Comparative study of physio-chemical characteristics of river Godavari In district Parbhani (M.S) India
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ABSTRACT

Present study deals with the monthly variation in the Physio-chemical characteristics of river Godavari (M.S) India in District Parbhani at khadka, which is polluted with Sugar industrial effluent, domestic sewage, the sample were collected from the two sampling point located away from each other by 0.5 kms & selected for investigation. study related with the pH, Conductivity, BOD (biological oxygen demand), Total Alkalinity, Turbidity, total Dissolved solids, Total Hardness, Ca, Mg, Chlorides, Nitrates, Dissolved oxygen, Silica. Important parameter shows correlations with other parameter hence serve as good river water quality & according to Brian Oram’s water quality index water quality as ‘Medium’.

Key words: Godavari river, Physio-chemical characteristics, sewage, industrial effluent, water quality index.

1. Introduction

Rivers are playing main role in fresh water resources & most of developmental activities are depends on the river water, river play an important role in assimilating carrying agricultural waste, manure, municipal waste these waste product are responsible for river pollutions (1-3). due to addition of various product in river water the physiochemical characteristics of water changes (4-5). industrial waste water drains are directly connected to the river & heavy metal pollution are occurred (7). the river pollution directly affect on the Ecology, variation in the Biotic factor (7-9). The river water used for Drinking, Agriculture, Fish culture, Power plant. Godawari is an important river in the Maharashtra (India). on the bank of river industries are located effluents from sugar industries, agricultural runoff, sewage enter in to the river and affect the water quality. Therefore present study has been undertaken to evaluate change in water quality of Godawari river in Dist Parbhani At Khadka Dam.

2. Material and Methods

Water sample are collected from two different site monthly located 0.5 kms each other. A & B sample collected in the polythene bottle and analyzed for water quality Viz. Temp, DO, Total Alkalinity at the site as their values are changes; pH, Conductivity, Turbidity, TDS are measure as per (IS 3025 –Part 11, 14, 10, 16) resp. Total alkalinity, Total Hardness, Ca, Mg, Chlorides are measured Titrimetrically, BOD determine by (IS3025 part 41), Nitrate, silica, Phosphate, Flouride, Cadmium are determine on spectrophotometrically (IS3025 Part 34-b, 35, 31, 23, 41) resp.

3. Water quality Index
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Water quality index measurement on Brian Oram’s online calculator (Oram 2007)\(^{(10)}\).based on weight age of individual parameter & its rating Scale.

4. Results and discussions

Monthly and seasonal variation in the water quality characteristics are graphically represented in figure as per Bhatnager & sagwan 2009 \(^{(11)}\). the lowering of pH value are due to the input of waste product in river water, the pH of sample is alkaline throughout the Period. Comparative study chart of mean value of water quality parameter WHO (1984, 1993) Standard for drinking water \(^{(12)}\) is shown in table 1.

