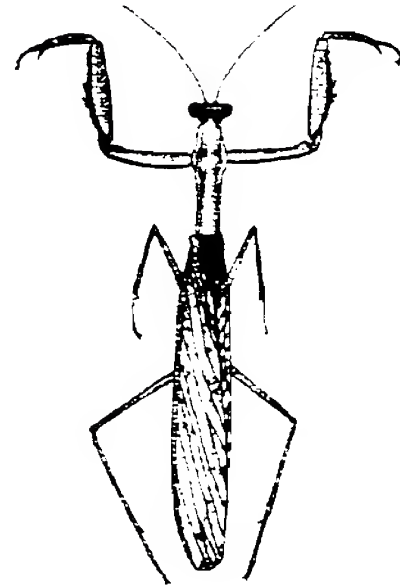


Mantis Study Group Newsletter 3

February 1997

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Editorial

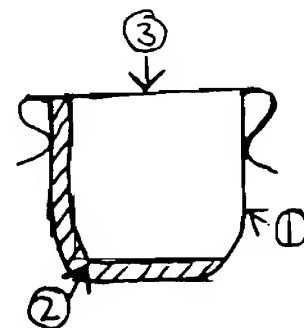
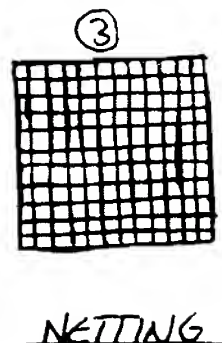
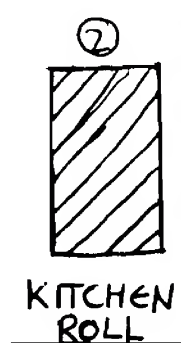
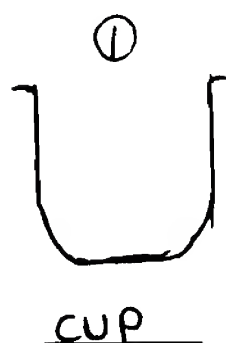
Well here I am at the end of January with only two short items from members to go with the next instalment of David Oliviera's key to mantids. What happened to all your New Year resolutions to write articles for the *Newsletter*? Please get writing for the next issue! Articles for the May issue should reach me before the middle of April at the latest.

As predicted in the last *Newsletter*, the MSG now has a membership of over 100. Welcome to all the new members.

In December we negotiated a deal with Peregrine Livefoods which gives MSG members in the UK a 10% discount on all live foods and food supplements. Their address, telephone number, and e-mail address is on page 10, contact them for a price list.

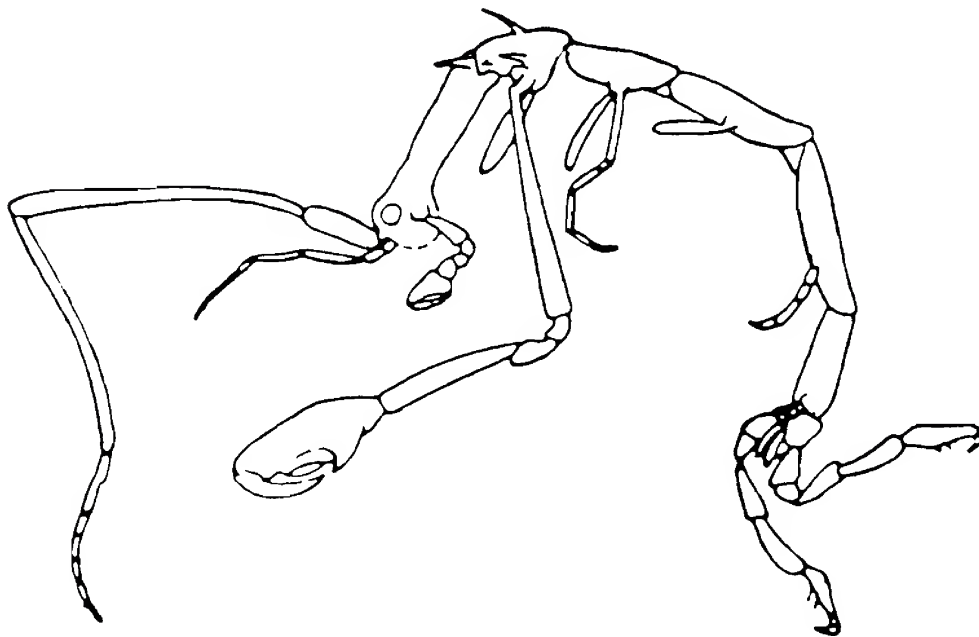
Rearing containers for nymphs - Steven Dickie.

