



ISSN : 0973-7057

A critical study of two species of the genus *Postorchigenes* Tubangui, 1928 (Prosthodendriinae: Lecithodendriidae, Trematoda)

Anita Jha^a, Umapati Sahay^b, A.P.V. Khalkho^c & Fauzia Sadaf^d

^aDept. of Zoology, Gardanibagh Girls College, Gardanibagh, Patna, Bihar.

^bDept. of Zoology, R.U., Ranchi, Jharkhand

^cDept. of Zoology., Chaibasa Womens College, Chaibasa, Jharkhand.

^dDept. of Zoology, Gardanibagh Girls College, Patna

Received 30th May, 2013; Revised 26th June, 2013

Abstract : *Postorchigenes monorchis* was described by Talukdar & Varma (1986)² (Published in *J. Assam. Science Society*) from the intestine of *Hemidactylus* sps. at Pathsala Assam where as *Postorchigenes chauhani* was described by Hasnain in 1989³ & published in Dr.B.S. Chauhan Comm. Vol. While describing the former species, Talukdar & Varma (1986)² committed certain mistakes such as not giving a scale in the camera lucida drawing provided, not showing bipartite vesicula seminalis interna, a long pars prostatica, a long narrow ejaculatory duct & the position of genital pore (though its presence has been mentioned in text to be just behind vesicula seminalis), also they did not provide any sketch of an egg. Besides irrelevant literatures have been cited in the reference part.

The latter species described by Hasnain in 1989³ also shows certain similarities with other species that its validity becomes questionable.

On the basis of informations gathered the authors have critically examined the aforesaid species to judge their position & validity.

Key words: *Postorchigenes*, critically examined.

INTRODUCTION

The genus *Postorchigenes* was established by Tubangui (1928)¹ with type species *P. ovatus* which he recovered from the intestine of a lizard (*Hemidactylus frenatus*) at Los Banos, Langua province, Luzon Philippines. The said trematode species was placed by him in the subfamily *Pleurogenetinae* Looss (1899)⁴ owing to (i) the arrangement of the genital glands, (ii) location of the genital pore away from the median line and (iii) the extent and distribution of vitellaria from the pharynx to the

acetabulum.

Gogate (1939)⁵ erected a new genus *Palitrema* for a trematode *Palitrema macrorchis* recovered from the intestine of *Hemidactylus brooki* and *Calotes versicolor* (at Rangoon). The trematode (*P.m.*) was placed in the family *Lecithodendriidae* on account of

- (i) The lateral, post acetabular position of the genital pore
- (ii) Presence of cirrus sac, long intestinal caeca and
- (iii) V-shaped excretory bladder.

As *P. macrorchis* showed some special features (large testes, oblique cirrus, acetabular position of ovary and pre-acetabular band of vitellaria extending from side to side), Gogate (1939)⁵ had to erect a subfamily *Palitrematinae* to accommodate the fluke.

Yamaguti (1958)⁶ considered *Palitrema* (Gogate,

*Correspondent author :

Phone : 09934157570

E-mail : sahayumapati@gmail.com

1939)⁵ a synonym of *Postorchigenes* (Tubangui, 1928)¹ to which Sinha and Hakim (1967)⁷ agreed, Fischthal and Kuntz (1967)⁸ also synonymized *Palitrema macrorchis* with *Postorchigenes ovatus*. *P. macrorchis* has also been recovered from *Hemidactylus flaviviridis* at Lucknow. Yamaguti (1958)⁶ erected a new subfamily

Prosthodendriinae in which following genera were kept (i) *Prosthodendrium* Dollfus (1931)⁹ (ii) *Aliptrema* Ruiz (1953)¹⁰ (iii) *Postorchigenes* Tubangui (1928)¹. This was supported by Hasnain (1989)³. Yamaguti (1971)¹¹ also provided a key to the genera of *Prosthodendriinae* (Synopsis of digenetic Trematodes page 457) which is as follows:

1. Vitellaria in neck region, uterine coils mainly in hind body 2
Vitellaria in pretesticular lateral fields of middle third of body, testes medial to caeca, anterior uterine coils may extend to near oral sucker *Aliptrema* Ruiz (1955)¹⁰
2. Caeca reaching beyond equator, testes somewhat diagonal, medial to caeca *Post-orchigenes* Tubangui (1928)¹
Caeca shorter, testes symmetrical in caecal zone or largely post caecal *Prosthodendrium* Dollfus (1931)⁹

The generic diagnosis of *Postorchigenes* as laid on page 459 of synopsis of digenetic trematode by Yamaguti (1971)¹¹ is as follows:

“Body oval to pyriform, spinulate, acetabulum small pre-equatorial, oral sucker small but somewhat larger than acetabulum, oesophagus short or moderately long, caeca reaching beyond equator. Testes sub symmetrical, post-acetabular in middle third of body just medial to caeca. Cirrus pouch to left of acetabulum, enclosing convoluted seminal vesicle. Genital pore submedian lateral or posterolateral to acetabulum. Ovary to right of acetabulum opposite cirrus pouch, seminal receptacle present. Vitellaria extending transversely across median line in front of acetabulum. Uterus occupying most of hindbody, eggs small numerous. Excretory vesicle unknown. Intestinal parasites of lizards occasionally of mammals (Chiroptera)”.

So far the authors are aware following Indian species have been reported under the genus *Postorchigenes*.

1. *P. ovatus* Tubangui (1928)¹
2. *P. macrorchis* Gogate (1939)⁵
3. *P. majeedi* Sinha & Hakim (1967)⁷
4. *P. indicus* Agarwal (1968)^{12,13}
5. *P. srivastavai* Pandey (1973)¹⁴
6. *P. rishikeshai* Lal (1979)¹⁵
7. *P. singhi* Singh (1981)¹⁶
8. *P. premvati* Sinha (1985)¹⁷
9. *P. monorchis* Talukdar & Varma (1986)²
10. *P. calotei* Hasnain (1989)³

Hasnain (1987)³- reported *P. calotei* from *Calotes versicolor* in his Ph.D. thesis but when he published the account in Chauhan's commoration volume in 1989 changed its name to *P. chauhani* (nom. nudum) vide page 107 – 110. *P. calotei* = (*P. chauhani*) was considered by Sahay, Alka & Verma (2002)¹⁸ synonym of *P. mazeedi*.

Key to the species of the genus *Post-orchigenes* have been given by Sinha & Hakim (1967)⁷; Singh (1981)¹⁶; Sahay, Alka and Verma (2002)¹⁸.

MATERIAL & METHODS

All relevant literatures have been consulted.

OBSERVATIONS & DISCUSSIONS

I. One of the characteristic feature of *P. monorchis* Talukdar & Verma (1986)² is the presence of one testis (ovarian side). While dealing with some of the *Ganeo* species (viz. *G. bufonis* Fotedar (1959)¹⁹, *Ganeo* sps. Kaw (1950)²⁰ & *G. gazipurensis* Pandey *et. al.* (1968)²¹, Vitellaria was found to be situated only on one side- contrary to bilateral situation. Similarly in *Metagonimus yokogawai* complete atrophy of testis & left vitellaria was reported by Ciurea (1933)²² – abnormal features.

Abnormality in nature should not be treated to have systematic value Dawes (1946)²³. As a result of this concept *G. (bufonis)*, *Ganeo* sps. & *gazipurensis* were synonymized. Therefore, the occurrence of one testis in *P. monorchis* is not sufficient for species separation.

II. The authors of *P. monorchis* have kept the species under the category where the body length is less than twice the breadth” & have compared their worm with *P. ovatus* Tubangui (1928)¹ & *P. macrorchis* Gogate (1939)⁵ showing the same situation.

They opine thus in *P. ovatus* & *P. macrorchis* intestinal caeca extends just beyond the testes where as in

Jha et al: A critical study of two species of the genus *Post-orchigenes* Tubangui, 1928 (Prosthodendriinae: Lecithodendriidae, Trematoda)

P.monorchis intestinal caeca extends much beyond – this is not valid because in generic character as laid in Yamaguti (1971)¹¹ – caeca has been shown to be “reaching beyond equator”. Extension of caeca just beyond testes or slightly beyond is meaningless.

III. Whether or not the placement of cirrus sac & its shape has a significance in species separation is a big question. In *P.ovatus* cirrus sac is elongated & oval, obliquely placed in *P.macrororchis* where as in *P.monorchis* Talukdar & Varma (1986)² cirrus sac is pear shaped, elongated having a curved neck” as per text & from the sketch it appears to be situated opposite to ovary overlapping postero-lateral margin of acetabulum. Seminal vesicle has been shown to be bipartite.

In the generic diagnosis of *Postorchigenes* Yamaguti (1971)¹¹ cirrus pouch has been shown to be “to the left of acetabulum enclosing convoluted seminal vesicle”.

Mackiewicz (1972)²⁴ in Caryophyllaeids opines that the cirrus sac varies greatly in size, less so in structure. In the diagram of *P.monorchis*, cirrus sac is not pear shaped rather it is curved & does not show bipartite seminal vesicle.

