

New species of Genus *Diplotriaeana* Railliet and Henry, 1909 (Filariidae: Nematoda) from *Passer domesticus* Linnaeus and *P. pyrrhonotus* Blyth (Passeridae: Passeriformes) in Jamshoro, Sindh, Pakistan

Jamshoro, Sindh, Pakistan'da *Diplotriaeana* Railliet ve Henry, 1909 Cinsinin, *Passer domesticus* Linnaeus ve *passer Pyrrhonotus* Blyth (Passeridae: Passeriformes) Yeni Türleri

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ABSTRACT

Objective: The present study was conducted to examine the filarial nematodes of house sparrow [*Passer domesticus* (Linnaeus, 1758)] and Sindh sparrow (*P. pyrrhonotus* Blyth, 1844) from Jamshoro, Sindh, Pakistan.

Methods: Twenty-three house sparrows and 12 Sindh sparrows were examined for nematode parasites. A total of seven birds were found infected by 16 filarial worms belonging to the genus *Diplotriaeana* Railliet and Henry, 1909. Birds were dissected and parasites were processed through the standard method of temporary slide mounting. Live worms were found embedded in the lungs of the host.

Result: The present specimens were known to be new to science. It is the first record of species of both domestic and Sindh sparrows in Pakistan. The prevalence and male–female ratio of the present species were conducted.

Conclusion: The present species was named as *Diplotriaeana passerii*. This name is given to new nematode species on the name of its type host. It was compared with previously known species of the genus *Diplotriaeana* on the basis of their diagnostic characteristics. (*Türkiye Parazitol Derg* 2015; 39: 265-9)

Keywords: *Diplotriaeana*, species novum, *Passer domesticus*, *Passer pyrrhonotus*, Pakistan

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ÖZ

Amaç: Bu çalışma Jamshoro, Sindh, Pakistan'daki ev serçesi [*Passer domesticus* (Linnaeus, 1758)] ve Sindh serçesindeki [*P. Pyrrhonotus* (Blyth, 1844)] filarial nematodları incelemek için yapılmıştır.

Yöntemler: 23 ev serçesi ve 12 Sindh serçesi nematod parazitleri açısından incelendiler. Toplam 7 kuşun, *Diplotriaeana* Railliet ve Henry, 1909 cinsine ait 16 filarioid kurtçuğundan enfekte olduğu belirlendi. Kuşlar diseke edildiler ve parazitler standart geçici lam montaj yöntemi ile değerlendirildiler. Canlı kurtçukların konağın akciğerlerinde yerleşmiş oldukları görüldü.

Bulgular: İncelenen türlerin bilim için yeni olduğu bilinmektedir. Bu, Pakistan'daki ev ve Sindh serçeleri cinslerinin ilk kayıdır. Bu cinslerin prevalansı ve erkek-dişi oranı değerlendirilmiştir.

Sonuç: Yeni belirlenen tür *Diplotriaeana passerii* olarak adlandırılmıştır. Tanısal özelliklerine dayanarak, *Diplotriaeana* cinsinin önceden bilinen türleriyle karşılaştırılmıştır. (*Türkiye Parazitol Derg* 2015; 39: 265-9)

Anahtar Kelimeler: *Diplotriaeana*, yeni türler, *Passer domesticus*, *Passer pyrrhonotus*, Pakistan

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INTRODUCTION

House sparrow (*Passer domesticus* Linnaeus, 1758) and Sindh sparrow (*P. pyrrhonotus* Blyth, 1844) (Passeridae: Passeriformes) are non-migratory birds in Sindh. Both species of sparrows are very similar in appearance (1, 2) and are abundant worldwide, except in Antarctica. These sparrows consume a wide variety of arthropods, including beetles, caterpillars, butterflies, moths, grasshoppers, and spiders. They also feed on flowers, grass, weeds, and seeds. Both the sparrows can be significant agricultural pests as well as beneficial to humans, particularly by eating insect pests. These sparrows are closely associated with permanent human habitations, including farmyards, villages, parks, suburban areas, and city centers (3, 4).

