Seasonal and spatial biometric variations in Rhizosolenia shrubsolei from 3 areas in the Suez Canal

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Abstract : The variations of cell dimensions of the planktonic diatom R.shrubsolei in the different habitats of the Suez Canal were studied in winter and summer. The results were discussed in view of different environmental conditions .

Introduction : Exchange of planktonic organisms on both sides of the Suez Canal is greatly affected by the direction of the water current and the high salinity barrier in the Bitter Lake . Successful propagation of transported species depends upon their tolerance to the new ecological conditions prevailing . How these varying conditions affect the morphology of plankton diatom has not been investigated before. It is aimed in this paper to study the size variations in R.shrubsolei in the different natural habitats of the Suez Canal as affected by the prevailing environmental conditions .

Material and Methods : Samples were collected in winter (temp. 14-15°C) and summer (temp. 29-30 °C) from Port Said, P.S. (S‰ : 37-39‰), the Bitter Lake, B.L. (S‰ : 44.6-45.8‰) and Suez Bay, S.B. (S‰ : 41.2-41.7‰). Measurements of cell length and diameter for 100 individuals from each site were taken .

Results and discussion : The results are shown in figures (1&2). Winter population : The average length of the B.L. population (590 u) was higher than that of S.B. (549 u) and P.S. (538 u). The length of P.S. population showed an expanded range (314-986 u). This population represents two distinct groups : a shorter one with length $<$500 u and longer one $>$550 u. The former probably belongs to the original population, while the other represents the transported population from the southern part of the Canal. Concerning the cell diameter, it was found that the average value of P.S. population

(20.5 u) was higher than that of both S.B. (17.8 u) and B.L. (17.9 u) . The diameter of P.S. population showed two components also. The narrow individuals probably represent allochthonous population, while the wider individuals may belong to the autochthonous population with shorter lengths.

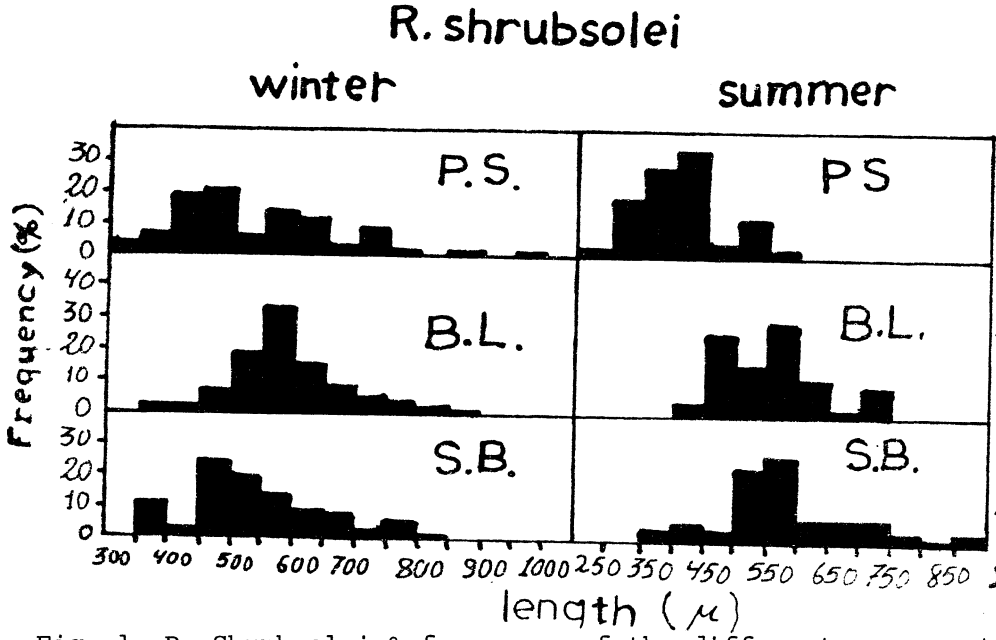

Fig. 1. R. Shrubsolei.% frequency of the different components of cell length in the three regions in winter and summer .

The similarity in dimensions of the population of the species between the three habitats during this season may be correlated with the strong northward current prevailing in the Canal in this season .

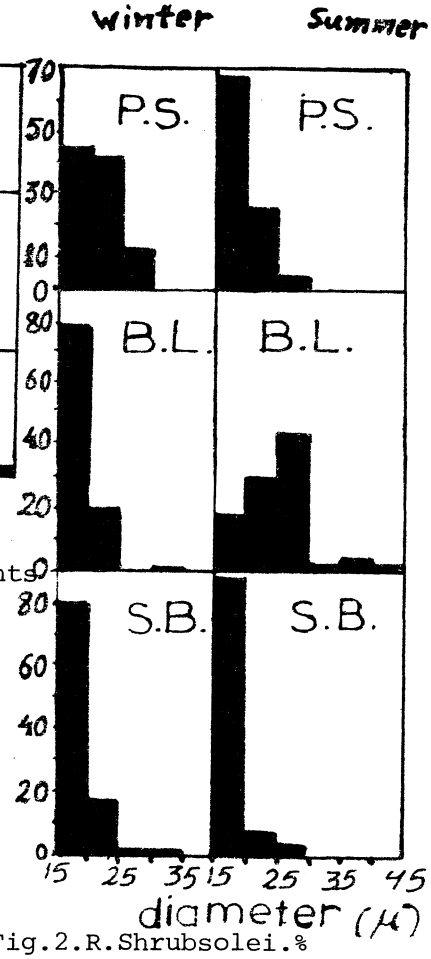

Fig.2.R.Shrubsolei.% frequency of the different components of cell diameter in the three regions in winter and summer .

Summer population : The average length of S.B. population (595 u) washigher than that in B.L. (565 u) and P.S. (407 u). The B.L. population showed 2 distinct length groups, one representing the indigenous population and the other probably reflects S.B. population. Both populations may be mixed through the tidal current between the two regions.

The length of P.S. population showed the smallest range in the three regions with also two populations. The major one (<450 u) probably belongs to the endemic population, while the minor part may represents the remnants of the B.L. population. On the other hand, the diameters of the summer populations in S.B. and P.S. were more similar (17 & 18 u respectively), while that of

the B.L. (25 u) was much larger. It seams therefore, that the high salinity of the B.L. when coupled with high temperature become detrimental to the species. The summer population of the B.L. was shorter and wider than these in the other two regions. It should be noted that the current in the Suez Canal in general and in the B.L. in particular is very weak during summer .