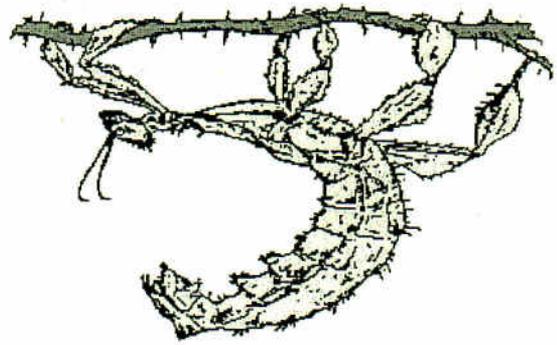
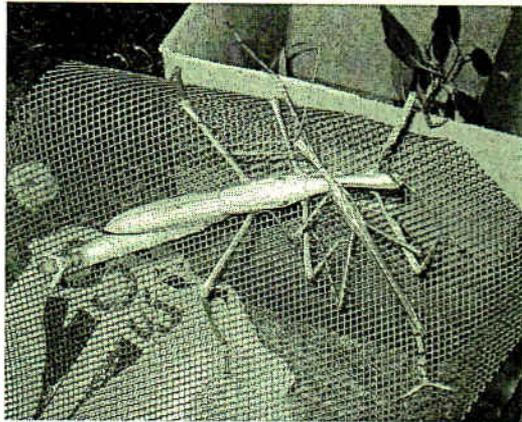


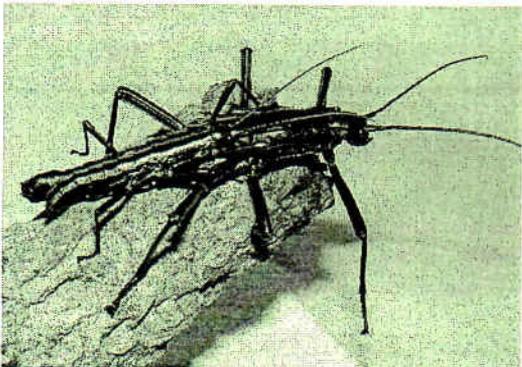
The Phasmid Study Group



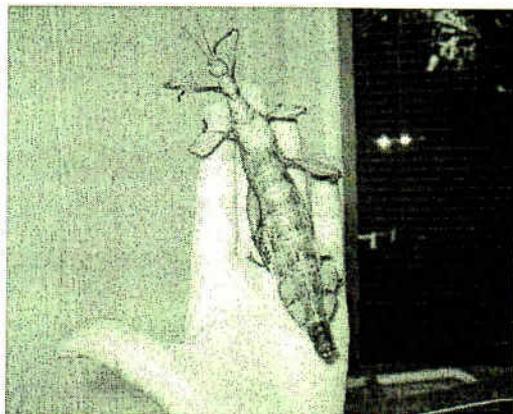
**SEPTEMBER 2003
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Eurycnema goliath.



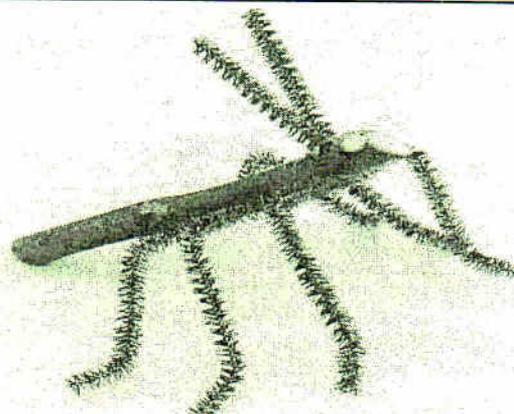
Anisomorpha monstrosa



STICK TALK

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Sticky Business

Diary Dates

Bugs & Beasties Show (later this year, date unknown)
Selby, North Yorkshire (Contact Steve Dye, www.bugsstuff.co.uk).

West of England Creepy Crawly Show (later this year, date etc unknown)

Lincoln Exotics (formerly: Invert) Show

Sunday, 7th September 2003. Main Hall, North Kesteven Centre, Lincoln.
(Just off the A1434, which is off the A46). (Contact Jim Tweadle, 01522 501241,
e-mail: jimtweadle@jungledesigns.freemove.co.uk). (Joy Gartside & Sally Ewen running a PSG stall here).

Castle Drogo, AES Bugshow!

25th October 2003, 11am-4.30pm, at Castle Drogo, Devon.

AES Exhibition

Saturday, 4th October, 2003, 11am. Kempton Park Racecourse, Staines Road, Kempton Park, Sunbury-on Thames, Middlesex.
Contact: AES, PO Box 8774, London, SW7; E-mail: wayne@theaes.org

PSG Winter Meeting and AGM

Saturday, 17th January, 11.30 am, Spencer Gallery, Natural History Museum, Cromwell Road, London.

Spring Entomological (formerly Kettering) Show

10.30 am, Sunday, March 28th 2004; Kettering Leisure Village. (Contact Jack Harris, 01455 444792).

British Tarantula Society Exhibition

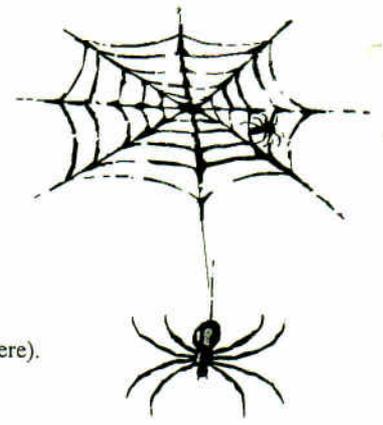
11am, Sunday, TBA May 2004. Woodgreen High School, Wednesbury, West Midlands. (2 mins from Junction 9 of the M6).
(Contact: Ray Hale 01323 489047).

PSG Summer Meeting

Saturday, TBA July 2004 – more details later.

Invertebrate Day at Colchester Zoo

Sunday, TBA August 2004 – Colchester Zoo, Maldon Road, Stanway, Essex. 01206 331292.



Please check with the organisers that shows are still on, & at times shown, before setting out - the PSG cannot be responsible for a wasted journey.

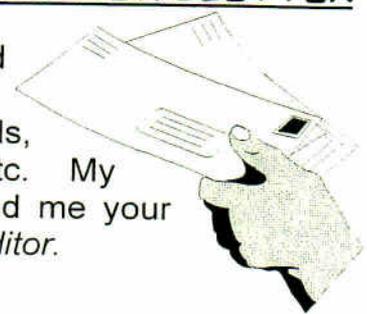
If you attend these or other shows, please send in a review for the newsletter.

If you are aware of any additional shows involving phasmids, or other insects, spiders, etc, however big or small the show, please pass the details on to the editor.

The Phasmid Study Group is invited to exhibit at some shows. If you would like to help run our stand, please contact the member named, or Paul Jennings, our Exhibitions and Meeting Officer: 89 Brackensdale Avenue, Derby, DE22 4AF, Tel: 01332 343477.

REQUEST FOR ARTICLES, ETC, FOR THE PSG NEWSLETTER

Please send me your articles, reviews on shows and meetings, wants & exchanges, drawings, photos, phasmid problems, answers to problems, crosswords, quizzes, puzzles, comments, web site details, etc, etc. My details are at the back of each Newsletter. Also send me your ideas or comments on the Newsletters. Many thanks, *Editor*.



PSG MEMBER KENNETH BLACKWELL

We regret to report to death of Kenneth Blackwell (PSG 271) of Westone, Northants, on 19 April 2003.

Editorial

Welcome to the September edition of the PSG Newsletter. I have never known such a hectic 3 months, seems like only yesterday that I was topping and tailing the June Newsletter.



OUR CONTRIBUTORS. As usual, we are greatly indebted to the considerable time and effort from our contributors; many thanks to you all for helping to make this Newsletter such a success. But do, please, keep the contributions coming in. And any member can send something in; I'd be pleased to hear from anyone.

THE NEWSLETTER. I was asked at the last PSG Committee Meeting what members liked and disliked about the Newsletter. I had to say that I got very little feedback but, what comments I have had, have generally been favourable. I've seen a recent postcard to Paul Brock saying they liked Joy's cartoon, Cameron's articles often attract excellent comments, I've had good feedback on the colour pictures of course, and a couple of letters to me said their favourite part was the puzzle page (sorry, but no-one sent me a quiz or crossword etc this time). Criticisms have been that there were not enough articles (we have had more articles per Newsletter since then), and that the fonts were too big and pages too sprawling (I've tried to address that too). If there are any changes you would like to see, please let me know; indeed I would welcome your views and comments, good or bad, so I can look into ensuring the Newsletter is a great read for all of our members.

THE COMMITTEE MEETING. Speaking of the last committee meeting, we had a great idea for the January PSG Meeting and, if successful, it may become a regular feature of all our meetings. It is a livestock and picture competition. Details of it are within this Newsletter (page 11), full rules etc should be in the December Newsletter. But basically, start grooming your sticks (any stick insect is eligible), and start painting or photographing them. Any number of entries per person is allowed, and there are prizes for the winners. All members are eligible to take part. As a bonus, the entries will give us all some interesting livestock and pictures to look at and to admire on the meeting day. The competition is being organised by our new committee member, Cameron, who is putting much effort into it, so I'm sure it will be a great success.

MEMBERS' CULTURE LIST. Another major item in the Newsletter is the Members' Culture List. Again there is mention of this elsewhere in this Newsletter (page 14). But basically, the list has been sent out with this Newsletter, and we want you to use it to tell us what livestock you currently have. Then we can have a comprehensive list of what species are and are not still in culture. But rest assured, this information on which cultures we each hold will remain anonymous, and your personal details will not be passed on to other members. This exercise was carried out many years ago and proved very interesting. It is also something successfully carried out recently by our European sister organisation. But it will not work without YOUR assistance, so please, please, just take a few minutes to complete the list, and post it back to Janine at the address shown at the top of the list. It is hoped that, by the January PSG Meeting, we will be able to announce what species are still in culture, and maybe there will be some surprises.

SHOWS & EXHIBITIONS. Now for a special thank you to the helpers on PSG stands at shows. We have a core of hard workers that regularly attend shows on our behalf; informing people about stick insects, gaining new members, and gathering funds for our coffers. Such names as Paul Brock, Paul Taylor, Phil Bragg, and Janine Fletcher, spring to mind. And, most importantly, Paul Jennings, our Exhibition and Meetings Officer, who puts so much effort into making the arrangements. Recently we have had a number of new helpers offering their time and efforts so the PSG can have a good showing at the Colchester Zoo Invertebrate Day, and the Lincoln Show, so our special thanks go out to Lois, Veronica, Joy, and Sally. If you are willing and able to help run a PSG stand at a show, please contact Paul Jennings our Exhibition and Meetings Officer.

Regards to all

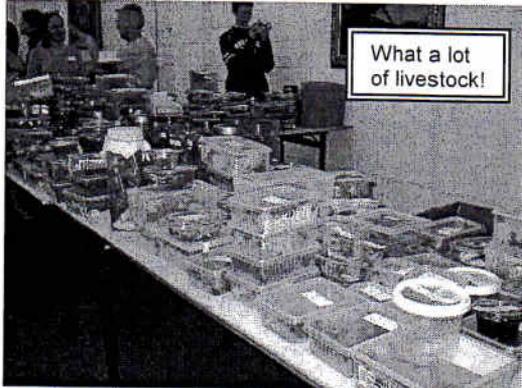
MIKE SMITH



THE PSG SUMMER MEETING by Mike Smith

What a day we had, where do I start? Well, for me it began when I offered a room to Timm Reinhardt, who came to England from Germany just to go to the meeting. I was really looking forward to meeting Timm, he seemed such a nice chap from our correspondence, and his articles in the Newsletter, and I was not disappointed when I met him face to face. I'd literally just returned from a week's holiday when I picked Timm up from the airport on the Friday, and when we left for the PSG meeting early Saturday morning I'd neither unpacked nor had enough sleep. But we got on really well, and the journey was soon over. My daughter Tracey could not make it this time.

We arrived at the museum too early for the meeting so, as planned, I showed Timm round the museum. I'd told Timm all about the dinosaur exhibition, and



What a lot of livestock!

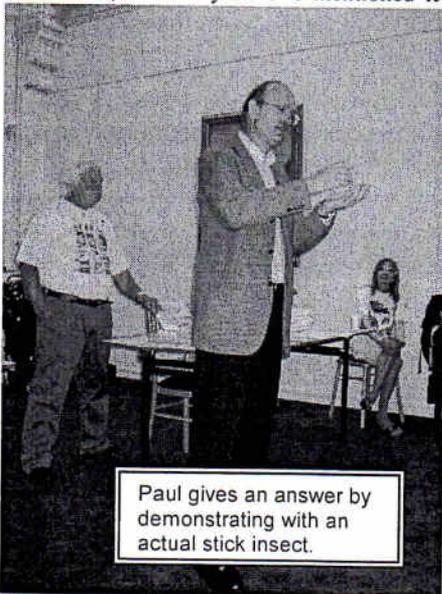
he was really looking forward to seeing it – but it was a bit of a disappointment to find most of it happened to be closed that day...

Next stop the insect room. The creepy crawly exhibition is mainly aimed at children, but it is fun watching the live leaf-cutter ants there. I also think Timm rather enjoyed the simulated earthquake we went to next! If you do ever get to go to a PSG meeting at the Natural History Museum, get there early (it opens at 10am), and have a good look round it before the meeting starts – it really is a great place, and ideally you need to spend the day there.

Anyway, we had timed it right – when we arrived at the meeting the chairs and tables had already been put out. Sorry about that Judith. I introduced Timm all

round, so he could put faces to all the people he had spoken to so often, then I chatted to the committee. There was a potential disaster looming; it was gone half past eleven, and only a disappointingly few members had turned up so far. Worse still, we had no speakers to give a talk (the agenda was written before speakers were found), and Phil Bragg was off sick, so we had no agenda for the committee meeting.

