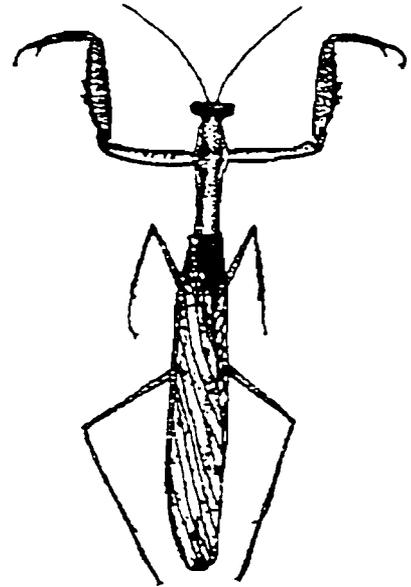


Mantis Study Group Newsletter 16

May 2000

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Editorial

Those who remember Geoff Hancock's request for information on wing folding in mantids may be interested to see the abstract of Barabás & Hancock's paper in the abstract section of this newsletter. In fact, since no one has written anything for the newsletter, except for the exhibition dates, there is nothing to read except the abstracts!

Thanks again to Kieren Pitts for helping with the abstracts section, and for printing and posting out the newsletters.

Paul Taylor is organising a joint MSG and PSG meeting on 18th June, details below.

Exhibitions

We hope to be exhibiting at all of the following events but do not yet have anyone to run a stand at Oldham on 10th June (offers to Paul Taylor or Phil Bragg please).

10th June 2000.

Creepy Crawly Show 2000. Queen Elizabeth Hall, Oldham. Open 1200-1700. No MSG stand planned - anyone want to do one?

10th June and 19th November 2000.

Creepy Crawly Show, Newton Abbot Racecourse, Devon. Open 1000-1700. Paul Taylor will be running a stand, contact him for details.

18th June 1999.

Mantis Study Group & Phasmid Study Group joint meeting and show. This will form part of the "2-4-6-8 Animal Show" at Birmingham Nature Centre, Cannon Hill Park, Pershore Road (the A441), about three miles from the centre of Birmingham. The event is open to the public from 1000-1600, entry £1.50 for adults, children free. The event is organised by Birmingham City Council but the MSG and PSG will have significant displays at this event and it provides an ideal opportunity for members in the Midlands to meet up. If you are able to assist on the day with displays and promotional material please contact Paul Taylor or Phil Bragg. We would like as many members as possible to bring material for display.

25th June 2000 (Sunday).

Flora & Fauna Fantastica 2000. A new show, organised by herpetile and carnivorous plant societies. It will be held in Nottingham University's sports hall. Open from 10.30-1600. The MSG will have a stand, further details from Phil Bragg.

9th July 2000.

Derbyshire and Nottinghamshire Entomology Society's Summer Exhibition. A small exhibition at Shipley Country Park visitor's centre, intended for the general public rather than entomologists, emphasis is on local insects and there are also guided bug hunts around the park. Since I'm always invited it's a good chance for members in the area to meet up and see some of my mantis collection. Contact Phil Bragg.

4th November 2000.

Derbyshire and Nottinghamshire Entomology Society's Annual Exhibition. At Broomfield College, near Breadsall, Derbys. Contact Phil Bragg for details nearer the time.

Mantis abstracts

The following are abstracts from papers published recently, or in some cases details of the paper but without an abstract. The papers are in English unless otherwise indicated. The editor would be grateful for copies of any recently published papers so that abstracts may be included in this section of the newsletters.

Barabás, S.P. & Hancock, E.G. (1999) Asymmetrical colour and wing-folding in *Tithrone roseipennis* (Saussure, 1870) a neotropical praying mantis (Mantodea: Hymenopodidae). *Tropical Zoology*, **12**: 325-334.

