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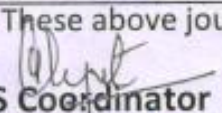
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### 3.2.1 Number of papers published per teacher in the Journals during the last five years (5)

Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISSN number
Study of Mineral status in different phases of life cycle of <i>Physalis minima</i> L. (Solanaceae)	Dr. D.K. Billore and Dr. Anita Soni	Botany	Gyan Ganga	2015	2395-4442
Study of Aquatic Biodiversity of Sirpur Talab of Dhar Road Indore : A Survey Report	Dr. D.K. Billore and Dr. Saroj Mahajan	Botany	Research Link - An International Journal - 152	2016	0973-1628
Hydrological study of Tapti River at Burhanpur (M.P.)	Dr. D.K. Billore and Dr. Archana More	Botany	Shodh, Samiksha aur Mulyankan	2017	0974-2832
Bamboo Productivity controls Degraded Gullied Lands	Dr. D.K. Billore and Dr. Archana More	Botany	Shodh, Samiksha aur Mulyankan	2017	0974-2832
Water Quality studies of two west of flowing river Narmada	Dr. D.K. Billore and Dr. Archana More	Botany	Shodh, Samiksha aur Mulyankan	2017	0975-3485
A Study in Flowering Periods of Common Allergenic Significant Plants Growing at Indore, Madhya Pradesh	Dr. D.K. Billore and Dr. Uday Chitnis	Botany	Ind. Res. Comm.	2017	0973-9661
Effect of Green Manure ( <i>Vallisneria Spirallis</i> ) on Gram ( <i>Cicer Arletinum</i> ) Germination	Dr. D.K. Billore and Dr. Malini Johnson	Botany	Naveen Shodh Sansar	2019	2320-8767

Link to paper :- <https://drive.google.com/file/d/1r6NYIAc78D8trRH11PopbmrVNQcTVuNy/view?usp=sharing>

NOTE:- These above journals are register in University Grands Commission.

  
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## ज्ञान-गंगा शोध पत्रिका

अज्ञानी महाविद्यालय - श्री नीलकण्ठेश्वर आसानीय स्नातकोत्तर महाविद्यालय, खण्डवा

सितम्बर-दिसम्बर 2015

### Study of mineral status in different phases of Life cycle of *Physalis minima* L. (Solanaceae)

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#### Introduction -

Most of the elements required by the plants are absorbed by them from the soil. The clay particles of soil are present in the form of colloides. In the middle of the last century water culture and sand culture experiments had established that the elements- Nitrogen, Phosphorus, Potassium, Magnesium and calcium were indispensable for plants. In the absence of any one of these elements the growth of shoots or roots was stunted. Deficiency effects e.g. Chlorosis, premature withering of leaves became apparent and the plants died before flowering.

#### Area of study -

For the present study of *Physalis minima* Dhar district of M.P. is selected. Dhar is located between 220 1' 14" and 230 9' 49" North latitude and 740 28' 27" and 740 41' 43" East longitude at the height of 543 meters above mean sea level covering 1570 villages distributed in 5092 Km<sup>2</sup> area. Climate of district is moderate type, rainfall occurs during July to October. Local tribe people are popularly known as Bhil.

#### Morphological characters -

*Physalis minima* linn. family-Solanaceae A small delicate erect pubescent, herb 1.5 meters tall, intermodal length 8.2 cm. leaves - petiolate, ovate to cordate, delicate, stipulate, acuminate having reticulate venation and undulate margin. Flowers- pedicilate, hermophorodite, complete, solitary small campanulate- Calyx-gamosepalous toothed, persistant, Corolla-5 petals gamopetalous, yellow having black spots. Stamens- epipetalous, style black long. Stigma-yellow and yellowish round ovary at the base. Fruit- berry, enclosed within enlargement 10 ribbed reticulate calyx. Seed-globose (Parmar and

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## Study of Aquatic Biodiversity of Sirpur Talab of Dhar Road Indore : A Survey Report