But after that, things just got better and better. We had our committee meeting and came up with a couple of ideas. Instead of a talk, we would have a question and answer session. And for the next meeting we would have a competition for best stick insect and best photo/picture of a stick insect (more about that elsewhere in this Newsletter, but everyone I've mentioned it to thinks it a wonderful idea). As we were having our committee meeting, so more and more members were

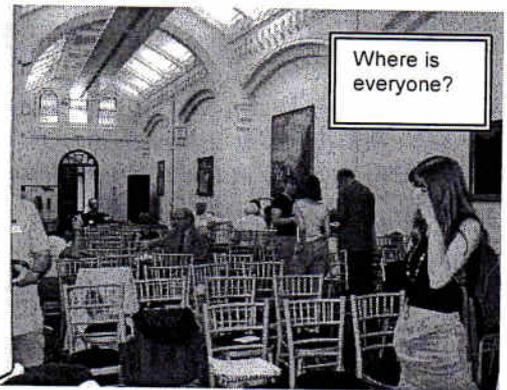


Paul gives an answer by demonstrating with an actual stick insect.

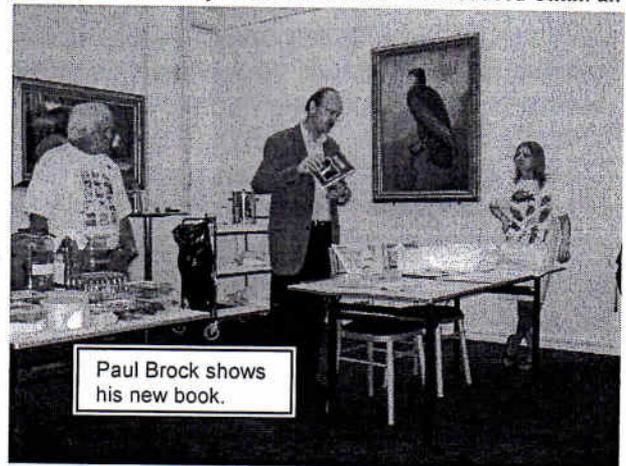
turning up, till we had a reasonable number in the end. In hindsight, we believe some members were off sick (there was a lot of sickness about then), and also there were the Wimbledon tennis finals that day, so maybe our turnout was quite good considering. And the livestock table, if anything, had more stock on it than usual.

Judith Marshall, our Chairman, opened the proceedings and welcomed all the members. Then Paul Brock introduced the members to the table of PSG merchandise, explaining what was available on sale, including his new edition book "Rearing and Studying Stick and Leaf Insects", and his new CD he had compiled with Daniel Otte: "The Phasmida Species File" (more about these elsewhere in this Newsletter), and these two items were apparently selling like hot cakes.

Then came the question and answer session. A bit like Gardener's Question Time, but less formal, and it was about stick insects rather than the garden. Ian Abercrombie led the session, taking questions from the members and answering them himself or calling upon our resident experts like Paul Brock to help out. As the members and experts warmed to their subjects, it proved one of the most interesting and informative sessions we have ever had at a meeting. Everybody said how much they enjoyed it, and I'd not be surprised if it does not become a regular feature of our meetings, by popular demand.



Where is everyone?

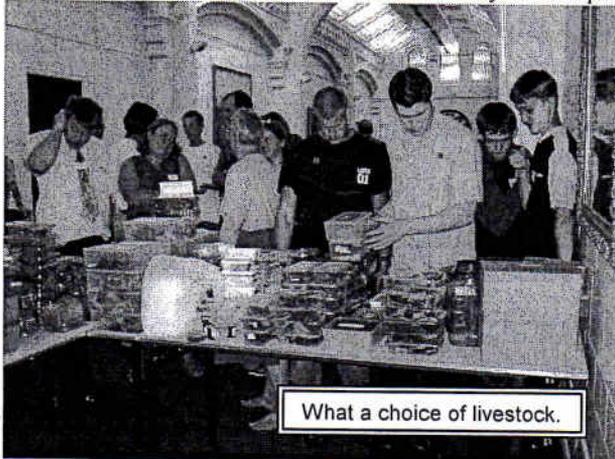


Paul Brock shows his new book.



Ian saying: "You can have two, if you want one."

There was an excellent discussion on various subjects eg on food plants. The general consensus of the "experts" was that many sticks eat many plants, so mix and match and experiment - especially with foodstuffs you have easy access to. There were some provisos, as I recall, eg do not feed with plants that may have been sprayed with insecticide, have a food plant in reserve if you are training a stick to feed on a summer-only food, some foods may make the stick change colour, and used alone some plants may not give the required nutrients to a particular stick insect. While convention dictates that privet, ivy, and young shoots of bramble, MAY be poisonous to some sticks, it was suggested that this is unlikely to be a problem as sticks will not (except in very rare cases) eat where the food is poisonous to them. I believe they said there are also some plants that will be eaten by nymphs and not adults, and vice versa.



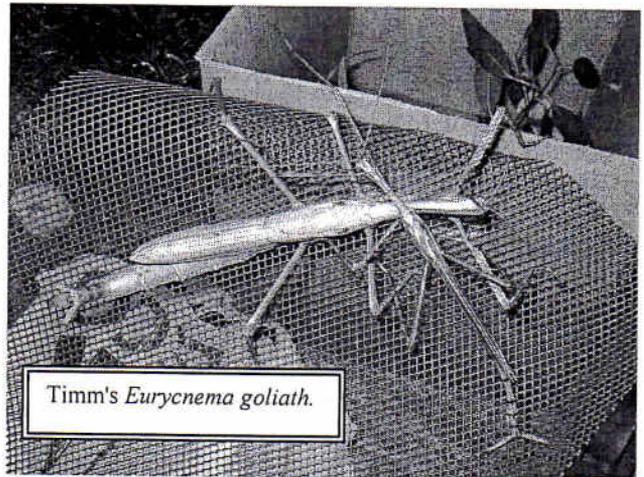
What a choice of livestock.

Personally, I would not experiment with a prized possession, eg if I had a rare stick insect I'd only feed it conventional food - just in case. But I may well try other foodstuffs as an experiment with common species, say 144s etc, though I mostly have access to common old bramble anyway. Perhaps if we all try some experiments, and make the results (both positive and negative) known, we can build up some very useful knowledge. Maybe we could also help update the food information on the PSG culture list.

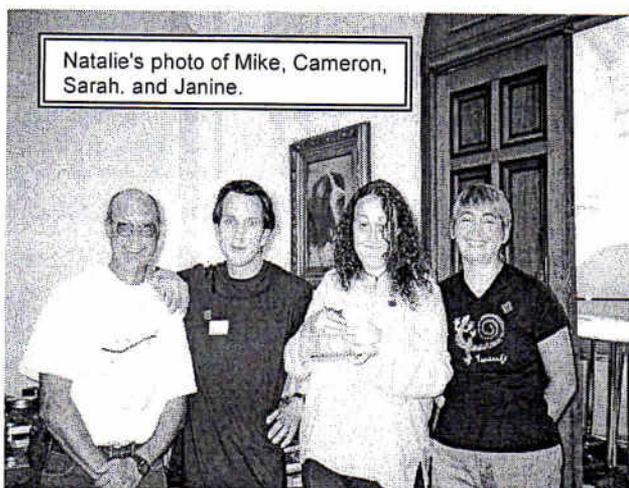
The discussion also covered the conventions on the naming of sticks, including why the *E. coriacea* should perhaps be *E. insularis*. Basically, the first name takes precedence over any subsequent naming; but there were some other, very complicated rules, as Judith explained (fortunately, not all the rules were covered at the meeting).

The other major event at the meeting was the lively, livestock exchange. Again Janine invited Ian to do the honours of dishing them out. Ian had a monumental task, however. We had more livestock than ever, it seemed; some unusual specimens, but much of it bread and butter stuff too, or duplicates - and a few less members than usual to pass them on to. Ian was magnificent but, for the first time I've ever known it, we had a few sticks left over. However, even these were picked up by members. Timm and I left the meeting laden down with sticks, only half of which we remembered asking for. (There were so many that Timm, who was of course delighted with them, could not fit them all into his luggage, so I sent them on to him by special postal delivery - in a very big box).

The highlight of the livestock table was a pair of *Eurycnema goliath*. Cameron brought a pair in for Timm to take back to Germany, and he brought another pair in for the livestock table. They had been receiving admiring glances all day, but when near the end Ian asked who wanted them, we were all so shell-shocked from the rest of the livestock exchange, that only Sarah put her hand up. I was not disappointed though, as I could not have had them because I have no access to the food they eat - which sadly is not bramble. These *E. goliaths* were in very big boxes, which is why Sarah and Timm were so laden down.



Timm's *Eurycnema goliath*.



Natalie's photo of Mike, Cameron, Sarah, and Janine.

Sarah Bowden had the biggest box of sticks I've ever seen. She said she had filled her small rucksack with sticks (which was all her partner said she was allowed to take home), but then put the leftovers into this enormous box (see photo on the next page).

As Timm and I were walking through the museum grounds on our way to our train home, we saw this big gaggle of people gathered in one corner. As we passed a little voice said "Hello Mike". On closer investigation, in the middle of this crowd was Sally Ewen, showing off her stick insects, to the enormous interest of every adult and child in a 100 metre radius it seemed. Apparently, a child had noticed her big bag of stick insects, so she let them have a closer look, then everyone else wanted to look too. However, Sally seemed quite comfortable, and appeared to be enjoying showing the sticks off, so we left her to it and commenced our long journey home. (Sorry, I did not get a photo of Sally).

All in all, the day panned out wonderfully well. I chatted with the PSG and Stick Talk regulars, Natalie took all our photos and posted them onto Stick Talk, and I purchased Paul's new book and CD. The next PSG meeting is the AGM in January; hope to see you there!

Sarah Bowden has also written an excellent review on the meeting, some of it from a slightly different perspective to mine. I must warn you that it includes some X Certificate stuff! Sarah, your articles never fail to amuse, it is always good to receive them. I get the impression there is never a dull moment when you are around.

Summer Phasmid Study Group Meeting - Saturday July 5th 2003 by Sarah Bowden

It was that time of the year again when I begged and stole all the tubs and containers I could find off of relatives, neighbours, and complete stranger's dustbins to make sure that any spare bugs I had could travel to London in style.

This year the journey wasn't so bad (see previous article in the September 2001, issue 88:1). I booked a coach from Somerset to Hammersmith, and then had to suffer the tube to South Kensington. This was the first year I've ever travelled to the meeting by myself, and fortunately my nightmare of becoming lost somewhere along the District and Circle lines didn't happen. Finally, I (sorry, we) arrived at the Natural History Museum, South Kensington, at about a quarter to twelve. It was brilliant to meet up with other people who I only ever see once or twice a year, and it was great to meet some new people as well

This meeting was a disappointing turn out, with only the 'regulars' attending, and we had no proper planned talks. However, Ian and Paul did a great Q&A session, including the benefits of diversity in a phasmid's diet, the reason why *Eurycantha coriacea* should be *Eurycantha insularis* and the change of name of PSG 82, formerly *Rhaphiderus scabrosus* now correctly identified as *Rhaphiderus spinigerus*. PSG 83 has now taken on the *scabrosus* suffix. Judith also did a great job of explaining the what's and why's of giving animals their Latin names, but it did get a bit confusing after a while!!!

There was a good side to the poor turnout. This meeting was one of the best I've ever seen for the range of less common stick insects at the livestock exchange. I believe that this was the first time ever when there was some livestock left over! I ended up coming away with a huge cardboard box packed full of stick insects, including some *Phaenopharos khaoyaiensis*, an adult pair of *Haaniella dehaanii*, *Heteropteryx dilatata* nymphs, *Acrophylla wuelfingi* nymphs, some adult *Brasidas samarensis* (beautiful insects - definitely my favourites!) and an adult pair of *Eurycnema goliath*.

Anyway, after battling my way from the museum to the tube (a big, big thank you to Natalie for making sure I got there safely!) I finally boarded the train to get to Hammersmith. When I arrived, I realised that there was an hour and a half to kill before my coach back to Somerset was due, so I decided to find a quiet pub and contemplate the day. I was sat at a table in The Trout, pint in one hand, when a small movement out of the corner of my eye caused me to glance at the cardboard box. I took a second look. A green head complete with waving antennae was quite happily gazing around the bar from a gap in the top of the cardboard. I quickly put down my drink and as quickly and discreetly as possible captured the escapee. Problem - a barmaid was approaching to empty the ashtrays. I'd only just bought my drink and didn't fancy getting kicked out of the pub before I'd finished it, so I did the only thing I could do at the time. I popped the *Brasidas* down the front of my top and leant an elbow on the top of the box, praying that no more renegade bugs would appear, and that no one would notice any untoward movement around my bosom.

The barmaid dutifully took her time cleaning out the offending ashtray, whilst I sat holding my breath for fear of dislodging the stick insect further into my undergarments and wearing the most inane grin on my reddening mug. Eventually, the time-wasting wench moved off to ashtrays anew, and with some difficulty, I managed to discreetly pluck the offending insect from my brassiere, opened the cardboard box, and replaced the fugitive back into its tub. After wrapping half a roll of sellotape around the tub, I thought (stupidly) that no more bugs could get out. Hmm. I caught the coach back to Somerset, which just happened to drop me off right in front of my local. I decided that it would be extremely rude not to pop in for a drink and tell everyone about my day, so in I went. You can guess the rest. Pint in hand, head pokes out of box..... well at least everyone knew what was in the box this time, so no more insects were subjected to Bra Tours 2003.

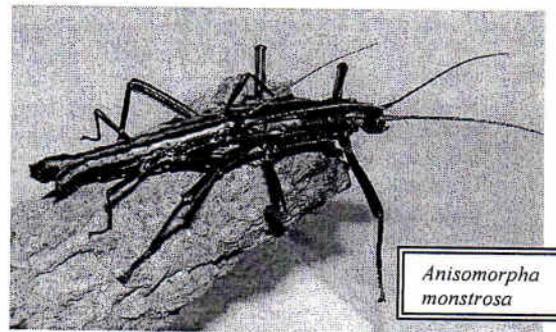
It was a great day, and if you've never been to a PSG meeting, I strongly suggest you go. You get to meet everyone, talk about sticks, swap ideas and theories about sticks, increase your menagerie of sticks, and learn more about sticks - it's great!



ABOUT PARACHUTISTS, LIVING WARNING SIGNS AND THE ODD MAN OUT!

