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## Description of Egg Laying Pattern and Egg Sac of *Steatoda grossa* (C.L. Koch, 1838)

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### Abstract

There are 6 reported species of *Steatoda* in India. *Steatoda* also known as false widow spider belongs to family Theridiidae. This paper is on a brief account on the egg sac of this animal with special reference to number of sac on each web. The study demonstrated a great variation in no. of egg sac on each web average number being 5 and size of egg sac average being 5mm(diameter) The egg sac have spokes on its surface. Egg sacs contain numerous white patches and moults.

**Keywords:** *Steatoda*, Egg sac, Theridiidae, Breeding.

### 1. Introduction

Spiders lay egg in egg sac. Spider egg sacs protect its eggs from external damage by both biotic and abiotic factors<sup>[1]</sup>. Spider eggs frequently suffer high mortality from organisms such as ants, wasps, flies and birds<sup>[2]</sup>. Some spiders take care of the sac but in our species maternal responses is limited to the construction of an egg sac<sup>[3]</sup>, egg sac are crucial for spiderling development, because they stay in it for several months usually winters without direct protection of the mother<sup>[4]</sup>. Egg sac construction and their number varies widely among different spider taxa<sup>[5, 6, 7, 8, 9]</sup>. However, detailed description of egg sac is lacking for many groups.

A basic consideration in most studies in reproductive behavior of spider relates egg production to energy availability<sup>[10]</sup>. In general, the number of clutches and number of eggs per clutch in animal is determined by food supply<sup>[11, 12, 13]</sup>.

Here we describe for the first time the egg sac structure post hatching behavior of the Araneid *Steatoda grossa*. Our specimen has been collected from Bagoda (22.5:75.9) Dist. Indore (M.P); India. The animal here resides in the cervices between rocks situated in walls and not on ground or the forest bed<sup>[14]</sup>. None of the specimen was found hanging on trees or shrubs all were in the cervices of rocks situated close to bed of forest. The animal has not been found in any other place of Indore having same habitat as that of Bagoda. Its Occurrence only in Bagoda is also a matter of interest and will be worked on. No detailed ecological study of this species has been done till date.

This study will provide information on structure of egg sac considering number of egg sac<sup>[15, 16]</sup> and efficiency of the sac to produce spiderlings in a territory of single female and content of egg sac post hatching.

### 2. Material and Methods

#### 2.1 Site of Collection

Our specimen has been collected from a remote village also a tourist spot. Bagoda (22.5:75.9) a Village from Depalpur Mandal, Indore District, Madhya Pradesh, India. Bagoda is 26.1 km far from its Mandal Main Town Depalpur. Bagoda is located 21 km distance from its District Main City Indore. It is located 190 km distance from its State Main City Bhopal.

#### 2.2 Sampling

Web of spider was observed and closely studied at 40 sites in Bagoda in November and December-2012. Collection of egg sac was made in first week of January 2013. Each site was allotted a separate number and egg sac was collected from each web in a separate vial. The selection criteria for web were random and no particular pattern was followed.

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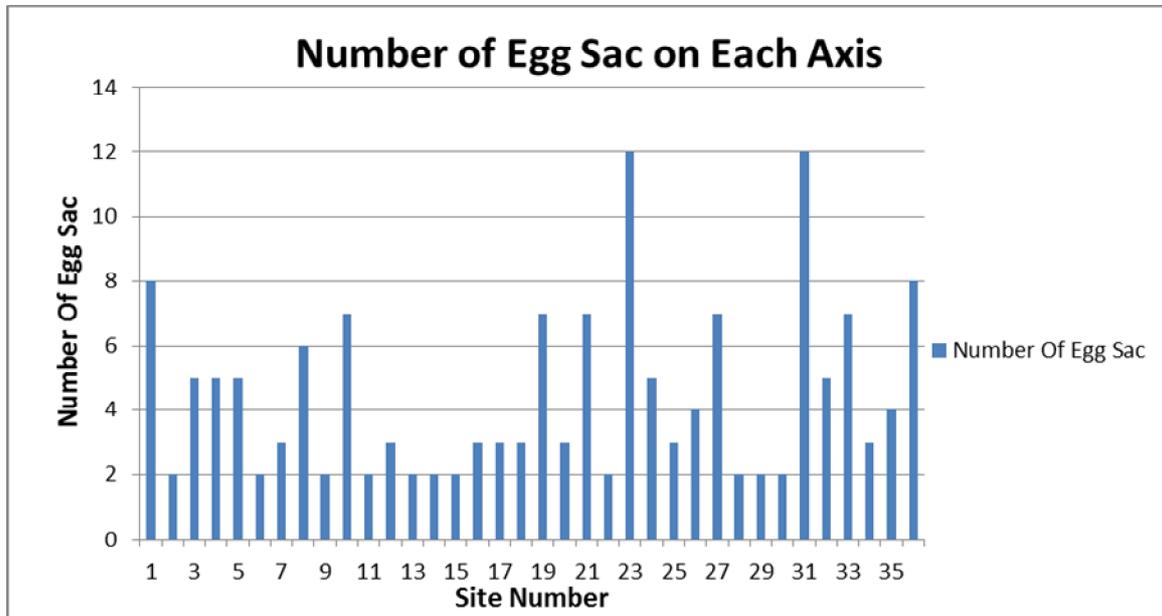
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**2.3 Analysis**

All the egg sac collected was cut open and observed for egg shells. The old sacs were observed for moults of spider lings. Other parameters calculated included length of sac considering the spoke and without considering the spoke measured with the help of ruler. The sac was also observed for its colour and transparency.

