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OBSERVATION ON THE DIVERSE MODE OF FEEDING HABIT BY A PHOLCID SPIDER [*CROSSOPRIZA LYONI* (BLACKWALL, 1867)] FROM BORTIBEEL, NORTH 24 PARGANAS, WEST BENGAL

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INTRODUCTION

Information on feeding behavior of Pholcid spider from Bortibeel, a potential wetland in the history of Gangatic estuarine system in North 24 Parganas district of West Bengal is lacking. Studies on feeding behaviors of areneid spiders from India were available with Tikader (1961, 1982). Majumder (2001). Kumar and Prasad (1977) published a note on dragonflies caught in spider webs Recently Majumder and Talukdar (2006), Talukdar and Majumder (2006, 2007a, 2007b, 2008) and Talukdar (2008) did some interesting observation on food and feeding behavior of four araneid species of the genus Argiope and Neoscona and one species each from family Tetragnathidae and Pholcidae from west Bengal. But studies on the feeding behaviour of *Crossopriza lyoni* (Blackeall 1867) from this area are not available.

During late winter of February, 2007 while carrying out the behavioral studies on the spiders of Bortibeel wetland, the author came across a female spider *(Crossopriza lyoni)* which was displaying its feeding behavior on a comparatively huge dragon fly Pantala flavescens(Fabricius) in the undistinguished web built in a concrete shed at the grid between 22°49'20.50" N and 88°24'17.40" E near paddy field of the wetland.

The present paper deals with several items like a). the details of the ecological condition of the wetland, b). The sites where the spider builds it's web for trapping insects in the dry seasons only, c). the food and the diverse pattern of feeding habits of Crossopriza lyoni (Blackeall), d). the pattern of retreat, e). The morphological structure and measurements of the spider and its prey among which a good number of paddy pests are included, f). The time span it needs to capture the prey, and digestive mechanism along with the biological significance regarding the advancement of predatory behavior and g). the pest control ability of the spider. Some of these observations might be carefully utilized for the purpose of biological pest control in paddy field ecosystem.

MATERIALS AND METHOD

The Study Area : A 13km stretch of Bortibeel marsh land crept up on several agricultural and fishing villages covering about 3,00,000 bighas of cultivated land situated between 22°43''29.70''-22°56'44.10'' degrees of North and 88°22'22.60''-88°28'44.20'' degrees of east between the altitude of 6.00m -15.00m in 5 assembly segments of Jagaddal, Khordaha, Amdanga, Naihati and Barasat. The study area is situated between the 87/A bus root and Nilganj road in North-South and between NH34 and Kalyani high way in East-West. Several rail stations like Halisahar, Naihati, Kankinara, Jagaddal, Shyamnagar, Ichhapur, Palta, Barrackpur and Barasat connect the large wetland area. Many villages like Ratanpur, Taraberia, Beharia, Boseganchia, Baraganchia, Kushdanga, Tapanpur and Tentulia are bordering the east while Dogachi, Panpur, Mukundapur, Uchhegarh, Mahakaltala, Basudevpur, Kadamtala, Uttar Hansia, Dashgaria, Kaliaghata and Mathurapur, are bordering the West of the Wetland. The most important thing of this wetland is the network of several canals namely Ichhapur Khal, Pancha khal, Trimohini khal, Koirapur khal, Basudevpur khal, Haujana khal and Pakhimara Khal etc. are connecting Noai Khal (Noai River) which was

previously connecting the Vidyadhari River and also included with the reverine net work of GANGA which is now almost disconnected.

Climate : Monsoon prevails for about four months from mid of June to mid of October with high humidity. Annual range of humidity is between 85-95%. July-August are the heavy rainfall months with precipitations as high as 400mm. Maximum temperature reaches up to 45 degree C in May while the mean maximum temperature is 30° C. observed in June. On the other hand the minimum temperature drops up to 8 degree C in January and the mean minimum temperature is 20° C.

Instruments : Collections were made by an inverted umbrella, forceps with soft-tension, small brush with a standard hand sweeping net (129 cm in diameter) and a sunca electronic emergency lamp. Taxonomic studies have been made by a Olympus dissecting type binocular microscope with ocular micrometer while behavioral observations were performed by a Sony Mini DV DCR-HC42E and an electronic stop watch. Black velvet paper and tabulated data sheets were used.

