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SPIDERS AS LARVAL FOOD OF *SCELIPHRON VIOLACEUM* (DAHLB.) (HYMENOPTERA : SPHECIDAE)

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INTRODUCTION

The Sphecid wasps are known to prepare mud cell, in and around the human habitations. They construct the mud cells in the corners of houses, on walls and logs, underneath of furnitures (Jaykar and Spurway 1964) and in pin-holes of electrical fittings (Joshi, 1984 and personal observations). The wasps, as mud potters, are known to be adapted for collecting and transporting small balls of soft mud for daubbing their nests (Hingston, 1926, 1927, Jaykar and Spurway, 1960, 1968, and Joseph and Raphel, 1991).

The mud potters are known to collect insects, both adults and larvae, spiders, and after narcotising, they are deposited in the cell, the breeding nest, in the form of ready food for the development of their larvae upto pupation. The above has been reported in the species of genera *Sceliphron*, *Chalybion*, *Tryperylon*, *Trypargilum* and *Pison*. This habit of them is known since 1898. The taxonomic studies on spider collections made by the mud potters have been initiated in recent years (Callan, 1987 ; Durris, 1969, 1970, Laing 1988 ; Obin 1981). Landes and his associates (Landes et al. 1988) report the seasonal and latitudinal variations in the spider prey of *Chalybion californicus* (Saussure) (Sphecidae) from four localities in Meryland, U. S. A. Similar studies have been made by Jocque (1988) on *Sceliphron spirifex* (Linn.) from Central Africa.

There is no work on the above aspects on any species of Indian doubbers except *S. madraspatanum* (Fabr.) made by Jaykar and Spurway, (1960 & 1968), and on *S. violaceum* (Dahlo.). The collection of spiders, as larval food has been accounted in their work but however, they have not dealt with the taxonomy of spider species and also have not mentioned regarding the preference to the spider species as larval food. In this communication efforts have been made to analyse both the above referred aspects.

Methods

Two study areas, one at Shivajinagar,. Pune 5 and another in the University campus, Pune 7 were selected. The nesting sites of *S. violaceum* (Dahlb.) were located in the study areas. The wasps were allowed to cap the breeding nests. These nests were uncapped gently with the help of forceps. The deposited prey (spiders) was gently taken out with the help of camel hair brush and collected in the specimen tubes containing 70% alcohol. Nest wise data was prepared and identification of the spiders was done using fauna of India : Araneidae (1982).

Observations and Discussion

The Spiders collected and stored by the daubber wasps. *S. violaceum* at study area I belonged to the families Araneidae (96%), Theridiidae (2.6%), and Hersiliidae and Uloboridae (0.7%) each. Whereas in the study area II the spiders collected by the wasp belonged to only one family, Salticidae. It was observed that the wasp generally collects 9-13 spiders per cell, may be depending on the size of the spiders collected for the respective cell. Table no. I presents species wise preference of spiders at locality I. The species *Neoscona mukerjei* Tikader was prefered in large numbers (30%). It is followed by *Leucauge decorata* (Black Wall) (11%), *Larina chloris* (Savigny & Audin) 9% ; *Meta* sp. 8%, *Araneus mitifica* (Simon) and *Cyclosa hexatuberculata* Tikader & Bal. 6% each, *Araneus bituberculatus* (Walk) 4%. It was interesting to note that at both the localities the prey mainly included the female spiders (83%).

From the above observations it is clear that *S. violaceum* have different larval food preference, which appears to be dependent on the locality. At locality I they prefer Araneid spiders in large numbers (percentage) and Salticids are preferred at locality II. Interestingly the above two spider families differ considerably in their habits and habitats. The spiders belonging to Araneid group are the true orb weavers. They occur on the webs while feeding, whereas the Salticids are either ground or tree trunk dwellers and non-orb-weavers. They prefer to hunt their prey through direct attacks.

At locality I, there is an abundance and diversity of Araneid spiders which it appears, gives a choide for the wasp to select and prefer different species as their larval food. Such a situation does not exist at locality II which has only one species of Salticid. Twenty one species of Araneids at locality I are found to be collected by the wasp as larval food. Amongst these *Neoscona mukerjei* Tikader are most commonly caught (30%) *Leucauge decorata* (Black Wall) (11%) and *Larina chloris* (Sav. and Audin) (9%) form the next choice. Thus, it indicates that the Araneid spiders constitute a dominent community at locality I. At the II locality, such a choice and preference is not possible, because it is having the dominance of only one species of Salticids.

