

Effect of Different Girth Classes on Gum Arabic Production from *Acacia senegal* in Arid Western Rajasthan

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Abstract: Hot arid regions of India lies between 24-29° North latitude and 70-76° East longitude covering an area of 317000 sq. km, which are spread over in the state of Rajasthan, Gujarat, Haryana, Punjab, Telengana, Maharashtra and Karnataka. Particular in Rajasthan, *Acacia senegal* (L.) Willdenow or *Acacia seyal* (Fam. Leguminosae) is an important species, the source of gum Arabic is found in the desert state of Rajasthan, especially in arid western Rajasthan. It's habitats in arid western Rajasthan included rocky hills, sandy plains, sandy hummock and sand dunes After repeated trials and error, ICAR-CAZRI, Jodhpur standardized the dose of Ethephon treatment of *A. senegal* trees for enhanced recovery of gum Arabic. The present study deals with CAZRI developed gum Arabic production technology correlation between different girth classes and gum Arabic production pattern. From the data obtained, after treatment, maximum average gum yield (375g) were obtain from DBH group (51-60 cm) followed by DBH group of 41-50 cm, (average gum yield 322.5 g). In case of DBH group of 20-30 cm, average gum yield was 210 g. it clearly appeared that girth has positively correlation with gum yield. If CAZRI gum inducing technology is applied appropriately with vigorous outreach programmes, the species can be source of income it millions of people in Indian arid and semi-arid regions.

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I. Introduction

A. senegal (L.) Willdenow or *Acacia seyal* (Fam. Leguminosae) (FAO 1999) is under dry tropical thorn forest in their classification of Indian forests. *Acacia senegal* is native to arid and semi-arid region of sub-Saharan Africa. This species is exotic but has been well naturalized in Indian sub-continent. Chaimphon and Seth (1968). This important species is prominently found in Rajasthan, especially in arid western Rajasthan. It is also found in other parts of India viz., of south-east Punjab, Gujarat, Madhya Pradesh, Maharashtra and Haryana. Particular arid western Rajasthan, species were found in rocky hills, sandy plains, sandy hummocks and sand dunes. In extreme western fringes of arid western Rajasthan the species forms important component of traditional agroforestry system (Tewari and Pareek 2015).

A. senegal is commonly under canopy trees which generally attains height of 4.5 to 8.0 m however, in most conducive environmental conditions it can attain height up to 14-15 m. Trunk may vary in diameter often attain a diameter of 25 -35 cm. Bark is grayish white, although in some mature old trees it may be dark, scaly and thin. (Hocking 1993).

A. senegal is main tree component in rocky land forms of arid western Rajasthan. Rocky-semi-rocky land forms are spread over in 12% area of arid western Rajasthan which accounted to be 23,520 sq km. In such land forms *A. senegal* can be a source of income to the farmers if they get some quantity of gum from the trees. The species is known for its edible high quality gum, commonly known as gum Arabic. Gum Arabic is "a dried exudates" obtained from the stems and branches of the species (FAO 1999). India has been a net importer ever since gum Arabic trade has got in its present shape in organized form. Imports, mainly from Sudan and Nigeria (the top gum Arabic producers), are needed to meet the country's requirements. Imports have increased from 4048 tons in 1992 to 26,098 tons in 2011 (UN Data 2011). India has the potential to produce independently a much higher quantum of gum Arabic because *A. senegal* trees are distributed abundantly throughout the arid and semi-arid tropics which constitute approximately 40% of the geographical area of the country. Tewari *et al.* (2017) stated that untapped trees or traditional gum tapping method did not produce at all or produced little gum implying that tapping is an important management tool for enhancing gum productivity. Moreover, most important issue is that this rich natural source of the country has left mostly un-tapped because in traditional gum tapping method in which the tree trunks are blazed as various parts of the stem results in production of only 15-45 g gum Arabic/ tree, which is not economically viable and as well as harmful for tree health.

Ethephon (2-chloroethylphosphonic acid) is a synthetic compound of ethylene, phosphate and chloride ions. It is a commonly known as plant growth regulator. In plant increased rates of ethylene biosynthesis