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Energic value of phytoplankton in relation to water quality of the river Gomati at Jaunpur

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SUMMARY

Monthly variation in algal GPP, NPP, CR, per cent respiration as well as NPP : GPP and NPP : R ratio were studied at four sampling sites of the river Gomati at Jaunpur (U.P.). Maximum value of GPP was found at S1 in May while lowest at S2 in August. Usually at all the sites, NPP were lower than S1. Baning a few expectations community respiration (CR) was usually less than 50% at all stations except S4 where values invariable exceed more than 50% and reached upto 92% in June. NP : GP ratio showed an increasing trend from S1 to S4. NP : GP ratio was generally more than one except few months and sites. Thus, on the basis of productivity and community respiration, it may be concluded that river is polluted in whole stretch of the city. Therefore, there is an urgent need for an effective management action plan to save the river.

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River, an important component of water resource, is the need for the development of an area. The flow of water plays an important role for determining the habitat conditions, distribution of abiotic and biotic constituents and horizontal movement of water mass of the river ecosystem. Algal flora consists of a diverse assemblage of nearly all major taxonomic groups. Many of the forms have different physiological requirements and show variation to physico-chemical parameters *viz*., light, temperature and nutrient regimes (Kumar, 1996). The community structure and abundance of planktonic algae are dependent on the physico-chemical nature of the river water is, primarily, synthesis of the primary producer and products are transferred to the consumers through different trophic levels.

Primary productivity has been used as potential index of productivity for many diverse ecosystem of the world (Wetzel, 1966) and gives a quantitative information about the amount of energy available to support the bioactivity of the system. The contribution of productivity studies were made by Gaarder and Gran (1927). The biological information alongwith physio-chemical information can be of great significance for river water quality monitoring because of flowing conditions which allow the pollutants to wash away leaving behind only the affected biota. Due to change in hydrochemistry of the river water as a result of pollution, the planktonic community is seriously affected (Harikrishna and Aziz, 2000; Kumar *et al.*, 2001; Pandit *et al.*, 2008; Singh *et al.*, 2010). There is a paucity of data on productivity in relation to physico-chemical properties of the river Gomati at Jaunpur. Hence, to fulfill this gap of knowledge and to provide the basic ecological information, the present investigation was undertaken to assess the effect of sewage and effluents on phytoplankton productivity of the river Gomati at Jaunpur (U.P.).

MATERIALS AND METHODS

Four sampling sites *viz*., Kalichabad ghat (S_1), Hanuman ghat (S_2); Achaladevi ghat (S_3) and Ramghat (S_4) to cover the whole distance of the river in city, were selected for the study of algal productivity in the river. Kalichabad ghat (S_1) was considered as control site of the river, S_2 and S_3 were the mixing zone and S_4 was selected as down stream of the river. Samples were collected in the secondd week of each month from the selected sampling sites in stoper bottle and brought to the laboratory for final analysis. The bottles were labelled as

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