Provisional Timetable
Oligochaete Workshop November 1994

Monday 14

Morning	Registration after 1000
Afternoon	Introduction to course- ethos, timetable, and domestic details. Significance of oligocheata and introduction to the relevant literature.

Tuesday 15

Morning	Morphology, preservation, and examination of oligochaeta
Afternoon	Examination of prepared material. Practice on disposable worms Use of keys, family descriptions, species description.

Wednesday 16

Morning	Continue examination of prepared material
Afternoon	Examination and identification of own or borrowed specimens

Thursday 16

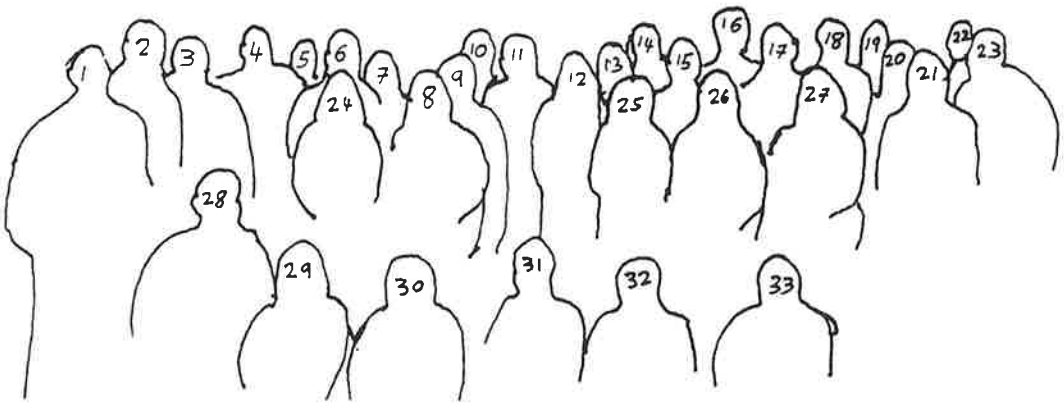
Morning	Final lab session Discussion

Oligochaete Workshop November 1994.
Delegate List.

Name	Organisation	Room number
Dr Peter Cunningham	AURIS Environmental	13D
Mr Mike Milligan	Center for Systematics and Taxonomy	17D
Ms Jennifer Boyle	Clyde River Purification Board	2D
Mr Myles O' Reilly	Clyde River Purification Board	11D
Ms Elaine Cunningham	Entec (Europe) Ltd	2D
Ms Susan Hamilton	Environment & Resource Technology Ltd.	9D
Dr Steve Hull	Forth River Purification Board	11D
Ms Rosie Fair	Independent	
Ms Sherry Forbes	Independent	
Mr Tim Mackie	Industrial Science Centre	12D
Ms Marie Pendle	Ministry of Agriculture Fisheries & Food	3D
Ms Nicky Rowberry	North East River Purification Board	4D
Dr Helgi Gudmundsson	NRA, Anglian Region	1D
Mr Chris Adams	NRA, Anglian Region	1D
Ms Liz Morris	NRA, Northumbria & Yorkshire Region	9D
Mr Roger Proudfoot	NRA, Northumbria & Yorkshire Region	13D
Ms Sarah White	NRA, South Western Region	5D
Ms Mitch Perkins	NRA, South Western Region	5D
Mr Trevor Baker	NRA, South Western Region	15D
Mr Pete Barfield	NRA, South Western Region	15D
Mr Ian Humpheryes	NRA, Southern Region	14D
Ms Julie Bywater	NRA, Thames Region	2W
Mr Dave Leeming	NRA, Thames Region	6W
Ms Judy England	NRA, Thames Region	3W
Ms Clare Dale	NRA, Thames Region	4W
Mr Andy Robinson	NRA, Welsh Region	12D
Ms Gill Davies	NRA, Welsh Region	3D
Ms Rosie Croxford	NRA, Welsh Region	7D
Ms Amanda Coates	SEAS Ltd.	7
Dr David Rendall	Solway River Purification Board	14
Ms Gabrielle Moffett	Tay River Purification Board	8D
Mr Iain Smith	Unicomarine Ltd	6D
Mr Paul Wilson	Unicomarine Ltd	10D
Dr Martin Dyer	Unicomarine Ltd	16D
Ms Chris Ashman	Zeneca Ltd	5W

