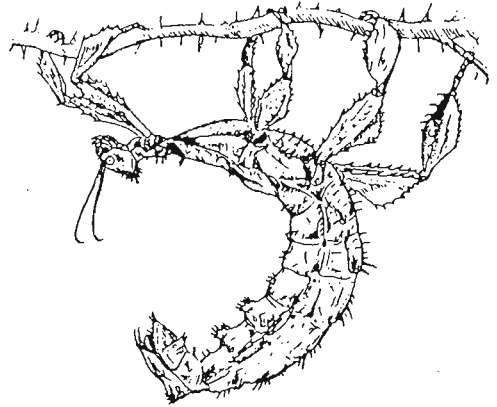


The Phasmid Study Group



Chair: Mrs Judith Marshall
Department of Entomology, British Museum (Natural History),
Cromwell Road, London SW7 5BD

Treasurer/Membership: Paul Brock (Phone 0753-79447)
"Papillon", 40 Thorndike Road, Slough, Berks SL2 1SR

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8 Foley Road, Pedmore, Stourbridge, W. Midlands, DY9 0RT

March 1989

NEWSLETTER NO. 38

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ANNUAL GENERAL MEETING REPORT

Some 50 members attended, including more than half a dozen from Europe. Unofficial simultaneous translations were in evidence - in spite of the very full programme, there still seemed plenty of time for friendly discussion. Over 30 species were given away - also some specially grown guava plants. Many thanks to all who helped on this busy day. Pity the lights failed about half way through!

MONEY AND MEMBERS - Paul Brock (No. 26) reported that 1988 ended with a record 322 members, up 61 on the previous year. There was much recruitment at exhibitions.

The Group's General Fund was reduced to £711 by the expected modest loss (some £36) in 1988. Costs should be covered in 1989 by the increased subscriptions.

Copies of his detailed report can be obtained from Paul on receipt of a stamped addressed 9 in x 4 in envelope.

NEWSLETTERS - Michael and Frances (No. 3) thanked the members for providing the largest-ever Newsletters in 1988 (almost double previous sizes), with six species reports instead of the usual four. Paul Brock gave us much help on taxonomy.

Members were urged to send in items well before the deadlines - it is seldom necessary to leave things until the last minute. Otherwise Frances can have to sort out any queries and type and past up the entire issue all in a couple of days - and her work is hard enough already!

LIBRARY - David Robinson's (No. 29) car unfortunately broke down on the way to the meeting! But via Judith Marshall (No. 13) he reminded members that back issues of Newsletters are available from him - please write to David for further details.

LIVESTOCK CO-ORDINATION - Phil Bragg (No. 445) urged all members to send him their surplus eggs, even of the common species, especially as he distributed all the surplus at the AGM. Eggs should preferably be pre-sorted, but this is not essential. Advance notice of wants at meetings would also be helpful.

EXHIBITIONS AND MEETINGS - Slides taken at the Leicester and AES exhibitions showed the new cages and poster displays being used on the Group's stands. Paul Jennings (No. 80) has had no replies to his Newsletter request for ideas for events at PSG meetings.

PUBLICITY - Attempts will be made to recruit more members from people already keeping phasmids. Please, as soon as possible, send Phil Bragg designs for a black and white poster (Newsletter page size or double) for display in zoos, museums, etc.

NEXT PSG MEETING - This is planned for the British Museum (Natural History) on 29th July 1989. Please send any agenda items to Adrian Durkin (No. 78) by 1st May.

FRENCH PSG - Pierre-Emmanuel Roubaud (No. 415) said that, since he founded the Group in September 1988, membership has increased to about 30, including some from outside France. Their second Revue has now been published. It has been agreed that articles in his Revue will be freely available for translation for our Newsletter, and vice versa. To this end, all articles to the English Newsletter will be deemed to be submitted also for translation for the French Revue.

MEMBERS' TELEPHONE NUMBERS - Willy de Ruyter (No. 367) can kindly supply a list of many of these numbers to members who particularly need them.

LOST AND FOUND SPECIES SLIDE SHOW - Members had a good opportunity to see some lost species, both as specimens and from Allan Harmans's (No. 189) slides. He also showed many of their natural foodplants and habitats. In Papua New Guinea one can sometimes find 20-30 species of phasid in a small area. A Phasma sp. was another example of a stick which bites. [See also Newsletter 24, pages 4 and 5.]

Adults and eggs of some dozen species found recently in Thailand National Parks and the Philippines were shown as slides by Heinz Herwaarden (No. 478) and Eric van Gorkom (No. 250). Hopefully, at least one of the species with microwings will become established. One of the eggs was some 11 mm long but only about 2 mm wide! A sad slide was of the Group's last Phibalosoma phyllinum.

GROUP'S COPY OF WESTWOOD - This is at last available again, and can be seen at Phil Bragg's home. He will also bring it to PSG meetings.

TYPEWRITER WANTED - Does anyone know of a good typewriter the Group could have cheaply for producing the Newsletter? We would be interested in an electronic daisy-wheel typewriter or, possibly, a small electric one. Please contact Michael and Frances (address at the end of the Newsletter) if you think you can help.

OFFICERS AND COMMITTEE - The following people were elected for the year:

Chair	Judith Marshall (No. 13)
Treasurer/Membership	Paul Brock (No. 26)
Secretary	Adrian Durkin (No. 78)
Editors	Michael Lazenby and Frances Holloway (No. 3)
Livestock Co-ordinator	Phil Bragg (No. 445)
Exhibitions & Meetings Officer	Paul Jennings (No. 80)
Librarian	David Robinson (No. 29)
Committee members	Willy de Ruyter (No. 367)
	Mel Herbert (No. 232)
	Angela Parwani (No. 419)
	Eric van Gorkom (No. 250)

Members are reminded always to write to the appropriate officer, and to enclose a stamped addressed envelope whenever they want a reply.

REVIEW OF "REVUE" by Michael and Frances (No. 3)

We were kindly given copies of the first two issues of the French PSG "Revue" at the AGM. Even with our poor French, we can thoroughly recommend this journal to all members with reasonable French (or willing to learn!). We understand that subscription from the UK costs £4 per year or thereabouts, and enquiries should be made to the Président, Pierre-Emmanuel Roubaud, 17 av. Foch, 94100 St Maur, France.

The articles, notes and wants and surpluses are similar to our Newsletter. Something we haven't space for is lists of individual members' species (eggs, nymphs and adults). Three of the 16 articles and notes in these first two Revues are French versions of Newsletter articles.

In future we may well provide summaries of all Revue articles and notes, and full translations of some - we haven't had time to decide yet!

EXHIBITIONS IN '89 by Paul Jennings (No. 80)

Eleventh Midlands Entomological Fair - Sunday 16th April, 11 a.m. - 5 p.m., at the Granby Halls Leisure Centre, Leicester. The PSG has booked three tables. Admission 50p adults, 25p juniors. Contact Phil Bragg (0602-222118) or myself (0582-583954) for further details.

Manchester Zoo Fair - Saturday 29th April, 11 a.m. - 5 p.m., at Dowson Road Primary School, Gloucester Road, Hyde, Manchester. The PSG has booked one table. Contact David Hewitt (0706-842355) for further details.

Fifth North London Entomological Fair - Sunday 4th June, 11 a.m. - 4.30 p.m., at Picketts Lock Centre, Picketts Lock Lane, Edmonton, London N9. The PSG will book two tables shortly. Contact myself (0582-583954) for further details.

Wigan Insect Show - Saturday 17th June, 1 p.m. - 5 p.m., at Wigan Pier. No tables have been booked yet, so would anyone interested in running an exhibit please contact me urgently.

Members wishing to bring a display of photographs, livestock, etc, to any of these exhibitions should please contact in advance the appropriate person above about what to expect. I would also like to hear from anybody about other suitable exhibitions, particularly if he/she would like to run a PSG stand.

NOTTINGHAM MEETING - The next meeting at Phil Bragg's house will be in May 1989; if you're interested, contact Phil in late April for details.

NEXT DUTCH-BELGIAN PHASMID DISCUSSION DAY - This will be on Sunday 7th May 1989 at Kim D'Hulster's (No. 372) home (phone 03/776 84 51). Dutch and Belgian PSG members will receive an invitation early in April. Members from other countries are cordially invited. If they are planning to visit, please contact Kim in advance.

MUSEUM NEWS by Phil Bragg (No. 445)

Derby City Museum now keeps four species of live sticks on display. The museum has offered to make PSG membership forms and care sheets available.

If you're interested in Midlands museum specimens, the following are known:

Coventry (Herbert Museum)	About 20 specimens
Derby City Museum	About 50 specimens
Leicester (New Walk Museum)	21 specimens
Stoke City Museum	Less than 20 specimens
Wollaton Park (Nottingham)	65 specimens (including some recent donations)

WANTS

Alain Deschandol (No. 238) wants Phyllium genus photos, drawings, papers, reports, notes, etc, for his collection.

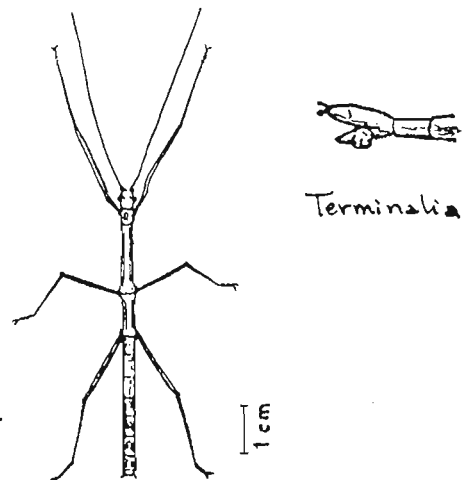
Professor D. Keith McE. Kevan (No. 441) wants orthopterological letterheads, stories, verses and information about objets-d'art, toys, etc, for his collection.

MALES OF CARAUSIUS MOROSUS AND SIPYLOIDEA SIPYLUS
by Alain Deschandol (No. 238)

After obtaining an S. sipylus male last year, I now have a C. morosus male in my culture (see drawing). What good luck! In both cases I have observed:

- The male is similar to the female in colours and shape, except the tip of the abdomen.
- The male is more slender and shorter.
- The male survives only a few weeks as adult.
- The genital organs of the male seem incomplete.
- My males do not mate with females (unlike some others).

What is their function?

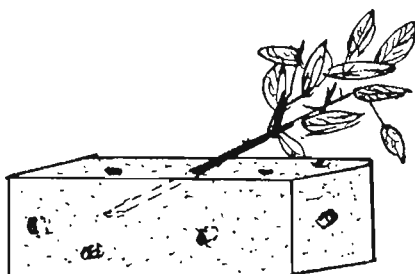


UNDERFLOOR CAGE HEATERS by Frances Holloway (No. 3)

My search for the latest address of the manufacturer mentioned in Newsletter 5 led me, via the discovery that this firm no longer makes heaters, to a pet shop in Derbyshire, and thence to Ultratherm Ltd in Scotland! Ultratherm (at 31 Cromwell Road, Buntisland, Fife KY3 9EH; phone 0592-874107) makes 1 mm thick plate heaters for vivaria. Wattages range from 7 W to 240 W; sizes from 6 in x 10 in to 70 in x 18 in, and prices from £6.75 to £33.85 - postage extra. Unfortunately, this firm has not replied to my letter asking how hot these heaters can get, and whether they are electrically safe in damp conditions.

USEFUL MOSS by Alain Deschandol (No. 238)

In cages where humidity is necessary I put in a brick of moss bought at a florist shop (cost: £1) - the French name is "florist moss". After immersing the brick in water for some minutes, much water is absorbed which can be used for foodplant sprigs stuck in the brick. My Eurycantha sp. use this moss to bury their eggs in!



