

Neoeneuterum minutum N. Gen. N. Sp. (Trematoda: Opecaeliidae: Enenterinae) from the Fish *Thynnus thunnia* of Karachi Coast

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SUMMARY: A new trematode genus *Neoeneuterum* has been described from the intestine of fish, *Thynnus thunnia*, of the Karachi coast. The species was named *N. minutum*. The new genus is characterized by having small, smooth, flattened and elongated body, a mouth surrounded by 6 delicate papilliform extensions, a prominent oral sucker, a conspicuous pre-pharynx, a moderately developed pharynx, an esophagus almost as long as the pre-pharynx, and long ceca not joined posteriorly. The acetabulum is in the anterior half of the body and is larger than the oral sucker. There are 2 testes that are soft and close together in the posterior quarter of the body. The cirrus pouch is large extending to posterior region and an external seminal vesicle is present. There is a pre-acetabular genital pore surrounded by a glandular area. The ovary is in front of the testicles, a seminal receptacle is present, and the vitelline follicles are large extending post-acetabular rejoining laterally to the posterior extremities of the body. The excretory vesicle is tubular. The new genus is included in the subfamily Enenterinae of the family Opecoeliidae but shows some important diagnostic variations, therefore, the subfamily evaluation has been amended to accommodate the new genus. The genus name shows its relation to the subfamily and the species name refers to its small size.

Key words: *Neoeneuterum minutum*, new genus, Trematoda, Opecaeliidae, Enenterinae, *Thynnus thunnia*, Karachi Coast.

Pakistanın Karaçi Kıyısından yakalanan *Thynnus thunnia* Balığında Saptanan *Neoeneuterum minutum* N. Gen. N. Sp. (Trematoda: Opecaeliidae: Enenterinae)

ÖZET: Yeni bir trematod cinsi olan *Neoeneuterum* Karaçi sahilinde yaşayan bir balık olan *Thynnus thunnia*'nın bağırsağından elde edilmiş ve tanımlanmıştır. Tür ismi *Neoeneuterum minutum*'dur. Yeni cins, küçük, düz ve yuvarlak vücudu olması, ağzının 6 kırılğan papilliform uzantı ile çevrili olması, belirgin bir ağız çekmeni bulunması, göz çarpan bir prefarinks, bir süzeye kadar gelişmiş farinks olması, prefarinks kadar uzun özafagusu bulunması, sekanın uzun olması ile karakterizedir. Asetabulum vücudun yarısının önünde ve ağız çekmeninden daha geniştir. Testisler iki tane olup, yumuşaktır ve vücudun arka bölümünde birbirine yakındır. Sirkus kesesi geniş olup arka bölgeye kadar uzanır. Dış seminal vezikülü vardır. Genital açıklık asetabulumun önünde ve bezlerle çevrilidir. Ovaryum testislerden önce olup seminal hazne bulunmaktadır. Vitellus bezi büyüktür, asetabulumun arkasından uzanır, yan duvarlara değerek vücudun arkasına kadar gider. Salgı vezikülü tubular yapıdadır. Bu yeni cins, Opecoeliidae ailesi ve Enenterinae alt ailesine dahildir, ancak bazı önemli değişiklikler bulunur. Bu nedenle, yeni bir cins olarak değerlendirilmiştir. Cins ismi, alt aile ile olan ilişkisini, tür ismi ise küçük boyutunu temsil etmektedir.

Anahtar Sözcükler: *Neoeneuterum minutum*, Trematoda, Opecaeliidae, Enenterinae, *Thynnus thunnia*, Karaçi, Pakistan

GİRİŞ

Several species of trematodes have been described from the fishes of Karachi coast (1, 2). But any species belongs to the family Enenterinae is not known from the fishes, of Karachi coast so far. Present is the first report of the family from Pakistan with the description of a new genus and species *Neoeneuterum minutum* from the intestine of fish *Thynnus thunnia* of Karachi coast.

The present specimen included in the subfamily Enenterinae show some morphological variations of diagnostic value. Therefore subfamily diagnosis is emended to accommodate the new genus and is described here.

MATERIALS AND METHODS

Several trematode were collected from the intestine of a single fish *Thynnus thunnia* of Karachi coast. Among these one appeared quite different and was processed for a detail study and selected to be described first. The specimen was fixed in AFA, stained with Mayer's carmalum by usual process, dehydrated, cleared and mounted permanently in Canada balsam by standard technique. Photograph of the whole mount

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was taken by a Nikon (Optiphot-2) photomicroscope using Fuji colour film. Diagram of genital region and associated structures was made with the help of a camera lucida and measurements are given length by width in millimeters. Holotype is in the collection of first author.

