SOME REMARKS ON THE NEOTROPICAL SPECIES OF THE GENERA PARAPHARYNGODON AND BATRACHOLANDROS (OXYURIDAE)

V. BARUŠ

Institute of Parasitology, Czechoslovak Academy of Sciences, Prague

Abstract. Tropidurus albemarlensis has been identified as a new host of the species Parapharyngodon scleratus. Measurements and figures based on the material from the new host are presented. A survey of hosts and the distribution of neotropical species of the genera Parapharyngodon and Batracholandros, as well as a key to their determination are given. Morphological studies of the species P. bassii based on the material from the typical host have shown that this taxon has characters both of the genus Parapharyngodon (lateral alae) and of Batracholandros (number of caudal papillae and their topography). An analogous phenomenon is mentioned in the species Thelandros salamandrace and T. magnavulvaris.

Studies on the helminth fauna of the animals from the Galapagos archipelago have so far been scant. Helminth fauna of the reptiles from this area is dealt with by Cuckler (1938) who found and described 1 new genus and 5 nematode species from Galapagos land iguana (Conolophus subcristatus). The helminth fauna of the Galapagos tortoise (Testudo sp.) is discussed in a paper by Walton (1942). We are indebted to Prof. Dr. I. Eibl-Eibesfeldt and Dr. P. Kramer, Director of the Charles Darwin Research Station on the Santa Cruz Island (Indefatigable), for kindly providing us with a smaller collection of nematodes from hosts of the species Tropidurus albemarlensis which had died in the vicinity of the Station in December 1970 and January 1971. This host has not yet been examined for helminth parasites. The present paper deals with the systematic evaluation of the obtained material, represented by the species of the genus Parapharyngodon, and a survey of the related species in the neotropical region.

Parapharyngodon scleratus (Travassos, 1923)

Host: Tropidurus albemarlensis (fam. Iguanidae). Location: large intestine.

Among the total of 4 specimens examined this species was found in three hosts (2—5 nematodes per one host). The material comprised 2 ♂♂, 5 ♀♀ and 2 larvae.

The available literary data prove that this species is largely distributed in Brazil. Travassos (1923) published the original description of P. scleratus from the hosts Tropidurus torquatus and Tropidurus sp. and assigned it to the genus Thelandros Weil, 1862. Later on, this species was found by Pereira (1935) in T. torquatus and Tapinurus scutipunctatus. Freitas (1957) newly erected a specific genus Parapharyngodon Chatterji,
1933 in which he placed also *P. sceleratus*. The subsequent findings of Alho and Rodrigues (1963), Rodrigues and Pinto (1967) and Rodrigues (1970) show that, apart from the hosts of the family Iguanidae, *P. sceleratus* parasitizes also *Hemidactylus mabouia* (fam. Gekkonidae) and *Ameiva ameiva* (fam. Teiidae). The finding of the new

host *T. albemarlensis* gives evidence on the South American origin of this faunistic element. Our material is in full morphological conformity with the data of the above-quoted authors. Therefore the comparative table (Table 1) shows the measurements only.
Table 1. Measurements (in mm) of males and females of the species *Parapharyngodon sceleratus* (Travassos, 1923) consistent with the data of different authors