On the subfamily Pseudophasmatinae - By Timm Reinhardt

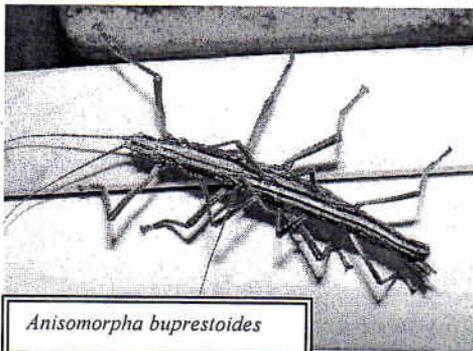
False ghost or *fraudulent spirit* is the literal meaning of their Greek name. Indeed referring to them as ghost is a well suiting description of the critters that lead a concealed life high in the treetops, hiding deep in crevices of hollowed trunks and resting between the leaf litter on the forest floor. The subfamily Pseudophasmatinae covers some of the perhaps strangest and most interesting phasmid species currently in culture. Furthermore the Pseudophasmatinae are one of the least homogenous subfamilies, being represented by genera like *Anisomorpha* on the one hand and *Pseudophasma* on the other hand, which on the first sight seem to have little in common.



Anisomorpha monstrosa

Disliked by some and adored by others, the Pseudophasmatinae divide the community of phasmid admirers. Therefore in the following paragraphs I shall concentrate on the remarkable aspects of this group of insects, and shall discuss one or two species in more detail. Unlike the majority of other phasmid species gathered in tropical Asia and Oceania, only this subfamily of the family Pseudophasmatinae, consisting of 5 tribes with somewhat 300 different species, are exclusively representatives of the new world insects.

Though appearance and behaviour differ greatly between the different tribes of *Pseudophasmatids*, there are some aspects that they all have in common, but which divide them from the other phasmid families. Taking a look at, for example, an adult *Anisomorpha monstrosa* HEBARD (PSG 122) female from Belize, the heavy cylindrical body is evident. Generally all *Pseudophasmatids* are short and cylindrical, appearing rather stocky and not remarkably large. Consequently most species range in size from 4 cm for the smallest, to 10 cm for the largest.



Anisomorpha buprestoides

Secondly, and this is why most Pseudophasmatinae species tend to have a bad image with quite a lot of phasmid enthusiasts, all species possess a pair of large glands, just behind the head on top of the first part of the thorax (called *prothorax*). This is used in order to produce and emit their typical strong defence odour. The milky white liquid is used to confuse and harm attacking predators, affecting their mucous membranes as well as disabling their senses. The odour is vaporised and sprayed upon the potential enemy at such a high pressure that it can still be effective at a distance of about 30cm. The effectiveness of their defence is even improved by the

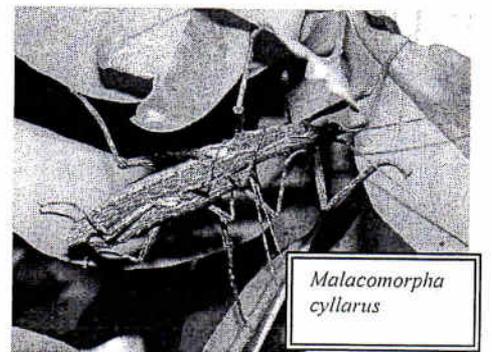
fact that the glands are connected to certain muscles enabling a 90° movement

Basically, although not taxonomically correct, the Pseudophasmatinae can be divided into two different groups sharing similar appearance and behaviour. On the one hand there are the *macropterous* and *brachypterous* species - in other words, those species that are fully or partially winged and often capable of flying quite reasonably. The numerous *Pseudophasma* are particularly representative of this group. Then on the other hand there are wingless (*apterous*) species such as the well-known *Anisomorpha* species. Currently there are around 15 Pseudophasmatinae species in 4 orders in culture although there are a lot more species and orders belonging to this subfamily. In the following I would like to concentrate on some of those species common in culture in some details.

Crevice creepers and romantics - *Anisomorpha* spp and *Malacomorpha jamaicana* REDTENBACHER (PSG 213) (*Pseudophasmatinae* → *Pseudophasmatinae* → *Anisomorphini*). Most wingless species of Pseudophasmatinae belong to the genus *Anisomorpha* or, like *Malacomorpha*, are nonetheless very closely related to *Anisomorpha*. They live close to the ground, feeding on low growing plants and shrubs in the wild. All species are nocturnal. During daytime they hide underneath dead leaves or loose bark, or in hollows in the trunks and roots of trees, in order to avoid being discovered by day-active predators. Consequently high numbers of individuals can often be found resting together in suitable places, forming a "sleeping community" during daytime.

As a result of their way of life and habitat, most wingless *Pseudophasmatinae* are extremely stocky and appear rather plump. With their short but strong legs and a broad slightly flattened body, they can squeeze into the smallest gaps and have a tight grip on the rough wooden surface of tree trunks and branches. Moreover the defence fluid *Anisomorpha* and *Malacomorpha* emit is extremely strong and the insects do not hesitate to spray it on every intruder or possible enemy.

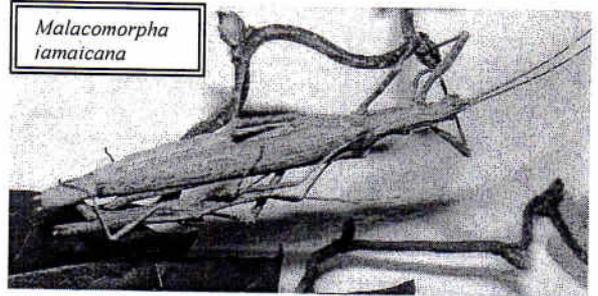
Nevertheless this aggressive and poisonous behaviour is also the main reason for the pretty and surprisingly colourful appearance of most *Anisomorpha* species. In fact the *Anisomorpha* species are walking warning signs. The bright colours and the stripe pattern symbolise "I'm poisonous and taste horrible so leave me alone!". The combination of red (*A. monstrosa*) or white (*A. buprestoides* (PSG 12), *A. ferruginea* (PSG 198) both from the USA) stripes on shiny black background seems in this case to be especially efficient. This startle colour is called aposematic or warning and it is definitely noticeable that although not less venomous, *Malacomorpha jamaicana* did not develop any kind of bright coloration and instead remained greyish black or brown.



Malacomorpha cyllarus

Apart from the attractive appearance, *Anisomorpha* also has another remarkable trait concerning their behaviour. Unlike all the other species of stick insects, all members of the order *Anisomorpha* are monogamous, a behaviour that is scarcely ever observed amongst insects in general. *Anisomorpha* males are extremely small and slender, even for a stick insect. In some species the males

measure only 1/3 the size of their massive female partner. Still, they have strong cerci (the pair of pincers on their rear end) which the male uses to attach to the rear end of the lady of his dreams. Usually this connection lasts their whole remaining life - the two will not part again until one partner dies. Sometimes adult males have been observed to attach even to sub-adult females in order to claim their mate as soon as possible because the competition for a mating partner is hard. Amazingly the female is able to moult properly even with the male attached to her during the procedure. Moreover if the female should die before her male, the male will even guard her after death for several days. All this may sound extremely romantic but actually has a very good biological reason. If the male stays on the back of his female he can make sure that no other male competitor will ever be able to fertilise this female's ova and therefore he can be sure that at least all the ova of his female will be carrying his genes.



Malacomorpha jamaicana

Malacomorpha jamaicana males are not that faithful to their females, compared with their close relatives. Although this Jamaican species will also stay attached to one female (sometimes for several weeks), they still change their mate from time to time. Anyhow they too have found a way to compete for an adored wife. If there are more males than females, they will inevitably fight for the ladies. In a manner similar to that of the large bulky and heavily armed *Eurycantha*, the slim small *Malacomorpha* males behave like brave warriors. Like *Eurycantha*, they usually start a fight by drumming on a well vibrating surface using their body and abdomen like a drumstick. I have never witnessed many fights or physical aggression but the fact that most of the males sooner or later will have shortened antennae and sometimes even lose half a leg overnight might hint on some kind of more serious fight taking place at night.

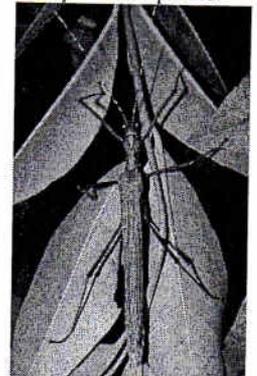
Flying ghosts and parachutists- *Pseudophasma* sp. (*Pseudophasmatinae* → *Pseudophasmatinae* → *Pseudophasmatini*) and *Malacomorpha cyllarus*. *Malacomorpha cyllarus* WESTWOOD (PSG 220) from Jamaica are very similar to their Jamaican fellows *Malacomorpha jamaicana*. Ova and nymphs of these two species look very much alike and even the adults do not differ much in either species except for the remarkable feature that *M. cyllarus* possess wings and their males at least are capable of flying. *M. cyllarus* males, are very slim and small and stay on the female's back for at least several days after the actual mating process. The females are plump and stocky and use their wings only for short downward glides, much like a parachute when falling. They too hide in hollows and holes near the ground during the daylight hours and only come out to feed when veiled by the darkness of night.



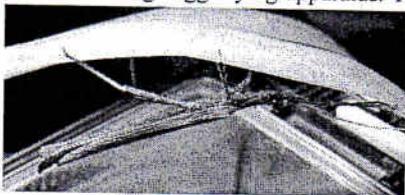
Pseudophasma sp.

On the other hand, the treetops are the home of the pilots amongst the Phasmids. *Pseudophasma* are fully winged insects with a much more slender body than their ground-dwelling relatives. Both sexes of all *Pseudophasma* species appear rather graceful, having long legs and antennae and exactly the right proportions in all body parts. Furthermore their large hindwings cover the full length of their abdomen and are quite often painted in bright colours. The eyes of some species are similarly bright. *Pseudophasma acanthonota* REDTENBACHER (PSG 189), for example, has shiny yellow eyes glowing like amber standing against the grey body colour. Curiously white-striped antennae are another outstanding characteristic of the larger nymphs and adults in several *Pseudophasma* species. (e.g. *P. rufipes* REDTENBACHER (PSG 85), *P. phthisica*, *P. acanthonota*).

Like in the majority of phasmid species, *Pseudophasma* males are naturally smaller than the females. Nonetheless, they are not as small as *Anisomorpha* males compared to their females. With their large wings, *Pseudophasma* are capable of flying quite reasonably. Actually a flying *Pseudophasma* is always a very impressive sight; sometimes red, sometimes black, flying adults resemble large butterflies rather than stick insects. In fact their wings are real multifunctional tools. Apart from flying and gliding they are also used for different defence purposes as a startle display. Moreover they can be used to confuse predators and, despite their bright colours, improve the insects' camouflage ability by attracting the enemy's attention on the red or black instead of the brown coloured body. Usually *Pseudophasma* are a lot more restrained in using their defence secretion although they are equally capable of emitting clouds of irritating vapour.



The odd end- *Creoxylus* sp. (*Pseudophasmatinae* → *Pseudophasmatinae* → *xerosomatini*). The only species that do not fit in the picture of the typical *Pseudophasmatid*, carefully created so far, are the insects belonging to the genus *Creoxylus*. They too are *Pseudophasmatinae*, but poorly show the typical characteristics. Male *Creoxylus* are long winged, usually grey or brown with faintly coloured wings. In the case of *Creoxylus spinosus* FABRICIUS (PSG 31) from Trinidad (probably the most common of these species in culture), the male's wings also show a small pink area right at the joint. The females on the other hand are completely wingless except for a set of very tiny wingbuds that are almost invisible. Furthermore the females are quite stocky and their rear end carries a strange egg laying apparatus. The so-called ovipositor resembles a duck bill and is used to deposit the small, slightly sticky eggs by use of three different methods. If possible the insects try to stick their eggs into small holes and gaps of bark or bury them in layers of lichen and moss. Sometimes the eggs are also simply stuck into the ground and, if no soil or suitable substrate is provided, the female will simply drop the egg onto the ground. In the case of *Creoxylus spinosus*, both sexes appear extremely warty with numerous tubercles on head, thorax and abdomen. In spite of their categorisation within the *Pseudophasmatinae*, *Creoxylus* do not emit any kind of unpleasant odour and have to rely completely on their good camouflage while they rest on the stems, trunks and branches of different trees.



In conclusion the *Pseudophasmatinae* are an extremely interesting subfamily and can in every respect compete with popular groups like Heteropteryginae or Phylliidae. All species are very interesting to watch and most of them are not difficult to breed and raise. Many

Pseudophasma and *Anisomorpha* feed preferably on privet (*Ligustrum* spp.) some also on lilac (*Syringa* spp.) and bramble (*Rubus* spp.). Airy conditions are often required by adults while nymphs need a certain humidity to grow and moult properly. Nevertheless, the defence odour should not be underestimated as it definitely can cause extreme reactions when it is carelessly rubbed into ones eyes, nose or mouth. Therefore *Pseudophasmatinae* are neither really suitable species for beginners nor good pets for younger children or asthmatic and allergic persons. Still, handled carefully, these squirting beasts can be a real enrichment for every phasmid collection.

References:

1. P.D. Brock, The Amazing World of Stick- and Leaf Insects; 1999
2. Phasmid Studies volume 10, no. 1, March 2001
3. Phasmid Studies volume 11, no. 2, June 2003
4. D. Otte & P. D. Brock, Phasmida Species File, 2003

And at last: actually I did already start this article in early May 2003, but after having read the latest Phasmid Studies (No. 2, 2003) I definitely had to change some of the taxonomic relations to keep the article as up to date as possible. Anyway I'd be very grateful for any comment or criticism. Moreover thanks to Sally L. Ewen for proof reading and all the nice encouragement.

Wow! Timm, this is a great article. These sticks are favourites of mine, but I never knew half of all that about them.

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THE BTS SHOW 18.5.03 A Review by Mike Smith

It was the 18th Birthday of the BTS show, and it was certainly a great day out to remember. I went with my daughter, Tracey. Although it was a quiet Sunday morning on the roads, and I was able to give the car a lot of wellie, it was still a gruelling 3 hour journey to reach the show. We arrived about 11.15am; which seemed just right as the queue was quite short by then.



I booked my photos into the competition first, and then we looked round the halls. Suddenly, the horrendous journey was made worthwhile. There were all sorts of critters on show and for sale, as far as the eye could see. It was not too crowded there either. There were tarantulas and scorpions of all shapes and sizes of course, but also lots of various insects (**stick insects**, mantids, beetles, butterflies, crickets, etc), many "odds and ends" like snails, millipedes, and centipedes, and of course the usual hardware that is needed for all the critters – cages, sub-strata, heat mats, forceps, thermometers, etc. Obviously, I took great interest in the stick insects. There was an enormous variety on sale, and they were excellent specimens.

