A Compendium of the Genus Mononchoides Rahm, 1928 (Diplogastrinae: Nematoda)[1]

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Abstract: The diplogasterid genus *Mononchoides* Rahm, 1928 (syn: *Eudiplogaster* Paramonov, 1952) is reviewed. Examination of the descriptions of nominal species and synonyms indicates that generic characters are stave-like anterior stomal rhabdions, a claw-like dorsal tooth and subventral pyramidal tooth, and a cylindrical or prismatic telostom which is somewhat smaller in diameter than the protostom region. An amended generic description, a key to 18 species, and a table of diagnostic data is given. *Mononchoides rhabdoderma* (Völk, 1950) n. comb. and *M. subamericanus* (van der Linde, 1938) n. comb. are proposed. *Diplogaster fictor* Bastian, 1865 is regarded as *species indeterminata* while *D. trichiuroides* Schneider, 1937 is placed in *species inquirendae*. The differences between *Mononchoides* and five closely related genera of the Diplogastrinae are outlined. *Key Words:* Diplogastridae, taxonomy, classification, key.

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The first description of a species of *Diplogaster* with a distinct two-part stoma and with the posterior portion of the stoma being more narrow and prismatic or cylindrical in shape than the anterior portion was by Bütschli, 1876 (5) who described *Diplogaster striatus*. Rahm, 1928 (20) described a nematode of similar structure which he named *Mononchoides longicauda*. However, he did not regard this nematode as a *Diplogaster* since he could not distinguish a posterior esophageal bulb and because he observed a duct leading ventrally from the end of the metacorpus which he was able to distinguish. No one has subsequently recorded the existence of such a duct in the Nematoda and examination of photographs in Rahm's article (21) raises question about the validity of his observations.

Filipjev, 1934 (8) and Chitwood and

Chitwood, 1937 (6) classified Rahm's species in the subfamily Diplogastrinae. Goodey, 1963 (11) regarded *Diplogaster striatus* Bütschli, 1876 as the type species of the genus *Mononchoides* but did not give reasons for synonymizing *M. longicauda* with *D. striatus*. Thus, the type species of *Mononchoides* is *M. longicauda* by monotypy. The necessity for the use of *M. longicauda* as the type species is unfortunate since structure of the stoma in this genus is more complex than was described by Rahm. Nevertheless, it would be unwise to change the type species since its type location is well specified and the description sufficient to identify the species when it is again recovered.

Because of the general complexity of the stoma within the *Diplogastridae* and because of Rahm's failure to completely describe *M. longicauda*, some species of Diplogastrinae have been placed in genera which are or may be synonymous with *Mononchoides*. The most significant of these is *Eudiplogaster* Paramonov, 1952 (18). Goodey, 1963 (11) was correct in synonymizing *Eudiplogaster* with *Mononchoides*.

Paramonov, 1952 placed *Mononchoides* in the subfamily Odontopharingidae Micoletzky, 1922 while he placed *Eudiplogaster striatus* (Bütschli, 1876) in the Diplogastrinae (Diplogastridae). His exclusion of *Mononchoides* from the Diplogastrinae, to which it had been assigned by Filipjev, 1934 (8), Chitwood and Chitwood, 1937 (6) and Goodey, 1951 (10), was made without explanation.

Weingärtner, 1955 (28) reviewed the genus *Diplogaster* and recognized *Eudiplogaster* Paramonov, but as a subgenus characterized by rib-like or stave-like reinforcements of the anterior wall of the stoma. These ribs are arranged radially around the oral aperture. Since Weingärtner did not amend the description for *Eudiplogaster*, the species assigned should conform to Paramonov's characterization of the genus. However, inspection of Weingärtner's figures show that the buccal capsules of some species in the subgenus deviate from the essential feature for the genus which Paramonov regarded as being a large, wide telostom with parallel walls. Andrássy, 1958 (1), in describing eudiplogasters of Hungary, employed Weingärtner's loose concept of the genus and thus, included some species of nematodes which properly belong in other genera. Meyl, 1961 (17) listed under *Eudiplogaster* all specific names which had been given by Paramonov, Weingärtner and Andrássy, as well as other species which he felt belonged to the genus.