RESULTS

Neoenenterum minutum (Fig. 1-3)

Host : *Thynnus thunnia*

Location : Intestine

Locality : Karachi

Number : A single specimen from a single host.

Cat. No: BM coll. T1230, holotype.

Description

Body cylindrical, small, smooth, tapered at each end, narrower anteriorly, forebody narrow, hindbody broader, broadest at the preovarian region, 1.2×0.25 in size. Oral sucker weakly developed, rounded, with 6 broad based marginal papilliform extensions anteriorly 0.07 in diameter. Prepharynx broad 0.035mm long, pharynx prominent 0.03× 0.035 in size. Esophagus is almost as long as prepharynx 0.027mm in length. Ceca long reaching to posterior end of body but not united posteriorly. Acetabulum larger than oral sucker 0.075 mm in diameter behind middle of anterior third of body. Testes two, tandem, posterior testis slightly irregular, in posterior part of the body, close together, 0.061-0.072 by 0.06-0.069 in size. Cirrus pouch is large, bifid anteriorly, extending posterior to acetabulum and overlapping it anteriorly, containing seminal vesicle and associated structures 0.21 by 0.052 in size. Genital opening preacetabular, surrounded by a saccular glandular area. External seminal vesicle 0.079 by 0.041 in size, elongated in shape. Ovary almost rounded, pretesticular and post equatorial, 0.062 in diameter. Seminal receptacle is postovarian, submedian separating the ovary from the testes. Metraterm weakly developed. Vitellaria, follicular, follicles large extending along ceca from the posterior margin of acetabulum region to posterior extremity. Excretory vesicle short, tubular. Uterus between ovary and acetabulum. Eggs are relatively large, operculate and 0.039-0.051 by 0.029-0.031 in size.

Neoenenterum n.gen.

Generic diagnosis: Opacoeliidae, Enenterinae. Body flattened, elongate and smooth. Mouth surmounted by six delicate, non-muscular extensions. Oral sucker prominent, prepharynx conspicuous, pharynx moderate in size, esophagus is as long as prepharynx. Ceca long extending to posterior end of the body but not united posteriorly. Acetabulum is large than oral sucker, in anterior half of the body, preequatorial. Testes two tend to be close together in the posterior quarter of the body. Cirrus pouch is long, posterior to acetabulum, genital pore preacetabular, surrounded by a rounded glandular area. Ovary pretesticular, seminal receptacle present, Laurer's canal

not prominent. Vitelline follicles are large extending from post acetabular region to posterior extremity of the body. Excretory vesicle tubular. Parasitic in marine teleost. Karachi, Pakistan.

Type species: *N. minutum*.

Enenterinae Yamaguti, 1958 emend subfamily diagnosis: Opacoeliidae. Body is sub-cylindrical, long, smooth. Oral sucker with 6 to 10 papilliform to conical muscular or non-muscular processes anteriorly. Prepharynx may be very long. Ceca may or may not be united posteriorly. Acetabulum in anterior half of the body. One or more (up to 15) accessory suckers may be present in front of the acetabulum embedded in body parenchyma. Testes single or double, tend to be in posterior half of the body. Cirrus pouch present may be long extending posterior to acetabulum. Genital opening preacetabular may be surmounted by a rounded glandular area. External seminal vesicle present or absent. Ovary median to submedian, pretesticular. Vitellaria, lateral, may be occupying all available space of hind body. Uterus winding in intercecal field between ovary and acetabulum.

