

HERBAL PLANTS OF HANUMANGARH DISTRICT : NEW SOURCES OF ASCORBIC ACID

B.B.S. KAPOOR, J. S. KHATRI, BHUMIKA and PRIYDERSHAN RANGA

Plant Physiology and Biochemistry Laboratory, P.G. Department of Botany, Dungar College, Bikaner - 334001, India.

Ascorbic acid contents of roots, shoots and fruits of *Abutilon indicum* (Linn.) Sweet., *Barleria prionitis* Linn., and *Solanum nigrum* Linn. have been analysed. Maximum ascorbic acid contents were found in the fruits of *Solanum nigrum* (60.01 mg/100g.d.w.) while, minimum in its roots (38.87mg/100g.d.w.)

Keywords : Ascorbic acid; Herbal plants; Semi-arid region.

The herbal plants of semi-arid region of Rajasthan are good and potential source of nutritionally and phytochemically important compounds so they can be considered as livestock feed. Ascorbic acid, also called as anti-scorbutic (Vitamin C), is an important primary product and well known for its property as an electron donor in photosynthetic photophosphorylation. The role of ascorbic acid in plant growth and metabolism has been worked out by various workers.

Free endogenous ascorbic acid has been recently reported from some arid zone tree species^{7,8}. In the present investigation attempts have been made to investigate the quantitative production of free endogenous ascorbic acid in the roots, shoots and fruits of *Abutilon indicum*, *Barleria prionitis* and *Solanum nigrum*.

Fresh and healthy roots, shoots and fruits of the selected plant species, collected from two different sites of Hanumangarh district i.e. Pilibanga area and Rawatsar area, were dried and homogenized in a mortar with 2% metaphosphoric acid (MPA)(10 mg powder : 100 ml MPA) and allow to macerate for one hour. The mixtures were centrifuged at low speed (2500 rpm) and supernatants were used for estimation of ascorbic acid following the colorimetric method⁹. Absorbancy of each of the sample was measured on a spectronic-20 colorimeter (Bausch &

Lamb) set at 546nm against blank. Five replicates were taken and values are expressed in mg / 100 g.d.w. ±SE.

The roots, shoots and fruits of all the three plant species showed much variation in the ascorbic acid contents. The maximum ascorbic acid contents were found in the fruits of *Solanum nigrum* (60.01 mg/100g.d.w.) collected from Pilibanga area while minimum in its roots (38.87 mg/100 g.d.w.) collected from Rawatsar area. Table1.

The present study thus indicates that herbal plants of semi-arid region of Rajasthan are good sources of ascorbic acid (Vitamin C) so they can be used as livestock feed.

References

1. Arnon D I, Whatley F R and Allen M B 1954, Photosynthesis by isolated chloroplast II, Photosynthetic Phosphorylation and the conversion of light into phosphate bound energy. *J. Amer. Chem. Soc.* 76 6324-6329.
2. Aberg B 1958, Ascorbic acid formation, storage, mobilisation and transformation of carbohydrates. In : *Encyclopedia of Plant Physiology*, Springer Verlag. Berlin 6 479-499
3. Mitsui A and Oi Y 1961, Endogenous changes of photochemical activities of Spinach leaves. *Plant Cell*

Table 1. Ascorbic acid contents (mg / 100 g.d.w.±SE.) of roots, shoots and fruits of selected plant species.

Plant species	Roots		Shoots		Fruits	
	Pilibanga area	Rawatsar area	Pilibanga area	Rawatsar area	Pilibanga area	Rawatsar area
<i>Abutilon indicum</i>	44.08 ±0.5796	47.31 ±0.2599	43.87 ±0.4243	49.89 ±0.5379	48.24 ±0.2708	52.07 ±0.4723
<i>Barleria prionitis</i>	47.32 ±0.6169	43.39 ±0.5709	52.64 ±0.2438	50.93 ±0.3685	57.09 ±0.6524	51.97 ±0.5404
<i>Solanum nigrum</i>	40.16 ±0.1648	38.87 ±0.8431	43.56 ±0.4922	40.80 ±0.1829	60.01 ±0.5832	53.19 ±0.1531

- Physiol. Tokyo*, 2 45-50
4. Isherwood F A and Mapson L W 1962, Ascorbic acid metabolism in plants : Part II. Biosynthesis. *Ann. Rev. Plant Physiol.* 13 329-350.
 5. Kapoor B B S 1989, Free endogenous ascorbic acid from *Argemone mexicana* growing in Arid Zone of Rajasthan. *Oikoassay* 6(2) 83
 6. Kapoor B B S and Priydershan Ranga 2003, Ascorbic acid contents from asteraceous medicinal plants of Rajasthan desert. *Indian J. of environmental sciences* 7(2) 173-174
 7. Harsh M L and Ahmed S 1994, *Maytenus emarginata*, *Parkinsonia aculeate* and *Tecomella undulata* : New Sources of ascorbic acid. *Oikoassay* 11 5
 8. Kapoor B B S and Ritu 1996, Comparative evaluation of ascorbic acid from some trees growing in arid zone of Rajasthan. *Oikoassay* 13 (1&2) 29
 9. Jenson W A 1962, *Botanical Histochemistry - Principles and Practice*. W.H. Freeman and Co. San Francisco. 201.