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VARIATIONS IN CHLORIDE CONCENTRATION IN GIRNA RIVER

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Abstract:

Chloride (Cl⁻) is a major anion found in all natural waters. It occurs naturally and is also a relatively minor contaminant. Chloride concentrations in Girna river range from less than 0.1 milligrams per liter (mg/L) in precipitation to close to 100,000 (mg/L) . The present paper deals with the chloride concentration with four precipitation to close to 100,000 (mg/L) . The present paper deals with the chloride concentration with four sampling stations in Girna river and recorded for two years (2012 and 2013) at 30 days interval regularly from each sampling station to study the variations in chloride content .

Key words : Girna river, Chloride concentration, Organic matter , Macrophytes

Introduction :

Chloride (Cl⁻) is a major anion found in all natural waters. It occurs naturally and is also a relatively minor contaminant. Chloride concentrations in range from less than 0.1 milligrams per liter (mg/L) in precipitation to close to 100,000 mg/L in Paleozoic brines. Chloride is non- humans, although there is a secondary drinking water standard of 250 mg/L. It is, however, toxic to deleterious to some plants and aquatic biota, thus the Chloride is also a very corrosive agent, and elevated levels pose a threat to infrastructure, such as road beds, bridges, and industrial pipes.

Chloride concentrations are elevated in most water bodies in the girna river region, primarily due to road salt runoff. Concentrations have been increasing general, concentrations continue to increase. These elevated Cl⁻ concentrations is a risk to aquatic ecosystems.

Chloride (Cl⁻) is a naturally occurring major anion found in all natural waters. Chloride behaves as a conservative ion in most aqueous environments, meaning its movement is not retarded by the interaction of water with soils, sediments, and rocks. As such, it can be used as an indicator of other types of contamination. Anomalously high concentrations can act as an "advance warning" of the presence of other more toxic contaminants. Concentrations of Cl⁻ in natural waters can range from less than 1 milligram per liter (mg/L) in rainfall and some freshwater aquifers to greater than 100,000 mg/L for very old ground waters within deep intracratonic basins (Graf et al., 1966; Psenner, 1989). Chloride is non-toxic to humans, but elevated levels make water unpotable due to the salty taste. In the U.S., there is a secondary (non-enforced) drinking water standard of 250 mg/L, but in areas of the world with water scarcities, drinking water can have considerably greater concentrations of Cl⁻. Chloride is corrosive to steel, thus it may corrode pipes in water treatment and industrial plants. Because it imparts a salty taste to water and is corrosive, elevated Cl⁻ levels in drinking water supplies can lead to increased treatment costs.

Materials & Methods:

The chloride in water indicate the presence of organic matter of animal origin .Kofid (1903) stated that principal source of chloride is animal matter .Krishnamurthy & Bharty (1996) Studied concentration of chloride in the river kali near Dandli , karnatka .In the present investigation ,a river Girna with four sampling stations A,B,C,D were selected and chloride was recorded for two years (2012-2013) at 30 days interval regularly from each sampling station and analysed as per standard procedure (APHA,1989)

Observations and Results :

The Site wise and year wise average of chloride are given in Table .I. as estimated the chloride concentration started increasing from January to June during year 2012-13 and then a sudden fall was in July .This fall is due to the increase in water level caused by dilution of water by rains the result shows resemblance with Gonzalves & Joshi (1946) who observed an inverse relationship between chloride contents and water level .The higher values of chlorides observed during April to June were due to accelerated activity of decomposition of aquatic macrophytes specially the submerged forms ,which died during this period of high temperature .

Seasonally ,the chloride content were observed Maximum in summer and minimum in monsoon .according to swarnalatha & Nursing Rao(1998) the chloride reaching to an optimum during summer season was due to the absence of oxygen caused by cyanobacterial blooms and the depletion seen in monsoon was on account of the dilution by rainwater and maximum in summer and winter season (Singh & Singh ,1995) .With respect to experimental sites ,the chlorides were lesser only at site A, whereas in the remaining sites more or less similar values were detected . The chloride concentration depends upon the inflow of water which comes from catchment area through run-off . Due to pollution and large amount of organic matter . Chloride also increases with increase in degree of eutrophication . The presence of chloride content is also affected by low rainfall in the study area.

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Table 1 Showing Monthly variations of chloride at four stations (A,B,C,D) in Girna river

for the year 2012-2013.

Month	A		B		C		D		Monthly Ave.	
	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013
January	120.0	140.0	200.0	140.0	200.0	120.0	150.0	160.0	167.5	140.0
Feb.	180.0	140.0	200.0	160.0	180.0	140.0	200.0	160.0	190.0	150.0
March	180.0	180.0	240.0	190.0	200.0	200.0	240.0	170.0	215.0	185.0
April	200.0	200.0	200.0	280.0	280.0	200.0	200.0	260.0	220.0	235.0
May	160.0	240.0	220.0	260.0	260.0	160.0	280.0	180.0	230.0	210.0
June	220.0	210.0	260.0	200.0	260.0	240.0	300.0	240.0	260.0	223.0
July	80.0	110.0	100.0	120.0	120.0	130.0	80.0	110.0	95.0	117.5
August	90.0	80.0	110.0	100.0	100.0	140.0	90.0	110.0	97.5	112.5
September	90.0	80.0	100.0	100.0	100.0	100.0	100.0	100.0	102.5	95.0
Oct.	80.0	120.0	120.0	100.0	140.0	120.0	110.0	100.0	112.5	110.0
Nov.	100.0	120.0	100.0	120	140.0	120.0	120.0	120.0	115.0	120.0
Dec.	130.0	130.0	150.0	150	150.0	150.0	120.0	150.0	112.5	112.5