The present work represents a taxonomic study of the nematodes belonging to the suborder Diplogastrina of the order Rhabditida and biological study of a new species *Myctolaimus oreodoxus* sp. n. Samples rich in organic matter were collected from different parts of the country, especially from the northern and north-eastern regions (Jammu and Kashmir, Uttar Pradesh, Uttarakhand and Manipur). The samples were collected in different seasons from different types of ecosystems like, farmyard manure, chicken manure, canals, ditches, ponds, tree-holes, mountains, hills, lakes, rivers, sewage, leaf-litter, forests, etc. The samples were processed by Cobb’s sieving and decantation and modified Baermann’s funnel techniques. The extracted nematode samples were examined under stereoscopic microscope. Nematodes were simultaneously killed and fixed in hot F.G. (8 ml of 40% commercial formaldehyde + 2 ml of glycerol + 90 ml of distilled water). Nematodes were then transferred to glycerine-alcohol (5 parts: 95 parts) and were kept in a desiccators for dehydration. Dehydrated nematodes were mounted in anhydrous glycerine on glass slides using wax as sealing material. All measurements were made on specimens mounted in dehydrated glycerine with an ocular micrometer. De Man’s (1884) formula for denoting dimensions of nematode was used. Morphological observations and drawings were made on Olympus BX50 DIC microscope and photographs were made on Nikon 80i DIC microscope.

In all, twenty-three species belonging to fourteen different genera falling under seven subfamilies under five different families under two superfamilies of the suborder Diplogastrina have been described. Of these, fourteen species and one genus which are new to science and nine already known species have been described and illustrated in detail. Five of the total fourteen genera and four of nine known species have been reported for the first time from India. The terminology used in the text to describe the parts of stoma is of De Ley et al. (1995) and of other structural details of
The systematic position of genera and species described in present study are given below:

**Order:** Rhabditida

**Suborder:** Diplogastrina

**Superfamilies**

1. Diplogasteroidea
2. Cylidrocorporoidea

**Families**

1. Diplogasteroididae
2. Diplogastridae
3. Neodiplogastridae
4. Tylopharyngidae
5. Cylindrocorporidae

**Subfamilies**

1. Rhabditolaiminae
2. Diplogasteroidinae
3. Demaniellinae
4. Diplogastrinae
5. Neodiplogastrinae
6. Tylopharynginae
7. Cylindrcorporinae

**Genera**

1. *Goffartia*
2. *Rhabditidoides*
3. *Acrostichus*
4. *Butleriuss*
5. *Diplogastrellus*
6. *Pseudacrostichus*
7. *Demaniella*
8. *Fictor*
9. *Koerneria*
10. *Mononchoides*
11. *Oigolaimella*
12. *Pristionchus*
13. *Tylopharynx*
14. *Myctolaimus*

**New genus**

1. *Pseudacrostichus* gen. n.

**New Species**

1. *Goffartia baldus* sp. n.
2. *Diplogastrellus curvatus* sp. n.
3. *Diplogastrellus neograciloides* sp. n.
4. *Diplogastrellus kashmeriensis* sp. n.
5. *Diplogastrellus loktakai* sp. n.
6. *Pseudacrostichus musai* sp. n.
7. *Fictor suptilis* sp. n.
8. *Fictor longicauda* sp. n.
9. *Mononchoides tenuispicula* sp. n.
10. *Mononchoides latigubernacula* sp. n.
11. *Oigolaimella brevigubernacula* sp. n.
12. *Pristionchus stercoraris* sp. n.
13. *Myctolaimus papillatus* sp. n.

14. *Myctolaimus oreodoxus* sp. n

**Known species**

1. *Rhabditidoides papillatus*

2. *Demaniella keirakensis*

3. *Acrostichus nudicapitatus*

4. *Butlerius micans*

5. *Diplogastrellus gracilis*

6. *Koerneria filicaudata*

7. *Mononchoides striatus*

8. *Oigolaimella longicauda*

9. *Tylopharynx foetida*

**Genera reported for the first time from India**

1. *Goffartia*

2. *Acrostichus*

3. *Butlerius*

4. *Pristionchus*

5. *Tylopharynx*

**Species reported for the first time from India**

1. *Acrostichus nuducapitatus*

2. *Butlerius micans*

3. *Mononchoides striatus*

4. *Tylopharynx foetida*
Characteristic features of the species studied

1. *Goffartia baldus* sp. n.

