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CYPERMETHRIN PESTICIDES IMPACTS ON MORPHOLOGICAL CHARACTERS OF *SOLANUM MELONGENA* LIN.

Priyanka Sharma

Department of Bioscience, D.A.V. (PG) College, Muzaffarnagar - 251 001 (U.P.), India.

Abstract

Pesticides have become necessary evil for agriculture. The term pesticides is a composite term that include all chemicals that are used to kill or control pests. We studied cypermethrin pesticidies impacts in different concentration *viz*. 0.01%, 0.15%, 0.25% and 1.00% on morphological parameters *i.e*. root length, shoot length, total number of branches/plant, total number of flowers/plant, total number of leaves/plant, leaf area, height of plants of *Solanum melongena* Lin. We found resulted the cypermethrin pesticides showed maximum stimulation at lower concentration and showed maximum inhibition at higher concentration of pesticides on all types of parameters of *Solanum melingena* Lin.

Key words : Cypermethrin, pesticides,shoot length, root length, height, flower,branches, leaf area.

Introduction

Pesticides are used worldwide to manage agricultural pests. They kill and repel unwanted pests, but also causes many human death each year. This lesion explores the widespread use of pesticides in agricultural and compare the benefits and problems associated with these helpful but dangerous chemicals. What do you think is the main goal of agriculture? Agriculture was developed to produces crops and livestock for human consumption. As the human population increase the amount of food produced is very important. Unfortunately, there are other organisms out there that want to consume the crops that are meant for human. It is estimated that nearly 37% of all crops produced in the united states each year are destroyed by a agriculture pests, which result in an economic loss of around Rs. 122 billion year. Due to this high loss in food production pesticides are often use to try to combat the problem. Pesticides are chemicals that are kills or manage the population of pests. There are many different types of pesticides on the market today but the most common are herbicides and insecticides which kill unwanted plants and insects. The damage caused by agriculture pests is a global problems and over the past half century the amount of pesticides used has increased fourfold. Over the years the widespread use of pesticides has had several benefits and also caused many problems.

The benefits of pesticides include increased food production, increased profits for farmers and the prevention the diseases. Although, pests consume or harm a large portion of agriculture crops, without the use of pesticides is likely that they would consume a higher percentage. Due to the use of pesticides, it is to possible to combat pests and produce large quantities of food. By producing more crops farmers are also able to increase profit by having more produce to sell. Pesticides also increase farm profit by helping the farmer save money on labor costs. Using pesticides reduces the amount of time required to manually removes weeds and pests from fields. In addition to saving crops and livestock pesticides have also had direct benefits to human health. It is estimated that since 1945 the use of pesticides has prevented the death of around 7million peoples by killing pests that carry or transmit diseases. Malaria which is transmitted by infected mosquitoes, is one of the most commonly known and deadly diseasesthat has decreased in prevalence due to the use of pesticides.

Pesticides have also been shown the disrupt the balance of an ecosystem. In many situations when a pesticides is used it also kills non-pest organisms. This can dirastically alter the natural balance of the ecosystem. BY removing non-pest organisms the environment can be changed to favour the pests.In addition the causing harm of wild life pesticides that travel from their original

location are known to cause harm to humans. Human exposure to pesticides has caused poisonings the development of cancer and the death of between 20,000 to 40,000 peoples worldwide each year.

Pesticides are of immunse value to our agriculture and have played a significant role in modern agriculture. They often provide dependable, persistent and relatively complete control of harmful pests with less expenses effort, skill and under standing. However, their repeated and in discontaminate use can be hazardous. The available literature shows that studies mostly related to data on safety or estimation of their residues on food and feed or on environmental pollution have been extensively reviewed.

Brinjal is one of the important vegetable crops in India grown throught the country round the year and popularly known as "poor men's crop" by Saini (1996). A herbaceous prickly or sometimes unarmed perennial 0.6 to 2.4 m. tall cultivated through out India as an annual for its edible fruit, leaves, ovate, sinuate or lobed flowers blue in small cluster of 2-5 berries large ellipsoid or elongate in various shade of white yellow or dark purple 2.5 to 25 cm. long glabrous with thick calyx seed many discoid.

