STUDIES ON DIGENETIC TREMATODES OF THE GENUS PROSTHODENDRIUM DOLLFUS, 1931 FROM SOME EGYPTIAN BATS. I. TREMATODES OF THE SUBGENUS PROSTHODENDRIUM DOLLFUS, 1931

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Abstract. A review of the genus Prosthodendrium Dollfus, 1931 is presented. It is suggested that Longitrema Chen, 1954 should be considered a synonym of Prosthodendrium. The division of the genus Prosthodendrium into two subgenera viz. Prosthodendrium Dollfus, 1931 and Paralecithodendrium Odhner, 1911 is discussed and accepted. Four species which have been assigned to the subgenus Prosthodendrium are described from some Egyptian bats. These included Prosthodendrium urna (Looss, 1907), P. longiforme (Bhalerao, 1926), P. parvolutus (Bhalerao, 1926) and P. khalili sp. n. P. urna is reported for the first time in Nectotis thebica and Asellia t. tridens. Both P. longiforme and P. parvolutus are recorded for the first time in Egypt. The validity of P. chilostomum (Mehlis, 1831) and P. chilostomum var. madagascarense Richard, 1966 is discussed and it is concluded that the latter should be considered a synonym of the former species. It is also suggested that P. brachyurra Groschaet et Tenora, 1971 should be considered a synonym of P. urna. A key is presented to differentiate those species of the subgenus Prosthodendrium known so far from Egyptian bats.

Dollfus (1931) established the genus Prosthodendrium for those lecithodendridi trematodes having testes anterior to uterine folds, vitellaria anterior to testes, genital pore anterior to ventral sucker and tegument without spines. Prosthodendrium dinantium (Bhalerao, 1926) was designated as the type species of the genus. Dollfus (1937) divided the genus Prosthodendrium into two subgenera viz. Prosthodendrium and Paralecithodendrium. Under the subgenus Prosthodendrium Dollfus, 1931, were included the species with unlobed ovary, while the other species with a distinctly lobed ovary were included in the subgenus Paralecithodendrium Odhner, 1911.

Chen (1954) reviewed the genus Prosthodendrium and transferred eight of the species existing at that time to the genus Longitrema Chen, 1954. In the genus Longitrema, Chen included those Prosthodendrium — like trematodes with elongated mouth and oral sucker, ovary never indented or lobulated, reproductive organs (except the uterus) never behind the acetabulum and the eggs invariably larger than 30 μm. With the exception of the shape of both the mouth and oral sucker together with the size of eggs, the characters of Longitrema are almost identical with those of Prosthodendrium and its subgenus Paralecithodendrium. In the experience of the present authors, the shape of the mouth and oral sucker could show considerable variations with the state and method of fixation of such delicate and small trematodes. Moreover, small variations in the measurements of eggs cannot be accepted as a character of generic importance in the distinction between the two genera. Accordingly, the present writers suggest that the genus Longitrema Chen, 1954, should be considered a synonym of Prosthodendrium Dollfus, 1931.

In order to facilitate the taxonomy of the genus Prosthodendrium, Dollfus (1954) suggested its division into two species groups and several subgroups according to the position of the ovary in relation to the oral sucker and testes. However, Dubois (1955)
believed that this division complicated the taxonomy of the genus since position of the ovary might vary in one and the same species, e.g., *Proshodendrium ascidia* and *P. scabrum*.


Neiland (1962) described *P. duboisii* from *Myctis lucifugus* originating from southeastern Alaska. Mituch (1964) working in Czechoslovakia, described *P. vasteteticullorum*, *P. mirabile*, *P. ile* and *P. cryptolecithum*.

Recently, *P. chilotomum var. madagascariense* Richard, 1966 was described from *Chlorophon limbatus*. Richard (1966) believed that this variety differed from *P. chilotomum* in the measurements of the oral sucker and acetabulum. The present writers calculated the ratio of the oral: ventral suckers in *P. chilotomum* described by Dubois (1955), Dubois (1960) and Odening (1964) and concluded that this ratio is fairly similar to that of *P. chilotomum var. madagascariense*. Accordingly, it is suggested that the latter variety should be considered a synonym of *P. chilotomum*.