Goodey, 1963 (11) listed 17 genera in the Diplogastrinae instead of the three listed by his father (10) and synonymized *Eudiplogaster* Paramonov, 1952 to *Mononchoides* Rahm, 1928. His definition of *Mononchoides* deviated from that by Paramonov. However, Goodey did not indicate that his was an amended description. Rahm did not give a characterization of the genus *Mononchoides*. Despite this, J. B. Goodey (11) synonymized *Mononchoides longicauda* to *Diplogaster striatus* which, in our opinion, was inadvisable and is rejected.

The characterization of *Eudiplogaster* Paramonov, 1952, a synonym of *Mononchoides* Rahm, 1928, is the only available valid diagnosis of the genus *Mononchoides*. Since Paramonov's description is not considered adequate, an emended description follows which is based on personal observations and on original descriptions and illustrations of species of *Mononchoides* and *Eudiplogaster* listed by Paramonov (18), Weingärtner (28), Meyl (17) and others.

SYSTEMATICS

Genus *Mononchoides* Rahm, 1928

Syn: *Diplogaster (Eudiplogaster)* Weingärtner, 1955 (in part), *Eudiplogaster* Paramonov, 1952 (in part) and *Eudiplogaster* Meyl, 1961 (in part).

DESCRIPTION EMENDED: Diplogastridae, Diplogastrinae: Free-living, predatory nematodes. Anterior end tapering very slightly. Posteriorly an elongated cone usually with whip-like tail. Tail filament, where known, 1/4 to 2/3 as long as rest of body, but frequently broken off. Phasmids sometimes difficult to see in male, always large and conspicuous in female, located just posterior to middle of non-filamentous protoplasmic portion of tail.

Lips obscure; *en face* view indistinctly showing 6 lips with a bristle-like papilla in the center of each. Cuticle usually with longitudinal striae and fine annules.

Stoma occasionally showing sexual

dimorphism,[3] with 4 sets of rhabdions: the anterior cheilorhabdions rib- or stave-like and slightly curved; the second set, the pro-mesorhabdions, a cylindrical shell extending posteriad into tissue that surrounds the metastom and telostom; the third set or metarhabdions consisting of 3 parts: (1) the dorsal part, which forms a large claw-like tooth; (2) the left lateroventral, or subventral, crescent which bears a rasp-like chitinized structure; and (3) the right lateroventral, or subventral, which bears a large, lateral, pyramidal tooth.[3] Metarhabdions attached to elongated telorhabdions, the fourth set of rhabdions, that forms cylindrical "second part" of stoma, which is of smaller diameter than anterior part. Telorhabdions extending posteriad into tissue surrounding esophageal lumen.

Vulva approximately median, excluding the filamentous tail. Gonads 2, opposed, ovaries reflexed.

Males similar to females but only approximately 3/4ths as long, usually bearing 4 cephalic setae just posterior to lips[3] and with 6-11 pairs of caudal papillae. Gonad single, testis reflexed.

Diagnosis: Membership in the genus *Mononchoides* is based on the possession of 3 stomal characters (Fig. 1): (a) Stoma in 2 parts; the posterior part cylindrical or prismatic; (b) Dorsal tooth large, curved and claw-like, extending from dorsal metarhabdion. Axis of tooth (but not the point which is directed forward) lying in transverse position. Right subventral metarhabdion with large pyramidal tooth; and (c) Anterior rhabdions rib-like or stave-like.

Valid Species of *Mononchoides*[4]

