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## Biology of coriander aphid, *Hyadaphis coriandri* (Das) on different coriander varieties

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### Abstract

The biology of coriander aphid, *H. coriandri* was studied on two varieties of coriander viz. least susceptible coriander variety RCr-436 and most susceptible coriander variety RCr-20 in the Department of Entomology, S.K.N. College of Agriculture, Jobner (SKNAU, Jobner) during *Rabi*, 2022-23. The first, second, third and fourth instar nymphal period were recorded  $1.60 \pm 0.42$  and  $2.25 \pm 0.38$ ;  $1.75 \pm 0.38$  and  $2.39 \pm 0.46$ ;  $1.42 \pm 0.45$  and  $2.41 \pm 0.38$ ;  $1.85 \pm 0.29$  and  $2.41 \pm 0.38$  days on most susceptible and least susceptible coriander varieties, respectively. The pre reproductive, reproductive and post reproductive periods of adult female were  $0.94 \pm 0.35$  and  $1.41 \pm 0.38$ ;  $6.71 \pm 0.99$  and  $5.81 \pm 0.93$ ;  $4.29 \pm 0.44$  and  $3.72 \pm 0.52$  days on most susceptible coriander variety RCr-20 and least susceptible coriander variety RCr-436, respectively. The reproductive potential of adult female was  $6.06 \pm 0.97$  and  $4.94 \pm 1.29$  nymphs per day per adult on most susceptible and least susceptible coriander varieties, respectively. However, during the life span, the reproductive potential of female was  $40.65 \pm 8.55$  and  $28.63 \pm 8.38$  nymphs per adult on most susceptible coriander variety RCr-20 and least susceptible coriander variety RCr-436, respectively. The adult longevity was observed  $11.94 \pm 1.04$  and  $10.94 \pm 0.98$  days on most susceptible coriander variety RCr-20 and least susceptible coriander variety RCr-436, respectively.

**Keywords:** Biology, coriander aphid and coriander

### Introduction

Coriander, *Coriandrum sativum* Linnaeus is one of the important seed spice winter crops belongs to family Apiaceae (Umbelliferae), native of Mediterranean region. It is popularly known as “*Dhaniya*” and grown both for green vegetable as well as for seed purpose. Coriander is mainly used in culinary, perfumery, confectionary and pharmaceutical industry. Its stem, leaves and grains have a pleasant aromatic odour. Coriander young plants (leaves and tender stems) are used for preparing *chutneys* and *sauces*. The fruits are extensively used as condiment in preparation of curry powder, pickling spices, sausages, and seasoning (Butani, 1984) [1]. Coriander seeds are considered to be diuretic, carminative tonic, stomachic antibilious, aphrodisiac and refrigerant. The seeds are chewed to correct foul breath and to lessen the intoxicating effect of spirituous liquors (Pruthi, 1976) [3]. Coriander oil is used in oleochemical and proved as a plastic lubricant in the manufacture of nylons and cosmetics (Verma, 2008) [5]. Biological study of insect pests provides sufficient information about seasonal abundance and vulnerable stage of insect, which helps in its management and is free from environmental pollution problems.

### Material and Methods

The biology of coriander aphid, *H. coriandri*, was studied under laboratory conditions on least susceptible variety RCr-435 and most susceptible variety RCr-20 of coriander. The aphid were reared on coriander leaves/inflorescence placed in petridishes (diameter 10 cm). The bottom of petridish was lined with moistened filter paper. A mature aphid who gives birth to young one was transferred on the leaves/inflorescence placed inside the petridish with the help of fine camel's hair brush to avoid physical injury to the aphid. Twenty nymphs were kept for constant observation and food (leaves/inflorescence) was changed in the morning. The observation were recorded twice a day i.e. in the morning (8.00 AM) and evening (6.00PM).

### Nymph

To study the nymph period, newly emerged nymph were transferred to petridishes (one nymph /petridish) containing fresh coriander leaves/umbels.

The number and duration of nymph instars were confirmed by the presence of exuviae in the petridishes. The observation on number of instars, their duration and the total nymphal period were recorded.

### Adult

After last moulting, the nymph attained the adult stage. The newly developed adults were reared individually in petridishes having fresh leaves/umbels. Their longevity and entire life span were computed. In order to study the pre-reproductive, reproductive and post-reproductive periods of aphid, the newly developed adults were reared individually on coriander leaves/inflorescence in separate petridishes. The pre-reproductive period was considered from the last moulting (Adult formation) to start of giving birth to nymph. The number of the days for which a given aphid continued to reproduce were considered as reproduce period. The post-reproductive period was considered between birth of last young ones and death of adult. The number of young ones produced by a single aphid were counted daily during its reproductive period and considered as its reproductive capacity.

