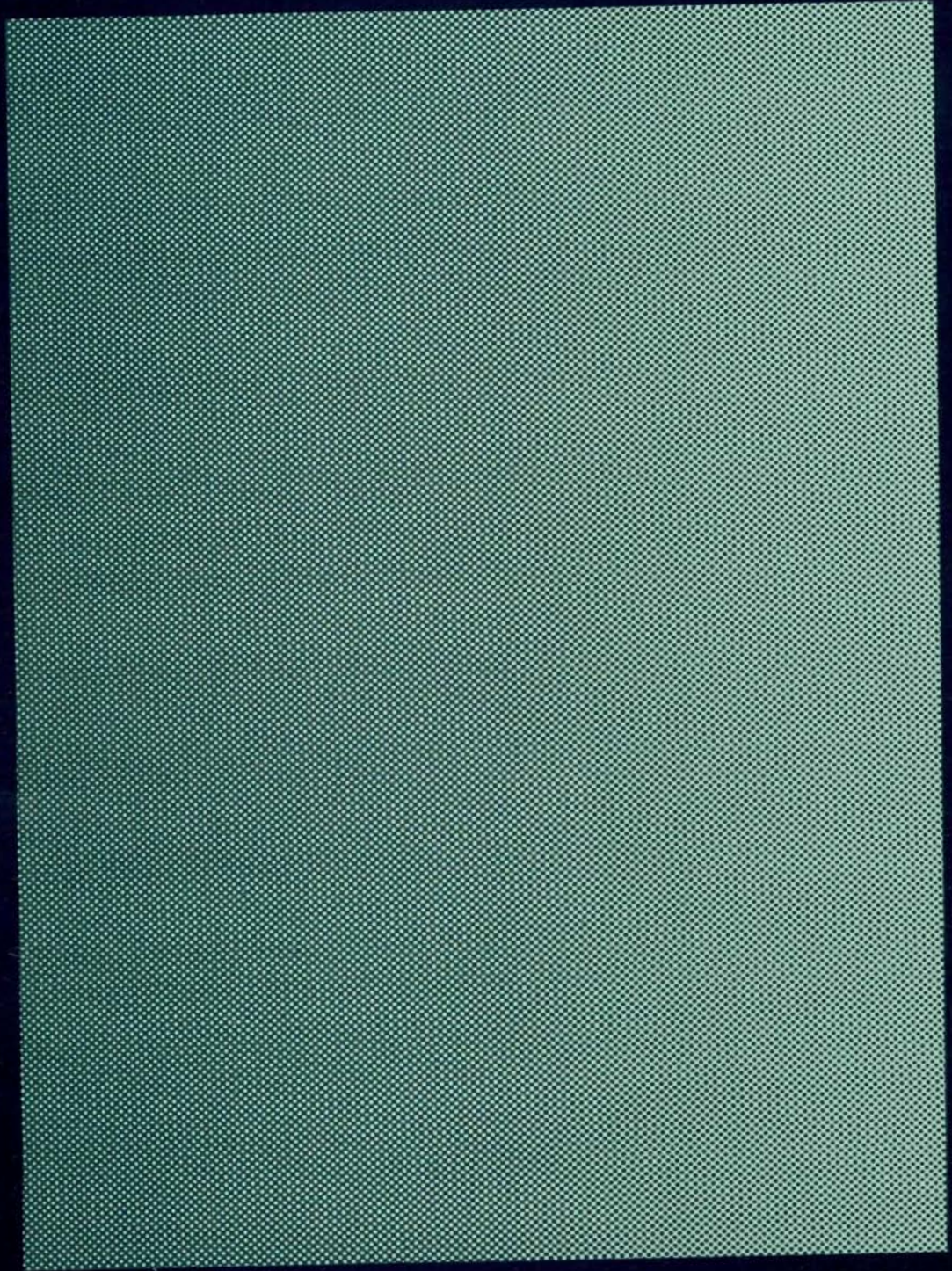


VOLUME 111 PART 4 NOVEMBER 1995

Parasitology



CAMBRIDGE UNIVERSITY PRESS

Parasitology

EDITORS

F. E. G. COX and C. ARME

EDITORIAL ASSISTANT

M. ELISABETH PAINTER Ph.D.

EDITORIAL POLICY

Parasitology publishes definitive papers on all aspects of pure and applied parasitology including biochemistry, molecular biology, immunology, genetics, ecology and physiology and also the application of new techniques, long term epidemiology studies, advances in the understanding of life-cycles, chemotherapy and major systematic revisions. Papers should normally be full length with an explanatory introduction and detailed discussion of the findings reported. Shorter reports of particularly important findings will also be considered.

EDITORIAL BOARD

R. M. ANDERSON, F.R.S., *University of Oxford*

R. W. ASHFORD, *Liverpool School of Tropical
Medicine*

J. R. BAKER, *Cambridge*

D. C. BARKER, *University of Cambridge*

J. BARRETT, *University of Wales, Aberystwyth*

D. A. P. BUNDY, *University of Oxford*

A. O. BUSH, *Brandon University, Manitoba*

E. U. CANNING, *Imperial College London*

L. H. CHAPPELL*, *University of Aberdeen*

D. W. T. CROMPTON, *University of Glasgow*

D. I. GIBSON, *Natural History Museum, London*

H. GINSBURG, *The Hebrew University of Jerusalem*

L. G. GOODWIN, F.R.S., *Finchampstead (Chairman)*

D. W. HALTON, *Queen's University, Belfast*

R. E. HOWELLS, *Wellcome Trust, London*

C. R. KENNEDY, *University of Exeter*

M. W. KENNEDY, *University of Glasgow*

D. L. LEE, *University of Leeds*

D. J. McLAREN, *Medical Research Council, London*

D. P. McMANUS, *Queensland Institute for Medical
Research*

D. H. MOLYNEUX, *Liverpool School of Tropical
Medicine*

P. W. PAPPAS, *Ohio State University*

R. A. PAX, *Michigan State University, East Lansing*

D. ROLLINSON, *Natural History Museum, London*

A. SAUL, *Queensland Institute of Medical Research,
Brisbane*