*Water is basic unit of life for all living organisms at this planet. Water is essential for drinking, domestic, irrigation and industrial purposes. The important source of potable for Indore inhabitants sirpur talab field survey study of macrophytes shows number of Environmental problems, like water pollution creates foul smell, taste, odor problems which are unpleasant to public convenience. The control measures are suggestion for water purification and management.*

SAROJ MAHAJAN \* & D. K. BILLORE \*\*

### Introduction :

Historic times man has been intimately associated with water and the evidence of past civilization that all historic human settlement were around inland fresh water recourses has conclusively proved it out of all the water on earth only 2.75% is fresh water water found on earth. Aquatic macrophytes are large plant which actively grow continuously or periodically depend upon availability of required amount of water. Fresh water macrophytes include free floating submerged ones with floating leaves emergent plants have arial parts. Aquatic plants respond strongly to the particular environmental condition within a wetland the chemical environment many aquatic system has changed at alarming rate. During the last century due to the intensified exploitation of the land for farming and urban expansion.

### Study Area :

The Sirpur talab is located at the Sirpur village (Tehsil and District Indore Madhya Pradesh) on the left side of Indore Dhar road (NH -59) about 8 km. west from the Indore city. This is situated at 22°40'N latitude and 75°45'E longitude. Sirpur talab is situated on the Sirpur village at an altitude of 421 meter above sea level. Macrophytes are the base of aquatic food chain. Aquatic macrophytic species were studied in sirpur talab (Indore) the present investigation which was under taken in period 2015- 2016.

### Material & Method :

During 2015-2016 (January to December) monthly visit to sirpur talab and collected macrophytes wash dry and prepared specimen herbarium sheets. The taxonomic status of the sample was identified with the help of flora and taxonomic publications.

### Observation :

#### Macrophytes :

(1) *Nymphoides indica* (L.) Kuntze : Leaves 7-7.5X20-22 cm orbicular. Sepals ovate lanceolate, acute. Petals ovate lanceolate, englandular, densely fimbriate, white with yellow base. Fruit globose.

(2) *Limnophila indica* (L.) Druce : Stem villous, puberulous or glabrous leaves 3 nerved, punctate ; emergent leaves serrulate to lobed; submerged leaves dissected. Flowers solitary axillary or racemose, pedicels longer than calyx. bracteoles 0 or 2. Corolla white

(3) *Hydrilla verticillata* (L.) Royle : A submerged herb with branched stem. Leaves 0.6-1.5 cm. long sessile in whorls of 4-8. linear acute, entire flowers minute, unisexual, white, dioecious, male flowers ; female small and pedicellate.

(4) *Ottelia alismoides* (L.) : A submerged or partly floating, fresh water herb; roots fibrous leaves very variable, submerged or often floating, 4-12 X 2.5-6 cm. oblong or orbicular, when orbicular reaching 7.5-14 cm. indiameter, membranous obtuse with cordate base, margin undulate, petioles trigonous, glabrous flowers, white,

(5) *Vallisneria spiralis* L. : A submerged, tufted, stoloniferous herb with a bunch of adventitious roots. leaves radical, variable in length according to the depth of the water, linear, flat, serrulate, subacute, glabrous. flowers dioecious, male flowers minute, ovoid submerged, shortly pendunculate, enclosed in 2 or 3 lobed spathe.

(6) *Trapa natans* L. : A free floating herb, bunch of green roots given out from the nodal region. Leaves 6-15X3-4.5 cm; floating in a rosette, rhomboidal; submerged leaves often dissected; dark green and shining above.

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## Hydrological study of Tapti River at Burhanpur (M.P.)



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## ABSTRACT

The Physico-chemical parameter of Tapti river (M.P.) India were investigated during January 2016 to February 2017. The study revealed that the river exhibit slight temporal and special variation in physicochemical character of water.

**Key words-** Environmental monitoring, physicochemical quality, total dissolved solid, Tapti River

## Introduction-

Tapti is a major River in central India. The river originates from the Betul district of Madhya Pradesh in the Satpura range at an elevation of 752 meter above the sea level. The states through which the Tapti river flows include Maharashtra, Gujrat and Madhya Pradesh. It has a total length of about 435 miles (700 km) and drains an area of 25,200 square miles (65,300 square km). It is one of the major rivers of peninsular India with the length of around 724 km; it runs from east to west. It rises in the Eastern Satpura Range of southern Madhya Pradesh state, and flows westward. It flows through Maharashtra's historic Khandesh and east Vidarbha regions in the northwest corner of the Deccan Plateau and South Gujarat before emptying into the Gulf of Cambay of the Arabian Sea, in the State of Gujarat.