Type species: *Mononchoides longicauda* Rahm, 1928

1. *Mononchoides adjunctus* Massey, 1966
2. *M. americanus* (Steiner, 1930) Chitwood and Chitwood, 1937
   Syn: *Diplogaster americanus* Steiner, 1930
   Eudiplogaster americanus (Steiner, 1930) Paramonov, 1952
   Diplogaster (Eudiplogaster) americanus Steiner, 1930 (Weingärtner, 1955)
3. *M. bollingeri* Goodrich, Hechler and Taylor, 1968
4. *M. changi* Goodrich, Hechler and Taylor, 1968
5. *M. elegans* (Weingärtner, 1955) Goodey, 1963
   Syn: *Diplogaster (Eudiplogaster) elegans* Weingärtner, 1955
   Eudiplogaster elegans (Weingärtner, 1955) Andrássy, 1958
6. *M. fortidens* (Schuurmans Stekhoven, 1951) Taylor and Hechler, 1966[5]
   Syn: *Diplogaster fortidens* Schuurmans Stekhoven, 1951
7. *M. histophorus* (Weingärtner in Körner, 1954) Goodey, 1963
   Syn: *Diplogaster (Eudiplogaster) histophorus* Weingärtner in Körner, 1954
   Eudiplogaster histophorus (Weingärtner in Körner, 1954) Andrássy, 1958
8. *M. isolae* (Meyl, 1953) Goodey, 1963
   Syn: *Diplogaster isolae* Meyl, 1953
   Eudiplogaster isolae (Meyl, 1953) Meyl, 1961
9. *M. leptospiculum* (Weingärtner, 1955) Goodey, 1963
   Syn: *Diplogaster (Eudiplogaster) leptospiculum* Weingärtner, 1955
   Eudiplogaster leptospiculum (Weingärtner, 1955) Andrássy, 1958
10. *M. longicauda* Rahm, 1928
11. *M. piracicabensis* (Rahm, 1928) Goodey, 1963
    Syn: *Odontopharynx piracicabensis* Rahm, 1928

[3] Dr. Hechler (in litt.) has found that the stoma of M. americanus displays sexual dimorphism, that the right subventral metarhabdion bears a large pyramidal tooth and that the male does not exhibit cephalic setae. The original description of the species did not give any of these details.

[4] No attempt has been made to list various species which have been synonymized to the Mononchoides listed below but only to identify those species which clearly belong to this genus.

[5] Captions to the drawings for Diplogaster fortidens and D. obscuridens were erroneously interchanged in the original paper by Schuurmans Stekhoven, as explained by Taylor and Hechler (26). The latter species accordingly was transferred back to the genus Diplogaster.