[Potatoes have also been recommended for sticking bramble stems into, but we can't remember who by! - Eds]

"WHO IS WHO WHEN EVERYBODY IS SOMEBODY ELSE" by Michael and Frances (No. 3)

In the course of time unidentified PSG sticks obviously frequently become identified and, dare we say, mistakes are occasionally found! So some stick names used in earlier Newsletter articles are no longer strictly accurate. We give below a key as to what these names should now be (NL1:2 means Newsletter 1, page 2). If the PSG number is given in any article, then the latest information should rather be obtained from the Species List.

- NL1:2 Unidentified Baculum from Thailand should be Baculum thaii.
- NL3:4 Watta Whopper should be Pharnacia acanthopus.
- NL4:3 T. cantori "odd" male should be Pharnacia acanthopus male.
- NL4:4 Bacillus granulatus is a synonym for Clonopsis gallica.
- NL5:2 Thailand unidentified ova should be Baculum thaii ova.
- NL6:4 "Log insect" should be Creoxylus spinosus.
- NL7:4 New Trinidad Species:2 should be Libethra regularis.
- NL9/10:2 Baculum sp. should presumably be Baculum thaii.
- Unidentified Thailand should be Baculum thaii.
- NL9/10:3-6 TAU2 The "Grass" Stick should be PSG 41.
- NL9/10:7-8 TAU3 The Madras Thorn Stick should be PSG 42.
- NL11:3 Indian stick should be Carausius morosus.
- NL12:3-4 Dominican Phasmid (U1) should be Aplopus sp. PSG 48.
- NL13:6 Thailand should be Baculum thaii.
- Indian should be Carausius morosus.
- Pink-winged should be Sipyloidea sipylus.
- NL16:2, 20:2, 23:3, 25:3, 26:3-5, 28:2
- Acanthoxyla prasina should be Acanthoxyla geisovii.
- NL20:2 Clitarchus hookeri should be Acanthoxyla inermis.
- NL23:6 A new Dares species should be Dares sp. PSG 69.
- NL27:6-8 See "Baculum impigrum (?)" by Burghard Hausleithner (No. 132) in NL28:5.
- NL28:2 New Philippines species should be PSG 90.

THE ORDINAL NAME FOR STICK INSECTS by D. Keith McE. Kevan (No. 441)

From the beginning, we have been called "The Phasmid Study Group". It could, however, be argued by pedants that this should be modified because the subject of study is not only imprecisely indicated but also the word used for it is incorrectly formed. The English word "phasmid", however, has been used entomologically for well over a century to signify any member of the group to which stick insects belong. The Oxford Dictionary says that this has been since 1872 (in the printed word) - though I suspect that there may have been earlier English usages. This is because the incorrectly formed scientific names "Phasmida" and "Phasmidae", from which the English word was derived, date back to Leach, in 1815, and to Kirby and Spence, in 1826, respectively. Since the English language, to its great advantage, is not bound by the grammatical conventions of those languages from which it borrows words - though it usually complies in principle with them - "phasmid" is quite acceptable English for general usage; except specifically for a member of the family (however defined) containing the genus Phasma (i.e., the Phasmatidae).

Phasma is the Latin equivalent of the Greek φάσμα, a ghost or spectre, and it has a rather long history, having been used by the early Latin poet and playwright Terentius Afer (Terence, second century BC). He probably got it from the title of a greek play by Maiandros (Meander). It was also used by the Latin poets Gaius Valerius Catullus (first century BC) and Junius Juvenalis (Juvenal, first century AD). It seems to have got into English only in the seventeenth century, being used, apparently from 1639 onwards, for any extraordinary visual phenomenon, and being abbreviated to "phasm" in 1656. This reinforces the idea that, as an English word, there is nothing against "phasmid", the less so because it is quite unambiguous (or was so until nematologists* began to use it in another context - but that opens up another can of worms, as it were!).

When it come to scientific names, however, because these are Latin, whether or not they are governed by the International Code of Zoological Nomenclature, their formation must adhere to the grammatical rules of Latin. Thus, derivatives of "phasma" must be formed by taking the genitive case of the noun, in this instance "phasmatis", removing the inflection, here "-is", and building on the remaining part, here "phasmat-", to form the new word. Thus we have "Phasmatidae" (and hence "Phasmatoidea", "Phasmatinae", etc), not "Phasmidae", which is incorrect. So "Phasmida" is unacceptable as a scientific name on grammatical grounds. The word should be "Phasmatida", if it is to be used.

Having established this, we have by no means settled the name that is to be used for the Order, because the International Code of Zoological Nomenclature (unlike the Botanical Code) has no rule (or even recommendation) for names above the rank of the family-group (i.e., above superfamily). "Thou pays thy money and thou takes thy choice!" - provided it is grammatically acceptable! How, then, does one choose?

There are several ways that one may arrive at a decision - other than putting available names in a hat and drawing one. For instance, one can take the earliest group name (presumably Latin and post-Linnaeus 1758) and use it unchanged, or one could use this name with some modification involving uniform series of terminations (as in the case of family-group names), or one could use the first-published name to be applied to the group according it a given ranking in the taxonomic hierarchy - in this case ordinal level - and there are doubtless other criteria that could be used. In the case of stick insects, however, no criterion is straightforward, except that "Cheleutoptera" of Crampton, 1915, seems to be the earliest name to have been used in establishing most of the group as an Order. It also has the suffix "-ptera", which can be employed in the case of all orders of true insects (though this is not generally done). Other than for insects, however, there has been no serious attempt at establishing uniform name-endings for orders of animals in general, with the result that there is no way to tell the rank of a higher group from its name.

*Those members who do not know what nematologists are, are advised to look it up! - Eds

There has also been little attempt to adopt the earliest appropriate names for animal groups, such as orders - few entomologists call fleas by their earliest name, Suctoria, for example. It has, however, been maintained that, for stick insects, the earliest appropriate name is "Phasmida" and that this is the name that should be stabilised. Yet we have already indicated that the word is grammatically incorrect and should, if used, be modified to "Phasmatida" for scientific purposes. In any event, "Phasmida" is not the earliest name for the group. This was, in fact, Caspar Stoll's vernacular "Les Spectres" (French) and "De Spookten" or "Scherminkels" (Dutch) of 1787/8,* used simultaneously with the Latin singular (and therefore unacceptable as a group name) "Spectrum". This last was only a generic name (in the usual sense, though Stoll' called his major groups genera and his minor ones families, contrary to standard practice!). "Spectrum" is, in any event, technically "unavailable" at the generic level for the purposes of zoological nomenclature because Stoll's 1787/8 work does not employ binominal nomenclature. Phasma of Lichtenstein, 1796, would fall as a junior synonym if Spectrum were accepted, and this would result in further problems of nomenclature. Phasma itself caused considerable trouble in the past as a result of the conflicting use initiated by Le Peletier de Saint-Fargeau and Audinet-Serville in 1825, and which was for long followed by others. The matter, at last, was put to rights by W.F. Kirby in 1904, but it was some time before the use of the generic name Phasma became stabilised with Lichtenstein's Ph. empusa as the type species. (Kirby, of course, used the unacceptable "Phasmidae" for the entire group!)

We can dismiss Stoll', 1787/8, as a starting point for the scientific naming of the group: this gives priority to "Phasmata", first used by Lichtenstein in a paper delivered in 1797, though not published until 1802. That this is merely the Greek form of the plural of Phasma cannot be used to disqualify the name in the absence of rules to the contrary. There are plenty of precedents for the acceptance of generic plurals as names of categories above the family-group level - for example, "Acari" for the mites. If we do not accept Lichtenstein's "Phasmata", we come next to family division "mantides: spectra" of Latreille, later in 1802, and "Spectra" of the same author, 1807 (used again 1825). This was followed by the vernacular "Spectres" and "Phasmes" in the posthumous, 1813, edition of Stoll's work, edited by Houttuyn, before Leach, 1815, published the incorrectly formed "Family" name "Phasmida". Later group names were "Phasmina" and "Phyllia" of MacLeay, 1821, "Phasmidae" of Kirby and Spence, 1826, "Spectrites" and "Spectrina" of Newman, 1834, "Phasmodea" of Burmeister, 1838 (corrected to "Phasmatodea" by Verhoeff, 1902, and Yakoson and Bianki, 1902), "Phasmides" (and "Phasmidae") of Audinet-Serville, 1838, "Ambulatoria" of Westwood, 1839 (he also used "Phasmidae" at a lower level), "Phasmoideae" of Fieber, 1850, and so on. To what ranks in taxonomic hierarchy the various names were first applied varied widely, as classification systems in the past were even more unstable than they are now. As often as not, they did not closely resemble recent concepts.

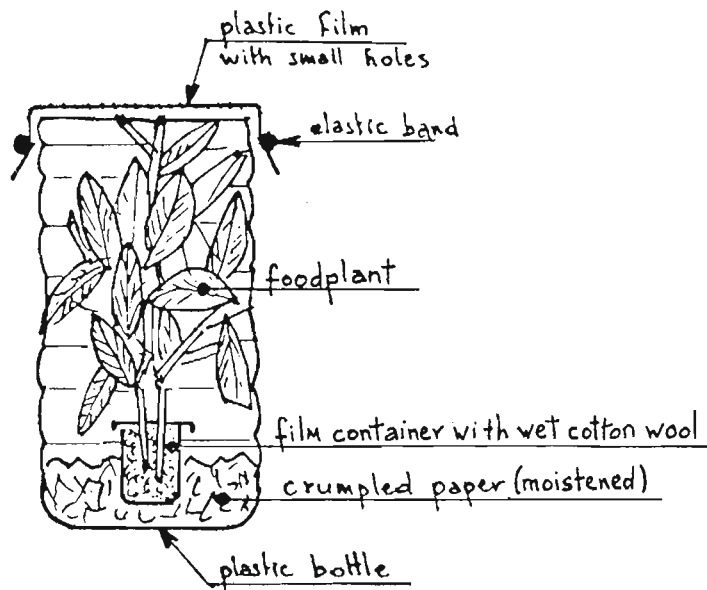
Whilst there is no rule by which to determine which of the many options should be selected, it would seem that the "best bet" is to base the name of the Order on "Phasmata", either as originally published or with some appropriate change in suffix to indicate ordinal status (such as "Phasmatida" or "Phasmatoptera" of Günther, 1956, from "Phasmoptera" of Crampton, 1915). "Phasmatodea" is an acceptable higher-category name, but the suffix usually has a subordinal connotation; indeed, the Suborder Phasmatodea (as discussed elsewhere by the present author) includes all living stick insects except for the genus Timema - if one accepts the particular classification concerned! The claim of "Cheleutoptera" (more widely used than generally supposed) to be the name of the Order has already been noted. It has another advantage in that, although it originally omitted the Phylliidae, it is now used for all suborders including fossil ones. Again, you pay your money and you take your choice!

*Latinising the earliest vernacular name for a group would not, in itself, contravene the principles of the International Code, for this allows the procedure for family-group names.

To the amateur the niceties of zoological nomenclature and the need for establishing a universal naming system may seem like so much trivial pedantry, but, as in all things, sine systemata chaos!