## Study area-

Burhanpur is a mid size city in M.P. state India. It is situated south western border of M.P. near north bank of the Tapti River Burhanpur was an important outpost of the Mughals. It is best known for the textile industries. It is the largest hub for power loom industry.

The Tapti River flows in central India from east to west between Godavari, Narmada. Geographical location of Burhanpur 21.300 N latitude, 76.20 E longitude.

## Methodology:

The Climatic and environmental parameters of Khandwa station are studied by the authors and Department of Botany and the same environmental parameters are also recorded by reference division, Tehsil office Khandwa and Central Government Office, Khandwa regularly every year. The measurement of rainfall by raingauge, relative humidity by pyrometer, maximum and minimum temperature by Stevensons screens IS 5948-1970. All these climatic parameters are recorded in every 24 hrs twice a day -8.30 AM and 5.30 PM at Khandwa. all these parameters are observed

specially the maximum and minimum is measured by Stevensons Screen with dry bulb and wet bulb thermometer.

## List of physicochemical parameters and their test methods

Parameters	Test Methods
Turbidity	Turbidity tube
Dissolved oxygen (DO)	Winkler method
Biochemical oxygen demand (BOD)	5 days incubation at 200 C and titration of initial and final do
Conductivity	conductivity meter
Alkalinity	Titration
Chloride	Argentometric titration
Nitrate Nitrogen (No3-N)	Spectrophotometric method
Total Hardness as CaCO3	EDTA titration
Calcium Hardness EDTA	titrimetric method
Magnesium Hardness	Calculation after analyzing
Hardness and calcium	

## Result &amp; Discussion-

Water quality is one of the key factor governing the life in lotic ecosystem. A physico-chemical characteristics of water are indicates significant variation throughout the study.

The recorded temperature ranged from 25.20c to 39.250 c. The mean value of water temperature predict that Tapti is a warm water river (Jhingran 1997) Turbidity fluctuated between 7.5 to 7.9 N.T.U. Conductivity fluctuated in the range of 146  $\mu$  mho/lit to 490  $\mu$  mho/lit conductivity indicates the mixing of sewage in river water (kulshrestraetal 1987) observed conductivity between 340  $\mu$  mho/lit to 450  $\mu$  mho/lit at river kashipra. Alkalinity of water is measure of weak and present in it and of cation balanced against them (severdrap tal.) Total alkalinity range from 99 to 243.5 mg/lit.

Moderately high alkalinity was predominanty due to carbonate and bicarbonates of calcium. Total alkalinity each be directly associated with temperature. in the present study total hardness range was 170 mg/lit to 179 mg/lit. Chatopadhyay (1980) at al attributed higher value of hardness due to surface runoff sewage.

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## Bamboo Productivity controls Degraded Gullied Lands

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### ABSTRACT

Ravines are the network of gullies. India is having 3.67 m ha of ravine lands which constitute 1.12% of total geographical area of 328 m ha (NCA, 1976). Very extensive degradation of land has occurred along some of the major river systems of the country in various states in the form of deep gullies important to increasing the desired level of forest cover, to counter impacts of climate change and to conserve land & water resources for sustaining and improving the production and productivity of these degraded ravine lands. Bamboo is one of the fastest growing plants having extensive fibrous root system, connected rhizome system, dense foliage, the leaf litter produced on the soil surface, etc., are some the important valuable characteristic features of bamboo for controlling soil erosion in degraded ravine lands. Better rainfall absorption and hydrologically best suited plantation in degraded ravine lands. India has one of the richest bamboo resources in the world and is second only to China in bamboo production.