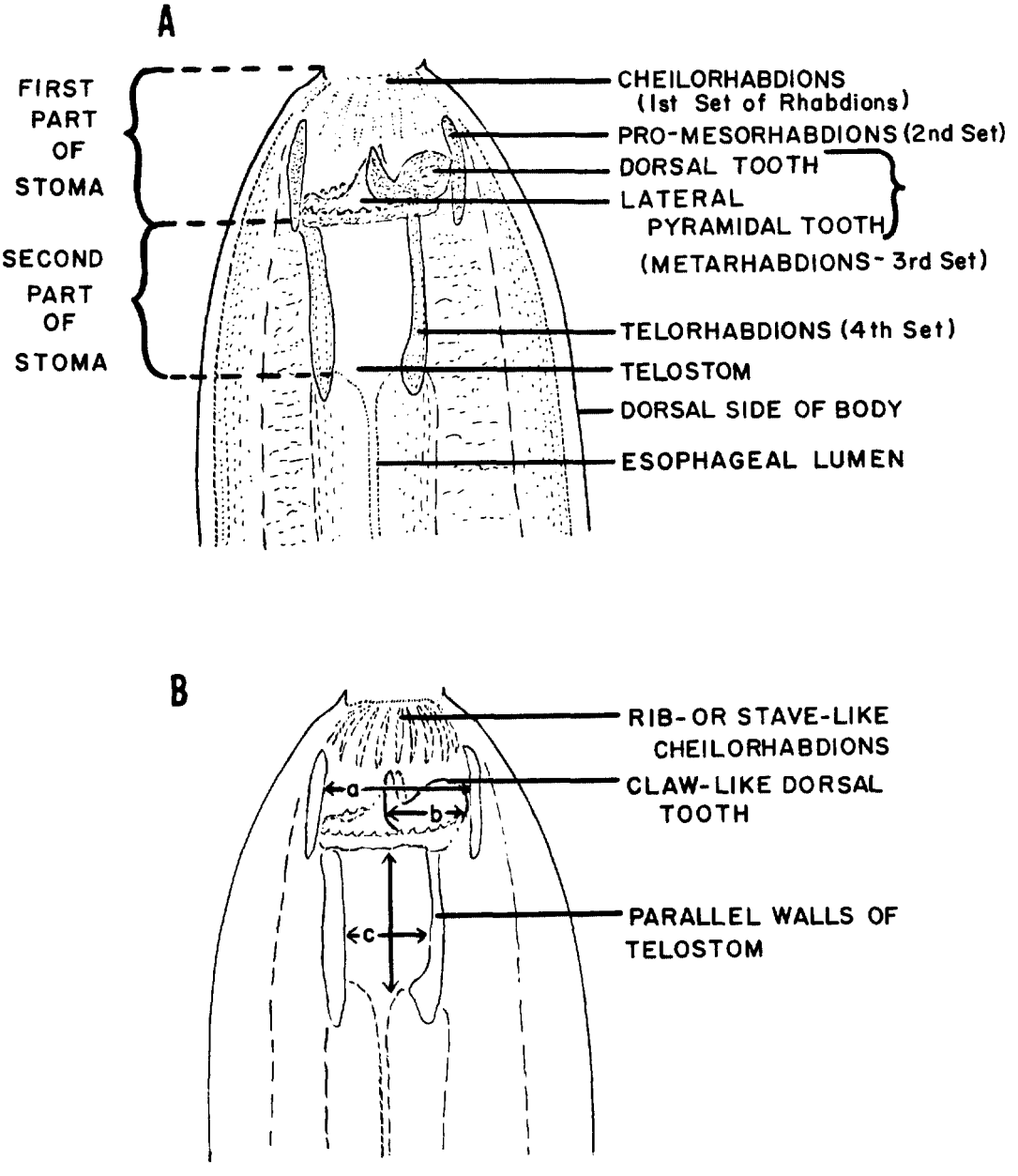

FIG. 1. Diagrammatic view of *Mononchoides* anterior end, (A) with important stomal structures identified, (B) showing those features considered significant for placement in genus. Measurements used in the accompanying keys and indicated above are: (a) width of pro-mesostom, (b) width of dorsal tooth, and (c) width and length of telostom.

Diplogaster piracicabensis (Rahm, 1928) Goodey, 1951

12. *M. pylophilus* (Weingärtner, 1955) Goodey, 1963

Syn: *Diplogaster (Eudiplogaster) pylophilus* Weingärtner, 1955
Eudiplogaster pylophilus (Weingärtner, 1955) Andrássy, 1958

13. *M. rhabdoderma* (Völk, 1950) n. comb.
    Syn: *Diplogaster rhabdoderma* Völk, 1950

14. *M. splendidus* (Körner, 1954) Goodey, 1963
    Syn: *Diplogaster (Eudiplogaster) splendidus* Körner, 1954
    Eudiplogaster splendidus (Körner, 1954) Andrássy, 1958

15. *M. striatulus* (Fuchs, 1933) Goodey, 1963
    Syn: *Diplogaster striatulus* Fuchs, 1933
    Pareudiplogaster striatulus (Fuchs, 1933) Paramonov, 1952
    Diplogaster (Eudiplogaster) striatulus Fuchs, 1933 (Weingärtner, 1955)
    Eudiplogaster striatulus (Fuchs, 1933) Meyl, 1961

16. *M. striatus* (Bütschli, 1876) Goodey, 1963
    Syn: *Diplogaster striatus* Bütschli, 1876
    Diplogaster (Eudiplogaster) striatus Bütschli, 1876 (Weingärtner, 1955)[6]
    Eudiplogaster striatus (Bütschli, 1876) Paramonov, 1952

17. *M. subamericanus* (van der Linde, 1938) n. comb.
    Syn: *Diplogaster subamericanus* van der Linde, 1938
    Prosodontus subamericanus (van der Linde, 1938) Goodey, 1963

18. *M. trichuris* (Cobb, 1893) Goodey, 1963
    Syn: *Diplogaster trichuris* Cobb, 1893.

Departures

Diplogaster sphagni Soós, 1938 (24) was successively placed in *Fictor* by Paramonov, 1952 (18), *D. (Eudiplogaster)* by Weingärtner, 1955 (28), *Eudiplogaster* by Andrássy, 1958 (1) and in *Mononchoides* by Goodey, 1963 (11). The posterior part of the stoma of this species is not cylindrical or prismatic but definitely funnel-shaped. Although the cheilorhabdial fringe depicted by Soós probably is "stave-like", the dorsal tooth is only vaguely pointed and not "claw-like". The authors feel that Paramonov's placement of this species in *Fictor* is best, on the basis of Soós's drawings.