In *MSG Newsletter 2*, Phil Bragg's article on rearing containers comprised of an empty yoghurt pot, a twig, and a cling-film cover. Personally I dislike using twigs for mantids to moult from as the mortality rate is very high. I rear my nymphs in clear plastic cups (yoghurt pots could be used) with a strip of kitchen roll covering its base and up to half of the container's side. The mantis then has easy access to the top and bottom of the container. I cover the lid with a square piece of netting, giving each nymph a large secure surface area to moult from. The netting is held in place by an elastic band. This method occasionally fails and you sometimes find a crippled individual on the bottom of a cup, but overall I found it more successful. See diagrams below.



Marine Mantids - Murray Eiland.

The "attitude of prayer" is the most indicative feature of the order Mantodea, as mantids are otherwise much like their relatives the stick insects, but for the fact that they are designed to be predators. Like all orthopteroid insects, the mantis order is greatly varied, and all members are clearly designed to capture prey. The head of the insect - similar to a raptorial bird - is distinctly triangular, with large compound eyes to locate prey with binocular vision. Due to their visual targeting method, mantids are diurnal. The head is extremely mobile, as it is the hub of the information gathering system that allows the mantis to lunge or strike at its prey with raptorial front legs. The insides of the front legs are lined with a row of spines arranged so that those on the femur are oriented in one direction, and those of the femur point to the other direction. When the femur and tibia of each leg snap shut during a lunge, these spines lock together. Once the prey is targeted, the front legs can be lashed out in a strike that lasts from between ten and thirty milliseconds.



The "skeleton shrimp" or "marine mantis", *Caprella* sp.

It is notable that spined raptorial front legs are neither a preserve of the mantids in particular, nor of the insects in general. The most notable parallel is the pincer of the crab, and a number of other crustaceans bear an even greater resemblance to mantids. One of the best examples is *Caprella*, a semisessile marine amphipod that bears two raptorial front legs on a long body. Three pairs of hind legs anchor the animal to the substrate. Known by the common name of skeleton shrimp, they are recognized for their ability to mimic the colour of their surroundings (such as seaweed), although after they are pickled they quickly lose their colour. In form these animals clearly resemble mantids, while their waiting/predatory behaviour resembles the orchid mantids in particular. The latter spend long periods of time waiting near the flowers they resemble for food to come to them. Clearly the basic design of the praying mantis is a trait that has evolved in distinct lineages as well.

Are mantids diurnal? - Phil Bragg.

The first time I read Murray Eiland's article (above) I did not notice anything odd; however, on the second reading I suddenly thought "Wait a minute, mantids are not all diurnal". Most of the mantids that I have collected in Borneo have been found at night when they seem to have come out of hiding and are sitting on leaves, or have been attracted to lights. Many species are attracted to lights (although mostly males) which shows they are active at night, and I have observed feeding and mating at night in the wild. In captivity my mantids often feed and mate at night. Just because an animal uses vision to locate its prey does not necessarily mean it is diurnal, cats and owls are well known examples of nocturnal, visually-hunting predators.

The diurnal or nocturnal behaviour of mantids must depend to a large extent on their usual prey, this in turn depends to a large degree on their habitat. In tropical countries it is best to stay out of direct sunlight to avoid over-heating. However, males in particular will need to move about in order to find a mate, looking for a female at night avoids exposure to the heat of the sun, and also reduces the risk of being eaten by a large predator. There are many other insects which are active at night and, since the temperature is lower at night, they tend to be slower than during the day, consequently they are easier for mantids to catch. The large eyes of mantids presumably give good enough vision to catch their prey at night without too much difficulty.

Lastly, if you look in the abstracts section of this *Newsletter*, there is a paper by Cumming which discusses the inter-relationships between bats and mantids - both fly at night. In view of the huge appetite of mantids, especially females, I suspect that most are active both during the day and at night: if they sleep at all they probably do so with their eyes "open".

Does anyone know of any experimental evidence - do mantids sleep? Who knows - perhaps the real reason they hold their "hands" together is so they can rest their head on them when they sleep!

Male *Tenodera fasciata* urgently needed

I have two adult females and no male. Can anyone help? If so please contact Phil Bragg, Tel: 0115-9305010.

Finding mates or obtaining different species

A reminder to members needing mates for their mantids, or wanting particular species: Steve Clark has the information on which members have which species. Also please keep him informed if you have spare males or surplus stock. If Steve cannot help you can put a note in the *Newsletter* but remember it only comes out every three months and this may be too late if you are waiting for a mate.

