MONONCHS
The mononchs are characterised by the presence of a thick body cuticle, a strongly sclerotized buccal cavity, provided with tooth or teeth, with or without longitudinal ventral ridges. They possess a strongly muscular, long and cylindrical oesophagus with greatly thickened lumen, an elaborate, tuberculate or non-tuberculate oesohago-intestinal junction. Prerectum and pre-anal pair of supplements are completely absent. A well developed gubernaculum, caudal glands and spinneret are usually present. They live in both soil and freshwater, feeding on microorganisms, protozoans, rotifers, smaller oligochaets and other phytophagus nematodes. They either swallow the prey entirely or may only rupture their cuticle to suck their body contents. Therefore all the members of this order Mononchida are having considerable importance not only taxonomically but also biologically because of their predatory habit which can be utilized for controlling other plant parasitic nematodes by the biological control measure. So it is very essential to study on this group of nematodes. In the present study 7 genera belonging to 5 subfamilies, 3 families, 2 superfamilies, 1 suborder of the order Monochida were reported. In all 15 known species were identified of which one species was reported for the first time from India and 2 new species have been described in detail.
ORDER MONONCHIDA JAIRAJPURI, 1989
SUBORDER MONONCHINA KIRJANOVA AND KRALL, 1989
SUPERFAMILY MONONCHOIDEA CHITWOOD, 1937
FAMILY MONONCHIDAE CHITWOOD, 1937
SUBFAMILY MONONCHINAE CHITWOOD, 1937
GENUS MONONCHUS BASTIAN, 1865

**GENERIC CHARACTERS**

Body almost straight and slender with elongate to filiform tails. Lip region almost continuous with body and labial papillae poorly developed. Buccal cavity elongate-cylindroid, thin-walled, tapering at base. Dorsal tooth small, apex directed forward and situated in the anterior half of buccal cavity. Non-tuberculate type of oesophago-intestinal junction. Amphidelphic type of female reproductive system. Spicules and accessory pieces long and slender, gubernaculum simple and crescent-shaped. Tail tip rounded to clavate. Caudal glands and spinneret well developed.

Type species: *Mononchus truncatus* Bastian, 1865

**SPECIES RECORDED FROM OTHER HABITATS OF MANIPUR:**

- *M. aquaticus* Coetzee, 1968
- *M. tunbridgensis* Bastian, 1865

In the present study, only one species of this genus was found. Its measurement and locality are provided.
MONONCHUS TRUNCATUS BASTIAN, 1865
(Fig. 18)

DIMENSIONS

Females (3) : L = 1.36 - 1.56 mm (1.48 mm), a = 30 - 38 (33.9), b = 3.7 - 4.4 (4.1), c = 6 - 8 (7.0), V = 54 - 57 (55.3), G₁ = 8 - 9 (8.4), G₂ = 9 - 10 (8.9), lip width = 19 - 21 um (20.8 um), lip height = 5 - 8 um (5.1 um), buccal cavity = 32 - 33 x 14 um (33 x 14 um), dorsal tooth = 23 - 24 um (24 um) from base of stoma, nerve ring at 98 - 106 um (102 um) from anterior end, tail = 203 - 222 um (212 um).

DESCRIPTION

Females : Body straight upon fixation, tapering towards head, tail curved ventrally. Cuticle smooth, 2 um. thick at various regions of the body. Lip region continuous with body contour, its width about thrice its height. Buccal cavity 32 - 34 um. long, 14 um wide. Dorsal tooth distinctly sclerotized, medium size, situated in anterior half of buccal cavity, its apex 24 um. or 70 - 75 % of the length of buccal cavity from base. Subventral walls without any denticles but with an indentation opposite dorsal tooth apex, nerve ring at 98 - 110 um. from anterior end of body. Excretory system not observed.

Vulva transverse, with prominent cuticularisation.

Reproductive system amphidelphic. Sphincter present at
oviduct - uterus junction, ovary reflexed. Tail elongate conoid and clavate at tip, 202 - 222 um or 8 - 9 anal body widths long. Caudal glands well developed, tandem, spinneret terminal.

Male: Not found.

HABITAT AND LOCALITY

Collected from soil around the roots of banana, Musa sp. from Viewland, Ukhrul district, Manipur.

REMARKS

Mononchus truncatus is reported for the first time from India. The present specimens conform well with those described by Bastian (1865)
SUBFAMILY PRIONCHULINAE ANDRASSY, 1976
GENUS PRIONCHULUS (COBB, 1916) WU AND HOEPPLI, 1929

GENERIC CHARACTERS

Body curved ventrally, more at the posterior end. Lip region set off with prominent lips and labial papillae. Buccal cavity large and heavily sclerotized, barrel-shaped with a tapering base. Dorsal tooth stout with its apex directing forward situated in the anterior half of buccal cavity and opposed by two longitudinal denticulate ridges. Non-tuberculate type of oesophago-intestinal junction. Female reproductive system amphidelphic. Arcuate and stout spicules, simple or bidentate gubernaculum, accessory pieces present or absent. Tail short, conoid and ventrally arcuate, caudal glands absent or very poorly developed, spinneret absent.

Type species; Prionchulus muscorum (Dujardin, 1845) Wu and Hoeppli, 1929.