Diplogaster fictor Bastian, 1865 (3) was placed in *Fictor* by Paramonov, 1952 (18), *Eudiplogaster* by Meyl, 1961 (17) and in *Mononchoides* by Goodey, 1963 (11). The stoma in Bastian's drawing does not show sufficient detail to justify placement in *Mononchoides*. No "stave-like" rhabdions or basal chamber of stoma are shown or described. There is no typical dorsal claw-like tooth but only 2 pyramidal teeth. The paucity of absolute data on this species necessitates its status as *species indeterminata.*

Diplogaster trichiuroides Schneider, 1937 (22) appears to have received more attention from others than the original author gave to the taxon. In fact, Schneider himself did not even refer to the species in his 260-page "Freilebenden und Pflanzenparasitische Nematoden Tierwelt Deutschlands" published just 2 years later in 1939. Nevertheless Paramonov, 1952 (18) placed the species in *Fictor*; Weingärtner, 1955 (28) returned it to *Diplogaster*, but in the subgenus *Eudiplogaster*; Goodey, 1963 (11) put it in *Mononchoides*; while Paramonov, 1964 (19) regarded it a *Eudiplogaster*. The description was based on a solitary male specimen; the female is unknown. There is no justification to seriously consider the species until it is redescribed, hence it is placed in *species inquirendae.*

Key and Diagnostic Data

A key to species can often be a valuable diagnostic tool if the divisions within it are based objectively on valid characters. Such characters are available only if the original descriptions were sufficiently precise and the drawings accompanying those descriptions were accurate and based on properly prepared specimens. In some cases topotype specimens, if correctly identified, may provide supplementary information. Regrettably, however, few keys fulfill these requirements; the key that follows is no exception.

[6] Weingärtner mistakenly cited Fuchs, 1933, instead of Bütschli, as the authority for this species.

TABLE 1. Diagnostic data on *Mononchoides* spp.

	Female											Male					
Mononchoides	Length (mm)	a	b	c	V%	Dorsal tooth width/ mesostom width Dt/Mw %	Telostom width/ telostom length Tw/Tl %	Tail length (μ)	Anal body width (μ)	Tail length/ anal body width T/ABW	Length (mm)	a	b	c	Spicule length (μ)	Gubernaculum length (μ)	No. of pairs of caudal papillae
adjunctus Massey, 1966	0.78-0.87	22.26	5.9-6.6	2.9-3.9	40-43	66	56	397	24.9	15.9	0.70	28.0	5.5	3.2	43.3	18.4	7
americanus (Steiner, 1930)	0.85-1.49	18-30	5.9-9.2	2.0-4.0	30-46	55-64	64	213-300	24-25	8.7-12.0	0.57-0.96	16-30	5.3-8.3	2.5-3.8	30-45	17-22	9-11
bollingeri Goodrich et al., 1968	2.40 (1.64-3.43)	25 (23-40)	7.1 (6.9-9.2)	2.8 (1.5-3.3)	32 (26-40)	71	46	763	26.2	29.2	1.60 (1.00-2.40)	28.8 (25-34)	6.3 (5.3-7.3)	2.6 (2.3-3.3)	38 (26-42)	17	10
changi Goodrich et al., 1968	1.35 (1.20-1.70)	22.5 (13-29)	7.6 (6.1-8.8)	2.5 (1.8-3.4)	36 (31-41)	69	56	542	25.8	21.0	1.01 (0.85-1.17)	26.2 (18-32)	6.1 (5.4-7.0)	2.8 (2.0-3.9)	48-49	28.4	8-9
elegans (Weingärtner, 1955)	1.21-1.61	32.7-37.0	7-9	2.3-2.8	51-61	74	47	552	27.5	20.1	0.88-1.15	34.0-42.5	6.6-7.8	2.2-2.6	38	18	9
fortidens (Schuurmans Stekhoven, 1951)	1.46	36.4	7.3	2.2	34	65	68	455	19.0	23.9	1.40-1.48	27-37	7	2.9-3.2	54	31	4-5
histophorus (Weingärtner in Körner, 1954)	0.63-0.95	23.4-29.5	5.1-6.2	3.9-6.6	41-45	64	138	99	27.0	3.7	0.70-1.05	22.8-28.8	4.5-6.2	3.1-4.2	37.6	9.6	10
isolae (Meyl, 1953)	1.09-1.28	31.0-31.5	6.9-7.4	1.9-2.6	30-36	64	88	530	28.0	18.9	?	?	?	?	?	?	?
leptospiculum (Weingärtner, 1955)	0.74-1.11	18.0-28.2	4.4-5.7	2.4-3.7	54-62	54	97	260	20.5	12.7	0.55-0.85	24.0-32.0	4.7-6.1	3.3-5.8	46.3	19	9
longicauda Rahm, 1928	1.35-2.52	18.0-32.0	7.0-9.0	2.8-3.7	62 (52-65)	52	48	595	20.2	29.5	1.35	21.5	6.8	3	45	23	5
piracicabensis (Rahm, 1929)	1.67-2.07	30.0-32.8	5.0-6.8	2.3-2.5	55 (48-59)	63	82	784	34	23.1	?	?	?	?	?	?	?
pylophilus (Weingärtner, 1955)	0.90-0.97	23.6-30.7	4.6-7.1	3.5-5.1	56-64	68	68	217	15.2	14.3	0.56-0.97	27.7-37.7	4.8-7.4	3.8-4.2	23.8	15	9
rhabdoderma Völk, 1950	1.15-1.28	20.2-25.0	7.1-8.8	2.3-2.9	35-39	49	36	405-451	35	12.2	0.89-1.18	21.2-27.0	7.1-8.5	2.5-3.2	43-46	19	9