Collections : Spiders were collected from the study areas directly from the webs by hand picking method. Web threads were collected in black velvet paper piece.

Preservation : Collected spider specimens were anaesthetized, killed in a killing jar and finally preserved in Oudman's preservative (90 parts 70% ethanol, 5 parts glycerol and 5 parts glacial acetic acid) in glass vials.

Identification : Well preserved spider specimens were sorted transferred in ethyl alcohol and studied under binocular microscope in a Petri dish. The specimens were identified up to species level.

OBSERVATION

On 22nd February, 2007 evening at about 5 PM while passing through the paddy field and was panning the torch lamp haphazardly to the vicinities nearby observed a huge dragonfly (*Pantala.flowescens)* measuring about 50 mm helplessly to toss about in an irregular spider web under a concrete shed and a Pholcid spider (*Crossopriza lyoni)* is moving around closely to the victim. With due attraction an interesting observation carried over for two hours and recorded the mode of feeding displayed by the spider. Generally Pholcid, the daddy-longlegs have a special method of hunting. Their untidy web is used more as a place to stay than for catching prey. The spider hangs upside down in the web. If the web becomes too dirty, then it is abandoned and a new web is woven. Their poison jaws are far too small to hold a prey. Here in case of this unnatural meal the predator had to struggle for at least one hour to inactivate the prey which have about a 5-6 fold of body length and at least 10 times of its volume. In addition the entangled dragonfly was expressing its vigor so desperately that the predator was not getting a chance rather getting fear to put injection to abate its victim. Later on with extra enthusiasm and courage while the first bite could have managed at 6-15 PM immediately the victim showed nothing effective on its vigor but the frequency of jerking which was displaying before .Gradually by the second and third bite the victim became immobilized. Unlike the other observations on feeding behaviour of the same *Crossopriza* species there was no sign of rapping of viscid silk web on the victim which is also very uncommon. During the whole process patience, courage, and perseverance of the predator expressed remarkably. Just after the movement of the victim settled down most interestingly it is observed that another female *Crossopriza* rush around and started sucking the juices from the same prey and the original predator have no counter-plea. Juice sucking process was executed from different part of the body of the victim though initially it was started from the wing-veins then the connecting junction of head and thorax and so on from every part of the body by almost sticking their body with the prey. After one more hour of observation the author had to leave the place. On the next very morning while reached there, no spider was observed near the apparently intact immobilized *Pantala* but some Pholcid spider feeding on other insects nearby and studied the diversity of their feed. The same observation was continued for almost two years till winter 2007 and there recorded hundreds of occasions regarding the feeding behaviour of Pholcid.

DISCUSSION AND SIGNIFICANCE

It is revealed from this study that prey of *Crossopriza lyoni* (Blackeall) are chiefly insects both in flying and jumping habit. Some times it is also observed that *Crossopriza lyoni* was feeding on other spider species. In one occasion on January, 2007 the author saw a *Crossopriza* adult female measuring about 8.5 mm feeding one male *Crossopriza* of 9.2 mm long showing the habit of cannibalism. More over, *Crossopriza* web is a natural insect trap which

catches many more prey than spider can eat. Observation revealed that during the process of retreat, smaller Pholcid spiders (6-8mm) bite more occasions (4-5) and relatively large spiders(9-11mm) bites less (2-3 times) to inactivate the prey may be due to high amount of venom injected by the larger spiders. It is also revealed from this study that *Crossopriza* consume every insect like flies, ear worms, and beetles and so on. They also put on their menu other spiders like the house spider, wolf spiders, jumping spiders and so on. In short, they can grab almost every insect in and around the house and even other daddy-longlegs through their diverse feeding habits. In the present study 10 insect species were found in the spider web in and around the paddy fields of Bortibeel which are pest to the crop and naturally controlled by *Crossopriza lyoni* (Blackeall) and highly significant as they regulate the population of insects and spiders in the house. Thus they can be considered as a potentially bio-controlling natural agent in the related environment of agriculture and domestic fields.