Table 1: Water quality parameters

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Temperature (°C)</td>
<td>23.5±0.8</td>
<td>22.9±0.9</td>
<td>-</td>
<td>- (°C)</td>
</tr>
<tr>
<td>2</td>
<td>pH</td>
<td>7.75±0.5</td>
<td>7.89±0.4</td>
<td>&lt;7.0-8.5</td>
<td>6.5-8.5</td>
</tr>
<tr>
<td>3</td>
<td>Conductivity</td>
<td>360-582</td>
<td>360-580</td>
<td>-</td>
<td>0-300 (µm cm(^{-1}))</td>
</tr>
<tr>
<td>4</td>
<td>Turbidity</td>
<td>3.8-14.8</td>
<td>5.0-14.2</td>
<td>&gt;5 NTU</td>
<td>5-10 NTU</td>
</tr>
<tr>
<td>5</td>
<td>Dissolved Oxygen</td>
<td>3.0-4.2</td>
<td>3.0-4.0</td>
<td>&gt;5 mg L(^{-1})</td>
<td>- mg L(^{-1})</td>
</tr>
<tr>
<td>6</td>
<td>TDS</td>
<td>308-428</td>
<td>304-434</td>
<td>-</td>
<td>- mg L(^{-1})</td>
</tr>
<tr>
<td>7</td>
<td>BOD</td>
<td>1-2</td>
<td>1-2</td>
<td>-</td>
<td>≤6 mg L(^{-1})</td>
</tr>
<tr>
<td>8</td>
<td>Total Alkinnity</td>
<td>120-212</td>
<td>114-220</td>
<td>600 mg L(^{-1})</td>
<td>13-246 mg L(^{-1})</td>
</tr>
<tr>
<td>9</td>
<td>Total hardness</td>
<td>133-182</td>
<td>134-197</td>
<td>&lt;75 mg L(^{-1})</td>
<td>300-600 mg L(^{-1})</td>
</tr>
<tr>
<td>10</td>
<td>Calcium</td>
<td>37-94</td>
<td>33-99</td>
<td>&lt;50 mg L(^{-1})</td>
<td>28-48 mg L(^{-1})</td>
</tr>
<tr>
<td>11</td>
<td>Magnesium</td>
<td>34-94</td>
<td>43-95</td>
<td>&lt;200 mg L(^{-1})</td>
<td>9.23-26.24 mg L(^{-1})</td>
</tr>
<tr>
<td>12</td>
<td>Sulphite</td>
<td>22-71</td>
<td>24-68</td>
<td>&lt;250 mg L(^{-1})</td>
<td>50-91 mg L(^{-1})</td>
</tr>
<tr>
<td>13</td>
<td>Chloride</td>
<td>32-89</td>
<td>28-87</td>
<td>-</td>
<td>7-26 mg L(^{-1})</td>
</tr>
<tr>
<td>14</td>
<td>Sulphate</td>
<td>22-71</td>
<td>24-68</td>
<td>-</td>
<td>- mg L(^{-1})</td>
</tr>
<tr>
<td>15</td>
<td>Nitrate</td>
<td>0-94</td>
<td>0.1-2.1</td>
<td>-</td>
<td>- mg L(^{-1})</td>
</tr>
<tr>
<td>16</td>
<td>Phosphate</td>
<td>0-5-7</td>
<td>0.4-1.4</td>
<td>-</td>
<td>- mg L(^{-1})</td>
</tr>
<tr>
<td>17</td>
<td>Fluoride</td>
<td>0.1</td>
<td>0.1</td>
<td>-</td>
<td>0.1-1.77 mg L(^{-1})</td>
</tr>
<tr>
<td>18</td>
<td>Silica</td>
<td>11.40-15.83</td>
<td>11-18</td>
<td>-</td>
<td>- mg L(^{-1})</td>
</tr>
<tr>
<td>19</td>
<td>Cadmium</td>
<td>0.02</td>
<td>0.02</td>
<td>-</td>
<td>- mg L(^{-1})</td>
</tr>
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</table>

The comparative value of analyzed physiochemical condition with drinking water standard WHO 1984-1993 \(^{(12)}\) & ICMR,1975 ,Standard \(^{(11)}\) the values of present study Normal within permissible limits . on the basis of present study water quality index calculated (oram 2007) ;water quality index in the range 90-100 indicate Excelent Quality ;70-90 - indicate Good Quality ;50-70- Medium Quality ;25-50 –Bad Quality ;0-25–Very Bad Quality it was found that water in MEDIUM Quality according to quality index.
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**Figure 1:** Monthly variation in pH in A & B sample

**Figure 2:** Monthly variation in Conductivity in A & B sample

**Figure 3:** Monthly variation in Turbidity in A & B sample.

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**Figure 4:** Monthly variation in TDS in A & B sample.

**Figure 5** Monthly variation in BOD in A & B sample.

**Figure 6** Monthly variation in Total alkanny in A & B sample.
Figure 7: Monthly variation in Total hardness in A & B sample.

Figure 8: Monthly variation in Calcium in A & B sample.

Figure 9: Monthly variation in Magnesium in A & B sample.
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**Figure 10**: Monthly variation in Nitrate in A & B sample.

**Figure 11**: Monthly variation in Phosphate in A & B sample.

**Figure 12**: Monthly variation in Fluoride in A & B sample.
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Figure 13: Monthly variation in silica in A and B sample.

5. Conclusions

Study of physiochemical parameter &WQI state that water is medium if the pollution due to sugar industries, industrial waste, agricultural run off increases then water quality again decreased & affect the aquatic ecosystem, hence it is recommended that before disposal of industrial waste, sewage treatment is should be used & then dispose to the river.

6. References