I generally found the prices to be a bit on the high side for most things, considering it was a show. For example, I saw a magnificent pair of *Eurycantha coriacea*, an adult male and female, for sale at a staggering £25 (and they were sold). There were bargains to be had of course, but you needed to shop around and, just as importantly, buy it before someone else did! I also found the stall holders very willing to give advice to you, even if you were not buying from them.



I managed to find some bargains.....so many, that I ended up spending a fortune, like I always do. Tracey got some snails and scorpions, and I got a tarantula and some baby scorpions, plus we got some crickets and heatmats, and some books, and.....etc, etc. I was a bit disappointed that the scorpions had no species



name on the box. It did on the box they were shown in, but they must have changed boxes when they were sold. I was so busy asking about how to keep them, I forgot to ensure I had their name. I'll seek identification of them next year.

I met Janine our Livestock Coordinator there, which was nice. But I did not recognise anyone else from the PSG there. Yet last year I met quite a few members. But the day was quite fun-filled. We had an excellent, very reasonably priced meal in the canteen. We then went to Andrew Smith's lecture. It was on the tarantula *Poecilotheria rufidrata*, which he found, after two and a half weeks searching the Cardoman Hills of India. He also told us of his adventures with the car, the natives, and the terrain, and it was such an interesting lecture the hour seemed to disappear in a few minutes. Then it was the competition results.

Tracey and I stood there in hope. I had produced some excellent photos, if I do say so myself. The problem was that ALL the photos in the competition were excellent. Anyway, I did not win, but I'll certainly try again next year.

This is one of the best shows in my diary, though it helps that I am a tarantula fan, so if you are in the area next year, I'd recommend you pop in and have a good look round. I'll post the date, when I get it, on the diary page of the Newsletter.

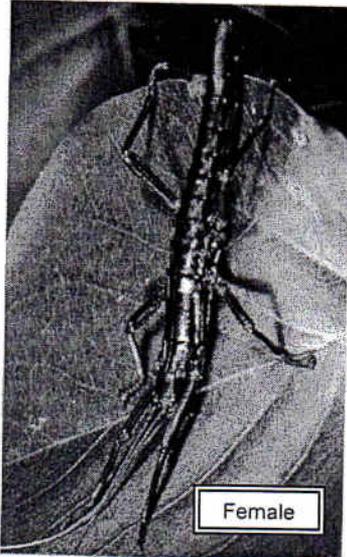
Arthropoda

As you may know, our PSG Newsletter articles are sometimes translated into German for the German magazine "Arthropoda". Well, I have at last got an opportunity to have some of their articles translated into English for the PSG Newsletter! The first two translations appears below (which, coincidentally were written by Oliver Zompro, a PSG member). Many thanks to Kai Schutte for supplying the articles, and to Timm Reinhardt for the translation.

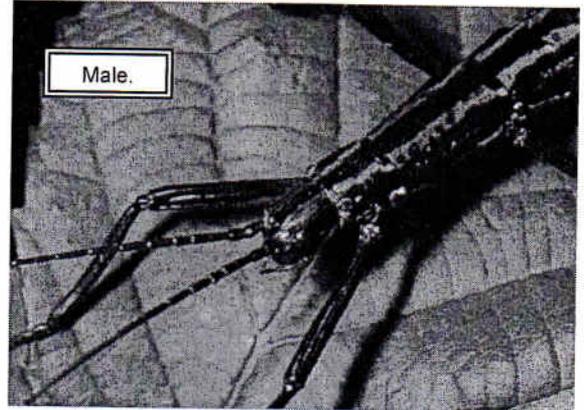
SOME REMARKS ON THE MATING BEHAVIOUR OF *ANISOMORPHA MONSTROSA* HEBARD 1932 (PSG 122)

By Oliver Zompro, first published in "Arthropoda" 5.4 (1997)

While male phasmids go through four juvenile instars, females mature after five nymphal instars. Consequently the female's development takes remarkably longer than the male's. Hence it is not unusual that male insects are full grown long before the final moults of the first female. In this case the males can be sometimes witnessed mating almost immediately after their final moult, as soon as their now full extended exoskeleton has hardened. In the genus *Anisomorpha*, the mating procedure lasts several months without intervention. Now the questions arises, how the still immature female is able to undergo the sensitive moulting procedure, usually taking place in the early morning, without being harmed but with a male attached.



When the author came home very early one morning and checked his cages as usual, he came across a single female apparently just perching up for moulting, attached to her a copulating male. Moulting took place in the usual manner and the female clung to its old exuvia for straightening and hardening its skin as normal. The male continued mating with the now empty skin. Having finished hardening, the female started



feeding on its old skin which fell to the ground soon, probably under the weight of the still attached male. Even this tumble from more than 55cm high did not disturb the male at all. Only when the skin slowly started drying up and the error became obvious, the male left the old exuvia to look out for a new female. Unfortunately this incident could not be documented by any means. So a female fifth instar nymph just before its last moult was separated in a cage together with a male. The procedure took place again as described above and the male was still attached to the female's exuvia, quickly fixed using a common ice-spray. Afterwards it was put in the freezer and treated in the way described by Zompro (1996)

References:

- Hebard, M. (1932) New species and records of Mexican Orthoptera. Trans. Am. Ent. Soc. 58: pp 214, pl.17
Zompro, O. (1996): Zum Sammeln, Transportieren, Konservieren und Züchten von Phasmiden. Ent. Z. 106(5): 194-202
Translation by Timm Reinhardt (2003)
Photos by Ron Baxter from his book "Rearing Stick and Leaf Insects" (added by the editor).

Species sheet: *Sungaya inexpectata* ZOMPRO, 1996

by Oliver Zompro first published in "Arthropoda" 5 (1)1997

Culture origin: Philippines, Luzon collected by O.Zompro. All individuals in culture are offspring of the holotype collected in 1995.

OZ No.: 271, PSG No: 195

Description: In general *S. inexpectata* is a rather typical representative of the subfamily Obriminae but the structure of their genitalia and the morphology of their ova differ remarkably from other orders in this subfamily. The adults are light yellowish brown in colour. The head is conical bearing a crown of several spines. The body is unarmed except from two projecting on the sides of the meso and metanotum. Growing up to 8,5 cm in length, *Sungaya* belongs to the medium sized Obriminae. Males are still unknown. The ova appear bellied in the middle unlike all *Obrimini* ova known so far.

Breeding: This species requires high humidity for a proper development. The ova are placed below different substrates. Suitable are moist sponges or simply rotting leaf litter left on the bottom of the tank. They are buried in batches every 10 days at a temperature of 25°C. It is advisable to collect the ova and incubate them separately on moist vermiculite in order to have a better control. Hatchlings are more than 1cm long and emerge after four months. They mature within three months and will commence egg-laying further three weeks later. Like most *Obrimini*, the adults are quite long living. They love to hide under pieces of bark and reproduce exclusively by parthenogenesis.



Nature's Chemical Warfare



Experiences of rearing *Alloeophasma cyllarus* (PSG 220)
and *Anisomorpha ferruginea* (PSG 198)

By Sally L. Ewen

I initially encountered *Alloeophasma cyllarus* and *Anisomorpha ferruginea* at my first ever PSG meeting, in July last year. I didn't know anything of these rather inconspicuous-looking species prior to the Livestock Distribution, and so did not instantly raise my hand when Ian picked up the box ready to give them away. However, I was very intrigued by the general response when Ian referred to them – with a tone of caution – as "sprayers". Most people shook their heads in decline, and I was left wondering what could be so bad about these rather anonymous-looking phasmids! Thus, rather foolishly perhaps, I raised my hand, and left at the end of the day with a tub of one and two tubs of the other.

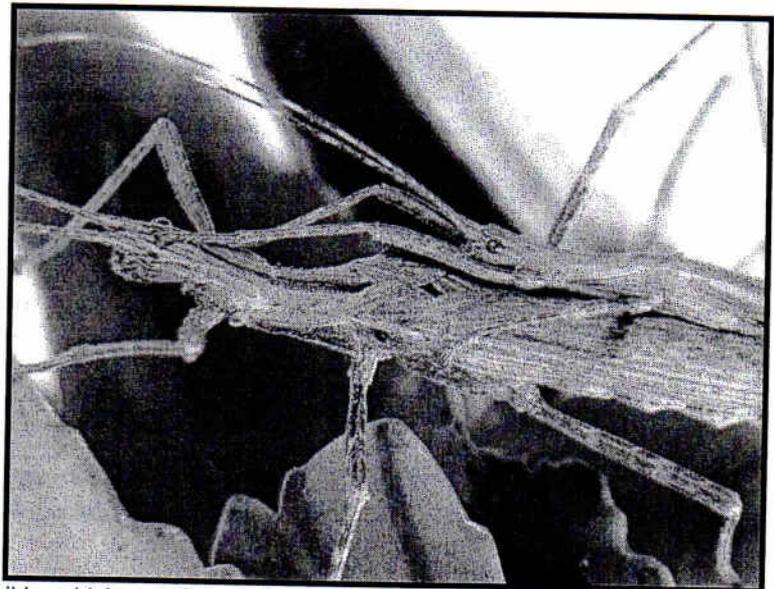
I have been rearing these species for almost a year now, and for some reason have actually become rather fond of "sprayers". In this short article I shall attempt to provide an introduction to these phasmids, and describe to you their rather effective chemical defence mechanism.

Alloeophasma cyllarus and *Anisomorpha ferruginea* are two species of the sub-family *Pseudophasmatinae*. They are similar in size, adult females being approximately 50-60 mm in body length, and adult males approximately 35-40 mm. *A. cyllarus* comes from Jamaica, whereas *A. ferruginea* is native to Southern USA.

Description of *Alloeophasma cyllarus*

All stages and both sexes of this species are a dull mottled brown colour. The texture of the body appears to be quite matt and almost 'feathery', which would aid the insect to blend in against a background of dead leaves and bark.

The adults of both sexes are visually similar, the only real difference being that males are a lot smaller and, as with many species of phasmids, they have a characteristic bump on the underside of the abdomen (known as the *subgenital plate*). Adults of this species have small, almost convex forewings, which are somewhat reminiscent of pointy shoulder pads! The hindwings, which reach down to the last abdominal segment when folded, are the same colour on the surface (*the pre-anal segment*) as the forewings, whilst the rest of the hind wing is seen to be translucent and almost colourless when outstretched.



When viewed from above, a thin black stripe is visible, which runs from between the eyes down to between the forewings. The long antennae of this species appear attractively stripy, being composed of alternating straw-coloured and dark brown-coloured segments.

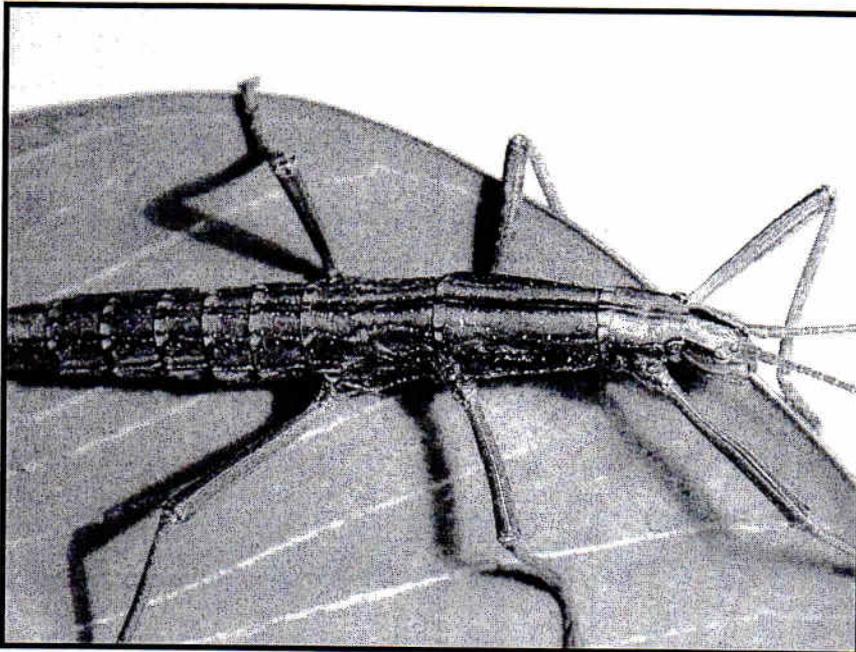
The ova are approximately 3mm in length, and are a dull ash-grey colour when dry. The operculum (lid) is barely visible, and the ovum as a whole could be described as being almost cylindrical in shape, with slightly rounded ends and being slightly swollen in the middle. Whilst writing this paragraph I accidentally crushed an ovum (sorry!) and noted, to my surprise, that the liquid contained within was deeply magenta-coloured. As with most phasmids, I keep the ova on a layer of vermiculite contained within a mesh-lidded plastic tub. I lightly spray the ova every few days, and I find that the nymphs hatch out after approximately 3-4 months.

Description of *Anisomorpha ferruginea*

Both sexes of *Anisomorpha ferruginea* are apterous (i.e. without wings). In contrast with *Alloeophasma cyllarus*, the body of this species is relatively glossy. Viewed from above, it would appear that the sausage-shaped body of the adults is predominantly dark brown, with two paler brown stripes running longitudinally down the length of the dorsal (i.e. upper) surface. As with *Alloeophasma cyllarus*, the main factor distinguishing males from females is their smaller size. In

addition, the aforementioned pale brown stripes are generally thinner in the males, making their body appear to be a darker colour overall.

The ova of this species are approximately 2-3 mm in length, and chocolate-brown in colour. Their shape is cylindrical though imperfect, and with irregular edges running down the length. Nymphs of this species generally hatch out within 3 months.



Culture

I keep both species in small, partially ventilated plastic tanks. I spray them rarely, since *Pseudophasmatinae* apparently prefer less humid conditions, and I feed them only on privet (*Ligustrum vulgare*) although I have read that lilac (*Syringa* spp.) is also accepted.