Key words: bamboo productivity, ravine lands, runoff, soil loss, economics

### Introduction

Riparian forest management compartment areas more than 25% up to 200 m from the bank of Narmada river have been included in this working circle. The main objective of this working circle is to check soil erosion and to increase the quality of water by conserving and developing the vegetation cover. Khandwa is having 4585.12 ha of riparian forest management area which constitute 2.15% of total management area. Rehabilitation of degraded ravine lands with various kinds of vegetation is immensely important to increasing the desired level of forest cover, to counter impacts of climate change. The National Commission on Agriculture has repeatedly indicated that gullied lands not only create problems where they exist, but are also the root causes for degradation of adjacent arable lands affecting production potential in a major way. There are several major areas of severe Bamboo Productivity in Forest and Non-Forest Areas 12 ravine erosion in India. Degraded ravines can be safely put under permanent vegetation for sustainable use. Bamboo has been identified as one of the promising species for protection and productive utilization of these lands. In degraded ravine lands enhances the flora and fauna and thereby restoring natural ecosystem to counter impacts of climate change and to conserve land & water resources for sustain and improves the production and productivity of degraded ravine lands. Various other research findings have reported positive utility of bamboo plantation for enhancing natural resource conservation (Lawler, 1993; Yan Hui et al., 1995). The utility of bamboo plantation as effective soil & water conservation measure has been

successfully demonstrated in vegetation was observed to be quite promising both in terms of controlling runoff and soil loss and economic returns. Zhou et al., (2005) reported that soil erosion was low in bamboo plot (178.15 kg/ha) as against other types of forest plantations. Bamboo plants having higher stem flow in comparison to other deciduous and coniferous forest trees, due to special canopy characteristics (Lu SY et al., 2007, Rao et al., 2012a).

Controlling soil erosion. Extensive fibrous root system, connected rhizome system, its comparatively dense foliage, the leaf litter produced on the soil surface, etc. are some the important valuable characteristic features of bamboo for controlling soil erosion, and its habit of producing new culms from underground rhizomes allows harvesting without disturbing the soil (Ben-zhi et al., 2005).

Francis, plantation have also been used to rehabilitate the land in different parts of the world (Christianity et al., 1996), for illustration, in India *Dendrocalamus strictus* shows positive land rehabilitating and restoring ability.

### Choice of bamboo species for ravine

Two important species of bamboo occurring in semiarid lands of India are *Dendrocalamus strictus* (Manvel or Solid bamboo) and *Bambusa bambos* (Katas or Thorny bamboo). Besides the above species, *Dendrocalamus hamiltonii* is present in small patches in semiarid regions of Uttar Pradesh and Madhya Pradesh. No other species of bamboo has been reported in the ravine lands. Most of the . The *Dendrocalamus strictus* is the most widely planted and most successful bamboo species for planting in the ravines. This is due

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## Water Quality studies of two west flowing river Narmada

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### ABSTRACT

Narmada and Tapi Rivers are both west flowing river of M.P. in the present study, Physico-chemical characters of two river have been compared during the year 2015-2016. Water samples have been analyzed during 2 years for their 34 Physico-chemical parameters.

Key words- Physico-chemical parameters. Total dissolved solid, self purifying capacity, deterioration.

### Introduction-

Narmada river is the life line of M.P. Narmada river provides drinkable water to the population of M.P. it is the main water resources for domestic purposes. Tapi river has been supported the large number of population, specially the indigenous people such as Dhodia & Bheel who are heavily dependent in it the River flows westward over a length of 724 km cover the there state m.p. Maharastra and Gurjrat. The state of M.P. River originate from the states M.P. from Betul district (Multa)

### Material and Methodology-

Sample were collected from both River divided into 6 sampling station, samples were taken in pre washed clean polyethylene bottles. The temperature of the sample were measured in the field on the spot. The samples were immediately analyzed in the chemistry lab to minimize the physicochemical changes each sample was analyzed using procedures outlines in the standard methods for the examination of water as suggested in Apha (1996)

The duration of sampling was categorized into three Pre monsoon, monsoon and post monsoon period.