The genus *Diplotrriaena* Railliet and Henry, 1909 has been reported by more than 60 species from different birds worldwide (5, 6, 7, 8, 9). From Pakistan, *D. nocti* was recorded from Rosy Starling *Sturnus roseus*, Bank Myna *Acridotheres ginginianus*, and *D. streptopelia* was reported from Laughing Dove *Streptopelia senegalensis* (10, 11).

The present species of the genus *Diplotrriaena* was collected from *P. domesticus* and *P. pyrrhonotus* in Sindh region, Pakistan. Although it was reported from *P. domesticus*, but the species was not described (5); thus, the present species was referred to be new to science. In the present study, the male and female ratio of parasites in both host birds and their prevalence were conducted (Table 1), the new species of *Diplotrriaena* has been compared with its closest allies (Table 2).

METHODS

A total of 23 birds of *P. domesticus* and twelve birds of *P. pyrrhonotus* were collected from Jamshoro, Sindh Province, Pakistan, and were dissected for their nematodes. Amongst these, 13 *P. domesticus* and 5 *P. pyrrhonotus* were found infected by eleven and five filarial worms of genus *Diplotrriaena* respectively (Table 1). Worms embedded in the lungs, trachea, and body cavity of the hosts were removed using a soft brush. Live specimens were killed in hot 70% ethanol and preserved in alcoholic glycerol solution. Photographs were taken using NIKON-P7000 digital camera. Measurements were obtained in millimeter and measurements of eggs in micrometer. Type specimens were deposited in APL-DZUSJ (Advanced Parasitology Laboratory, Department of Zoology, University of Sindh, Jamshoro), Pakistan.



Figure 1. *Diplotrriaena passeri* sp. n. female anterior portion

Table 1. Male and female ratio and collection of *Diplotrriaena passeri* n. sp. from Sindh, Pakistan.

Host Species	No. of hosts examined	No. of hosts infected	No. of nematodes collected			Prevalence (%) of parasitic infection	Ratio of male and female of <i>D. passeri</i> n. sp.
			Male	Female	Total		
<i>P. domesticus</i> (house sparrow)	23	13	4	7	11	56.52	0.57:1
<i>P. pyrrhonotus</i> (Sindh sparrow)	12	5	1	4	5	41.66	0.25:1
Total	35	18	5	11	16	51.42	0.45:1

Table 2. List of comparative Morpho-taxonomic characters with measurements of different species of genus *Diplotriaeana* from different hosts.