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hosts</strong></td>
<td><em>Tropidurus</em></td>
<td><em>Ameiva ameiva</em></td>
<td><em>Hemidactylus</em></td>
<td><em>Tropidurus</em></td>
</tr>
<tr>
<td></td>
<td><em>torquatus</em></td>
<td></td>
<td><em>mabouia</em></td>
<td><em>albemarlensis</em></td>
</tr>
<tr>
<td></td>
<td><em>Tapirus</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>scutipunctatus</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Males</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body length</td>
<td>2.30—2.70</td>
<td>2.44</td>
<td>1.35—3.30</td>
<td>1.75—3.19</td>
</tr>
<tr>
<td>Maximum width</td>
<td>0.27—0.38</td>
<td>0.40</td>
<td>0.23—0.34</td>
<td>0.20—0.48</td>
</tr>
<tr>
<td>Oesophagus length</td>
<td>0.32—0.34</td>
<td>0.63</td>
<td>0.35—0.51</td>
<td>0.29—0.51</td>
</tr>
<tr>
<td>Nerve ganglion</td>
<td>—</td>
<td>0.17</td>
<td>0.10—0.14</td>
<td>0.11—0.16</td>
</tr>
<tr>
<td>Excretory pore</td>
<td>0.64—0.84</td>
<td>—</td>
<td>1.05—1.24</td>
<td>0.39—0.80</td>
</tr>
<tr>
<td>Tail length</td>
<td>0.066</td>
<td>0.098</td>
<td>0.049—0.082</td>
<td>0.073—0.11</td>
</tr>
<tr>
<td>Distance</td>
<td>—</td>
<td>—</td>
<td>0.026—0.036</td>
<td>0.021—0.029</td>
</tr>
<tr>
<td>tail—cloaca</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spicule length</td>
<td>0.095—0.103</td>
<td>0.097</td>
<td>0.099—0.097</td>
<td>0.080—0.109</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum width</td>
<td>0.65—1.00</td>
<td>0.98</td>
<td>0.64—0.75</td>
<td>0.82—0.98</td>
</tr>
<tr>
<td>Oesophagus length</td>
<td>0.87—1.20</td>
<td>1.36</td>
<td>1.15</td>
<td>0.95—1.45</td>
</tr>
<tr>
<td>Nerve ganglion</td>
<td>—</td>
<td>0.25</td>
<td>0.15—0.18</td>
<td>0.14—0.18</td>
</tr>
<tr>
<td>Excretory pore</td>
<td>1.63—1.74</td>
<td>2.80</td>
<td>0.77</td>
<td>—</td>
</tr>
<tr>
<td>Vulva from anterior</td>
<td>0.65—0.76</td>
<td>5.93</td>
<td>3.40—3.74</td>
<td>3.58</td>
</tr>
<tr>
<td><a href="#">from excretory pore</a></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anus</td>
<td>0.28—0.32</td>
<td>—</td>
<td>0.35—0.37</td>
<td>0.31—0.39</td>
</tr>
<tr>
<td>Tail length</td>
<td>0.19—0.21</td>
<td>0.21</td>
<td>0.140—0.168</td>
<td>0.11—0.18</td>
</tr>
<tr>
<td>Eggs</td>
<td>0.082 × 0.045</td>
<td>0.126 × 0.054</td>
<td>0.072—0.079 × 0.036</td>
<td>0.077—0.083 × 0.043—0.047</td>
</tr>
</tbody>
</table>

**Neotropical Species of The Genera Parapharyngodon and Batracholandros**

Originally, the nematode species discussed below were placed in the genus *Thelandros* Weid., 1862 while the genus *Parapharyngodon* Chatterji, 1933 was placed in synonymy with the above-quoted genus (Walton 1941; 1942). Only when Lucke (1952) had proved that the type of the genus *Thelandros* (species *T. alatus* Weid., 1862) had no lateral alae, Read, Amrein and Walton (1952) erected the genus *Pseudothelandros* for those nematode species whose males possess lateral alae. Freitas (1957) proved that for the species with lateral alae belonging to the genus *Thelandros* the genus *Parapharyngodon* had been established by Chatterji as early as in 1933. Freitas therefore placed the genus *Pseudothelandros* in synonymy with *Parapharyngodon*. Both the genus *The-
landros and Parapharyngodon have a worldwide distribution and most of their definitive hosts belong to the class Reptilia (mainly Sauria). Only a small number of species parasitize the hosts of the class Amphibia (Walton 1941; Freitas 1957).

The genus Batracholandros, erected by Freitas and Ibáñez (1965) for the species previously listed to the genus Thelandros and parasitizing frogs (Freitas 1962; Freitas and Ibáñez 1962), has so far been reported from neotropical region only. The genus Batracholandros differs from Parapharyngodon in the absence of lateral alae, from Thelandros in the shape of the eggs, in the location and number of caudal papillae (it has no precloacal ones), in the presence of only one odd papilla on the tail (most species of the genus Thelandros bear 2 papillae on the tail), and, finally, in the absence of the peri-oesophageal ring formed by ovaria in the species of the genus Thelandros.

At present, altogether 7 species of the genus Parapharyngodon are known from neotropical region; 6 of them parasitize hosts of the families Iguanidae, Gekkonidae, and Teiidae (Reptilia) and only one species parasitizes the families Hylidae and Bufonidae (Amphibia). In the genus Batracholandros only 2 species are known parasitizing frogs of the families Hylidae and Bufonidae. A list of the neotropical species of the two genera with a survey of their definitive hosts and their geographical distribution is given below:

Genus: Parapharyngodon

1. P. sceleratus (Travassos, 1923)  
   Tropidurus torquatus  
   Tropidurus sp.  
   Tapinurus scutipunctatus  
   Hemidactylus mabouia  
   Ameiva ameiva  
   Tropidurus albemarlensis  
   Mabuya maculata  
   Diploglossus lessonae  
   Hemidactylus mabouia  
   Ameiva ameiva  
   Liolaemus lenzi  
   Anolis carolinensis porcatus  
   A. homolechis  
   A. sagrei bremeri  
   Leiocephalus cubensis gigas  
   Ameiva auberi  
   Hyla insulsa  
   Bufo emplusus  

