

## On the Occurrence of the Siphonophores *Muggiæa atlantica* Cunningham and *Muggiæa kochi* (Will) in the English Channel.

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IN 1892 Cunningham described a new species of Siphonophore, *Muggiæa atlantica*, which was first noticed by him in the waters of the English Channel off Plymouth in the autumn of 1891. Since then there have been records from time to time of the occurrence of this species at Plymouth (see Plymouth Marine Fauna, 1931, p. 84), and its distribution in the English Channel and Irish Sea in 1904 was worked out by Gough (1905).

While examining a number of *Muggiæa* caught off Plymouth in the autumn of 1933 I noticed that the species differed slightly from Cunningham's description. On closer examination it was found that the species was *Muggiæa kochi* (Will) which although superficially resembling *M. atlantica* differs mainly in that the hydræcium is shorter and the somatocyst only extends to between a third and a half the height of the nectosac. On examining large numbers of specimens it was found that in 1933 no *M. atlantica* occurred in the catches of plankton but all were *M. kochi*. It was of interest therefore to know whether *M. kochi* had appeared in the waters of the English Channel in previous years with *M. atlantica*. Opportunity for such an examination was afforded by the storage in the Plymouth laboratory of all the fortnightly catches taken from the Seven Stones Light-vessel since the year 1913. This collecting was stopped at the end of 1928, but in later years the data have been supplemented by the examination of weekly hauls taken with a 2-metre stramin ring-trawl 2 miles east of the Eddystone. Examination of all these collections has given the following interesting information (see page 556) on the occurrence of the two species.

From the data supplied it seems that *Muggiæa atlantica* occurred for an unbroken series of years from 1913 to 1924 (excepting 1915, when none were seen in the collections), but that in 1925 *M. kochi* first made its appearance and that since that time *M. atlantica* has disappeared from the area.

<i>M. atlantica.</i> <i>M. kochi.</i>			<i>M. atlantica.</i> <i>M. kochi.</i>		
Seven Stones.			Seven Stones.		
Aug. 5th, 1913	+	—	Dec. 1st, 1921	many	—
Nov. 1st „	+	—	Dec. 14th „	+	—
Dec. 14th „	+	—	Aug. 6th, 1922	many	—
Jan. 28th, 1914	+	—	Aug. 31st, 1923	+	—
June 25th „	many	—	Nov. 1st „	+	—
Aug. 24th „	+	—	Nov. 12th „	+	—
July 2nd, 1916	many	—	Dec. 2nd, 1924	+	—
Sept. 30th „	many	—	Oct. 4th, 1925	—	+(1)
Aug. 5th, 1917	+	—	Oct. 17th „	—	+(1)
May 11th, 1918	+	—	Oct. 22nd, 1926	—	+
Sept. 11th, 1919	+	—	Jan. 4th, 1927	—	+(1)
Oct. 16th „	many	—	Sept. 15th, 1928	—	+(1)
Oct. 28th „	+	—	Sept. 30th „	—	+
Aug. 2nd, 1920	+	—			
Oct. 27th „	+	—	Plymouth.		
Nov. 8th „	+	—	Oct., 1928	—	+
July 11th, 1921	+(1)	—	Aug.-Dec., 1930	—	+
July 22nd „	+	—	Jan.-April, 1931	—	+
Aug. 7th „	many	—	Aug. 28th „	—	+(1)
Sept. 6th „	many	—	Oct.-Dec. „	—	+
Sept. 20th „	+	—	Aug.-Dec., 1933	—	+
Oct. 26th „	many	—	Jan.-Feb., 1934	—	+
Nov. 7th „	many	—			

+ = present.  
 — = absent.  
 (1) = only one individual in the catch.

There are no records for 1929. In 1932, although collections were examined weekly, no *Muggiæa* were found. Unfortunately I discovered the disappearance of *M. atlantica* after I published my report (1933) on the seasonal distribution of the ring-trawl plankton and in Table I in that publication the *Muggiæa* occurring in 1930-1931 are given as *M. atlantica*. These specimens have been re-examined and found to be *M. kochi*.

Both species are warm water forms and it is remarkable that they have not appeared together in some years or even alternated from year to year. One would like to have information from other regions to see if *M. kochi* now predominates in its area of distribution. The two species were at any rate present together in 1931, for I understand from Mr. A. K. Totton of the British Museum that he took both *M. atlantica* and *M. kochi* in the Bay of Algeiras. The actual geographical distribution of both species appears to be little known and they seem to have been rarely met with in the collections of oceanographical expeditions. Moser (1925, p. 107) remarks that *M. atlantica* has not been taken in the Atlantic outside British waters, but has been found twice in the Pacific, by Doffein in Sagami Bay on the Japanese coast and by Bigelow in the eastern tropical Pacific. More recently it has been recorded by Bigelow and Leslie (1930) as frequent in the plankton of Monterey Bay on the Californian coast of America. It is remarkable, however, that Bigelow (1911) did not find this species in the Biscayan plankton collected by Fowler on

the *Research*, nor was the species recorded in the collections of the Plankton Expedition (Chun, 1897). That it probably does occur in the Atlantic outside British waters is, however, suggested by the statement of Totton quoted above.

Moser states on the other hand that *M. kochi* is very frequent not only in the Mediterranean but also in the whole central Atlantic, being recorded by Chun near the Canaries, Fewkes on the coast of N. Carolina and by herself in material collected by Hartmeyer from the Tortugas. Until now, Bigelow's record (1911) from the Bay of Biscay was the most northerly record for its occurrence.

It seems possible that both species are essentially inhabitants of less contaminated coastal waters, which would account for their absence in the collections of oceanographical expeditions. When occurring in our waters they generally first appear towards the end of the summer and often continue on through the autumn to the January or February in the following year.

A number of *M. kochi* were measured from the catches on October 25th and November 15th, 1933. These specimens had been preserved in formalin.

Overall measurements from the mouth of the nectosac to the exterior apex varied between 2.3 mm. and 4.9 mm., the majority lying between about 2.7 and 4.0 mm. Measurements of the distances between the mouth of the nectosac and the summits of the somatocyst and of the hydroecium showed that on the average the somatocyst extended 51-52% of the height of the nectosac from its mouth, and the hydroecium 15-16%, the range for the former being 41-59% (1 extreme measurement gave 68%) and for the latter 13-19%.

I am very grateful to Mr. A. K. Totton for kindly confirming the identification of many specimens of the two species.

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