Oligochaete '94

Organised by Unicomarine at Preston Montford



1	Paul Wilson	12	Rosie Croxford	23	Dave Leeming
2	Helgi Gudmundsson	13	Liz Morris	24	Nicky Smith
3	Chris Adams	14	Roger Proudfoot	25	Sherry Forbes
4	Mike Milligan	15	Rosie Fair	26	Julie Bywater
5	Iain Smith	16	Andy Robinson	27	Amanda Coates
6	Elaine Cunningham	17	Tim Mackie	28	Myles O' Reilly
7	Gabrielle Moffett	18	Pete Barfield	29	Judy England
8	Nicky Rowberry	19	Steve Hull	30	Marie Pendle
9	Jennifer Boyle	20	Clare Dale	31	Mitch Perkins
10	David Rendall	21	Susan Hamilton	32	Chris Ashman
11	Peter Cunningham	22	Martin Dyer	33	Sarah White

Trevor Baker and Ian Humpherves are not pictured.

OLIGOCHAETA COURSE - GENERAL NOTES

Course leader Mike Milligan from Florida, (recommended by R. O. Brinkhurst).

Address - Mike Milligan
PO Box 37534
Sarasota
Florida, USA
Zip Code 34278

Fax: 0101 813 365 5540

(a) As far as Mike Milligan is concerned chaete and setae are interchangeable terms.

(b) Sexual reproduction - All oligochaets can reproduce about 4 times per year. After reproduction sexual structures (including genital chaete) dissapear until the next reproductive phase. This means that large worms with no sexual structures can be found. Only a small percentage of worms are mature at any one time.

(c) Dealing with large numbers of worms - Mike Milligans approach:-
If he ~~feels~~ finds large numbers (eg. more than 100), he sub samples.

(1) Counts all worms
(2) Place worms in grided dish (50 - 60 grids)
(3) Using random number, select series of squares and remove all worms from those squares
(4) Identify and extrapolate up numbers

TUBIFICOIDES NOTES - FROM SLIDE EXAMINATION - CLEARED SPECIMENS

T. amplivasatus

Naked. Dorsal anterior mainly hair setae, bifids small. Ventral teeth same length upper slightly thinner.

Penis sheath - Only marginally longer than wide.

T. benedii

Papillate. Chaete as description.

Penis sheath with distinctive inflated distal end.

T. brownae

Naked. Anterior dorsal, 3 per bundle, upper tooth thinner and shorter, teeth divergant. Posterior ventral only 1 chaete per bundle, teeth divergant, upper thinner and shorter.

Penis sheath distinctirve, very conical.

T. crenacoleus

Naked. Anterior dorsal upper tooth thinner and shorter.

Penis sheath distinctive, lateral projection (See Brinkhurst, page 1271)

T. diazi

Naked. Anterior dorsal upper tooth thinner and shorter.

Penis sheath distinctive, small hook on side (fairly easily seen on slide) (See Brinkhurst, page 1271)

T. fraseri

Naked. Anterior dorsals 3 per bundle, upper tooth shorter, thinner? (2nd specimen - 2 per bundle)

No visible penis sheath on any slide experiment (7 looked at)

T. heterochaetus

Papillate posteriorly. Anterior dorsal both teeth appear long and thin. Ventral posterior simple points.

Penis sheath - not seen.

T. insularis

Heavily papillate. Anterior dorsal setae longer and fatter. Hair setae fine and short.

2nd specimen not so heavily papillate but penis sheath distinct, squat and very wide at end.

T. motei

Naked. Groove behind clitellum distinct (on some specimens) runs across worm dorsally. Anterior dorsal setae 3 in bundle, upper tooth thinner and slightly shorter.

Penis sheath distinctive, tapers and is narrow at distal end.

T. pseudogaster

Naked. Anterior dorsal upper tooth larger and thinner.

Penis sheath, elongate cylinder.

T. scoticus

Naked. Posterior dorsal setae pointed - 4 per bundle - distinctive.

Penis sheath not seen.

T. swirencoides

Papillate. dorsal and ventral bifids very different and distinct. Dorsal setae "closed" and hairs.

Penis sheath - not seen on 3 specimens examined.