Gupta and Mehta (1976) described *P. mukkandi* from *Pipistrellus dormeri* in India. More recently, Blankespoor and Ulmer (1972) described *P. volaticum* from *Lasius borealis* and *Eptesicus fuscus* in U.S.A.

**MATERIAL AND METHODS**

Bats were collected from different localities in Egypt during the period from March, 1972 to May, 1975. These localities included: Old Cairo City, Abu Rawash and Sakkara in Giza Governorate, Bani Swad Governorate, Al Kharga Oasis in the Western Desert and Quena and Luxor in Upper Egypt.

The bats were indentified using two standard references by Anderson and Winton (1992) and Harrison (1964). Bats were brought alive to the laboratory, narcotized with chloroform, dissected and examined for helminth parasites. The trematodes were fixed in cold or hot 70% alcohol after relaxation. They were stained using Harris’s alum hematoxylin and Mallory triple stain (Weesner 1968) and the usual carmine stains (Gurr 1968).

Drawings were made to the scale using a camera lucida. All measurements are in millimetres.

**RESULTS**

The incidence of trematodes of the genus *Proshodendrium* in seven species of Egyptian bats is reported elsewhere (Saoud and Ramadan, in press). Four species belonging to the subgenus *Proshodendrium* are described in the present investigation. Three of these are known species which are redescribed and their specific diagnosis amended, while the fourth is a new species for which the name *P. khabili* sp.n. is suggested.
1. Prosthodendrium (Prosthodendrium) urna (Looss, 1907) Dollfus, 1931

The present description is based on twenty-six specimens collected from the small intestine of Taphozous nudiventris nudiventris, caught from Soltan Hassan Mosque in Cairo, Nycteris thebaica and Asellia tridens tridens, from Abu-Rawash.

The body is pyriform, tegument smooth without tegumental spines. The posterior end of the body may have a concavity in the region of excretory pore. The length is 0.930 - 1.479 while the width is 0.599 - 0.845 attained at the post-testicular level. The ratio between length to width is 1.2 - 1.8 : 1. The oral sucker is subterminal, round or cup-shaped and measures 0.064 - 0.094 × 0.075 - 0.126. The pharynx is globular, measuring 0.034 - 0.057 long by 0.037 - 0.057 wide. The prepharynx is absent. The oesophagus is relatively long; it measures 0.133 - 0.189 in length. The intestinal caeca are sacculated and terminate in front of the anterior margin of the testes. The ventral sucker is round in shape, it is situated 0.39 - 0.60 from anterior end and measures 0.068 - 0.091 in length and 0.060 - 0.102 in width. The ratio between oral sucker/ventral sucker is variable, being 0.92 - 1.2 : 1. The two testes are symmetrical, slightly round to oval in shape with smooth outline, and situated on both sides of the body at the level of the ventral sucker. The right testis measures 0.132 - 0.225 long and 0.124 - 0.241 wide. The left testis measures 0.113 - 0.225 long and 0.128 - 0.253 wide. The ovary is spherical or oval in shape and lies laterally on the left side of the postacetabular region. A part of it may be overlapped with left testis; it measures 0.113 - 0.235 long by 0.128 - 0.253 wide. The cirrus pouch is large in size, irregularly round in shape, situated below the intestinal bifurcation, completely or partly overlapping the acetabulum and measures 0.189 - 0.310 long and 0.162 - 0.239 wide. The genital pore is post-acetabular and lies at different levels between the ventral sucker and the intestinal bifurcation; it measures 0.038 - 0.064 in diameter. The vitellaria are paraeial; they consist of grapelike bunches of follicles, extending from the posterior border of testes to the region of the intestinal bifurcation. The numbers of vitelline follicles are 9 - 20 and 10 - 22 on the right and left sides respectively. The uterus occupies most of the posterior half of body; it is densely coiled and formed of ascending and descending coils. The eggs are long oval in shape an average 0.021 - 0.023 by 0.008 - 0.011.

