

Registered Air mail

Department of Zoology,
Institute of Science,
15, Madam Cama Road,
Bombay - 400 032.
INDIA

October 18, 1979.

To

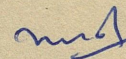
Dr. Clark Hubbs
Managing Editor (Copeia)
Department of Zoology
The University of Texas at Austin
Austin, Texas 78712

Sir,

I am sending herewith (in triplicate) a note entitled "Absence of female heterogamety in Gambusia affinis population from India" along with 3 text figures. I shall thank you to kindly find a place in the early issue of your esteemed journal and oblige.

Thanking you,

Yours faithfully,



(Dr. M.S. Rege)

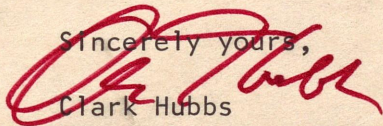
Encl: as above.

Oct. 25, 1979

Dear Dr. Rege:

Thank you for submitting "Absence of female heterogamety in Gambusia affinis population from India" to Copeia. I have sent it to Dr. Gerald Smith to process the reviews. When he completes that task, Dr. Smith will contact you regarding suitability for Copeia.

Sincerely yours,



Clark Hubbs
Managing editor
Copeia

Clark Hubbs
Department of Zoology
University of Texas
Austin 12, Texas



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Dr. M.S. Rege
Dept. of Zoology
Institute of Science
15, Madam Cama Road
Bombay - 400 032
INDIA

Is the paper current with respect to the issues and literature involved?

no

Are the descriptions accurate? incomplete

Are the interpretations and conclusions justified? yes

Are the illustrations necessary and satisfactory?

Recommendations:

 Accept. This is a top priority paper.

 Accept revised version incorporating suggestions below.

 Reject in present version.

XX Reject. Inappropriate for Copeia.

Comments and suggestions:

The importance of this manuscript has been preempted by the recent publication of Black and Howell (Copeia 1979:509) who clearly established that the presence of heteromorphic sex chromosomes in Gambusia affinis was dependent upon the subspecies examined. Since the origin of the introduced population of G. affinis sampled by Krishaja and Rege was unspecified and the subspecies unknown, the results of the study are of little general interest.

RECEIVED DEC 17 1979

The following person(s) would be appropriate reviewers for this manuscript.

Is the paper current with respect to the issues and literature involved? No

Are the descriptions accurate? Yes

Are the interpretations and conclusion justified? See comments

Are the illustrations necessary and satisfactory? Very good

Recommendations: _____ Accept. This is a top priority paper.
_____ Accept revised version incorporating suggestions below.
 X _____ Reject in present version.
_____ Reject. Inappropriate for Copeia.

Comments and suggestions:

Recently, Black and Howell (Copeia, 1979) analyzed various populations of Gambusia affinis in the U.S. Gambusia affinis contains two widely-ranging subspecies, G. a. affinis and G. a. holbrooki. Black and Howell (1979) discovered that those Gambusia affinis exhibiting female heterogamety for sex chromosomes was actually G. a. affinis. Gambusia a. holbrooki does not contain heteromorphic sex chromosomes on either sex. I would suspect that the authors are reporting on G. a. holbrooki.

If these populations are G. a. holbrooki, it is doubtful that chromosomal rearrangements resulting in the loss of heteromorphic sex chromosomes occurred after introduction. If these populations are not G.a. holbrooki, then the authors should reevaluate the situation.

Department of Zoology,
Institute of Science,
15, Madame Cama Road,
Bombay 400 032

March 26, 1980

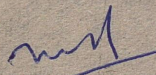
Dear Dr. Hubbs.

This has reference to a short paper entitled "Absence of female heterogamety in Gambusia affinis population from India" communicated for publication to Copeia by me on 16/10/79. Your letter dated Oct. 25, 1979 informed me about the receipt of the said paper by you and about yours forwarding the same to Dr. Gerald Smith for processing the same.

I have not heard further about it either from your office or Dr. Smith. May I therefore request you to kindly look into the matter and let me know at your earliest and the latest position regarding this paper.

An early reply will be highly appreciated.

Sincerely Yours



(Dr. M.S. Rege)

Dr. Clark Hubbs
Managing Editor
Department of Zoology
The University of Texas at Austin
Austin, Texas 78712.



THE UNIVERSITY OF TEXAS AT AUSTIN
AUSTIN, TEXAS 78712

Department of Zoology

April 8, 1980

Dr. M.S. Rege
Dept. of Zoology
Institute of Science
15, Madame Cama Road
Bombay 400 032

Dear Dr. Rege,

I have your inquiry about the status of your paper "Absence of female heterogamety in Gambusia affinis population from India". I have no insight as to its current status but by means of a carbon of this letter I am informing Dr. Smith of your concern.

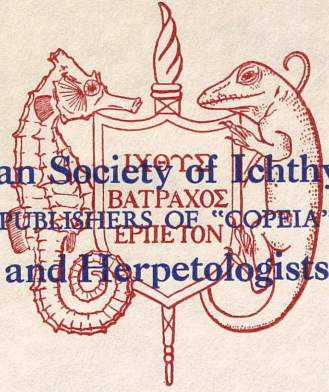
Sincerely,

A handwritten signature in dark ink, appearing to read "Clark Hubbs".

