

EFFECT OF POLLUTED WATER ON LEAF ANATOMY OF *EUPHORBIA GLOMERATA* GROWING NEAR TAPTI RIVER

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Abstract: *Euphorbia glomerata* were collected from Hatnur, Thermal power plant Deepnagar and Paper mill area. Thickness of upper epidermis, Lower epidermis of leaf, U/L Epidermis ratio was decreased at all polluted levels. Leaf Thickness, upper epidermis and lower epidermis decreased more at region V which is highly polluted. U/L epidermis ratio found increased at region V. Characters of palisade & spongy tissue was also decreased as the level of water pollution increased.

INTRODUCTION:

Thermal power plant and Paper mill these are the two industrial sources situated near the Tapti river which continuously releases wastes in river, hence water becomes polluted. Water pollution is mainly indicated by the cuticular features of the plant. therefore attempt was tried to find out damaging impacts of polluted water in relation to anatomical features of *Euphorbia glomerata* growing near Tapti river.

MATERIALS AND METHODS:

Leaves of *Euphorbia glomerata* collected from Hatnur, T.P.P. Deepnagar area and Paper mill area. The T. S. washed with water, stained in safranin and mounted in glycerin. The T. S. was examined under microscope (45x) objective. Anatomical features studied like Thickness of upper epidermis (U), thickness of lower epidermis (L), thickness of U/L ratio, thickness of palisade layer, thickness of spongy cell, mesophyll tissue ratio (P/S). By using ocular and stage micrometer the measurements & observations were done. Stastical data analysed by the statistical methods given by Palanichamy & Manoharan (2001).

Table1 Relative degree of pollution level.

| Sr. No | Locality | Relative Degree | Source of pollution. |
|--------|------------------------|-----------------|------------------------|
| I | Hatnur | + | Non polluted |
| II | T.P.P After mixing | ++ | T.P.P. Hot water |
| III | T.P.P before mixing | +++ | Hot water of T.P.P. |
| IV | Ash water after mixing | +++ | T.P.P. water with ash. |
| V | Paper mill. | ++++ | Paper mill effluent. |

Table 2 : Effects of polluted water on leaf anatomy of *Euphorbia glomerata*

| Species | Locality | Leaf thickness | Thickness of upper epidermis (U) (μm) | Thickness of lower epidermis.(L) (μm) | Thickness of epidermis. U\L ratio (μm) |
|----------------------------|----------|------------------------------|--|--|---|
| <i>Euphorbia glomerata</i> | I | 75.27 \pm 0.16 | 10.23 \pm 0.43 | 17.26 \pm 0.48 | 0.59 \pm 0.11 |
| | II | 73.00 \pm 0.34 (-3.01) | 10.03 \pm 0.22 (-1.93) | 16.87 \pm 0.67 (-2.25) | 0.64 \pm 0.13 (+8.47) |
| | III | 72.18 \pm 0.23 (-4.10) | 9.33 \pm 0.07 (-8.79) | 14.76 \pm 0.05 (-14.48) | 0.68 \pm 0.07 (+15.25) |
| | IV | 66.22 \pm 0.27 (-12.04) | 10.24 \pm 0.02 (+0.09) | 14.71 \pm 0.23 (-14.77) | 0.67 \pm 0.0 (+13.55) |
| | V | 64.18 \pm 0.78 (-14.83) | 8.17 \pm 0.22 (-20.13) | 14.00 \pm 0.07 (-18.88) | 0.71 \pm 0.15 (+20.33) |

Anatomical studies under 45X objective, bracket values denotes difference in percent from control

Table 3 Effect of polluted water on mesophyll tissues.

| Species | Sites | Thickness of palisade cells(μm) | Thickness of spongy cells (μm) | Mesophyll tissue ratio(p/s) | Frequency of palisade cells/ unit area | Frequency of spongy cells/ unit area. |
|---------------------|-------|--|---|-----------------------------|--|---------------------------------------|
| <i>E. glomerata</i> | I | 18.86 \pm 1.17 | 28.21 \pm 0.74 | 0.64 \pm 0.0 | 7.22 \pm 0.34 | 8.86 \pm 0.21 |
| | II | 17.89 \pm 1.02 (-5.14) | 26.21 \pm 0.72 (-7.08) | 0.67 \pm 0.0 (+4.68) | 7.14 \pm 0.21 (-1.10) | 8.73 \pm 0.17 (-1.46) |
| | III | 16.91 \pm 0.70 (-10.33) | 25.27 \pm 0.09 (-10.42) | 0.67 \pm 0.11 (+4.68) | 7.13 \pm 0.07 (-1.24) | 7.55 \pm 0.17 (-14.78) |
| | IV | 15.19 \pm 0.42 (-19.45) | 24.77 \pm 0.70 (-12.19) | 0.57 \pm 0.20 (-10.93) | 6.21 \pm 0.02 (-13.98) | 6.99 \pm 0.0 (-21.10) |
| | V | 14.74 \pm 0.58 (-21.84) | 22.19 \pm 0.0 (-21.33) | 0.62 \pm 0.07 (-3.12) | 5.41 \pm 0.11 (-25.06) | 6.14 \pm 0.28 (-30.69) |

Anatomical studies under 45X objective, bracket values denotes difference from control

RESULT AND DISCUSSION

All anatomical features of *Euphorbia glomerata* decreased at region V. Leaf thickness is mostly decreased, Thickness of upper & lower epidermis also decreased at region V. Thickness of U/L epidermis is noted increased. In *E. glomerata*. Thickness of palisade & spongy cells decreased respectively.

Salgare and Jaiswal (1989) studied auto exhaust pollution on stem anatomy of some angiospermic plants at Manoor national highway No. 8. Salgare and Thorat (1989) have reported inhibitory effects on all the parameters studied for anatomy of some trees. Yogesh patil (2015) also reported detrimental effects on plants due to water pollution. Salgare and Palav (1989) recorded inhibition for different parameters studied under the anatomy of *Ipomea cornea*.

Current observation based on anatomical characters of leaf thicknesss, upper and lower epidermis, palisade cells, spongy cells, frequency of palisade, spongy cells per unit area were significantly reduced when the pollution level increased. so, the current records similar to earlier investigators (Salgare and Palav 1989, Salgare and Thorat, 1989; Salgare and Iyer 1989).

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