Prosthodendrium urna was originally described by Looss (1907) from Pipistrellus kuhli in Egypt. Pande (1935) described P. urna loossi from Pipistrellus javanicus in India. However, DuBois (1955) did not find enough grounds to distinguish that subspecies from Looss' species and accordingly suggested that P. urna loossi Pande, 1935 should be considered a synonym of P. urna (Looss, 1907).

Macy et al (1961) recorded P. urna in Rhinolophus euryale euryale, Taphozous perforatus, Rhinolophus euryale acrotis, Pipistrellus sp. and Rhinolophus blasii in some localities of Egypt and Yemen. Hejneman and Macy (1962) reported the same species from Taphozous perforatus. Rhinolophus euryale euryale and Pipistrellus kuhli in Egypt. Groschaft and Tenora (1971) described a related species, Prosthodendrium brachypus from Megaderma lyra in Afghanistan. In Table 1, a comparison is given of the previous and present descriptions of P. urna and that of P. brachypus.

It is clear from the above tables that the description of P. urna in the present investigation has widened the range of variations which are found in the measurements of the various organs of that trematode. It is also evident that the measurements of P. brachypus urna lie within the same range of variation observed in P. urna. Groschaft and Tenora (1971) separated P. brachypus urna from P. urna on the basis of the position of ovary and cirrus pouch together with the presence of a concavity in the region of the excretory pore. However, it has been found during the present study that the position of the ovary and cirrus pouch may exhibit a reasonable range of variation within the same species. The presence of a concavity in the region of the excretory pore has been occasionally recorded in the present redescription of P. urna. Moreover, P. urna was previously recorded from India (Pande 1935). Accordingly, the present writers suggest that P. brachypus urna Groschaft et Tenora, 1971 should be considered a synonym of P. urna (Looss, 1907).

The present redescription of P. urna from Nycteris thebaica and Asellia t. tridens represents the first host record of that trematode in these two hosts.
In the light of the present description of *P. urna*, the specific diagnosis is amended as follows:

Body pyriform. Length 0.500—1.479, width 0.300—0.845. Ratio of length/width 1.06—1.8:1. Oral sucker 0.060—0.094 x 0.070—0.126. Pharynx 0.030—0.044 x 0.033—0.057. Prepharynx absent. Oesophagus 0.095—0.159. Ventral sucker 0.040—0.076 x 0.055—0.102. Ratio of oral sucker/ventral sucker 0.92—1.4:1. Ventral sucker situated at 0.39—0.60 from the anterior end of the body. Right testis 0.109—0.241 x 0.124—0.241. Left testis 0.113—0.236 x 0.128—0.253. Ovary 0.095—0.211 x 0.102—0.225 situated laterally in the postacetabular region. Cirrus pouch 0.117—0.310 x 0.161—0.239. Vitellaria 7—22 on each side. Genital pore preacetabular; 0.038—0.094 in diameter. Eggs 0.021—0.026 long x 0.008—0.013 wide. Hosts: *Pipistrellus kuhlii*, *Pipistrellus javanicus*, *Megaderma lyra*, *Rhinolophus eiuicus* brachygnathus, *R. c. acroto*, *Rhinolophus blasii*, *Taphozous perforatus*, *T. n. mulivertris*, *Nycteris thebaica* and *Asellia t. tridens*.