TABLE 1. Diagnostic data on *Mononchoides* spp. (Continued)

Mononchoides	Female									Male					
	Length (mm)	a	b	c	V%	Dorsal tooth width/ mesostome width Dt/Mw %	Telostom width/ telostom length Tw/Tl %	Tail length (μ)	Anal body width (μ)	Tail length/ anal body width T/ABW	Length (mm)	a	b	c	Spicule length (μ)	Gubernaculum length (μ)	No. of pairs of caudal papillae
splendidus (Körner, 1954)	1.15-1.31	26.6-35.7	6.3-6.7	3.1-3.4	41-42	77	41	380	21.9	17.4	0.84-0.89	26.8-28.3	5.5-6.2	3.1-3.8	37-43	19-22	9
striatulus (Fuchs, 1933)	0.44	26.6	6.2	3.9	45-48	57	113	114	9.6	11.9	0.37-0.45	29.7-31.0	5.4-6.2	3.6-3.7	14	7-8	5
striatus (Bütschli, 1876)	1.50	?	7-8	3-4	50	53	78	375-500	?	?	1.00	?	?	?	?	?	10(11?)
subamericanus (van der Linde, 1938)	1.13	27.8	6.6	2.1	35.7	77	33	550	24.9	22.1	?	?	?	?	?	?	?
trichuris (Cobb, 1893)	1.50	32.3	8.3	1.9	28	60-70	18(?)	810	27	30	1.27	39.9	7.4	2.3	24.4	11.1	10

Key to species of *Mononchoides*[7]

1. Female body length 0.4 mm, male with 5 pairs caudal papillae and spicules 14μ long ..... *striatulus* (Fuchs, 1933)
   Female body length 0.63 mm or more, males (when known) with at least 7 pairs caudal papillae (except *M. longicauda* and *M. fortidens* which have only 5 pairs), and spicules longer than 23μ ...2
2. T/ABW = 29 or more, tail length = about 600μ or more 3
   T/ABW = 24 or less, tail length = 550μ or less (exception: *M. piracicabensis*) 5
3. Tail length about 600μ, V% = 52-65, male with 5 pairs caudal papillae..... ..... *longicauda* Rahm, 1928
   Tail length 750μ or longer, V% = 28-40, male with 10 pairs caudal papillae.....4
4. Female length 1.5 mm, spicule length = 24μ ..... *trichuris* (Cobb, 1893)
   Female length 1.6 - 3.4 mm, spicule length = 26 - 42μ .... *bollingeri* Goodrich *et al.*, 1968
5. V% = 48 or more 6
   V% = 46 or less 10
6. Female body length 1.2 mm or less, tail length 260μ or less 7
   Female body length 1.2 mm or more, tail length 375μ or more 8
7. Dt/Mw = 54%, spicule length = 46μ, Tw/Tl = 97% .... *leptospiculum* (Weingärtner, 1955)
   Dt/Mw = 68%, spicule length = 24μ, Tw/Tl = 68% ... *pylophilus* (Weingärtner, 1955)
8. "c" ratio = 3-4, Dt/Mw = 53%, tail length = 375-500μ .....*striatus* (Bütschli, 1876)
   "c" ratio = 2.3 - 2.8, Dt/Mw = 63-74%, tail length = 550-784μ 9