The value of brinjal is enhanced as a vegetable during autumn when other vegetable are scarce. They are eaten when approaching ripeness and area fairly good sourceof calcium, iron, phosphorus and vitamin B. Roots of egg plant are credited in the indigenous medicine as antiasthmatic and general stimulant. Leaves are said to possess sialagogue and asthma. Brinjal are recommended in liver complaints.

Materials and Methods

The investigation has been conducted to study the effect of various concentration of cypermethrin (0.01%, 0.15%, 0.25% and 1.00%) pesticides on morphological aspects of economically important Solanaceous crops *i.e. Solanum melongena* Lin. Which are widley grown in this locality. This work has been divided in to two phase. First phase covers seedling studies, it include seed germination, seedling growth, dry weight and enzymes. The second phase in the work include plant studies the parameter taken in to account are morphological studies growth and yield, biomass and enzymes such as ribonulease, 5 '-nucleotidase, acid phosphatase, alkaline phosphatase and mineral contents *viz*. nitrogen, phosphorus, potassium and calcium and chlorophyll and protein contents. We discuss here morphological characters of *Solanum melongena* Lin. *i.e.* root length, shoot length, height of plants, numbers of leaves, flowers, brances and leaf area etc. The seeds of brinjal (Type - Sandya) was obtained from Sabzi Beez Bhundar Shop, Muzaffarnagar the authorised dealer of Nunhems Seeds Pvt. Ltd. These varieties were selected because they showing to be highly productivity, commonly used by the farmers of this area and high economic value.

Results and Discussion

Cypermethrin pesticides influence morphological parameter of growth *viz*, shoot length, root length, height of plant, number of branches, number of leaves and leaf area. In lower concentration of cypermethrin pesticides (at 0.01% concentration) stimulate all the growth parameters significantly and at higher concentration inhibits all the growth parameters. The inhibition was found to be concentrations dependent the maximum inhibition was recorded in highest (at 1.00%) concentration of pesticides after 15 days of sowing of brinjal crops. Respectively the pesticides show maximum phytotoxicity after four consecutive sprays. Cypermethrin (tables 1, 2, 3, 4, 5, 6, 7) at lower concentration stimulate the shoot length and root length height, leaf area, number of

Table 1 : The effect of cypermethrin on total number of branches of *Solanum melongena* Lin.

Treatment	Total bumber of branches (plant) days after sowing					
	15	30	45	60	75	90
Control	1.570±0.083	4.300±0.304	5.285±0.022	5.900±0.249	6.700±0.145	6.970±0.071
0.01%	1.800±0.182 (+12.77)	4.450±0.200 (+3.37)	5.408±0.017 (+2.27)	6.180±0.037 (+4.53)	6.840±0.058 (+2.04)	6.995±0.036 (+0.35)
0.15%	1.640±0.025 (+4.26)	4.380±0.265 (+1.82)	5.356±0.042 (+1.32)	5.998±0.015 (+1.63)	6.790±0.083 (+1.32)	6.985±0.060 (+0.21)
0.25%	1.010±0.077 (-35.66)	3.890±0.091 (- 9.53)	4.490±0.020 (-15.04)	4.700±0.174 (-20.33)	4.980±0.074 (-25.67)	5.120±0.073 (-26.54)
1.00%	0.395±0.038 (-74.84)	1.650±0.265 (-61.62)	2.349±0.021 (-55.55)	2.720±0.107 (-53.89)	2.949±0.043 (-55.98)	3.490±0.060 (-49.92)

Table 2 : The effect of cypermethrin on total number of leaves of *Solanum melongena* Lin.