**Location**: Small intestine. **Distribution**: Egypt, Yemen, India and Afghanistan.

### Table 1. A comparison of *P. urna* and *P. brachyurna*

<table>
<thead>
<tr>
<th>Characters</th>
<th><em>P. urna</em> (Looss, 1907)</th>
<th><em>P. urna</em> (Present material)</th>
<th><em>P. brachyurna</em> Groschaft et Tenora, 1971</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Body shape</strong></td>
<td>Pyriform</td>
<td>Pyriform</td>
<td>Pyriform</td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td>0.500—0.550</td>
<td>0.930—1.479</td>
<td>0.730</td>
</tr>
<tr>
<td><strong>Width</strong></td>
<td>0.300—0.330</td>
<td>0.599—0.845</td>
<td>0.686</td>
</tr>
<tr>
<td><strong>Length/Width</strong></td>
<td>1.6:1</td>
<td>1.2—1.8:1</td>
<td>1.06:1</td>
</tr>
<tr>
<td><strong>Oesophagus</strong></td>
<td>Double of the pharynx length</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pharynx</strong></td>
<td>0.030—0.033</td>
<td>0.034—0.057</td>
<td>0.044</td>
</tr>
<tr>
<td><strong>Ventral sucker</strong></td>
<td>0.040—0.050 &lt;i&gt;x&lt;/i&gt;</td>
<td>0.068—0.091 &lt;i&gt;x&lt;/i&gt;</td>
<td>0.076—0.095</td>
</tr>
<tr>
<td><strong>Oral sucker/Ventral sucker</strong></td>
<td>1.4:1</td>
<td>0.92—1.2:1</td>
<td>1.2:1 (or same size)</td>
</tr>
<tr>
<td><strong>Cirrus pouch</strong></td>
<td>Situated below intestinal bifurcation partly or completely overlapped by acetabulum.</td>
<td>0.124—0.310 &lt;i&gt;x&lt;/i&gt; 0.162—0.239</td>
<td>Precetabular Same level of ventral sucker</td>
</tr>
<tr>
<td><strong>Genital pore Testes</strong></td>
<td>Anterior border at the level of ventral sucker lies at 42/100.</td>
<td>Preacetabular</td>
<td>Post acetabulum</td>
</tr>
<tr>
<td><strong>Ovary</strong></td>
<td>Medial</td>
<td>0.132—0.225 &lt;i&gt;x&lt;/i&gt;</td>
<td>0.109—0.117</td>
</tr>
<tr>
<td><strong>Vitellaria</strong></td>
<td>Extend from anterior border of testes up to the intestinal bifurcation.</td>
<td>0.124—0.241</td>
<td>0.119—0.131</td>
</tr>
<tr>
<td><strong>Eggs</strong></td>
<td>0.024—0.026 length</td>
<td>0.021—0.023 &lt;i&gt;x&lt;/i&gt;</td>
<td>0.023—0.013</td>
</tr>
</tbody>
</table>
2. Prosthodendrium (Prosthodendrium) longiforme (Bhalerao, 1926) Dollfus, 1937

Fig. 2

The following description is based on thirty four specimens collected from the small intestine of Taphozous n. nudiventris, Rhinopoma hardwickei eutopos and Asellia tridens tridens, collected from Soltan Hassan and Soltan Barkouky Mosques in Cairo and the environs of Giza Pyramids.

The body is elongate with rounded extremities. The tegument is smooth, without tegumental spines. It measures 0.986 –1.704 long by 0.458 –0.775 wide. The length/width ratio is 1.70—2.60 : 1. The oral sucker is subterminal, most frequently longer than wide, and measures 0.225—0.352 long by 0.197—0.352 wide. The pharynx is oval or round in shape and measures 0.064—0.127 long by 0.079—0.172 wide. The oesophagus is absent in most specimens but few worms have a very short oesophagus, measuring 0.034—0.042 in length. The intestinal caeca are short, sacculated in shape, terminating always in front of the anterior margin of the testes, but in few specimens they end a short distance from the testes. The ventral sucker is round in shape, always smaller than the oral sucker and measures 0.197—0.239 long by 0.148—0.239 wide. The oral sucker/ventral sucker ratio is 1.09—1.63 : 1. The ventral sucker is situated at 0.465—0.865 from the anterior end of the body. The testes are symmetrical, lying at the same level in the acetabular region. They are oval or round in shape, with smooth or slightly irregular outline. The right testis measures 0.183—0.282 long by 0.092—0.268 wide, and the left testis measures 0.162—0.317 long by 0.141—0.246 wide. The cirrus pouch has an irregular oval shape; it lies between the ventral sucker and intestinal bifurcation and measures 0.106—0.169 long by 0.148—0.268 wide. The genital pore is round in shape, preacetabular, and measures 0.032 in diameter. The ovary is round or slightly oval in shape, lies mostly between the ventral sucker and left testis or between ventral sucker and right testis. In few specimens, the ovary lies posterior to the ventral sucker but more commonly it lies lateral to it. The ovary measures 0.106—0.261 long by 0.113—0.204 wide. The vitellaria lie anteriorly on both sides of the body and consist of 8—26 glands on the right side and 9—20 on the left side. The vitellaria may extend anteriorly to reach the level of the pharynx or the posterior half of oral sucker. The uterus occupies the posterior half of the body. The eggs are oval in shape, large in size and measure 0.025—0.037 by 0.011—0.019.