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Plate 1

The prey : ***Pantala flavescens*** (Fabricius, 1798)

The predator :
Crossopriza lyoni (Blackwall, 1867)

Plate 2

Photographs showing the time line of hunting the pray by *Crossopriza lyoni*

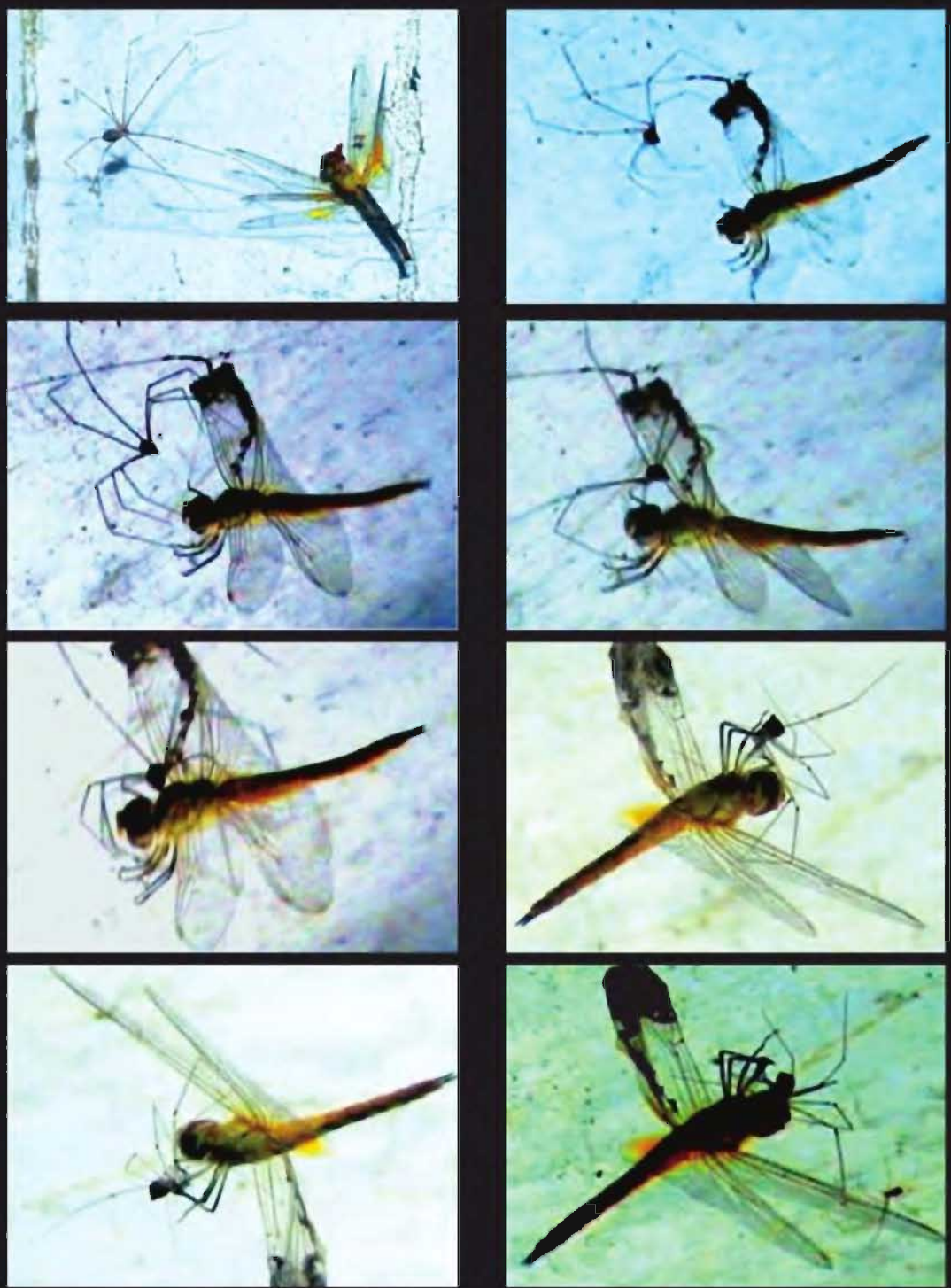

Plate 3

Stages of gregarious feeding by ***Crossopriza lyoni***