Forthcoming Exhibitions & Meetings

MSG Meeting - 17th May. See page 14 of this *Newsletter*.

The MSG will be exhibiting at the following exhibitions:

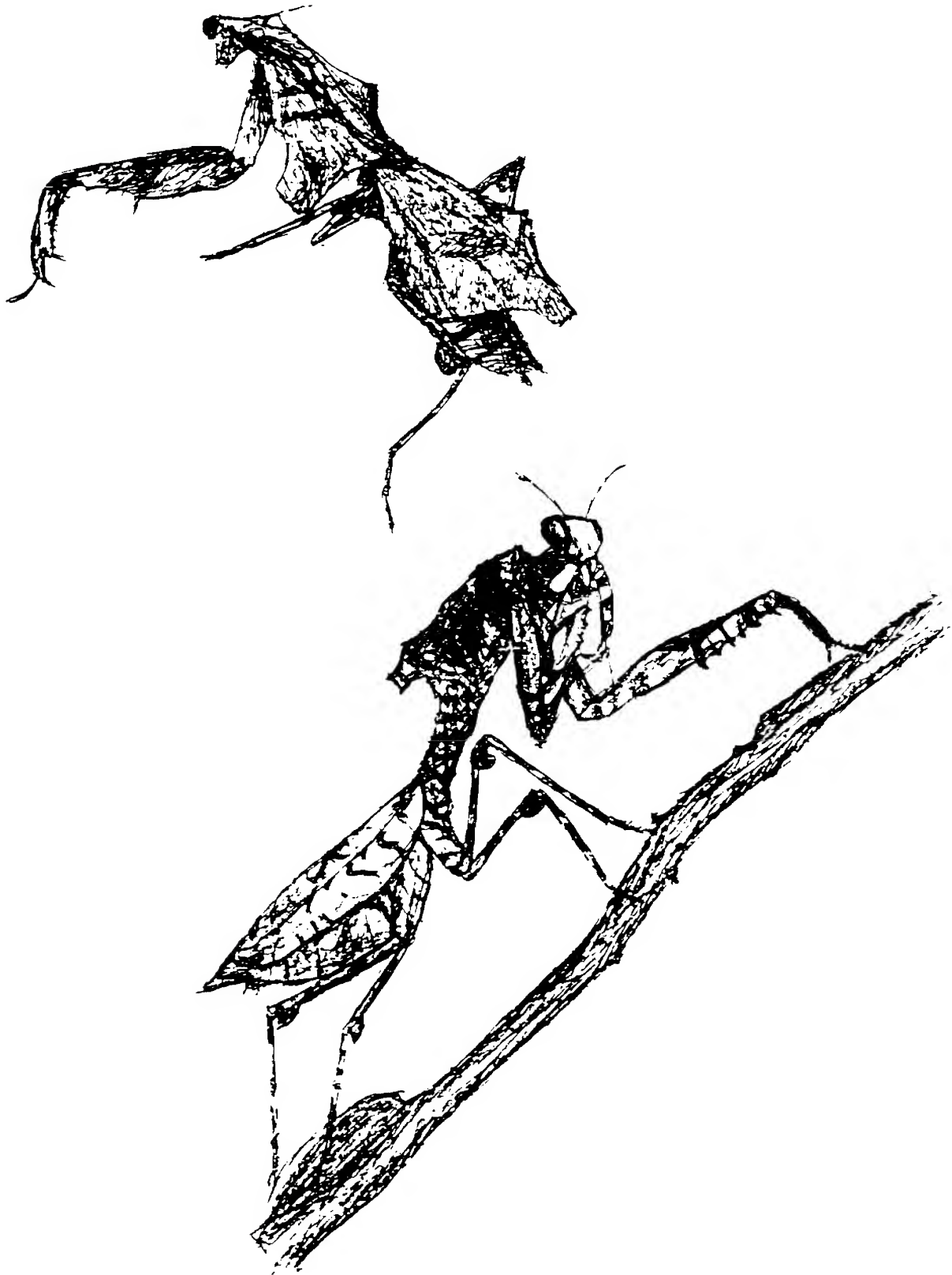
Midlands Entomological Fair - 23rd March from 1030-1630 at Granby Halls, Aylestone Road, Leicester. Admission: adults £1.50, under 16 £0.50 (last year's prices).

British Tarantula Show - 18th May at Wenesbury, West Midlands. No further details at the moment; contact Paul Taylor nearer the time for details.

Illustrations of dead-leaf mantids by Mike Jope.

Top: *Deroplays truncata* (Guérin-Méneville).