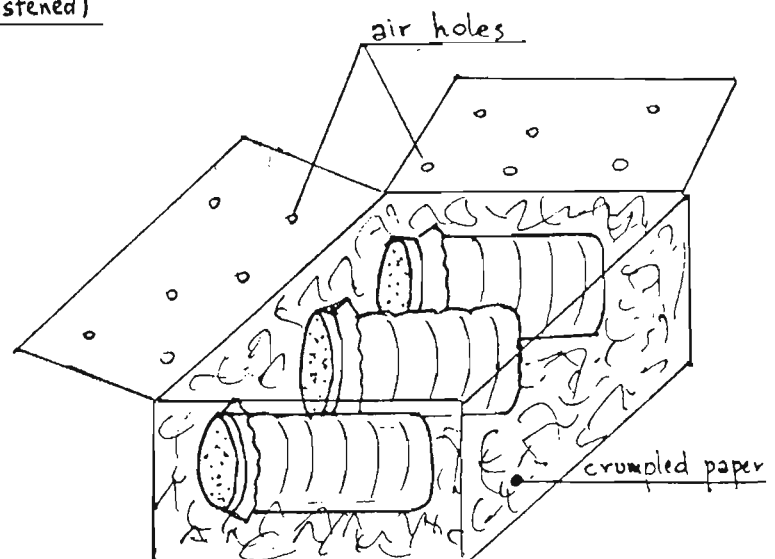
For the details of the early references to the literature relating to the different names mentioned, the reader is referred to the following (though there are not too many private copies around!): Vickery, V.R., and Kevan, D.K.McE., A Monograph of the Orthopteroid Insects of Canada and adjacent Regions (2 volumes), Mem. Lyman ent. Mus. & Res. Lab., 13 (1983), 1462 pages.

HOW TO SEND STICK INSECTS BY POST by Alain Deschandel (No. 238)



I use a method which gives good results. I put my stick insects into plastic bottles as shown in the drawing. I use plastic water bottles and cut off their necks. The foodplant stems are pushed into film containers filled with wet cotton wool. The film containers are confined in moistened crumpled paper and the whole must be rigid.

The plastic bottles are put into a rigid (cardboard or wooden) box with crumpled paper. The box must be full to escape crushing during travel.



Stick insects can survive several days in these conditions and arrive safely at their destination. However, it is preferable not to send parcels when the weather is too cold.

[More-general advice on posting stick insects (and their eggs) is given in Newsletter 30, pages 4 and 5. - Eds]

BOXES FOR POSTING STICKS by Phil Bragg (No. 445)

The delicatessen counters at supermarkets get their salads supplied in plastic ice-cream-type containers, although they seem to be made from a slightly different type of plastic. I find these excellent for posting sticks (something I do about twice a week!). They are strong enough to stand up to the postal service, and they are light in weight and therefore the cost of postage is low. Although I get mine via a friend, I am sure that most supermarkets would be happy to give these boxes away, if asked when they are not too busy! ASDA in Nottingham throw away 50 or more boxes per week.

I use A3 size computer printout paper to wrap boxes of sticks. With the print on the inside you get a very high-quality wrapping paper! If you know anyone with access to a computer they always seem to have a lot of unwanted printouts!

[Some plastic boxes could easily be crushed in the post. - Eds]

THE EGG-LAYING PATTERN OF HERMARCHUS STAL SPECIES (PSG 57) by Paul Brock (No. 26)

Ulrich Ziegler (No. 233) kindly sent me some eggs of PSG 57, a fine, large stick-like species said to be from Queensland, Australia. I intend contacting suitable museums in Australia in an effort positively to identify this species, but know little or nothing about its origin as a culture stock. I believe that it was first bred by European PSG members in the mid 1980s, and any information would be appreciated.

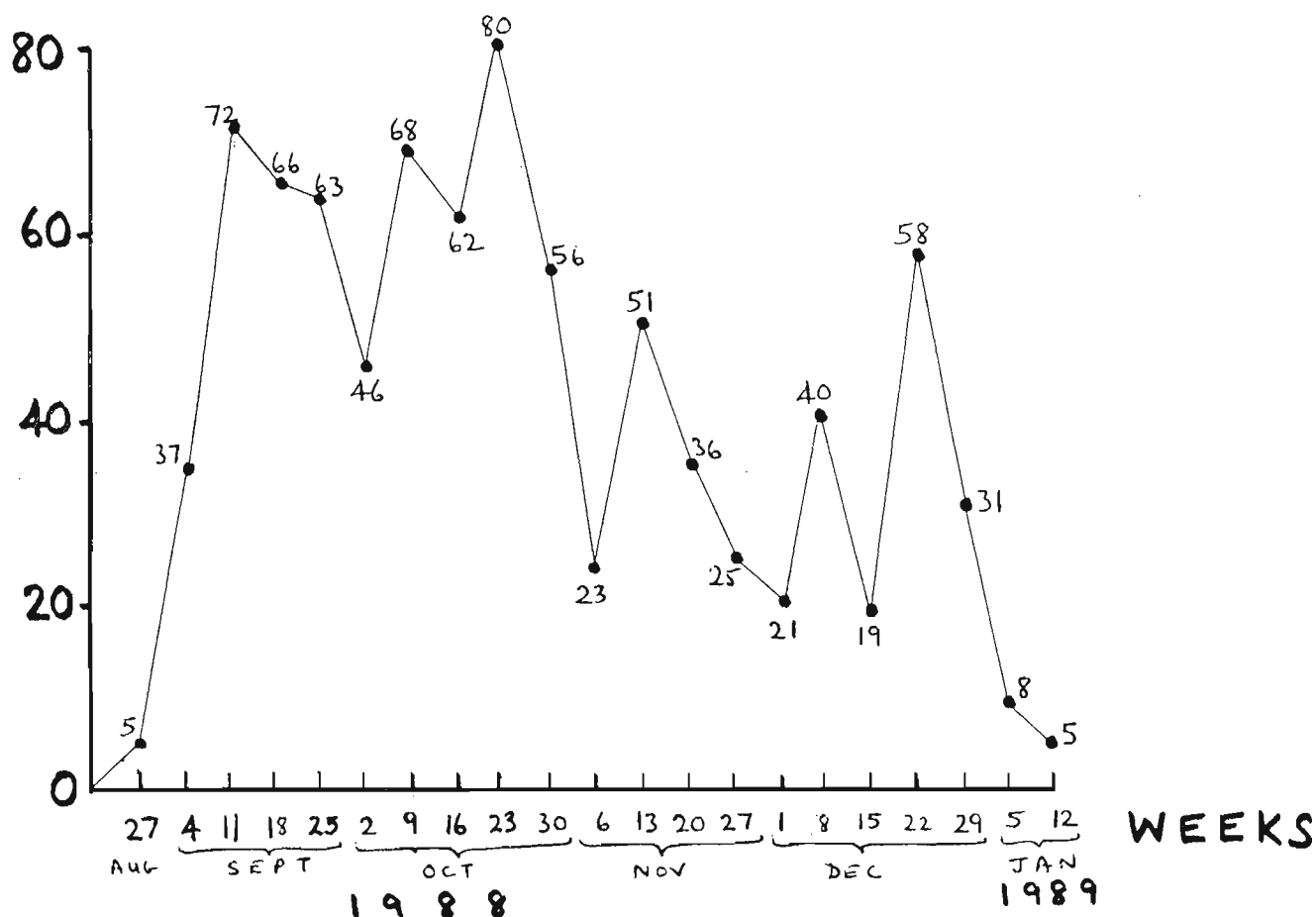
Bruno Kneubühler (No. 440) gave a brief account of the species (Newsletter 37, page 7, with a note on deformities on page 9), commenting that they lived no more than 2½ months as adults. My experience with the only specimen I reared was somewhat different. I used bramble and *Eucalyptus gunnii* as foodplants, and the insect reached maturity in early August 1988 and lived over 5 months.

Eggs were first laid in the week ending 27th August 1988 and in the first half of the insect's life reached peak numbers - up to 11.4 per day in the week ending 23rd October. A total of 872 eggs were laid in the 21-week duration of egg laying, an average of 42 per week - which includes periods of poor egg laying at commencement in August 1988 and just before the insect's death on 12th January 1989. During the first 10 weeks 555 eggs were laid (average 55.5 per week), but the last 11 weeks yielded only 317 eggs (average 28.8 per week).

The specimen was kept in a large glass aquarium with ample room and without disturbance from other insects - usual temperatures were 70-85°F in the daytime and 65-70°F at night. A drop in temperatures to below 65°F occurred occasionally on some evenings, which particularly accounts for a drop in egg-laying activity in the weeks ending 2nd October and 6th November. (The egg-collecting date was changed in December, hence one period of only 5 days!)

Observations of the egg-laying activity of other species in a similar format would make an interesting project for our younger members in particular.

NO. OF EGGS



METHYL-4-HYDROXYBENZOATE MOULD INHIBITOR (FOR EGGS)

Judith Marshall (No. 13) has found that this can be obtained from BDH Limited (11 branches and distributors in the UK) for £5.10 + 15% VAT for 100 g (No. 29231 2J). Information can be obtained from their Head Office at Broom Road, Poole, Dorset BH12 4NN (telephone 0202-745520).

HATCHING EGGS by Michael and Frances (No. 3)

Many methods are advocated for hatching eggs, and to make the choice harder, what works for one member may not work at all or as well for another! This article briefly reviews various methods which have been suggested.

The easiest way is to leave the eggs with the frass at the bottom of the cage, and this works very well for some members. But this method does have several disadvantages. Many eggs need moisture to hatch and this may easily cause mould in the frass - but then again, some members say this does not matter! If your cage is not heated internally or not in a heated room, your eggs may be too cold to hatch - but then again, some members succeed in hatching eggs kept well below the temperature regarded as essential by other members! A practical difficulty is that you probably won't know how many eggs you have in the frass. So any surplus will have to be disposed of after you have hatched what you want, and giving away a sudden vast surplus of unsexable nymphs or about-to-hatch eggs can present several obvious practical difficulties!

Another, semi-natural, hatching medium is peat, and the eggs can be placed on or (if the stick does so) buried in it - peat does not go mouldy nearly so easily as frass.

Cleaner hatching substrates which are advocated include sand and paper kitchen towels. Any substrate may well need to be kept moist and this is easier with some than others. Finally, some eggs can be hatched without any substrate at all.

The egg box should obviously be large enough for a nymph easily to hatch from the egg and stretch its legs and, if you expect mass hatching, larger still! Many suitable plastic boxes can be found.

From what we have seen above, there is no agreement on the correct hatching temperature, and all one can say is that it should be somewhere between 85°F and "room temperature". It is possible that varying the temperature daily will also help the eggs to hatch.

EURYCANTHA CALCARATA HATCHING RATE by Paul Jennings (No. 80)

I have read of different methods used to hatch ova of this species, including burying them in peat. I decided to incubate mine on very slightly moist tissue paper at 75-80°F (24-27°C). The result was 67 hatched out of 81 incubated, giving an 83% hatch rate (further ova could still hatch as the last one hatched only a few days ago). The survival rate of the first instar nymphs is also very high (approximately 85%).

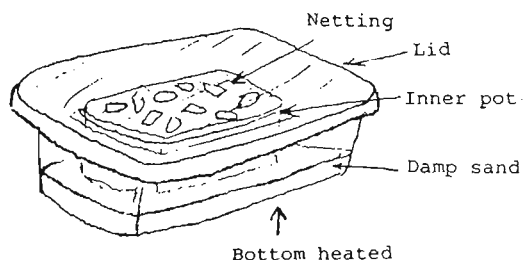
One other interesting point is that the above ova were the first laid by a single mated female, which disagrees with the theory of Michael and Frances (No. 3) that the first 20-30 eggs laid may not hatch (Newsletter 34, page 12). Sorry!

I have also hatched *Heteropteryx dilatata* ova in the same way, but do not have exact hatch rates. Both species were housed with peat on the floor to enable the females to bury their ova in the natural way.

HOW I HATCHED PHYLLIUM GIGANTEUM

by David Davis (No. 377)

I kept the eggs suspended above damp sand on nylon netting at 70°F in very humid conditions.



PHYLLIUM SPECIES - ADDITIONAL COMMENTS FROM FIRST-HAND EXPERIENCE

by John P. Killingbeck (No. 509)

Following the interesting articles on leaf insects by Pat Matyot (No. 604) and Mel Herbert (No. 232) in Newsletter 37 (pages 11 and 12-14 respectively), I thought I would like to add an account of my own experiences regarding the culture of these remarkable and appealing insects.

