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Studies on Pollination Mechanism, Breeding pattern and Foraging behavior of insects in *Trachyspermum ammi* (Linn.) Spr.

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Abstract

Flower is a reproductive part of phanerogams, which bears most conspicuous structure carpel and stamen. The importance of flower lies in its connection with the formation of new off springs, which is a very manifest property of life. Floral biology recently developed into a full grown community science. The present paper highlights the pollination mechanism and breeding pattern in *Trachyspermum ammi* (Linn.) Spr.

Key-words: Pollination, Breeding, *Trachyspermum ammi* **.**

Introduction

The central theme of floral biology is pollination and breeding pattern. Visitors play a vital role in pollination mechanism. Researchers have suggested that constancy of many artaicular pollinators to plant increase the possibility of pollination, and reduce pollen and seed wastage[1]. It was also highlighted on the affect of foraging behaviour of bees on a specific plant[2]. Likewise, foraging behaviour of flies, moths, bugs and beetles have been worked out by several scientist[3-8]. Honeybees are commonly used as an important pollinator in number of crop plants. It was stressed the need of participation of other bees also and suggested the introduction of these in such areas [1-3]. Obviously, the contribution of authors indicates that the pollination studies are mostly centered on the entmophilous plants which have some economic importance.

Methodology

Pollination and Breeding Pattern

Pollination mechanism and breeding pattern in *Trachyspermum ammi* were studied as cited below:

Self pollination

The flowers ere bagged days earlier to the day of anthesis and the sequence of fruits set were observed.

Natural open pollination

Flowers were marked and allowed to undergo natural open pollination.

Insect pollination

The visitors of the flowers were collected with the help of nylon mesh butterfly nets and they were transferred to insect killing bottles containing chloroform moist cotton pad. They were examined under

microscope. The samples were collected from the experimental field during the peak flowering months. [4-6]

Foraging behavior of insects

The study deals with different kind of insects visiting on the flowers of *Trachyspermum ammi*. [7-9]

Pollination value

The pollination value was calculated by the following formula: [7-9]

$$PV = \frac{\text{Number of mature seeds}}{\text{Number of mature seeds + Number of immature seeds}} \text{ --X } 100$$

Results and Discussion

Despite repeated trials made in every flowering months on 100 of flowers, the fruit setting were observed in natural open pollination and insect pollination and the date so obtained are mentioned in table 1.

Table 1: Fruit set % in different pollination in *Trachyspermum ammi*

Replicates	Natural Open Pollination	Insect Pollination
R_1	38	76
R_2	56	88
R_3	45	78
Total	139	242
X	46.3	80.6
±SD	46.3 ±5.3	80.6±4.2
±SEM	46.3 ±1.6	80.6±0.8

Table 2 shows the different kind of insects visiting on the flowers of *Trachyspermum ammi*. It is obvious that the insects like *Apis florae and A. indica* collect both pollen and nectar, while *Terias hecabe, T. theophyratus, Hypolymous species* sip the nectar with the help of their long proboscis. It was also observed that the *Apis* species directly alight on the essential organs and collect pollen from dehisced anther and nectar from nectaries.

The foraging behaviour of vespidean, pentatomidean and formacidian insects were not significant. They were seldom seen on flowers. Moreover, *Componotus* sp. and *Pentamoid bug* were devouring the floral parts only.

Table 2: Arthopode associates of *Trachyspermum ammi*

Visitors type	Family	Forage type
Apis floraea	Hymenoptera Apidae	Pollen and Nectar
A. indica	Hymenoptera Apidae	Pollen and Nectar
A. dorsata	Hymenoptera Apidae	Pollen and Nectar
Catopsilla pyranthea	Lepidoptera Coliadinae	Nectar

Componotus sp.	Formicidae	Floral parts
Hypolymous polyna	Coleoptera	Nectar
Pentamoid bug	Pentomide	Floral parts
Polistes dorsata	Vespidae	Floral parts and Nectar
P. hebrioua	Vespidae	Floral parts and Nectar
Ropalidia spatulata	Vespidae	Floral parts and Nectar
Terias hescabe	Lepidoptera Coliadinae	Nectar
T. theophyratus	Lepidoptera Coliadinae	Nectar
Vespa orientalis	Vespidae	Floral parts and Nectar
Unidentified moth	Lepidoptera	Floral parts

A distinct visiting pattern was observed in the activities of bees and flies. The bees appear at about the time of anthesis while flies were seen on flowers all over the day. Out of these two insects, the bees seems to be more efficient pollinators to that of flies and boost

The flowers of ajwain are protandrous and pollen liberated from the dehisced anther was attached in the wings and body of visitors and when these insects' creeps over another flower they bring out cross pollination. It has been observed that all the insects visiting the flowers were not equally effective pollinators. Among these, the butterflies and honeybees were effective pollinators based on their nectar behaviour and abundance. The other insects like wasps, moths and bugs were either less frequent or their floral behaviour pattern do not permit the significant contact with stigma and pollen.

The data on pollination value of *Trachyspermum ammi* in different fruit setting months is mentioned in table 3. The pollination value was maximum (85.8%) in the month of December and minimum (77.5%) in the month of November.

Table 3: Pollination value of *Trachyspermum ammi* in different flowering months

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Months	**Replicates**			X	±SD	±SEM
	R_1	**R_2**	**R_3**			
Nov	74.5	79.8	78.3	77.5	±1.5	±0.7
Dec	91.3	80.7	85.6	85.8	±4.8	±1.5
Jan	80.5	82.4	81.7	81.5	±1.8	±0.6
Feb	75.6	78.3	80.5	78.1	±2.5	±1.1

Conclusion

Plant under study exhibits both open and insect pollination. However, maximum fruit setting is observed as a consequence of insect pollination. The insects visiting the flowers obtain pollen and nectar. All the insects visiting flowers are not equally effective pollinators Honeybees and butterflies are major pollinators and play an active role in pollination. The plant studied gives a maximum pollination value (91.3) in the month of December and minimum (74.5) in the month of November.

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