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INFLUENCE OF BAP ON *IN VITRO* REGENERATION OF SHOOTS FROM IMMATURE LEAVES OF GROUNDNUT (*ARACHIS HYPOGAEA* L.)

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radhakrishnan.nrcg@gmail.com* **Abstract : Cytokinins are used in *in vitro* protocols singly or in combinations with auxins to induce cell proliferation and promote shoot regeneration. We report a protocol for efficient regeneration of immature leaf explants from groundnut (*Arachis hypogaea* L.) var. Kadiri-6 and K-134 using a combination of NAA and BAP. A maximum of 90% regeneration with more than 7 shoots per explant was obtained from explants cultured on MS medium with 4 mg/L BAP and 1 mg/L NAA with subsequent substitutions of NAA with AgNO₃ for shoot induction and AgNO₃ by GA₃ for elongation of the shoots. The levels of BAP in the culture medium significantly influenced the frequency

of regeneration. This protocol of indirect regeneration from the immature leaves may be used in genetic transformation protocols of groundnut with higher efficiency of recovery of plantlets. **Keywords** : *Arachis hypogaea*, BAP, Immature leaves, Regeneration

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PHYTO-SOCIOLOGICAL EFFECT OF DAIRY EFFLUENT ON WEED FLORA IN ASSOCIATION WITH MUSTARD CROP (*BRASSICA JUNCEA* L. CZERN & COSS.)

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Abstract: Samples of dairy effluent were collected from Parag milk plant Partapur, Meerut. Three concentrations (25, 50 and 100%) were used in this experiment. Tap water served as control. Effect of dairy effluent was studied on weeds in association with Indian mustard cvs. Pusa Bold, Pro Agro 4001 and T-59, which is grown as oil crop in India and abroad. The effluent effect with different concentrations has been assessed in all the cultivars of *B. juncea*. It was observed that weed frequency was higher significant in cultivar T-59 whereas, Pusa Bold greatly reduced it. Phyto-sociological dominance of *Cannabis sativa* L. and co-dominance of *Chenopodium album* L. in crop have also been recorded.

Keywords : Allelopathic effect, *Brassica juncea*, *Cannabis sativa*, *Chenopodium album*, dairy effluent, Meerut, weed density, weed frequency

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TO DEVELOP SUPER RICE HYBRID STUDIES ON COMBINING ABILITY OF NPT LINES OF RICE (*ORYZA SATIVA* L.)

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Abstract : Combining ability in NPT lines of rice for Super hybrid rice breeding programme has been carried out in line x tester mating design involving 3 stable CMS lines and well adapted 9 testers of different eco-geographic origin in rice. It revealed presence of predominance of non additive gene action for the characters under study. Among the lines IR 79156A was identified as a good general combiner followed by APMS 6A and IR58025A and within the tester ET 1-13, IRFAN-115, and ET 1-12, was found to be good combiner for grain yield per plant. Promising hybrids based on *per se* performance, SCA, GCA and Heterosis for grain yield per plant are IR79156A/ET-1-10, APMS6A/ET1-12, IR58025A/IRFAN-115, IR79156A/ET-1-1and IR79156A /TOX 981-11-2-3. These promising hybrids offer greater scope for further exploitation of hybrid vigour commercially.

Keywords : New plant type, Hybrid rice, CMS, Combining ability

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***ALLIUM SATIVUM* L. (GARLIC) - POTENTIAL ELIXIR OF LIFE**

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Abstract : Garlic, botanically *Allium sativum* L. (family Alliaceae) is one of the oldest known horticultural crops. It is a multi-purpose herb relished as a flavouring agent around the world. No other herb has served as many culinary and medicinal purposes in as many cultures as garlic. Nature has also showered its benevolence on it by ingeniously packing a chemical factory in it. By virtue of these active principles, garlic seems to have the potential to cure almost every disease. This paper is an attempt to consolidate unsurpassed medicinal promises offered by garlic.