Bottom: *Deroplays desiccata* Westwood.



Keys to genera of the subfamily Mantinae

by David Oliveira, 62 Coombe Lane West, Kingston, KT2 7BY, U.K.

As with the keys to families and subfamilies in previous *MSG Newsletters*, the following keys are based on translations of the works of Giglio-Tos (1927, Orthoptera, Mantidae. *Tierreich*, 50: 1-707) and Beier (1968, Mantodea (Fangheuschrecken). *Handbuch der Zoologie*, 4(2)2/12: 1-47) and follow the classification of Beier with some details filled in by reference to Giglio-Tos. The same limitations apply: the key is entirely derivative, not based on any original observations by me and I may well have introduced errors in the translation, in addition to any errors in the original sources. There are also, of course, the underlying taxonomic difficulties.

Genera described since Beier (1968) are not included.

Any comments, criticisms or additions would be very welcome.

Family Mantidae

For the key to the 21 subfamilies of this family see *MSG Newsletter* 1: 12-14. For keys to all subfamilies except Mantinae see *MSG Newsletter* 2: 11-26. Keys to the genera in other families of mantids will appear in the next *Newsletter*.

Subfamily Mantinae

Key to tribes

1. First discoidal spine as long as second, and often longer.
..... Archimantini
- First discoidal spine shorter than second. 2

2. External border of anterior femora smooth between the spines, exceptionally toothed and then with 3 discoidal spines, otherwise 4 discoidal spines. Mantini
- External border of anterior femora toothed between spines. 4 discoidal spines.
.....Miomantini

Tribe Archimantini

Key to genera

1. Cerci cylindrical. 2
- Cerci flattened in a ribbon, at least distally. 3

2. Supraanal plate rounded. Anterior tibia with 9-10 outer spines.
..... *Pseudomantis*
synonym *Austromantis* Sjöstedt
- Supraanal plate triangular. Anterior tibia with 7 outer spines.
..... *Rhodomantis*
synonym *Truxomantis* Sjöstedt

3. Cerci short, not prolonged beyond abdomen, only distally compressed.
..... *Coenomantis*
synonym *Thorodia* Tindale
- Cerci prolonged beyond the abdomen, entirely compressed. 4

- 4. Mid and hind femora with single preapical lobe. *Austrovates*
synonym *Heterarchimantis* Werner
- Mid and hind femora simple. 5
- 5. Eyes rounded *Archimantis*
synonym *Rheomantis* Giglio-Tos
- Eyes in the form of a blunt cone. *Nullabora*

Tribe Mantini

Key to genera

- 1. External border of anterior femora toothed between spines. 3 discoidal spines.
. *Omomantis*
- External border of anterior femora smooth between spines. 4 discoidal spines. . . 2
- 2. Discoidal area and, to a lesser extent, costal area of wings with black or red bands.
. 3
- Wings never with black or red bands in discoidal and costal areas.
. 6
- 3. Inner apical lobes of anterior coxa contiguous. *Plistospilota*
- Inner apical lobes of anterior coxa divergent. 4
- 4. Tip of discoidal area of wings traversed by numerous parallel tightly packed sigmoidal veins. *Polyspilota*
- Tip of discoidal area of wings without tightly packed sigmoidal veins. 5
- 5. Metazone of pronotum shorter than anterior coxa. *Prohierodula*
- Metazone of pronotum at least as long or much longer than anterior coxa.
. *Cataspilota*
synonym *Calospilota* Giglio-Tos
- 6. First segment of tarsus of hind leg at most as long as the three following segments together. 7
- First segment of tarsus of hind leg as long or longer than all remaining segments together. 9
- 7. Inner apical lobes of anterior coxa divergent. *Oromantis*
synonym *Uromantis* Giglio-Tos
- Inner apical lobes of anterior coxa contiguous. 8
- 8. Mid and hind legs conspicuously short. *Phaeomantis*
- Mid and hind legs normal. *Stagmomantis*
synonyms *Stauromantis* Giglio-Tos, *Auromantis* Giglio-Tos
- 9. Metazone of pronotum clearly shorter than anterior coxa. 10
- Metazone of pronotum roughly as long or longer than anterior coxa. 11