### Result and Discussion

The first instar nymph was light green, pear shaped, delicate, transparent and wingless. The data presented in table –1 & 2 revealed that the first instar nymphal period on least susceptible coriander variety RCr-436 varied from 2 to 3 days with an average of  $2.25 \pm 0.38$  days. whereas, first instar nymphal period on most susceptible coriander variety RCr-20 varied from 1 to 2 days with an average of  $1.60 \pm 0.42$  days. The second instar nymph was pale green and differed from the first instar in its size as well as in its appearance. The second instar nymphal period on least susceptible coriander variety RCr-436 varied from 2 to 3 days with an average of  $2.39 \pm 0.46$  days. whereas, that reared on most susceptible coriander variety RCr-20 varied from 1 to 2 days with an average of  $1.75 \pm 0.38$  days. The colour of third instar nymph remained more and less same. The third instar nymphal period of the nymphs reared on least susceptible coriander variety RCr-436 varied from 1.5 to 3 days with an average of  $1.94 \pm 0.38$  days, whereas, that reared on most susceptible coriander variety RCr-20 ranged from 1 to 2 days with an average of  $1.42 \pm 0.45$  days. The fourth instar nymph was green colour and comparatively active. The nymphal period of fourth instar nymphs reared on least susceptible variety RCr-436 ranged from 2 to 3 days with an average of  $2.41 \pm 0.38$  days, whereas, that reared on most susceptible variety RCr-20 ranged from 1.5 to 2.5 days with an average of  $1.85 \pm 0.29$  days. The perusal of Table—1 & 2 revealed that the total nymphal period on least coriander susceptible coriander variety RCr-436 ranged from 8 to 10 days with an average of  $8.88 \pm 0.56$  days whereas, such period on most susceptible coriander variety RCr-20 ranged from 5 to 8 days

with an average of  $6.12 \pm 1.01$  days.

The adult was yellow green in colour with elongated and pear-shaped body. The antennae were five segmented and shorter than body length. The legs were long, stout and covered with the hairs. Observations on pre-reproductive period of female indicated that the aphids reared on least susceptible coriander variety RCr-436 ranged from 1 to 2 days with an average of  $1.41 \pm 0.38$  days. whereas, on most susceptible coriander variety RCr-20 it ranged from 0.5 to 1.5 days with an average of  $0.94 \pm 0.35$  days. It started giving birth to young ones afterwards. The reproductive period of adult female on least susceptible coriander variety RCr-436 ranged from 4 to 7 days with an average of  $5.81 \pm 0.93$  days. whereas, on most susceptible coriander variety RCr-20 it varied from 5 to 8 days with an average of  $6.71 \pm 0.99$  days. The post reproductive period of female adult on least susceptible coriander variety RCr-436 varied from 3 to 4.5 days with an average of  $3.72 \pm 0.52$  days. whereas, on most susceptible coriander variety RCr-20 it varied from 4 to 5 days with an average of  $4.29 \pm 0.44$  days. Afterwards the adult female died. The adult aphid longevity, when reared on least susceptible coriander variety RCr-436 varied from 9 to 12.5 days with an average of  $10.94 \pm 0.98$  days, whereas, on most susceptible coriander variety RCr-20 it ranged from 9.5 to 13.0 days with an average of  $11.94 \pm 1.04$  days.

The duration of entire life span from first instar nymph to death of adult aphid indicated that the total life span on least susceptible coriander variety RCr-436 varied from 17.5 to 21.5 days with an average of  $19.82 \pm 1.21$  days. whereas, on most susceptible coriander variety RCr-20 it varied from 14.5 to 20.5 days with an average of  $18.06 \pm 1.42$  days. A single female when reared on least susceptible coriander variety RCr-436 produced 12 to 42 young ones, in its life span with an average of  $28.63 \pm 8.38$  nymphs. The number of young ones produced per day by single aphid ranged from 2 to 7 with an average of  $4.94 \pm 1.29$  nymphs (Table- 1&2). On most susceptible coriander variety RCr-20, a single female produced 4 to 8 nymphs per day with an average of  $6.06 \pm 0.97$  nymphs and 24 to 52 nymphs with an average of  $40.65 \pm 8.55$  nymphs during its life period.