Genus: Batracholandros

1. B. oswaldocruzi (Travassos, 1925)  
   Hyla mesophaea  
   Brazil

2. B. spectatus (Freitas et Ibáñez, 1962)  
   Bufo spinulosus limensis  
   Peru

Neotropical species of the genus Parapharyngodon reported from hosts of the class Reptilia are very closely related in their morphology and measurements. We consider the subspecies P. senisfaciecaudus cubensis described by Baruš and Coy Otero (1969) to be an independent species because the features that distinguish it from the remaining species of this genus are evidently of specific value. In reference to the shell structure of the eggs the above-mentioned species of the genus Parapharyngodon may be divided into two groups: P. sceleratus and P. cubensis have eggs with a dotted surface, whereas P. alvarengai, P. largitor, P. senisfaciecaudus, and P. verrucosus have eggs with a smooth
surface. Except *P. sceletus*, which bears 9 caudal papillae, all the remaining species parasitizing Reptilia have only 6-7 caudal papillae. Other features suitable for the differentiation of the species are the length of spicules, the size of eggs, differences in the topography of caudal papillae and in the length of lateral alae.

The species *P. bassii* takes a special position in the genus *Parapharyngodon*. Originally it had been assigned to the genus *Thelandros* by Walton (1940), later on to *Parathelandros* Baylis, 1930 by Skryabin et al. (1960). Baruš and Moravec (1967) transferred this species to the genus *Parapharyngodon*. The study of the morphology

**Fig. 2.** *Parapharyngodon bassii* (Walton, 1940) from the host *Hyla insulsa*. A — anterior part of male body (ventral view); B — posterior part of male body (ventral view); C, D — posterior part of male body (lateral view); E — posterior part of male body (ventral view). Orig.
of *P. bassii* recovered from the typical host *Hyla insulsa* (= *H. septentrionalis*) revealed that the males had characteristic lateral alae which justified the accommodation of this taxon in the genus *Parapharyngodon*. Other morphological features, however, demonstrate its evident affinity to the species of the genus *Batracholandros*. Thus e.g. the coils of ovaries do not form the perioesophageal ring typical of *P. bassii* (Fig. 2); there are 5 caudal papillae, 1 pair of which is situated paraloacally, 1 pair postcloacally; only one duplex papilla is present on the tail (Fig. 3). In young males of the species

---

*Fig. 3. Parapharyngodon bassii* (Walton, 1940) from the host *Hyla insulsa*. A, B, C — anterior part of female body (variability of the location of ovary coils). Orig.

*P. bassii* the duplex papilla on the tail is not distinctly developed, but at this stage it has the form of a single papilla (an analogy to the adult species of the genus *Batracholandros*). In the original description of *P. bassii*, Walton (1940) also mentions the presence of another pair of papillae near the cloaca (situated postcloacally). Although we observed in some specimens two small cuticular convexities in this region, it was not possible to consider these formations as papillae. The eggs of this shape have a dotted to striated shell. In measurements our material corresponds with the original description by Walton (1940) and the redescriptions published by Baruš and Moravec (1967).
Consequently, the species under consideration undoubtedly stands between the genera *Parapharyngodon* and *Batracholandros*. It would not seem to be appropriate to erect the category of genus for this taxon at present, because the main feature, i.e. the presence of lateral alæ in males, lists it explicitly to the genus *Parapharyngodon*.

It is necessary to add that also the North American species of the genus *Theilandros*, namely *T. salamandrae* Schad, 1960 and *T. magnavulvaris* (Rankin, 1937) parasitizing salamanders of the genera *Aneides*, *Batrachoseps*, *Ensatinia*, *Dienyctylus*, *Desmognatus*, and *Plethodon*, have only one duplex papilla on the tail (Schad 1960, 1963). The other species of the genus *Theilandros*, parasitizing reptiles, bear 2 single papillae on the tail. Though on the basis of further morphological features number and topography of the other caudal papillae and the shape of eggs *T. salamandrae* and *T. magnavulvaris* belong to the genus *Theilandros*, among the other species of this genus these two are obviously the most closely related to the genus *Batracholandros*.

Original descriptions of the species of the genera *Parapharyngodon* and *Batracholandros* from neotropical region, known heretofore, are included in different papers. For easier orientation we are enclosing a key to determination.