Defence tactics

Alloeophasma cyllarus and *Anisomorpha ferruginea* display similar defensive behaviour, much of which is characteristic of many members of the *Pseudophasmatinae*. Firstly, these species are notably crepuscular in nature (i.e. active in the twilight). This is typical of most phasmid species since it serves to protect them from daytime predators (for example, birds). However, the aforementioned two species go one step

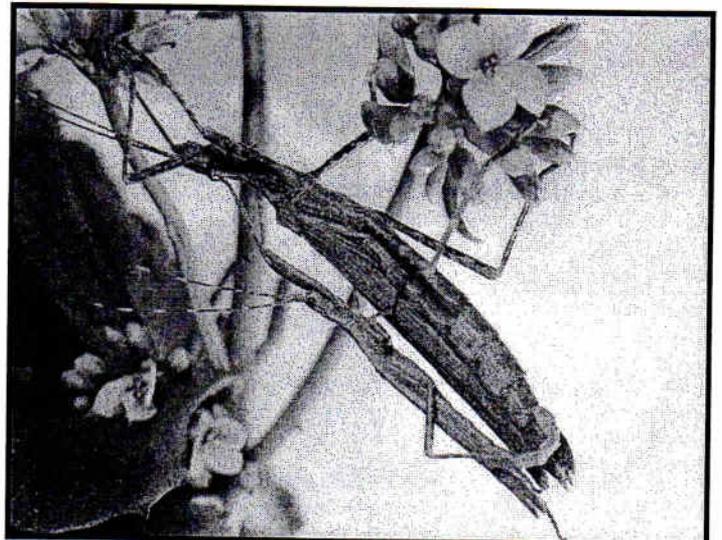
further, in that they actively search out dark crevices in which to hide, such as the underside of rocks and bark, and in the corners of their tank. If space is lacking, the insects will not hesitate to pile on top of one another, in order that they are all able to hide away in the dark. I have found that it helps to place a rolled up tube of corrugated cardboard, or something similar, in their tank. The insects like to hide in this during the daytime, and when I need to clean them out, I simply lift out the tube and all the insects come with it!

A second defence mechanism of this species is that they run fairly fast, and do not stop moving until they have found someplace secure in which to hide.

However, the most notable defence tactic is that, when threatened, they are capable of spraying a fine mist of a very offensive chemical. In both species this appears to originate on the pronotum, just below the head. You can actually see the spray when a light is shining behind the insects; using this set-up, I have seen *Alloeophasma cyllarus* emit a fountain 10cm high!

Because of this chemical defence mechanism, I'd suggest that "sprayers" be handled minimally, and should not be kept by children, nor by people prone to breathing difficulties or allergies.

The vapour emitted by *Anisomorpha ferruginea* smells a little like blue cheese, whereas that of *Alloeophasma cyllarus* smells somewhat peppery. Both contain a component that irritates the throat and nasal passage, causing one to cough and sneeze quite dramatically! If the chemicals enter a small wound, such as those inevitably caused by collecting bramble for one's phasmid collection, a stinging sensation is experienced, and the area can become red and enflamed. What's more, the spray of a related species, *Anisomorpha buprestoides*¹, has been observed to cause temporary blindness to man, though I personally have not had the misfortune of being sprayed in the eyes by any of the *Pseudophasmatinae*!



Conclusion

Okay, I realise that I have not painted too pleasant a picture of these two species, practically likening them to skunks or walking puffballs! Yet, as I said before, I personally am quite fond of these "sprayers". Is it simply an attraction to the more sinister side of nature, in the same way that some people are enthralled by Black Widow spiders, dangerous snakes and the like??? Or is it merely that I pity these very attractive insects, who are only behaving in a way that has enabled the species to survive amid the numerous predators that exist in their natural environment? Whatever the reason, I assure you

that they really are charming phasmids, and I thoroughly encourage the majority of you to consider adding some of the *Pseudophasmatinae* to your collection.

Afterword

Shortly after I wrote this article, my whole culture of *Alloeophasma cyllara* died within a few hours of one another. They became listless, and then fell to the ground twitching and jerking. These symptoms are indicative of pesticide poisoning, and indeed, I had just that day replaced their food. However I am a little confused, since I used the same source of (untreated) privet as always, and washed the leaves as usual before feeding them to my collection. Moreover, I had that same day placed privet from the exact same source into several other of my tanks, some of which contained young nymphs. Yet none of these other phasmids appeared to suffer. If anybody has any suggestions as to what went wrong, I would be grateful to hear from you. E-mail: sally.ewen@talk21.com

Regarding *Anisomorpha ferruginea*, I expect to be able to bring some along to the next PSG meeting, should anybody be interested.

References

¹ Brock, Paul D.,
The Amazing World of Stick and Leaf Insects

Acknowledgements

Thank you very much to Timm Reinhardt who was kind enough to proof read my article and share with me his knowledge of many aspects of *Pseudophasmatinae*-keeping. Timm also suggested that my *A. cyllarus* culture may have been poisoned by new growth on the tips of the privet shoots; I shall thus aim to feed only mature privet leaves to phasmids.

I believe this is the first article I have received from Sally – it really is great stuff. I hope we hear more from you.

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PSG MEMBERS' CULTURE LIST – PLEASE HELP

Associated with this Newsletter is a PSG Member's Culture List. Please, please, take a few minutes of your time to read it, fill it in, and send it off to Janine Fletcher at the address shown, as soon as possible. If you know your sticks by common name only, and you do not know its PSG No, just write in its common name. You will NOT be contacted by all and sundry, only possibly Janine, the purpose is just to find out what species are in culture in the PSG and where. Many thanks.

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A LOVELY POEM

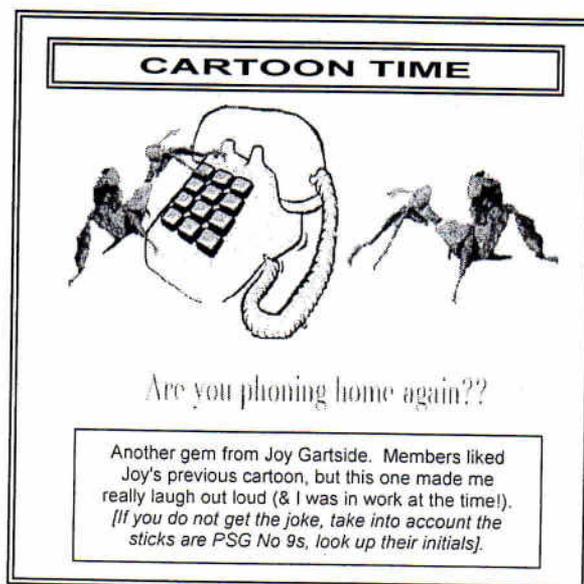
By Rev Joy Gartside

EASY LIFE?

When he looks up from his perch
Hanging from the branches
Does he look up to the stars and search
for Mars or Venus or alien ships coming to Earth

What is on his mind as he clings?
Lofty things like physics or the dynamics of the circle?
Or where indeed to find
The next place for him to unwind

Suddenly new piece of food he sees
is it worth moving to get it? Yes!!
Off he goes fast as the breeze.



INSECT CAGES – AN IDIOT'S GUIDE by Sarah Bowden

The one question people ask me when talking about phasmids, is 'where do you keep them?' It isn't difficult to make up housing for your stick and leaf insects, and it can be as cheap or as expensive as you want it to be. No matter what you keep your bugs in, make sure it is practical and safe for the insects and those who will be in close proximity to the cage.



Make sure that:

- *The cage is suitable (e.g. high/humid enough) for the species you intend to keep in it
- *Escape proof
- *Any wood is treated to prevent rotting
- *Any materials used in the cage are harmless to insects e.g. paints, sharp edges etc
- *It is easy to maintain

Here is a list of some of the types of cages I keep my bugs in.

Fish Tanks. These are a cheap, economical type of enclosure. They are easy to come by, and as an added bonus can be stood up on end to house the longer insects. On the other hand, they can be heavy and awkward to manoeuvre and clean. An easy way to fix a lid to a horizontal tank is to make one from mesh, or you can buy custom-made mesh lids used for reptiles. If the species needs a high humidity, a lid can be made entirely from wood, or a wooden frame supporting glass or Perspex. For a taller tank, a door can be made from wood, and the frame glued to the sides of the tank. The door

can then be covered with mesh or Perspex, depending on the species' humidity requirements.

Home Made Cages. With a little imagination these can be quickly and cheaply made from some sheets of MDF, wire mesh and/or Perspex. The advantage of home made cages is that you can build them to fit anywhere you want, any size you want and any shape you want.

Customized Cages. I have cages made from old display cabinets and cupboards, and have even heard of people using the shell of an old TV to make a stick cage! Use your imagination!

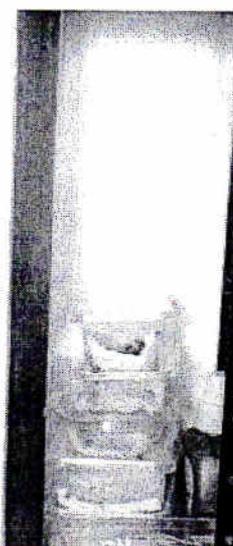
Plastic Storage Boxes. These are great for the smaller species and nymphs of the species that require a higher humidity. They come in a wide range of sizes, can be easily stacked and cleaned, are very inexpensive and you can decide yourself on the amount of ventilation holes (tip-to make ventilation holes, carefully heat the metal end of a screwdriver, skewer or similar instrument. Then, push this through the plastic. Alternatively cut a hole in the lid or side of the box and glue wire mesh to the box). [Editor's note – I use an old soldering iron to make holes.]



Sweet Jars. These are invaluable for keeping nymphs. They are cheap, easy to clean out and easy to come by. Humidity can be a problem though, so make sure the lid has enough ventilation holes in it, or alternatively a square of cloth secured with an elastic band can be used.

Shop Bought Cages. These are useful, but are expensive. If I won the lottery, all my bugs would live in these cages!!! P&P can be an added expense. They are easily obtained over the Internet and mail order companies.

Cages are always a topical subject. Thank you Sarah for some excellent ideas. If any readers have further ideas, please share them with us, drop me a line and if possible a photo too. There may be a talk on cage-making at the January PSG meeting...

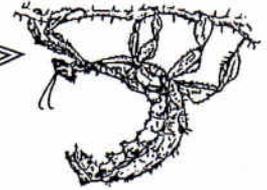


The Stick Talk list has recently had some changes made, including a new e-mail address. It is totally independent of the PSG, though many Stick Talk list members are also members of the PSG. If you want to join the list, e-mail:

admin@sticklist.com

It's totally free of charge; and if you do not like it, just send an e-mail asking to be taken off the list. As a Stick Talk list member, you could receive two or more e-mails a day, but usually quite short. Typical issues raised are in the following short extracts - enjoy.

**STICK
TALK**
Please note the
new e-mail
address.

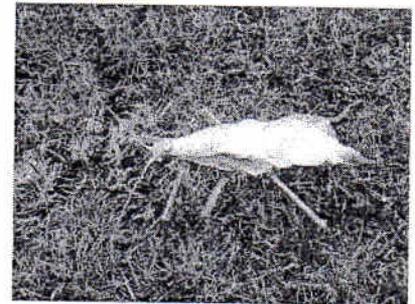


By Mike Smith

STOP PRESS: At the time of writing, it is fairly certain that the new e-mail address will be: **admin@sticklist.com**. The new web site is **www.sticklist.com**. By the time this Newsletter arrives on your doorstep, the new addresses should be up and running. If you have any problems with them, then e-mail me at **editor@stickinsect.org.uk**, and I can give you the latest information.

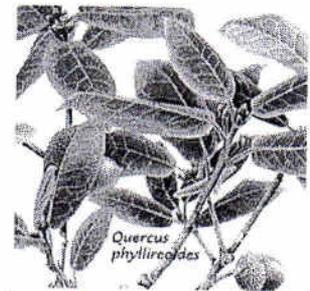
It is proposed that different moderators will take turns at running the new Stick Talk list but, by technology that is beyond me, the e-mail address will remain the same. However, the general layout and usage of the list should remain the same, so it will be as enjoyable, thought-provoking, informative, and up-to-date as ever before. It is also moderated so it's secure, safe from abusive language, and there will be no spam. It still may not be everyone's 'cup-of-tea', but you are welcome to give it a try.

JUNGLE NYMPHS. It is great to read how successful people have been with Jungle Nymphs. Be wary of the last moult though. I lost my female that I thought was an adult (certainly looked adult), when after a few months she decided to have another "final" moult which went disastrously wrong and I lost her. Hence I got no ova either. I had great fun with her though - remember that she was the one that escaped into my garden and I searched the garden day and night for 3 days till I finally found her sitting nonchalantly on my garden wall, and she was greatly admired by my friends and visitors. At least I have some photos.



EURYCHEMA GOLIATH. As I'm having not much to do at the moment, I just attached two pictures of my two *Eurycnema goliath*. Hope you like it. As all my new bugs have settled in all right by now, I shall take some more pictures ASAP ;-)

EVERGREEN OAK. The leaves of this plant are shiny and dark green, almost like holly leaves and quite large. Also, the same shape as holly leaves but not having such sharp points. I have not found many species eat it except in small amounts. It lives in shaded woodland places, at least this is mostly where I find it, and it puts out a lot of suckers ie small runners from the parent plant and can grow quite high. This is a web site that may help you find out about the plant <http://www.murayoshi.com/en/oak.html>. This is the Japanese evergreen oak.



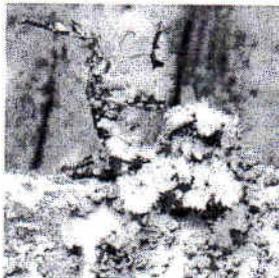
MOULTING. The information about moulting and insect growth is not quite correct. It depends on what you mean by "growing". When insects moult, they puff themselves up with air, just after the old exoskeleton is shed, and stay that way until the new exoskeleton hardens. The new exoskeleton cannot grow. However, the insect is much smaller once it lets the air out, and it does have space to grow within the new "shell". Quite a bit of length can be added as the membrane between the plates of the exoskeleton stretch. Huge increases in mass can also occur. So, you will see your larvae get bigger between moults, even though they can't make the plates of their exoskeleton larger.

MORE MOULTING. Re. growing at/in between moults, I would second Ted's comments. When Phasmids get their new skin (after a moult) there is room for them to grow into it - therefore, in between moults, you will see some considerable growth. When the insect actually moults, initially it will look longer than before, but it will be very skinny, almost completely 'squashed'. This will be for two reasons - before its moult it will not have eaten for 3 days, therefore, empty of food and, secondly, to allow space for the insect to grow until its next shed. Hope this makes sense.