10.	Wings clear.	<i>Palaeophorina</i>
-	Wings smoky brown.	<i>Pictomantis</i>
11.	Claw-groove in middle or distal half of anterior femur.	12
-	Claw-groove in proximal half of anterior femur.	18
12.	Wings of female markedly shortened.	13
-	Wings of female well developed, or only a little shortened.	14
13.	Cerci simple.	<i>Tauromantis</i>
-	Cerci compressed.	<i>Phasmomantis</i>
14.	Eyes in the form of a blunt cone.	<i>Mesopteryx</i>
-	Eyes rounded.	15
15.	Claw-groove in distal part of anterior femur.	<i>Statilia</i>
-	Claw-groove in middle of anterior femur.	16
16.	Mid and hind femora with apical spine.	<i>Tenodera</i>
	synonyms <i>Paratenoderia</i> Rehn, <i>Epitenoderia</i> Giglio-Tos	
-	Mid and hind femora without apical spine.	17
17.	Inner face of anterior coxa with one basal non-callous spot.	<i>Mantis</i>
-	Inner face of anterior coxa with several callous spots. <i>Paramantis</i> Roy, 1967, p. 134	
18.	Inner apical lobes of anterior coxa divergent.	<i>Bisanthe</i>
-	Inner apical lobes of anterior coxa contiguous.	19
19.	Frontal sclerite fairly markedly transverse.	<i>Notomantis</i>
-	Frontal sclerite not or only a little transverse.	20
20.	Wings of female with transverse yellow band in discoidal area.	<i>Isomantis</i>
-	Wings of both sexes of uniform colour, clear or smoky brown.	21
21.	Sides of pronotum strongly toothed.	<i>Alalomantis</i>
-	Sides of pronotum at most very finely toothed.	22
22.	Costal area of elytra with widely meshed veins.	23
-	Costal area of elytra with very fine, densely meshed veins.	24
23.	Metazone of pronotum simple.	<i>Hierodulella</i>
-	Metazone of pronotum with lamellar expansions.	<i>Pnigomantis</i>
24.	Discoidal area of elytra completely clear.	<i>Tarachomantis</i>
-	Discoidal area of elytra opaque, at least in the costal edge.	25

25. Frontal sclerite not transverse. *Hierodula*
 synonyms *Rhombodera* Burmeister, *Sphodromantis* Stål,
Rhomboderella Giglio-Tos, *Parhierodula* Giglio-Tos,
Rhomboderula Giglio-Tos, *Ephierodula* Giglio-Tos,
Camelomantis Giglio-Tos, *Tamolonica* Werner,
Zopheromantis Tindale
- Frontal sclerite clearly transverse. *Tisma*

Tribe Miomantini

Key to genera

1. Anterior femur with 5 outer spines. 2
 - Anterior femur with 4 outer spines. 3
2. Very thin insects. Supra-anal plate very long, lanceolate. *Ischnomantis*
 - Normally proportioned insects. Supra-anal plate not prolonged, scarcely longer than broad. *Iris*
3. Mid and hind femora with large preapical lobes. *Phyllomantis*
 - Mid and hind femora simple. 4
4. First segment of tarsus of hind leg at most as long as the next three segments taken together. 5
 - First segment of tarsus of hind leg roughly as long or longer than all the remaining segments taken together. 8
5. Anterior tibia with 8-14 outer spines. 6
 - Anterior tibia with 7 outer spines. 7
6. Inner apical lobes of anterior coxa contiguous. *Trachymantis*
 - Inner apical lobes of anterior coxa divergent. *Sphodropoda*
 synonym *Ngawala* Tindale
7. Dorsal border of anterior femur straight. *Parasphendale*
 synonym *Carvilia* Kirby
 - Dorsal border of anterior femur distally curved, with lamellar expansion.
 *Cilnia*
 synonym *Leomantis* Rehn
8. Metazone of pronotum considerably longer than anterior coxa. 9
 - Metazone of pronotum at most just a little longer than anterior coxa.
 12
9. Supra-anal plate markedly prolonged, lanceolate. 10
 - Supra-anal plate not prolonged, transverse. 11