IV. Literatures cited in the paper of *P.monorchis* number 3,4,5,6,7,8 are irrelevant and should not have been cited.

V. The sketch of *P.monorchis* provided in the article is

without a scale.

VI. Genital pore has been shown to be situated just behind seminal vesicle in *P.monorchis* contrary to generic diagnosis by Yamaguti (1971)¹¹ where it is “submedian lateral or posterolateral to acetabulum”. It seems to be an observational mistake of Talukdar & Varma (1986)².

Therefore, *P.monorchis* is kept under enquiry.

As regards *P.chauhani* Hasnain (1989)³ is concerned the following points indicate that it is a **synonym of *P.majeedi*** Sinha & Hakim (1967)⁷:

- i. Both the species fall in the category where body length is twice the breadth.
- ii. In both species, intestinal caeca extend much beyond testes.
- iii. Both species show cirrus sac muscular, narrow and curved, lying obliquely on the left side opposite ovary.
- iv. Both species show genital pore ventro sinistral overlying the left testis.

The accounts of *P.rishikeshai* Lal (1979)¹⁵, *P.singhi* Singh (1981)¹⁶, *P.premvati* Sinha (1985)¹⁷ have not been published as yet.

The best would be to carry out Karotypic study of all the species to ascertain the validity of the above referred species till then *P.monorchis* is kept under enquiry & *P.chauhani* is considered as a synonym of *P.majeedi*.

Keys as provided by different authors are as follows:

I. Key to the species of the genus *Post-orchigenes* by Sinha & Hakim (1987)⁷.

- [A] Body length less than twice the breadth; intestinal caeca extend just beyond the testes.
- i. Cirrus sac oval *P.ovatus* Tubangui (1928)¹
 - ii. Cirrus sac elongate & placed obliquely *P.macrororchis* Gogate (1939)⁵
- [B] Body length more than twice the breadth; intestinal caeca extend much beyond testes..... *P.majeedi* Sinha & Hakim (1967)⁷

II. Tentative key to species of the genus *Postorchigenes* (As proposed by Sahay, Alka & Anjana Verma (2002)¹⁸- slightly modified.

- [A] Body length less than twice the breadth, intestinal caeca extend just beyond the testes-
- i. Cirrus sac slightly oval situated on left side of body partly covered by acetabulum *P.ovatus* Tubangui (1928)¹
 - ii. Cirrus sac elongated and placed obliquely, genital pore overlapping the testis *P.macrororchis* Gogate (1939)⁵
Cirrus sac elongated, pear shaped with curved neck, placed opposite to ovary, overlaps the postero lateral (left side) of VS, testes single.***P.monorchis* Talukdar & Verma (1986)²
(A species under enquiry)
 - iii. Cirrus sac elongated placed obliquely but lying opposite

- to ovary near acetabulum & touches the anterior border
of anterior testis, one testis is extra caecal. **P.premvati* Sinha (1985)¹⁷
- [B] Body length more than twice the breadth, intestinal caeca extend much beyond testes-
- i. Genital pore ventro sinistral overlying the left testis
cirrus sac muscular with both ends narrow & curved,
commence at anterior border of VS & lie obliquely
on the left side, opposite ovary *P.majeedi* Sinha & Hakim (1967)⁷
- ii. Cirrus sac muscular both ends not narrow curved
commence at anterior border of ventral sucker &
lie obliquely opposite to ovary, genital pore ventro
sinistral, overlying the testis. *P.chauhani* Hasnain (1989)³
(Syn. *P.mazeedi*)
- iii. genital pore lying anterior to left testis *P.indicus* Agarwal (1968b)^{12 & 13}
- [C] Body length twice the breadth of body, intestinal caeca extend to the hind region of body.
- i. Cirrus sac transversely elongated slightly curved at
the level of acetabulum, genital pore behind the
ventral sucker **P.srivastavai* Pandey (1973)¹⁴
- ii. Cirrus sac commencing from a point much anterior
to anterior border of ventral sucker genital pore
preacetabular **P.rishikeshai* Lal (1979)¹⁵

