



PERFORMANCE OF *ASPARAGUS RACEMOSUS* WILD AND SAPONIN CONTENT UNDER *GMELINA ARBOREA* BASED AGROFORESTRY SYSTEM

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ABSTRACT- The study was conducted under 8 year old *Gmelina arborea* based Agroforestry system at experimental plot of Tropical Forest Research Institute, Jabalpur, Madhya Pradesh. *Asparagus racemosus* a shade loving medicinal plant was intercropped with *Gmelina arborea* along with other species like turmeric, zinger and Piper betle. During the study period, observations on growth and yield parameters were recorded. Its saponin content under intercrop and sole condition were also assessed. The results indicated that *A. racemosus* performed better when intercropped with *Piper betle* and *Gmelina arborea* (T₂) and yield was significantly higher (in term of growth parameters and yield such as plant height, number of fingers, finger length, finger diameter, root fresh weight, root dry weight, number of fruit and weight of fresh fruit) as compared to *Asparagus racemosus* with *Zingiber officinale* (T₃) and Control (*Asparagus racemosus* sole i.e. T₅). Similarly, the Saponin content extracted from *A. racemosus* intercropped with piper betle and *G. arborea* (T₂) was also higher and decreased significantly under T₃ and Control (T₅).

Keywords: *Agroforestry system, Asparagus racemosus, Gmelina arborea, Saponin, Satawar, Zingiber officinale.*

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INTRODUCTION

Agroforestry systems as a means of land use are not new to our rich heritage. The system proved as multi tier cropping system besides providing higher income, also allow to farmers to meet their various needs. These systems utilize the soil from its best capability and generate higher biomass from the same piece of land by improving soil fertility. Agroforestry system offers a good scope for more efficient use of land, water, other natural and human resources. *Asparagus* is one of the important genera of family Asparagaceae representing around 1500 species worldwide and are distributed in temperate and subtropical regions. It grows wild as well as in urban areas and under cultivation. This shade loving perennial medicinal plant grows better under the shade of tree canopy and the shade proves significantly beneficial for the growth and yield of the crop. A number of tropical medicinal and aromatic plants (MAPs) are well adapted to partial shading, moist soil, high relative humidity and mild temperature (Vyas and Nein, 1999;

Bimlendra and Madan, 2014), which suggests medicinal plants as a perfect crop to be intercropped with trees yielding timber and fuel wood, fruit trees etc. Some well known medicinal plants like Safed musli (*Chlorophytum borivillianum*), Sarggandha (*Rauvolfia serpentina*), Turmeric (*Curcuma longa*), wild turmeric (*C. aromatica*), Kali musli (*Curculigo orchioides*) and Ginger (*Zingiber officinale*) (Chadhar and Sharma, 1998; Mishra and Pandey, 1998; Prajapati *et al.*, 2003) successfully intercropped with fuel wood trees such as *Acacia auriculiformis*, *Albizia lebbeck*, *Eucalyptus tereticornis*, *Gmelina arborea* and *Leucaena leucocephala* in India. Only four out of 6454 herbaceous medicinal plants have been tried as intercrop under two – year old poplar (*Populus deltoids*) spaced @ 5 m apart (Kumar and Gupta, 1991), indicating that most of the medicinal plants can be grown in agroforestry systems. A significant (40-45%) decrease in the yield of traditional crops was observed after 3 year of planting. Shade loving and perennial