10. Hind tibia with small spines inferiorly. *Eremoplana*
- Hind tibia without small spines inferiorly. *Solygia*
11. Apical lobe of wing prolonged, extending well beyond anal lobe. *Euchomena*
- Apical lobe of wing not prolonged. *Deiphobella*
12. Wings completely absent (may have reduced elytra). 13
- Wings normally developed or shortened, but never completely absent.
. 14
13. Anterior tibia with 7-8 outer spines. *Geomantis*
- Anterior tibia with 6 outer spines. *Geotherpis*
14. Hind tibia without small spines inferiorly, only bristles. 15
- Hind tibia with small spines inferiorly. 20
15. Supra-anal plate longer than broad. 16
- Supra-anal plate transverse. 17
16. Anterior tibia with 7 outer spines. *Miomantis*
synonyms *Calidomantis* Rehn, *Oreomantis* Uvarov
- Anterior tibia with 10 outer spines. *Callimantis*
17. Costal area of elytra of female expanded, broader than half the discoidal area.
. 18
- Costal area of elytra of female not expanded, thinner than half the discoidal area.
. 19
18. Wings of female with transverse yellow bands. *Paracilnia*
synonym *Zulumantis* Sjöstedt
- Wings of female clear. *Taumantis*
19. Pronotal disc with granulations. *Arria*
- Pronotal disc without granulations. *Neocilnia*
20. Supra-anal plate transverse. 21
- Supra-anal plate longer than broad. 24
21. Inner apical lobes of anterior coxa divergent. 22
- Inner apical lobes of anterior coxa contiguous. 23
22. Anterior tibia with 6 outer spines. *Carvilia* Stål
- Anterior tibia with 8-9 outer spines. *Bolivaria*
23. Metazone of pronotum scarcely twice as long as the prozone. *Pararivetina*
- Metazone of pronotum at least three times as long as the prozone. . . . *Pseudempusa*

24. Anterior tibia with 7-8 outer spines. 25
 - Anterior tibia with 9-10 outer spines. 26
25. Claw-groove in proximal part of anterior femur. *Rivetina*
 synonyms *Fischeria* Saussure, *Eufischeriella* Giglio-Tos
- Claw-groove in middle of anterior femur. *Deiphobe*
 synonym *Sphendale* Stål
26. Wings of male long, longer than the abdomen. *Microthespis*
 - Wings of male short, shorter than the abdomen. *Teddia*
- * Also included by Giglio-Tos: *Severinia*
 Beier has *Gretella* Werner as *genus incertae sedis*.
- + *Indothespis* Werner
Beesoniella Werner



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Mantis abstracts

The following are abstracts from papers published recently. 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.

Cleal, K.S. & Prete, F.R. (1996) The predatory strike of free ranging praying mantises, *Sphodromantis lineola* (Burmeister): II. Strikes in the horizontal plane. *Brain Behavior and Evolution*, **48**(4): 191-204.

The predatory behaviour of free ranging praying mantises, *Sphodromantis lineola* (Burmeister), in response to prey at various positions in the horizontal plane was examined using high speed (200 frames per second) videography. We found that the movements of the meso- and metathoracic legs over the course of the strike were analogous in many respects to those made by the cockroach *Periplaneta americana* during escape turns. When mantises struck at prey directly ahead of them, they were propelled forward by extensions of the metathoracic femur-tibia, and the meso- and metathoracic coxa-femur joints (changes in the latter were determined indirectly via changes in the femur-pterothorax angles). This pattern of movements is similar to that of cockroach Type 1 turns. However, when prey lay to either side of the pterothorax-abdomen axis, mantises turned toward the prey as they struck. These turning movements were the result, primarily, of changes in the femur-thorax angles. Specifically, as the mantises turned toward the prey, contralateral mesothoracic femora and metathoracic tibiae and femora extended, and the corresponding ipsilateral joints extended to a lesser degree or flexed. This pattern of movements is similar to that of cockroach Type 2 turns. In addition, these leg movements were accompanied by flexion of the prothorax-abdomen angle which turned the prothorax even further in the direction of the prey. We found a stronger relationship between mantis leg movements and the position of the prey in relationship to the pterothorax than between the leg movements and the position of the prey in the visual field. Our data suggest that the praying mantis' central nervous system integrates proprioceptive and visual information in order to determine the location of prey in 'pterothorax-centred' rather than 'head-centred' space.

Cumming, G.S. (1996) Mantis movements by night and the interactions of sympatric bats and mantises. *Canadian Journal of Zoology*, **74**(9): 1771-1774.

Bat-insect interactions should be a useful source of case studies for the "arms race" of predator and prey adaptations; currently, well-detailed examples are needed for the formulation of general hypotheses. In this paper I add to information on bat-mantis interactions, testing four predictions of the hypothesis that mantises with ears can detect and avoid bats: that mantises will fly by night, that they will be vulnerable to bats, that echolocating bats will be better at catching deafened than normal mantises, and that mantises which can hear bats' calls will take evasive action. I found that tagged *Miomantis* cf. *natalica* Beier flew substantially on dark nights; indoors, undeafened mantises were better at avoiding *Rhinolophus clivosus* (Rhinolophidae: Microchiroptera) than were deafened mantises (n = 20 pairs; Mann-Whitney test, z = 4.58, p < 0.001). *Rhinolophus clivosus* echolocates at 80-85 kHz, implying that *M. cf. natalica* can hear higher frequencies than most mantises

(the usual best frequencies for mantises are 30-60 kHz); this is supported by D.D. Yager, who found that two other *Miomantis* species can hear at 80-150 kHz. The development of higher frequency hearing in *Miomantis* spp. was probably driven by predation from rhinolophid and hipposiderid bats, many of which echolocate at frequencies over 60 kHz. These taxa would be suitable for further research into predator-prey coevolution.