M. E. SCOTT, *McGill University*

A. SHER, *National Institutes of Health, Bethesda*

V. R. SOUTHGATE*, *Natural History Museum,
London*

R. C. TINSLEY, *University of Bristol*

K. VICKERMAN, F.R.S., *University of Glasgow*

D. WAKELIN, *University of Nottingham*

P. J. WHITFIELD, *King's College, London*

R. A. WILSON, *University of York*

M. E. J. WOOLHOUSE, *University of Oxford*

* Representing the British Society for Parasitology.

Parasitology (ISSN 0031-1820) is published ten times a year in January, February, April, May, June, July, August, September, November and December, plus two supplements issued in March and October. The March supplement contains the Proceedings of the Autumn Symposium of the British Society for Parasitology and the October supplement is specially commissioned.

Subscriptions may be sent to any bookseller or subscription agent or direct to the publisher: Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU. Subscriptions in the USA, Canada and Mexico should be sent to Cambridge University Press, Journals Department, 40 West 20th Street, New York, NY 10011-4211. All orders must be accompanied by payment. The subscription price (excluding VAT) of volumes 110 and 111, 1995 is £258 (US \$478 in the USA, Canada and Mexico), payable in advance, for ten parts plus supplements; separate parts cost £23 or US \$42 each (plus postage). EU subscribers (outside the UK) who are not registered for VAT should add VAT at their country's rate. VAT registered subscribers should provide their VAT registration number. Japanese prices for institutions (including ASP delivery) are available from Kinokuniya Company Ltd, P.O. Box 55, Chitose, Tokyo 156, Japan. Second class postage paid at New York, NY and at additional mailing offices. POSTMASTER: send address changes in USA, Canada and Mexico to *Parasitology*, Cambridge University Press, 110 Midland Avenue, Port Chester, New York, NY 10573-4930.

