ON THE EARLY STAGES OF THE REED LEOPARD MOTH *PHRAGMATAECIA CASTANEAE* HB. (LEP.: COSSIDAE)

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Abstract

Observations on the larval and pupal stages of *Phragmataecia castaneae* (Hb.) are presented.

Introduction

The early stages of *Phragmataecia castaneae* are well described and illustrated in the Victorian literature on the Cossidae. There are a number of references in the 19th century journals and main Lepidoptera works that followed the discovery of the insect new to Britain by Henry Doubleday at Holme Fen in 1841. James Baldwin (1878), suggested that "the discovery of the larva and pupa led to it being taken in abundance", and it seems that Doubleday followed up his discovery with energetic and successful field work. Little new information or details on the insect's habits in the early stages seems to have been added to the record for many years, and what was known of the methods used by the Victorian and Edwardian collectors seems to have been lost.

P. castaneae is a well known and common moth at Wicken Fen in Cambridgeshire. Males come readily to light sometimes in good numbers. On some nights I have seen 30 to 40 at a single light and it appears that the moth is strongly and widely spread over the reserve. Thanks to the assistance of a former Property Manager of the fen, Tim Bennett, on a couple of occasions in the 1980s I was able to take several generators and associated light trapping gear into the heart of the fen far beyond the range that equipment can be readily hand-carried to. Using an all-terrain vehicle for transport, records were obtained showing that this species was amongst the commonest flying to light on some nights by Drainer's Dyke, which separates Verrall's Fen from Sedge Fen. Females of the species were far scarcer. Out of some four hundred examples of this species seen over the years, I have only taken five females at light. Of bred insects collected in the early stages and bred through, the proportion of male to female is much closer. Pruscha (1972) suggests a ratio of trapped adult insects between 10:1 and 20:1, and a bred ratio of 5:4, the former figures relating to males. My own observations are rather different but also suggest that the females are far more common than light trapping would indicate. It seemed a little unusual that my captive stock has produced most females before the males emerge and this would be an interesting trend to confirm in wild caught specimens. For instance, the first specimen taken in my garden trap in 2003, was a female at light on the night of 8 June. The first male of the season arrived at light on 11 June in the same trap. It is worth noting also the mobility of the species, as my trap was at least 250 metres outside the fen reserve and the nearest reed stands.

Random searches for larvae at Wicken in the 1970s and 1980s by the writer were fruitless apart from an empty pupal case in a reed stem near the wind pump on the

northern end of the fen. The discovery of the article by Dr E. A. Cockayne (1931) [the cover and title page is mis-dated, 1931-32]) on this insect, was very illuminating. On 29 September 1930, in the company of the Cambridge lepidopterist H. Worsley Wood, 14 larvae were collected on Wicken Fen, by cutting reed stems between 12 to 18 inches [30 – 48cm] below water level. With this note in mind, I visited the fen on 26 September 1996 and worked the area to the west of the wind pump. Armed with a pair of long handled lawn edging shears, I was able to reach reeds out in the pools of the old brick clay pits and by sliding the shears down interesting looking stems, could cut as far down as 24 inches or more below water level. In the space of an hour or so I obtained some 17 larvae, ranging in size from half an inch to one and a quarter inches (Plate A).