The frequency and type of forewing colour asymmetry in *Tithrone roseipennis* (Saussure, 1870) (Mantodea Hymenopodidae) was examined and 29 out of 35 specimens had red/green forewing asymmetry. The insects, from both field-collected material and museum specimens, contained both left and right forewing asymmetry morphs. This colour asymmetry was found to be linked to wing-folding. Asymmetrical mantids always appeared to cryptically green at rest, decreasing the chance of predator detection. It is suggested that red and green colour pigments are genetically encoded for, and genetic epistatic interactions result between forewing coloration and wing folding mechanisms. The forewing coloration of *T. roseipennis* is an example of antisymmetry.

Cho, S.Y., Hahn, B.S. & Kim, Y.S. (1999) Purification and characterization of a novel serine protease with fibrinolytic activity from *Tenodera sinensis* (Chinese mantis) egg cases. *Journal of Biochemistry and Molecular Biology*, **32**(6): 579-584.

Mantis egg fibrolase (MEF-3) was purified from the egg cases of *Tenodera sinensis* using ammonium sulphate fractionation, gel filtration on Bio-Gel P-60, DEAE Affi-Gel blue gel affinity chromatography, and MONO-Q anion-exchange chromatography. This protease had a molecular weight of 35,600 Da as determined by SDS-polyacrylamide gel electrophoresis under reducing conditions and its isoelectric point was 6.0. The N-terminal amino acids sequence was Ala-Thr-Gln-Asp-Asp-Ala-Pro-Pro-Gly-Leu-Ala-Arg-Arg. This sequence was 80% homologous to the serine protease from *Tritirachium album*. MEF-3 readily digested the alpha- and beta-chains of fibrinogen and more slowly the gamma- chains. It showed strong proteolytic and fibrinolytic activities. Phenylmethanesulphonyl fluoride and chymostatin inhibited its proteolytic activity, while EDTA, EGTA, cysteine, beta-

mercaptoethanol, elastinal, tosyl-lysine chloromethylketone, and tosyl-amido-2-phenylethyl chloromethyl ketone did not affect its proteolytic activity. Among the chromogenic protease substrates, the most sensitive one to the hydrolysis of MEF-3 was benzoyl-Phe-Val-Arg-p-nitroanilide. Based on these experimental results, we speculated that MEF-3 is a serine protease with a strong fibrin(ogen)olytic activity.

Gonka, M.D., Laurie, T.J. & Prete, F.R. (1999) Responses of movement-sensitive visual interneurons to prey-like stimuli in the praying mantis *Sphodromantis lineola* (Burmeister). *Brain Behavior and Evolution*, **54**(5): 243-262.

Previous behavioral work using both mechanical and computer-generated visual stimuli has demonstrated that mantids use a computational algorithm to recognize prey similar to that used by some amphibian predators: A stimulus elicits prey capture behaviour if it falls within a perceptual envelope defined by five fundamental stimulus parameters: (1) overall size, (2) length of the leading edge, (3) contrast to the background, (4) location in the visual field, and (5) apparent speed. In this study, we recorded simultaneously from both cervical nerve cords of monocular *Sphodromantis lineola* while they viewed the same visual stimuli successfully used in the behavioral studies. Extracellular recordings showed three consistently proportioned amplitude classes of movement-elicited spikes in each cord and these were repeatedly and reliably identifiable across mantids. Overall, the movement-elicited activity in both cords was dominated by very large spikes suggesting the existence of several large, descending movement-sensitive interneurons projecting both ipsilaterally and contralaterally from the optic lobes. However, only the largest contralateral spikes occurred preferentially to prey-like stimuli, mirrored the behavioral response curves generated by *S. lineola* to the same visual stimuli, and displayed activity peaks that were correlated with the times at which the mantis emitted predatory strikes.

Maxwell, M. (2000) Does a single meal affect female reproductive output in the sexually cannibalistic praying mantid *Iris oratoria*? *Ecological Entomology*, **25**(1): 54-62.

1. One explanation of the evolution of sexual cannibalism, the female's consumption of a male during or following courtship or copulation, is that this behaviour increases the female's fitness. This study tests the assumption that a single meal increases female reproductive output significantly in the sexually cannibalistic praying mantis *Iris oratoria* L.

2. In 38 mating trials, seven of the females cannibalised the males. In order to augment the number of females that fed, an additional nine females were each fed one cricket nymph at the end of the mating trial.

