

## EFFECT OF FLAVONES ON THE CHLOROPHYLL CONTENT OF *LEMNA PAUCICOSTATA* HEGELM.

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Effect of eleven substituted flavones on the chlorophyll content of *Lemna paucicostata* Hegelm was studied. All the compounds enhanced the levels of chlorophylls. At higher concentrations they showed a tendency towards decreasing the chlorophyll levels.

**Keywords :** Flavones; Lemna; Chlorophyll.

Flavones are important phenolic compounds belonging to flavonoid group. Flavones were found to promote the growth of *Lemna* (Rao and Rao, 1987). Popovici and Weissenbock (1977) found high flavone content in leaves of oat at their fullest physiological activity and a progressive decrease at senescence. The present study aims at finding the effect of flavones on the chlorophyll content of *Lemna paucicostata* Hegelm.

The substituted flavones used in the present study were collected from Department of Chemistry, Osmania University. Clonal and axenic cultures of *L. paucicostata* maintained on modified Bonner and Devirian medium (Gupta and Maheshwari, 1969) were used for the present study. 100 ml medium (without sucrose) was taken into each 250 ml Erlenmeyer flask and autoclaved. The medium in the flasks was supplemented with solutions of flavones. Each compound was tested at five concentration levels viz. 0.01, 0.05,

0.1, 0.5 and 1.0 ppm. Each flask was inoculated with ten *Lemna* plants. The cultures were allowed to grow under continuous fluorescent illumination (light intensity 5000 lux) at  $25 \pm 1^\circ\text{C}$ . On the 10th day chlorophyll was extracted from 5 mg of plant material in 5 ml methanol (96% v/v). The chlorophyll content was estimated adopting the formulae of Holden (1965) as given by Rao and Rao (1985). The results are shown in Table 1.

All the flavones enhanced the chlorophyll contents of *Lemna*. Among all the flavones 5,7-dihydroxy-3-methyl flavone (0.1 and 0.5 ppm), 7-O-carboxymethyl-3-methyl-3',4'-dimethoxyflavone (0.5 ppm) and 7-allyloxy-3',4',5'-trimethoxy flavone were proved to be most effective. In an earlier study (Rao and Rao, 1987) these three compounds also proved to be most effective in promoting the growth of *Lemna*. Popovici and Weissenbock (1977) found that when oat leaves were green, the content of flavones was high and in



TABLE 1  
EFFECT OF FLAVONES ON THE CHLOROPHYLL CONTENT OF *LEMNA PAUCICOSTATA*\*

Compound	Chlorophyll a $\mu\text{g/g.fr.wt}$						Chlorophyll b $\mu\text{g/g.fr.wt}$						Total chlorophyll $\mu\text{g/g.fr.wt}$					
	Concentration						Concentration						Concentration					
	0.01 ppm	0.05 ppm	0.1 ppm	0.5 ppm	1.0 ppm	1.0 ppm	0.01 ppm	0.05 ppm	0.1 ppm	0.5 ppm	1.0 ppm	1.0 ppm	0.01 ppm	0.05 ppm	0.1 ppm	0.5 ppm	1.0 ppm	
7-Hydroxy flavone	223	280	296	198	173	78	63	106	70	61	301	343	402	268	234			
5,7-Dihydroxyflavone	272	296	294	296	288	96	106	175	106	64	368	402	670	402	372			
7-Hydroxy-3-methyl flavone	312	304	313	312	272	94	127	148	94	96	406	431	451	406	368			
5,7-Dihydroxy-3-methyl flavone	535	634	626	626	469	172	152	186	186	123	707	786	812	812	469			
5,7-Dimethoxy flavone	394	428	445	387	371	141	171	158	119	131	556	599	603	506	582			
7,3',4',5'-Tetramethoxy-3-methyl flavone	371	428	536	395	321	131	171	193	141	114	502	599	628	556	435			
7-O-Carboxymethyl-3-methyl-3',4'-dimethoxy flavone	304	395	494	519	403	126	141	176	184	162	530	536	670	703	565			
7-O-Carboxymethyl-8-formyl flavone	395	436	371	371	402	141	137	131	131	106	536	573	502	502	402			
7-Alloxy-3',4',5'-trimethoxy flavone	388	494	488	445	330	172	176	206	158	148	560	670	694	663	461			
7-Propargyloxy-5-hydroxy flavone	272	395	363	288	223	96	141	163	64	78	368	536	526	372	301			
5,7-Dibenzoyloxy flavone	263	272	296	422	371	76	96	106	147	131	339	368	402	569	502			
Control	272					96					368							

\* Each value represent the mean of 3 replicates.



senescing leaves their content was low. It is a well established fact that senescence is associated with the loss of chlorophylls, proteins and nucleic acids (Thimann, 1986). Rao and Rao (1987) found that the growth promotion by *Lemna* was associated with higher levels of protein nitrogen and RNA. The present study reveals that the growth promotion of *Lemna* was associated with higher levels of chlorophylls, proteins and RNA. The Growth inhibition at higher concentrations by certain flavones (Rao and Rao, (1987) was also accompanied by the low levels of these three metabolites.

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