### Result and discussion -

The physic-chemical parameter both the River viz. Narmada and Tapi River has been compared during 2015 to 2016 from all results it is clearer that Narmada River water quality was slightly different, compared to Tapi River. The slightly higher value of pH in Tapi River compare to the Narmada River. Shows that Tapi River water is more alkaline. in Tapi river B.O.D. and Fe recorded higher in monsoon compared to post monsoon which could be due to acidification of water caused by the elevated microbial degradation of organic debris and concentrated dissolved solid in the monsoon period. The application of chemical fertilizers, run off from agricultural field and other anthropogenic sources are the mainly responsible for over degraded quality of Tapi River.

The alkalinity may also the caused due to evolution of  $CO_2$  during decomposition of organic matter.

The water of Tapi River is hard at misplaces. The concentration of  $mg^{++}$  exceed the safety limit prescribed for drinking water at some of the station and may cause physical disorders. At most of the station however

Note- 1. The high valve of turbidity found as compared to Narmada River during rainy season may be due to

List of physicochemical parameter and their test method.

Parameters	Test Methods
Turbidity	Turbidity tube
Dissolved oxygen (DO)	Winkler method
Biochemical oxygen demand (BOD)	5 days incubation at 20° C and titration of initial and final do
Conductivity	conductivity meter
Alkalinity	Titration
Chloride	Argentometric titration
Nitrate Nitrogen (No,-N)	Spectrophotometric method
Total Hardness as $CaCO_3$	EDTA titration
Calcium Hardness	EDTA titrimetric method
Magnesium Hardness	Calculation after analyzing Hardness and calcium

Chemical analysis result were compared with standard guideline produced by ISI value

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## A STUDY ON FLOWERING PERIODS OF COMMON ALLERGENICALLY SIGNIFICANT PLANTS GROWING AT INDORE, MADHYA

PRADESH, INDIA

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**ABSTRACT :** Flowering plants are an integrated part of our ecosystem. They not only act as producers but also add aesthetic value to our surroundings. Pollen grains sometimes trigger on allergic reactions in sensitive people. Precise knowledge of flowering periods of allergenically significant plants is a pre-requisite to predict pollen allergy. Present study was undertaken to study the flowering periods of these plants. The results obtained were compared with that observed in a previous study and a shift in flowering period has been noticed.

**KEY WORDS :** Allergic plants, Flowering period, Indore, Variation in flowering period

### INTRODUCTION

Indore is, about 500 years old historical city. It was ruled by Holkar dynasty which nurtured a number of gardens like Lal Bagh, Navratan Bagh and Fal Bagh etc. British invasion in the region resulted in their residency over here. The area under their influence (now, known as Residency area) has many exotic and pure trees. After independence, many new plants were introduced through the efforts of government departments, public support and voluntary organisations. Most of the Indore roads now have an assortment of road side trees and cannot be said to be an asset of a particular species.

Pollen grains of these flowering plants interact with nature in a number of ways. Some of these pollen grains may trigger on allergic reactions in sensitive people. The present study was undertaken to record the flowering period of various allergenically significant plants growing at Indore and adjoining areas. Obtained findings were compared with the flowering periods recorded during an earlier study by Solanki (1983).

### MATERIALS AND METHODS

The study area, i.e. Indore and its adjoining areas, was periodically visited to observe the vegetation type and the flowering period for a period of three years i.e. from July

2010 to June 2012. The flowering twigs of the plant specimen were collected and identified with the help of local and other floras (Duthel, 1903-1929, Hooker, 1872-97). Vital data as habitat, distribution frequency, type of cultivation, mode of pollination and the flowering period was recorded. Vernacular names were also noted. The flowering period is considered with the commencement of budding to the shedding of all the flowers of the plant.

A flowering calendar was prepared on the basis of the observations made during three years. Relevant information of allergenically significant plant species was recorded. A complete record of various meteorological parameters such as Minimum and Maximum Temperature, Relative Humidity, Rainfall and Wind velocity was maintained throughout the study period (Table 1).

Earlier study (Solanki, 1983) also collected meteorological data for 10 years. Average values for corresponding months were calculated and compared with the data of present study (Fig 1 and 2).

### RESULTS

Indore is a beautiful city, where nature has bestowed its blessings in the form of fertile black cotton soil, moderate temperature range, gentle winds and sufficient rainfall.