Keywords : *Allium sativum*, Chemical, Food, Health, Spice

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EFFECT OF WEED AND INTEGRATED NUTRIENT MANAGEMENT ON YIELD OF POTATO (*SOLANUM TUBEROSUM*) UNDER DRIP IRRIGATION

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Abstract : A field experiment was conducted at IGKV, Raipur (C.G) during *rabi* 2010-11. The soil of experimental site was clay loam in texture, neutral in soil reaction. The climate of the region is sub humid with an average annual rainfall of 1200-1400 mm. Results revealed that drip irrigation 100 % or 125 % of OPE proved comparable and gave higher growth parameters, yield attributes (number of stolons plant⁻¹, number of tubers plant⁻¹, fresh weight, dry weight of tubers, tuberization efficiency) and total tuber yield of potato crop as compared to furrow irrigation. The herbicide Metribuzin (500 g a.i. ha⁻¹PE) proved better among other weed management practices recorded the maximum growth parameters, yield attributes (number of stolons plant⁻¹, number of tubers plant⁻¹, fresh weight, dry weight of tubers, tuberization efficiency) and total tuber yield of potato crop. Application of 75% N inorganic fertilizer + 25 % N organic (Poultry manure) + PSB + Azotobactor produced significantly highest growth parameters, yield attributes (number of stolons plant⁻¹, number of tubers plant⁻¹, fresh weight & dry weight of tubers, tuberization efficiency) and total tuber yield.

Keywords : Drip irrigation, Weed management, Integrated nutrient management, Potato

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ENVIRONMENTAL INFLUENCE ON CYTOMIXIS IN *CORCHORUS FASCICULARIS* LAMK. (TILIACEAE)

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Abstract: Cytomictic behaviour (intensity assessed from the frequency of hypo- and hyperploid meiocytes formed) is noted in a single plant (to avoid any intra plant variations) of *Corchorus fascicularis* Lamk. from the natural population under a unit location (West Bengal plains, Kalyani, Nadia; latitude 22°50' to 24°11' N, longitude 88°09' to 88°48' E, altitude 9.75 m, sandy loamy soil, pH-6.89) from early June to early July 2012. Meiosis has been studied from 6 samples under the assessed period. High temperature has intensified the phenomenon of cytomixis as evidenced from the enhanced frequency of hypo- and hyperploid PMCs formation without affecting pollen fertility. Apart from cytomixis, differential condensation of chromosomes, meiocytes with 2 nucleoli, occurrence of minute fragments, high frequency of univalent formation and irregular anaphase I separation are also observed. Results obtained have been discussed.

Keywords: *Corchorus fascicularis*, Cytomixis, Temperature effect

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BIOEFFICACY OF INSECTICIDES AS SEED TREATMENT AGAINST EARLY SUCKING PESTS OF SOYBEAN CROP.

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Abstract : A Field experiment was laid out in randomized block design with six treatments including untreated control replicated four times. This crop was sown on 5th July 2009 in plot size of 25 square meters. The crop management practices (i.e. field preparation, sowing, weeding, fertilizer application etc.) were adopted as per the recommended practices. In this experiment numbers of sucking pests were counted at seven days interval starting from 20 days of sowing till five weeks after first observation. The number of jassids and white flies were counted from top three and two middle leaves of randomly selected 5 plants in each plot. The whitefly population was comparatively higher than that of jassids. Imidacloprid 600 FS when applied as seed treatment at the rate of 0.75 g.a.i/kg seed was most effective against the sucking pests upto four week of seed germination with least 6.71 insect/plant. It was followed by Imidacloprid 600 FS @ 0.60 g.a.i./kg seed and Thiamethoxam 70 WS @ 2.1 g.a.i./kg seed with 9.66 and 11.02 sucking pests/plant.

Keywords : Bioefficacy, Imidacloprid, Sucking pests, Thiamethoxam, Seed treatment, Soybean

EVALUATION OF FRONTLINE DEMONSTRATION OF LENTIL (*LENS CULINARIS* L.) IN SOUTH EASTERN PLAIN ZONE OF RAJASTHAN

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Abstract : Studies were undertaken in agro-climatic zone-V (Humid South Eastern Plain) of Rajasthan situated in between 25°45' and 26°33' N latitudes and 75°27' and 77°26' E longitude at an altitude of 273 m from mean sea level, to evaluate the yield and economic feasibility of improved technology transfer in lentil through front line demonstrations conducted during 2007-08 to 2009-10. Adoption of improved technology had significant impact on seed yield and economic return in lentil. Improved technology enhanced lentil seed yield from 775 kg/ha (farmers' practice) to 999 kg/ha (improved technology), an overall increase of 28.81 %. Among the critical inputs, weed management ranked first (38.45 %), followed by varietal improvement (29.16 %), whole package technology (24.70 %) and nutrient management (23.64 %). The comparative profitability due to improved technology was fetched higher to the tune of Rs. 4896/ha over farmers' practice. The benefit: cost ratio was also higher and recorded 2.04 compared to the farmers' practice. Thus, to further bridge up the gap between technologies developed and technology transferred, there is need to strengthen the extension network besides emphasis on specific local recommendation.