OTHER TAXA

Adelodrilus cooki	Very distinctive penial setae - 2, each with a different shape - see Brinkhurst (page 87)
Aktedrilus monospermathecus	Small worm, chaete upper tooth very fine, thin and shorter than lower tooth.
Bathydrilus rarisetus	1st 3 setae groups paired, slightly hooked end, rest very distinctive single large simple chaetae.
Phallodrilus partheropeus	Modified genital setae very distinctive, with a robust rounded end. About 9 or 10 genital setae in each bundle, much larger than normal chaete.

ERRATUM

Marine Tubificid Taxonomy

The following corrections should be made:

The ventral setae of *Paranais* start on II. The dorsal setae start on V.

Marine Tubificid Taxonomy

There are three families of oligochaeta found in marine and brackish waters:-

- **Naididae.** This is mostly a freshwater family, although several species can be found in brackish water. They have male pores in the ovarian segments between V and VII, form chains of zooids when reproducing asexually, and may have eyes. The genus *Paranais* is the only truly marine member in UK waters; it is found intertidally in estuaries and on coasts and be recognised by its short stubby appearance, and long bifid setae with equal teeth. Ventral setae start on I which can give them a bearded appearance.

- **Enchytraeidae.** These are most readily recognised by their small tightly coiled appearance and short stout simple or sigmoid setae.

- **Tubificidae**. Most marine and estuarine oligochaetes belong to this family. They have male pores in ovarian segment, usually XI, and spermathecae in X. There is a large range of setal types.

Aeolosomatidae are no longer generally considered to belong to the oligochaeta (Brinkhurst 1981; Milligan 1994).

The following will deal with those features that *I* consider the most useful in splitting and identifying tubificids. For a more detailed description see Brinkhurst (1981).

Gross Morphology

Tubificids can be found in large numbers, especially in muddy estuaries; often the only sensible way to split them down into different taxa is by features discernible under a dissecting microscope:-

- **Papillations** are small cuticular papillae sometimes found on the body wall that give the worm a matt appearance under low power. With experience papillations are easy to discern using a dissecting microscope. Take note of presence, density, and where they start. There is sometimes some variation of the degree of papillation between tubificids of the same species.
- **Hair setae** are long thin pointed setae, like capillary setae on polychaetes, that are found dorsally on some worms. They can be discerned more easily with a touch of back-light. Take care not to confuse hair setae with long other setae; if in doubt check one or two worms under the compound microscope. Problems can also be caused when all or some of the hair setae are broken.
- **Prostomium shape** varies between animals of the same species, but with practice it can be of use. Look for features such as the relative size to the main body, how pointed or rounded it is, and whether a constriction separates it from the main body.

- **Other body wall features,** such as secondary annulation between the septa and the presence of sub-dermal particles, are often useful. Do not confuse sub-dermal particles with papillations; if in doubt check using a compound microscope.
- **The size and shape of the worm** is also of use. Features to look out for are how portly the worm seems, or whether it is particularly fat anteriorly and slender posteriorly.

Setal Morphology

Setae can be easily seen using a compound microscope. Setal types and distribution can vary between species, while remaining reasonably consistent within a species. Consequently they are the tubificid spotter's favourite feature for identifying worms.

Tubificid setae start on segment II. Each segment has four bundles: two dorsal and two ventral.

There are several types of tubificid setae.

- **Hair setae** are elongate slender setae terminating in an acute point. They are only found dorsally.
- **Bifid setae** (fig. 1a) have two terminal teeth. The relative length and thickness of the upper and lower tooth can be significant. Take care as the angle at which the seta is laying on the slide can effect the apparent relative sizes of the teeth.
- **Pectinate setae** (fig 1b) are bifid setae with a series of fine intermediate teeth found between the main bifid fork. At first glance they may be difficult to distinguish from bifids.
- **Palmate setae** (fig 1c) are similar to pectinate setae, except that the intermediate teeth are the same size as the outer ones.
- **Genital setae** are found ventrally in some mature worms. Spermathecal (fig. 1d) setae are usually found in segment X, penial (fig 1e) setae in XI.

Note the setal types and the number of setae per bundle. There are often differences in setal types and numbers between bundles.

Anterior/Posterior

Posterior segments typically have fewer setae per bundle than anterior ones. The relative size of bifid teeth may also differ between anterior and posterior segments. In some tubificids with hair setae, eg *Tubificoides swirenocoides* accompanying anterior dorsal bifids may be replaced by single pointed setae posteriorly.