What I write is drawn purely from personal experience, so there is no list of references at the end of this article.

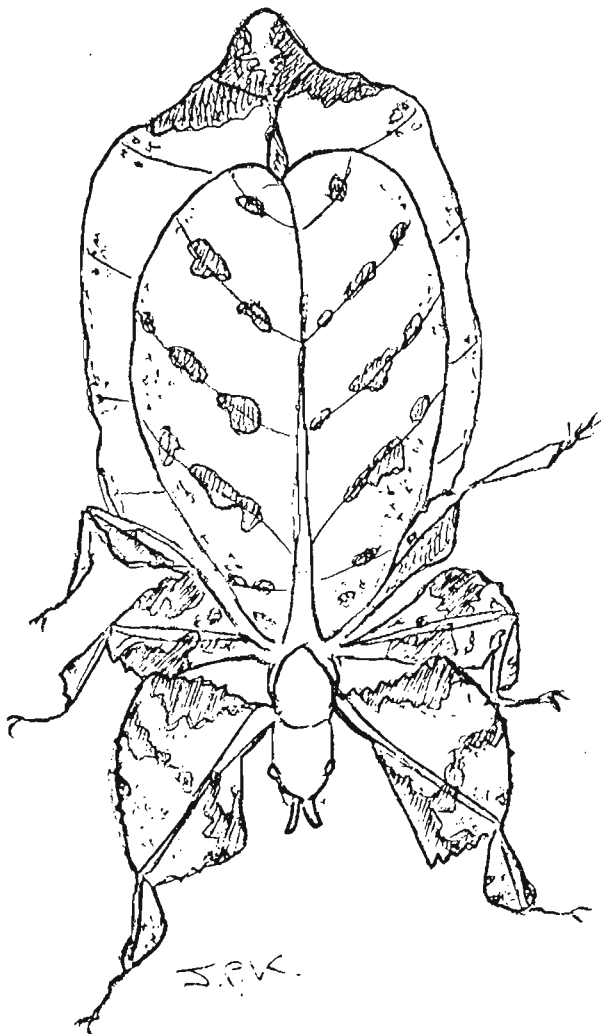
My particular culture of Phyllium (I do not know their specific name for certain) was obtained commercially as 12 ova some two or more years ago from the well-known Midlands firm Entomological Livestock Supplies. The culture is presently coming to the end of its third generation in my care. It has now been divided into two separate colonies, only one of which is held by me. Although I have also given out occasional groups of nymphs, as far as I know none of these has established a separate colony.

My present colony results from my third attempt at Phyllium culture, earlier attempts having failed at the hatchling stage.

Adults

Broadly I would agree with the descriptions in Mel's article regarding size and most other features, although the transparent spots mentioned on the females are not covered by the wings on my specimens.

It may also be of some significance that the abdomens of my females are rather more tapered than the illustration in Mel's article suggests. If indeed species



Phyllium sp. female -
mottled form

are distinguished by abdomen shape, then mine are obviously not the same species as those illustrated.

However, the most striking variance I have with Mel's description is regarding coloration. Mel states "Many females also have a few brownish spots on the body", but the majority of my females are to a greater or lesser degree clearly mottled, with attractive symmetrical brown patches on the legs, wing covers and abdominal flanges. It is of particular interest that the proportion of heavily mottled females to lightly spotted ones has risen with each generation. As far as I remember (although I made no records), the original group was all green, the second generation had only one heavily marked female, whilst the current generation has more mottled than lightly spotted or plain females. This rate of change suggests environmental factors at work. Incidentally, there is no evidence of mottling on a female until the final instar, and males appear unaffected, as yet.

My final comment on this section concerns the flight of males, which I have witnessed a number of times. Particularly when I am changing the food a male will occasionally embark upon a delicate spiralling flight towards the light bulbs in the room. The flight is rather difficult to describe in any more detail but is somewhat reminiscent of a lacewing. On each occasion flight has taken place in a very warm room. Brief abortive flights are also made from time to time in the cage itself.

Culture

Nymphs - I would say that, apart from the differential rates of maturing between males and females, the single greatest obstacle to leaf insect culture is survival of the first instar. I personally have found that the easiest way of inducing the young to begin eating is to mix them with nymphs of another phasmid, combined with regular spraying with water. Nymphs which have commenced eating gradually lose their deep red colour and become much less energetic in their habits than is initially the case. Newly hatched nymphs kept alone or exclusively together seem, in my experience, likely to fail to begin feeding and perish within 3-5 days. I would agree with Mel that, once feeding has commenced, the main danger is over and mortality is henceforth low.

Foodplants - Initially I went to the trouble of providing my Phyllium with guava leaves (a reasonably easy plant to grow in a heated greenhouse), on which they thrived! Later I transferred them to bramble and the second and third generations were successfully reared on this. Unlike Mel, I had no trouble using bramble as a food. Having read Mel's article, I tried a sprig of evergreen oak with my colony. The insects consumed it with relish and clustered around it, preferring it to bramble. Therefore I would concede that oak is probably the best and most preferred Phyllium food.

Temperature - My cultures have been kept at temperatures between 20° and 25°C, with short spells above and below these figures.

Humidity - It is often stated that leaf insects require frequent and regular spraying in order to maintain high humidity. However, I have found that spraying need only be occasional, particularly in winter. Excessive dampness is not desirable and may encourage disease.

Lighting - Containers heated by electric light bulbs seem quite suitable for Phyllium in my experience. The insects seem indifferent to the alternating light and dark regime (as the thermostat switches on and off) and can be observed moving and feeding even when the lights are full on.

Once a culture is "launched", i.e. a few mated females have been achieved, the resulting eggs should ensure enough nymphs to overcome the problems of differing male and female maturity rates in future generations.

Given appropriate conditions, the leaf insect seems no more delicate than any other phasmid. Overcrowding must be avoided and reasonable cleanliness observed, as with any insect. Success comes as a result of keen observation and sensitive and prompt attention to any problems which arise.

DISTRIBUTION OF EUROPEAN AND MEDITERRANEAN STICK INSECTS OF THE GENERA
BACILLUS, CLONOPSIS AND LEPTYNIA by Paul D. Brock (No. 26)

These notes and maps are intended as a basis for further distribution records, which will be published in a detailed paper at the earliest opportunity. This "draft" information is provided now owing to considerable interest shown by members in the European species - it brings together many records from various sources including some not previously mentioned in the literature.

These records are valuable in extending our knowledge on distribution and include sightings which conflict with previously published information. It is interesting to note that confirmed records of Clonopsis gallica at Quiberon, Brittany, and of Bacillus rossius at Boulogne are close to Britain!

It should be noted that distribution records often reflect the collector's searching areas; not the species' true distribution.

I will be pleased to provide further information regarding specific countries on request (+SSAE).

It is often best to search for adult Clonopsis and Leptynia in spring/early summer and for Bacillus in autumn. Searches on or near foodplants in the daytime will be well worthwhile.

Please keep the records rolling in!

A key to species is not appropriate at this stage as detailed descriptions of four Bacillus species are still unpublished. Most European species breed by means of parthenogenesis although males are found in varying numbers in some cases, as indicated.

THE SPECIES

KEY: PC = personal correspondence; BM(NH) = British Museum (Natural History);
OUM = Oxford University Museum; FP = foodplant(s).

Many thanks are due to all friends and members who kindly provided records (some of which are not specifically included in this work, e.g. those for B. rossius and C. gallica).

1. Bacillus rossius (Rossi)

Records from Albania, France (incl. Corsica), Greece, Italy (incl. Sicily and Sardinia), Spain and Yugoslavia are too numerous to mention owing to constraints on space, but certain unusual records are mentioned below. This species is also widespread in northern Africa.

ALBANIA Kaltenbach (1961): Elbasan, Durrës, Borshi' sud l. Vlora.
BM(NH): Sarande, Sept. 1984 [M. Chinery].

FRANCE Stan Pack (PSG 99, PC 1984): Boulogne. FP rose, bramble, Fuchsia rivertonii magellanica. The furthest northern European record for a Bacillus species; usually associated with the south of France and likely to have been introduced.

GREECE (CORFU) Eric van Gorkom (PSG 250, PC): rossius? - species not determined with certainty.

Numerous FP are given in Bullini (1981).

Males often turn up in the more southerly range.

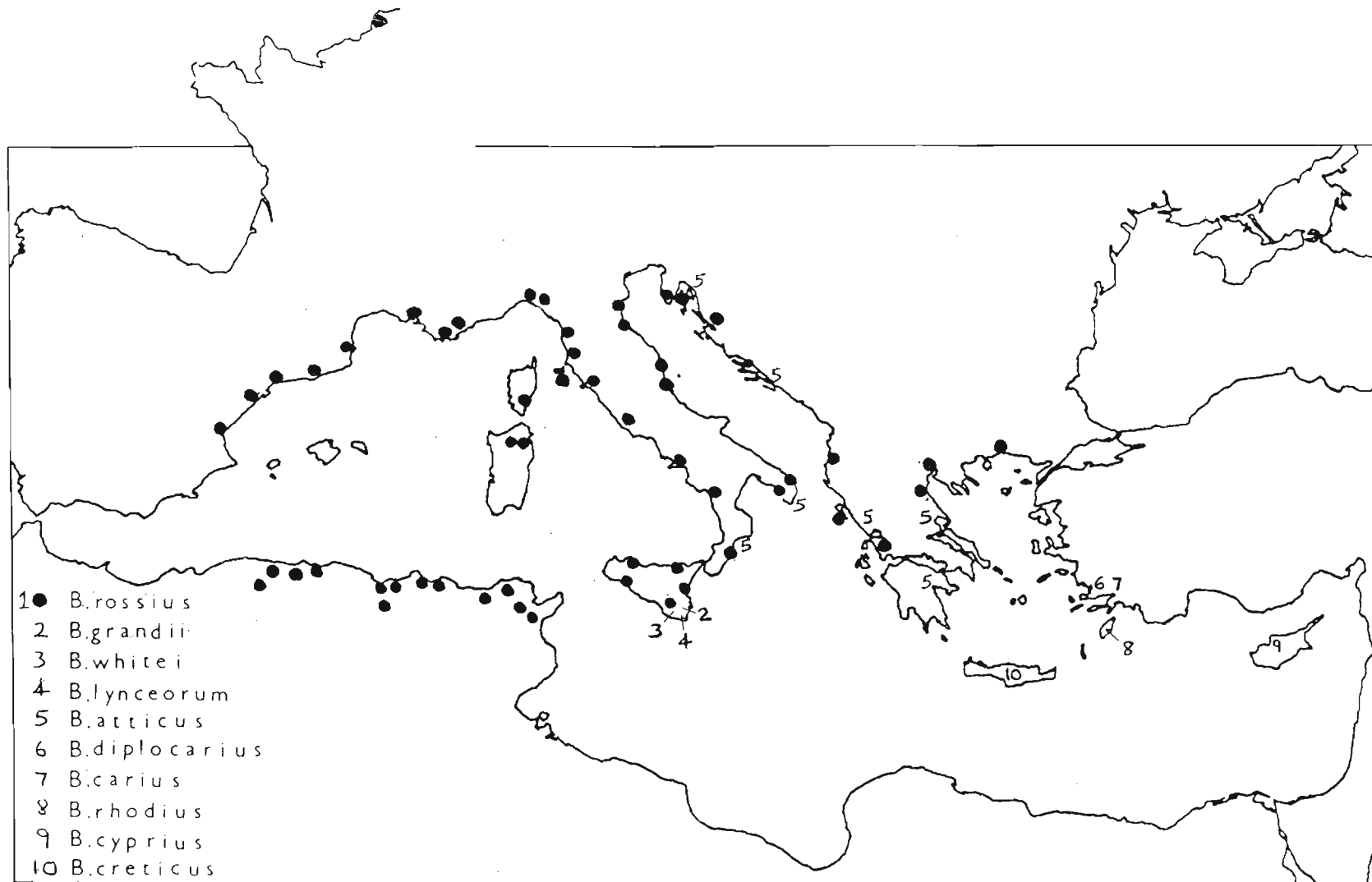
2. Bacillus grandii Nascetti and Bullini

ITALY (SICILY) Nascetti & Bullini (1982): Surroundings of Noto, Palazzolo Acreide and Canicattini Bagni (Syracuse). FP mainly bramble.