Information on back volumes, permissions and advertising is given on the inside back cover.

The Journal is listed in the major relevant abstracting and indexing services worldwide, including Abstracts on Hygiene and Communicable Disease, Biological Abstracts, Biotechnology Research Abstracts, Chemical Abstracts, Current Awareness in Biological Science, Current Contents, Dairy Science Abstracts, Excerpta Medica, Helminthological Abstracts, Index Medicus, Index Veterinarius, IABS, Protozoological Abstracts, Reviews of Applied Entomology, Tropical Diseases Bulletin, Veterinary Bulletin.

INSTRUCTIONS TO AUTHORS

Parasitology publishes original papers on all aspects of the subject. There is no set maximum or minimum length, but excessively long papers are unlikely to be accepted. Short papers reporting definitive findings are acceptable provided that they are prepared in the approved form for this journal. Reviews dealing with important aspects of the subject not covered elsewhere are commissioned by the Editors, who welcome suggestions for suitable topics.

Manuscripts that are essentially protozoological and/or immunological should be sent to Professor F. E. G. Cox, Immunology Section, King's College London, Campden Hill Road, London W8 7AH, U.K. All other manuscripts should be sent to Professor C. Arme, Parasitology Research Laboratory, University of Keele, Keele, Staffs ST5 5BG, U.K.

The original and one copy of both text and figures, which should not be larger than A4 size, should be submitted in a stout C4 size envelope (325 × 330 mm).

Submission of a manuscript implies that it has been approved by all the named authors, that it reports their unpublished work and that it is not being considered in whole or in part for publication elsewhere.

In order to facilitate publication and to avoid delays authors should follow these *Instructions to Authors* and refer to a current number of *Parasitology* for the correct style. Manuscripts not prepared in the correct style will be returned to the authors for revision.

(1) *Style*. Manuscripts must be in English and typewritten on A4 paper (210 × 295 mm) **in double spacing throughout** with a left-hand margin of about 40 mm. All headings should be flush left and all pages numbered.

(a) *Title-page*. A concise but informative full title plus a running title of not more than 40 letters and spaces, name(s) of author(s) and the address, including post, zip or other code, of the institute where the work was carried out. Footnotes indicating other addresses may be included. Nothing else should appear on the title page.

(b) *Summary*. A 150- to 200-word informative précis of the contents and conclusions of the paper in a form suitable to be used as an abstract plus 3–6 key words suitable for indexing.

(c) *Introduction*. A short introduction to the background and the reasons for the work.

(d) *Materials and Methods*. Sufficient experi-

mental details must be given to enable other workers to repeat the work.

The full binomial name should be given for all organisms and all animals except those commonly used in laboratories. Generic names should be given in full when first mentioned and subsequently if any confusion is likely to arise. Authors should follow *International Rules for Nomenclature* and, if new names are introduced, the *International Code for Zoological Nomenclature*. All strains and sources of hosts and parasites should be stated.

S.I. units should be used wherever appropriate. Abbreviations should be used sparingly and unambiguously. The following examples are commonly used and need not be spelled out: ADP, AMP, ATP, bp, kDa, cpm, D.F., DNA, ED₅₀, Fig., g, h (hour), i.m., i.p., M_r, min, NAD, NADP, No., pH, p.i. (post-infection), ppm, %, rpm, RNA, sp., spp., s.c., s.d., s.e., WHO, [³H]alanine, [6-¹⁴C]glucose. Standard chemical, biochemical and molecular abbreviations should be used. In case of any doubt, authors are advised to spell out the term in full on first usage followed by the abbreviation in parentheses.

(e) *Results*. These should be concise and should not include methods or discussion. Text, tables and figures should not duplicate the same information.

(i) *Tables*. Tables should be self-explanatory, with the title at the top and organized to fit into one or two column widths. If possible, rules, particularly vertical ones, should be avoided. Each table should be typed, double spaced, on a separate page and numbered consecutively and its position indicated in the text.