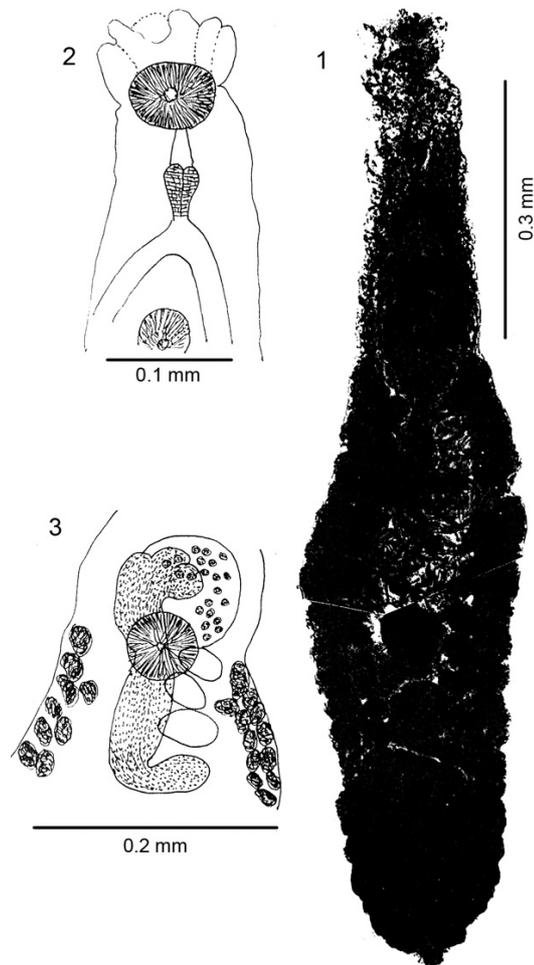


Fig. 1-3. *Neoenenterum minutum* type specimen. 1. Entire specimen; 2. Anterior end of body showing papilliform extensions surrounding the mouth; 3. Genital region with associated structures.

DISCUSSION

The present specimens are included in the sub-family Enenterinae Yamaguti, 1958 of the family Opecoeliidae Yamaguti, 1971 but cannot be accommodate in any of the genera of the sub-family. There are three genera in the sub-family Enenterinae namely, *Enenterum* Linton, 1910; *Cadenatella* Dollfus, 1946 and *JeanCADENATIA* Dollfus, 1946.

The genus *Enenterum* is characterized by having mouth terminal, surrounded 10 short rounded lobes arranged in pairs, oral sucker moderately large, prepharynx conspicuous, pharynx large, esophagus practically absent, ceca united behind posterior testis, acetabulum a little larger than oral sucker, one third to one fourth body length from the anterior extremity. Testes tandem, close together in posterior half of the body, cirrus pouch saccular containing convoluted seminal vesicle, well developed prostatic complex and short cirrus, between acetabulum and intestinal bifurcation, genital pore preacetabular, seminal vesicle and Laurer's canal present. Vitelline follicles are small diffuse in the hind body, uterus between ovary and acetabulum. Excretory vesicle is tubular reaching to ovary (3).

In genus *Cadenatella* oral sucker is terminal, with 8 short digitiform circumoral appendages, prepharynx is very long, pharynx large and esophagus is short. Ceca are united posteriorly. Acetabulum is well developed in anterior third of the body. Cirrus pouch is saccular between acetabulum and intestinal bifurcation or anterolateral to acetabulum may be practically absent and genital pore preacetabular. External seminal vesicle long, sinuous extending posterior to acetabulum. Ovary is pretesticular median seminal receptacle and Laurer's canal present. Vitelline follicles are small, commencing at level of ovary or testis, confluent in post testicular area. Uterus is between ovary and acetabulum. Excretory vesicle is tubular (3).

In genus *JeanCADENATIA* the terminal oral sucker is surmounted by 10 conical tentacles, prepharynx very long, pharynx is pyriform, large, esophagus is also long, ceca opening outside by cloaca. Acetabulum is prominent, far apart from anterior extremity. Usually a row of variable number of accessory ventral suckers between pharynx and acetabulum are present. Testes directly tandem exceptionally single, postequatorial, cirrus pouch practically absent, anterodorsal to acetabulum, genital pore preacetabular. Ovary is pretesticular, seminal

receptacle and Laurer's canal present. Vitelline follicles are small, commencing at level of ovary or behind testes. Uterus between ovary and genital pore. Excretory vesicle is tubular.

The present specimen has only 6 rounded, delicate, non-muscular lobes anteriorly, prepharynx is prominent but not very long, pharynx is also prominent, pyriform, ceca are not united posteriorly as contrary to the three above mentioned genera of the sub-family Enenterinae. Acetabulum is in anterior half of the body, pre-equatorial in position, accessory suckers are not present as in the genus *JeanCADENATIA*. Testes are two tender, almost smooth, near to posterior extremity of the body. Cirrus pouch is long extending much posterior to acetabulum unlike the three genera of the family in which it may be absent, small, saccular, preacetabularly or anterolateral to acetabulum. Genital opening anterior to acetabulum, surmounted by an oval glandular structures. Ovary is rounded, median, pretesticular, seminal receptacle is present, Laurer's canal is not obvious. Vitellaria consist of relatively large follicles, lateral in position, commencing immediately posterior to acetabulum and extending to posterior extremity of the body.

The present specimen although included in the subfamily Enenterinae shows some important diagnostic variations such as 6 anterior extensions instead of 8 to 10, separate ceca not united posteriorly, large cirrus sac extending much posterior to acetabulum and the genital opening surmounted by a glandular area. Therefore the subfamily diagnosis is emended accordingly to accommodate the present specimen and a new genus *Neoeneuterum* is proposed with the species name *Neoeneuterum minutum* n. gen. n. sp. The genus name refers its affiliation with sub-family Enenterinae and the species name to its small size.

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