SPECIES RECORDED FROM OTHER HABITATS OF MANIPUR:

E. muscorum Wu and Hoeppli, 1929

The specimen of the genus Prionchulus are rare in this state. In the present work only a few specimens of Prionchulus muscorum were recorded from Tamenglong district.
PRIONCHULUS MUSCORUM (DUJARDIN, 1845) WU AND HOEPPLI, 1929

DIMENSIONS

Females (6) : L = 1.84 - 2.24 mm (2.02 mm), a = 31 - 32 (31.5), b = 4 - 4.4 (4.2), c = 17 - 18 (17.7), c' = 2.6 - 2.8 (2.7), V = 64 - 69 (66), G₁ = 11 - 15 (12), G₂ = 9 - 15 (12), lip width = 32 - 37 um (34 um), lip height = 10 - 13 um (11 um), buccal cavity = 34 - 42 X 21 - 24 um (37 X 21 um), dorsal tooth = 29 - 32 um (30 um) from base of stoma, subventral walls bear two longitudinal denticulate ridges. Nerve ring at 138 - 163 um (157 um) from anterior end of body. Excretory system well developed, comprising an excretory pore, ampulla, excretory duct and the renettes. Reproductive system amphidelphic. Sphincter weakly developed at oviduct - uterus junction. Uterine eggs measuring 102.4 X 59.2 um, with smooth shell. Rectum measuring 32 - 40 um (38 um) long. Tail conoid, arouate ventrally, 100 - 131 um (121 um) long. Caudal glands and terminal opening absent.

Male : Not found.

HABITAT AND LOCALITY

Detected from soil around the roots of banana, Musa sp. from Maram, Tamenglong district, Manipur.

REMARKS

The present specimens agree well with the dimensions and descriptions given by Jairajpuri (1970).
GENUS CLARKUS JAIRAJPURI, 1970

GENERIC CHARACTERS.

Body curved ventrally and more at the posterior end. Lip region set off and labial papillae prominent. Buccal cavity barrel-shaped, provided with non-denticulate ventral ridge. Dorsal tooth with its apex directing forward situated in the anterior half of buccal cavity. Non-tuberculate type of oesophago-intestinal junction. Amphidelphic type of female reproductive system. Short and stout spicules and lateral accessory pieces, gubernaculum simple and crescent-shaped. Tail ventrally arcuate, short and conoid, caudal glands absent or poorly developed, spinneret absent or inconspicuous.

Type species: Clarkus papillatus (Bastian, 1885) Jairajpuri, 1970.

SPECIES RECORDED FROM OTHER HABITATS OF MANIPUR:

Clarkus sheri (Mulvey, 1987) Jairajpuri, 1970
Clarkus elongatus Jairajpuri and Khan, 1977

In the present study, two species of the genus were recorded. The two known species were Clarkus sheri and Clarkus elongatus. Measurements and localities are provided.
CLARKUS SHERI (MULVEY, 1967) JAIRAJPURI, 1970

DIMENSIONS

Females (24) : $L = 1.85 - 2.12$ mm ($1.67$ mm), $a = 30 - 36$ (33), $b = 3.9 - 4.7$ (4.2), $c = 17 - 18$ (17.3), $c' = 2.2 - 3.1$ (2.45), $V = 60 - 82$ (61), $G_1 = 12 - 13$ (12.3), $G_2 = 10 - 12$ (11.3), lip width = $32 - 35$ μm (33.5 μm), lip height = $9 - 10$ μm (9.3 μm), buccal cavity = $36 - 40$ X $17 - 18$ μm (37.5 X 17.3 μm), dorsal tooth = $27 - 28$ μm (27 μm) from base of stoma, subventral walls with non-denticulate ridge. Nerve ring at 131 - 153 μm (142 μm) from anterior end of body. Reproductive system amphidelphic. Sphincter at oviduct-uterus junction poorly developed. Rectum = $35 - 36$ μm (36 μm) long. Tail conoid, ventrally arcuate, 100 - 117 μm (110 μm) long. Caudal glands absent.

Male : Not found.

HABITAT AND LOCALITIES


REMARKS

The present specimens adjusted well with the descriptions and dimensions given by Jairajpuri and Khan (1982)
CLARKUS ELONGATUS JAIRAJPURI AND KHAN, 1977

DIMENSIONS

Females (16) : L = 2.15 - 2.77 mm (2.26 mm), a = 29 - 49 (33), b = 4.5 - 4.8 (4.6), c = 17 - 20 (19), c' = 2.7 - 3.1(2.9), V = 60 - 62 (61), G1 = 8 - 14(11.8), G2 = 9 - 14(11), lip width = 30 - 34 um(33 um), lip height = 8.6 um, buccal cavity = 34 - 39 X 17 - 22 um ( 38 X 19 um), dorsal tooth = 25.8 um from base of stoma, subventral walls with non-denticulate ridge. Nerve ring at 149 - 160 um(154 um) from anterior end of body. Reproductive system amphidelphic. Sphincter not present at oviduct-uterus junction. Rectum = 39 - 43 um(41 um) long. Tail conoid, elongated, ventrally arcuate, 107 - 129 um(119 um) long. Caudal glands absent.

Male : Not found.

HABITAT AND LOCALITIES:

Detected from soil around roots of banana, Musa sp. from (1) Noneh, (2) Tupul, Tamenglong district, (3) Saparmaina village, Senapati district, and (7) Viewland, (5) Wino Bazar, (8) Mahadeva, Ukhrul district, Manipur.