[7] **Table 1 is a synopsis of morphological measurements and other information of diagnostic value on species presented in the key. The table and key are based on data concerning females and males, when applicable. When specific information is not presented in the text of the original publication, it has been obtained from the accompanying drawings. When measurements were made from the same anatomical feature in more than one drawing of a species, the average of those measurements was obtained. If certain information on a species was not reported, a question mark was inserted in the table. Symbols used in the key are explained below:**

Dt/Mw% = greatest width of dorsal claw-like tooth divided by width of mesostom.

Tw/Tl% = width of telostom divided by length of telostom as measured from posterior edge of metarhabdion to beginning of lumen of procorpus at base of telostom.

T/ABW = tail length divided by width of body at anus.

9. Female length = 1.2 - 1.6 mm, Tw/Tl = 47%, tail length = 552μ ..... *elegans* (Weingärtner, 1955)
   Female length = 1.7 - 2.1 mm, Tw/Tl = 82%, tail length = 784μ ..... *piracicabensis* (Rahm, 1928)
10. Female length <0.95 mm, T/ABW = 3.7 - 15.9 11
    Female length >1.09 mm, T/ABW = 12.2 - 23.9 13
11. Tw/Tl = 138%, T/ABW = 37, male with 10 pairs caudal papillae ..... *histophorus* (Weingärtner in Körner, 1954)
    Tw/Tl = 56-70%, T/ABW = 8.7 - 15.9, males with 7 or 9-11 pairs caudal papillae ..12
12. T/ABW = 15.9, males with 7 pairs caudal papillae ..... *adjunctus* Massey, 1966
    T/ABW = 8.7 - 12.0, males with 9-11 pairs caudal papillae ..... *americanus* (Steiner, 1930)
13. T/ABW = 24, "a" ratio = 36.4, male with 4-5 pairs caudal papillae ..... *fortidens* (Schuurmans Stekhoven, 1951)
    T/ABW = 22 or less, "a" ratio = 35.7 or less, males (when known) with 8-9 pairs caudal papillae 14
14. V% = 41-42, tail length = 380μ ..... *splendidus* (Körner, 1954)
    V% <41, tail length >400μ 15
15. T/ABW = 12.2, tail length <450μ, Dt/Mw = 49% ..... *rhabdoderma* (Völk, 1950) n. comb.
    T/ABW >18, tail length >525μ, Dt/Mw = 64-77% 16
16. Female length = 1.35 (1.2 - 1.7) mm, Tw/Tl = 56%, "c" ratio = 2.5 (1.8 - 3.4) ..... *changi* Goodrich *et al.*, 1968
    Female length = 1.09 - 1.28 mm, Tw/Tl = 33 or 88%, "c" ratio = 2.1 - 2.6 17
17. Tw/Tl = 88%, "a" ratio = 31, T/ABW = 19.. ..... *isolae* (Meyl, 1953)
    Tw/Tl = 33%, "a" ratio = 28, T/ABW = 22.. *subamericanus* (van der Linde, 1938) n. comb.

MORPHOLOGICAL AND BEHAVIORAL OBSERVATIONS[8]

The rib or stave-like anterior rhabdions of the species examined are each tipped with 2 sclerotized filaments, sometimes called "bifurcations", which arise in such manner as to indicate that bifurcation is not appropriate terminology. The tip filaments could conceivably be the true cheilorhabdions. Consideration as such would obviate the difficulty in accounting for a full complement of 5 sets of rhabdions. Unfortunately, the tip filaments are extremely fine and may have escaped detection in some diagnoses of nominal species. While anterior rib-like rhabdions with "bifurcated tips" are indicated to be a characteristic of *Mononchoides* by Goodey (11) and thus illustrated by Weingärtner (28), this feature may also be found in genera close to *Mononchoides* (syn. *Eudiplogaster*).

In *Mononchoides changi*, and perhaps in other species, the amphids are obscure in lateral view but a dorso-ventral view reveals the amphidial orifice just posterior to the lips and a fine channel leading to the sensilla pouch which is situated next to the posterior portion of the stoma.