REFERENCES

1. **Tubangui, M.A. 1928.** Trematode parasites of Philippine vertebrates. *Philipp.J.Sc.* **36:** 351 – 361.
2. **Talukdar, S. and B.P. Varma 1986.** On *Postorchigenes monorchis* sp.nov. (*Prosthodendriinae* : *Lecithodendriidae*, Trematoda) from the Indian wall lizard *Hemidactylus* species. *J.Assam Science Society.* **28(2):** 7 – 10.
3. **Hasnain, M. 1989.** On a new species of *Postorchigenes* from the intestine of *Calotes versicolor* Dr. B.S.Chouhan comm.. vol. 107 – 110.
4. **Looss, A. 1899.** Weitere Beitrage zurkenntnis der Trematoden fauna Aegypteus. Zugleich Versuch einer naturalichen Gliederung des Genus *Distomum* Retzius. *Zool. J.Syst.* **12:** 521 – 784.
5. **Gogate, B.S., 1939.** On a new trematode *Palitrema macrorchis* gen et. Sp. Nov. from Rangoon Lizards. *Rec.Ind.Mus.* **41:** 57 – 60.
6. **Yamaguti, S. 1958.** Systema Helminthum Part I & II Inter Science Publishers INC New York, London.
7. **Sinha, D.P. and A.Hakim. 1967.** On *Postorchigenes majeedi* n.sp. (*Prosthodendriidae*: *Lecithodendriinae*) from Indian house gecko *Hemidactylus flaviviridis* *Zool. Anz.* **178:** 39 – 42.
8. **Fischthal, J.H. and R.E.Kuntz. 1967.** Digenetic trematodes of amphibians and reptiles from Fiji New Hebrides and British Solomon Islands. *Proc.Helm.Soc.Wash.* **34(2):** 244 – 251.
9. **Dollfus, R.Ph. 1931.** Amoenitates helminthologicae. A propos de La creation de *Lecithodendrium Laguncula*. Ch.W.Stiles et. M.O. Nolan, 1931. *Ann. Parasit.* **9(5):** 483 – 484.
10. **Ruiz, J.M. 1953.** Contribucao ao estudo das formas larvariar de trematodes brasileiros. *Mem.Inst.But.* **25(2):** 77 – 89.
11. **Yamaguti, S. 1971.** Synopsis o digenetic trematodes of vertebrates. Kagau Publishers, Japan.
12. **Agarwal, V. 1968b.** Two reptilian trematodes from Lucknow. *Ann. Par.* **43:** 333 – 338
13. **Agarwal, V. 1968a.** On some trematodes parsites of Amphibia from Lucknow. *Rev.Biol.Trop* **15:** 1 – 11.
14. **Pandey, K.C. 1973.** A study of some known and unknown trematodes of reptiles *Ind.J.Zool.* **15:** 179 – 186.

*Not published yet. Taken from thesis.

Jha et al: A critical study of two species of the genus *Post-orchigenes* Tubangui, 1928 (Prosthodendriinae: Lecithodendriidae, Trematoda)

15. Lal, A.K. 1979. Ph.D. thesis, Patna University, Patna-5.
16. Singh, A. 1981. Studies on the digenetic trematodes of some vertebrates in and around Patna and some haematological investigations of *Acridotheres tristis* carrying cestode infection Ph.D.Thesis Patna University, Patna, India
17. Sinha, M. 1985. Studies on the digenetic trematodes of some vertebrates in and around western Patna Ph.D.Thesis Patna University, Patna-5, India.
18. Sahay Umapati, Alka ad Anjana Verma, 2002. On a new key to the species of the genus *Post-orchigenes* (Trematoda) Tubangui (1928) with historical review. *J.Curr.Sc.* **2(1)**: 79 – 81.
19. Fotedar, D.N. 1959. On a new species of the genus *Ganeo* Klein, 1905 and some notes on the genus *J.Helminth.* **33(3-3)**: 151 – 160.
20. Kaw, B.L. 1950. Studies in Helminthology. Helminth parasites of Kashmir Part I. Trematoda. *Indian Jour. Helminth.* **2(2)**: 67 – 126.
21. Pandey, K.C. and K.K.Chakraborty. 1968. On a new trematode from Common Indian frog, *Ganeo gazipurensis* nsp. *Science & Cult.* **34(5)**: 218 – 219.
22. Ciurea, I. 1933. Sur quelques larves des vers parasites de L'homme, des mammiferes et des oiseaux ichthyophages trouves chez les poissons des grandes lacs la Bessaralie, du Dniester et de son liman. *Arch Roum Path. Exp. Microbil.* **6**: 151 – 170.
23. Dawes, B. 1946. The Trematoda with special reference to British & other European forms Cambridge Univ. Press. 644pp.
24. Mackiewicz, S. 1972. Caryophyllidea (Cestoidea): A review. *Experimental parasitology.* **31**: 417 – 512.

* * *