3. Three measures of female reproductive output - the occurrence of oviposition, the mass of the first ootheca, and the number of eggs in the first ootheca - increased significantly with female feeding condition, which was a reflection of food consumed before the mating trial. Females that copulated later in the season tended to lay lighter oothecae.

4. The females' consumption of a meal during the mating trial, either a conspecific male or a cricket, did not influence any measure of reproductive output significantly, although possible effects upon subsequent oothecae cannot be ruled out.

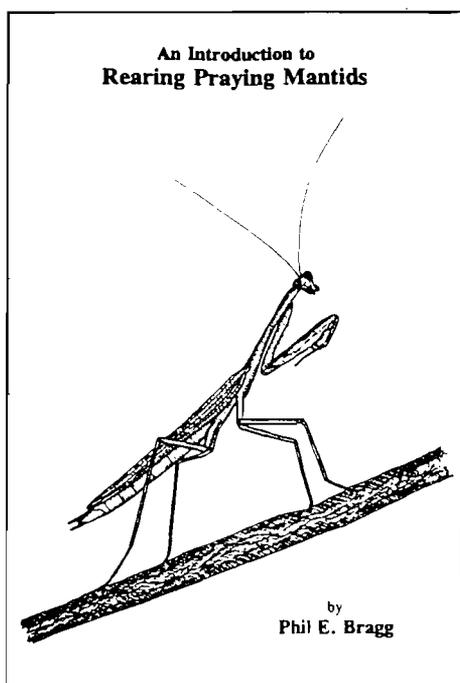
5. If, as the present study suggests, a single meal provides a negligible or delayed benefit to female reproductive output, the evolution of sexual cannibalism might lie in alternative explanations, which include possible fitness benefits to cannibalistic females in the nymphal stage or possible paternity benefits to the cannibalised males.

Roy, R. (1999) Updating of the knowledge for the genus *Oxypilus* Audinet-Serville, 1831 (Mantodea, Hymenopodidae). *Bulletin de la Société Entomologique de France*, **104**(4): 327-335. [in French]

An updating of the knowledge for this genus is given with the description of two new species: *Oxypilus cherlonneixi*, *Oxypilus montanus*.

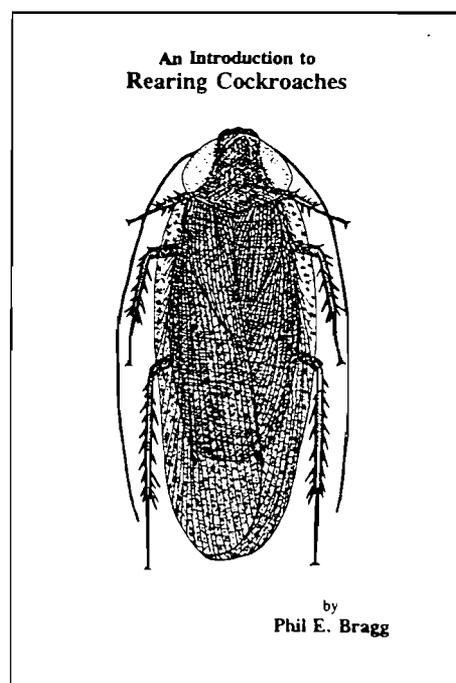
Yamawaki, Y. (2000) Saccadic tracking of a light grey target in the mantis, *Tenodera aridifolia*. *Journal of Insect Physiology*, **46**(2): 203-210.

I presented a horizontally moving square on a computer display to the mantis, *Tenodera aridifolia*, and examined the effects of target brightness and velocity, and background brightness on its tracking behaviour. The mantis tracked a light grey square with more saccadic head movements than a black square, although these squares moved on a homogeneous background. The amplitude of saccades was larger when the light grey square moved at a lower velocity. The background brightness had little effect on the type (smooth or saccadic) of tracking behaviour. These results suggest that the saccadic tracking of light grey objects on a homogeneous background may not be caused by low contrast, i.e., the difficulty in discriminating the object from the background. The possible biological significance of saccadic tracking on a homogenous background is discussed.



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