*Goffartia baldus* sp. n. is characterized by a small slender body, large amphidial apertures and wine glass shaped fovea; a smooth round lip region without discernable labial papillae; a tubular stoma with almost equal cheilo- and gymnostoms; pharynx with a short corpus and a long post-corpus; two pairs of unicellular glands at base of vagina, large prominent phasmids; a broad keel-shaped gubernaculum with distal sleeve and nine pairs of genital papillae.

2. *Diplogastrellus curvatus* sp. n.

*Diplogastrellus curvatus* sp. n. is characterized by small body, sharp and anteriorly directed dorsal tooth supported by a small tooth, a short post-uterine sac, amphidial apertures at the base of cheilostom, arcuate and cephalated spicules with anteriorly curved distal tip, and a broad, keel-like gubernaculum proximally with a notch and a fine tip distally and nine pairs of genital papillae.

3. *Diplogastrellus neograciloides* sp. n.

*Diplogastrellus neograciloides* sp. n. is characterized by a slender body, far posteriorly located amphidial openings, a large dorsal tooth with ventrally directed apex, an elongate median bulb, post-uterine sac with remnants of gonad, stout and arcuate spicules with blunt tips, globular gubernaculum with a distal sleeve and eight pairs of small genital papillae, v4 far posterior to cloaca, v7 absent.
4. **Diplogastrellus kashmeriensis sp. n.**

*Diplogastrellus kashmeriensis* sp.n. is characterized by a small body, tubular stoma, claw-like dorsal tooth and a supporting tooth, presence of post-uterine sac; slender gubernaculum with a large sleeve and nine pairs of genital papillae.

5. **Diplogastrellus loktakai sp. n.**

*Diplogastrellus loktakai* sp. n. is characterized by small body, large dorsal tooth with ventrally directed apex, a short post-uterine sac, amphidial apertures oval, at the level of dorsal tooth, arcuate and proximally knobbed spicules, a keel-like gubernaculum proximally notched, distally with a pointed extension and nine pairs of genital papillae.

6. **Pseudacrostichus musai sp. n.**

This species is characterised by presence of strong longitudinal striations; barrel-shaped stoma, anisotopic gymnostom with slightly shorter dorsal wall than the subventrals, anisomorphic stegostom with large and sharp anteriorly pointed dorsal tooth supported by a small tooth at base, subventrals with a small tooth each; amphidelphic gonad with posterior branch shorter than the anterior one in all the specimens; set off spermatheca, inflated and separated from oviduct and uterus; slightly arcuate, cephalated spicules with proximal half broader than the distal half; a large, and well built gubernaculum with a thread-like extention proximally and gradually tapering towards the distal end and nine pairs of genital papillae.

7. **Fictor suptilis sp. n.**

This species is characterized by a small body, wide lip region, dorsal and right subventral wall of stegostom with a claw-like tooth, left subventral wall provided with serrated plate, presence of cuticular infolding anterior to
cloaca, long, ventrally arcuate setose spicules, a slender gubernaculum with an extension proximally and a sleeve distally sleeve and eight pairs of setose genital papillae.

8. *Fictor longicauda* sp. n.

It is characterised by a medium sized body, presence of several warts on the gymnostomal walls, left subventral stegostomal wall with serrated margin divisible into two plates, slender ventrally arcuate spicules, gubernaculum broad proximally and tapering distally with a proximal hook-like extension and a distal sleeve, nine pairs of genital papillae, GP v2 just below the cloaca and *pd* far posterior to GP v7 in the filiform part of the tail and long filiform tail.

9. *Mononchoides tenuispicula* sp. n.

This species is characterized by a wide tubular part of stegostom, anteriorly directed excretory duct, narrow, arcuate spicules provided proximally with rounded head and a narrow, keel-like gubernaculum with roughly pointed proximal end, narrowing distally to a fine tip provided with a sleeve.

10. *Mononchoides latigubernacula* sp. n.

*Mononchoides latigubernacula* sp. n. is characterized by a wide cheilostomal region, short and wide tubular part of stegostom, strongly curved setose spicules and a broad, keel-shaped gubernaculum with a small distal sleeve.

11. *Oigolaimella brevigubernacula* sp. n.

*Oigolaimella brevigubernacula* sp. n. is characterised by a medium-sized right claw-like dorsal tooth, a small-sized pointed right subventral tooth
and a left subventral ridge, conspicuously large spermatozoa in the female reproductive tract, keel-shaped gubernaculum with a small pointed extension distally and nine pairs genital papillae.

12. *Pristionchus stercoraris* sp. n.