Some setae may only be found in certain segments such as palmate setae in *Tubifex costatus*, or genital setae in *Limnodriloides spp.*

Dorsal/Ventral

Some setae, such as hair setae, are only found dorsally. Genital setae are always ventral.

There is usually a difference between the accompanying dorsal bifids of tubificids with hair setae, and the equivalent ventral bifids.

In tubificids with only bifid setae there is usually no difference between dorsal and ventral bundles.

Internal Morphology

The internal morphology of oligochaetes is important in identification. This will be dealt with during the course by Mike Milligan.

References

Brinkhurst (1982) British and Other Marine and Estuarine Oligochaetes. Linnean Society.

Milligan (1994) Identification Manual for Florida Oligochaetes (draft copy). Unpublished.

III COLLECTION AND PREPARATION

Many environmental investigations require amassing a large number of substrate samples in a very short period with the organisms to be sorted from the debris and identified at a later time. The most common method of collecting sediment is with either a grab sampler (i.e., a PONAR or Eckman) or hand core. Epsom salts may be added to the sample for 15 to 30 minutes to narcotize the organisms. The sediment is then washed through a 0.5mm or less screen. The residue is then fixed with a 10% formalin solution stained with rose bengal to facilitate separation of the worms from the sediment. After a minimum of 48 to 72 hours, the formalin is decanted off the sample and replaced with 70% ethyl- or isopropyl alcohol. These samples may remain in this condition indefinitely, providing the alcohol label is periodically checked.

Sorting the worms from the residue is accomplished using a dissecting microscope.

If the purpose of the collection is strictly for finding oligochaetes and quantification is not a factor, an alternate method may be employed: elutriation. For elutriation, a bucket is filled about one-third to one-half full with sediment. The sediment is passed through a 1cm to 2cm screen to remove the rocks, course gravel, detritus and vegetation. Water is added to the sediment and swirled to suspend the organisms, the supernatant is decanted into a .025mm screen and the resulting organisms rinsed into an appropriately labelled container. The sediment should be elutriated an additional two or three times to ensure removal of the majority of worms from the sediment.

The live worms are then sorted from the sediment within 12 hours and fixed in a 10% formalin solution for at least 48 to 72 hours, and transferred to 70% alcohol.

For routinely examining large collections, the fastest method is to mount the worms on microscope slides in Amman's lactophenol. This is a temporary medium composed of phenol (carbolic acid), lactic acid, glycerol and water in a ratio of 1:1:2:1. Two drops of mounting media are placed on each slide. One to five worms (depending on their size) are arranged in a row within each drop, and a cover slip is placed over the worms. Placement of the worms in a single row with their heads pointing in the same direction facilitates identification of large numbers of specimens simply by moving the stage left to right without having to look away from the microscope trying to locate each specimen. Tubificids may be fairly long and have a tendency to coil up upon fixation, frequently obscuring taxonomically important characters. To straighten when mounting, grab one end with the forceps and drag it on the dry part of the slide into the drop of Amman's. This usually removes the kinks. The slides are placed on slide trays, which can be stacked and are available through scientific supply distributors. Metal cookie sheets can be an inexpensive alternative, gluing thin spacers at 2.5cm intervals to keep the slides separate. After each tray is mounted, examine the slides to ensure there are no air bubbles. If necessary, add a drop of mounting media next to the cover slip. Capillary action will draw the fluid in to eliminate air spaces.

Identification of freshwater material requires examination of setae and/or cuticular structures, such as penis sheaths. For this purpose, chemical maceration of the internal structures facilitates these observations. Gentle heating in a drying oven set at approximately 90°C (or on top of an electric range with burner control set at 3-1/4) for about 15 to 30 minutes, depending on the size of the worms. Since temperature controls vary for each unit, experimentation and continuous examination of the specimens is initially required to prevent melting the worms, leaving only a scattered mass of setae.

If permanent mounts are required, Hydramount or CMC-10 may be used. The specimens may be mounted directly into these media from water or alcohol (or Amman's) as described previously for temporary mounts. Both media will also clear the specimens after a day or two.

Identification of marine oligochaetes frequently requires the examination of internal structures. Generally, mount all specimens temporarily in Amman's lactophenol for preliminary examination. Specimens which need to be maintained for reference are carefully removed from the slide, stained in paracarmine stain, destained to the appropriate tint in acidified alcohol, dehydrated through an alcohol series, cleared in terpineol (xylene works well, but renders the material brittle), and mounted in Canada Balsan.