Iwasaki, T. (1996) Comparative studies on the life histories of two praying mantises, *Tenodera aridifolia* (Stoll) and *Tenodera angustipennis* Saussure (Mantodea: Mantidae): I. Temporal pattern of egg hatch and nymphal development. *Applied Entomology and Zoology*, **31**(3): 345-356.

The habitats of two praying mantises, *Tenodera aridifolia* and *T. angustipennis*, comprised different parts of grasslands in central Japan. The life histories were investigated in the habitat where each species was predominant. Egg hatch, nymphal development and adult emergence of the larger mantis, *T. aridifolia*, occurred earlier than those of the smaller congener, *T. angustipennis*. These three aspects of development of the former species were more divergent in timing than those of the latter. Durations and survival rates of nymphal and adult stages were slightly longer and higher, respectively, in *T. aridifolia* than in *T. angustipennis*.

Iwasaki, T., Aoyagi, M., Dodo, Y. & Ishii, M. (1996) Life history of the first generation of the dermestid beetle, *Thaumaglossa rufocapillata*. *Applied Entomology and Zoology*, **31**(3): 389-395.

The life history of the dermestid beetle, *Thaumaglossa rufocapillata*, in summer has been unknown, although adults are seen in spring and autumn, and the larvae of the overwintering generation are found in overwintering egg cases of praying mantises. Hatched egg cases of the two mantises, *Tenodera aridifolia* and *T. angustipennis*, were collected in southern Osaka in the summer of 1993 and 1994, and activities of the dermestid were observed. Adults emerged from August to October in 1993 and 1994. These individuals were considered to be the 1st generation. The temporal pattern of emergence was similar between the two mantis species. The mean number of adults emerging from an egg case, which ranged from 5.5 to 9.1, did not differ significantly between the two mantis species in the two years. The sex ratio in emerging adults was not biased from 1:1. The adult dermestids of the 1st generation emerged from 56.3% of hatched egg cases in *T. aridifolia* and 70.0% in *T. angustipennis* in 1993, and the rates were 65.0 and 70.0%, respectively, in 1994. The rates of the 1st generation were much higher than those of the overwintering one. The bethylid wasp, *Laelius* sp., was observed for the first time to parasitize the dermestid larvae.

Moran, M.D., Rooney, T.P. & Hurd, L.E. (1996) Top-down cascade from a bitrophic predator in an old-field community. *Ecology (Washington D. C.)*, **77**(7): 2219-2227.

We tested the hypothesis that a bitrophic (third and fourth level) arthropod predator can exert a cascading, top-down influence on other arthropods and plants in an early successional old field. First-stadium mantids, *Tenodera sinensis*, were added to replicated open-field plots in numbers corresponding to naturally occurring egg hatch density and allowed to remain for approx 2 months. Sticky-trap dispersal barriers around both control and mantid-addition plots allowed us to monitor emigration of arthropods continuously during the experiment. Biomass of herbivores, carnivores, and plants, and abundances of arthropod taxa within plots were

determined at the beginning, middle, and end of the experiment. The impact of mantids on the community was a top-down trophic cascade, beginning at the fourth trophic level and evident at each of the lower three levels. Mantids induced marked behavioral responses in other predators, but interference among predators did not prevent the trophic cascade. The most common predators, cursorial spiders, emigrated from mantid addition plots in significantly greater numbers than from controls. This behavioral response may have resulted from avoidance of predation or competition. Mantids decreased biomass of herbivorous arthropods through predation, and this decrease in turn increased biomass of plants. Therefore, these generalist predators were able to decrease herbivory enough to affect plant growth. This and other recent studies indicate that top-down effects can be important in structuring terrestrial communities. Ours is the first example of a top-down cascade by a generalist arthropod predator in a nonagricultural ecosystem and illustrates the importance of detecting behavioral responses in studies of trophic interactions.

Nel, A. & Roy, R. (1996) Revision of the fossil "mantid" and "ephemerid" species described by Piton from the Palaeocene of Menat (France) (Mantodea: Chaeteessidae, Mantidae, Ensifera: Tettigonioidea). *European Journal of Entomology*, **93**(2): 223-234.

