

Effects of aqueous extracts of Basil, Sodom's apple and Coriander on leafminer damage to Okra

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Abstract

An experiment was conducted at the University of Gezira Experimental farm to evaluate the effects of 10% aqueous leaf and fruit extracts of Basil (*Ocimum basilicum* L.), leaf extracts of Sodom's apple (*Calotropis procera* Ait) and fruit extract of Coriander (*Coriandrum sativum* L.) on damage of okra by the vegetable leafminer (*Liriomyza* spp). . The experimental design was a completely, randomised block with 4 replicates. The treatments consisted of spraying okra plants with 10% aqueous extracts of basil, sodom's apple and coriander. The efficacy of the extracts was assessed by periodic counting of active mines (where leafminer larvae were alive and feeding). The results indicated that the three aqueous extracts significantly ($P < 0.05$) reduced the infestation level by the leafminer on okra leaves. Sodom's apple extract resulted in the lowest cumulative number of active mines (106), leafminer followed by coriander (124) and basil (132). The control treatment had 489 active mines. These three plants should be promoted for the management of leafminers on okra.

Key words: Aqueous extract, leafminer, Okra, Sudan

Résumé

Une expérience a été menée dans la ferme expérimentale de l'Université de Gezira pour évaluer les effets des extraits du fruit et de la feuille à 10% de solution aqueuse de Basilic (*Ocimum basilicum* L.), des extraits de feuilles de pomme de Sodome (*Calotropis procera* Ait) et l'extrait du fruit de la coriandre (*Coriandrum sativum* L.) sur les dommages du gombo par la mineuse des feuilles des légumes (*Liriomyza* spp.). Le dispositif expérimental était entièrement, en blocs aléatoires avec 4 répétitions. Les traitements ont consisté en la pulvérisation des plantes de gombo avec d'extraits de basilic, de pommes de Sodome et de la coriandre à 10% aqueux. L'efficacité des extraits a été évaluée par comptage périodique de mines actives (où des larves des mineuses sont vivantes et nourries). Les résultats ont indiqué que les trois extraits aqueux ont réduit de façon significative ($P < 0,05$) le niveau d'infestation par la mineuse des feuilles sur les feuilles de gombo. L'extrait de la

pomme de Sodome a abouti au plus faible nombre cumulatif de mines actives (106), la mineuse des feuilles suivie par la coriandre (124) et le basilic (132). Le traitement de contrôle a eu 489 mines actives. Ces trois plantes devraient être promues pour la gestion des mineuses sur le gombo.

Mots clés: extrait aqueux, mineuse, gombo, Soudan

Background

Okra (*Ablemoschus (Hibiscus) esculentus*) ranks third among the major vegetable crops, and is one of the most popular and main Sudanese dishes. The most famous cultivars of okra in the Sudan are Khartoumia, Momtaza, Karrari, Kassala, Dwarf long green and Clemson spineless (Bugstaler *et al.*, 1984). Okra is grown under irrigation all year around. It is attacked by a number of insect pests one of the most important being the vegetable leafminers (*Liriomyza* spp). These are one of the largest groups or genera with over 300 species through out the world. Of these, only about 15 species are known to feed on cultivated plants and thus have some actual or potential economic significance. In the Sudan two species of *Liriomyza* have been reported: *L. trifolii* (Burgess) (Sharaf EL-Din *et al.*, 1997), and *L. sativae* (Blanchard) recorded by Martinez and Brdat (1996). A number of plant based and non-plant based insecticides are applied for the management of leafminers on okra. These are however expensive and in many cases inaccessible to farmers. This study was thus carried out to evaluate the efficacy of three botanicals on management of leafminers on okra.

Materials and Methods

An experiment was conducted at the University of Gezira Experimental Farm to evaluate the effects of 10% aqueous leaf and fruit extracts of Basil, (*Ocimum basilicum* L.), leaf extracts of Sodom's apple, (*Calotropis procera* Ait) and fruit extract of Coriander, (*Coriandrum sativum* L.) on the vegetable leafminer, *Liriomyza* spp. damage on okra. The experiment was designed as a completely randomised block with plots assigned to the 4 treatments (i.e., 3 extracts and a control) and replicated 4 times. Un-dressed okra seeds were sown in these plots in July 2008. Aqueous extracts (10%) were made from these plants. Fresh leaves of sodom apple, leaves and fruits of basil, and fruits of coriander were dried in the laboratory at room temperature (30°C), crushed by hand and then ground by an electric blender mixer. The resulting powder was then stored in tightly covered glass jars and kept at room temperature in the laboratory ready for extraction. The extracts were applied by spraying until okra leaves well covered. Control plots were

Research Application

sprayed with distilled water. The efficacy of the extracts was assessed in terms of the number of active mines in okra leaves over time. leafminer

The results (Table 1) indicated that the three aqueous extracts significantly ($P < 0.05$) reduced the infestation level by the leafminer on okra leaves. The effect of the different botanicals was also significant among them. Sodom's apple extract resulted in the lowest infestation level leafminer (mean number of active mines = 106), followed by coriander (124) and lastly basil (132). Control plots registered the highest number of active mines (489). In addition, the between treatment mean values for Sodom apple, coriander and basil were significantly different from each other and also from the control. These three plants should be promoted for the management of leafminers on okra.

Table 1. Mean number of active mines of the leafminers *Liriomyza spp.* on okra leaves during the experimental period.

Treatment	Means							Mean of all counts
	Count 1	Count 2	Count 3	Count 4	Count 5	Count 6	Count 7	
Control	405 a	457 a	492 a	505 a	513 a	526 a	537 a	489 a
Sodom apple	348 b	117 b	113 b	69 c	33 b	33 b	32 b	106 d
Basil	399 a	218 c	155 c	113 d	17 c	12 c	12 c	132 b
Coriander	396 a	236 d	215 d	23 d	0 d	0 d	0 d	124 c
S.E. \pm	2.624	2.217	2.107	1.493	1.987	2.072	2.098	0.49
CV%	14.22	14.43	14.54	10.00	22.40	24.01	24.19	16.30

Means followed by the same letter (s) were not significantly different ($P < 0.05$) at Duncan MRT.

References

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