**3. Result**

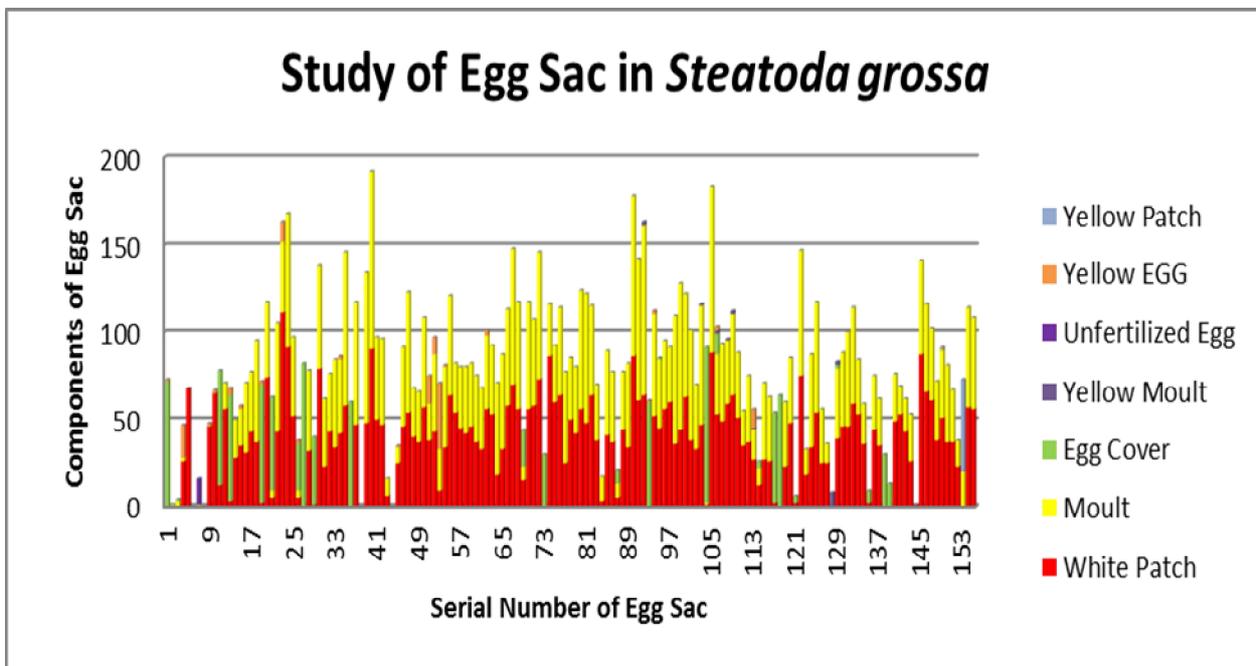
On an average 5 egg sac were being found on each web, minimum 2 and maximum 12. Average length of each egg was  $5.1 \pm 0.84$  cm.



**Graph 1:** number of egg sac per web of *S. grossa* in 36 sites

Average length along the spoke of each sac was  $6.9 \pm 1.105$  Solid white patches found in each egg is around  $40 \pm 23.81$ . There were spokes throughout circumference of eggs Number of moult in each sac is around  $36 \pm 23.63$ .

In one egg sac 15 unhatched or black egg were observed. In one egg sac 53 yellow patches instead of white were observed. In 21 egg sac yellow eggs were observed. In 15 egg sac complete egg shell was observed.



**Graph 2:** Study of egg sac in *S. grossa*

**4. Discussion**

A great variation in number of egg sac laid on each web can be due to available food (Kessler 1971). All the sites were of same

habitat so other environmental factors will probably not hold well in explanation of such variation.



**Fig 1:** Web of Spider in Captivity

Spokes present on egg sac helped it to remain attached to web (to increase friction) so that no external agent could easily carry them away. Spider web was seen quite above the ground to ensure less prey attack. Egg sac showing egg covers did not have white patches; so the patches can be related to the remains of egg shell and not some other insulating agent. Moults were observed in almost all egg sacs indicating that I instar developed inside the egg sac and then moved out of the sac.

In many egg sacs white patches were observed indicating unfertilized dried egg. Few yellow eggs were observed indicating existence of yolk. Black egg found indicated unhatched dead spiderlings.

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