Treatment	Total bumber of branches (plant) days after sowing					
	15	30	45	60	75	90
Control	5.540±0.216	14.400±0.547	16.450±0.036	18.100±0.108	22.180±0.033	24.530±0.035
0.01%	6.650±0.214 (+16.69)	15.520±0.102 (+7.21)	17.450±0.031 (+5.73)	19.350±0.069 (+6.45)	23.590±0.039 (+5.97)	25.540±0.028 (+3.95)
0.15%	5.580±0.172 (+0.71)	14.790±0.098 (+2.63)	16.680±0.069 (+1.37)	18.750±0.051 (+3.46)	22.590±0.103 (+1.81)	24.830±0.028 (+1.20)
0.25%	3.490±0.120 (-37.00)	12.450±0.067 (-13.54)	13.490±0.062 (-17.99)	14.180±0.108 (-21.65)	15.500±0.038 (-30.11)	16.240±0.057 (-33.79)
1.00%	2.350±0.075 (-57.58)	10.720±0.086 (-25.55)	11.480±.054 (-30.21)	12.470±0.054 (-31.10)	13.440±0.048 (-39.40)	14.280±0.065 (-41.78)

Table 3 : The effect of cypermethrin on root length of *Solanum melongena* Lin.

Treatment	Root length plant days after sowing					
	15	30	45	60	75	90
Control	3.400±0.457	7.700±0.434	10.700±0.570	13.400±0.239	14.000±0.216	14.500±0.237
0.01%	4.500±0.421 (+24.44)	8.900±0.523 (+13.48)	11.200±0.179 (+4.46)	14.200±0.098 (+5.63)	15.500±0.074 (+9.67)	15.700±0.224 (+7.64)
0.15%	3.5000±0.322 (+2.85)	7.800±0.523 (+1.28)	10.800±0.346 (+0.92)	13.600±0.382 (+1.47)	14.200±0.159 (+1.40)	14.600±0.334 (+0.68)
0.25%	2.500±0.714 (-26.47)	5.300±0.366 (-31.16)	8.200±0.209 (-23.36)	11.000±0.147 (-17.91)	11.700±0.383 (-16.42)	12.000±0.086 (-17.24)
1.00%	1.8000±0.852 (-47.05)	4.000±0.418 (-48.05)	6.500±0.361 (-39.25)	9.700±0.369 (-27.61)	10.300±0.342 (-26.42)	10.500±0.314 (-27.58)

Table 4 : The effect of cypermethrin on shoot length of *Solanum melongena* Lin.

Treatment	Shoot length plant days after sowing					
	15	30	45	60	75	90
Control	6.500±0.371	17.700±0.336	26.500±0.225	52.000±0.070	72.600±0.152	88.500±0.123
0.01%	8.000±0.183 (+18.75)	19.500±0.238 (+9.23)	28.700±0.266 (+7.66)	55.000±0.080 (+5.45)	74.900±0.205 (+3.07)	90.200±0.051 (+1.88)
0.15%	6.700±0.638 (+2.98)	17.900±0.380 (+1.11)	26.900±0.343 (+1.48)	53.000±0.069 (+1.88)	73.200±0.069 (+0.81)	89.200±0.051 (+0.78)
0.25%	5.300±0.273 (-18.46)	15.400±0.231 (-12.99)	24.300±0.246 (-8.30)	50.500±0.129 (-2.88)	68.900±0.214 (-5.09)	75.300±0.059 (-14.91)
1.00%	3.400±0.430 (-47.69)	12.500±0.292 (-29.37)	20.000±0.130 (-24.52)	43.400±0.120 (-16.53)	60.500±0.135 (-16.66)	67.200±0.086 (-24.06)

branches, flower, fruit/plant of plants. The maximum stimulation of shoot length was recorded at lower concentration where the stimulation was 18.75% root length was 24.24%, height of plant was 62.62%, total no. of branches was 65.11%, etc in comparison to control in brinjal. Effect of pesticides *i.e.* cyermethrin and bioproducts on shoot and fruit borer incidence in brinjal (Mishra and Ram, 2004) and different concentration of cypermethrin was found maximum inhibition at higher concentration in all the morphological parameters of brinjal. Height of plants inhibites by every used concentration of endosulfan as observed by Trivedi *et al*. (1983). Some foliar insecticides *i.e.* ethion and cypermethrin against *Aphis gossypioglover* infesting brinjal (Dhamdhere and Mathur, 1994). Various other workers have observed dual effect *i.e.* stimulation in

Table 5 : The effect of cypermethrin on leaf area of *Solanum melongena* Lin.