P. longiforme (Bhalerao, 1926) was originally described as Lecithodendrium longiforme from Tadarida plicata in Burma. Dollfus (1937) transferred that species to the genus Prosthodendrium. Pandé (1935) described P. longiforme altahabadi and P. bhaleraoi from Scatophilus kuhli in India, but Dubois (1955) considered these two forms as synonyms of P. longiforme. Rohde (1963) reported the same species of trematodes from Cheirodore torquatus in Malaya.

Húrková (1963) reported P. longiforme for the first time in Europe from Rhinolophus ferrumequinum in Czechoslovakia. Later, the same species of trematodes was reported by Mátíšká (1967) from Myotis daubentoni, M. oxygnathus, M. dasycneme and Rhinolophus ferrumequinum in Hungary, Andreiko and Skvortsov (1968) from Myotis daubentoni and Plecotus auritus in U.S.S.R., Zdizitowiecki (1969) from bats in Poland. Recently, Grochańska and Tenora (1971) discovered the same species from Eptesicus serotinus, Taphozous nudiventris and Megaderma lyra from Afghanistan.

The present description of P. longiforme represents the first record of that trematode in Egypt. This record extends the distribution of that species of trematodes to the African Continent.

P. longiforme can be easily separated from P. pyramidum (Looss, 1896) — which is also found in Egypt — in the measurements of oral sucker and oesophagus, the caeca being perpendicular to the oesophagus and ending half way between the two suckers and in having the ventral sucker and testes of almost the same diameter. The shape of the body, length of oesophagus and arrangement of vitellaria also differentiate P. longiforme from P. urna.

In the light of the present description of P. longiforme, its specific diagnosis is amended as follows:

Body elongate. Maximum length 0.811—3.510. Maximum width 0.35—1.47. Length/width ratio 1.5—2.9 : 1; oral sucker 0.191—0.405×0.162—0.362. Pharynx 0.05—0.130×0.054—0.102.
Fig. 1. Prosthodondrium urna, Fig. 2. P. longiforme, Fig. 3. P. parvouterus, Fig. 4. P. khalili sp. n. Ventral views.
Oesophagus 0.034—0.097 long. Ventral sucker 0.126—0.320×0.13—0.405. Oral sucker/ventral sucker ratio 1.09—1.63 : 1. Right testis 0.100—0.320×0.087—0.420. Left testis 0.100—0.450×0.080—0.292. Ovary 0.07—0.240×0.063—0.270. Vitellaria variable from 6—36 glands on each side. Cirrus pouch 0.080—0.296×0.117—0.268. Genital pore preacetabular; 0.032 in diameter. Eggs 0.025—0.037×0.011—0.021.

Hosts: Todarida plicata, Myiatis dawentoni, M. oxygnathus, M. dasychene, Rhinolophus ferrumequinnus, Plecotus auritus, Nycteris noctula, Epitesicus serotinus, P. pipistrellus kuhli, Nyctinomus pictus, Scotophilus temmincki, Cheiromeles torquatus, Taphozous n. nudicentrus, Megaderma lyra, Rhinopoma hardwickei cystops and Ascella t. trident.


