

The Primary Production of the Larnaca Salt Lake - A Bioenergetic Approach

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INTRODUCTION

The purpose of this study was to measure the primary production of the Salt Lake of Larnaca. The productivity of the ecosystem and its overall function was determined.

Site Description: The Salt Lake of Larnaca is the biggest and lowest in a series of lakes situated to the southwest of Larnaca town. It covers an area of 5.01km² and its lowest part lies 2.16m below the sea level. Natural catchment area is about 5.7km².

The basin of the Lake is dry and covered by a salt crust during the summer months. Water in the Lake usually appears after the first rainfall and builds up at rates depending on the precipitation. The rainfall occurs mainly during the winter months and is considered as contributing most of the Lake's water.

The water collected in the Lake has no other way to escape except through evaporation.

The conditions which will prevail in the habitat of the Salt Lake in given a year are not predictable because they depend on - and they are imposed by - the meteorological conditions of the year; the environment of the Larnaca Salt Lake, in which biological activity will develop, is unpredictable. (Hadjistephanou, 1989).

MATERIALS AND METHODS

The primary production of the Salt Lake was determined by measuring the photosynthesis by the oxygen method. Estimates were made on three selected dates, the beginning, the middle and the end of the period during which water is present in the Lake's basin.

The experimental procedure as it is described by Strickland and Parsons (1972) was strictly followed. The LB and DB samples were tight on poles which marked two stations, one on the central and deepest part of the Lake and another on the periphery.

The energy absorbed by the water was calculated from the meteorological data for the solar radiation of the area.

RESULTS AND DISCUSSION

The titration results were plugged into the equations given by Strickland and Parsons (1972) and the gross and net photosynthesis, as well as respiration were calculated in mgC/m²h. These figures were converted in MJ per m² per day. The estimations are given on Table below.

Table.: The Primary Production of the Salt Lake of Larnaca in MJ/m².d

Date	Station	Gross Photosynthesis	Respiration	Net Photosynthesis
29/12/1988	A (surf.)	0.0019	0.0045	0.000
	A (bott.)	0.0019	0.0045	0.000
	B	0.0047	0.0057	0.000
24/ 2/1987	A (surf.)	0.00088	0.00210	0.00000
	A (bott.)	0.00088	0.00160	0.00000
	B	0.00220	0.00106	0.00114
18/ 5/1987	A (surf.)	0.0384	0.0254	0.01297
	A (bott.)	0.0401	0.0275	0.01262
	B	0.0396	0.0227	0.01343

The results of the Table show that gross photosynthesis is detected during the whole wet period of the Lake and that photosynthetic activity is uniform in the water column.

At the beginning of the period of water accumulation gross photosynthesis was detected in the Lake, but the energy lost in respiration exceeds photosynthesis. On the contrary, net primary production is detected in the ecosystem towards the end of the wet period, in May. On February, around the middle of the wet period, the ecosystem is found to be in a transitional phase.

On the basis on Odum's (1963) classification, the ecosystem of the Larnaca Salt Lake is a heterotrophic ecosystem for a period from November till February i.e. from the beginning to the middle of the wet period of this seasonal lake. Nonetheless, the tendency is for ecosystems to proceed towards stability and thus to maintain themselves over both the short and long term. This tendency for the Larnaca Lake ecosystem is initiated from about the middle of the wet period onwards and the system appears with net primary production.

The function of the Larnaca Lake ecosystem as described above appears on an annual basis in temperate systems, where the spring-summer autotrophism is offset to varying degrees by fall-winter heterotrophism (Kormondy, 1976).

Although net primary production is detected during the second half of the wet period, the ecosystem of the Larnaca Lake is not very productive.

REFERENCES

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