Bisexual.

3. Bacillus whitei Nascetti and Bullini

ITALY (SICILY) Nascetti & Bullini (1982): Floridia, Lentini, Syracuse, Cassaro, Canicattini Bagni, Noto, Palazzolo Acreide, Raguse (Syracuse and Raguse). FP bramble.



EUROPEAN & MEDITERRANEAN DISTRIBUTION

IN THE GENUS BACILLUS

4. Bacillus lynceorum Bullini and Nascetti

ITALY (SICILY) Bullini, Nascetti & Bullini (1984): Surroundings of Santo Pietro (Catania), near Vittora (Raguse). FP bramble.

Hybrid between B. grandii and B. whitei.

Mazzini & four others (1987) also mention other nearby areas with a map of species 1, 2, 3 and 4 in Sicily.

5. Bacillus atticus Brunner

GREECE Brunner (1908): Attica.

Harz & Kaltenbach (1976): Athens, Hymmethus.

Goday, Bullini, Nascetti & Bullini (1982): Argos.

Ulrich Ziegler (PSG 233, PC 1987): Sithonia Metamorphosis.

ITALY Goday, Bullini, Nascetti & Bullini (1982): Capo Lizzuto (Calabria). Hybrid with B. rossius from Alimini (Apulia).

Mazzini, Nascetti & Bullini (1982): Confined to southern Apulia and the Iolian coasts of Basilicata and Calabria - specific locality mentioned: Alimini between Lecce and Otranto (Apulia).

Nascetti & Bullini (1982): Between San Cataldo and Otranto (Lecce), between Crotone and Capo Rizzuto (Catanzaro), between Metaponto (Matera) and Sibari (Cosenza).

YUGOSLAVIA Harz & Kaltenbach (1976): Meleda, Kres, Lošinj, Mljet, Hvar (Dalmatia).

Bullini (1981) gives wild FP Pistacia lentiscus (Anacardiaceae) (main FP), Cistus (Cistaceae) and Pinus (Pinaceae).

6. Bacillus diplocarius Scali and Mantovani unpublished7. Bacillus carius Scali and Mantovani unpublished

TURKEY Gasperi, Malacrida, Mantovani & Scali (1987): Bodrum. FP lentisc.

Brock: (Bacillus species as yet undetermined) Datça, April 1988.

FP lentisc; in captivity lentisc, Eucalyptus gunnii and bramble.

8. Bacillus rhodius Mantovani and Scali unpublished

GREECE (RHODES) Gasperi, Malacrida, Mantovani & Scali (1987): Arnitha. FP lentisc.

Brock: Faliraki, June 1987. FP lentisc. rhodius? - egg differs from description in Mantovani & Scali (1985).

9. Bacillus cyprius Uvarov

CYPRUS The species occurs in both the Turkish and Greek parts of the island.

Brock (1987a) (includes map): Turkish part of northern Cyprus -

Halévgá, Gecitköy, Karaagac, Esentepe; Greek part of northern Cyprus - Aphrodites Bay-Polis; Greek part of southern Cyprus - Akrotiri, Amathus, Governor's Beach. FP lentisc; in captivity reluctantly bramble.

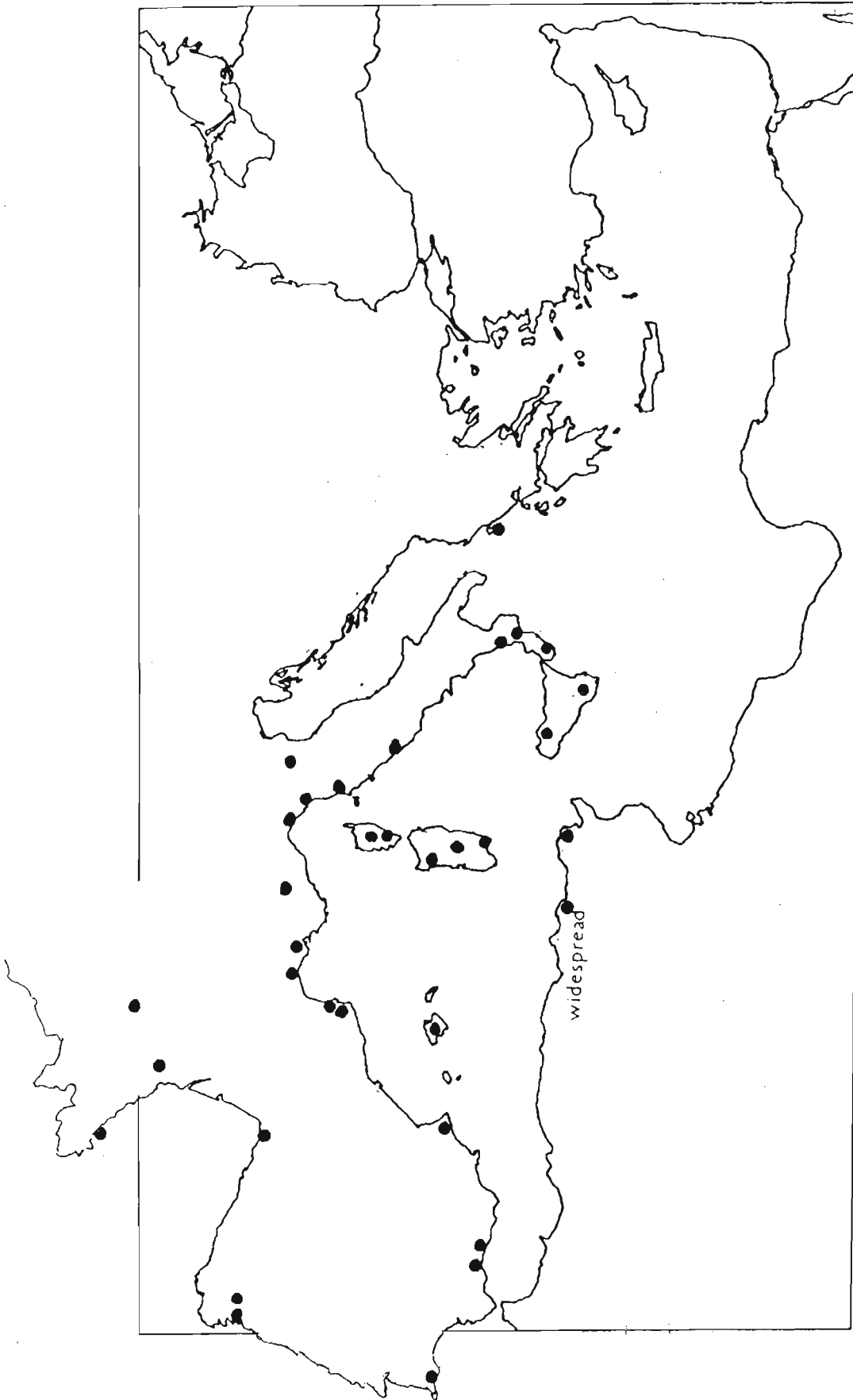
10. Bacillus creticus Scali and Mantovani unpublished

GREECE (CRETE) Gasperi, Malacrida, Mantovani & Scali (1987): Paleochora. FP lentisc.

Brock: Nr. Rethymnon, Oct. 1987. FP lentisc. Awaiting confirmation following description of species.

11. Clonopsis gallica (Charpentier)

Widespread in parts of France (incl. Corsica), Greece (incl. Corfu), Italy (incl. Sicily, Sardinia), Portugal (incl. Azores) and Spain (incl. Majorca). Records are too numerous to mention owing to constraints on space, but certain unusual records are mentioned below.



DISTRIBUTION OF CLONOPSIS GALLICA

11. Clonopsis gallica (continued)

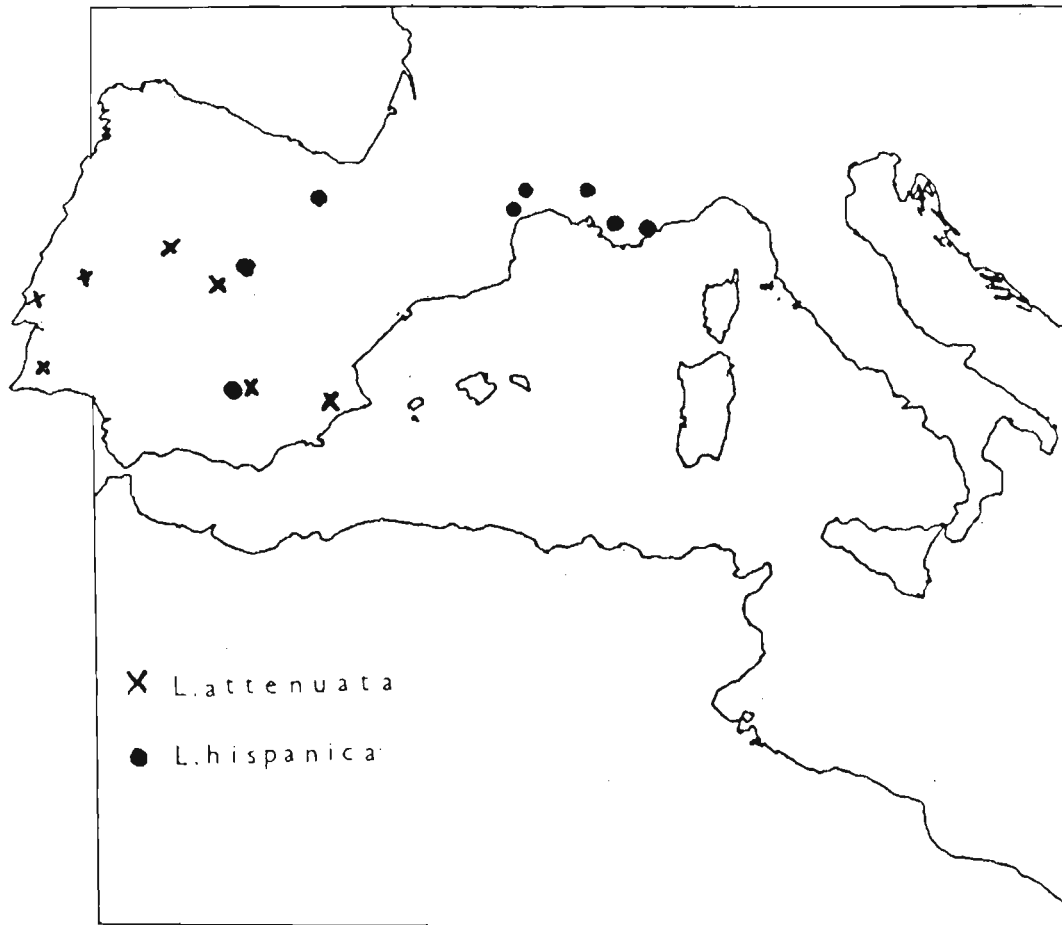
- GREECE Mentioned in Harz & Kaltenbach (1976) and others without details of localities. The only definite record I can trace is Mrs F.M. Murphy (PC 1988): Roda, Corfu, April 1983 - slides show the insects resting on live and dried up grass (incl. close-ups).
- PORTUGAL Bolivar (1876) mentions "Portugal" [Charpentier] but I have been unable to trace other records except OUM "Portugal"; and Brock: Carvoeiro and Portimao (Algarve), 3-10 June 1986 - FP Cytisus scoparius, Cytisus sp. - numerous adults and nymphs.
- SPAIN Several records from mainland Spain but the only mention of a locality in Majorca I can trace is OUM: Pass of Soller on Palma side, 1 July 1901 [W. Holland].