REMARKS

The dimensions and morphological characters of the present specimens conform well with those described by Jairajpuri and Khan( 1977)
FAMILY MYLONCHULIDAE JAIRAJPURI, 1989
SUBFAMILY MYLONCHULINAE JAIRAJPURI, 1969
GENUS MYLONCHULUS (COBB, 1916) ALTHERR, 1953

GENERIC CHARACTERS

Body comparatively small and ventrally arcuate posture. Lip set off and with prominent labial papillae. Buccal cavity goblet-shaped, tapering at base. Dorsal tooth large to massive, located in the anterior half of buccal cavity. Sub-ventral walls bear several rows of small denticles in a transverse way opposite to base of dorsal tooth, a pair of ventral teeth usually present. Oesophago-intestinal junction of non-tuberculate type. Female reproductive system amphidelphic. Spicules short, gubernaculum simple or bidentate with or without lateral accessory pieces. Tail short, arcuate and variable in shape. Caudal glands usually well developed, grouped or tandem. Spinneret terminal or subterminal.


SPECIES RECORDED FROM OTHER HABITATS OF MANIPUR:

*M. minor* (Cobb, 1893) Andrassy, 1958
*M. contractus* Jairajpuri, 1970
H. dentatus Jairajpuri, 1970
H. hawaiiensia (Cassidy, 1931) Andressy, 1958
M. sigmaturus (Cobb, 1917) Altherr, 1953.

Analysis of soil samples collected from different localities yielded many specimens of *Mylonchulus* which represent four known species. Measurements and localities are provided.

**Mylonchulus lacustris** (N.A. Cobb in M.V. Cobb, 1915) Andressy, 1958

**DIMENSIONS**

Females (35) :  
L = 1.20 - 1.42 mm (1.31 mm), a = 23 - 32 (27), b = 3.6 - 4.0 (3.8), c = 30 - 36 (33), V = 66 - 69 (67), G₁ = 12 - 16 (13), G₂ = 13 - 19 (16), lip width = 26 - 30 um (28 um), lip height = 9 - 11 um (10 um), buccal cavity = 32 - 35 X 18 - 20 um (33 X 19 um), dorsal tooth = 23 - 25 um (24 um) from base of stoma, subventral walls bear 7 transverse rows of denticles, submedian teeth well developed. Nerve ring at 100 - 118 um (109 um) from anterior end of body. Reproductive system amphidelphic, sphincter not present at oviduct-uterus junction. Tail conoid, arcuate, 38 - 49 um (43 um) long, caudal glands tandem, spinneret terminal.

Male : Not found.
HABITAT AND LOCALITIES


REMARKS

The present specimens show a slight variation in body length from those described by Khan and Jairajpuri (1979)

MYLONCHULUS CONTRACTUS JAIRAJPURI, 1970

DIMENSIONS

Females (6) : L = 0.60 - 0.95 mm (0.78 mm), a = 29 - 31 (29.8), b = 2.1 - 3.1 (2.7), c = 29 - 35 (31.8), c' = 1.3 - 1.8 (1.5), V = 58 - 61 (59.3), G1 = 6 - 8 (6.8), G2 = 6 - 7 (6.7), lip width = 16 - 18 um (16.8 um), lip height = 5 - 6 um (5.3 um), buccal cavity = 17 - 18 X 10 - 12 um, dorsal tooth = 13 - 15 um (13.8 um) from base of stoma, subventral walls bear 5 transverse rows of denticles. Submedian teeth present. Nerve ring at 82 - 87 um (85 um) from anterior end of body. Excretory system indistinct.

Male: Not found.

HABITAT AND LOCALITIES

Detected from soil around roots of banana, local names Changbi, Heitei Hei (AB group) and (ABB group), from (1) Potsangbam, (2) Kumbi, (3) Irengbam, (4) Bishnupur, Bishnupur district, and (5) Canchipur, (6) Elangbam Leikai, (7) Samurou, Imphal district, Manipur.

REMARKS

The present specimens fit well with the dimensions and descriptions given by Jairajpuri (1970) and Jairajpuri and Khan (1979).

**HYLONCHULUS DENTATUS** JAIRAJPURI, 1970

DIMENSIONS

Females (24): \( L = 0.99 - 1.8 \text{ mm (1.4 mm)}, a = 31 - 42 \)
(36), b = 3 - 4 (3.2), c = 30 - 47 (36.5), V = 64 - 70 (67.3), G₁ = 10 - 14 (11.7), G₂ = 11 - 13 (12), lip width = 25 - 30 um. (27.5 um), lip height = 7 - 10 um. (8.5 um), buccal cavity = 27 - 29 X 17 - 20 um. (28 X 18 um), dorsal tooth = 20 - 23 um. (21.7 um) from base of stoma, subventral denticles numerous, submedian teeth prominent, nerve ring at 102 - 116 um. (110 um) from anterior end, reproductive system amphidelphic, vulval papillae present, three pre- & one post-vulval, rectum 18 - 23 um (20 um), tail elongate conoid, sharply bent, 37 - 55 um (41 um) long. Caudal glands grouped, spinneret terminal.

Male: Not found.

HABITAT AND LOCALITIES

Soil around roots of banana, Musa sp. from (1) Ukhongsang, (2) Waithou, (3) Tentha, Thoubal district, and (4) Pallel, (5) Chakpikarong, (6) Chandel Proper, Chandel district, Manipur.