This species is characterized by faint annulations on cuticle, steno- as well as eurystomatous types of stoma, thin-walled cheilostom, anisitopic and anisomorphic stegostom, a large claw-like dorsal tooth, a retrose triangular right subventral tooth, a serrated ridge on left subventral wall, long isthmus, long elongate cardia, amphidelphic female reproductive system, slender spicules with anteriorly curved distal tip, a boat-shaped gubernaculum with a medial dorsal convex; proximally with an anteriorly directed needle-like extension and distally with a sleeve, and eight pairs of genital papillae.

13. *Myctolaimus papillatus* sp. n.

*Myctolaimus papillatus* sp. n. is characterized by fine transverse and longitudinal striations, nine or ten pairs of genital papillae in males, slender and arcuate spicules, gubernaculum with distal sleeve, and a long filiform tail.

14. *Myctolaimus oreodoxus* sp. n

*Myctolaimus oreodoxus* sp. n. is characterized by a thin cuticle with longitudinal lines, ovaries with well developed sphincter muscles and long conoid female tail. Males with nine pairs of genital papillae (3 pre-cloacal and 6 post-cloacal), slender and arcuate spicules, gubernaculum with distal sleeve, narrow leptoderan bursa and a short conoid tail with small spine.

15. *Rhabditidoides papillatus*

Measurements and description of our specimens conform well with that of the original specimens described by Mahamood and Ahmad, 2009.
However, differences were found in length of stoma (13 – 15 µm vs 16 – 18 µm), slightly shorter isthmus and in position of v1 (posterior to the spicules head vs at the level of spicules head), position of v2 (almost at the level of upper cloacal lip vs always anterior to upper cloacal lip), position of ad (at the level of GP v5 or slightly anterior to it vs always anterior to v5).

16. *Demaniella keirakensis*

Measurements and description of our specimens conform well with that of the original specimens of *Demaniella keirakensis* described by Mahamood *et al.* (2006a) in general morphometrics, presence of bilobed glandular part of uterus, long and narrow oviduct, not connected with spermatheca anteriorly, opening adaxially in the glandular part of uterus, presence of a large pouch-like spermatheca, in shape of spicules and gubernaculum and number and arrangement of genital papillae. However some slight differences were observed in position of nerve ring (slightly posterior to the base of median bulb vs just below the base of median bulb), shape of female tail (only long filiform vs variable: short conoid to long filiform), shape of gubernaculum (slightly pointed proximal end vs blunt), greater $a$ value in males (31 – 39 vs 19.7 – 28.4) and in position of phasmids from anus in males (20 – 24 µm vs 17 – 19 µm).

17. *Acrostichus nudicapitatus*

The description and morphometric measurements of our specimens concur well with that of Steiner (1914). However, a slight variation was observed in the built of spicules (heavily built with blunt distal tip vs moderately built with relatively pointed distal tip).
18. *Butlerius micans*

The descriptions and morphometric measurements of our specimens concur well with that of Pillai and Taylor (1968b) in general morphometrics, presence of zipper-like structure in the lumen of procorpus, in shape of spicules and number and arrangement of genital papillae. However variations were observed in $c$ value (2.4 - 3.0 vs 3.1- 5.0), in $b$ value in males (5.0 - 5.95 vs 6.3 - 8.7), in the position of nerve ring (in the anterior half of isthmus vs at the middle of the isthmus), in the position of excretory pore (conspicuous, slightly posterior to hemizonid vs inconspicuous, at the level of beginning of basal bulb) and in the shape of gubernaculum (with a distal sleeve vs without a distal sleeve).

19. *Diplogastrellus gracilis*

Measurements and description of our specimens conform well with that of the original specimens described by (Bütschli, 1876) Paramonov, 1952. However, differences were observed in total length of the body in both the sexes (0.7 – 0.99 mm vs 1.35 – 1.39 mm in females and 0.6 – 0.8 mm vs 1 – 1.07 mm in males), smaller $V$ value (62.6 – 71.3 vs 73 – 77), smaller $a$ value in males (25.3 – 29.1 vs 36.0), smaller $b$ value in males (4.9 – 6.7 vs 8.2), smaller $c$ value in males (4.2 – 6.5 vs 7.1), presence of massive dorsal tooth with serrated anterior-ventral margin vs smaller tooth lacking serrations), bursal rudiments (absent vs present), position of $v1$ (within the spicular range when retracted vs beyond the spicular range).

20. *Koerneria filicaudata*

The measurements and descriptions of our specimens agree well with the original specimens given by Khera (1970). However, differences were
found in having slightly greater \( a \) value (36.9 – 45.6 vs 34 – 36), greater \( b \) value (6.8 – 8.2 vs 5.7 – 6.2) and slightly longer stoma (8 – 10 \( \mu m \) vs 7.5 – 8.5 \( \mu m \)). The measurements and descriptions of our specimens also conform well with that given by Mahamood and Ahmad (2010). However, slight differences were found in having greater \( a \) value (36.9 – 45.6 vs 28.8 – 35.9), greater \( b \) value (6.8 – 8.2 vs 5.6 – 6.6), shorter stoma (8 – 10 \( \mu m \) vs 11 – 13 \( \mu m \)) and shorter reflexed part of ovary.