**KEY TO THE NEOTROPICAL SPECIES OF THE GENUS PARAPHARYNGODON**

1. Mature eggs with a smooth shell ........................................ 2
   - Mature eggs with dotted to striated shell ...................... 5
2. Six caudal papillae in males (3 pairs; odd postcloacal papilla absent) ........................................ P. alvarengai Freitas, 1957
   - Seven caudal papillae (3 pairs; one odd postcloacal papilla present) ........................................ 3
3. The first and second pair of caudal papillae situated at different levels (the first precloacally, the second parcloacally) ........................................ 4
   - The first and second pair of caudal papillae situated in one transverse line (both parcloacally); the length of spicule 0.054—0.072 mm ........................................ P. largitor Alho et Rodrigues, 1963
4. Length of spicule 0.088—0.10 mm; length of eggs 0.113—0.122 mm ........................................ P. senisfacieaudus Freitas, 1957
   - Length of spicule 0.055—0.060 mm; length of eggs 0.078—0.082 mm ........................................ P. verrucosus Freitas et Dobbin, 1959
5. Nine caudal papillae (4 pairs and 1 odd papilla); length of spicule 0.080—0.103 mm ........................................ P. sceleratus (Travassos, 1923)
   - Seven or less caudal papillae ........................................ 6
6. Seven caudal papillae in males (3 pairs and 1 odd papilla); length of spicule 0.077—0.080 mm ........................................ P. cubensis (Baruś et Coy Otero, 1969)
   - Five caudal papillae in males (2 pairs and 1 duplex papilla on the tail); length of spicule 0.045—0.065 mm ........................................ P. bassii (Walton, 1940)

**KEY TO THE SPECIES OF THE GENUS BATRACHOLANDROS**

- Lenght of spicule 0.030—0.040 mm; size of eggs 0.126—0.140 × 0.057—0.067 mm ........................................ B. spectatus (Freitas et Ibáñez, 1962)
- Length of spicule 0.052—0.056 mm; size of eggs 0.153—0.159 × 0.067—0.073 mm ........................................ B. oswaldocruzi (Travassos, 1925)
НЕКОТОРЫЕ ПРИМЕЧАНИЯ К НЕОТРОПИЧЕСКИМ ВИДАМ РОДОВ PARAPHARYNGODON И BATRACHOLANDROS (OXYURIDAE)

В. Барум

Резюме. Tropidurus albemariensis установлен в качестве нового хозяина нематоды вида Parapharyngodon sceleratus. Приведены размеры и рисунки материала от нового хозяина. Эти данные позволили расширить определение неотропических видов, входящих в состав родов Parapharyngodon и Batracholands, а также их определитель. Морфологическое изучение вида P. bassii на основании материала от типичного хозяина показало, что этот таксон имеет характерные признаки как рода Parapharyngodon (латеральные крылья), так рода Batracholands (число каудальных сечений и их топография). Аналогичное явление упоминается у видов Thelandros salamandrae и T. magnavulvaris.

REFERENCES

—, —, MORAVEC P., Systematic studies of parasitic worms, found in the hosts Lepisosteus tristichus (Ginglymod, Lepisosteidae) and Hyla insulsa (Scaphiotos, Hylidae) from Cuba. Věstník Čs. spol. zool. 31: 1—14, 1967.
TRAVASSOS L., Informacões sobre a fauna helmintológica de Mato Grosso. Folha Méd. 4: 58, 1923.
Notes on *Mehdiella microstoma* (Drasche, 1884) from *Testudo hermanni* Gmelin, 1788

In a nematode collection from the host *Testudo hermanni* from Albania (the hosts were captured during the Czechoslovak parasitological expedition to Albania in 1958 and the material provided by courtesy of Professor B. Ryšavý, DSc.), we found also the species *Mehdiella microstoma*. According to data in the literature, this helminth species is distributed mainly in the Palearctic region (Petter A. J., Mém. Mus. National Hist. Nat. 39: 1–252, 1966); its definitive hosts are members of the genus *Testudo* (*T. graeca graeca, T. graeca iberica, T. horsfieldii* and *T. hermanni*). The finding of *M. microstoma* in *T. hermanni* has been reported by Petter only (1966) from Roumania.

This author (Petter A. J., Ann. parasit. 30: 648–671, 1961) pointed out several interesting morphological signs of this taxon, which is, in fact the typus genericus of the genus *Mehdiella* Seurat, 1918. These are, particularly, differences in the topography of the lips of the males and females. In the male, the lips are arranged in a typical triangle (as in most oxyurids), in the females the division of the ventro-lateral lips is indistinct and the lips are situated at one level opposite the dorsal lip. Viewed sideways it appears that only two lips are present on the cephalic end of this species. An exceptional feature is the length of the female’s oesophagus occupying approximately one third of its overall