



## Research Paper

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# Evaluation of diploids and autotetraploid genotypes of ashwagandha (*Withania somnifera* Dunal.) for growth, yield and quality characters

■ K.M. VIDYA, L. HEGDE<sup>1</sup>, G. SARASWATHI<sup>2</sup> AND B.M. VIJAY KUMAR<sup>2</sup>

### Members of the Research Forum

#### Associated Authors:

<sup>1</sup>College of Horticulture (UHS),  
Sirsi, UTTAR KANNADA  
(KARNATAKA)

<sup>2</sup>College of Horticulture (Dr.  
Y.S.R.H.U.), Rajendranagar,  
HYDERABAD (A.P.) INDIA

#### Author for correspondence :

**K.M. VIDYA**

Kittur Rani Channamma College of  
Horticulture (U.H.S.), ARABHAVI  
(KARNATAKA) INDIA

Email : [guddy.vidyagowda@gmail.com](mailto:guddy.vidyagowda@gmail.com)

**ABSTRACT :** The autotetraploid and diploids of two varieties of Ashwagandha namely JA-20 and Poshita were evaluated in a field trial under randomized block design with five replications to study the growth, yield and quality characters at Kittur Rani Channamma College of Horticulture, Arabhavi, during 2010-2011. Analysis of variance revealed significant difference among ploidy levels. Among the diploids and autotetraploids JA-20, JA-20 (4n), Poshita and Poshita (4n) evaluated, genotype Poshita (4n) recorded superior results in several morphological characters like plant height, plant spread, number of leaves per plant, leaf area and leaf area index. For root yield and alkaloid content, induced autotetraploid were found to be at par with diploid in both JA-20 (5.06 q/ha and 0.44 %, respectively) and Poshita (5.14 q/ha and 0.36 %, respectively). However, the root alkaloid yield proved to be significant and superior in both the tetraploids JA-20 (253.63 kg/ha) and Poshita (248.77 kg/ha) over their respective diploids. Thus it shows the potentiality for autotetraploids as improved variety.

**KEY WORDS :** *Withania somnifera* Dunal., Root yield, Genotypes, Alkaloid content

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In traditional/ Ayurvedic system of medicines, Ashwagandha (*Withania somnifera* Dunal.) is an important medicinal crop. Its root extract is widely used as tonic and in numerous ailments. Due to its wide usage as general tonic in weakness related ailments it is considered as 'Indian ginseng'. Its cultivation is spread over 10,780 ha with a production of 8,429 tonnes in India (Kubsad *et al.*, 2009). The traditional cultivation areas are in north western Madhya Pradesh and nearby Nagore district of Rajasthan. Recently it is also being cultivated in southern states of Andhra Pradesh and Karnataka. Since it has potential to grow under rainfed conditions, there is need to increase its cultivation in newer areas in South India. However, there is apparent lack of improved varieties of ashwagandha to increase the yield potential. Therefore, the present investigation was carried out to evaluate the available variability for higher growth, yield and quality.

## RESEARCH METHODS

The experiment was carried out at the experimental field

of the Department of Medicinal and Aromatic Plants, K.R.C. College of Horticulture, Arabhavi during 2010-11. The soil of the experimental site was sandy loam in texture. The four ashwagandha genotypes namely diploids and autotetraploids of JA-20 and Poshita (Plate 1) were evaluated in the present study. Field experiment was conducted in randomized block design with three replications. Each treatment was accommodated 5.0 x 3.0 m plot with a spacing of 30 x 10 cm. The crop received regular intercultural operations and irrigations. Crop was harvested after 150 days after sowing. Ten competitive plants from each plot were randomly taken and observations were recorded for various growth, yield and quality characters. The total alkaloid content was analysed as per the method suggested by Mishra (1986). Statistical analysis for various growth, yield and quality parameters were estimated standard statistical procedures given by Panse and Sukhatme (1967).

## RESEARCH FINDINGS AND DISCUSSION

The results obtained from the present investigation are