Morphological and Physiological Characterization of Ocimum sanctumL. extracts on Vigna radiata L.Wilzeck Varieties

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Abstract- *The Present Investigation was conducted with three varieties of mungbean during summer season in 2014-2015. Morphological characterization of three varieties of mungbean indicated the high level of variation among their plant weight, leaf number, leaf diameter and leaf weight, leaf length, pod length, No. of pods per plant, No. of seeds per plant that selection will be effective for three types of different extracts of Ocimum sanctumL. on Vigna radiata L. Wilzeck. Three medicinal plants are Ocimum sanctumL., Calotropis procera, Astragalous tribuloides Delile. Among these medicinal plant extracts we use three extracts for each medicinal plant. These extracts are Alcoholic, Aqueous acidic and Alkaline extracts on three varieties of mungbean. Three varieties of mungbean is IPM-02-03, RMG-492and SML-668. In this study we were evaluate that among these varieties of mungbean SML-668 is treated with Ocimum sanctumL. alcoholic extract is better than other extracts of Ocimum sanctumL.*

Keywords- Vigna radiata L. Wilzeck, IPM-02-03, RMG-492, SML-668, Ocimum sanctumL., Calotropis procera, Astragalous tribuloides Delile

I. INTRODUCTION

The mungbean (Vigna radiata L. Wilzeck) is one of the most important, short season and summer-cultivated legume. It is widely grown in throughout the tropics and subtropic regions (Liu etal.,2011;Thomas etal.,2004).Mungbean are low in fat content, its calorific value is low while it has excellent digestibility(Fan and Sosulski.,1974).Vigna radiata L. Wilzeck is used for both seeds, forage and produce large amount of biomass(El-Karamany etal.,2003). Vigna radiata is excellent source of antioxidant activities (Fery etal. 2002).Seed germination helps to synthesis of new compounds (Tang etal. 2014a). They are rich in various phytonutrients, such as minerals, aminoacids, vitamins, proteins and phytochemicals (Kavas & El, 1991). Vigna radiata is also help in maintaining the soil fertility (Senanayake etal., 1987; Zapata etal.1987). Mungbean contribute more than 95% to the total pulse production in the country (Rahman, 1988).

The importance of medicinal plants such as Calotropis procera, Astragalous tribuloides and Ocimum sanctum L. Calotropis procera is also used antihelmintic, antimicrobial, anticancer, anticoagulant, analgesic(Jain S.C, Sharma R. and Sharma R.A.,1996). Ocimum sanctum L. plant extracts play important role in protecting the human health including cough, asthma, fever, arthritis, eye disease, indigestion, hiccups, gastric and cardiac disorders, back pain, skin disease, ringworm, insect, snake and scorpion bites and malaria(Singh N, Hoette Y, Miller R. Mahajan 2010; Mahajan N, Rawal S, Verma M, Poddar M, Alok SA 2013;Mohan L, Amberkar MV, Kumari M,2011;Pattanayak P, Behera P, Das D, Panda SK,2010;Mondal S, Mirdha BR, Mahapatra SC,2009).Astragalous tribuloides help to give the potential benefits for immune system of heart, liver and in adjunct cancer treatment(Karin M, Greten FR,2005).The aim of the present study that SML-668 variety of mungbean is more effective for Ocimum sanctum L. extract that is used for human welfare.

II. MATERIAL AND METHOD

The present study was conducted at the Krishi Vigyan Kendra, Banasthali University, Banasthali, Rajasthan over the month of June and July month during the two successive seasons of 2013/2014.

2.1 Seeds collection

Three varieties of mungbean seeds were collected from Krishi Vigyan Kendra, Banasthali University, Banasthali, (Rajasthan). These varieties are IPM-02-03, RMG-492 and SML-668.These varieties was available n the month of June and July Season in 2013 and 2014 during two successive seasons.

2.2 Preparation of medicinal plant extracts from donor plants.

Alcoholic Extract: 0.2 gm of leaves samples were crushed in 1 ml of 80% aqueous methanol. The samples were centrifuged at5000rpm for 10 minutes and supernatent was collected which is concentrated with vaccum concentrator.

Acidic Extract: 1gm of leaves was boiled in 0.2 M HCL for 25-30 minutes. It was filtered with minutes. It was

filtered with muslin cloth and separated out with ethyl acetate. Shake well and kept it for five minutes and concentrate with vaccum concentrator, this separation is done three times with ethyl acetate. Finally, it was dissolved in 80% aqueous methanol.

Alkaline Extract: 0.2 gm of the leaves was boiled in 0.2 M HCL for 25-30 minutes centrifuged it at 5000rpm for 10 minutes. Pellets kept in 2M NaOH for overnight. Then, again centrifuged it at 5000 rpm for 10 minutes. Filtered it with muslin cloth an adjust its pH 2.0 with concentrated 1 N HCL and separate it out with ethyl acetate and finally dissolve it in 80% methanol.

2.3 Seed cultivation

Seeds of each variety were soaked in distilled water for 24 hr and imbibed in different medicinal plant extracts for 48 hr and kept in plant growth chamber in order to allow them to germinate. After 48 hr of soaking, seeds were transferred to autoclaved petridishes by using sterilized forceps having wet double layered filter paper. Petridishes were kept in plant growth chamber for providing suitable conditions for germination.

The plants were grown in pots for 21 days till the appearance of the second tri-foliate leaf (21 DAS). A set of biochemical experiment were done with the control plants. The plants were then subjected to different medicinal plant extracts for the next seven days.