Some fossil insects from the Palaeocene of Menat (France), described by Piton as Mantodea, but also Ephemeroptera are revised. The presence of the Neotropical mantid family Chaeteessidae in the Palaeocene of France, inferred by Gratshev & Zherikhin, is confirmed. The presence in Menat of the mantid family Empusidae was an error of interpretation. The order Ephemeroptera is represented only by an undescribed nymph. Biogeographic implications are discussed briefly.

Prete, F.R. & Cleal, K.S. (1996) The predatory strike of free ranging praying mantises, *Sphodromantis lineola* (Burmeister): I. Strikes in the mid-sagittal plane. *Brain Behavior and Evolution*, **48**(4): 173-190.

The predatory behaviour of free ranging praying mantises, *Sphodromantis lineola* (Burmeister), in response to prey at various positions in the midsagittal plane, was examined using high speed (200 frames per second) videography. Predatory strikes fell neatly into two categories based on the elevation of the prey from the surface on which the mantises stood: high strikes and low strikes. When the prey was 35 degree or more above the surface (measured from the mesothoracic tarsus), mantises assumed a posture that elevated and pointed the body upwards (high strikes). When prey was near or below the surface on which the mantises stood, they assumed a posture that lowered the body and shifted its centre of gravity forward (low strikes). Each of these two initial postures was followed by distinctly different constellations of movements, which included a rapid grasping movement of the raptorial forelegs and, if the prey was sufficiently distant, a displacement of the body upwards (high strikes) or forwards (low strikes). Our analyses suggest that prothoracic angle and, to a lesser degree, head angle and the degree to which the mesothoracic legs are extended provide the critical proprioceptive cues used in programming the appropriate attack sequence. Based on our results, we hypothesize that mantises process visual and proprioceptive information indicating prey location in 'pterothorax-centred space'.

Roy, R. (1996) Revision of the Sibyllinae (Mantodea). *Bulletin du Museum National d'Histoire Naturelle Section A Zoologie Biologie et Ecologie Animales*, **18**(1-2): 69-138. [In French].

The exclusively African subfamily Sibyllinae, with the type genus *Sibylla* Stål, 1856, is fully revised by examining more than 1000 specimens. Identification keys are provided at all the levels, and descriptions with measurements and illustrations are given for all the taxa, while an inventory of known specimens is established for each. One genus, one subgenus and six species are newly named, and an attempt of evolutive scheme is provided, from morphological, biogeographical and biological data. New genus: *Leptosibylla*; new subgenus: *Sibyllopsis*; new species: *Leptosibylla gracilis*, *Presibylla speciosa*, *Sibylla maculosa*, *S. marmorata*, *S. operosa*, *S. punctata*.

Yaseen, A.E., Mostafa, F.M. & Kawashti, I.S. (1996) Karyological studies on five Egyptian species of Dictyoptera (Pterygota: Insecta). *Cytologia (Tokyo)*, **61**(3): 285-295.

Chromosomes in five species of the order Dictyoptera *Periplaneta americana*, *Blattella germanica*, *Supella supellecillum*, *Mantis religiosa* and *Sphodromantis bioculata* have been studied. In *Periplaneta americana* (Family Blattellidae), the diploid chromosome number of 32 + XX in females and 32 + XO in males was observed, while the diploid chromosome number in the two species *Blattella germanica* and *Supella supellecillum* (Family Blattellidae) were 22 XX in female, 22 + XO males and 18 + XX in females, 18 + XO in males respectively. The diploid chromosome number for the two species *Mantis religiosa* and *Sphodromantis bioculata* (Family Mantidae) were determined to be 26 + XX in females, 26 + XO in males and 22 + XX in females, 22 + XO in males respectively. Karyotypic data for these five species had been studied in details. These results are reported for the first times in Egypt.

MSG Meeting

The Blattodea Culture Group have invited the MSG to hold a combined meeting on 17th May. The meeting will be at the Nature Centre, Pebble Mill, Birmingham. Details are still being arranged but it is expected to last all day and there will probably be several talks or slide shows. Both groups will be putting on a display of live and preserved insects. The next *MSG Newsletter* will be out in May but could be too late for the meeting; if you want further details and a map then send a self-addressed envelope to Phil Bragg, 51 Longfield Lane, Ilkeston, Derbyshire, DE7 4DX.

Cockroaches

Interested in cockroaches? The Blattodea Culture Group produces a newsletter for people interested in culturing cockroaches. For further information contact: The Blattodea Culture Group, c/o Adrian Durkin, 8 Foley Road, Pedmore, Stourbridge, West Midlands, DY9 0RT, U.K.