REMARKS

The present specimens agree well with the dimensions and descriptions of the species given by Jairajpuri (1970) and Khan & Jairajpuri (1979).
**MYLONCHULUS HAWAIENSIS** (CASSIDY, 1931) ANDRASSY, 1958

**DIMENSIONS**
Females (21) : $L = 0.89 - 1.05 \text{ mm (0.97 mm)}, a = 20 - 24 (21), b = 2.9 - 3.1 (3.0), c = 27 - 32 (29), c' = 1.2 - 1.5 (1.45), V = 80 - 83 (62), G_1 = 11 - 13 (12), G_2 = 9 - 14 (11), \text{lip width} = 20 - 22 \text{ um (20.8 um)}, \text{lip height} = 8 - 9 \text{ um (8.4 um)}, \text{buccal cavity} = 12 - 14 \times 20 - 22 \text{ um (12.6X20.8 um)}, \text{dorsal tooth} = 17 - 19 \text{ um (17.8 um)}$ from base of stoma, subventral walls bearing 8 or 7 transverse rows of denticles. Submedian teeth present. Nerve ring at 96 - 101 \text{ um (99 um)} from anterior end of body. Excretory system indistinct. Reproductive system amphidelphic. Sphincter not present at oviduct uterus junction. Rectum 20 - 21 \text{ um (20.4 um)}, long. Tail tip slightly clavate, 32 - 35 \text{ um (34 um)} long, caudal glands tandem, spinneret terminal.

**HABITAT AND LOCALITIES**
Detected from soil around the roots of banana, *Musa* sp. from (1) Ningthoukhong, Bishnupur district (2) Samurou, Imphal district, (3) Viewland, (4) Siroli, (5) Thawai, Ukhrul district, and (6) Tupul, (7) Kamkhungong, Tamenglong district, Manipur.

**REMARKS**
The present specimens show considerable variations in the size of buccal cavity, position of amphidial apertures, dorsal tooth, position of vulva and in the shape of tail from those described and reported by Jairajpuri (1970).
GENUS PARAMYLOCHULUS JAIRAJPURI AND KHAN, 1982

GENERIC CHARACTERS


Type species: Paramylochulus index (Cobb, 1906) Jairajpuri and Khan, 1982.

SPECIES RECORDED FROM OTHER HABITATS OF MANIPUR:

E. index (Cobb, 1906) Jairajpuri and Khan, 1982
E. mulveyi (Jairajpuri, 1970) Jairajpuri & Khan, 1982

In the present study soil samples collected yielded only two known and one new species of the genus Paramylochulus. Dimensions and localities only in case of known species and with necessary illustrations in case of new species are provided.
**PARANYLONCHULUS INDEX** (COBB, 1906)  
*JAKATURI* AND  
*KHAN, 1982*

**DIMENSIONS**

Females (25) :  
L = 0.76 - 0.87 mm (0.80 mm),  
a = 27 - 33 (29),  
b = 2.9 - 3.2 (3.1),  
c = 32 - 34 (33),  
V = 73 - 77 (75 ),  
G1 = 9 - 16 (13),  
lip width = 14 um,  
lip height = 3.2 um,  
buccal cavity = 16 - 18 X 8 - 12 um (17 X 10 um),  
dorsal tooth = 13 - 15 um (14 um) from the base of the stoma,  
5 rows of subventral denticles,  
nerve ring at 105 - 108 um (107 um) from anterior end,  
reproductive system monoprodelphic,  
posterior uterine sac absent,  
rectum = 15 - 16 um (15.5 um),  
tail hemispheroid with a ventral finger like projection,  
24 - 30 um (27 um) long.  
Caudal glands grouped.  
Spinneret terminal.

Male : Not found.

**HABITAT AND LOCALITIES**

Detected from soil around roots of banana,  
varities Champakola, Jahaji, Bhimkola (AAB,AAA and ABB group)  
from (1) Viewland, (2) Winobazar, (3) Lambui village,  
(4) Kangkhui Khulen, Ukhrul district, (5) Noneh,  
Tamenglong district, (6) Haram, Senapati district and (7)  
Iroisemba, (8) Elangbam Leikai, (9) Pheiyeng, Imphal  
district, Manipur.
REMARKS

The present specimens have a slightly longer tail when compared with the descriptions and dimensions of the species as given by Jairajpuri (1970). However these are regarded as intraspecific variations.


DIMENSIONS

Females (12) : L = 0.93 - 1.12 mm. (1.02 mm), a = 34 - 41 (37), b = 2.9 - 3.7 (3.1), c = 22 - 29 (26), c' = 1.6 - 2.6 (1.8), V = 62 - 79 (75), G1 = 11 - 16 (13), lip width = 14 - 16 um. (15 um), lip height = 4.8 - 6.4 um (5.9 um), buccal cavity = 16-19X9.6-10.4 um. (17X10 um), dorsal tooth = 13 - 16 um. (14 um) from base of stoma, subventral walls bearing 4 transverse rows of denticles, inner two rows very faint. Submedian teeth absent. Nerve ring at 91 - 147 um (123 um) from anterior end of body. Excretory system indistinct. Reproductive system mono-prodelphic, posterior uterine sac absent. Sphincter present at oviduct-uterus junction. Rectum measuring 18 - 27 um. (24 um) long. Tail elongate-conoid, 43 - 50 um (46 um) long. Caudal glands grouped. Spinneret terminal.