Clark Hubbs
Managing Editor
Copeia

6

CH/job
cc: Dr. Gerald R. Smith



American Society of Ichthyologists
PUBLISHERS OF "COPEIA"
and Herpetologists

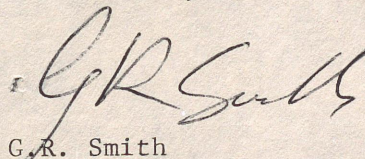
DR. GERALD R. SMITH, EDITOR
COPEIA: Genetics, Development, Morphology
Museum of Zoology
University of Michigan
Ann Arbor, Michigan 48109

May 5, 1980

Dr. M.S. Rege
Dept. of Zoology
Institute of Science
15, Madame Cama Road
Bombay 400 032 INDIA

Enclosed are copies of your manuscript on the lack of female heterogameity in Gambusia affinis from India, with reviewers' comments. As you can see, a problem has arisen because of the discovery by Black and Howell (Copeia 1979:509). Because the information in your manuscript was pre-empted (through no fault of yours) at the time you submitted it, we are rejecting the manuscript.

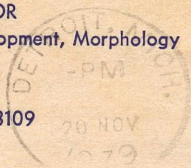
Best wishes,



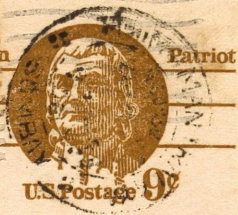
G. R. Smith

GRS:lak
Enc

GERALD R. SMITH, EDITOR
COPEIA: Genetics, Development, Morphology
Museum of Zoology
University of Michigan
Ann Arbor, Michigan 48109



EISENHOWER • USA



Dr. M. S. Rege
Dept. of Zoology
Institute of Science
15, Madam Cama Road
Bombay 400 032 INDIA

Dear Dr. Rege:

This is to acknowledge receipt of your manuscript: Absence of female heterogamety in *Gambusia affinis* population from India with A.P. Krishnaja

It has been assigned number CG- 221 . Please refer to this number
in corresponding with reference to this article. The manuscript has been sent to two independent reviewers. You will be notified upon completion of the review process, hopefully in several weeks.

Gerald R. Smith
Editor: COPEIA
Genetics, Development, Morphology

ABSENCE OF FEMALE HETEROGAMETY IN GAMBUSIA AFFINIS POPULATION

FROM INDIA - Fishes as a group exhibit an ^{array} ~~array~~ of cytological sex determining mechanisms, some primitive others rather specialised. Thus, sex chromosomes of the XX - XY; XX - XO and WZ - ZZ types as well as multiple sex chromosomes have been reported in certain groups of fishes (Ebeling and Chen, 1970; Uyeno and Miller, 1972). Yet a number of fishes studied do not show any difference between male and female karyotypes. Chen and Ebeling (1968) reported female heterogamety of WZ type in females and ZZ type in males of Californian and Texan populations of Gambusia affinis. The presence of a large metacentric chromosome among the 48 chromosomes that make up the karyotype in the females was taken as evidence of female heterogamety. However, Cataudella and Sola (1977) reported absence of such heteromorphic chromosomes in G. affinis populations from Italy. In an earlier study Sharma et al. (1960) reported $2n=46$ in G. affinis population from India.

During a screening programme for the selection of a suitable fish species in our mutagenic experiments, we examined Gambusia affinis (Baird and Girard) karyotypes and the findings on the same are reported here. 15 females and 10 males collected from Masunda Lake in Thane district near Bombay were used for this study. Chromosome preparations were made according to the method already described (Krishnaja and Rege, 1979). The fishes were either injected 0.04 % colchicine or left in water containing colchicine 0.0125 % for 4 to 6 hours.

