

UNIVERSITY OF PUNE

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To avoid delay in reply, please quote

Ref. No. : Ph.D./ 330

Date : 2/9/04

To, **Dr. Niranjan Vasudeo Joshi**
Centre for Ecological Studies
Indian Institute of Science
Bangalore - 560012

Subject : Thesis submitted by **Maithili Mahesh Jog**
for the Degree of Doctor of Philosophy in **Env. Sciences**
of University of Pune, Pune.

Sir / Madam,

I am thankful to you for having accepted to examine the Ph.D. thesis entitled **study of Quantitative Biological Patterns in Abundance and distribution of Parasites of wild mammals of India**, submitted by **Shri. / Smt. Maithili Mahesh Jog** for the Degree of Doctor of Philosophy in **Env. Sciences** of this University.

You are requested to kindly forward your report making a specific recommendation as to whether the thesis should be accepted, rejected or resubmitted after revision. It is desirable that you conclude your report with the sentence "**I recommend that the thesis be accepted / rejected / revised and resubmitted for Ph.D. degree of University of Pune**". The external referees are requested to send one copy of the report to the Guide of the student and two copies (original and xerox) to the Dy. Registrar (P.G. Unit) of the University directly by mentioning the reference number of the letter.

We shall appreciate your sending the report with the signature as early as possible but not later than three months from receipt of thesis.

The thesis may be returned separately by Registered Post. The postal expenses will be reimbursed on submission of receipts alongwith the honorarium bill.

A honorarium bill form is enclosed herewith to enable you to send your bill for examining the thesis.

Kindly acknowledge the receipt of this letter and the thesis.

Thanking you,

Yours faithfully,

[Signature]

for Registrar.

Encl. : As above.

Copy f.w.c.s. to : **Dr. Milind Wadve**
Dept. of Microbiology, Abasaheb Ganesh College

Dr (Mrs) S. A. Paranjape Pune - 4
Dept of statistics, University of Pune, Pune - 2

Report on the thesis

"Study of Quantitative Ecological Patterns in Abundance and Distribution of Parasites of Wild Mammals of India"

by Ms Maithili Mahesh Jog

for the degree of Doctor of Philosophy in the department of Environmental Sciences of the University of Pune

In terms of the quality, quantity, style of writing as well as contents, this is an excellent thesis and the candidate richly deserves the award of the degree of Doctor of Philosophy for the research described in this thesis.

Some of the work described in the thesis also seems to have been published in well-respected, peer reviewed international journals, thus demonstrating the high quality of the work.

The candidate has carried out a thorough, extensive and systematic compilation of a very large datasets, consisting of a large number of species (Operational Taxonomic Units) of parasites, collected from the fecal samples of a large number of species of mammals, and from a large number of locations across India. The amount of intense and disciplined intellectual effort required for successfully completing such an exercise is very high. The candidate should be specially commended for undertaking this task as the database prepared by her is certain to be of great use to very many researchers in the days to come.

The introduction of the thesis is extremely well written and forms a rich source of very interesting accounts of the interactions of parasites and hosts. The many unusual evolutionary perspectives and scenarios provided by the candidate make the chapter quite fascinating to read. The survey of literature is also more than adequate. There are a few minor errors in the citing of references (missing year, missing details, missing reference etc., marked on the copy of the thesis), but they are not serious enough to warrant any alterations in the thesis.

The next two chapters describe the various details associated with the collection of data with clarity and in adequate detail.

The next chapter presents the analysis of the patterns of distribution of parasites as determined from the observed samples. The aggregated nature of the distributions has been inferred using the variance by mean ratio. Different distributions such as Normal, Log-Normal, Weibull have been used to examine how well they match the observed data for some of the host species. More extensive analysis has been carried out using the negative binomial distribution, and the goodness of fit has been evaluated and reported using the chi square value.

The variable of interest here is the parasitic load, and a value corresponding to "the number of parasites PER GRAM of the sample" seems to have been used in the above analysis.