Normal FP rose, bramble and others (see Bullini 1981).
Males are extremely rare, and unknown in most countries.

12. Leptynia hispanica (Bolivar)

- FRANCE Records obtained via Philippe Lelong (PSG 474) from literature in his possession: Azam Digne (Basses-Alpes), Draguignan, Figagnières, Roquebrune (Var); Berenguier La Bastide (Var), Vernet (Mt. Canigou) locality "La Mort de l'Homme" (Pyrénées-Orientales), Mas des Gardies - Sauve road Bois de Vacqueyrolles (Gard); Capelle Narbonne (Aude); Farard Argelliers (Hérault) locality "Les chênes" Montarnaud road. FP Dorycnium suffruticosum.
Philippe Lelong's own records (PC 1988): Barjac, 1986 & 1988; Anduze (Gard), 1988. FP Dorycnium suffruticosum.
Chopard (1951) in addition to details of some of the Lelong references also gives: Vaufrèges, Cassis, La Ciotat (Bouches-du-Rhône), Montpellier (Hérault) [De Vichet], Plan d'Aups [Soyer], St-Michel-l'Observatoire [Dufay], Saint-Geriès de Malgoirès (Gard) [A. Hughes], Douzère (Drôme) [P. Blaine], harmas de Fabre (Vaucluse) [Marcel Roland].
Stan Pack (PSG 99, PC): Mercantour National Park.
John Muggleton (PC 1988, with many thanks for detailed records):
- Garrigue to the east of D161 between St Pons-de-Mauchiens and the Abbaye de Valmagne (north west of Sète) (Hérault), 1987;
- Near Malaucène - clearing in pine wood on the lower slopes of Mt Ventoux (Vaucluse), 1986;
- Garrigue north of Roussillon (Vaucluse), 1986;
- Small plateau above the Ravine des Arcs, St Martin-de-Londres (Hérault), 1983;
- Le Castellans (ruin) Commune d'Aumelas between Vendémian and St Paul-et-Valmalle (Hérault), 1987;
- By roadside D201 Plateau des Gras (Ardèche), 1986.
John found specimens relatively easily in suitable localities by sweeping low vegetation. FP not certain - found on or near Thymus vulgaris, never on Dorycnium; locality St Martin-de-Londres on taller vegetation (?broom). In captivity newly hatched nymphs will eat a garden variety of Helianthemum and later instars wild rose; but not broom or thyme at all.
Brown forms have been reared as well as green (contrary to Philippe Lelong's experience).
- SPAIN Harz & Kaltenbach (1976): Logroño, Madrid, Escorial, Alcarria, Lérida, Bronchales, Montarco, Pyrenees.
BM(NH): Jaén, Sierra de Cazorla east of Nava Del Espino, Sierra de Guadarrama.
OUM: Barcelona height 3000-4000 ft Montserrat - Hospederia to S. Gerónimo, 15 July 1901 [A.H. Hamm].
Gangwere & Anor (1973): Guadarrama Mts, 45 km north west of Madrid.
FP mainly broom Sarothamus scoparius, also Cytisus purgans, Genista cinerea, Genista florida; in captivity also Rosa canina.

Bisexual, can breed by parthenogenesis.



DISTRIBUTION OF LEPTYNIA

13. Leptynia attenuata Pantel

PORTUGAL

Burr (1910): Castello Branco, San Fiel.

BM(NH): Estremadura, Mafra; Foia Bei, Monchique.

SPAIN

Burr (1910): Talavera; Capeda south of Salamanca; Urdu above Toledo.

Harz & Kaltenbach (1976): Jaén, Granada, Sierra de Benia (Alicante), Sierra Guadarrama - Cercedilla.

BM(NH): Granada, Sierra Nevada; Puerto de la Ragua height 2000 m; near Navacerrada, Madrid height 1300 m - shrubby hillside, grassy areas.

Gangwere & Anor (1973): Guadarrama Mts, 45 km north west of Madrid.

FP broom Sarothamus scoparius.

Bisexual, can breed by parthenogenesis.

"BRITISH" SPECIES

Acanthoxyla geisovii (Kemp)

Acanthoxyla inermis Salmon

Clitarchus hookeri White

See Brock (1987b) and Marshall & Haes (1988) (maps) for detailed information.

References - to be listed in full in a future publication.

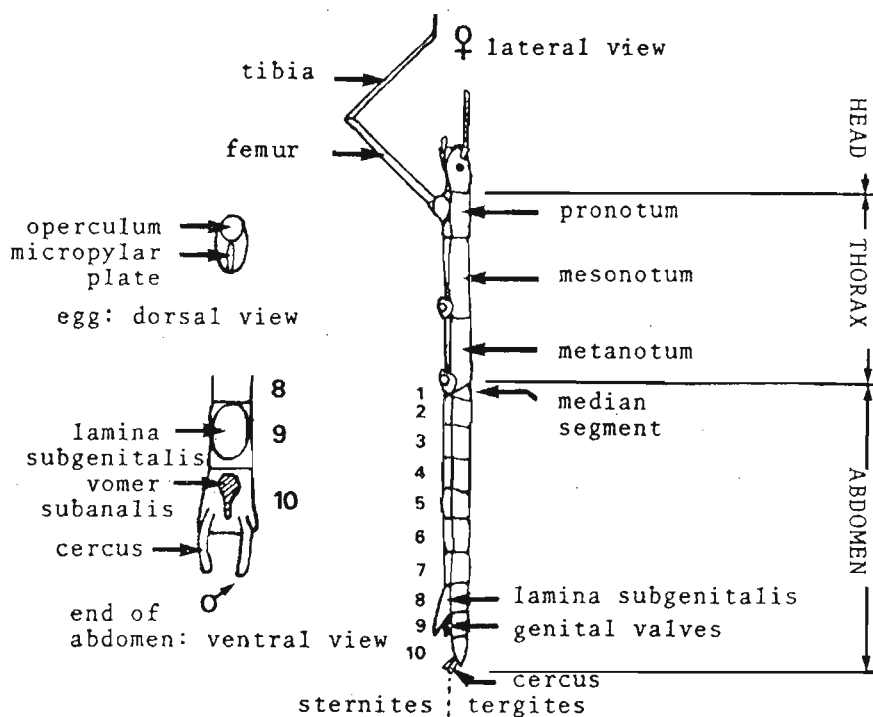
IDENTIFICATION OF FRENCH STICK INSECTS by Philippe Lelong (No. 474)

There are three stick insect species native to France which, although similar in general appearance, are easy to identify by close examination.

Note that observations relate to French specimens only: colours, sizes, etc, may vary in other parts of their range.

Systematic key to adults

The drawing below illustrates the terms used to describe phasmids and their eggs. Sternites and tergites are the ventral and dorsal plates respectively of the abdominal segments. The numbers 1-27 in brackets in the text refer to the drawings in Plates I, II and III.



- The ventral median keel of the middle and hind tibiae forks out apically and its branches enclose an almost triangular area (25)

..... (A) *Areolatae*

- (i) *Bacillus rossius* (Rossi)
- (ii) *Clonopsis gallica* (Charpentier)

- Middle and hind tibiae without such a triangular area (26)

..... (B) *Anareolatae*

- (iii) *Leptynia hispanica* (Bolivar)

(A) *Areolatae* Family - Bacillidae, Subfamily - Bacillinae, Tribe - Bacillini

♂ - Antennae with 20 segments, longer than mesonotum, 11-13 mm long (1b).

- Tenth tergite slightly indented, base of tenth sternite with a large corneous hooked vomer subanalis (8c).

♀ - Antennae with 20-25 segments, 5-10 mm long (19).

- Fore and middle femora with 2-4 small spines (22), the base of the femora being red on the inside and black on the outside.
- Short lamina subgenitalis not reaching the end of ninth tergite and with very visible genital valves (5c).
- Mesonotum and metanotum finely granulated, sometimes smooth for green specimens.

..... (i) *Bacillus rossius*

- ♀ - Antennae with less regular number of segments.
 - Mid and hind femora sometimes with two large leaf-like spines (24).
 - Thoracic segments and first three tergites with a large hump in the middle of the posterior edge (27).

... (i) Bacillus rossius var. lobipes (Lucas)

(Extreme form of rossius, unstable and not hereditary.)

- ♂ - Antennae with 12 segments, shorter than mesonotum, 5-6 mm long (2b).
 - Cerci slightly curved without dilated base.
 - End of tenth tergite very indented, base of tenth sternite with a very small vomer subanilis (7).

- ♀ - Antennae with 12 or 13 segments, 3-4 mm long (20).
 - Fore femora with two small spines, no red or black at the base (23).
 - Long lamina subgenitalis reaching the end of the ninth tergite hiding the genital valves (4).
 - Mesonotum and metanotum very granulated.

..... (ii) Clonopsis gallica

(B) Anareolatae Family - Heteronemiidae, Subfamily - Pachymorphinae,
 Tribe - Ramulini

- ♂ - Antennae with 15-17 segments.
 - Cerci very curved with dilated base (9).
 ♀ - Antennae with irregular number of segments, usually 11-17, of uneven length (21).
 - End of abdomen very compressed, tenth sternite ending in sharp point with fili-form cerci and the last three segments forming a rigid block (6).

..... (iii) Leptynia hispanica

Note that both sexes of Leptynia are usually much shorter than Bacillus and Clonopsis (see Table 1).

Table 1. Adult insect sizes (in mm, with mean values in brackets)

		<u>Bacillus rossius</u>	<u>Clonopsis gallica</u>	<u>Leptynia hispanica</u>
Total length (without antennae)	♂	52-76 (56)	48-54 (50)	35-42 (40)
	♀	64-105 (89)	62-70 (69)	48-58 (52)
Fore femora	♂	20-24	14-18	16-19
	♀	17-29 (25)	20-21	11-12
Mid femora	♂	13-15	9-12	11-12
	♀	11-17 (15)	12-13	8.5-10
Hind femora	♂	16-19	10-16	14-16
	♀	12-24 (17)	15-16	11-13
Antennae	♂	8-13	5-6	5-6.2
	♀	5-12 (9)	3-4	3.2-3.5
Mesonotum	♂	10-15	9-10	6.8-7.5
	♀	12-17 (16)	12-14	7.9-10
Metanotum with median segment	♂	11-16	10-11.5	9
	♀	12-20 (17)	13-14	9.5

Other useful distinguishing points are as follows. The eggs of Leptynia are sausage shaped (12) and often laid in groups in soil or glued on to a support; those of Bacillus and Clonopsis are rounder and dropped to the ground. Bacillus eggs are black with a grey micropylar plate (10), whereas Clonopsis eggs are completely brown (11). Female adults of Leptynia in France are always green with a lateral white line, whereas green and brown colour forms occur in females of Bacillus and Clonopsis. Brown females of Bacillus are the most common colour phase.

Reproduction

All three species breed by means of parthenogenesis - although males of all species have been recorded in France they are extremely rare and tend to be gynandromorphic. I have found one male gynandromorph of Clonopsis gallica at Castanet-Tolosan (Haute-Garonne).