ANATOMY. The internal anatomy of a phasmid is mostly the same as in every other insect (although there are of course individual differences in e.g. the existence of certain glands. Gut physiology depends on their specific food etc.). The insect's heart is the main element in its circulatory system, but unlike the heart of a vertebrate, it is simply a perforated tube running longitudinally through thorax and abdomen. By contracting, it ensures the regular flow of the insect's body fluids (insect blood is called hemolymph and instead of running through ateria and veins it just fills the whole body cavity). Due to the fact that the hemolymph fluid doesn't contain haemoglobin (the stuff which makes mammal blood seem red being responsible for the transport of oxygen) the insect's circulatory system has little to do with the respiratory system. While vertebrates have lungs or gills for breathing, the insect's respiratory system consists mainly of a net of small tubes called tracheae which are connected to the spiracles. This network of breathing tubes provides the necessary oxygen for all

interior organs, the guts, heart, neural system etc. Well I think this are the main functions in a nutshell, probably little complete but hopefully a useful overview (would have been easier if I had a good schematic drawing.)

3D IMAX MOVIE. The new BUGS in 3D IMAX movie is FANTASTIC!!! It is viewed through insect sight lines (down low in the bush) and follows the development and life of a Papilio butterfly from egg to adult and a preying mantid from hatching through to adulthood as well. The only criticism I can have is that it's a little tragic in the final scene where the two stars meet up. I won't completely ruin the ending, but I'm sure you can figure who wins! Very true-to-life, but I heard a couple of little ones in the theatre who were a little upset! A sole stick insect has a couple of seconds of stardom when they are showing other inhabitants of the bush, so don't go seeing it hoping for lots of stick shots. I always find that the IMAX movies are incredible for visual impact. Anyways, just that this one's subject was close to my heart. Enjoy the show!



PHASMID DECEIVER. I thought I would share this with you all, it's called a "phasmid deceiver", that's all I know about it. I wish I had one or two of those.

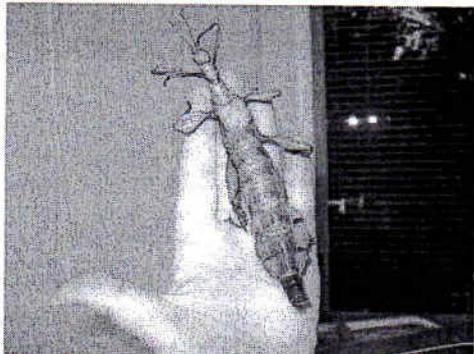
Et BEHAVIOUR. I would like to add to Joy's note on *Extat* behaviour. By handling them regularly, you could well get them conditioned to being handled, but I find that a small percentage of *Extats* can develop aggressive tendencies once mature, where they use their hind legs like giant pincers, snapping them open and closed to try and catch the assailant (your finger) within. Although this is not such an issue with the males, it can be painful with the females as they have rather large spines. With the adults, rather than attempt to pick them up, I place my hand in front of them (palm up) and allow them to walk on. As most stick insects

tend to be rather stationary during the day time I encourage them to walk forward by either gently blowing or tapping their hind legs so they begin to move. I would add, though, that the majority of my adult female *Extats* have been very mild mannered.

ANY EXPERTS? Any experts out there? Looking at the tails, one of these *Aretaon asperimus* (*asperimii*?) has the start of an ovipositor, and one has some "development" below the tail. Are they just two females at different stages, or is one a male?



BE WARY OF EURYCANTHA. Don't worry - I was scared of my *Eurycantha* when I got them (quite a few years ago now!) - but I kept handling them and got used to them, and now I handle any of the stick insects - the only ones I am wary of are the sticks that spray! Just keep handling your *ETs* as they grow up and you will get used to them!



HANDLING STICKS. Did you click on the picture? That's me holding one of my female *Ets*. When I first started out with stick insects, I was quite timid about picking them up. But over time I got used to them and now I even hold my adult Jungle Nymphs. There was only one incident where an adult Jungle Nymph had a fit and started kicking like a mule. But even then I didn't get hurt. You got to move very slowly and always talk to them. Many of my sticks recognize my voice and climb right up on my hand. They will not do the same for strangers. Before you know it, you'll be a great stick-handler.

FEEDING EURYCANTHA. Re feeding *Eurycantha calcarata* - these insects are absolute gluttons. Mine will eat almost anything, including bramble, hypericum, oak, hazel, ivy, rose, eucalyptus, hawthorn, spider plants, money plants Christmas cacti, lettuce and apples! Mine have also eaten grass in the past, but I wouldn't recommend this as a staple diet. As was discussed at the summer PSG meeting, the wider the variety of food your sticks get, the healthier they will be. But always make sure they have a food plant available to them that you know they will eat! Some sticks will starve rather than try a new food plant. Also be careful of pesticides in any food plant - even if you think it is safe, always double check to make sure. Wash food plants thoroughly, never collect from beside a main road or polluted river, make sure that any cuttings donated from a neighbour are completely pesticide free and don't feed newly bought houseplants for at least 9 - 12 months.

THANKS FROM JOY. I didn't mean that the *Ets* were yummy to eat, I meant a yummy colour ooppssss! That means I loved the colour (not to say I don't like chocolate in its real form). Sorry for the confusion. I received my PSG magazine the other day and it was really interesting; a great article by Cameron, as always he manages to produce something valid to us mere mortals :o) I thought the colour page was good also with Natalie's moulting stick and the close-ups came out really well too. Mike and the rest of the staff did a good job as always.

These items are typical of the sort of subjects covered in Stick Talk. I hope you found them interesting. If you have any of your own comments on these or other matters, please send them in to me for inclusion in the next Newsletter. (And the last item was an unsolicited, genuine entry in Stick Talk!).

Rearing and Studying Stick and Leaf Insects

A short review of Paul Brock's new book, by Mike Smith

Paul has a new A5 paperback book out which he introduced, hot off the presses, at the PSG Summer Meeting. I was one of the first to buy a copy (and I note I am a proud owner of a signed copy at no extra charge). It is an update of his previous, 1992 book of the same name, and again it is an AES (Amateur Entomologist Society) publication.

I recommend this book particularly to newcomers on the subject. It has 90 pages summarising everything any newcomer is ever likely to need to know, about virtually all aspects of stick insects; and it is a useful reference for the more experienced rearer. With 29 figures, 8 colour plates, and 14 black and white plates

It begins with a brief introduction to stick insects, including some interesting facts. Goes on to the structure of a stick insect, with its life history and development, then on to the rearing of stick insects.

It lists the culture history, distribution, description, foodplants, and detailed notes on twenty-two species

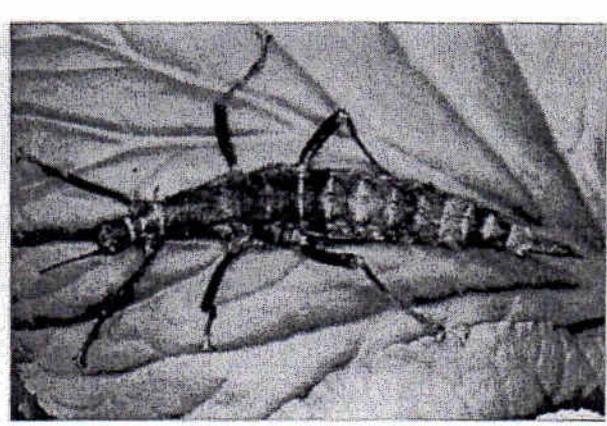
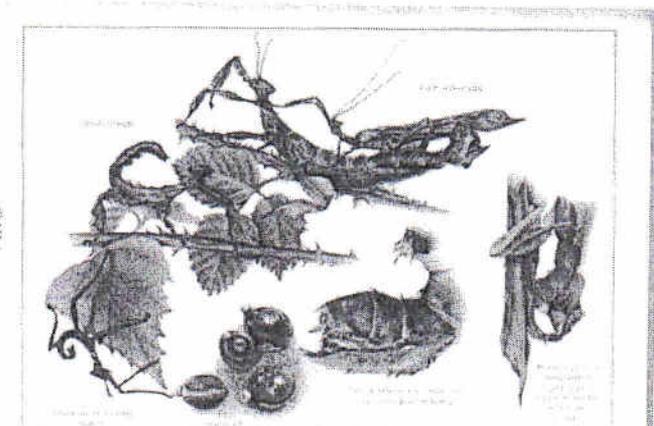
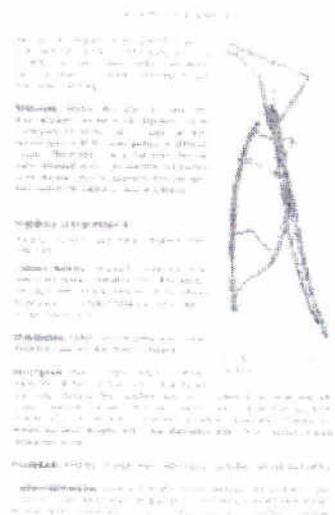
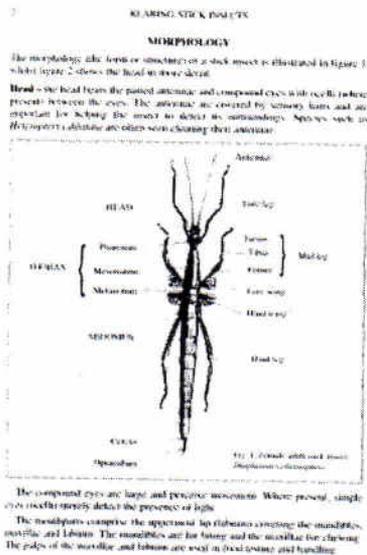
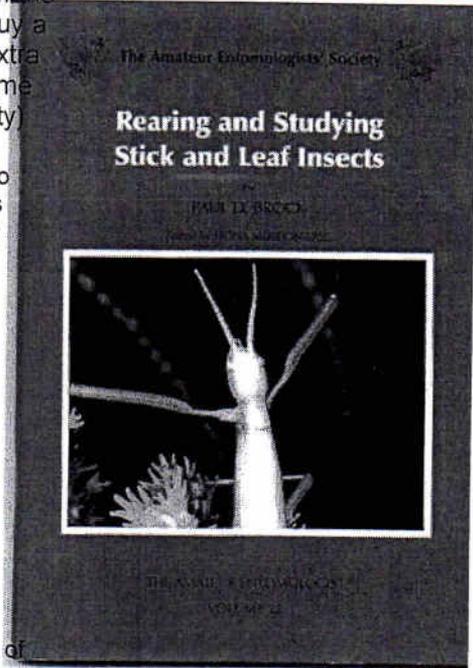
widely bred in captivity, each with drawings or a black and white photo, together with its PSG No.

In the centre of the book are around 18, excellent colour photographs of sticks.

The next section covers origin, description, and brief notes on many other species.

Finally, the back of the book covers the collection and photography of stick insects, a glossary of terms, further reading, and an index.

This low cost guide is available from the AES, £8.50 incl. p&p UK, £9.35 by surface mail (ISBN 0 900054 54 9). Available direct from AES Publications, 1 Tower Hill, Brentwood, Essex, CM14 4TA, England.



Eurycnema goliath PSG 14

The fabled phasmid from Australia By Cameron Die Königin

Introduction *Eurycnema goliath*, for me, was one of those fabled stick insects that was read about and talked about everywhere yet never seemed to be available to the novice phasmid collector. Most phasmid books and websites had pictures of this spectacularly big and beautiful insect and I knew from experience that insects can never be pictured as well as they appeared in real life. Therefore, this was a species that I really wanted to have, but could never get in my collection to see for myself how spectacular it really was.

My position was about to change, however, whilst I was at the PSG summer 2002 meeting when there was a vast quantity of *Eurycnema goliath* and *E. osiris* ova (eggs) available and I was fortunate to come away with a good amount and have an attempt at hatching.

Therefore, the following article is comprised of two areas: the natural history that is based on what I collated from both books and the Internet, whilst the cultural and behavioural information is based on my personal experiences.

Natural History

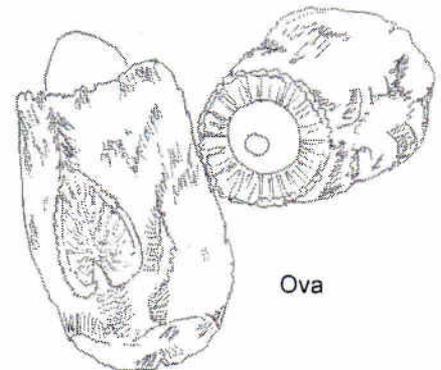
Classification *Eurycnema* belongs to the subfamily Phasmatinae in which are also other well-known large phasmids such as *Acrophylla* and *Phasma* species. There are four species within the genus, *E. goliath*, (distribution – see below, *E. osiris* (another Australian species), *E. versirubra* (Java, Timor, Peninsular Malaysia and Singapore) and *E. nigrospinosa* (Papua New Guinea) [see Brock, P.D., reference 1].

Eurycnema goliath is commonly known as the Goliath Stick Insect.

Distribution *Eurycnema goliath* is confined to Australia; New South Wales (near the border with Queensland), Northern Territory (Tennant Creek) and Queensland (widespread, mainly coastal) [see Brock, P.D. reference 1]. The *Eurycnema goliath* currently in culture originally came from S. E. Queensland.

Description

Ova These are very distinctive, measuring 5 - 6mm in length and 3 – 3.5mm wide (not including the capitulum). The capsule is roughly barrel shaped, dark brown in colour (although this is not constant as there are lighter patches throughout) and on one side is the pale brown, heart shaped micropylar plate. An interesting feature of the ova is best seen under a hand lens or microscope; the surface texture can be best described as a fake fur rug that has seen better days and not unlike a miniature version of a *Banksia* seed case, with the pile, for want of a better word, running from the base up to the operculum. Newly laid ova, when a bright light is shone on them, have a reflective surface, as if a slug has left its trail over it.

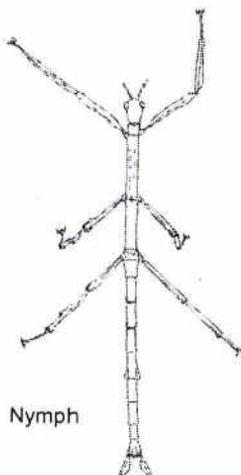


The operculum (the opening from where the nymph will emerge) is flat and radially ridged, resembling a bicycle wheel with many spokes, and very pale in colour. From the centre rises the capitulum – composed of a central stalk, upon which sits an ochre coloured, hollow sphere, that has a central opening uppermost. The base of the sphere, where it sits on the stalk is flattened. The whole capitulum looks very much like a little orange fungus.