Treatment	Total leaf area/plant (cm^2) days after sowing					
	15	30	45	60	75	90
Control	6.350±0.014	14.750±0.002	19.350±0.016	24.980±0.007	30.900±0.011	37.850±0.012
0.01%	7.900±0.189 (+19.62)	15.920±0.002 (+7.34)	21.100±0.393 (+8.29)	26.080±0.007 (+4.21)	32.450±0.010 (+4.77)	39.430±0.011 (+4.00)
0.15%	6.800±0.144 (+6.61)	15.110±0.012 (+2.38)	20.080±0.043 (+3.63)	25.110±0.023 (+0.51)	31.490±0.002 (+11.87)	38.680±0.015 (+2.14)
0.25%	4.990±0.003 (-21.41)	13.320±0.017 (-9.69)	17.750±0.003 (-8.26)	20.100±0.166 (-19.53)	22.710±0.019 (-26.50)	25.907±0.001 (-31.57)
1.00%	3.980±0.037 (-37.32)	12.360±0.018 (-16.20)	15.430±0.001 (-20.25)	18.520±0.008 (-25.86)	20.510±0.002 (-33.62)	23.550±0.001 (-37.78)

Table 6 : The effect of cypermethrin on height of *Solanum melongena* Lin.

Treatment	Average height of plant days after sowing					
	15	30	45	60	75	90
Control	9.900±0.385	25.400±0.127	37.200±0.196	65.400±0.122	86.600±0.127	103.000±0.106
0.01%	12.500±0.290 (+20.8)	28.400±0.122 (+10.56)	39.900±0.136 (+6.76)	69.200±0.120 (+5.49)	89.900±0.181 (+3.67)	105.900±0.156 (+2.73)
0.15%	10.200±0.312 (+2.94)	25.700±0.137 (+1.16)	37.700±0.197 (+1.32)	66.600±0.101 (+1.80)	87.400±0.156 (+0.91)	103.800±0.095 (+0.77)
0.25%	7.800±0.458 (-21.21)	20.700±0.363 (-18.50)	32.500±0.106 (-12.63)	61.500±0.271 (-5.96)	80.600±0.208 (-6.92)	87.300±0.121 (-15.24)
1.00%	5.200±0.465 (-47.47)	16.500±0.202 (-35.03)	26.500±0.157 (-28.76)	53.100±0.134 (-18.80)	70.800±0.254 (-18.24)	77.700±0.182 (-24.56)

Table 7 : The effect of pesticides on total number fo flower/ plant of *Solanum melongena* Lin.

Treatment		*Solanum melongena*
		Days after germination
		75
CY	Control	27±1.614
P E	0.01%	32±0.744 (+15.62)
R	0.15%	30±0.744 (+10.00)
ME	0.25%	23±0.860 (-14.81)
THRIN	1.00%	20±0.911 (-25.92)

@ Values are represented as mean ± S.E. (10 observation).
@ Values are significant at P 0.05 (Fisher 's 't' test).
@ Value non significant at P 0.05 level.
@ Value in parenthesis represent percent inhibition (-) or promotion (+) in comparison to control.

lower concentration and inhibition in higher concentration (Padhi and Das, 1978; Karuna and Shukla, 1981; Rao and Rao, 1983; Hassan and Alexander, 1984; Raza *et al*., 1984 and Kumar, 1990). Sharma (1979) and Ragab (1981) reported that aldicarb in low concentration enhanced height of plants. Philomena and David (1985) was found enhanced of height of legumes in 0.1% concentration of monocrotophos but inhibition by 0.05% concentration of carbendazim.

Relative efficacy of some insecticides *i.e.* ethion at 0.03%, cypermethrin at 0.01%, monocrotophos at 0.03 %, endosulfan at 0.05% concentration etc. reduced the pest population (Yadav and Sharma, 2003). Paras Nath, Chauhan and Rana (2004) was found adverse effect of the insecticides on branches and plants show drying/wilting burning and curling symptoms at highest concentration of pesticides on okra and the result revealed that the ready-mix insecticides had no phytotoxic effects on okra. Branching of pea and black gram inhibites by every used concentration of endosulfan and dimethoate pesticides except lowest concentration of dimethoate, which stimulate the number of branches in pea and black gram

as observed by Gupta (1986) and Kumar (1990).

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