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On *Pliovitellaria osteobramensis* Gupta & Sinha, 1984 - a critical review

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Abstract :*Pliovitellaria osteobramensis* a Caryophyllaeid cestode was for the first time reported by Gupta & Sinha in 1984 from the intestine of *Osteobrama- cotio* (Ham) at Lucknow. Unfortunately Hafeezullah (1993)[4] transferred this species under the genus *Paracaryophyllaeus* Kulakovaskaya (1961)[5] on the ground that in *P.osteobramensis :*

(i) Male and female genital pores are separate (not monogonoporate),
(ii) External seminal vesicle is absent,
(iii) Uterus extends almost to anterior level of cirrus sac,
(iv) the testes commence from a level much behind anterior level of vitellaria and
(v) absence of single bothrium on scolex (all these he concluded by seeing the camera lucida drawing of *P.osteobramensis given by* Gupta & Sinha (1984)[3] published in *Ind.Jour.Helminth*. **Vol.XXXvi(i) :** 73-80.

Another species reported from India under the genus *Paracaryophyllaeus* is *P.lepidocephali* by Kundu (1985)[6] which was recovered from the intestine of *Lepidocephalichthys guntea* (Hamilton) belonging to *Cypriniformes* : *Cobitidae*, reported from Garapota and Canning town, West Bengal- according to Hafeezullah (1993)[4] although *P.lepidoecephali* was originally described under the genus *Lytocestoides* by Kundu (1985)[6].

The authors have valid reasons to restore the original status of *Pliovitellaria osteobramensis* Gupta & Sinha (1984)[3] on scientific grounds .

Key words : *Pliovitellaria osteobramensis* review & *Paracaryophyllaeus.*

INTRODUCTION

Genus *Pliovitellaria* was erected by Fischthal (1951)[2] with type species *P.wisconsiensis* which harbours *Notemigonus crysoleucas auratus, Hyporhynchus notatum* at Wisconsin USA.

From India *Pliovitellaria osteobramensis* was reported by Gupta & Sinha (1984)[3]. Its placement in the genus *Paracaryphyllaeus* Kulakovaskaya (1961)[5] by Hafeezullah (1993)[4] is being discussed.

MATERIALS AND METHODS:

All original research papers and & some slides have been consulted and seen.

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OBSERVATION AND DISCUSSIONS

A key to the *Caryophyllinae* Nybelin (1922)[10] under the family *Caryophyllaeidae* Leuckart (1878)[7] is given on page 19 of Systema Helminthum cestoda Vol.II by Yamaguti (1959)[12]. In this key it has been given that in *Pliovitellaria*:-

1. Ovary is H Shaped.
2. Post ovarian vitellaria is present,
3. Scolex is without any terminal introvert rather is poorly defined with a pair of shallow loculii.
4. Uterine coils never extend anterior to cirrus sac and
5. Genital pores are in posterior half of body.

Whereas the generic diagnosis for *Pliovitellaria Fischthal* (1951)[2] is as follows : (vide Systema Helminthum

vol.II. cestodes of vertebrates)[12] :

"Scolex poorly defined varying little in shape, with a pair of **acetabular bothria**. Testes numerous (42-64), entirely medullary in one layer or two. A thick-walled external seminal vesicle present, cirrus pouch post-equatorial, **cirrus joining utero-vaginal duct ventral to posterior part of cirrus pouch. Ovary H shaped**, distinctly lobate, entirely medullary, about 1/3rd of body length from posterior extremity. **Uterine coils not extending anterior to cirrus pouch**, but a short distance posterior to ovary, surrounded by unicellular glands, through out its length; seminal receptacle thin walled, extending longitudinally dorsal to ovarian commissure. Vitellaria entirely medullary, lateral to testes, partly inter testicular, in narrow row lateral to uterus, interrupted in ovarian zone, occupying whole medulla **posterior to uterus**, eggs oval, numerous, Excretory vesicle opening terminally, parasitic in *Cyprinidae*".

Mackiewicz (1974)[9] also provided a key to the single – gonoporate *Caryophyllaeid* genera from vertebrate hosts in which external seminal vesicle has been shown to be present ovary distinctly H-shaped, scolex clavate or clavoloculate & harbour, *Cyprinidae* are some distinguishing characters of *Pliovitellaria* Fischthal (1951)[2]. Mackiewicz (1974)[9] had only one specimen of *Paracaryophyllaeus* & he could not ascertain the external sem. Vesicle and placement of the inner longitudinal muscle. *Paracaryophyllaeus* being restricted to Palearctic *Cobitidae*.

In a key to the genera of *Caryophyllaeidae* Leuckart[7] (in Luhe, 1910) Cestoda Carus, 1863 : *Caryophyllidea* Van Beneden (in carus, 1863) proposed by Singh, Sahay and Prasad (2007)[11] also the distinguishing characters for *Pliovitellaria* has been shown to be –

1. Scolex poorly defined with a pair of acetabular bothria or clavate or cuneiform, ovary though H shaped near the middle of body, vitellaria entirely medullary lateral to testes, partly intertesticular, a narrow row lateral to uterus interrupted in ovarian zone occupying whole medulla posterior to uterus, post ovarian vitellaria extensive, internal seminal vesicle present, external seminal vesicle thick walled, cirrus sac post equatorial and joins utero vaginal duct ventral to posterior part of cirrus sac (monogonoporate)".