Given time, the capitulum itself degenerates, and by the time the nymph emerges from the ova, little, if anything remains of it.

Newly Hatched Nymphs The nymphs normally hatch during the hours of darkness and they can be quite active running around rapidly, especially when disturbed, and not remaining motionless like many other species.

They are also, not surprisingly considering the size of the ova, quite large measuring 25 mm in length and are a dark orange-brown colour without any distinctive markings. The cerci (appendages protruding from the abdomen tip) are quite visible and remain a feature throughout the life of the insect.



The body and legs are long and slender, giving the nymph a gangly appearance, yet the antennae are very short and not at all noticeable.

There are certain behaviours that can be observed and are carried through the whole of the life of the insect. When at rest, as with many other phasmids, the forelegs are held directly in front as a continuation of the body, whilst the mid and hind legs are held splayed out away from the body and each other. Here *Eurycnema* will rest during the hours of daylight and generally move once it gets dark. There is a simple way to get the insects to move during the day if wanted, and that is to create air movement: both nymphs and adults will then commence moving and feeding, walking in a side to side rocking motion to mimic plant stems moving in the breeze.

Moulted Nymphs There is little change after the first moult except that the nymphs increase in size, with the colour and lack distinctive markings remaining the same.

Once the nymphs achieve their second moult, then the changes become more noticeable and from the orange-brown they change to brown-grey colour, the richness of which varies from nymph to nymph. The brown-grey colour is not constant

and throughout, is variously mottled with lighter and darker shades, and as the nymph passes through successive moults, the brown tones tend to fade leaving more of a mottled grey colour - the camouflage qualities being excellent, and the nymphs resembling dead twigs. After the third moult it is possible to begin sexing the nymphs, but to have a reliable result the nymphs need to be compared.

The males have cerci that are longer and thinner than the females. The male genitalia begin to form, appearing on the underside of the abdomen tip as a small characteristic bump. Females tend to be stockier in build than the males, with thicker bodies and thicker legs, although the latter can be due to long low appendages running down the limbs. The antennae are much longer in males than they are in females and although, when the nymphs first hatch, the antennae are of equal length between the sexes, the male antennae get progressively longer compared to the females as they undergo subsequent moults.

After the fourth moult, spine development on the legs becomes more noticeable. The spines on the fore and mid legs tend to be regular, small serrations, whereas the spines on the hind legs are somewhat more dramatic to look at. Here they are variable in size, some small, some large, but there are normally two very prominent ones that sit on the inside of the tarsi. These are broad based, quite formidable looking spines. Despite the grey colour of these older nymphs, with all the mottling and various shades of light and dark grey, they are very attractive and, in their own right, can be just as interesting, if not more so, than many other species.

By the ultimate moult, male nymphs are large, measuring 14.5 cm in length (head to abdomen) with wing buds that measure only 1.5cm in length. When the nymph completes its final moult, there is no increase in size as would be expected, and this is likely due to the development of the wings that increase dramatically in size to 10.5 cm in length. It is also at this final nymph stage that distinctive raised dark bars appear on the underside of the thorax, especially between the middle legs and hind legs. The female nymph just prior to the final moult measures 18.5 cm. All the features appearing set the stage for the final moult.

The Adults Although the nymphs up until the final moult are very attractive, with the various mottled patterns, stripes and spines, this pales into insignificance once they reach the adult stage; and the suspense whilst you wait for this to happen can be almost unbearable. The nymphs, like the majority of phasmids, usually moult during the hours of darkness so, when the fully mature *Eurycnema* is first seen, it is quite breath taking. The final moult takes about 1 – 1.5 hours, with most of this time needed for the wings to expand to their full size. For the first few hours after the moult, the insect's colours can be quite pale, but after this time they brighten considerably.

It is also worth mentioning at this stage the insect's habit of flicking the long thin droppings as they are produced. Although I have seen this in larger nymphs and adults, I have yet to see this in the younger nymphs. It has been suggested that this is a means of protection; by not leaving an accumulation of droppings on the ground underneath where the insect is living, then predators are not so likely to find them.

Adult Male The adult male has one less moult than the female, and therefore matures earlier at about six months from hatching.

The head is a yellow-green, with three green stripes running from the front over to the thorax; one through each of the eyes, and one over the middle of the head. The antennae are 7cm long.

The thorax is also yellow-green, with green tubercles and stripes on the underside, and two small spines on the upper surface of the mesothorax. The area on the underside of the thorax, where the legs join, is flushed pink and is most noticeable around the hind legs. The legs themselves are long and slender, the same yellow green as the thorax, and display bright green spines, except on the tibia of the hind legs where they are larger and are a deep pink colour.

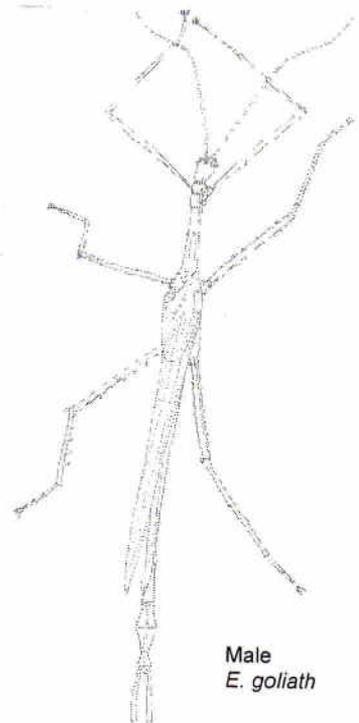
The flexible abdomen is bright green, with each abdominal segment on the underside separated from the next by a thick, contrasting white and deep pink stripe. The tip of the abdomen carries the long, green and brown coloured cerci. The wings are long and run down three quarters of the abdomen. Where the abdomen is so narrow, the wings virtually encase them on either side, with only the end showing.

The small fore wings are the same bright green as the abdomen. The large hind wings are made up of two parts; the pre-anal and the membranous anal fan. The pre-anal part is a much thicker more rigid structure, that adds strength to the whole hind wing and, when they are closed over the abdomen, creates a protective casing. This pre-anal part of the hind wing is bright green like the forewing with a deep, fuchsia pink underside that is not normally visible, unless the wing is opened. The rest of the hind wing, the anal fan, is a transparent green.

The most noticeable feature of the wings are the two broad white stripes that run continuously down, from the forewings to the tip of the hind wings. The widest point of the insect's body is where the wings join onto the thorax, and here the joint on each wing is raised up into two blunt points that tend to have a pinkish tinge. Although I have never seen the males fly, Paul Brock (personal communication) has observed them flying in the wild.

Adult Female *The female takes about seven months to reach maturity and, as with the male, there is not such a dramatic increase in size after the final moult as much energy is put into developing the wings, the final length being 22cm (the ultimate size can be variable, as recorded in the literature, [see Brock, P.D. reference 2]). As an adult, it is an impressive insect, much bulkier and longer than the male and although at first they look very similar in the colouration and patterning, there are some subtle differences. Like the male that has two small spines on the upper side of the mesothorax, the female's is virtually smooth and the antennae are 3cm long.*

The broad white strips that runs down the wings is broken, with a short strip on the forewing, and another short one on the hind wing; it does not reach as far as the wing tip, as it does in the male. Also the wings themselves do not cover the abdomen as much, rather to

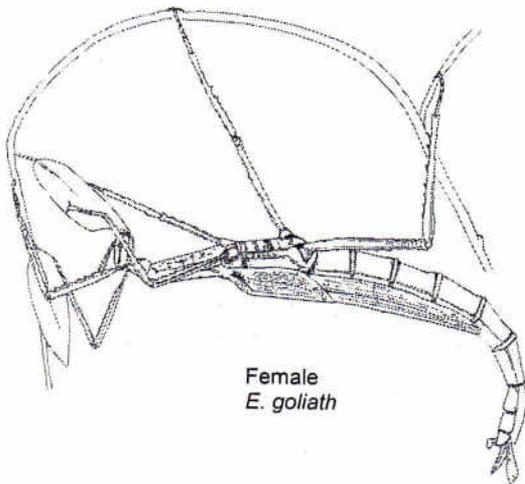


Male
E. goliath

only approximately two thirds down. When the female is in the process of laying ova, they hardly wrap around at all, as the abdomen can reach 2 cm thick. The female is not capable of flight.

The under surface of the abdomen still has the pink and white stripes between each abdominal segment, but they are much more broader and the pink is a much lighter shade, also, with the wings not covering so much of the abdomen, the pink stripe can be seen to continue over onto the upper surface of the abdomen whereas the white does not. The 1.5 cm long cerci are also much broader than the males.

A distinctive feature of the female *Eurycnema goliath*, and shared by several other species, is the presence of the chute, an extension of the abdomen and looking very much like an ovipositor. (The difference is that an ovipositor is used to bury ova as seen in genera such as *Aretaon*, *Eurycantha* and *Heteropteryx*. However, *Eurycnema* does not bury its ova). Even this chute attains large proportions, measuring 4.5 cm from where it joins the abdomen to its tip; 2.5 cm of it actually extending beyond the end of the abdomen. Instead of burying the ova, the chute is used for flicking the ova/frass, and this is explained further on.



The adult female, if disturbed without due care, has several methods of defence that can be quite surprising, although this behaviour can vary from one individual to another with some being more 'volatile' than others.

One of the more frequent methods is to splay the hind limbs to reveal two shiny black coxae, on the underside of each of hind leg. The coxa is best described as the 'ball joint' where the hind leg joins onto the abdomen. So where at one moment there was a green insect camouflaged in with its surroundings, there are now two 'black eyes' staring out. If this does not deter the predator, the females will then proceed to snap open and close the hind legs whilst trying to catch the assailant within and, as the hind limbs, especially the tibiae, carry rather large spines, this could prove to be quite painful.

Another tactic is to flash the bright red strip found on the underside of the pre-anal of the hind wings, and this can be quite surprising. Sometimes this is accompanied by a loud hissing/rattling sound that is also generated by the wings. Although this behaviour is also seen in other phasmids, it is all the

more startling simply because of the large size of the insect. (There are some good colour photographs of this behaviour in the book *The Amazing World of Stick and Leaf Insects* by Paul Brock, see reference 6).

Reproduction Receptive to the males within a couple of days after the final moult and, as with most species, will mate for quite a few hours at a time at any time of the day. The males are not territorial and, once mating has completed, the pair will separate and each will go off to feed or rest.

Within a few weeks the female's abdomen begins to increase in diameter as the eggs develop and, shortly afterwards, laying commences. The ova, as they emerge from the end of the abdomen, are flicked by the female with quite considerable force and the chute, acting like a catapult, aids this considerably. From experience, the eggs easily travel two metres and, given the opportunity, could travel further.

There have been several theories put forward for the reasons for flicking both the ova and droppings. As well as the one mentioned above, by moving the ova away from under the bush upon which the adults are feeding they will be less easily found by parasites and fungal diseases that are attracted by the presence of the adults. Also, it could possibly aid dispersal of the species, getting the ova away from the food plant the parents are on and nearer to others, a feature shared by many plant species that catapult their seeds.

As I have not raised a full generation of *E. goliath* from my own laid ova, I have no experience of the quantity of ova a female can produce nor the incubation period, although from the literature I have read, the ova take about six months to hatch. The females can apparently produce a prodigious amount of ova and, judging from what mine have laid in the short period since laying commenced, this seems to be the case (Paul Brock has advised me that they can lay several hundred).

The ova seem to vary considerably in size, with a reasonable percentage being smaller than the maximum size, and these seem to be laid through out the life of the insect and not just at the commencement of laying as is usual with other phasmid species. I do not know as yet whether these smaller ova are viable.

Culturing Respite the dramatic and beautiful appearance of *Eurycnema goliath*, this species is quite easy to rear and I have not experienced any great difficulty. The greatest obstacle would be getting a sufficient supply of *Eucalyptus* and having a cage large enough for the adults.

Ova and the Hatching Nymphs The ova are kept in a well-ventilated container. This is simply a plastic container where the lid has had the central portion cut out and replaced with plastic mesh. The ova sit on a thin bed of vermiculite and are sprayed with water every three to four days.

As the nymphs hatch, they are placed into suitable containers (see below) with fresh supplies of *Eucalyptus*. As with any newly hatched nymphs, the leaves of some of the *Eucalyptus* are cut to provide easy areas to feed from, especially as some species of *Eucalyptus* can have very thick leaves. I personally prefer to give the nymphs what are termed the juvenile leaves. These are produced by many of the *Eucalyptus* species when they are young; they are often kidney shaped, are quite thin, and clasp the stem as opposed to the long, pendulous adult leaves that are often thicker.

Accommodation When I received the ova, the advice I was given, and have followed, was to keep the insects well ventilated and to keep the humidity to a minimum.

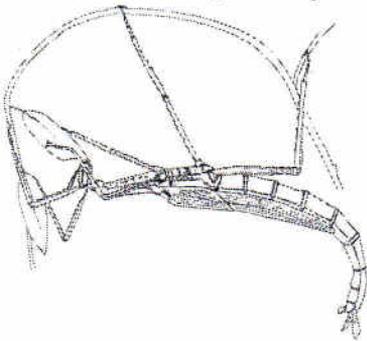
The insects are kept in cages constructed mostly from wire mesh that allow a free flow of air from all sides. To begin with, the size of the cage is not too important as the nymphs are small; ideally keep them in small cages so that observation is easy. As they increase in size though, they are transferred to a cage that is three feet in height to allow for the successful moulting of the female nymphs in to adults. As with any phasmid, the height of the cage in which they are kept must be 2 1/2 to 3 times the length of the mature insect.

The *Eurycnema* are not supplied with any special heating and are quite happy at room temperature, which is between 21 – 24 degrees centigrade.

Diet *Eurycnema* are fed on a diet of various *Eucalyptus* species, although the only species that I have identified is *Eucalyptus gunii*. I would recommend, when giving them a new species of *Eucalyptus*, is try a small amount along with their regular species and see if they take to it. Paul Brock has advised me that there are some species on which they are not so keen. They have also been fed on *Acacia* when available and also a close relative of *Eucalyptus callistemon*.

The *Eucalyptus* usually lasts one week before it needs to be replaced, (*Eurycnema* do not have large appetites, so it is rarely all eaten), as it begins to dry out and die. Because of the need to keep a low humidity level, I never spray the insects with water, all the moisture needed coming from the leaves they ingest.