Another interesting observation made in this regards relates to the preference by the wasp for female spiders at both the localities (83%). This further indicates an

TABLE I. Showing the food preference for the wasp *S. violeceum* (Dahlb.) in two study areas.

Spider Families	Name of spider species	Locality (Study areas)	Nest Nos. 1 to 13	Particulars of prey Female	Male	Species in %	Family in % (Appr.)
1	2	3	4	5	6	7	8
Araneidae.	1. *Neoscona mukerjei* Tikader		1 to 10	36♀ ♀	2♂ ♂	30.3%	
	2. *N. rumfi* (Thorell).		6	1♀		0.7%	
	3. *N. elliptica* & Bal.		10	2♀ ♀		1.5%	
	4. *N. sinhagadensis* (Tikader)		4, 7 & 8	4♀ ♀	1♂	3.9%	
	5. *N. theis* (Wrlckenaer)		5, 8 & 9	7♀ ♀	1♂	6.3%	
	6. *N. laglaizei* (Simon)		2, 3 & 9	3♀ ♀	1♂	3.2%	96%
	7. *Neoscona* sp.	I	9	3♀ ♀		2.3%	
	8. *Lecauge decora* (Blackwall)		1, 2, 3, 5, 6, 7, 8 & 11	13♀ ♀	1♂	11%	
	9. *Lecauge* sp.		1	1♀		0.7%	
	10. *Larina chloris* (Sav. & Audin)		7, 8, 10, & 11	10♀ ♀	1♂	8.7%	
	11. *Araneus mitifica* (Simon)		1, 2, 4, 5, 6 & 11	3♀ ♀	4♂ ♂	6.3%	
	12. *A. bituberculatus* (Walk)		11	5♀ ♀		3.9%	
	13. *Cyclosa hexatuberculata* Tikadar & Bal.		1, 2, 6, 10 & 11	7♀ ♀		6.3%	
	14. *C. confraga* (Thorall)		4 & 5	2♀ ♀		1.5%	
	15. *C. mulmeinensis* (Thorall)		5	2♀ ♀		1.5%	
	16. *C. spirifera* Simon		8	1♀		0.7%	
	17. *Cyclosa* sp.		5	2♀ ♀		1.5%	
	18. *Meta* sp.		4 & 11		1♂ 9 Immture	7.9%	

TABLE I. (*Continued*)

1	2	3	4	5	6	7	8
	19. *Cyrtophora citricola* (Forskal)	I	1, 5 & 6	3♀♀		3.0%	
	20. *Argeope aemula* (Walk.)		6	2♀♀		1.5%	
	21. *Poltys* sp.		2	1♀		0.7%	
Hersiliidae.	22. *Muricia indica* Simon		3	1♀		—	0.7%
Uloboridae.	23. *Uloborus* sp.		2	1♀		—	0.7%
Theridiidae.	24. *Theridion* sp.		3	3♀♀		—	2.6%
Salticidae.	25. *Salticus* sp.	II	12 & 13	13♀♀		—	100%

abundance of female spiders in population at both the locations. Apart from it, it may also be concluded that the wasps have developed the ability to locate and hunt the female spiders, since the female spiders provide more nourishment to the developing larvae of the wasp because they are larger in size. This would also result in minimum hunts to catch the spiders. Since the natural status of the ratio of female to the male in a population was not yet established in case of any spider species from India, it would be imperfect to mention about it but now it is known that the natural spider population alway has more number of females than males for any species of spiders.

Jocque (1988) has indicated that the prey of *Sceliphron spirifex* (Linn.) belong to 8 spider families. 56% spiders belong to Araneidae, and 31% to Salticidae. The other families like Clubionidae, Theridiidae, Hersiliidae, Tetragnathidae respresent less than 10%, white (1962) reports on the presence of Lycosidae and Zodaridae in the nests of some species of *Sceliphron* in Sierra Leon.

The above studies, thus indicate that the above cited two species of *Sceliphron* have an impact on the population of certain spider species, since a large prey per cell per nest is required. Further, the wasp *S. violaceum* mainly predates on female spiders and this would have a direct impact on the spider population, because before breeding activities are completed the female individuals are preyed upon, further, the two Indian species, *S. madraspatanum* and *S. violaceum* might have a competition for prey, and to confirm this furthers efforts are needed and the same are in progress.

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