The dorsal tooth is active at the beginning of the feeding process but it has not been seen extended beyond the stomal cavity. This tooth is capable of being held in a partially rotated position in which the tooth point acts against the 2 dorsal stave-like rhabdions for grasping the prey. The tooth is usually not maintained in this position, however, and returns to the normal position as feeding progresses. Then, as before, the tooth point moves in a longitudinal and then in a ventral to dorsal arc with each pulsation of the median bulb. This action of the tooth punctures membranes drawn "balloon-like" into the buccal cavity; however, the pulsation of the median bulb is not always accompanied by the movement of the tooth.

The point of the dorsal claw-tooth and that of the large pyramidal tooth which is based on the right subventral metarhabdion extend anteriorly in such a manner that the points of the 2 large teeth are closely adjacent. In the species thus far studied, both lateroventral metarhabdions bear numerous fine toothlets on the anterior edge. This characteristic has not been mentioned in the descriptions of most species.

The rhabdions of the stoma and anterior part of the esophagus are heavily sclerotized which makes these some of the earliest features distinguishable in the larva developing within the egg. The lumen of the isthmus and posterior bulb of the esophagus are more difficult to distinguish. The cardia or esophago-intestinal valve is obscure, its presence usually suggested

[8] Made by the senior author.

by the distance between the posterior bulb and intestine. The intestine of *Mononchoides* usually appears black due to oil-like globules in the intestinal cells.

Cross sections of the body of *M. changi* resemble small "gears" or toothed wheels due to the character of the longitudinal ridges, sometimes described as "striae" or "wings". There are 40 longitudinal ridges at the approximate mid-section of *M. changi*. Extra longitudinal ridges inserted in the lip region almost double the number of cuticular ridges in the stomal region. Treatment with 5% sodium hypochlorite reduces the cuticle to a cage-like structure due to thickness of the ridges.

The occurrence of a long, thin, filamentous tail tip which is commonly 1/3 to 1/2 the entire body length has not been described for all of the species in *Mononchoides*; but Paramonov, 1952 (18) and Goodey, 1963 (11) considered it characteristic of the genus.

Males of *Mononchoides* spp. rarely feed on adult *Panagrellus* spp. but frequently feed on the spillage from the feeding of females of *Mononchoides* on adult *Panagrellus*. Males have been observed to prey upon young *Panagrellus* larvae.

Weingärtner (28) stated that related species show the greatest similarity in the position of the male caudal papillae. The existence of rudimentary bursae (caudal alae) in *Mononchoides* (syn. *Eudiplogaster*), also indicated by Weingärtner, has not been substantiated.

DISCUSSION

The Diplogastrinae are a group of somewhat poorly differentiated genera that bear some striking resemblances to one another. Frequent manipulation of species in and out of different genera has left the group in a confused state which appears evident by the absence of any generic treatments since the work of Goodey, 1963 (11). The authors believe that the present treatment of the genus *Mononchoides* will be short-lived, hopefully because it will give subsequent reviewers a starting point from which to conduct more exhaustive studies.

Five diplogasterid genera show strong similarities to *Mononchoides*. *Koerneria* Meyl, 1961 (17) differs in having a cylindrical or a funnel-shaped telostom with a small knob-shaped protuberance on the outside subventral walls. The dorsal tooth appears to be only slightly claw-like while the cheilorabdions usually are undivided forming an "entire" ring. *Prosodontus* Paramonov and Sobolev in Skrjabin, Shikhobalova, Sobolev, Paramonov and Sudarikov, 1954 has a thorn-like dorsal tooth which lacks the posteriorly directed section close to the body of the dorsal metarhabdion. The subventral metarhabdions do not bear teeth. The telostom may be tube-like or more broadly cylindrical. *Fictor* Paramonov, 1952 (18) has a telostom which is tube-like and quite unlike the telostom of *Mononchoides*. The stoma frequently exhibits knobs and other somewhat aberrant structures. *Mikoletzkya* Weingärtner, 1955 (28) possesses a cheilostom in the form of a ring of short wide pieces that are closely positioned together. The telostom, while being generally cylindrical, seems to be irregular in shape and structure. Practically all species of *Mikoletzkya* are known insect parasites or associates. *Diplenteron* Andrássy, 1964 (2) has a stoma quite similar to *Mononchoides* but the left subventral metarhabdial plate has two small teeth or points, the tail is unusually short and bluntly conical and a pre-rectum is present.

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