Problems The only difficulty I have encountered, and can be encountered in other species as well, is when the almost mature nymph moults too close to the base of the cage. With such a low drop, the wings can often become crumpled and, although the insect will climb higher up to complete the process and harden up, the wings never recover. This doesn't seem to have any adverse effect on the insect, although it does look a little unsightly.



Similar Species The conditions for culture, as described above, have also been used with *Eurycnema osiris* and the results have been just as successful. As this species is similar in many respects to *Eurycnema goliath* I thought it appropriate to follow this up with an article in the next newsletter.

Acknowledgements When I was writing this article, I received a great deal of support from Paul Brock. Not only did he answer my various questions, but he also sent me copies of the articles listed within the references below. Having then proof-read the final piece, he gave me much useful and constructive advice and, for this, I am grateful.

References

1. Brock, P.D. September 2000. New record for the Goliath Stick Insect *Eurycnema goliath* from Northern Territory, Australia. *The Phasmid Study Group Newsletter No. 84, Page 13.*
2. Brock, P.D. 1998 Studies on the stick insect genus *Eurycnema* with particular reference to Australian species. *Journal of Orthoptera research* 7: 61 - 70

There are some good websites that provide information on *Eurycnema*;

3. A guide to Stick insects of Australia by Peter Miller (<http://www.acay.com.au/~pmiller/>)
4. Brisbane Insects and Spiders Home Page by Peter Chew (http://www.geocities.com/brisbane_hoppers/Goliath.htm)
5. Goliath stick insect by Chris Parry (<http://www.geocities.com/chris123yh/eurycnema/eurycnema.htm>)
6. The Amazing World of Stick and Leaf Insects by Paul Brock (some information and photographs).

Appendix

For anyone wishing to culture any new species, the best advice I can give is to not only search through books and the Internet, but to speak to other members who have raised the species concerned themselves and, through this, lots of useful tidbits of information can often be forth coming. This I did at the meeting whilst I received my ova and it proved invaluable in raising this species and, despite reports that it is a difficult species for rear, was actually quite easy.

Many thanks Cameron for this thorough, detailed, and remarkably interesting article. There have been a few mentions of the Goliath in this newsletter, so it was a particularly timely and topical subject to choose. I still think it is not an insect for the faint-hearted but, after this article, it will no longer be such a mystery to our members.

PHASMIDA SPECIES FILE:
A CATALOG TO THE STICK INSECTS OF THE WORLD
JANUARY 21, 2003 Copyright 2002 by Daniel Otte and Paul Brock. All rights reserved.

Paul and Daniel have produced as an excellent CD (PDF file), or available as a paper copy (504 pages), an index of all known stick insects of the world. This gives all the research information on the classification of phasmids that anyone could ask for. It may be thought of as being for the specialist only but, at the Summer Meeting where it made its debut, Paul Brock sold out of the CD, and I was the first to purchase one. To give you a feel for it, I have selected parts of its Introduction, and its detail on the family *Heteronemidae*. Mike Smith.

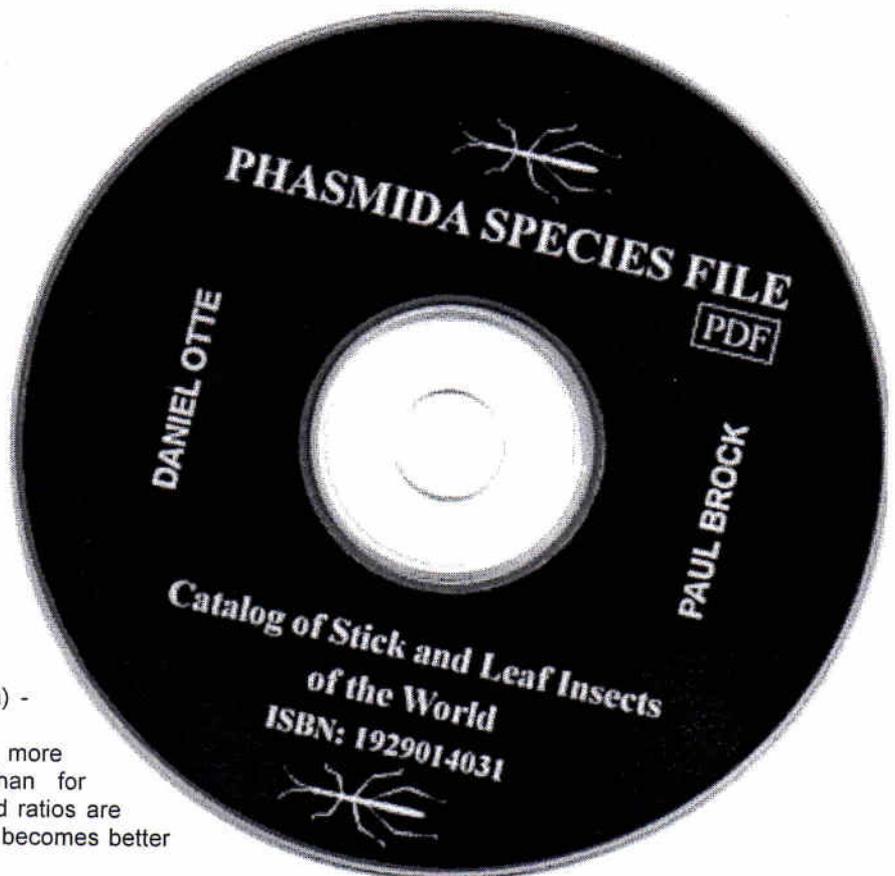
"INTRODUCTION

This volume covers all known living species of *Phasmida*. It includes 8 families, 21 subfamilies, 39 tribes, 523 genera and 2822 species as well as 34 junior homonyms, and 461 junior synonyms. It is the first complete catalog of the world's stick and leaf insects.

The distribution of known species is roughly as follows (in order of magnitude):

Indomalaysia (Pakistan to Malaysia and Indonesia) - 1508 species
South America (Panama Canal to Tierra del Fuego) - 591 species
Central America (Mexico to Panama and Caribbean islands) - 274 species
Eurasia (England to China (north of the Himalayas) - 250 species
Africa - 201 species
Australasia (New Guinea and Australia) - 172 species
Pacific Ocean islands - 112 species
Indian Ocean islands - 94 species
North America (United States and Canada) - 66 species

These numbers reflect, we believe, more intensive collecting in eastern Asia, than for example, South America. The numbers and ratios are liable to change considerably as the group becomes better known.



FAMILY HETERONEMIIDAE

SUBFAMILY HETERONEMIINAE

TRIBE HETERONEMIINI

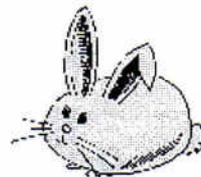
- 1904 Rehn, Proc. Acad. Nat. Sci. Philad., 56: 47
1953 Günther, Beitr. Ent. 3(5): 561
1977 Bradley and Galil, Proc. Entomol. Soc. Washington 79(2): 178-180
2001 Zompro, Revue suisse de Zoologie 108(1): 191 >>Belongs to suborder *Areolatae*
2001 Zompro, Studies on Neotrop. Fauna and Env. 36(3): 221
Bacunculini [SYN]
1896 Kirby, Trans. Linn. Soc. Lond., Zool. (2) 6: 464 >>Bacunculinae
1953 Günther, Beitr. Ent. 3(5): 550 >>Bacunculini
1977 Bradley and Galil, Proc. Entomol. Soc. Washington 79(2): 201 >>Bacunculini
2001 Zompro, Studies on Neotropical Fauna and Environment 36(3): 222 >>Subfamily *Pseudophasmatinae* invalid as type genus is synonym of *Heteronemia*."

Availability Details:

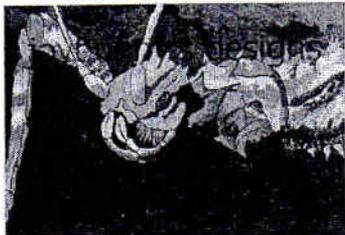
Otte, D. & Brock, P. 2003. *Phasmida Species File. A Catalog of the Stick and Leaf Insects of the World*. The Orthopterists' Society. Price 25\$ (ISBN 1-929014-03-1). A complete catalog of species, essential for researchers, or for anyone with an interest in classification. A user friendly PDF file, scheduled for annual update, check for availability in other formats (paper copy US \$60 + postage) [currently available from Paul Brock, 40 Thorndike Road, Slough SL2 1SR for £17 including postage & packing in UK, add 10% postage costs for overseas].

Sticky Business by Joy Gartside

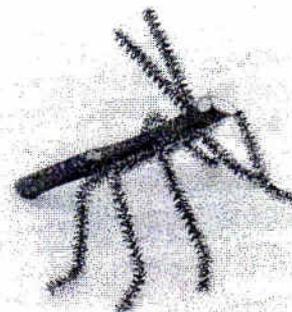
We all know Joy has been wonderful in providing excellent and thought-provoking articles, poems, cartoons, and pictures for the PSG Newsletter. Joy is also helping to run a PSG stall at the Lincoln Show with Sally, is a regular contributor to Stick Talk, and keeps numerous critters. It is a wonder therefore that Joy has any spare time for anything else. Well now, Joy is also an artist, concentrating on the subject of stick insects, Joy creates toys for around £4 to £5 each, and paintings for around £7 to £40 each. They are advertised on her website



<http://www.joybunnysartdesigns.i12.com> and a sample of her work is pictured here (and see also her picture on the Colour Page page 26). But for the best views, go to the website, where purchases may also be safely made on-line. Joy's work is sold at many shows, and is sought after by members of Stick Talk (in one case, to decorate their wedding dress), so I thought PSG members might like to see her work for themselves. With a little arm-twisting, and to make it more interesting, Joy has kindly shared the story of her craftwork career with us, in this article.



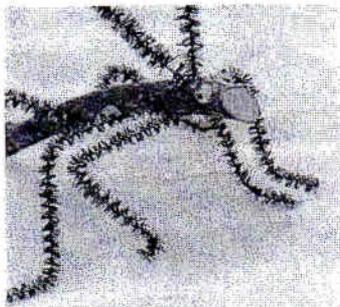
It all began last year when Steve Dye was asking for phasmod owners to come and participate in his Bug and Beastie show at Selby. That, combined with my interest for things creative, was all the encouragement I needed to start up **Joybunny's Art Designs**. Of course, there was floundering in some muddy waters to come, but I set out with a happy heart. After all wasn't this what I worked for my degree for, to make a name for myself?



So there I was with a blank canvas and no ideas in my head. My first stopping point was the room I keep my stick insects in. I was displaying items at a bug show, so of course it would have to be bugs, and in my case stick insects; and as a stick keeper I had plenty of subjects in my room. But the problem was this, how I would get them to sit still. I have an enduring vision of a *Phaenopharos khaoyaiensis*, refusing to sit in the lovely set I had created for her, constantly climbing up everything in an effort to get to the ceiling. I finally managed my first drawing, which serves as a reminder to me that things are never that easy. My second attempt, at drawing an *E. calcarata* nymph, was not much better. How could I get a picture of a stick insect without worrying about them moving? The

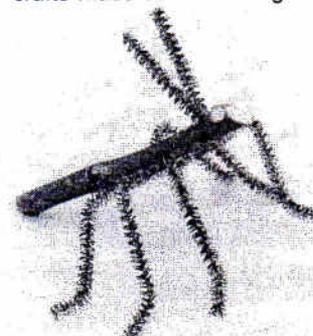
internet was my answer, and I found Mark Watson's site on *Bugs In Cyberspace* very quickly, and the photos were of good quality. Without more ado I wrote to Mark and he was kind enough

to allow me to use his photos and, along with permission from *Bugs In Cyberspace*, I had a very good photo base to work from, and the stick painting part of my enterprise was starting to take off.



Now painting is all very well, and it is interesting, but I was sitting doing my cross stitch one night, and was thinking how can I incorporate my sewing into the display? I had a few bits of felt and other craft items left over from University days when I did my art degree and so I made a stick insect with it. The kitten that we had just brought home was very interested in my sewing, and was constantly pinching my threads to play with. On more than one occasion I remember her taking my scissors and running off with them tucked under her stomach. That kitten of ours has been a source of much hilarity within my business. I cannot put a paintbrush down without her rolling it off the work surface onto the floor and then running off with it. Of course this isn't much help when I'm trying to paint or sew.

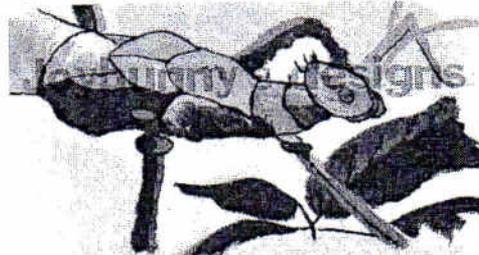
The day of the first showing of my paintings and toys arrived, I was so nervous I didn't sleep much the night before. But in general it went well I have found that a balance of real sticks to display along with the crafts made an interesting combination. Because the work I do is mainly in close up, there were many people who said they hadn't realised stick insects were so diverse. I remember one young gentleman was very amused by the toys sitting on the cages of the real sticks, in fact a lot of people thought the toys were real in that situation.



A natural extension of all this productivity seemed to be to set up a business, but how was I to do it? Things are difficult for me because I am disabled and unable to work for above a quarter of an hour without feeling uncomfortable. Being wheelchair bound meant that I couldn't canvas prospective buyers in the normal way. So I started from home by finding an internet provider and putting my crafts on the web. I found i12.com very helpful and so **Joybunny's Art Designs** was truly on its way. One day the site will contain much more than just

stick insect items, but for now I am happy to be able to make items in my own time and to do stick shows when I am able. So maybe if you go to one of the shows one day you will find me and my sticky business.

If you are interested in my work or wish to purchase items outside shows, or live outside of the UK, then I do have a website that you can peruse what stock I have and the various prices therein. If the website hasn't what you are looking for you can always email me at sales@revjoybunny.fsnet.co.uk. I will make best endeavours to see if I can produce what you require.



THE COLOUR PAGE!



The PSG Summer Meeting page 6



Eurycnema ooliath.



Stickv Business page 25



Anisomorpha monstrosa male. page 10.



Malcomorpha cyllarus



Stick Talk. page 16.



Insect Cases page 15.



The PSG Summer Meeting page 6



Anisomorpha buprestoides page 7



Stick Talk. page 16.



Stick Talk. page 16.



Book Review, page 18.

Pictures look great in colour.....

Please send in yours!



Stick Business, page 25.