To the best of my knowledge, the negative binomial distribution is appropriate for a discrete variable, and not for a continuous variable like "numbers PER GRAM", which may take a fractional value. If the actually observed frequency in a sample has been divided by the weight of the sample to obtain the "per gram" value, it is not clear how the variable can be treated as a discrete variable, and how the negative binomial would be an appropriate description in such a situation.

More importantly, if the weight of the actual samples were say 2 grams, the variance to mean

ratio will become smaller by a factor of two when the values are converted to "per gram". All the chi-square values will also be lower by a factor of two in such a situation. It therefore appears that all inferences based on the variance to mean ratio and on the chi square values reported in this chapter may need a careful reconsideration in the light of the possible effect of conversion to "per gram" from the actually observed values.

However, if the thesis supervisors and the candidate feel that this is far too minor an issue and since the overall inference about the aggregated nature of the distribution is unlikely to change, no alteration in the values of variance to mean ratio and the values of chi square reported in this chapter is necessary, I have absolutely no objection whatsoever for the Ph.D. degree to be awarded to this thesis in its present form.

The most important contribution of this chapter in the thesis (and which is not affected by the per gram conversion) is the very intriguing linear relationship seen between the log of the variance and the log of the mean. The manner in which the data points representing samples from many different species of hosts and from many locations in the country lie so close to a line with slope 1.75 is quite astonishing. It would be worthwhile to explore the robustness of this relationship further, e.g., by restricting the analysis to only non-zero values, or by treating the proportion of parasite-free samples as a separate parameter of the distribution etc. However, none of these are necessary at the present stage, and the result reported herein can be no doubt be regarded as a very important one even without any further analysis.

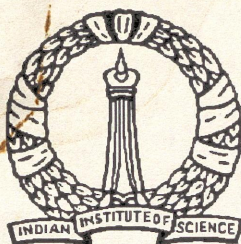
In the same chapter, the candidate has explored the influence of a number of different factors (e.g. parasite mobility, host density) on the parasite distribution by setting up a variety of plausible mathematical models. The technique of computer simulation has been effectively used to demonstrate how combinations of different parameter values quantifying the different factors can lead to patterns adequately close to the observed ones.

The next chapter uses the technique of logistic regression to quantitatively examine the influence of different biotic (e.g. host body size, home range) as well as abiotic (e.g. rainfall, latitude) factors on the distribution of parasites loads. The analysis has been carried out separately treating individuals as a unit as well as by treating species as a unit. Some of the important species have been examined in more detail. Predator pressure, followed by diet (herbivory-carnivory gradient) emerge as important factors, and candidate has successfully demonstrated the robustness of these inferences.

The last chapter describes a very imaginative analysis of 'predator-parasite mutualism' in the chital-dhole system. An excellent combination of empirical data analysis and detailed and sophisticated mathematical modeling makes this investigation particularly praiseworthy.

The final section 'Conclusions' is crisp, highly readable and summarizes the very many different findings reported in this voluminous thesis in a very succinct and cogent manner that is a pleasure to read.

To conclude, I recommend that the thesis be accepted for Ph. D. degree of the University of Pune.



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Prof. N.V. Joshi

April 1, 2005

To
The Deputy Registrar (P.G. Unit)
University of Pune
Ganesh Khind
Pune - 411 007

Dear Sir/Madam

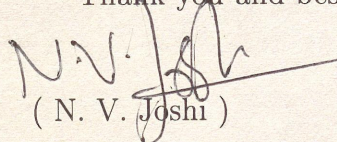
Thank you very much for your letter Ph.D./330 of 2/9/2004 (and the subsequent telephonic as well as written reminders), and the copy of the thesis "Study of Quantitative Ecological Patterns in Abundance and Distribution of Parasites of Wild Mammals of India" submitted by Ms Maithili Mahesh Jog for the degree of Doctor of Philosophy in the department of Environmental Sciences of your University.

I have examined the thesis carefully, and find that the thesis is acceptable, in its present form, for the Ph.D. degree of University of Pune. Detailed comments (original and one copy) are enclosed alongwith, as suggested in your letter. Some comments have also been made on the copy of the thesis, which will be mailed to you separately as per the instruction in your letter. There are no points to be raised/questions that need to be asked at the time of the viva voce examination, should there be any.