2.4 Planting material and Procedure

Uniformly mixed field soil was filled in well labelled pots with 19.4 cm and diameter 3.8cm. The varieties of genus Vigna radiata selected for the experiments viz, IPM02-03, RMG 492, SML-668 were obtained from Krishi Vigyan Kendra, Banasthali, Rajasthan.Seeds of each variety were soaked in distilled water for 24 hr and imbibed in different medicinal plant extracts for 48 hr and kept in plant growth chamber in order to allow them to germinate. After 48 hr of soaking, seeds were transferred to autoclaved petridishes by using sterilized forceps having wet double layered filter paper. Petridishes were kept in plant growth chamber for providing suitable conditions for germination. The plants were grown in pots for 21 days till the appearance of the second tri-foliate leaf (21 DAS). A set of Morphological and Physiological experiment were done with the control plants. The plants were then subjected to different medicinal plant extracts for the next seven days.

III. RESULTS AND DISCUSSION

The plantlets of V. radiata were observed for disease symptoms and the disease index calculated. The following morphological traits were determined at harvest.

Morphological traits: Plant height (cm), Leaf Number, Leaf weigth (cm), Leaf Diameter (cm), Leaf length (cm), Pod Length(cm),No. of pods per plant, No. of seeds per plant

Table 1: Effect of *O. sanctum* extracts on Plant weight, Leaf Number, Leaf Weight and Leaf Diameter at harvest

Varieties of Mungbean	Varieties of Medicinal plants	Extracts of Medicinal plants	Plant weight (g)	Leaf Number	Leaf Weight	Leaf Diameter(cm)
IPM-02-03	***Ocimum sanctum* L.**	Control	3.680 ± 0.137	12 ± 0.58	0.204 ±0.012	1.587 ±0.133
		Alcoholic Extract	3.123 ± 0.131	10 ± 1.00	0.176 ±0.011	1.130± 0.118
		Acidic Extract	2.800 ± 0.079	08 ± 0.58	0.144 ±0.009	0.913 ±0.009
		Alkaline Extract	2.259 ± 0.253	06 ± 0.58	0.120 ±0.008	0.837 ±0.018
RMG-492	***Ocimum sanctum* L.**	Control	4.001 ± 0.131	14 ± 1.53	0.362 ±0.009	2.537 ± 0.119
		Alcoholic Extract	3.257 ± 0.062	12 ± 0.58	0.303 ±0.007	2.027 ± 0.093
		Acidic Extract	3.036 ± 0.137	09 ± 1.00	0.256 ±0.014	1.520± 0.080

		Alkaline Extract	2.707 ± 0.154	08 ± 0.58	0.230 ±0.008	0.953 ± 0.084
SML-668	***Ocimum sanctum* L.**	Control	4.959 ± 0.264	17 ± 1.15	0.394 ±0.012	3.819 ± 0.013
		Alcoholic Extract	4.028 ± 0.053	15 ± 1.15	0.338 ±0.018	2.643 ± 0.130
		Acidic Extract	3.429 ± 0.254	12 ± 0.58	0.293 ±0.012	2.260 ± 0.149
		Alkaline Extract	2.989 ± 0.031	09 ± 2.00	0.246 ±0.015	1.687 ± 0.147

Table 2: Effect of *O. sanctum* extracts on Leaf length, Pod length, No. of pods per plant, No. of seeds per pod at harvest.

Varieties of Mungbean	Varieties of Medicinal plants	Extracts of Medicinal plants	Leaf Length (cm)	Pod Length (cm)	No. of pods per plant	No. of seeds per Pod
IPM-02-03	***Ocimum sanctum* L.**	Control	5.127±0.067	3.063±0.057	08.00±0.58	07.00±1.00
		Alcoholic Extract	4.280 ± 0.111	2.517±0.182	07.00±1.00	06.00±1.15
		Acidic Extract	3.186 ± 0.094	2.150±0.050	06.00±1.16	06.00±1.53
		Alkaline Extract	2.640 ± 0.072	2.055±0.032	05.00 ± 1	04.00±1.00
RMG-492	***Ocimum sanctum* L.**	Control	6.767 ± 0.125	3.440±0.140	10.00±1.00	09.00±0.58
		Alcoholic Extract	5.707 ± 0.101	3.100±0.056	09.00±1.16	08.00±1.53
		Acidic Extract	4.527 ± 0.122	2.850±0.085	08.0± 1.00	06.00±1.53
		Alkaline Extract	3.260 ± 0.121	2.420±0.075	07.00±0.58	05.00±0.58
SML-668	***Ocimum sanctum* L.**	Control	7.163 ± 0.057	4.057±0.040	12.00±1.73	10.00±0.58
		Alcoholic Extract	6.963 ± 0.085	3.863±0.075	11.00±1.00	09.00±1.00
		Acidic Extract	6.063 ± 0.075	3.034±0.071	10.0 ±0.58	08.00±0.58
		Alkaline Extract	5.417 ± 0.085	2.563±0.055	09.00±1.00	08.00±1.00

IV. CONCLUSION

Experimental Investigations were conducted to determine the plant weight, leaf number, leaf weight and leaf diameter, leaf length, pod length, No. of pods per plant, No. of seeds per pod. Mungbean respond most effective response with Ocimum sanctum L. extracts. Three different extracts were used in each variety of mungbean. Among three varieties of mungbean SML-668 shows maximum plant weight when it is treated with alcoholic extract of Ocimum sanctumL. Similarly, Leaf Number, Leaf weight and Leaf Diameter, leaf length, pod length, No. of pods per plant, No. of seeds per pod is maximum in SML-668 variety when it is treated with alcoholic extract of Ocimum sanctumL. It shows that Ocimum sanctum L. Alcoholic extract is more effective on SML-668 variety of mungbean as comparison to other extracts of Ocimum sanctumL. and other varieties of mungbean.

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