Male : L = 1.15 mm, a = 45, b = 3.4, c = 30, T = 44, lip width = 16 um, lip height = 4.8 um, buccal cavity = 17.6 X 9.6 um, dorsal tooth = 14.4 um from base of stoma, nerve ring at 96 um from anterior end of body spicules, 41.8 um
long, lateral accessory pieces 6.4 μm. long, gubernaculum 8.0 μm. long. Ventromedian supplements 8 in number and copulatory muscles strong.

HABITAT AND LOCALITIES

Detected from soil around roots of banana, local name Meitei Hei, Mayang Hei (ABB, ABB group) from (1) Kabowakching, (2) ningthoukhong,(3) Kumbi, Bishnupur district (4) Viewland, Ukhrul district and (5) Thoubal proper, (6) Kakching Khunou, Thoubal district, Manipur.

REMARKS

The present specimens conform well with those dimensions and descriptions given by Jairajpuri (1970) and Jairajpuri and Khan (1979) except the presence of sphincter at oviduct-uterus junction. The species Paramylonchulus mulvey is widely and abundantly distributed in and around the roots of banana in Manipur but the male specimen is found very rarely.

PARAMYLONCHULUS INDISTINCTUS N.SP.

(Fig. 19)

DIMENSIONS

Paratype females (2) : L = 1.05 - 1.06 mm (1.055 mm), a = 37 - 41 (39), b = 3.1, c = 27 - 29 (28), c' = 1.6 - 1.7
(1.85), V = 77 - 79 (78), G1 = 11 - 12 (11.5), lip width = 14 - 15 um (14.5), lip height = 6 um, buccal cavity = 17 - 19 X 9 - 10 um (18 X 9.5 um), dorsal tooth = 14 - 16 um (15 um) from base of stoma, subventral walls bearing distinct transverse rows of denticles. Nerve ring at 91 - 102 um (97 um) from anterior end, rectum = 19 um, tail = 38 - 38 um (37 um), ABD = 22 um.

Holotype female : L = 0.93 mm, a = 34, b = 2.9, c = 20, c' = 1.6, V = 73, G1 = 14, lip width = 18 um, lip height = 6 um, buccal cavity = 19.5 X 12 um, dorsal tooth = 17 um, from base of stoma, subventral walls bearing 2 distinct transverse rows of denticles. Nerve ring at 94 um from anterior end, rectum = 24 um, tail = 47 um, ABD = 26 um.

Paratype male : L = 1.15 mm, a = 45, b = 3.4, o = 26, c' = 1.9, T = 44, lip width = 16 um, lip height = 5 um, buccal cavity = 18 X 10 um, dorsal tooth = 14 um from base of stoma, subventral walls bearing 2 distinct transverse rows of denticles, Nerve ring at 98 um from anterior end, spicule = 40 um, gubarnaculum = 8 um, ventromedian supplements = 8, tail = 45 um, ABD = 24 um.

DESCRIPTION

Female : Body ventrally arcuate upon fixation, cuticle smooth, 1 - 2 um, thick on various regions of the body. Lip region slightly set off, its width about more than twice
its height. Amphid small, cup-shaped, 4 um wide and 11 um from anterior end. Buccal cavity 17 - 19 um long and 9 - 10 um wide. Dorsal tooth massive, distinctly sclerotized, situated in anterior half of buccal cavity, its apex 14 - 16 um from base of stoma or 82 - 86% of the length of buccal cavity from base. Subventral walls bearing 2 distinct outer rows of denticles, inner rows scattered, not arranged in definite rows. Nerve ring at about six labial-widths from anterior end. Excretory pore indistinct.

Vulva transverse, Vagina thick-walled, short. Reproductive system mono-prodelphic, posterior uterine sac absent. Sphincter present between oviduct-uterus junction, ovary reflexed. Rectum 19 um long. Tail less than twice anal body-widths long, elongate-conoid, caudal glands present, arranged in tandem, opening terminal.

Male: Body postures almost similar with female. Spicule 40 um long, gubernaculum 8 um in length, lateral guiding pieces 8 um long, ventromedian supplements 8 in number. Tail 45 um long.

**TYPE HABITAT AND LOCALITY**

Detected from soil around roots of banana, *Musa* sp. from Viewland, Ukhrul district, Manipur.
TYPE SPECIMENS

Collected in March, 1992. Holotype female on slide AN32/Paramylonchulus indistinctus n.sp./ and paratype females and male on slides AN33/Paramylonchulus indistinctus n.sp./1-2,1, deposited in the Parasitology Laboratory, Life Sciences Department, Manipur University, Canchipur - 795 003.

DIFFERENTIAL DIAGNOSIS

Paramylonchulus indistinctus n.sp. comes close to P. mulyevi, (Jairajpuri, 1970) Jairajpuri & Khan 1982, But it differs from P. mulyevi in having scattered inner denticles on the subventral wall, sphincter at oviduct-uterus junction, tandem spinneret, longer spicule and shorter gubernaculum. (sphincter absent at oviduct-uterus junction, spicule = 40 um, gubernaculum = 8 um, spinneret grouped in P. mulyevi)
SUPERFAMILY ANATONCHOIDEA JAIRAJPURI, 1969
FAMILY IOTONCHIDAE JAIRAJPURI, 1969
SUBFAMILY IOTONCHINAE JAIRAJPURI, 1969
GENUS IOTONCHUS (COBB, 1916) ALTHERR, 1950

GENERIC CHARACTERS

Body comparatively bigger in size and slightly curved ventrally at the tail region. Lip region set off and with prominent labial papillae. Buccal cavity generally barrel shaped and flattened at base. Dorsal tooth small to medium-sized, variable in position from base to anterior half of buccal cavity, subventral teeth absent. Oesophago-intestinal junction of tuberculate type. Female reproductive system amphidelphic or mono-prodelphic, spicules long and arcuate, lateral accessory pieces may be present or absent, gubernaculum simple or bidentate. Tail elongated and filiform, shape and size variable. Caudal glands and terminal opening usually present.