Species of genus <i>Diplotriaeana</i>	<i>D. passerii</i> n. sp. (Chandio, Dharejo, Naz and Khan, 2015)	<i>Diplotriaeana</i> sp. Borji and Razmyar, (2011)	<i>Diplotriaeana</i> sp. (Moazeni and Razavi, 2002)	<i>D. nagpurensis</i> Karve, 1934 (Gupta and, Johri 1988)	<i>D. streptopelia</i> Bilqees and Jehan, 1977	<i>D. thomasi</i> Henri and Sibert, 1944
Type Host and Type Locality	* <i>P. pyrhoneotus</i> and <i>P. domesticus</i> Pakistan	<i>Acridotheres tristis</i> Iran	<i>P. domesticus</i> Iran	<i>Acridotheres tristis</i> Lucknow, India	<i>Streptopelia senegalensis</i> Pakistan	<i>Zonotrichia albicollis</i> Illinois, USA
Entire Body Size (mm)						
Male	4.2–4.96×0.16–0.2	Not given	35–40×0.686	30.81–45.56×0.50–0.61	29.9–30.79×0.50–0.55	43×0.63
Female	15.8–17.6×0.28–0.32	10–15×0.75–0.80	58–80×0.979	135.60×0.35	76.0–77.67×0.7	112–0.84
Entire Esophagus Size (mm)						
Male	0.504–1.306×0.018–0.246	Not given	Not given	6.38–8.84	6.71	Not given
Female	0.578–1.93×0.023–0.144	Not given	Not given	11.76	Not given	Not given
Tridents Length (mm)						
Male	0.122–0.26	Not given	Not given	0.08–0.14	Not given	0.067
Female	0.123–0.183	0.145–0.155	Not given	0.10	0.11–0.12	0.054
Spicules Shape	Unequal and Dissimilar	Not given	Unequal and Dissimilar	Unequal and Dissimilar	Unequal and Dissimilar	Unequal and Dissimilar
Spicules Size (mm)						
Left Spicules	0.33–1.47	Not given	0.795	2.32–2.87	2.86	0.89
Right Spicules	0.26–0.61		0.553	0.52–0.64	0.64	0.67
Spicular Sheath	Smooth	Not given	Not given	Not given	Not given	Denticulate lateral edges of Left Spicule
Vulva Size (mm)	0.298–0.476	Not given	0.504	0.76	0.27–0.29	0.67
Eggs Size (µm)	472–948×17–425	50×25	35×50	41–60×35–41	40–60×29–30	47–57×35–39

*Host type of the present studied species of *Diplotriaeana* T: Trident, v: Vulval opening.

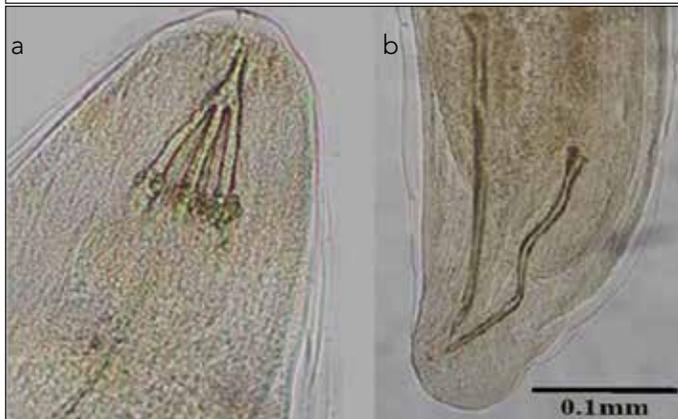


Figure 2. *Diplotriaeana passerii* sp. n. a. Trident of male; b. Spicules in male posterior end.

RESULTS

***Diplotriaeana passerii* n. sp. (Fig. 1-5; Table 1-2)**

Species Type: *Diplotriaeana passerii* n. sp.

Host Type: *P. pyrhoneotus* Blyth, 1844; it is also collected from *P. domesticus* Linnaeus, 1758.

Locality Type: Jamshoro, Sindh, Pakistan.

Taxonomic Status:

Family: Filariidae Claus, 1885

Subfamily: Diplotriaeinae Skrjabin, 1916

Genus: *Diplotriaeana* Railliet and Henry, 1909

Male (Fig. 1-2): Body is 4.2-4.96 mm in length and 0.16-0.2 mm in width and esophagus is 0.504-1.306 mm in length and 0.018-0.246 mm in width; length of nerve ring from the anterior end is 0.172-0.33 mm and that of tridents (Fig. 2a) is 0.122-0.258 mm. Spicules (Fig. 2b) are unequal in length and dissimilar in shape. Left spicule is larger than the right spicule. Left spicule is 0.33-1.47 mm and right spicule is 0.26-0.61 mm in length. Distal end of both spicules is tipped with translucent expansion and caudal papillae absent.

Female (Fig. 3-5): Body is 15.8-17.6 mm in length and 0.28-0.32 mm in width and esophagus is 0.578-1.927 mm in length and 0.023-0.144 mm in width. Length of nerve ring from the anterior end is 0.172-0.33 mm, Tridents (Fig. 3) is 0.123-0.183 mm, vulva is 0.298-0.476 mm. Well-embryonated eggs (Fig. 5) measure 29-193µm long and 18-222µm wide.