I very much regret the delay in sending the report and the inconvenience caused due to the delay.

As per the instructions in your letter, I am marking copies of this letter as well as a copies of the detailed report to the guides of the student (Prof. Milind Watve and Prof. Mrs. S. A. Paranjape). I do not wish to claim the honorarium. I do not wish to claim any reimbursement for the postal expenses incurred in sending the thesis. Hence, no bills have been enclosed.

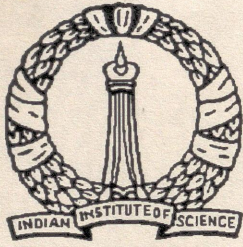
Thank you and best regards


(N. V. Joshi)

encl: Two copies of the detailed report.

cc:

Prof. Milind Watve, Dept. of Microbiology, Abasaheb Garware College
Prof. Mrs. S. A. Paranjape, Dept. of Statistics, University of Pune



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Prof. N.V. Joshi

April 7, 2005

To
The Deputy Registrar (P.G. Unit)
University of Pune
Ganesh Khind
Pune - 411 007

Dear Sir/Madam

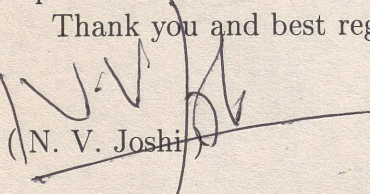
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I have examined the thesis carefully, and find that the thesis is acceptable, in its present form, for the Ph.D. degree of University of Pune. Detailed comments (original and one copy) were already sent to you by speedpost/courier on 1 april 2005. Some comments have also been made on the copy of the thesis, as mentioned in my earlier letter.

The copy of the thesis enclosed alongwith, is being mailed to you as per the instruction in your letter.

As mentioned in my earlier letter. I do not wish to claim any reimbursement for the postal expenses incurred in sending the thesis. Hence, no bills have been enclosed.

Thank you and best regards


(N. V. Joshi)

encl: Copy of the thesis

पुणे विद्यापीठ
UNIVERSITY OF PUNE



गणेशखिंड
पुणे — ४११ ००७
प्रशासन (शिक्षक कक्ष)

☎ ०२०—२५६०११०७, २५६०११०६, २५६९९२३१

फॅक्स— ०२०-२५६९३८९९

तार— 'युनिपुणे'

संदर्भ क्र. अेटी/

दिनांक :

Ganeshkhind, Pune-411 007
Pune - 411 007.

Admin (Teaching Section)

☎ 020 - 25601107, 25601106, 25699231

Fax. - 020-25693899

Telegarm 'UNIPUNE'

Ref. No. AT/CMs/1982

DATE : 30/6/05

- 1) Dr. Kalidas Sen,
Department of Chemistry,
Hyderabad Central University,
Hyderabad
- 2). Prof. Abhijit Mookerji,
S.N. Bose Center for Basic Sciences,
J.D. Block, Sector 3,
Salt Lake City,
Koltatta - 700 098
- 3) Prof. N.V. Joshi,
Center for Environmental Studies,
Indian Institute of Science,
Bangalore - 560 012

Sir/Madam,

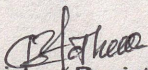
I am pleased to inform you that the University Authorities have nominated you to work as Subject Experts for Selection for three posts of Professor, five posts of Reader and five posts of Lecturer in the Center for Modelling and Simulation, University of Pune, under Section 76 of the Maharashtra Universities Act, 1994, will be held on Wednesday 13th July 2005 at 10.30 a.m. in Sant Gadge Maharaj Sabhagriha, Main Building, University of Pune. The Colloquium for the post of Professor will be held on the same day at 9.30 a.m. in the Centre for Modelling and Simulation.

You are kindly requested to accept the invitation and inform us about your particulars and travel plan etc. as per the enclosed format. The synopsis is enclosed herewith

Please contact undersigned if you need any additional information. T.A. & D.A. will be paid to you as per the University Rules.

Thanking you,

Yours faithfully,


for Assistant Registrar
Administration Teaching

Encl : as above

Prof. N. V. J.

from

Ravi^D