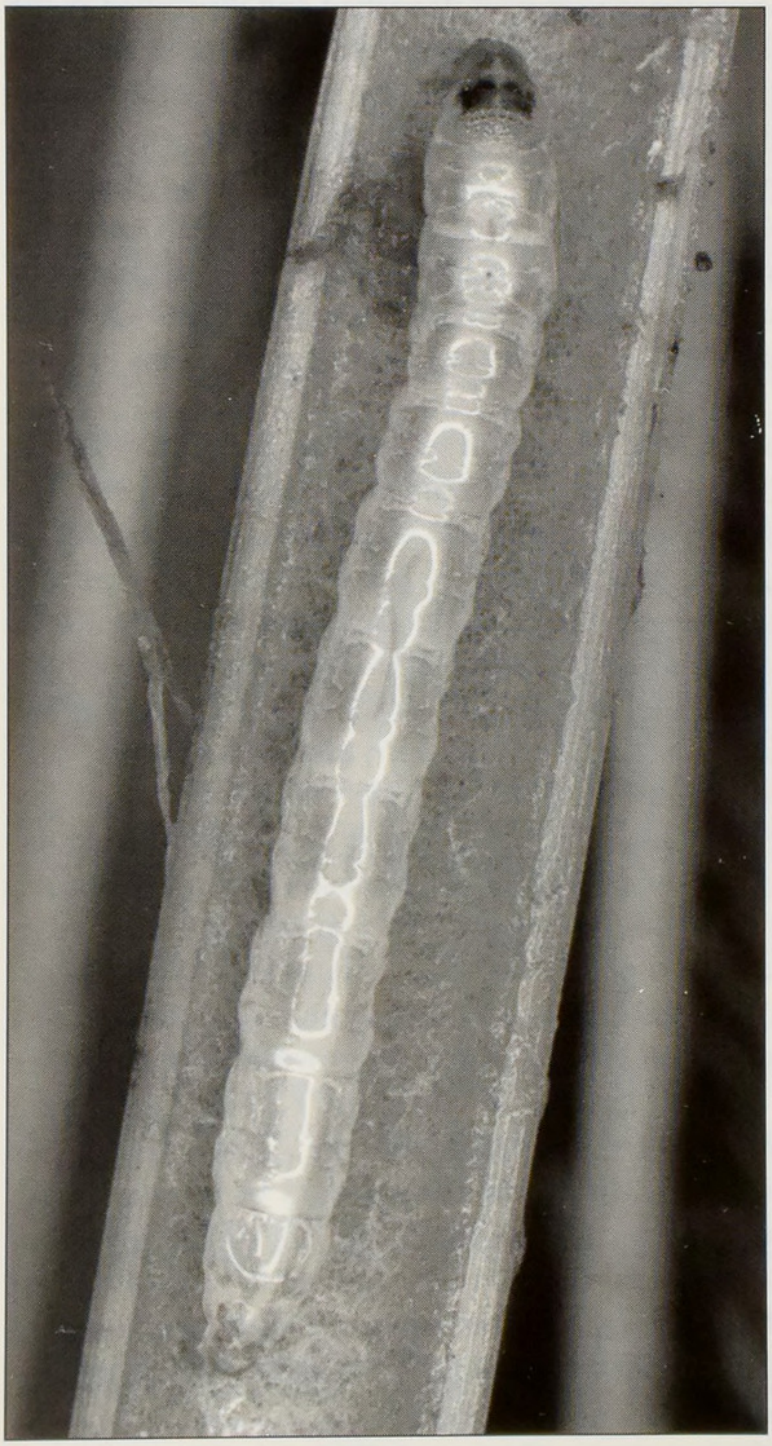

Plate A.
Final instar larva of *Phragmataecia castaneae* (Hb.)

These larvae were taken home and introduced into the lower stems of reeds planted in anticipation in my garden pond. The stems were slit vertically low down, the opening wedged apart with match sticks until the larva had been encouraged to enter, one to a stem, and the stem closed and bound with plastic tape, and the reed marked for future recognition. Reeds cut in this way loose some of their structural strength and break more readily in winter wind than uncut ones. They were therefore supported to stop wind breakage. The following spring, the stems were harvested at ground level and kept in moist sand. Moths emerged at the expected time. Some were lost due to fungal attack, some vanished but most were reared successfully. Larvae not fully grown were inserted into reeds growing in tubs and taken to Wicken when I moved there. Coals to Newcastle.

Having made the move to Wicken in 1997, it was much easier to spend time studying the early stages and with similar success. A main interest was to establish if there were external signs indicating which reeds were infested. Some of the internal reed feeders like *Archanara geminipuncta*, and *A. dissoluta* are quite easily located by the discolouring of reed leaves as they wither amongst the surrounding green foliage. I spent considerable time while looking for larvae of *P. castaneae* studying reed stands, selecting stems that caught my eye for a variety of reasons before I noticed that in late September and into October most reeds are in full flower. Some otherwise healthy plants, of similar height, colour and stature lacked flower heads. These almost always produced a larva when cut at maximum reach even to a depth of two feet. Any less and the cut stem would show the distinctive blackish brown internal damage left by a feeding larva though the larva was left still in the lower section. Or more unpleasantly the cut stem would show the cross section of a larva sliced in two. I can see no other obvious sign of larval activity. These affected reeds are just as robust as those in the surrounding growth.