Table 2. Egg sizes (in mm)

	<u>Bacillus rossius</u>	<u>Clonopsis gallica</u>	<u>Leptynia hispanica</u>
Length	2.3-2.4	2.8	4.1
Width	1.3-1.5	1.6	1.3
Height	1.7	2.1	1.5
Total no. per female	250-300	70-80	20-30
Maximum no. per female per day	4-5	1-2	<1

Table 3. Biotope and geographical range

	<u>Bacillus rossius</u>	<u>Clonopsis gallica</u>	<u>Leptynia hispanica</u>
Foodplants in wild	Arborescent heather (<u>Erica arborea</u>), bramble, rose.	Mostly wild rose and bramble.	Leguminosae: broom, <u>Dorycnium suffruticosum</u>
Height found above ground	3-4 m	1-2 m	0-30 cm
Range	Mediterranean area and Corsica in limestone regions. Common species.	Southern and central France (except mountains) and Corsica. Very common species.	Sparsely distributed in south east France (Cévennes) and Mediterranean area (to 1000 m). Rare species.

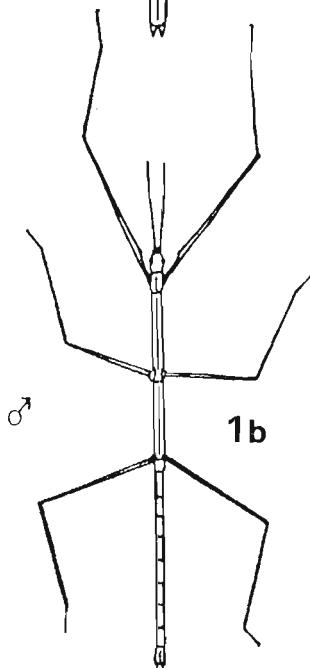
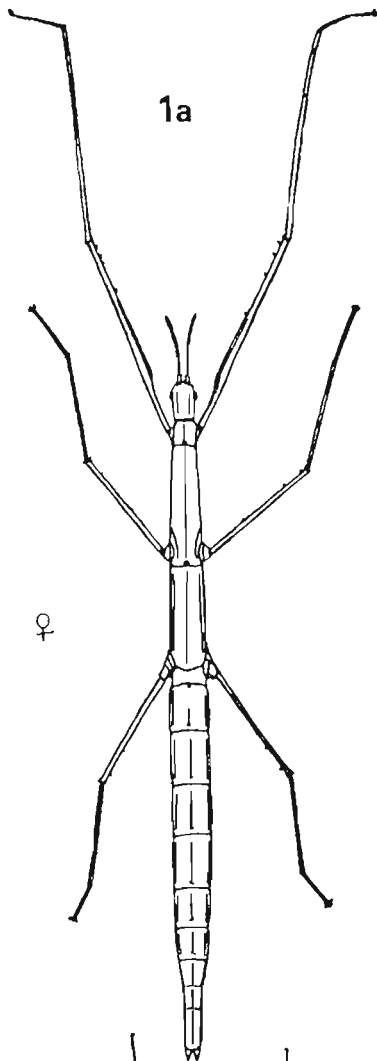
For more detailed information see Paul Brock's article on distribution elsewhere in this Newsletter.

Table 4. Culturing

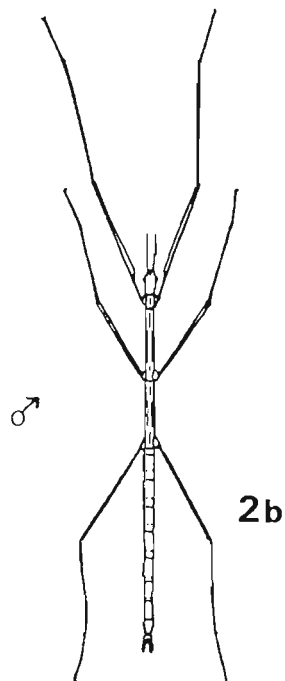
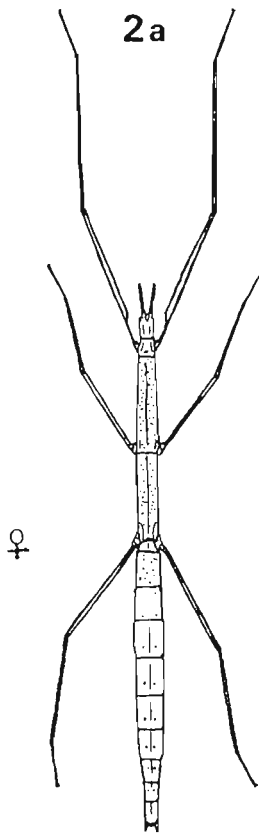
	<u>Bacillus rossius</u>	<u>Clonopsis gallica</u>	<u>Leptynia hispanica</u>
Foodplants in captivity	Bramble	Bramble and rose	Rose
Resistance to temperatures $>35^{\circ}\text{C}$	Yes	No	Yes?
Spraying allowable	No	No	No
Egg-laying	Haphazardly	Haphazardly	In sand or glued on support
Diapause in eggs	No	Yes	Yes?
Hatching time	All year	April	Spring
Present in winter	Yes	No	No

Sadly my culture of Leptynia hispanica is lost: the eggs failed to hatch.

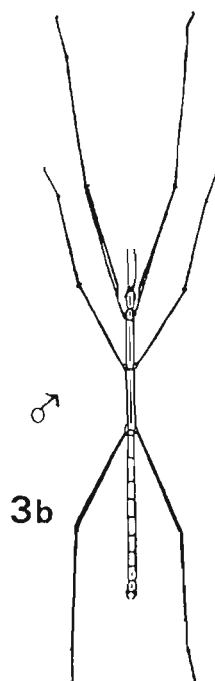
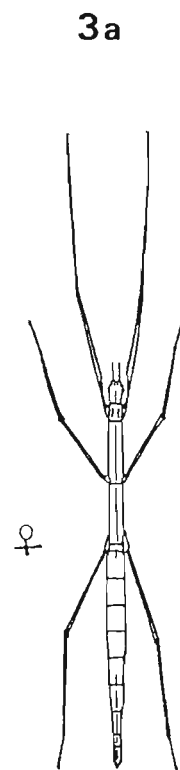
Plate I. Adults



Bacillus rossius (x1)

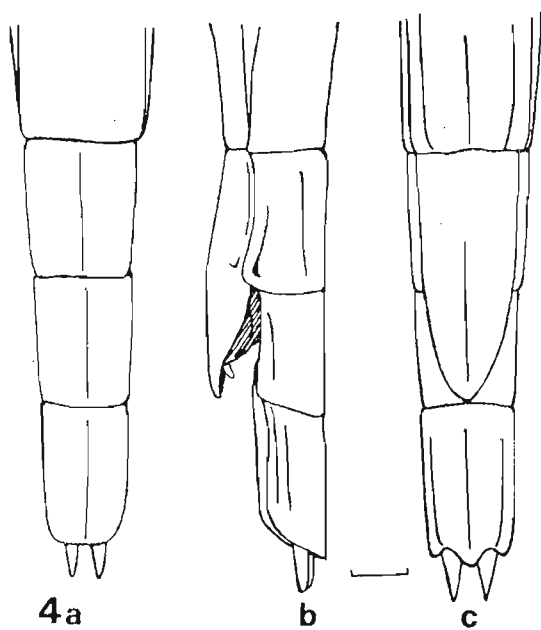


Clonopsis gallica (x1)

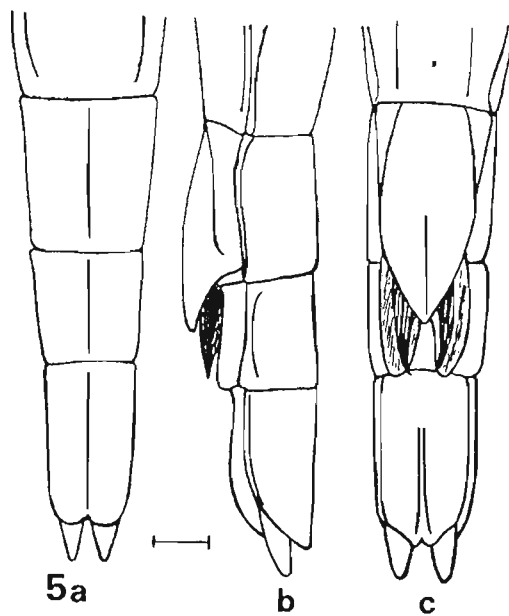


Leptynia hispanica (x1)

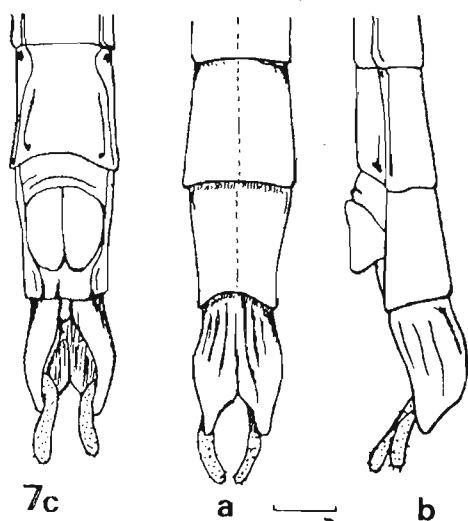
Plate II. End of abdomen (a = dorsal view, b = lateral view, c = ventral view)
(Bar lines = 1 mm throughout)



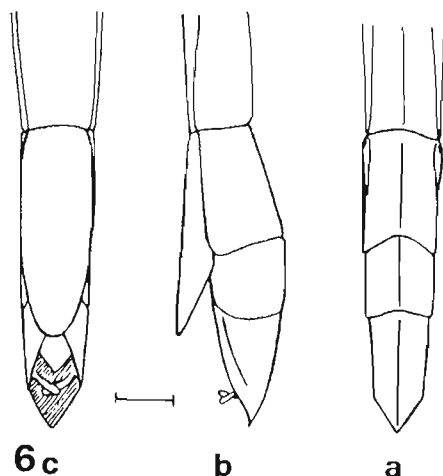
Clonopsis gallica ♀ (x7.5)



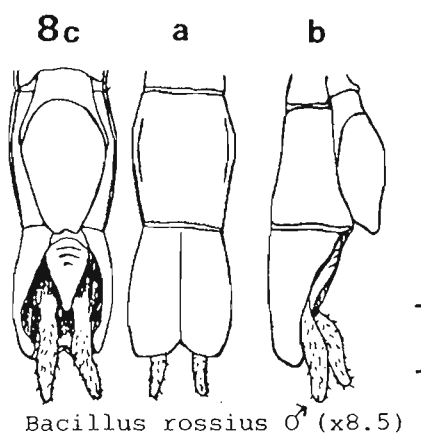
Bacillus rossius ♀ (x7.5)



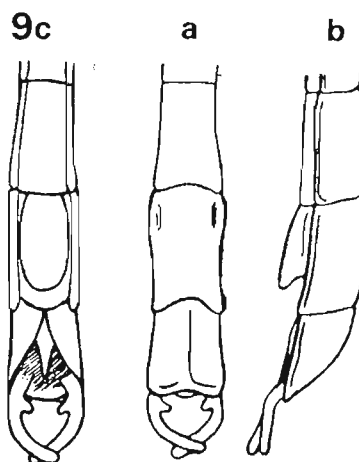
Clonopsis gallica ♂ (x8.5)



Leptynia hispanica ♀ (x7.5)

