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Resistance of Bottle gourd ,Lagenaria Siceraria (`moline) standl. to whitefly Bemisia tabaci (Genn.)(Homoptera: Aleyrodidae).

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Abseract

Serial extracts of dried bottle gourd, Lagenaria Siceraria (Molina) standl, leaves were made with solvents of increasing polarity. Extracts were topically sprayed on eggplants Solanum melangera leaves as a host plant for whitefly, Bemisia tabaci .

All extracts at different concentrations caused increased mortality rate of adults and immature stages, and reduce egg viability of whitefly ,as well as, prolonged the developmental period of the immature stages.

Introduction

Bemisia tabaci (Genn.). a serious pest of agranomically important crops in many parts of the world. Cucurbits were severely damaged by whitefly feeding and infection with squash leaf curl viruses ,and lettuce infections yellow viruses ,(Courdiet *et al.* 1985;Kishaba *et al.* 1992). Other crops such as cotton, tomato , carrots , lettuce , melons , and sugar beets are also damaged either with lettuce infections yellow, or with squash leaf viruses (Al-mansour ,et al.1995,in press). Recent studies have Showed that B tabaci has developed resistance to organophosphates and pyrethroid insecticides (Prabhaker , *et al.* 1985); thus , present agronomic practices have not appreciably reduce the whitefly population , or the spread of the viruses.

Allelochemics are emerged as new generation of natural insecticides they are behavior-modifying chemicals that do not rersist in the environment and that have unique mode of action, low mamalian toxicity, and are potentially compatible with natural enemies. Field observations showed that bottle gourd, Lagenaria siceraria showed a high incidance of adult mortality of whitefly. These observations suggesed that this plants may have some factors that may affect whitefly survival.

Our objectives is to determine the biological activity of bottle gourd, L. seceraria extracts against B.tabaci as meassured by the mortality rate of adult and immature stages, as well as, the developmental period.

Meterials and Methods

Whiteflies were collected from

the field and keept in a cylindrical cage (15cm in diameter and 30 cm in hight), containing a young eggplant, Solanum melangena as a host plant. Insectswere mantained in incubuter conditions of 25+1°C and 70+5% relative humidity) , and 600 lux light intencity. Insect identification was based on Azab *et al*.(1971). Bottle gourd L. seceraria plants were grown in the experimental field at Babylon, University during 1994. The leaves were collected then washed with top water and keep at (-18°C).

Three different solvent were used in this study: Hexane, a non polar solvent, Ethylacetate modratly polar , and Ethanol a polar solvent . 50 gm of dried and milled leaves were successively extracted in a soxhlet extractor for 24 hrs. Each solvent extract then transferred to rotary evaporator at 50 c. 3.02 gm of extracted materials in hexane were obtained and 3.42 gm and 4.31 gm were obtained in ethylacetate and respectively. One gm of each extracted materials was dissolved in 2 ml of ethanol and the total volume then reached 100 ml by using distilled water. Five differnt concentrations for each extract were prepared; zero as control (made of 2 ml of ethanol + 97 ml dist. water +1 ml liquid parafine +1-2 drops of tween), 10,25, 50 and 100 %. One ml. of liquid parafine 1% was added to each concentration as adhasive agent, and 1-2 drops of tween as a surfactant.

One hundred adult whitefly were introduced to experimental cage (5 replicates for each concentration), supplied with young egg plant (4-leaf stage) spraed with each concentration of each solvent extract. Spry gun used in this study was provided by London shandon scientific co. The cages then kept in the incubator condition mentioned before. The mortality rate were recorded after 24 hr. then after till the end of the 7 th day of sprying . The same procedure was conducted with the immature stages (egg, larvae, andpupere), by taking 25 individuals 24 hrs. old). Then surounded by oil ring (mustard oil: Canada balsam 50% :50%).

Cummulative mortality and the developmental period as affected by different concentrations used in this study. 25 eggs (24 hrs. old) were spryed with each concentration (Five replicates each).

The mortality rate and the developmental period were recorded until the adults were emerged.

Statistical analysis of data was based on completed randemized desigen by using analysis of variance with confidance limits of 95%(Litter and Hills ,1972). All mortality rates were corrected according to Abbot's formula (Abbot, 1925).