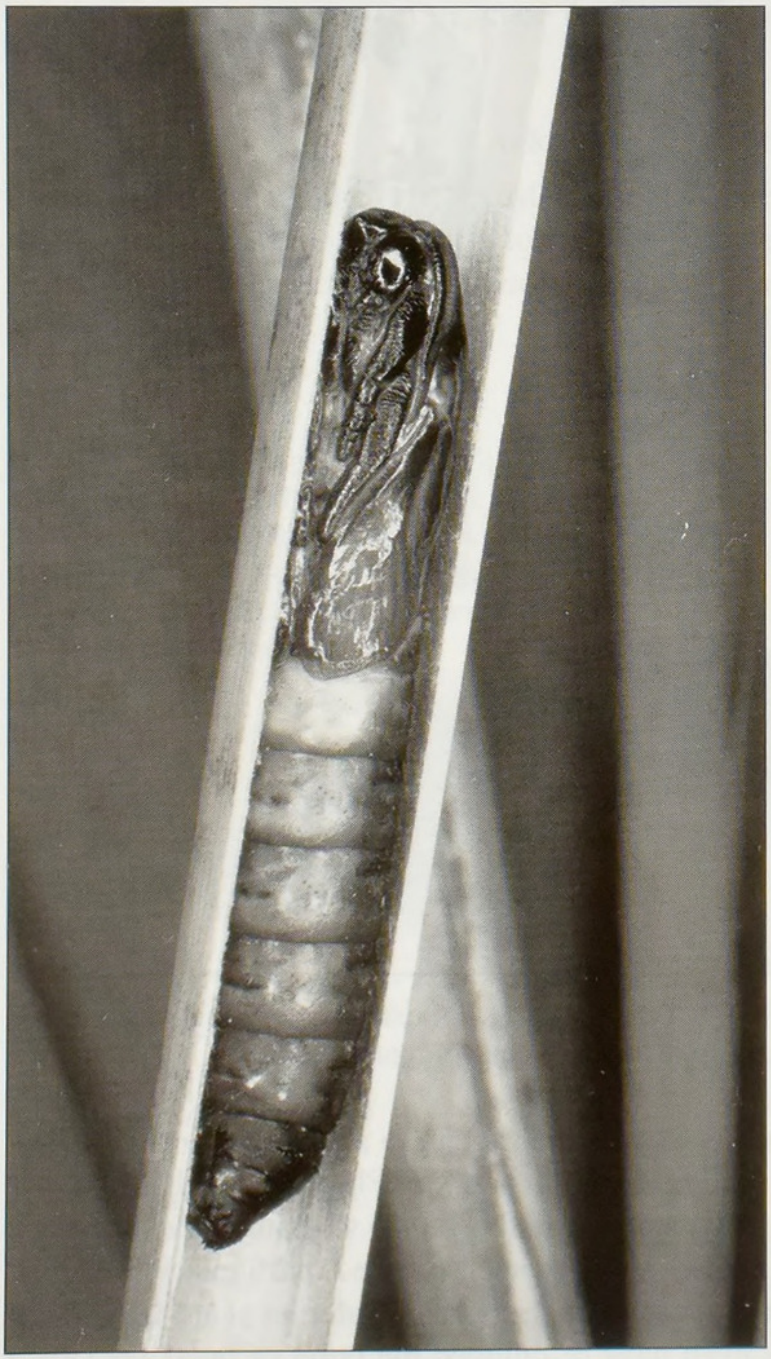

Plate B. Pupa of *P. castaneae* (Hb.)

The use of long handled shears is a great asset though caution has to be exercised when working the edges of the pits. I do not know how deep they are, but when working over the edge of water of this type, the possibility of doing a header into the water has to be considered, whereafter access to lots of otherwise inaccessible reeds may be facilitated!

The pupae (Plate B) are best obtained in mid to late May in an average season, again the lack of any flower head remnants help the search though many have been blown away during the winter. Earlier in the month larvae are encountered and much later, empty pupae or stems frustrate

Plate C. Pupal cases of *P. castaneae* (Hb.). 1. Typical emergence position; 2. Pupa and exit window just below wind fracture; 3. Showing exit from broken stem; 4. Empty case.

the searcher. At this time the larva has moved up the stem to a point six to nine inches above the surface of the water, usually just below a node (Plate C, Fig. 1). At about that height, a plug of pale stem fragments caps the larval workings and the larva pupates not far below it, head up. After a strong spell of wind, particularly in April, reed stems that have broken at about six to 12 inches above water level are very likely to be occupied and the larva may even have re-plugged the point of breakage (Plate C, Fig. 2.)

Regarding the old observations that the pupa is capable of rapid movement up or down the stem, I have not been able to confirm this. Mr. Doubleday writing in July 1850 in the Zoologist, p. 2884, "This insect has occurred in great profusion in the neighbourhood of Whittlesea-Mere this season. The larvae feed within the stems of the common reed, and the pupa, which is remarkably elongated, is exceedingly active, moving up and down the stems of the reed with great rapidity". I have watched movement down the stem of pupae but I would not like to create a picture of anything other than a slow steady wriggling progression. Exceedingly active would not be suitable for my observations.

The emergence "window" is virtually invisible and I do not think it practical to look for this external sign at this time. The pupa extrudes from the reed stem to about one third of its length prior to emergence. My notes suggest that emergence takes place in the evening, often about 10pm.

Acknowledgements

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