogether, the most posterior spine excepted were reduced to fairly low, transverse tubercles (fig. 2 e). One of the largest specimens (from Stat. 28) is a male, in which the carapace measures 25¹/₂ mm. to the tip of the rostrum (the rostrum however is in reality 12 mm. and the carapace itself without the rostrum 15 mm. long), while the greatest breadth is 11¹/₂ mm.

I have compared a small "Talisman" specimen of *M. longirostris* taken off the Sudan with one of similar size from the "Ingolf" St. 28 and found the most perfect agreement between them; this specimen agrees fairly well also with the description of *M. longirostris* by the French authors, but it should be remarked, that I have not seen either in their co-type or in my smaller "Ingolf" specimens anything similar to the carapace as figured by them, in which the breadth is considerably greater in front than near to the posterior margin and the process from the front outer angle is long and broad.

The species stands fairly near to *M. simplex* A. M.-Edw. as was already noted by the French authors, who indicate a number of differences in the "Travailleur" and "Talisman" reports. I have examined one of their co-types of *M. simplex* from St. Vincent, West Indies and consider it a good species, which in addition to the differences summarised by A. Milne-Edwards & Bouvier is distinguished from *M. curvirostris* by its longer and more slender chela.

28. *Munidopsis Antonii* A. M.-Edw.

Pl. III, figs. 3 a—3 b.

1884. *Galathodes Antonii* A. Milne-Edwards, in Filhol, La Nature Vol. XII, p. 231, fig. 2 (teste A. M.-Edw. & Bouvier).

1888. *Munidopsis Antonii* Henderson, Challenger Anomura, T. XXVII, p. 151, Pl. XVIII, fig. 1.

1900. — — A. Milne-Edwards & Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I, p. 321, Pl. IV, fig. 2, Pl. XXX, figs. 21—25.

Occurrence. This species was taken by the "Ingolf" at a single station.

Southern Part of Davis Straits: St. 36, 61° 50' N. L., 56° 21' W. L., 1435 fm., temp. 1.5°; 1 spec.

Distribution. A. Milne-Edwards & Bouvier note the species from two points north of the Azores at 42° 15' N. L. and 42° 19' N. L. where the depth was 2114 and 2133 fm. In the "Challenger" the species is noted from west of Valparaiso, 1375 fathoms and S. W. of Australia, 1800 fm.

Remarks. My single specimen, a female, has been compared both with the descriptions of A. Milne-Edwards & Bouvier and with a co-type from the Paris Museum. My specimen differs only in that the rostrum is somewhat longer, the spine on the outer corner of the second antennal segment longer and more pointed, reaching out a little past the centre of the outer margin of the following joint, and lastly in that it has four pairs of spines on the gastric area. In all other respects, viz. antennules, eyes, granulation on the thorax, spines and granulation on the legs, it agrees with the description and the Paris specimen. Concerning the rostrum it may be remarked that, according to the measurements of the French authors, this was 14.5 mm. long in a female in which the cephalothorax with rostrum was 45 mm., that is, scarcely a third of the latter length; in my specimen the cephalothorax with rostrum is 26 mm., the much upward curved rostrum 8.8 mm., thus a little over a third of the whole length. For the rest, my figures of the cephalothorax will show the details in the spiny ornamentation.

29. *Munidopsis similis* Smith.

Pl. III, figs. 4 a—4 b.

1885. *Munidopsis similis* S. I. Smith, Proc. U. S. Nat. Mus., VII, p. 496.

1887. — — — Rep. U. S. Comm. Fish and Fisheries for 1885, p. 647, Pl. V, figs. 1—1e, Pl. VI, figs. 2—2 a.

Occurrence. This species has been taken once by the "Ingolf".

West of Iceland (halfway between Iceland and Greenland): St. 11: 64° 34' N. L., 31° 12' W. L., 1000 fm., temp. 1.6°; 1 spec.

Distribution. *M. similis* was founded on a specimen taken off the east coast of America at 46½° N. L. in 1060 fm.; *M. crassa* Smith, to which *M. similis* appears to belong as a variety, was founded on a specimen taken off the east coast of America at 36° 16½' N. L., in 2574 fm. There is also considerable probability that *Munidopsis subsquamosa* var. *aculeata* Hend. belongs to *M. crassa* + *M. similis* and this form was taken by the "Challenger" west of Patagonia, 1450 fm. and "between Station Island and the Crozets", 1375 fm.

Remarks. S. I. Smith founded *M. similis* on a single female, in which the carapace (with rostrum) was 24.2 mm. long; he states that it "is very closely allied to *M. crassa*, and will possibly be a variety of it", but of *M. crassa* he had only seen his type-specimen, a very large female, which the carapace with rostrum measured 65 mm. My single specimen, a female with eggs, is nearer to *M. similis* than to *M. crassa*, but is somewhat larger than the former, as the carapace with rostrum is 40 mm., the rostrum itself 12.4 mm., and it differs from both and especially from *M. crassa* in that the rostrum is longer, narrower and more curved upwards and in that the spiny structure along the anterior margin of the carapace is reduced to but a single process outside the bases of the antennæ. The gastric area has two larger and five smaller spines as also a number of smaller, round tubercles; on the posterior half a number of smaller, flat tubercles; the hepatic area has some larger, round tubercles; on the posterior half of the carapace there are numerous raised portions which have a certain resemblance to transverse keels and are from three to more times as long as broad. The rostrum is strongly recurved, narrow in its distal two-thirds, upper margin keeled, under surface flat and lateral margins with three to four serrations at the middle. The antero-lateral process of the carapace is of good size, another but smaller process is present about halfway between this and the basis of the antenna and between this and the rostrum the anterior margin is smooth; the lateral margin has some smaller spines, one or two of which are situated on the anterior angle of the anterior branchial area. The furrows between the different areas of the carapace are well-marked and smooth. The eyes, antennules and the limbs on the cephalothorax agree with the corresponding parts of *M. similis* in the features in which S. Smith finds differences between this form and *M. crassa*. The abdomen is essentially intermediate between those in *M. similis* and *M. crassa*. For the rest, my specimen shows all these features in my specimen.