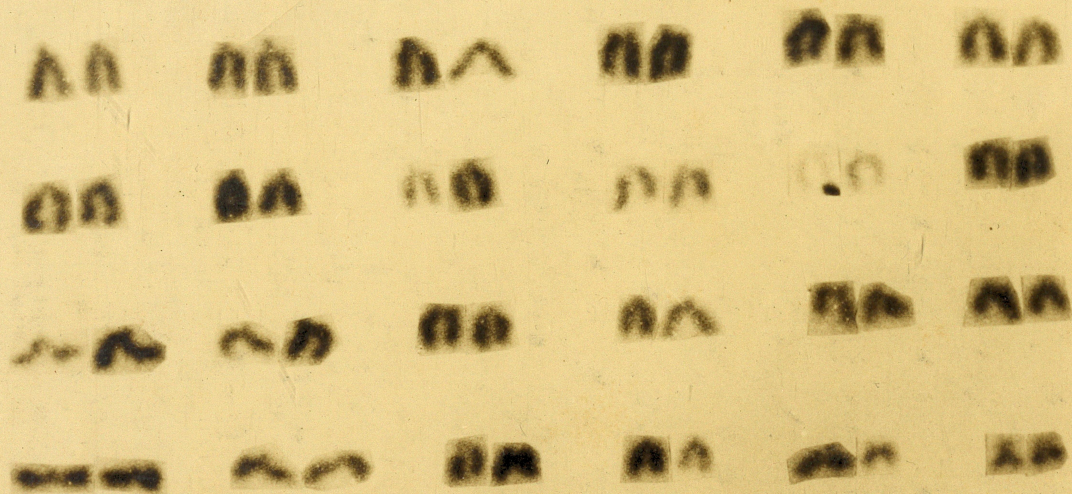
Karyotypes from males as well as females (Fig.1a and b) showed a modal diploid number of $2n=48$ with 23 pairs of acrocentric chromosomes along with a small pair of submetacentric (metacentric ?) chromosomes. No evidence of a heteromorphic sex chromosome pair was noticed in this population. This absence of a heteromorphic chromosome pair may be attributed to certain chromosomal re-arrangements that might have taken place in these introduced populations. Interestingly meiotic preparations from males revealed 24 bivalents with one showing possible end to end association (Fig.1c). Atypically behaving bivalents have been noticed in some species lacking morphologically differentiated sex chromosomes (Thorgaard, 1977). Different degrees of sex chromosome polymorphism has been noticed in other species of fishes as well, such as killifish species (Chen, 1971), Mudminnow (Howell and Bloom, 1973), Rainbow trout and Sockeye Salmon (Thorgaard, 1977;1978).

References :-

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- Krishnaja, A.P. and Rege, M.S. 1979. Some observations on the chromosomes of certain teleosts using a simple method. *Ind. J. Expt. Biol.* (in press).
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- Uyeno T. and Miller, R.R. 1972. Second discovery of multiple sex chromosomes among fishes. *Experientia* 28: 223-225,

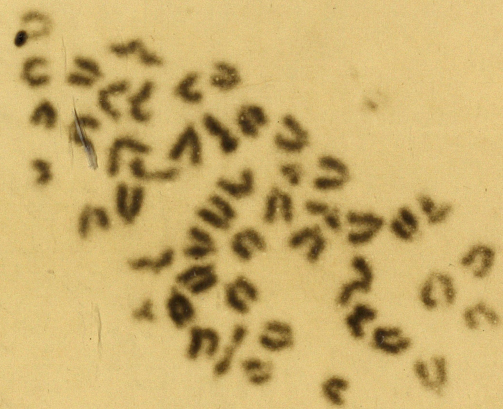
Krishnaja, A.P. and Rege, M.S.
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Bombay 400 032
India.



GAMBUSIA AFFINIS - MALE (GILL)

10μ

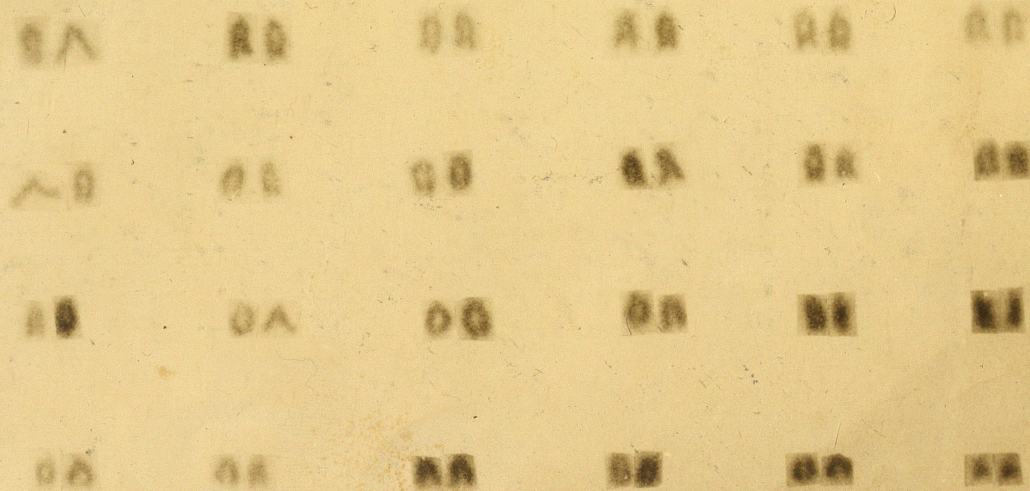
1a



1a



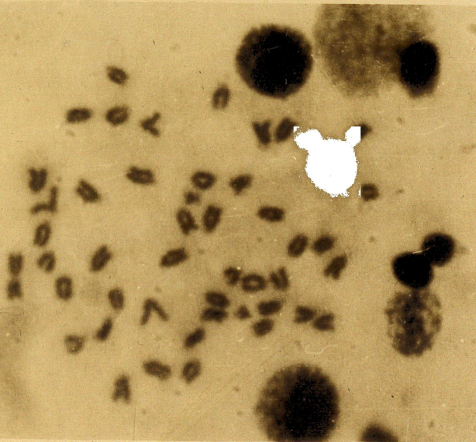
1c



GAMBUSIA AFFINIS - FEMALE (GILL)

10μ

1b



1b