Keywords : Improved technology, Front line demonstration, Lentil, Net return, B: C ratio

STUDIES ON HETEROSIS AND COMBINING ABILITY FOR DEVELOPING NEW PLANT TYPE HYBRIDS IN RICE (*ORYZA SATIVA* L.).

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Abstract : The heterosis and combining ability were estimated for grain yield, and its component traits in 27 cross combinations including 9 elite promising new plant type lines used as testers and 3 wild abortive type cytoplasmic male sterile lines generated through Line x Tester mating design with 15 characters to develop efficient heterotic hybrids for this ecosystem. New plant type models have been modified to adjust to various rice growing regions. The result revealed that grain yield and its component showed highly significant differences for all the traits. Among the 27 hybrids, five hybrids viz., IR58025A /IRFAN-115, IR58025A/SR-6-SW-8, IR58025A /ET 1-13, APMS 6A /ET 1-12, and APMS 6A /NPTR-2 were recorded to have significant heterosis for grain yield and seven hybrids showed significant negative heterosis for earliness and three hybrids for plant height. These may be exploited for heterosis breeding and should be screened for stability in yield.

Among the lines IR 79156A was identified as a good general combiner followed by APMS 6A and IR58025A and within the tester ET 1-13, IRFAN-115, and ET 1-12, was found to be good combiner for grain yield per plant. Promising hybrids based on *per se* performance, SCA, GCA and Heterosis for grain yield per plant are IR79156A/ET-1-10, APMS6A/ET1-12, IR58025A/IRFAN-115, IR79156A/ET-1-1 and IR79156A /TOX 981-11-2-3. These promising hybrids offer greater scope for further exploitation of hybrid vigour commercially.

Keywords : Heterosis, Combining Ability, New Plant Type, Yield, Rice, CMS

CRITICAL LIMIT OF AVAILABLE ZINC FOR WHEAT IN SOILS OF SUB-HUMID SOUTHERN ZONE (IV- B) OF RAJASTHAN

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Abstract : A pot culture experiment was conducted during the year 2006-07 to assess the critical limit of zinc in soils as well as in wheat plant with eighteen alkaline soils collected from different sites of Zone (IV-b) of Rajasthan. The DTPA-extractable Zn in these soils was found positively correlated with organic carbon, clay and per cent dry matter yield of wheat. A significant negative correlation was observed between pH, sand, calcium carbonate (CaCO₃) and electrical conductivity

(EC). The critical limits of available Zn for soil and plant were worked out to 0.63 mg kg⁻¹ and 38.98 mg kg⁻¹, respectively. Application of 10 mg Zn kg⁻¹ soil recorded maximum mean dry matter yield of wheat i.e. 17.59 g pot⁻¹. Bray's per cent yield (Wheat) versus DTPA-zinc in soil was found to be 0.58 mg kg⁻¹ by graphical method and 0.63 mg kg⁻¹ by statistical method.
Keywords : Critical limit, Zinc, Bray's per cent yield, Alkaline soil

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YIELD ATTRIBUTES AND YIELD OF RICE (*ORYZA SATIVA* L.) AS INFLUENCED BY INTEGRATED WEED MANAGEMENT IN SYSTEM OF RICE INTENSIFICATION (SRI) UNDER CHHATTISGARH PLAINS

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Abstract : An experiment carried out to find out the yield attributes and yield of rice (*Oryza sativa* L.) as influenced by integrated weed management in system of rice intensification (SRI) under Chhattisgarh plains during *Kharif* season of 2009 at Research cum-Instructional Farm, Department of Agronomy, IGKV, Raipur (C.G.). The experiment laid out in Randomized Block Design (RBD) with three replications. Results revealed that post-emergence combined application of Fenoxaprop-p-ethyl 60 g ha⁻¹+ Ethoxysulfuron 15 g ha⁻¹ at 20 and 35 DAT was statistically at par with hand weeding (twice) at 20 and 40 DAT for producing yield attributing characters like plant height, test weight, number of grain panicle⁻¹ etc. under system of rice intensification method of rice. Grain yield and straw yield was recorded maximum under the post-emergence application of Fenoxaprop-p-ethyl 60 g ha⁻¹+ Ethoxysulfuron 15 g ha⁻¹ at 20 and 35 DAT followed by hand weeding twice. However, both were comparable. All the treatments gave significantly higher seed yield than unweeded control. The highest gross return and B:C ratio was obtained from Fenoxaprop-p-ethyl 60 g ha⁻¹+ Ethoxysulfuron 15 g ha⁻¹ at 20 and 35 DAT followed by hand weeding and lowest from unweeded control.