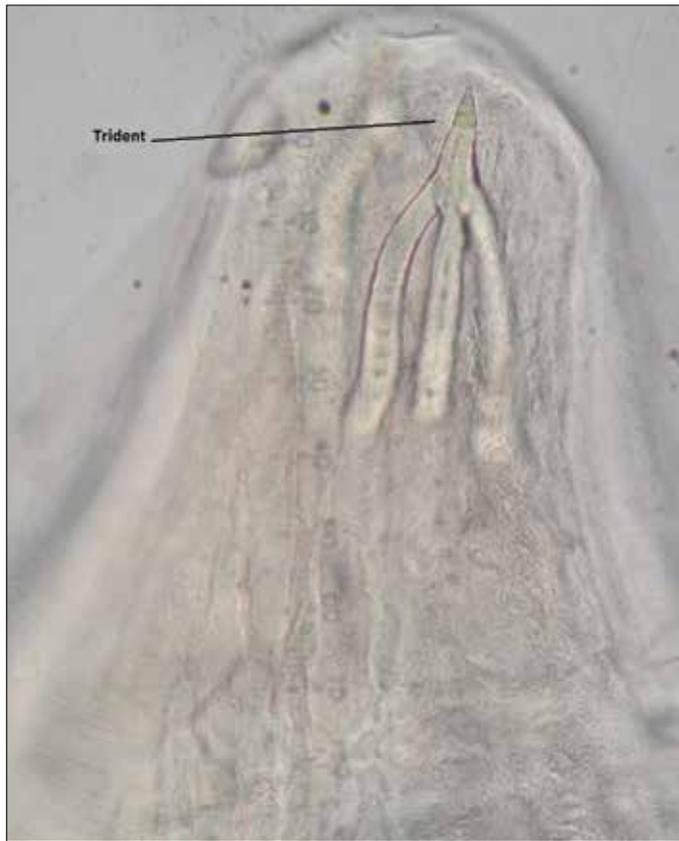


Figure 3. Female anterior portion showing trident.



Figure 4. Female posterior portion

Etymology: The present species of genus *Diplotrriaena* was given its name based on its host species, *P. pyrrhonotus*.

DISCUSSION

The present species referred to genus *Diplotrriaena* Railliet and Henry, 1909 are nematodes parasitizing the air sacs, lungs, tracheae, and body cavity of *P. domesticus* (domestic sparrow) and *P. pyrrhonotus* (Sindh sparrow) from Sindh, Pakistan.

Different species of this genus have been reported from the diverse species of Passeriformes, Psittaciformes, Anseriformes, and Falconiformes (12, 13, 14).



Figure 5. *Diplotrriaena passerii* eggs

This present specimens further differ from other species of the genus *Diplotrriaena* reported from different localities in various hosts with regard to the body length of males and females, length of tridents at the anterior end, spicular sheath, spicules, and vulva as well as eggs size (Table 2). On the basis of the aforementioned diagnostic characteristics, the present specimens are identified as new species in genus *Diplotrriaena*, and *D. passerii* n. sp. name has been suggested as a generic name for its host.

CONCLUSION

During the present work, *Diplotrriaena passerii* sp.n. is collected from the two species of Old World Sparrows *P. domesticus* and *P. pyrrhonotus* of the family Passeridae with their prevalence rates and male and female specimen ratio (in parenthesis) being 56.52% (0.57:1) and 41.66% (0.25:1), respectively (Table 1). Both the host species were reported as new host records for this genus from Pakistan, hence the species of genus *Diplotrriaena* has been given the name of host genus as *D. passerii*.

Ethics Committee Approval: Ethics committee approval has been received.

Informed Consent: This study informed consent was for Sindh University.

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