21. *Mononchoides striatus*

The description and morphometric measurements of our specimens concur well with that of original specimens given by (Butschli, 1876) Goodey, 1963. However, a slight difference was found in length of tubular part of stegostom (longer than wide vs as long as wide).

22. *Oigolaimella longicauda*

The description and measurements of our specimens agree well with *O. longicauda* (Claus, 1862) *apud* Fürst von Lieven (2003) in the morphometric values, in the general shape of body, in number and arrangement of genital papillae and in shape of spicules and gubernaculum. However, slight differences were found in the value of \( c' \) in females (20.7 – 26.3 vs 15.2 – 19.3) and position of phasmsids from anus (26 – 27 \( \mu m \) vs 29 – 48 \( \mu m \) in females and 23 – 25 \( \mu m \) vs 36 – 39 \( \mu m \) in males) and in length of gubernaculum (10 – 11 \( \mu m \) vs 8 – 9 \( \mu m \)).

23. *Tylopharynx foetida*

There are only two species representing the genus *Tylopharynx*, namely *T. foetida* (Butschli, 1874) Goffart, 1930 and *T. clariamphida* Wu *et al.* (2001). *T. foetida* has been reported from different parts of Europe and *T. clariamphida* was collected from China. This is the first report of the genus.
Tylopharynx from India. Measurements and descriptions of our specimens agree well with that of the original specimens of *T. foetida* described by Bütschli, 1874. However, differences were found in having shorter stoma (11 – 13 μm vs 14 – 15 μm), longer tail (c = 2.7 – 3.09 vs 3.4 – 4.8), shorter anal body diam. (c′ = 18.2 – 20.4 vs 9.8 – 15), slightly smaller anterior pharynx (59 – 70 μm vs 72 – 81 μm), and in position of excretory pore (opposite to basal bulb vs opposite to isthmus).

**Biology of *Myctolaimus oreodoxus* sp. n.**

The embryonic and post-embryonic development of *Myctolaimus oreodoxus* sp. n. has also been studied in detail. The process of fertilization, egg-laying, cleavage pattern, activities of first stage juveniles within the egg, hatching, moulting and copulation were also observed and studied. The pattern of cleavage during the embryonic development of *Myctolaimus oreodoxus* sp. n. resembles with *Cylindrocorpus longistoma* described by Chin, 1977. The first division in the egg is always transverse giving rise to two unequal blastomeres. During pronuclei fusion, it has been observed that the egg pronucleus moves towards sperm pronucleus and their fusion occurs at the posterior pole of the egg. Cytoplasmic streaming was also observed in *Myctolaimus oreodoxus* sp. n leading to pseudocleavage after sperm entry. After fertilization, the point of sperm entry marked the posterior pole of the egg. *M. oreodoxus* sp. n. has a short life cycle as that of other diplogastrid nematodes. Eggs of *M. oreodoxus* sp. n. were elongated, smooth-shelled like that of *Mononchoides changi* (Hechler, 1970), *Mononchoides fortidens* (Tahseen *et al.*, 1990) and *Oscheius shamimi* (Tahseen & Nisa, 2006). The movement in the embryo for the first time was observed in tadpole stage a,
The intra-uterine development was not observed in *M. Oreodoxus* sp. n. Hatching occurred as a result of pressure on the egg shell due to growth of the embryo and also due to labial probing against egg shell. These probings were not specifically localized and no blister formation occurred.

The reproductive system in *M. oreodoxus* sp. n. was found to develop from a single obliquely oriented primordium which has also been reported for *Mononchoides fortidens* (Tahseen et al., 1990), *Diploscapter coronata* (Hechler, 1968), *D. orientalis* (Tahseen et al., 1990) and *Oscheius shamimi* (Tahseen & Nisa, 2006). In *M. oreodoxus* sp. n. it was observed that the number of germinal nuclei remains unchanged in second stage. The sexes in *M. oreodoxus* sp. n. could be differentiated from the second moult onwards, by the appearance of specialized ventral chord nuclei opposite to the genital primordium in females and by differentiated development of the genital primordium in both sexes. The juveniles could not be differentiated exclusively on morphometric values due to overlap in ranges. But growth patterns of the genital primordium were found to be good markers to differentiate different juvenile stages.