The eggs are ca. 3 mm. in diameter. — Just after the specimen came up in the trawl, I noted that it was uniformly white with yellowish red eyes, while the eggs were bright scarlet red.

As a result of the above I have considered myself justified in referring my specimen to *M. similis* Smith; so long as it cannot be determined with certainty that this species should be included under *M. crassa* as a variety or only as a synonym, I have thought it best to keep the first name. Under "distribution" I have further expressed my views concerning *M. crassa*, *M. similis* and *M. subsquamosa* var. *aculeata* Hend.

30. *Uroptychus nitidus* A. M.-Edw. var. *concolor* A. M.-E.

38. *Diptychus nitidus* A. Milne-Edwards, Bull. Mus. Comp. Zool. Vol. VIII, p. 62.

39. — — — — —, var. *concolor*, A. Milne-Edwards & Bouvier, Ann. Sc. nat., Zool., Sér. 7, T. 16, p. 225, fig. 16, fig. 21.

40. — — — — — A. Milne-Edwards & Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I, p. 360, Pl. IV, fig. 4, Pl. XXXII, figs. 15—19.

Occurrence. The "Ingolf" has brought home a single specimen.

South-West of Iceland: St. 84: 62° 58' N. L., 25° 24' W. L., 633 fm., temp. 4.8°; 1 spec.

Distribution. The species was first taken by the "Blake", later by the "Challenger" at the

Antilles; A. M.-Edwards & Bouvier (Mem. Mus. Comp. Zool., XIX, p. 139) state: "L'espèce typique paraît être localisée dans la mer des Antilles. . . ., elle ne remonte pas au-dessus de 80 brasses et descend jusqu'à 573", and they continue: "Elle est représentée dans les eaux orientales de l'Atlantique par la variété *concolor* A. Milne-Edwards et E. L. Bouvier du Talisman (495 à 1600 mètres), et dans le Pacifique oriental par la variété *occidentalis* Faxon de l'Albatross (495 brasses)". I think that "var. *concolor*" really belongs to *U. nitidus* as a variety; "var. *concolor*" has been taken by the "Caudan", "Travailleur" and "Talisman" in the Gulf of Gascogne and from there southwards to the Cape Verde Islands, in 495—1710 meters, also in the Indian Ocean off Cape Natal, 440 fm. (Stebbing). Alcock (1899) gives *U. nitidus* — presumably not the typical form but var. *concolor* — from the Laccadives, 636 fm., and from the Bay of Bengal, 320—296 fm. It appears to me somewhat more doubtful whether var. *occidentalis* Faxon is a variety of *U. nitidus* or an independent species, as Faxon (Mem. Mus. Comp. Zool. XVIII, p. 101) gives several differences between the two, but naturally I can contribute nothing to the solution of the question. Faxon has only had four specimens of his *U. nitidus* var. *occidentalis* from a station in the Gulf of Panama, 458 fm. (the 495 cited above from the French authors must have been an error in printing).

Remarks. I have compared the "Ingolf" specimen with two specimens of *U. nitidus* var. *concolor* taken by the "Talisman" and found complete agreement.

31. *Uroptychus rubro-vittatus* A. M.-Edw.

1881. *Diptychus rubro-vittatus* A. Milne-Edwards, C. R. Acad. Sc. 5. déc. 1881 (teste A. M.-Edw. & Bouvier).
 1894. — — A. Milne-Edwards & Bouvier, Rés. des Camp. Sc. de l'Hirondelle, Fasc. VII, p. 88, Pl. VI, figs. 1—12.
 1900. — — A. Milne-Edwards & Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I, p. 356, Pl. XXXII, figs. 6—14.

Occurrence. This species was not brought home by the "Ingolf"; on the other hand it was taken by the "Thor" in 1903 at the following locality.

South of Iceland: 63° 12,5' N. L., 20° 06' W. L., 300 fm.; 13 spec.

Distribution. The species has been taken several times in the eastern Atlantic, namely, off northern Africa and southern Europe between 26° 20' N. L. and 46° 40' N. L. as also at the Azores (A. Milne-Edwards & Bouvier, Bonnier, Caullery). The depth was from 160 to 744 fm. Its occurrence south of Iceland is interesting.

Remarks. Some of the specimens taken are remarkable for their quite unusual size; they are much larger than those whose measurements are given in the literature and I may therefore give some details concerning them. The largest male has the following dimensions: length from tip of rostrum to end of abdomen 33 mm., thorax with rostrum 18 mm., left first leg 63 mm.; in the largest female with eggs the length of the body when stretched was 40 mm., of thorax with rostrum 17 mm., left first leg 56 mm.