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The occurrence of Penilia avirostris Dana in the waters of the North West African shelf

by

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Penilia avirostris, the most primitive, and simultaneously one of the few species of marine Cladocera, is a characteristic element of the zooplankton of warm seas. It is found near the south European and African Atlantic coasts, in the Mediterranean and Black Seas, where it is usually a seasonal component of the zooplankton. Occurs in temperature ranges from 11° to 26°C /Casanova, 1964/, attains maximum numbers as a rule, at a temperature of 20°C. The biology and ecology of this species is best known in the Mediterranean and Black Sea thanks to the works of Casanova and Margineanu.

Found in the Mediterranean from March to November, with the main development intensity during the period from July to September. The greatest numbers found in the Black Sea, are during August and September. It then occurs in great volume, frequently comprising the predominant element of the summer zooplankton. Considered by some planktonologist to be a brackish waters species /Casanova, 1965/ it can withstand a large salinity fluctuation range / 11‰ to 36‰/.

There is less data available as regards its occurence in the coastal waters of North West Africa. So far, it has been found in the Gulf of Guinea, where it occurs in fairly high density, and also in the Atlantic waters near Gibraltar. According to M.L.Furnestin /1957/,

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it does not occurs in the coastal waters of Marocco, which would indicate a disjunction in its distribution.

Obserevations of the occurrence and distribution of Penilia avirostris in the water of the North West African shelf, were carried out in 1964 - 1973, basing on samples taken during cruises made by m/t "Wieczno" and m/s "Turlejski". Investigations were carried out in the shelf waters lying outside the belt of territorial waters of the coastal states.

Although each of the cruises covered slightly different regions and took place in different months, the section of shelf between 4°N and 39°N was investigated in 4 different seasons:
spring : III/IV,1966, summer : 12.6.-4.8.1967, autumn : IX/XI.1964.,XII. 1971, IX/XII,1973, and winter: II/III,197o. /Table I./

The intensity of development of this species is during the autumn months /October - December/, and in this months it attains its greatest range /Fig. 1/. During this period it is found in waters with depths of 2o m to loo m.,but is most numerous in waters with depths of 4o m. to 7o m. Although it is the most numerous species of the Cladocera in these waters, it is not, even at this time, the predominant component of the zooplankton, its participation does not exceed several percent, its maximum density : 7,5oo per sq.m. / pos. 28°22'N, depth 48 m., in a sample dated 1.12.1963./.

During the winter it is only found in the waters between 12°49'N and 15°47'N, the greatest concentrations forming in the region of the mouth of the Gambia River. It occurred in both shallow and deeper waters, sometimes being very dense in the latter / e.g. on 21.2.7o, pos.13°32'N., depth 224 m. : 4,875 per sq.m./, also being observed in sporadic cases, in the waters beyond the shelf.For instance, on 15.2.197o, it was observed at dapths of 89o m. and 2.2oo m meters / 87o and 24o per sq.m. respectively/.

In the summer, it was only observed in one sample taken from pos. 13°57'N at a depth of 55 m. It was not very numerous : 485 per sq.m.

This species was not found in material collected during the spring.

On summing up it can be stated that Penilia avirostris is a seasonal component of the zooplankton in the waters in question. It is most frequently represented in the region of the River Gambia /12°N - 13°N/, and it is here that it can be found for the longest period of time: from summer to winter. Its maximum occurrence in the waters to the

noth of this region, is during the autumn months.

As already mentioned, this species attains its maximum frequency in the late summer, in the Mediterranean and Black Sea. The shifting of the period of maximum frequency to the autumn months in the North West African waters, may be due to the specific hydrological regime of this waters. Seasonal changes in the range of the cold Canary Current, and the periodical occurence of upwelling over a large stretch of North West African shelf waters, means that Penilia avirostris finds optimum thermal conditions here in the autumn, and in the region of the mouth of River Gambia - in the winter also. The coastal waters on the stretch of shelf between Cape Verde and Cape Blanc are too cold for this species' optimum requirements /15° to 17° C/. In the summer, however, these waters have temperature exceeding 20°C, which should not therefore its occurrence. A factor which my restrict the occurrence of this species in this region, is the salinity, which rises rapidly with the rise mf in temperature /K.Wiktor, K.Chłapowski,1970/.