Its natural vegetation was of Dry Deciduous Teak

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## Effect Of Green Manure (*Vallisneria Spirallis*) On Gram (*Cicer Arietinum*) Germination

Malini Johnson\* D.K. Billore\*\*

**Abstract** - *Vallisneria spirallis* is the rich source of variable nutrients and chemical constituents. The present investigation was conducted with submerged aquatic weed, *Vallisneria spirallis* obtained from Sirpur talab, Indore (M.P.) on grams (*Cicer arietinum*) plants. The fresh aquatic weeds were processed and mixed in different ratio with soil. The research was undertaken to study the affect of application of different ratio of green manure and soil on grams crop. There were five treatments in total consisting of green manure and soil. The present investigation has been initiated to evaluate the effectiveness of manure on growth of grams. The results obtained proved that all the vegetative growth parameter viz-number of pods and length of grams plants were significantly improved by the use of green manure manufactured from aquatic weeds- *Vallisneria spirallis*. Farmers use huge chemical fertilizers for gram production, which causes health and environmental hazards. Adoption of green manure in grams cropping systems and improvement of organic manure are needed to reduce use of chemical fertilizer.  
**Key Words** - Green manure, *Vallisneria spirallis*, grams.

**Introduction** - *Vallisneria spirallis* is a beautiful submerged aquatic plant with conspicuous transverse darker bands on leaves it can survive in a few centimeter of water. *Vallisneria spirallis* is a perennial tufted stoloniferous herb with a bunch of adventitious roots. The plant possesses numerous mechanisms of vegetative reproduction that enable it to spread very rapidly. Management and control of this weed have been achieve by the potential use of it as green manure in agricultural field. The advantages of green manuring for increased crop productivity has also been reported elsewhere (Kelssa, 1988; Tadesse, 1989; Yeshanew and Asgeill, 1999). Use of chemical fertilizers has increased worldwide for cereal production (Abril et al., 2007) due to availability of inexpensive fertilizers (Graham and Vance, 2000). The continued use of chemical fertilizers causes health and environmental hazards (Pimentel, 1996). Effective use of green manure is an important issue in developing countries. The manure contains important nutrients such as N, P, K, organic matter, Ca, Mg, etc. (Abdelhamid et al., 2004)

Effective use of green manure is an important issue in developing countries. Possible options to reduce chemical fertilizer use could be adoption of grams crops and reduces dependence on chemical fertilizer. Uses of such green manure in agriculture may contribute to conserve the environment as well as improve soil fertility.

**Study Area** - Indore district lies the heart of malwa plateau. Geographically it lies at 20 .40, N latitude and 75. 45, E longitude and 553 meter from sea level. Sirpur talab is

constructed in the year 1868 during the regime of Holkar State. The Sirpur talab is located at the Sirpur village district Indore (M.P.) Sirpur talab is manmade, totally rain feed perennial water body, open enough to get solar radiations  
**Materials And Methods** - The soil was collected from Sirpur talab and mixed well. This soil samples were dried samples and ground with the help of wooden pestle and mortar than it was passed through 2 mm sieve to separate the coarse particles.

Aquatic weed *Vallisneria spirallis* was separated by hand from Sirpur talab. Aquatic weeds absorbed nutrients are added back to soil on as fertilizer. They thus could be used for nutrient recycling. The aquatic weeds and soil mix properly and the soil of the experimental pot was prepared for growing grams by using different ratio of weeds and soil viz control and pure weeds in the ratio 3:1 the three part weeds and one part soil and another 1:1 50% weeds and 50% soil, similarly 1:3 ratio one part weeds and three part soil were mix and filled in pot.

*Cicer arietinum* -JG11- was grown in different pots in last week of November 2010. During observations water is the most important factor affecting crop cultivation, 250 ml. of water was given in different plastic pots alternate days. There cultivation was simple. Thus were harvested during the last two weeks of April.

**Result And Discussion** - Gram (*Cicer arietinum*) is one of the earliest grain legumes to be domesticated by man in the old world. The present study was undertaken to assess the effect of *Vallisneria spirallis* use as green manure on

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