(ii) *Figures*. Figures may be line drawings or half tones and all should be referred to consecutively as figures, e.g. Fig. 1, and their positions indicated in the text. The maximum size for any figure or group of figures is a single page. Captions for figures should be typed on a separate page. All figures should be clearly identified on the back with the author's name, the short title of the paper and the figure number.

Line drawings should be not larger than twice the final size and should fit into either one (80 mm) or two columns (166 mm). Lines should be bold enough to stand reduction to 0.25–0.35 mm. Preferred symbols are ○ ● □ ■ △ ▲, and these should be used consistently. Lettering should be kept to a minimum and should be self-explanatory and unambiguous. Lettering will normally be inserted by the printer and should be indicated in soft pencil or on a transparent overlay. If authors wish to use their own high-quality labelling it must be in the following

typeface and size, 2 mm for numbers and upper case and 1 mm for lower case, when reduced (e.g. A B C D E a b c d e, Days after infection, 10, 20, 100 μm , etc.). If in any doubt, it is better to submit unlabelled figures together with labelled overlays or labelled xerox copies. The best reproduction is obtained from original drawings on drawing or tracing paper, but high-quality glossy prints are acceptable. It is recommended that authors prepare suitably reduced figures in order to judge the final appearance.

Half-tone illustrations should be submitted the same size as they will appear in the journal and should be selected to fit one column (80 mm) or two columns (166 mm). Composite illustrations should be accurately mounted on thin card and must not exceed the final page size (166 \times 258 mm). The component parts of a composite illustration should be identified as A, B, C, etc. Explanatory labelling can be inserted either by the printer or by the author. Lettering for the printer should be indicated on a transparent overlay. Lettering inserted by the authors must be in the following typeface and size, 2 mm for numbers and upper case and 1 mm for lower case, (e.g. A B C D E a b c d e, Nucleus, 50 μm , 150 kDa, etc.). Where appropriate, scale bars and units should be given. Statements of magnification are not acceptable.

(f) *Discussion*. This should not be excessive and should not repeat results nor contain new information, but should emphasize the significance and relevance of the results reported.

(g) *References*. The Harvard System must be used for the citation of references in the text, e.g. (Brown & Green, 1989) or Brown & Green (1989). The names of all authors up to three should be included when first cited in the text, e.g. Brown, Green & White (1989). For all subsequent citations use the form Brown *et al.*; this form should be used for all citations, including the first, for four or more

authors. Different papers published in the same year should be distinguished by a letter after the date, e.g. 1989*a*. Great care should be taken to avoid confusion of multi-author papers with the same senior author. References to unpublished observations, abstracts or papers 'in preparation' should be cited only in exceptional circumstances. Papers 'in Press' may be cited provided that the full title and journal are given.

References must be listed in alphabetical order, and both the title and name of the journal must be given in full in the following style.

CHAPPELL, L. H. (1988). The interactions between drugs and the parasite surface. *Parasitology* **96** (Suppl.), S167–S193.

GARDNER, R. A. & MOLYNEUX, D. H. (1988). *Schizotrypanum* in British bats. *Parasitology* **97**, 43–50.

MEIS, J. F. G. M. & VERHAVE, J. P. (1988). Exoerythrocytic development of malaria parasites. In *Advances in Parasitology*, Vol. 27 (ed. Baker, J. R. & Muller, R.), pp. 1–61. London: Academic Press.

SMYTH, J. D. & HALTON, D. W. (1971). *The Physiology of Trematodes*, 2nd edn. Cambridge: Cambridge University Press.

The accuracy of the references is entirely the responsibility of the author(s) and will not normally be checked during the editorial procedures.

(2) *Proofs and reprints*. Page proofs will be sent to the named author by the Press and will already have been read for printer's errors, but it is the responsibility of the author to ensure that no errors remain. Only essential corrections should be made, and authors will be charged for excessive alterations at the proof stage. Authors will receive 50 reprints free of charge and additional reprints can be ordered at the proof stage.