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EFFECT OF*BOSWELLIA SERRATA* GUM ON SEED GERMINATION OF SOME SEEDS.

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ABSTRACT

The gum of *Boswellia* species has been used as incense in religious and cultural ceremonies and in medicines since time immemorial. Gum is naturally occurring chemical substance in the plant,*Boswellia serrata (Salai/Salai guggul*), is a moderate to large sized branching tree of family Burseraceae (Genus *Boswellia*), grows in dry mountainous regions of India, Northern Africa and Middle East.. After processing, the gum is then graded according to its flavour, colour, shape and size. In India, the States of Andhra Pradesh, Gujarat, Maharashtra, Madhya Pradesh, Jharkhand and Chhattisgarh are the main source of *Boswellia serrata*. There are different name of plants according to locality. Gum is a substance which exudates naturally from the stem or from the wounds of trees. Gums are colloidal in nature soluble in water but completely insoluble in alcohol and ether. Impact of gum collected fromwas studied for different time period of 1% gum concentration on the germination of cereals, pulses and oil seeds like wheat, jowar, cowpea, gram, safflower and soybean. Percent germination or percent inhibition of germination, root and shoot length of seedlings was measured after 7 days of incubation at room temperature. It was concluded from the present investigation that 1% concentration of *Boswellia serrata*gum was found to promote the germination of wheat, jowar, cowpea, and soybean at 10 hour treatment.

Key Words: Gum,*Boswellia*, Seed Germination.

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INTRODUCTION

Gums are a group of plant product resembling carbohydrates and widely distributed in vegetable kingdom. The vegetable gum constitute an important group of economic plant product and are utilize in several ways. It is very commonly used by human being from ancient time. Nowadays in modern industry large quantity of gum have been used for manufacture of pharmaceutical products. Gums are characterized by ability to dissolve in water forming viscid solution by absorbing water to form jelly gelatinous paste. When these jelly exposed to air these gelatinous paste loose the water and dry to hard clear or with different colour Gums are characterized by ability to dissolve in water forming viscid solution by absorbing water to form gelatinous paste. In some cases the production of gum has been attributed to fungi attacking the plant, these fungi being responsible for enzymes that penetrate the tissues and transform the celluloses and hemicelluloses of the cell wall into gum..

. Malcolm (1936) concluded that the production of gum in Sudan gum Arabic trees is due to bacterial agency. The real cause of production of gum inmany trees is uncertain. The best use of gum is to prepare sticky substance for pasting the paper and other things. Treatment of gums to seeds has positive effect on seed germination. *Acacia* gum is being widely used as an experimental vehicle for drugs in physiological and pharmacological experiments, and it is supposed to be an inert substance, recent reports have confirmed that it has some biological properties as an antioxidant (Trommer and Neubert, 2005; Ali and Al Moundhri, 2006, Hinson *et al.,* 2004) on the metabolism of lipids (Tiss *et al.,* 2001, Evans *et al.,* 1992), positive contribution in treating kidney, (Matsumoto *et al.,* 2006; Bliss *et al.,* 1996, Ali *et al.,* 2008), cardiovascular (Glover *et al.,* 2009) and gastrointestinal diseases (Wapnir *et al.,* 2008, Rehman *et al.,* 2003). *Acacia* gum is usually referred as Gum Arabic (GA). It is an edible biopolymer obtained as

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exudates of mature trees of *Acacia* spp. The exudate is a non-viscous liquid, rich in soluble fibers, and its emanation from the stems and branches usually occurs under stress conditions such as drought, poor soil fertility, and injury (Williams and Phillips, 1990).