A comparison of the characters of the genera *Pliovitellaria* Fischthal (1951) and *Paracaryophyllaeus* Kulakovaskaya (1961) shows that-

In (1) *Pliovitellaria* uterine coils donot extend anterior to cirrus pouch but a short distance posterior to ovary (In *Paracaryophyllaeus* uterine coils extend anterior to cirrus sac.).

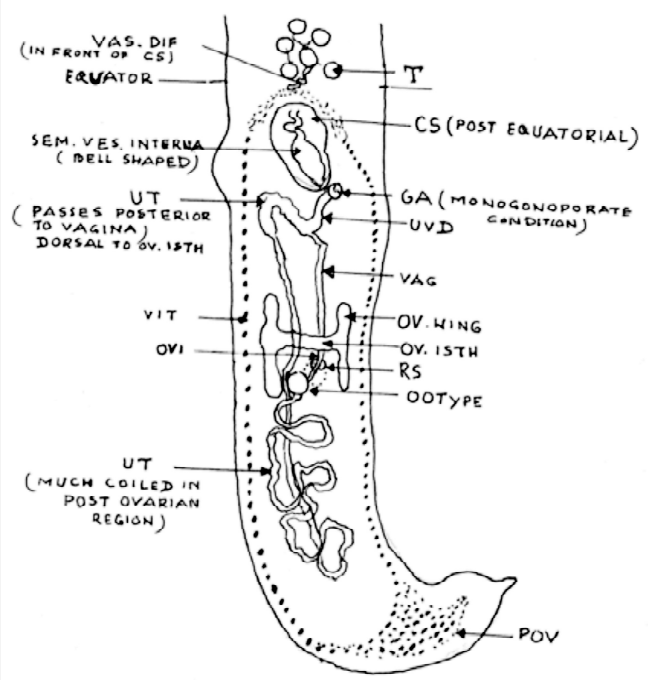
In "*P.osteobramensis* uterus is a slender tube arising from posterior end of ootype, much convoluted in the post-ovarian region, extends anteriorly dorsal to ovarian isthmus upto cirrus sac, passes posterior to vagina before opening into genital atrium (situated at 4.95-5.69 from posterior end i.e., cirrus joins uterovaginal duct ventral to posterior part of cirrus pouch" (Hafeezullah reported in *P.osteobramensis* the male & female gonopore separate.

In the diagram provided by Gupta and Sinha (1984) for *P.osteobramensis* external seminal vesicle is not clear, neither the uterus extends anterior to cirrus sac (it is definitely restricted to posterior end of cirrus sac.

Commencement of medullary testicular follicles 16-41 in number from anterior end of cirrus sac upto 2.00 to 2.87 mm of anterior end has been observed by Gupta & Sinha (1984)[3] in *Pliovitellaria osteobramensis*. (Hafeezullah, 1993)[4] contrarily mentions "testicular follicles extend from much behind (about 2.00-3.00mm) ***anterior level of vitellaria to cirrus sac***. There seems to be drastic change of statements. That means he has ignored the area ahead of anterior vitelline follicles 2-2.87mm is not "much behind" in worms measuring 6.87-9.66 mm. Besides the number of follicles & their disposition in medullary region is age dependent.

The follicular medullary vitellaria commence at a distance of 0.58 to 0.82mm from anterior end in one row up to posterior end of body has been reported by Gupta and Sinha (1984)[3] in *Pliovitellaria osteobramensis* which is an observational mistake. Hafeezullah (1993)[4] seems to have corrected the observation of Gupta & Sinha (1984)[3] by seeing the camera lucida drawings of *Plivitellaria osteobramensis* Gupta and Sinha (1984)[3] modifying as under-

"Vitellarial follicles extends from some distance behind scolex to cirrus sac. Post-ovarian set of vitelline follicles present. Pre-ovarian and post-ovarian vitellaria are connected laterally by a row of vitelline follicles" to



Pliovitellaria osteobramenis (Redrawn, not to scale)

which the present authors agree.

Single bothrium (0.10 to 0.13mm) is present in *Pliovitellaria osteobramensis* (It is not an artifact as stated by Hafeezullah, 1993)[4].

Last but not the least, a monogonoporate species like *Pliovitellaria osteobramensis* can not therefore, be transferred to the genus *Paracaryohyllaeus kulakovaskaya* (1961)[5] as in *Paracaryophyllaeus* the species are bigonoporate. The original status of *P.osteobramensis* is thus restored however, the occurrence of *Pliovitellaria* species in Oriental region is perplexing. Mackiewicz (1972)[8] has also doubted the existence of the genus *Paracaryophyllaeus* Kulakovaskya (1961) that is why he has kept the genus among the "incertae sedis".

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