EVALUATION OF ASCORBIC ACID CONTENT *IN VIVO* AND *IN VITRO* IN BALANITES AEGYPTIACA DEL.

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ABSTRACT

Evaluation of Ascorbic acid content of roots, leaves, fruits and tissue cultures from the selected medicinal plant *Balanites aegyptiaca* growing in arid zone of Rajasthan was carried out. Among all the samples the maximum (92.3 mg/100 g.d.w.) amount of ascorbic acid was found in 6 weeks old tissue cultures, while the leaves of *Balanites aegyptiaca* had minimum concentration (58.2 mg/100 g.d.w.) collected from field area of Bikaner District.

KEY WORDS: Ascorbic acid contents, *Balanites aegyptiaca*, *in vivo* and *in vitro*

INTRODUCTION

The medicinal plant species growing in arid zone of Rajasthan are good and potential source of nutritionally and phytochemically important compounds so these can be used as herbal medicine and 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 doner in photophosphorylation.

Balanites aegyptiaca Del. (Zygophyllaceae), known as 'desert date,' and locally as Hingota. It is a spiny shrub or tree up to l0 m tall, widely distributed in arid region of Rajasthan. It is traditionally used in treatment of various ailments i.e. jaundice, intestinal worm infection, wounds, malaria, syphilis, epilepsy, dysentery, constipation, diarrhoea, hemorrhoid, stomach aches, asthma, and fever. It is also used as fodder for livestock.

The role of ascorbic acid in plant growth and metabolism has been worked out by various workers [1-5]. Free endogenous ascorbic acid has been recently reported from some arid zone plant species [6-16].

MATERIALS AND METHODS

Plant parts were collected in polythene bags. The samples were dried, powdered and then used for the estimation of free endogenous ascorbic acid.
The surface sterilized seeds were aseptically placed on hormone free MS medium for germination in the dark at 28±2oC. Cotyledons and radicals from these aseptically grown15 – 20 days old seedlings were taken as explants.
These explants were then established and maintained by frequent subculturing after 4 weeks on MS Medium supplemented with various concentrations and combinations of kinetin and 2, 4-D for callus induction and kinetin and BAP for induction of multiple shoots. Cultures were maintained in growth chamber with regulated temperature (26±2oC), relative humidity (55±5%), 3000 lux light intensity. Data was recorded after 2, 4, 6, 8 and 10 weeks and growth indices were calculated.

Fresh and healthy roots, leaves and fruits of the selected plant collected from Bikaner district and tissue cultures 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 method [5]. Absorbancy of each of the

sample was measured on a spectronic-20 colorimeter (Bausch & Lamb) set at 546nm against blank. Values are expressed in mg / 100 g.d.w

RESULTS AND DISCUSSION

Concentration of the ascorbic acid in the various parts (roots, leaves and fruits) and 2, 4, 6, 8, 10 weeks old tissue cultures of the selected plant species *Balanites aegyptiaca* are presented in Table- 1.

Table 1: Ascorbic acid contents (mg/100 g.d.w) from plant parts and tissue cultures

Plant	Roots	Leaves	Fruits	Tissue Cultures 2 weeks	Tissue Cultures 4 weeks	Tissue Cultures 6weeks	Tissue Cultures 8 weeks	Tissue Cultures 10 weeks
Balanites aegyptiaca	74.3	58.2	80.8	43.3	90.3	92.3	82.3	81.2

The present investigation shows that among all the samples tested the ascorbic acid content was found to be maximum (80.8 mg/100 g.d.w.) in the fruits, while minimum (58.2 mg/100 g.d.w.) in the leaves of *Balanites aegyptiaca.*

In tissue cultures of *Balanites aegyptiaca* maximum (92.3 mg/100 g.d.w.) ascorbic acid content was found in 6 week old tissue cultures, while minimum (81.2 mg/100 g.d.w.) in the 10 weeks old tissue cultures.

Among all the various plant parts and tissue cultures the maximum (92.3 mg/100 g.d.w.) amount of ascorbic acid was found in 6 weeks old tissue cultures, while the leaves of *Balanites aegyptiaca* had minimum concentration (58.2 mg/100 g.d.w.).

CONCLUSION

The present study thus indicates that medicinal plants of this arid region of Rajasthan are good source of ascorbic acid (Vitamin C) so these can be used as livestock feed and as herbal medicine for human welfare.

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