Type species: Iotonchus gymnolaimus (Cobb, 1893) Andrassy, 1958.

SPECIES RECORDED FROM OTHER HABITATS OF MANIPUR:

I. trichurus (Cobb, 1917) Andrassy, 1958
I. iairi (Lordello, 1958) Clark, 1960
Analysis of soil samples collected from around the roots of banana yielded three known species and one undescribed species of the genus *Iotonchus*. Dimensions and localities only in case of known species and with necessary illustration in case of new species were provided.

**IOTONCHUS LONGICAUDATUS BAQRI, BAQRI & JAIRAJPURI, 1978**

**DIMENSIONS**

Females (14) : $L = 1.01 - 1.24$ mm ($1.13$ mm), $a = 33 - 42$ (36.8), $b = 3.5 - 4.3$ (4.0), $c = 3 - 3.7$ (3.3), $c' = 13 - 15$ (14), $V = 51 - 58$ (54), $G_1 = 14 - 16$ (15), lip width $= 19 - 22$ um (20.7 um), lip height $= 6 - 8$ um (7 um), baccal cavity $= 20 - 24 \times 10 - 14$ um ($22 \times 12$ um), dorsal tooth $= 11 - 14$ um (12.7 um) from base of stoma, nerve ring at 92 - 97 um (95 um) from anterior end of body, reproductive system mono - prodelphic, sphincter present at oviduct - uterus junction. Tail long filiform $316 - 336$ um (322 um) long. Caudal glands tandem. Spinneret terminal.
Male: \( L = 1.02 \text{ mm} \), \( a = 34 \), \( b = 4.04 \), \( c = 4.2 \), \( c' = 10 \), \( T = 27.8 \), lip width = 14.4\( \mu \text{m} \), lip height = 6.4\( \mu \text{m} \), buccal cavity = 19 \( \times \) 11\( \mu \text{m} \), dorsal tooth = 8.0\( \mu \text{m} \) from base of stoma, nerve ring at 112\( \mu \text{m} \), from anterior end of body, spicules 37\( \mu \text{m} \) long, gubernaculum 4.8\( \mu \text{m} \) long. Ventromedian supplements 8 in number and copulatory muscles strong.

**HABITAT AND LOCALITIES**

Detected from soil around roots of banana, local name Changbi (AB group) from (1) Meitram, (2) Sekmai, (3) Iroisemba, (4) Elangbam Leikai, (5) Lamphel and (6) Pheiyeng, Imphal district, Manipur.

**REMARKS**

The female specimens fit well with those dimensions and morphological characters described by Baqri and Jairajpuri (1978). The male of *I. longispidatus* conform with the single specimen reported by Gambhir and Dhanachand (1990).

**LOTONCHUS PARABASIDONTUS** HULVEY AND JENSEN, 1989

**DIMENSIONS**

Females (18): \( L = 2.05 - 2.98 \text{ mm} \) (2.82 mm), \( a = 24 - 41 \) (34), \( b = 4.2 - 4.9 \) (4.5), \( c = 7 - 9 \) (8.3), \( c' = 7 - 8 \)
(7.5), $V = 59 - 64$ (61), $G_1 = 16 - 23$ (19), $G_2 = 18 - 22$ um (18.7 um), buccal cavity = $41 - 50 \times 30 - 36$ um (46 X 33 um), dorsal tooth = $12 - 14$ um (13 um) from base of stoma, nerve ring at $137 - 179$ um (156 um) from anterior end, reproductive system amphidelphic, rectum = $17 - 35$ um (26 um) long, tail elongated filiform, 225 - 368 um (314 um) long, caudal glands prominent, spinneret terminal.

Males (14) : $L = 2.08 - 2.76$ mm (2.39 mm), $a = 31 - 38$ (35), $b = 3.9 - 4.5$ (4.25), $c = 9 - 11$ (10), $T = 31 - 63$ (47), lip width = $35 - 45$ um (40 um), lip height = $12 - 16$ um (14 um), buccal cavity = $42 - 50 \times 27 - 30$ um (46 X 28 um), dorsal tooth = $12 - 14$ um (13 um) from base of stoma, nerve ring at $134 - 179$ um (153 um) from anterior end of body, spicules 91 - 103 um (97 um) long, lateral accessory pieces 18 - 21 um (19.5 um) long, gubernaculum = $20 - 30$ um (28 um) long. Ventromedian supplements 12 - 15 in number and copulatory muscles strong.

**HABITAT AND LOCALITIES**

Detected from soil around roots of banana, variety Champakola and Jahaji (AAB and AAA group) from (1) Lambui village, (2) Viewland, (3) Thawai, Ukhrul district, (4) Noneh, (5) Kamkhugong, Tamenglong district, (6) Pallel, Chandel district, and (7) Thoubal proper, Thoubal district, Manipur.
REMARKS

Ilotonchus parabasidontus is distributed widely and abundantly in and around the roots of banana in Manipur. However, they show considerable variations in the body size, oesophageal length, size of male reproductive organs and buccal cavity.