Keyword : Weed management, yield attributes, integrated weed management, rice

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AVAILABLE MICRONUTRIENT STATUS IN SOILS OF GOGUNDA TEHSIL, UDAIPUR DISTRICT (ZONE IV- a) OF RAJASTHAN.

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Abstract : A study was carried out to assess the micronutrient status of soils of the Gogunda Tehsil, Udaipur district (Zone IV-a) of Rajasthan. The EC of soils ranged from 0.05 to 2.0 dSm⁻¹ and OC varied from 0.40 to 21.0 g kg⁻¹. The pH of soils ranged from 6.5 to 9.20. CaCO₃ content ranged from 0.2 to 41.0 g kg⁻¹. The available Fe, Zn, Cu, and Mn ranged from 1.25 to 15.25, 0.25 to 12.42, 0.50 to 7.05 and 2.14 to 112.95 mg kg⁻¹ respectively.

Keywords : Fertility Status, Micronutrients, Correlation, Critical limit

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SHELF LIFE OF COMPOSITE FLOUR IN DIFFERENT PACKAGING MATERIALS UNDER ACCELERATED CONDITION

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Vigyan Kendra, Dhamtari, IGKV Raipur, C.G. Abstract : "Increasing prevalence of obesity and physical inactivity has lead to increase in number of people with diabetes. A composite flour utilizing *ragi* and wheat flour is used to

prepare composite flour ratio being 70:30 (Wheat: Finger millet). The composite flour contains fairly good amount protein (10.49%), ash (1.38%) and 251.724 (mg/ 100 g) calcium which shows that the product is nutritionally rich especially in terms of calcium and protein. The fat content (1.5%) is quite low. The storage studies were performed under accelerated condition (89% RH and 40°C temp.) using the packaging materials multilayer, LDPE and kraftpaper. The packed samples of composite flour were analyzed after a fixed interval of 10 days for change in moisture, fat, rancidity and colour up to 90 days. After 90 days of storage it was found that multilayer is best and cost economic packaging material for composite flour.” **Keywords :** Accelerated condition, Composite flour, Packaging materials

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RELATIVE TOXICITY OF SPRAY SCHEDULES TO NATURAL ENEMIES OF KEY INSECT PESTS OF COTTON

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Abstract : The toxicity of spray schedules was evaluated against three predators which revealed that higher population of spider, chrysopa and coccinellids were recorded in spray schedule S₂ (all the five sprays of Btk), S₁ (all the five sprays of azadirachtin), S₅ (all the five sprays of cow urine 5 %) and S₆ (all the five sprays of cow urine 10 %) indicating their low toxicity. The population of predators in these schedules was comparable to that of control. The treatments of synthetic insecticides viz., methyl demeton, monocrotophos, deltamethrin, endosulfan, alphamethrin and imidacloprid proved highly toxic to all the three predators resulting in their low population. The endosulfan was found less toxic to the predators than all other synthetic insecticides.

Keywords : Relative toxicity, Spray schedules, Natural enemies, Cotton

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SCREENING OF SOYBEAN VARIETIES AGAINST GIRDLE BEETLE

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Abstract : Twelve advanced varieties (AVT) of soybean were screened against girdle beetle under randomized block design in which plot size was 1m x 5m, row to row spacing 30 cm replicate twice. The observations were taken at fortnightly interval by counting total numbers of girdle beetle affected plants out of total numbers of plants in each plot. The observations were initiated with first appearance of girdle beetle on the crop. Based on seasonal mean of girdle beetle infestation the per cent plant damage ranged from 1.57 to 7.91 per cent. The variety NRC-37 with 1.57 per cent infested plants was least infested by girdle beetle followed by Bragg, JS-20-06, and NRC-77 with 1.73, 2.73 and 2.74 per cent infested plants, respectively. Variety RKS-54 with 7.91 per cent infested plants was most damaged by girdle beetle. The grain yield from different varieties ranged from 1720 to 2220 kg/ha. Highest yield was recorded in NRC-77 which was almost similar to that obtained in Bragg and NRC-37 with 2210 and 2200 kg/ha, respectively.

Keyword : Girdle beetle, Soybean, Screening, Genotype, Population dynamic, Bragg, NRC-37

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EFFECTS OF PGPR (PLANT GROWTH PROMOTING RHIZOBACTERIA), SULPHUR AND MICRONUTRIENT ON MORPHOLOGICAL CHARACTERS OF LENTIL (*LENS CULINARIS*).