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Table I. Specification of material collected

Date	Region penetrated	No of samples	Sampling gear
Spring:			
23.3. 66 - 1o.4.66	11°N to 19°N	19	Apstein net
Summer:			
12.6.1967 - 4.8.1967	7°N to 26°N	57	Hensen net
Autumn:			
27. 9.1964 - 28.12.1964	4°N to 21°N	19	Apstein net
1.12.1971 - 7.12.1971	32°N to 38°N	6	Hensen net
12.11.1973 - 3.12.1973	16°N to 32°N	19	Hensen net
Winter:			
4.2.197o - 4.3.197o	12°N to 24°N	71	Hensen net

Fig. 1. Distribution of Penilia avirostris during the autumn /October - November/

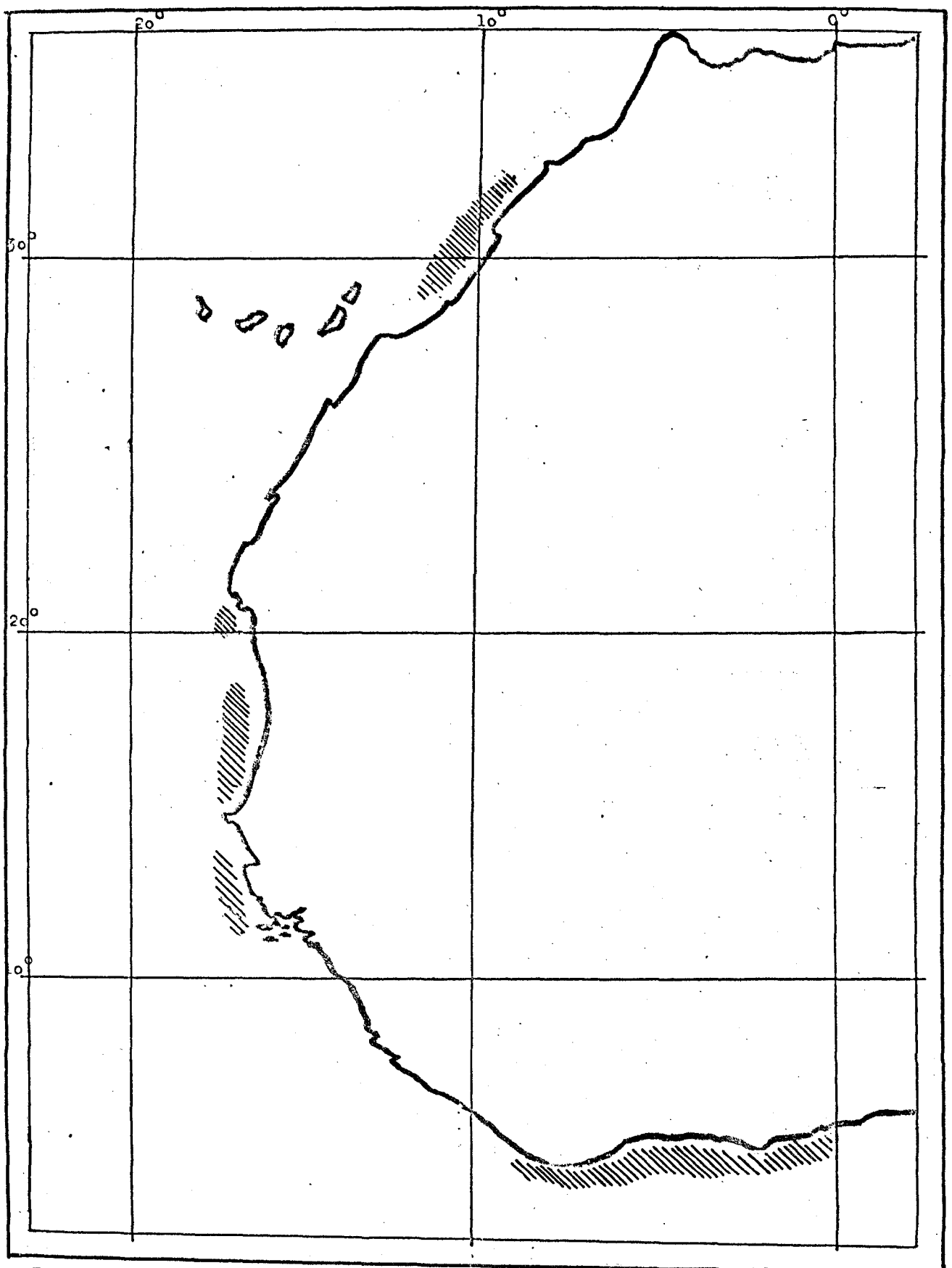

Fig. 1.