

Seasonal variation in gallotannin from mangroves

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Monthly variations in the content of gallotannin from the leaves of ten mangrove species (*Aegiceras corniculatum*, *Avicennia marina*, *A. officinalis*, *Bruguiera cylindrica*, *Ceriops decandra*, *Excoecaria agallocha*, *Lumnitzera racemosa*, *Rhizophora apiculata*, *R. lamarckii* and *R. mucronata*) were studied. The highest content of gallotannin was recorded in *Ceriops decandra* and *Rhizophora* spp.

Mangroves are rich sources of tannins. However, there is no specific report on gallotannins which are used in leather, medical, pharmaceutical, food and in beverage industries¹. Hence, the present study was made on gallotannin content of mangrove leaves.

Healthy leaves of 3rd, 4th and 5th positions from shoot apex were collected from Pichavaram mangrove forest (lat. 11°26'N; long. 79°48'E) southeast coast of India. The fresh leaves were ground and extracted in boiling MeOH (50%) for 15 min and analysed for

gallotannin in spectrophotometer (Hitachi, model 220S) at 481 nm using KIO₃ (1%) as a reagent². The gallotannin content is expressed in mg per gram of leaf dry weight, using wattle tannin as the standard.

The content of gallotannin ranged from 0.013 (*Rhizophora apiculata*) to 3.555 mg.g⁻¹ dry wt (*Ceriops decandra*) (Table 1). The average content of gallotannin was 1.676 mg.g⁻¹ in *C. decandra*, 1.403 mg.g⁻¹ in *R. mucronata*, 0.936 mg.g⁻¹ in *R. lamarckii* and 0.787 mg.g⁻¹ in *R. apiculata*.

Table 1—Gallotannins from mangrove leaves (mg.g⁻¹ dry weight)

Mangrove species	Jan.	Feb.	March	April	May	June	July
<i>Aegiceras corniculatum</i> (L.) Blasco	0.417	0.194	0.246	0.749	0.319	0.499	0.656
<i>Avicennia marina</i> (Forsk.) Vierh.	0.320	0.319	0.125	0.502	0.440	0.673	0.786
<i>A. officinalis</i> Linn.	0.190	0.194	0.016	0.480	0.547	0.597	0.428
<i>Bruguiera cylindrica</i> (L.) Bl.	0.136	0.283	0.290	0.257	0.727	0.805	1.207
<i>Ceriops decandra</i> (Griff.) Ding Hou.	1.111	0.999	1.410	1.009	1.331	1.133	1.130
<i>Excoecaria agallocha</i> Linn.	0.380	0.444	0.340	0.609	0.830	0.729	0.777
<i>Lumnitzera racemosa</i> Willd.	0.404	0.777	0.140	0.577	0.771	0.666	0.738
<i>Rhizophora apiculata</i> Blume.	0.013	0.392	0.400	1.144	0.483	0.666	1.284
<i>R. lamarckii</i> Montr.	0.146	0.527	0.410	1.816	0.826	0.952	0.728
<i>R. mucronata</i> Lamk.	1.238	0.749	0.853	0.626	0.649	0.833	1.050
	Aug.	Sept.	Oct.	Nov.	Dec.	Mean	
<i>Aegiceras corniculatum</i> (L.) Blasco	0.972	0.969	0.895	0.650	0.699	0.604	
<i>Avicennia marina</i> (Forsk.) Vierh.	0.790	0.957	1.120	1.386	1.200	0.717	
<i>A. officinalis</i> Linn.	0.513	0.891	0.833	0.948	1.240	0.581	
<i>Bruguiera cylindrica</i> (L.) Bl.	0.595	0.774	0.930	0.655	0.580	0.602	
<i>Ceriops decandra</i> (Griff.) Ding Hou.	0.939	1.388	3.555	2.787	2.451	1.676	
<i>Excoecaria agallocha</i> Linn.	0.899	0.570	0.627	0.614	0.599	0.616	
<i>Lumnitzera racemosa</i> Willd.	0.730	0.788	0.833	0.684	0.463	0.622	
<i>Rhizophora apiculata</i> Blume.	1.233	0.447	1.047	1.126	1.226	0.787	
<i>R. lamarckii</i> Montr.	0.774	0.910	1.148	1.010	1.960	0.936	
<i>R. mucronata</i> Lamk.	1.214	1.550	2.976	2.654	2.455	1.403	

Ceriops decandra and *Rhizophora* spp. showed relatively high gallotannin content, which can be attributed to the abundant occurrence of tannin cells in hypodermal tissues of the species³. The highest content of gallotannin was estimated during monsoon (Oct.-Dec.) in most of the mangrove species analysed. Conditions of the monsoon such as low salinity, high humidity etc., would have enhanced the gallotannin content of mangrove leaves in order to protect the leaves from predators and pathogens¹, which became aggressive and virulent during monsoon.

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References

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