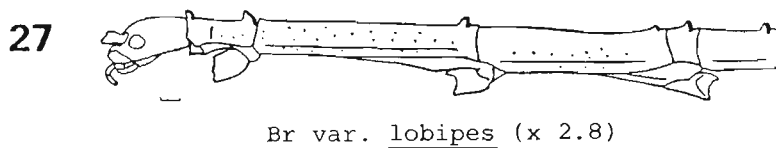
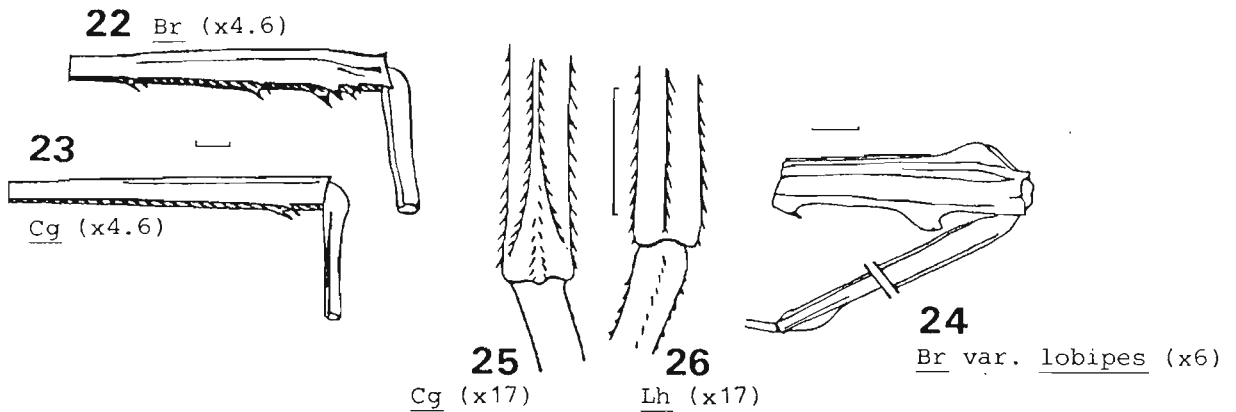
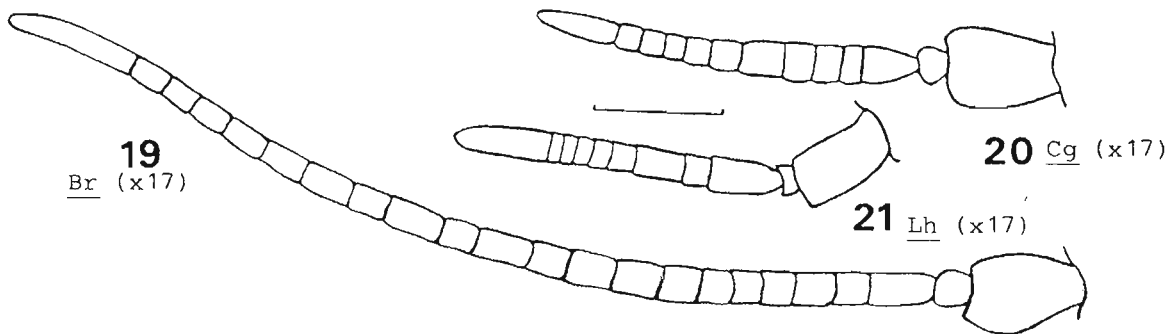
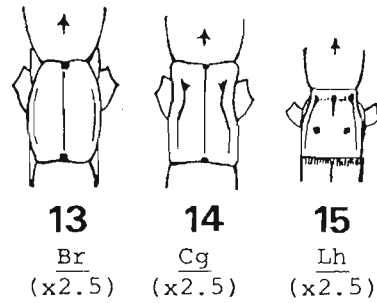
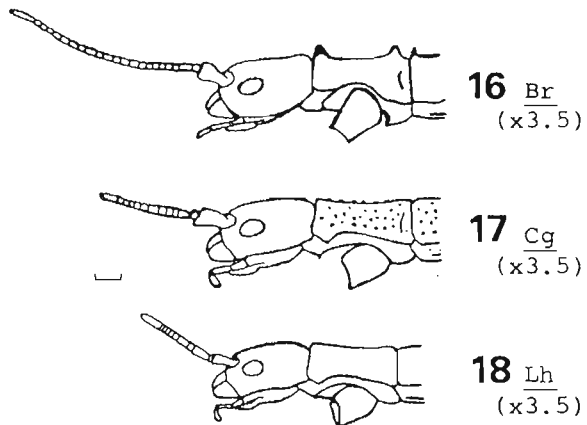
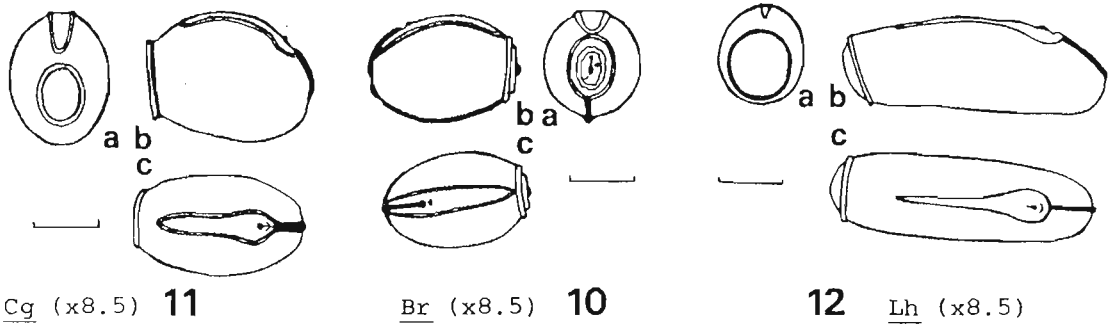


Bacillus rossius ♂ (x8.5)



Leptynia hispanica ♂ (x8.5)

Plate III. Egg (10-12; a = frontal view, b = lateral view, c = dorsal view); pronotum (13-15; the arrow points towards the head); lateral view of head with antenna (16-18); antenna (19-21); end of middle femur (22-24); apex of hind tibia with ventral median keel (25-26) (Bar lines = 1 mm throughout)
Br = Bacillus rossius, Cg = Clonopsis gallica, Lh = Leptynia hispanica



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PSG NO. 45: CLONOPSIS GALLICA (CHARPENTIER) by Paul Brock (No. 26)

For drawings of the adults and egg see those by Philippe Lelong (No. 474) on pages 21 and 23 of this issue.

First described: As Bacillus gallicus by Charpentier 1825; placed in the genus Clonopsis by Pantel 1915. A subspecies Clonopsis gallica occidentalis Bolivar occurs in Morocco and the Azores.

Range: This species is widespread and locally common in some areas of mainly southern Europe and North Africa (see my notes on distribution on page 14 of this Newsletter). Whilst frequently found near the coast, it more often occurs inland than Bacillus species, in whose company it is sometimes collected.

Culture history: Parthenogenetic stock was imported on various occasions from France (including Corsica), Spain and Portugal. Until the 1980s this species was seldom reared in captivity - stock of Bacillus rossius (Rossi) was often sold by dealers in error as the Corsican stick insect Clonopsis (or Bacillus) gallica (or gallicus).

Adults: Both sexes are wingless. The female is slender and stick-like, and coloured green or brown (the legs are usually the same shade but sometimes with slightly mottled colouring). Browns may vary from straw coloured to

dark brown, but greens are usually light. Lengths are quoted as 62-79 mm (Harz and Kaltenbach, 1976) and 59-73 mm (average 67 mm) (Brock, unpublished - from 24 specimens brought back from Portugal in 1986). Antennae are short; shorter than in B. rossius and with only 12-14 segments (B. rossius has 20-25 segments). The pronotum has a few tubercles, the mesothorax and metathorax being more strongly granulated. The femora have 1-3 spines on the ventral edges subapically.

The male is extremely rare - a very slender insect 54-57 mm long. Brown and green colour forms probably occur, but the insect is usually light green. He has four lines on his thorax, two red and two dark green. I have not heard of males reared in culture stocks, which reproduce by more or less obligatory parthenogenesis as in the wild (Chopard, 1951). It appears that males recorded in the wild may be gynandromorphs. Males have been found in France but not in Italy.

Ova:

Eggs are simply dropped, singly, usually at night. Females each lay approximately 80-100 eggs (see Carlberg, 1987, who collated data from various published papers). In the wild these are generally laid in May-July and hatch the following spring, although Voy (1952, 1954) comments that eggs laid during the autumn have a 2-year cyclic development. Lelong reports that eggs of this species undergo diapause, and hatch only after one or two cold periods.

The eggs are brownish and somewhat rough, with dimensions as follows: capsule length 2.4 mm, capsule width 1.5 mm and capsule height 1.8 mm. The micropylar plate is elongated and the operculum flat. See Clark (1976) for a detailed description which points out differences between the similar eggs of C. gallica and B. rossius. Carlberg (1987) mentions a development of unfertilised eggs of 30% in the first year and 60% in the second year. In my experience the hatch rate is high (about 80%+) and eggs can sometimes hatch in about 4 months to produce two generations a year (Portuguese stock).

Nymphs:

These are about 10-11 mm from head to tip of abdomen on hatching and entirely apple green, including the antennae (B. rossius has reddish brown antennae, but other Bacillus species also have green antennae). Brown colour forms can appear from the second instar onwards. Mortality in the first instar is moderate and there is no reason why a reasonable percentage (30-60%) should not survive in the right conditions (see "Rearing"). Sometimes established nymphs die for no apparent reason but enough usually survive to continue the cultures with ease. There are four moults according to Voy (1954) but five moults according to Lelong, with the following instar lengths (in mm):

	1st	2nd	3rd	4th	5th	6th
Voy	15.5	22	33	46.5	62-70	
Lelong	7	11	20	32	50	69

Differences between my quoted length for newly hatched nymphs and Voy's length for first instar nymphs may arise if Voy measured his lengths later on in the instar.

Foodplants:

Bullini (1981) gives the following foodplants in captivity: Rosa, Rubus, Potentilla, Crataegus, Prunus, etc (all Rosaceae), Genista (Papilionaceae), Hypericum perforatum (Guttiferae), Coriaria myrtifolia, etc (Coriariaceae); and in the wild: mainly Rosa, Rubus, Crataegus and Prunus. The many (over 60, 80% of them green) specimens I saw in Portugal in 1986 were feeding exclusively on brooms (Cytisus scoparius and Cytisus sp.), including a low-growing variety with hardly any leaves! The insects took well to bramble (Rubus) in captivity.

Rearing: Eggs, nymphs and adults should be kept at 18-20°C and 50% relative humidity (Bullini and Bullini, 1971; Voy, 1954), and certainly to raise the temperature and/or humidity significantly is usually fatal. Nymphs mature quicker at high temperatures - the optimum is 18°C (56-74 days, mean 63) but below 18°C approximately 91 days is usual (Carlberg, 1987). The ideal cage is an all-netting one which can be sprayed a little on a daily basis. Although this latter is not essential, ventilation of some sort is. Adults live between 30 and 100 days - a shortened life-span may be due to higher temperatures (in which case eggs are generally laid at a more rapid pace). For example, I used to keep mine at 24°C and adults rarely lived beyond 45 days.

Defence: In Portugal the insects (nymphs and adults) curled their abdomens and bent their fore legs when disturbed, which may make them look menacing to predators. Others feigned death, sometimes after walking quickly away initially.

Comments: A straightforward species to rear if kept cool, although not as prolific as B. rossius.

Acknowledgement: Many thanks to Philippe Lelong for the very detailed way he completed a Study Sheet.

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FORTHCOMING SPECIES REPORT - Oreophoetes peruanas. Please send all your information on this species to the Editors (address below) as soon as you can.

NEXT SPECIES REPORT - Baculum insignis. Please send all your information on this species to the Editors (address below) to reach us by 1st May 1989, or preferably earlier.

NEXT NEWSLETTER - Please send all other contributions to the Editors: Michael Lazenby and Frances Holloway, at 9 Oaklands Court, Nicoll Road, London NW10 9AU, to reach us by 1st May 1989, or preferably earlier. Up-to-the-minute items may be accepted up to 15th May 1989.