Table 1 : The efficts of Hexane (1), Ethylacetate (2) ,and ethanol (3) extracts of Lagenaria Siceraria levaes on the mortality rate developmental period of whitefly Bemisia tabaci.

extract concentration %	Egg hatchability %			larual mortality %			Pupal mortality %			adult mortality %			developmental period of immature stages(days)		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
0.0	95	95	95	4.1	4.1	401	8.5	8.5	8.5	10	10	10	15.3	15.3	15.3
10	86.3	85.1	91.5	25.5	37.3	11.4	39.5	41.4	18.4	29.6	43.2	34.0	17.4	19.9	16.3
25	88.1	85.6	90.2	39.4	45.2	23.7	55.3	61.7	35.4	45.0	70.3	45	21.3	20.1	19.1
50	75.3	80.4	80.4	86.3	87.4	45.3	98.1	91.3	60.3	88.3	93.0	42	26.4	24.2	22.1
100	85.3	75.6	66.7	100	100	55.7	100	100	68.2	100	100	67.6	———	———	———
L.S.B 0.05	5.3	4.8	3.6	8.9	6.8	9.3	12.9	10.2	13.4	9.6	11.2	3.8	2.1	4.1	2.9

Results and Discussions

Study results clearly indicated that solvent extracts of bottle gourd ,L .siceraria exert adverse effects on the mortality rates of all develomental stages of B. tabaci in all concentration used (table 1). Egg hatchability was affected to variying degree. Generrally there is an inverse correlation between egg hatchability and the extract concentration. The obtained data showed that hexane and ethylacetate extract were the most effective, while ethanol was the least . Egg hatchability vability ranged between 95-66.7%,95-75.6%, and 95-8.3% in hexan , ethylacetate , and ethanol extracts respectively. Mortality rate of larval ,pupul, and adult stageswere directly correlatted with extract concentration. (table 1).

Again hexane and ethylacetate extract were the most effective than ethanol extract in all concentration used (table 1). Cummulative mortality rates were renged between 10-100% in both hexane and ethylacetate and from 10 to 67.9% ethanol.

Developmental period also affected by bottle gourd extracts (table 1). Generally the developmental time was prologed, it ranged between 15.3 days and 26.5, 24.2, and 22.1 days in hexane ethylacetate,and ethanol extracts respectively.

Meisner *et al*(1981) found that Spodoptera littoralis larvae lost weight when fed on Catharanthus roseus and they did not pupate. While Binder and waiss (1984) findings indicated that soybean leaf extraacts caused increased larval mortality of Helionthis zea . Ladd et.al. (1984) found that azadirachtine completely disrupted normal development and increased the duration of the immature stages of japanes beetle. Also ,neem seed extracts resulted in a reduction of egg viability and oviposition, prolonged larval period and larval mortality of sweet potato whitefly, B. tabaci (Coudriet *et al*.1985). All above mentioned finding are support present study findings.While, Kishaba *et.al* (1992) suggested that trichame configuation could be a factor in reduction of B. tabaci on L. siceroria which is conflected with present study findings. Al-Mansour *et al* (1995 a,b)(in press) found that unicorh Ibcella lutea extracts strongly affected B.tabaci mortality rate and prolenged developmental period of immature stages, which is support present study findings.

Obtined data clearly indicated that bottle ground extracts with hexane and Ethylactate strongly effected whitefly biological perfformance suggesting the presence of either terpinoids or phenolic compounds that might have the effects observed. More studies are needed to determine the bioactive chemicals (materials) involve in the resistance of L . siceraria to whitefly attack.

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مقاومة نبات القرع الابيض Langeraria Siceraria للذبابة البيضاء Bemisia tabaci

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الخلاصة

تم استخلاص اوراق الشجر الابيض (او السلاحي) Lagenaria siceraria الجافة بواسطة مذيبات عضوية مختلفة القطبية. وقد تم رش الباذنجان الذي استخدم كمضيف للذبابة البيضاء Bemisia tabaci بتراكيز مختلفه من المستخلصات. اوضحت النتائج بان التراكيز المختلفة للمستخلصات قد اثرت على الاداء الحياتي للذبابة البيضاء من خلال زيادة هلاكات الاطوار غير البالغة والبالغة وخفض حيوية البيوض معبرا عنها بقلة الفقس . اضافة الى ذلك فقد اظهرت النتائج زيادة في مدة الاطوار غير البالغة.