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Abstract : A field trial was conducted during the rabi season of 2009 at the research farm of J.V. College, Baraut, to study the role of PGPR with sulphur and micronutrients viz. Zn, Mo and Mn on the cultivar L-4076 and PL-406 of lentil (*Lens culinaris*). Application of PGPR along with S @ 60 kg/ha, Zn @ 4 kg/ha, Mn @ 0.5 kg/ha and Mo @ 0.1 kg/ha showed

significant result in comparison of any other treatment including control in respect of Plant height, number of Branches/Plant in both variety increases with the inoculation of PGPR + S with all the micronutrients were highly significant over any other treatments. PGPR in combination with Sulphur and micronutrients attained maximum number of leaf in comparison to PGPR + S, PGPR with all the micronutrients PGPR alone and uninoculated control. Number of Pod per plant is more in both variety L-4076 and PL-406 inoculated with PGPR, S and micronutrients as compared to control. The combined application of PGPR, S and all micronutrients attained significantly higher nodules weight than any other treatments. It is concluded that use of PGPR, S and micronutrients would be an effective approach for better morphological character of lentil under natural conditions.

Keywords: PGPR, Sulphur, Zn, Mo, Mn, *Lens culinaris*, L-4076 and PL-406

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AN ANALYSIS OF ENTERPRISE RELATED ATTRIBUTES OF RURAL WOMEN ENTREPRENEUR IN INDORE BLOCK OF INDORE DISTRICT (M.P)

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Abstract: The study was conducted in purposively selected block of Indore district of Madhya Pradesh during 2009-10 in order to know the entrepreneurial behaviour of rural women in terms of their enterprise and family background attributes. The results of the study revealed that majority of the respondents of the respondents were living in nuclear family, medium family size, belonged to nuclear parental home, middle positions in their parental home, middle daughter in-law, had up to 2 earning members in their family, 2 members for support as working hands, experience of one to year, did not receive any training and works for 5 to 8 hours. Further it was found that majority were satisfied from the choice of enterprise, chosen their enterprise because of their self interest, got idea of enterprise from relatives, friends and family members, investing medium amount of money, marketing opportunity up to medium level, didn't possess technical skills and competencies, possess the ability of accounting and managerial skill, did vocational diversification, had done input agreement from village and done marketing agreements.

Keywords: Block, Madhya Pradesh, Rural women

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STUDIES ON THE PHOTOSYNTHETIC PIGMENTS OF GARDEN PEA GROWN ON FLY ASH AMENDED SOIL

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Abstract : There are several sources to generate power like thermal power, nuclear power, tidal power, hydro power and power from fossil fuel and other non conventional sources. Due to large coal reserves in India energy generation through thermal mode is most common. Indian coal is high in ash content (35- 45 %). Present generation of fly ash from coal combustion in TPPs is about 160 MT/year in our country. Management of fly ash is a serious problem worldwide. The present study is an attempt for finding the eco- friendly solution of the problem through fly ash soil amendment technology (FASAT). Field experiments were designed by using fly ash (FA), organic manure like farmyard manure (FYM), biocompost (SOM) and chemical fertilizer (CF) in different combinations. Four pea cultivars Azad P₁, E₆, Arkel and PSM were used in the study. Biochemical parameters (conc. of chl a, b and total chl) were estimated at 60 DAS by using fresh leaves. There was an increase in photosynthetic pigments in all treatments as compared to control. The increase was discernible under integrated nutrient supply system. The positive outcome of the results of the present investigation is expected to encourage use of fly ash in agriculture and thus decreasing environmental pollution. However, the changes in soil environment caused by fly ash incorporation need to be investigated on long term basis.

Keywords : Coal, Fly ash, Pea, Photosynthetic pigments, Pollution

ANTIBACTERIAL INVESTIGATION OF BLACK PEPPER AGAINST *SHIGELLA DYSENTERIAE*

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Abstract : Aim of this study was to evaluate the antibacterial activity of different extracts of *Piper nigrum* L. against *Salmonella typhi*. Three extracts such as aqueous, ethanolic and chloroform extracts of *Piper nigrum* seeds were prepared. 4 different concentrations such as 15, 20, 25, 30 mg/ml of them were made. Antimicrobial activity was determined by Agar well diffusion method. Results showed that 30 mg/ml of aqueous, ethanol and chloroform extract of *Piper nigrum* gave 23.2±0.2, 22.4±0.2, 22.2±0.4 mm of inhibition zones, respectively. Aqueous extract was observed to be best among all extract of *Piper nigrum*.

Keywords : *Piper nigrum, Shigella dysenteriae*