3. Prosthodendrium (Prosthodendrium) parvouterus (Bhalerao, 1926) Dubois, 1955 (Fig. 3)

The following description is based on twenty eight specimens collected from the small intestine of Taphozous nudicentrus nudicentrus from Soltan Hassan Mosque, Rhinopoma hardwickei cystops from Jebel Al-Ahmar and Ascella tridentis tridentis from Soltan Barkouky Mosque in Cairo, Bani-Swail and Al-Kharga and Otonycster hispinitid from Sakkara, Giza.

The body shape is round or widely oval. The tegument is smooth without tegumental spines. The body length measures 0.570—1.620, the body width 0.423—2.154. The ratio of length/width is 0.79—1.34 : 1. The oral sucker is round in shape, subterminal, measuring 0.075—0.162 long by 0.087—0.190 wide. The pharynx is round in shape and measures 0.032—0.085 long by 0.037—0.085 wide. The prepharynx is absent. The oesophagus is variable in length; some specimens have no distinct oesophagus and others have a short oesophagus that measures 0.037—0.113 long. The intestinal caeca extend laterally to the anterior border of the testes. They may be thin or circular in shape. The ventral sucker is round in shape, measures 0.051—0.211 long by 0.055—0.218 wide and lies 0.324—0.739 from anterior extremity. The testes are oval in shape with a smooth outline, situated para-acetabularly. The right testis measures 0.102—0.359 long by 0.130—0.577 wide. The left measures 0.119—0.366 long by 0.164—0.683 wide. The cirrus pouch is irregularly round or oval, preacetabular, lying immediately below the intestinal bifurcation. It measures 0.104—0.423 long by 0.119—0.493 wide. The genital pore is preacetabular in position and measures 0.037—0.092 in diameter. The ovary is oval or oblong in shape, lies on the right or left side and at the same level with the ventral sucker, or slightly anterior to it. It measures 0.111—0.542 by 0.094—0.225. The vitellaria are protostegian, composed of 30—45 follicles on each side. The uterus fills the posterior half of body; the uterine loops are mostly transverse, reaching up to the posterior margin of testes. The eggs are yellowish in colour and oval in shape, measuring 0.015—0.032 by 0.008—0.015.

Prosthodendrium parvouterus (Bhalerao, 1926) has been originally discovered in Todarida plicata in Burma. Mödlinger (1930) reported the same species from Miniopterus schreibersii in Hungary. Yeh (1957) recorded it from a bat (neither genus nor species specified) in Northern Rhodesia (Zambia). The same species was described from bats by Rohde (1963) in Malaya, Húrková (1963) in Czechoslovakia, Poland, Hungary, India and Morocco, (cited from Húrková, 1963), Odening (1968) in Vietnam and Groschaft and Tenora (1971) in Afghanistan. The present description of P. parvouterus represents the first record of that species from Egypt. This extends the known distribution of that species into the north-eastern parts of the African continent.

P. parvouterus can be distinguished from P. urna and P. pyramidum by the body length/width ratio, intestinal caeca and the relative length of oesophagus and pharynx. From P. cordiforme (Braun, 1900) it can be separated by size of eggs, position of ventral sucker and number of vitelline glands.

The specific diagnosis of P. parvouterus should be amended as follows:

Body length 0.360—1.620. Body width 0.300—2.154. Oral sucker 0.050—0.173×0.087—0.190. Pharynx 0.032—0.085×0.037—0.085. Oesophagus 0.037—0.113 long, being absent in
some specimens. Ventral sucker 0.048—0.211 × 0.055—0.218. Suckers ratio 0.66—1.81 : 1 and ventral sucker lies between 42—53/100 from the body length. Right testis 0.080—0.365 × 0.102—0.387. Left testis 0.060—0.366 × 0.104—0.663. Ovary 0.073—0.542 × 0.058—0.233. Cirrus pouch 0.066—0.423 × 0.100—0.493. Genital pore 0.037—0.092 in diameter. Vitellaria 20—56 follicles on each side. Eggs 0.015—0.032 × 0.008—0.018.


