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### Microbiological Proxies and Geo-environmental Assessment: A Study from Gomati River, Lucknow, Uttar Pradesh, Central Ganga Plain (CGP), India

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Lucknow district is a part of Central Ganga Plain in the state of Uttar Pradesh covering an area of 2,528 sq. km. and lies between North latitudes 26°30' and 27°10' and East longitudes 80°30' and 81°13'. In the present study four water samples for the phyto-plankton in relation to heavy metal concentration were studied from the Gomati river samples. Diatoms are very sensitive for heavy metal concentrations as it affects diatoms community structure and morphological growth forms and their cell wall structure, particularly Cu, Cd and Zn seem to be the most effective trace metals in the production of abnormal cell structure. The high abundance of Amphora, Eunotia and Nitzschia at stations DW-2 and DW-3 marks the influence of sewage pollutants and other organic matter richness under study domain. However, in the station DW-4 (Barrage) the abundance of Synedra, Navicula, Gomphonema, Melosira, Epithemia, etc. marks the diatom population. The presence of Cocconeis in high frequency in station DW-1 (Chandrika Devi) indicates that the taxa is most closely associated with cleaner waters and is not favoured by sewage effluents. The diatoms represented at this station (DW-1 and DW-4) belong to clear and low polluting levels. It is noted that assemblages of Epithemia and Melosira are yet not certain as they represent low frequency in the diatoms count. Thus the present high diversity of diatoms at all stations allows to characterize water quality assessment based on microbiological prospect.