Gums are to be found in a greater or less degree in most plant families. The gum occurs in about 44 families covering 1,900 genera and 21,000 species. Various organs of the plant may produce or secrete them. They may be produced only in very small quantity and not be readily discernible or they may be produced very copiously forming large, conspicuous incrustations on the surface, as with most of the commercial gums, particularly the tree gums. Certain families of flowering plants are notable for the number of species they contain that are free gum yielders. Among them notable is the Leguminosae, in which a hundred or more species of *Acacia* alone are known to yield gum, including those that are commercially important for gum arabic. Several species of *Astragalus* are also free gum yielders and are the source of gum tragacanth. Some additional notable gum yielding genera in the family are *Albiszia, Bauhinia, Caesalpinia, Ceratonia* and *Pithecolobium*. Other important gum yielding families are Anacardiaceae, Combretaceae, Meliaceae, Rosaceae and Rutaceae.

MATERIAL AND METHODS

01) Collection of Gum samples: Plant gums were regularly collected in all the seasons. It was done by using axe, sterilized blade. Fine cut was made at different parts of the plant, like root, stem, leaves, flower and fruits. Later on at 30, 45 and 60 days exudates gums where collected in presterlized plastic bags, kept in laboratory condition until it was used (Badar, 2011).

02) Preparation of fine powder of Gum: The fine powder of collected dry gums was prepared by using mixer grinder and kept in clean glass pots at 4-6^{O}C temperature.

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03)Application of gum on seed germination: The effect of different time period (1 hr, 3 hr, 5hr, 10hr) of plant gum on seed germination and the impact of different concentration like 1%, 2%, 3% and 4% on cereal, pulses and oil seeds of seed mycoflora have been studied. The impact of different time period of percent gum concentration of *Boswellia serrata*were studied on the germination of cereals, pulses and oil seeds like wheat, jowar, cowpea, gram, safflower, soybean and the results are summarized in Table.*Boswellia serrata*gum was applied on germinating seeds for 1 to 10 hour treatments. The results were recorded at different time intervals by measuring shoot length and root length by vigour formula (Abdul Baki A.A.and Anderson J.D.1975).

RESULTS AND DISCUSSION

It was observed from the 1% concentration of*Boswellia serrata* gum was found to promote the germination of wheat, jowar, cowpea and soybean at 10 hour treatment. 1 hour treatment was found to promote the germination of wheat, cowpea, gram and soybean. It was also found to promote the shoot length, root length of wheat, cowpea, gram whereas it was found to retard the growth of shoot and root length of jowar and soybean. Similar type of results were recorded for 3 hour 5 hour treatment.Whereas, at 10 hour treatment the shoot and root length of all treated seeds except Soyabean were found to be increased as compared to control..

*The Boswellia serrata*gum is being widely used for industrial purposes such as a stabilizer, a thickener, an emulsifier and an encapsulating in the food industry, and to a lesser extent in textiles, ceramics, lithography, cosmetic and potential Antiinflammatory agent (M.Z.Siddiqui 2011.)Hence, the *Boswellia serrata*gum can be useful for induces maximum seed germination in various ways.

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Table 01: Impact of different time period of *Boswellia serrata*gum on seed germination (1% gum concentration)

Sr. No.	Seed plant Name	1 hr			3 hrs			5 hrs			10 hrs			Control		
		% germ	Shoot length (mm)	Root length (mm)	% germ	Shoot length (mm)	Root length (mm)	% germ	Shoot length (mm)	Root length (mm)	% germ	Shoot length (mm)	Root length (mm)	% germ	Shoot length (mm)	Root length (mm)
1.	Wheat	80	4.2	2.2	70	4.0	3.1	80	4.9	2.7	90	6.0	5.2	70	3.4	2.1
2.	Jowar	70	7.2	5.5	80	3.9	3.0	70	5,3	2,8	90	5.7	4.2	80	6.1	5,9
3.	Cowpea	80	3.2	3.2	70	3.7	2.9	90	4,7	3.8	70	4.3	3.8	60	2.9	2.8
4.	Gram	80	3.2	2.3	80	4.2	2.7	80	5.0	3.2	60	4.1	3.4	60	1.8	2.3
5.	Safflower	70	3.5	2.7	80	4.1	3.3	80	5.2	3.1	70	3.9	3.6	70	3.1	2.6
6.	Soyabean	70	3.6	3.5	80	3.8	2.9	80	5.1	2.9	80	3.1	3.8	80	3.4	2.9

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