The developmental period of coriander aphid was greatly influenced by different varieties of coriander. The variation in temperature period of the aphid amongst test varieties may be due to difference in the physio-chemical nature of the coriander varieties. Moreover, these findings get support from the results of Singh *et al.* (2005) [4] who reported four nymphal instars coriander aphid on different coriander cultivars and the total nymphal duration, pre- reproduction, reproduction and post- reproduction period also varied in different coriander cultivars. The total nymphal period and total life span was longer on least susceptible variety as compared to most susceptible variety of coriander reported by Pareek (2009) [2] are in conformity of the present investigation.

**Table 1:** Biology of coriander aphid, *Hyadaphis coriandri* (Das) on most susceptible coriander variety RCr-20

Particulars	No. of individuals observed	Observations		
		Minimum	Maximum	$\bar{X} \pm \sigma$
1. Nymph				
a. 1 <sup>st</sup> instar period (days)	20	1.0	2.0	1.60±0.42
b. 2 <sup>nd</sup> instar period (days)	20	1.0	2.0	1.75±0.38
c. 3 <sup>rd</sup> instar period (days)	19	1.0	2.0	1.42±0.45
d. 4 <sup>th</sup> instar period (days)	17	1.5	2.5	1.85±0.29
e. Total nymphal period (days)	17	5.0	8.0	6.12±1.01
2. Adult				
a. Pre reproductive period (Days)	17	0.5	1.5	0.94±0.35
b. Reproductive period (days)	17	5.0	8.0	6.71±0.99
c. Post reproductive period (days)	17	4.0	5.0	4.29±0.44
d. Adult longevity (days)	17	9.5	13.0	11.94±1.04
3. Total life span (days)	17	14.5	20.5	18.06±1.42
4. Reproductive potential				
(nymph/adult)	17	24	52	40.65±8.55
(nymph/day/adult)	17	4.0	8.0	6.06±0.97

**Table 2:** Biology of coriander aphid, *Hyadaphis coriandri* (Das) on least susceptible coriander variety RCr-436

Particulars	No. of individuals observed	Observations		
		Minimum	Maximum	$\bar{X} \pm \sigma$
1. Nymph				
a. 1 <sup>st</sup> instar period (days)	20	2.0	3.0	2.25±0.38
b. 2 <sup>nd</sup> instar period (days)	19	2.0	3.0	2.39±0.46
c. 3 <sup>rd</sup> instar period (days)	18	1.5	3.0	1.94±0.38
d. 4 <sup>th</sup> instar period (days)	16	2.0	3.0	2.41±0.38
e. Total nymphal period (days)	16	8.0	10.0	8.88±0.56
2. Adult				
a. Pre reproductive period (Days)	16	1.0	2.0	1.41±0.38
b. Reproductive period (days)	16	4.0	7.0	5.81±0.93
c. Post reproductive period (days)	16	3.0	4.5	3.72±0.52
d. Adult longevity (days)	16	9.0	12.5	10.94±0.98
3. Total life span (days)	16	17.5	21.5	19.81±1.21
4. Reproductive potential				
(nymph/adult)	16	12	42	28.63±8.38
(nymph/day/adult)	16	2.0	7.0	4.94±1.29

## Conclusion

The aphid species completed the life span earlier on the most susceptible coriander variety than the least susceptible coriander variety. The reproductive potential was higher in most susceptible coriander variety as compared to least susceptible coriander variety.

## References

1. Butani DK. Spices and Pest Problems On coriander. Pesticides, 1984;18:15-17.
2. Pareek RK. Eco-friendly management of insect pest complex of coriander with special reference to aphid, *Hyadaphis coriandri* (Das) under semi-arid conditions. Ph. D. Thesis, Submitted to Rajasthan Agricultural University, Bikaner; c2009.
3. Pruthi HS. Spices and Condiments Narional Book Trust, India, New Dehli; c1976, p. 98-103.
4. Singh MP, Bhanot JP, Kalra VK. Biology of coriander aphid, *Hyadaphis coriandari* (Das) on some varieties of coriander. Annals of Agri Bio Research. 2005;10:163-166.
5. Verma P. Coriander oil Novel industrial Uses. In National Workship on Spices and Aromatic Plants, held at Jodhpur (February 6-7, 2008), 2008, p. 16.