Bacterioplankton production and its relation to phytoplankton production

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The relation between bacterioplankton production and phytoplankton production was studied on monthly basis from January 1980 to September 1982 in the area of the coastal (Kastela Bay) and open (Stoncica) Middle Adriatic.

Bacterioplankton production constitutes a significant percentage of primary production values in both study areas (Table 1). This means that, apart from primary phytoplankton production, bacteria play an important part in carbon supply to the study areas.

Bacterioplankton production constitutes, on the average, 9 to 28% of phytoplankton production in the Kastela Bay upper layers, and from 10 to 40% in the open sea.

Bacterioplankton appears to play a more important part in organic carbon environmental supply in the open sea, an oligotrophic area, than in the Kastela Bay where other members of food chain occur in greater numbers.

However, it should be emphasized that on some occasions bacterioplankton production may exceed phytoplankton production. This occurs during maximum bacterioplankton activity and termination of phytoplankton bloom (summer) and very often in deeper layers (Table 1) where primary production is minimum due to poor light penetration This was established only for a shorter period of time (in the Kastela Bay in July and at Stoncica in August), whereas annual values for phytoplankton production were considerably higher.

Bacterioplankton production maxima were recorded from both study areas mainly in summer, and those of phytoplankton in spring. This means that there is a time shift in their succession. This shift is more regular in the open sea than in the changed natural environment of the Kastela Bay.

Table 1.- Bacterioplankton production and its relation to phytoplankton (%) (means for 1980-1982 period)

Month	Depth	K.B.	St.	Month	Depth	K.B.	St.
	0	12.4	35.6		0	89.8	99.0
	10	21.7	17.3		10	98.4	<100.0
I	20	12.8	27.5	VII	20	>100.0	>100.0
	30	74.9	49.0		30	>100.0	>100.0
	50		33.9		50		>100.0
	75		49.5		75		>100.0
	0	8.3	25.6		0	82.6	>100.0
	10	4.3	12.4		10	>100.0	>100.0
II	20	6.7	40.3	VIII	20	>100.0	>100.0
	30	60.6	47.3		30	>100.0	>100.0
	50		33.9		50		>100.0
	75		>100.0		75		>100.0
	0	21.2	27.9		0	32.5	76.7
	10	9.0	26.6		10	25.5	73.4
III	20	17.7	15.8	IX	20	98.9	79.9
	30	39.4	36.2		30	>100.0	97.0
	50		45.4		50		>100.0
	75		>100.0		75		>100.0
	0	6.4	6.5		0		75.5
	10	11.5	28.1		10		73.4
IV	20	52.8	21.7	X	20		>100.0
	30	40.5	57.7		30		>100.0
	50		49.8		50		>100.0
	75		>100.0		75		>100.0
	0	8.3	21.7		0	6.7	22.6
	10	99.0	46.6		10	72.3	17.8
V	20	67.5	35.6	XI	20	>100.0	16.7
	30	>100.0	19.2		30	>100.0	42.6
	50		25.1		50		83.7
	75		>100.0		75		>100.0
	0	12.2	41.1		0	-	0.0
	10	15.2	34.4		10	9.7	20.5
VI	20	36.5	48.7	XII	20	>100.0	41.0
	30	69.8	42.5		30	>100.0	27.7
	50		33.1		50		36.2
	75		>100.0		75		>100.0