ILOTONCHUS INDICUS JAIRAJPURI, 1969

DIMENSIONS

 Females (6) :  L = 1.46 - 1.78 mm (1.57 mm), a = 28 - 30 (28.7), b = 3.8 - 4.2 (4.0), c = 3 - 6 (4.5), V = 58 - 62 (60.3), G1 = 7 - 8 (7.3), G2 = 6 - 10 (7.8), lip width = 37 - 42 um (39.5 um), lip height = 9 - 14 um (12 um), buccal cavity = 39 - 48 X 24 - 30 um (42.3 X 28.6 um), dorsal tooth = 7 - 9 um (7.8 um) from base of stoma, nerve ring = 130 - 141 um (135.7 um) from anterior end of body. Excretory system not observed. Reproductive system amphidelphic. Sphincter not present at oviduct-uterus junction. Tail elongate, conoid, tapering regularly 274 - 280 um (277.5 um) long, caudal glands rather poorly developed, opening subterminal dorsally.

Male : Not found.
HABITAT AND LOCALITIES

Detected from soil around roots of banana, local name Meitei Hei and Changbi (ABB and AB group) from (1) Nambol, (2) Ningthoukhong, (3) Wangoo, Bishnupur district, (4) Kakching Khunou, (5) Tentha, (6) Ukhongsang, Thoubal district, Manipur.

REMARKS

The present specimens fit well with those dimensions and descriptions given by Jairajpuri (1969).

IOTONCHUS LONGISACATUS N.S.P.

(FIG. 20)

DIMENSIONS

Paratype females (2) : L = 1.83 - 2.17 mm (2.00 mm), a = 48 - 54 (51), b = 4.6 - 5.1 (4.9), c = 3.3 - 3.8 (3.6), c' = 21, V = 56 - 59 (57.5), G₁ = 12 - 14 (13), G₂ = 4.9 - 6.4 (5.7), lip width = 32 um, lip height = 12 - 14 um (13 um), buccal cavity = 30 - 37 X 22 um (34 X 22 um), dorsal tooth = 13 um from base of stoma, rectum = 17 - 19um (18 um), tail = 560 - 568 um (564 um), ABD = 27 um

Holotype female : L = 1.88 mm., a = 51, b = 4.7, c = 3.9, c' = 19, V = 59, G₁ = 14, G₂ = 5, lip width = 22 um, lip
height = 14 um, buccal cavity = 34 X 22 um, dorsal tooth = 13 um from base of stoma, rectum = 20 um, tail = 531 um, ABD = 25 um

DESCRIPTION

Female: Body ventrally arcuate upon fixation. Cuticle smooth, 4 - 5 um thick at various regions of the body. Lip region slightly set off, its width about twice its height. Amphid cup-shaped, 4 um wide and 15 um from anterior end. Dorsal tooth distinctly sclerotized, medium size, situated at the basal region in posterior half of the buccal cavity, its apex 13 um from the base of stoma or 35 - 43% of the length of buccal cavity from base. Nerve ring at about four labial widths from anterior end. Excretory pore indistinct.

Vulva transverse, with prominent cuticular pieces. Vagina thick-walled, short. Reproductive system mono-prodelphic. Sphincter present at oviduct - uterus junction, ovary reflexed. Vulval papillae present, 0 - 1 pre - and 0 - 1 post - vulval. Rectum less than one anal body - width long. Tail about twenty anal body widths long, filiform, caudal glands present, arranged in tandem, opening terminal.

TYPE HABITAT AND LOCALITY

Detected from soil around roots of banana, Musa sp. from Noneh, Tamenglong district, Manipur.
TYPE SPECIMENS

Collected in July, 1993. Holotype female on slide AN12/1 Iotonchus longisacatus n.sp. /3 and paratype females on slides AN12/1 Iotonchus longisacatus n.sp./1,2, deposited in the Parasitology laboratory, Life Sciences Department, Manipur University, Canchipur - 785003

DIFFERENTIAL DIAGNOSIS

Iotonchus longisacatus n.sp. comes close to L. trichurus (Cobb, 1917) Andrassy, 1958 and L. bagrii Jairajpuri, 1969. From L. trichurus it differs in value of 'a', in the shape and size of lip and buccal cavity, more anteriorly located dorsal tooth, presence of vulval papillae, presence of sphincter at oviduct-uterus junction, presence of uterine sac and in having longer tail. (a = 30 - 45, lip width = 24 - 30 um, lip height = 7 -12 um, buccal cavity width = 16 - 19 um, dorsal tooth = 5- 8 um from base of buccal cavity, tail = 370 - 430 um in L. trichurus). It differs from L. bagrii in having longer body, narrower lip and buccal cavity, slightly anteriorly located dorsal tooth, posteriorly located vulva and longer tail ( L = 1.47 - 1.71 mm, V = 62 - 70, lip width = 35 - 44 um, buccal cavity width = 28 - 32 , dorsal tooth = 8 -11 um, tail = 270 - 350 um in L. bagrii)
SUBFAMILY HADRONCHINAE KHAN AND JAIRAJPURI, 1980

GENUS PARAHADRQNCHUS MULVEY, 1978

GENERIC CHARACTERS

Body comparatively bigger in size and slightly curved ventrally at the tail region. Lip region set off and with prominent labial papillae. Buccal cavity barrel-shaped, thick-walled, flattened at base. Dorsal tooth massive, located in the posterior half of buccal cavity. Subventral walls bear few large denticles opposing the dorsal tooth. Oesophago-intestinal junction of tuberculate type. Reproductive system amphidelphic or mono-prodelphic. Spicules, gubernaculum and lateral accessory pieces large and prominent. Caudal glands and terminal opening well developed.