4. Prosthodendrium (Prosthodendrium) khalili sp. n. (Fig. 4)

The present description is based on thirty seven specimens collected from the small intestine of *Taphozous nudiventris nudiventris* caught from Soltan Hassan Mosque at Cairo and also from *Asellia t. trident* captured from Qena. The new species is named in the honour of the late Dr. M. Khalil, for his distinguished contributions to parasitology in Egypt.

The body is fairly round or long oval in shape. The tegument is smooth and is completely devoid of any armature. It measures 0.542—1.021 long by 0.338—0.901 wide. The length/width ratio is 0.96—1.95 : 1. The oral sucker is round and slightly subterminal, measuring 0.109—0.151 long by 0.113—0.170 wide. The pharynx is seen immediately behind the oral sucker, which is oval in shape and measures 0.034—0.057 long by 0.040—0.053 wide. In most specimens the vitellaria cover the pharynx and thus it may mask that structure.

The oesophagus is completely absent. The intestinal caeca diverge laterally from the posterior border of the pharynx and terminate anterior to the testes. The ventral sucker is fairly round in shape; it is always smaller than the oral sucker and measures 0.075—0.094 long by 0.066—0.094 wide. It lies at 0.296—0.408 from the anterior extremity. The ratio of oral sucker/ventral sucker is 1.4—2 : 1.

The testes are irregularly round or slightly oval bodies situated immediately behind the intestinal caeca. They lie at the same level with the ventral sucker. The right testis measures 0.094—0.225 long by 0.091—0.282 wide, the left testis measures 0.109—0.254 long by 0.075—0.310 wide. The cirrus pouch is oval or irregularly rounded in shape, it lies between intestinal bifurcation and ventral sucker and measures 0.037—0.127 long by 0.053—0.170 wide. The genital pore measures 0.026—0.034 by 0.026—0.042. The vitellaria consist of numerous packed follicles lying dorsally at the anterior part of the body, occupying the area from the anterior border of the testes to the middle of the oral sucker and forming a continuous transverse band. The two vitelline ducts unite immediately posterior to the ventral sucker and the common vitelline duct then opens into the ootype. The uterus occupies most of the posterior part of the area behind the testes. The eggs are oval in shape, yellow or brown in colour and measure 0.015—0.026 by 0.009—0.015. There is a V-shaped excretory bladder that leads into an excretory pore situated at the posterior extremity of the body.

*Prosthodendrium khalili* sp. n. differs from all the known species of the subgenus *Prosthodendrium* by the distribution and topography of the vitellaria, being in the form of a continuous transverse band extending from the anterior extremity of the body to the anterior border of the testes. Moreover, it can be easily separated from other related species such as *P. ascidia* (Van Beneden, 1873) by the large measurements of body and oral sucker, absence of oesophagus, and the topography of the ventral sucker. It can be differentiated from *P. parvulifer* by the ratio of oral sucker/ventral sucker and the size of eggs as well as the arrangement of vitellaria. Finally *P. khalili*

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sp.n. differs also from *P. urina* and *P. pyramidum* mainly in the body shape, length of oesophagus and the shape of intestinal caeca.

The writers believe that all these differences are sufficient to designate *P. khali*li as a new species.

**Hosts:** *Taphozous n. nudiventris*, and *Asellia t. tridens*.

**Location:** Small intestine. **Distribution:** Cairo and Quena Governorates, Egypt.

**Type:** Deposited in the Helminthological collection Department of Zoology, Ain Shams University. It is collected from *Taphozous nudiventris nudiventris* caught from Sultan Hassan Mosque on 2.10.1972.

**A KEY FOR THE IDENTIFICATION OF THE EGYPTIAN SPECIES OF THE SUBGENUS PROSTHODENDRION DOLLFUS, 1931**

Duhos (1960) presented a key for the identification of species assigned to the subgenus *Prosthodendrium*. The following key is proposed to differentiate five species so far described from Egypt.

