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## Efficacy of Predatory Spiders (*Agelenopsis* sp.) on Asiatic Pennwort Cutworms

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The grass spider (*Agelenopsis* sp.) is known as American grass spider which is one of the most commonly found in Asiatic pennywort plantations. It belongs to the family Agelenidae, order Araneae. It is a predatory spider and consume various type of insect pests in pennywort growing area including *Spodoptera litura*, *Empoasca* sp., *Aphis craccivora* Koch and Asiatic pennywort cutworms. The efficiency of grass spider was investigated under the laboratory condition (30 degree celcius: 70%RH). There was no significant interaction between gender and larval stage ( $p>0.05$ ). Both gender and larval instar had effect on efficiency test ( $p<0.01$ ). The grass spider prefer the first instar larvae of pennywort cutworms the most.

**Keywords:** *Agelenopsis* sp., pennywort cutworms, efficacy test

### Introduction

Spiders are regarded as predatory eight- legged animals. They belonged to class Arachnida, order Araneae in phylum Arthropoda. They can be found in almost every regions of the world including the arid desert and soggy in a deep cave, high mountain, or even in the water (Kumar *et al.*, 1997). Grass spider (*Agelenopsis* sp.) is known as American grass spiders, funnel spider or grass spider ranked in family Agelenidae. It is a small predatory spider found in pennywort growing areas and the surrounding (Ayoub *et al.*, 2005). Their preys are pennywort caterpillars, leaf hoppers and other small insects in the area. This spider species spin silk web into a funnel shape as a shelter and a long rectangular flat sheet attached to the funnel web to trap preys. The victim will be pests of leafhoppers, aphids, whitefly larvae, ants, etc. It can be seen that the spider grass can be a very useful a kind of marriage in using control pests (Fraser, 1987).

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Objective: This study is to investigate gender relatedness and larval stage on feeding rate of the grass spider on pennywort cutworms under the laboratory condition.

## **Materials and methods**

### ***Spider Collection***

Adults and the spiderling of *Agelenopsis* sp. were collected by using the sweep net and vacuum suction from the experimental station of Faculty of Agricultural Technology, King Mongkut's Institute of Technology Ladkrabang (Fig 1). The samples were individually transferred to a plastic cup (250 ml). The early instars of mealworms are provided as food. Newly emergence of spider adults were used for further studies.

### ***Rearing of Asiatic Pennywort Cutworms***

Pennywort cutworms were collected from non insecticide treated farm of pennywort. They were mass rearing in the laboratory. After mating, the female moth laid eggs singly (Fig. 2) on the rearing container or on the pennywort leaves. Newly hatched larva was the first instar larva. Fresh leaves of pennywort were provided for larvae. The head capsule width was used to separate the larval stage (Fig. 3-7) for efficiency test.

### ***Predatory efficiency test of Agelenopsis sp. on Asiatic pennywort cutworms***

The design of this experiment is 2x5 factorial in completely randomized design with 15 replications.

Factor A gender of spider: male and female

Factor B larval stage of prey: larval instar 1-5 of pennywort cutworms

### ***Data analysis***

The data was analysed by using SPSS version 20.

## **Results and Discussion**

Efficacy of grass spiders on different larval stage of pennywort cutworms, the result showed that no interaction between gender and larval stage was detected on number of larval feeding consumed (Table 1).



**Fig. 1** A grass spider adult



**Fig.2** Eggs of *Z. ochreata*



**Fig. 3** The first instar of *Z. ochreata*



**Fig. 4** The second instar of *Z. ochreata*



**Fig. 5** The third instar of *Z. ochreata*



**Fig. 6** The fourth instar of *Z. ochreata*



**Fig. 7** The fifth instar of *Z. ochreata*

Both gender and larval stage of preys are the factor that effect the predatory efficiency of this grass spider species. Number of pennywort cutworm instar 1-5 consumed by the male was 1.30, 0.63, 0.28, 0.34 and 0.28 respectively; By the female spider 1.03, 0.70, 0.10, 0.11 and 0.16, respectively. This result is consistent with Riechert and Bishop's report (1990) that the spiders are predators consuming other animals for food, reduce the number of insect enemies of crop plants, fruits and vegetables to reduce the damage of the production with the economic effects.

**Table 1.** Tests of Between-Subjects Effects

Dependent Variable: number

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	22.676 <sup>a</sup>	9	2.520	25.395	.000
Intercept	36.319	1	36.319	366.066	.000
sex	.770	1	.770	7.765	.006
larval stage	21.390	4	5.348	53.898	.000
sex * larval stage	.515	4	.129	1.299	.274
Error	13.890	140	.099		
Total	72.885	150			
Corrected Total	36.566	149			

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