Type species: Parahadronchus andamanicus (Jairajpuri, 1969) Mulvey, 1978

SPECIES RECORDED FROM OTHER HABITATS OF MANIPUR:

E. subhQuicus Dhanachand, Renubala and Mohilal, 1991
E. siroii K. Renubala and Dhanachand, 1992
E. marani K. Renubala and Dhanachand, 1992
The samples analysed during the present work yielded a large number of specimens of Parahadronchus belonging to the two known species of E. shakili and E. siroii. Measurements and localities are presented.

PARAHADRONCHUS SHAKILI (JAIRAJPURI, 1969) MULVEY, 1978

DIMENSIONS

Females (24) : $L = 2.9 - 3.3$ mm (3.2 mm), $a = 43 - 46$ (45), $b = 4.1 - 4.5$ (4.3), $c = 6.0 - 7.1$ (6.9), $c' = 9.1 - 9.9$ (9.5), $V = 80 - 82$ (61), $G_1 = 12 - 17$ (14), $G_2 = 11 - 14$ (13), lip width = 43 - 45 um (44 um), lip height = 19 um, buccal cavity = 54 - 58 X 34 - 35 um, dorsal tooth = 24 - 26 um (23 um) from base of stoma, number of submedian denticles = 3 pairs, nerve ring at 178 - 192 um (183 um) from anterior end, reproductive system amphidelphic, rectum = 43 - 46 um (44 um), tail elongate conoid, tapering sharply, 453 - 467 um (460 um) long, caudal glands prominent, spinneret terminal.

Male : $L = 2.62$ mm, $a = 45$, $b = 4.5$, $c = 7.3$, $c' = 8.9$, $T = 27$, lip width = 37 um, lip height = 14 um, buccal cavity = 48 X 30 um, dorsal tooth = 22 um from base of stoma, number of submedian denticles = 3 pairs, nerve ring at 157 um from anterior end of body, spicules 88 um long, lateral accessory pieces 16 um long, gubernaculum 22 um long. Ventromedian supplements = 14 in number and copulatory muscles strong.
HABITAT AND LOCALITIES

Detected from soil around the roots of banana, local name Changbi (AB group) from (1) Lambui village, (2) Viewland, (3) Wino Bazar, (4) Kangkhui Khulen, Ukhrul district, Manipur and (5) Sekmai, (6) Canchipur, Imphal district, Manipur.

REMARKS

The present specimens fit well with those dimensions and descriptions given by Mulvey (1978).

PARAHADRONCHUS SIROII RENUBALA AND DHANACHAND, 1992

DIMENSIONS

Females (3) : $L = 2.46 - 2.55 \text{ mm (2.51 mm)}$, $a = 46 - 53$ (50), $b = 4.4 - 4.6 \text{ (4.5)}$, $c = 4.4 - 4.9 \text{ (4.7)}$, $c' = 15 - 16 \text{ (15.3)}$, $V = 54 - 56 \text{ (55)}$, $G_1 = 12 - 14 \text{ (12.8)}$, $G_2 = 15 - 17 \text{ (16)}$, lip width = 35 - 40 um (38 um), lip height = 14.4 um, buccal cavity = 51 - 53 X 29 - 32 um (52.3 X 30.3 um), dorsal tooth = 21 - 24 um (22 um) from base of stoma, number of submedian denticles = 6 pairs, nerve ring at 160 - 197 um (182 um) from anterior end, reproductive system amphidelphic, rectum = 32 - 38 um (34 um), tail filiform, 520 - 560 um (538 um) long, caudal glands arranged in tandem, opening terminal.
Males (3): $L = 2.17 - 2.48$ mm (2.32 mm), $a = 44 - 55$ (49),
$b = 4.3 - 4.5$ (4.4), $c = 5.4 - 6.2$ (5.9), $c' = 10$, $T = 45 - 54$ (48), lip width = 34 - 35 um (34.3 um), lip height = 13 - 14 um (13.7 um), buccal cavity = 45 - 48 X 26 - 29 um (46 X 27 um), dorsal tooth = 19 - 20 um (19.3 um) from base of
stoma, number of submedian denticles = 4 - 5, nerve ring at
152 - 192 um (187 um) from anterior end of body, spicules
69 - 78 um (74 um) long, lateral accessory pieces 16 - 18 um
(16.7 um) long, gubernaculum 17 - 18 um (17.5 um) long.
Ventromedian supplements 11 - 13 in number and copulatory
muscles strong, tail = 384 - 400 um (395 um).

HABITAT AND LOCALITIES

Detected from soil around the roots of banana, local names Changbi and Meitei Hei (AB and ABB group) from
(1) Zinthiang, Churachandpur district, (2) Nambol,
Bishnupur district, (3) Ukhongsang, Thoubal district, (4)
Mahadeva, Ukhrul district, (5) Noneh, (6) Tupul, (7)
Kamkhugong, Tamenglong district, Manipur.

REMARKS

The present specimens agree well with those
dimensions and descriptions given by Renubala and
Dhanachand( 1992)