1. Vitellaria forming a continuous band anterior to testes ........ *P. khali*li sp. n.
   —Vitellaria not forming a continuous band ............................. 2

2. Caeca lying at right angles to oesophagus, the diameters of testes and ventral sucker equal .............. *P. pyramidalum*
   —Caeca not lying at right angles to oesophagus and testes diameter larger than that of ventral sucker

3. Oesophagus length more than twice the pharynx length .... *P. urina*
   —Oesophagus length smaller than twice the pharynx length ........ *P. longiforme*

4. Ratio of length/width more than 1.5:1 ...................................... *P. parvusareus
   —Ratio of length/width less than 1.5:1 ...................................... *P. longiforme*

**ИЗУЧЕНИЕ ДИГЕНЕТИЧЕСКИХ ТРЕМАТОД РОДА PROSTHODENDRIUM DOLLFUS, 1931 ОТ НЕКОТОРЫХ ЕГИПЕТСКИХ ЛЕТУЧИХ МЫШЕЙ. 1. ТРЕМАТОДЫ ПОДРОDA PROSTHODENDRIUM DOLLFUS, 1931**

М. Ф. А. Сауд и М. М. Рамадан


**REFERENCES**


RICHARD J., Trematodes de Chirotères de Madagascar. I. Identifiation de Plagiorchis vespertilionis et description de

Symposium on the study of transcontinental connections of migratory birds and their role in distribution of arboviruses, held in Novosibirsk, July 28 — August 1, 1976

The proceedings of this meeting were undertaken as an extension of the programme of a symposium which had been organized in Novosibirsk in 1969, when representatives of 14 countries discussed the results obtained then in the research on the role of migratory birds in dissemination of arboviruses and outlined the prospects in this research problem. This particular research has been long included in the tasks of the Institute of Parasitology, Czechoslovak Academy of Sciences, where a number of relevant parasitological and virological studies were carried out as well as studies with new aspects, e.g. studies on the importance of birds in the dissemination of mycotic pathogens. Since the first symposium the research centres in various countries and continents accumulated many new data and there was a need for another discussion on the methods used and theoretical considerations as well.

The second symposium was organized again by the Biological Institute of the Siberian Branch of the USSR Academy of Sciences and by the Institute of Poliomyelitis and viral encephalitides, the USSR Academy of Medical Sciences.

The symposium included 3 basic topics:
1. regional and transcontinental migrations of birds; 2. biocenotic relationship of migratory birds and their importance in distribution of arboviruses; 3. parasites of birds — reservoirs and vectors of arboviruses.

The chosen topics were in harmony with professional lines of attending specialists in ornithology, parasitology, entomology and epidemiology. Thus, a favourable working atmosphere was created in which the presented papers could be discussed from all aspects.

The symposium was attended by 168 specialists from 20 countries: 4 from Finland, 3 from Poland, 2 from Czechoslovakia and Switzerland respectively, and 1 from each country — Canada, Denmark, Egypt, England, France, Greece, Holland, Indonesia, Iran, Iraq, Japan, Nigeria, Norway, Sweden and USA. The organizing country, the USSR, was represented by 142 participants.

During the sessions at the Novosibirsk "Academic village" 40 papers were delivered in full text. About 90 additional papers appeared in the form of abstracts in a volume published in Russian and English. This volume served as a basis for lively discussions which continued during a 2-day boat trip on the river Ob. The goal of this excursion were the biotopes where the staff members of the Biological Institute of the Siberian Branch of the USSR Academy of Sciences carry out their field studies, but the working programme of the symposium, in the form of lectures and discussions, continued on board ship, in the cinema room.

The results achieved in Czechoslovak research centres were presented in 2 papers. The paper of B. Rosický and M. Daniel (Institute of Parasitology, Czechoslovak Academy of Sciences) was concerned with the problem of tick importation by migratory birds and with the question of their possible involvement in the life of new biocenoses. Č. Folk (Institute of Vertebrate Zoology, Czechoslovak Academy of Sciences) read a paper on the possible transmission of arboviruses by birds in Central Europe.

The materials submitted at the symposium