Dissection of the male genitalia of large specimens such as *Thalassodrilides* is recommended for accurate identification. The dorsum of segments VII through XIII is teased open to expose the spermatecae and male genitalia. The lateral portions of the body wall are teased away, leaving only the ventral section containing the male and female pores and associated genital structures. Care may be taken to then remove the alimentary canal. The dissection may either be accomplished in the final mounting medium or completed in alcohol, dehydrated and mounted in Canada Balsan. Care must be exercised in the latter method to avoid loss of or damage to the specimen.

Oligochaetes reported from estuarine conditions.

Tubificoides swirenocoides: Forth, Humber, Solway, Tamar, Tees.
Tubificoides scoticus: Forth.
Tubificoides pseudogaster: Clyde Est, Dumbarton, Dundee foreshore, Forth, Humber, North Sea, Tay, Throughout estuaries in North East, Throughout estuaries in South West, Weston-Super-Mare.
Tubificoides insularis?: Uncommon in estuaries in North East.
Tubificoides insularis: Braughty, Forth, Tay.
Tubificoides heterochaetus: Thames Est.
Tubificoides diazi: Forth, Harwich, Wash.
Tubificoides crenacoleus: Tyne.
Tubificoides benedii: All Estuaries in Solway RPB region, Clyde Est, Estuaries throughout the UK, Firth of Clyde, Forth, Humber, Inverk Bay, R Ythan, Severn, Staithes, Tay Nshore, Thames Est, Throughout estuaries in North East, Throughout estuaries in South West
Tubificoides amplivasatus: Forth, Humber, North Sea, Severn, Weston-Super-Mare.
Tubificidae sp (immature without hairs): R Ythan.
Tubificidae indet: Braughty, Tay.
Tubifex tubifex: Thames Est.
Tubifex nerthus: Urr.
Tub'pse': Humber.
Tub sp cf galiciensis (insularis): Forth, Tees.
Psammoryctes barbatus: Thames Est.
Potamothrix (Euilyodrilus) hammoniensis: Thames Est.
Phalodrilus prostatus: Tay.
Paranais littoralis: Clyde Est, Eden, Firth of Clyde, Forth, Humber, R Don NE Scotland, Seal Sands, Tees, Teignmouth.
Paranais frici: Humber.
Nais elinguis: R Don NE Scotland.
Monopylephorus irroratus: Cree, Gt Ouse.
Lumbricillus lineatus?: Lower Tees, Tweed Est, Tyne Est.
Limnodrilus udekemianus: Thames Est.
Limnodrilus hoffmeisteri: Clyde Est, Severn, Thames Est.
Heterochata costata: All Estuaries in Solway RPB region, Dundee foreshore, Forth, Mersey, R .
Heterochaeta costata: Clyde Est, Garwick Est, Holy Loch.
Grania sp: Solway.
Enchytraidae: All Estuaries in Solway RPB region.
Enchytraidae spp: R Don, R Ythan.
Enchytraid spp: Humber.
Enchytraid indet.: Thames Est.
Deveron, R Ythan, Solway, Tay, Thames Est, Throughout estuaries in North East, Throughout estuaries in South West, Upper Wash Estuaries.
Clitellio arenarius: Braughty, Forth, Humber, Inverkething Bay, Tay, Thames Est.
Amphichaeta sannio: Forth.

Oligochaetes reported from upper estuarine or freshwater conditions.

Tubificoides benedii: All Estuaries in Solway RPB region, Estuaries throughout the UK, Forth, Inverk Bay.
Tubificidae indet: Drainage ditch/stream.
Tubifex tubifex: Clyde Est, Forth, Humber, Thames Est, Upper Wash Estuaries.
Stylodirilus heringianus: Thames Est.
Stylaria lacustris: Clyde Est, Forth, Thames Est.
Psammoryctes barbatus: Thames Est, Wash estuaries.
Potamothriz (Euilyodrilus) moldaviensis): Thames Est.
Potamothrix (Euilyodrilus) hammoniensis: Thames Est.
Paranais littoralis: Humber.
Nais elinguis?: Inner Farne, Tyne Estuary.
Nais elinguis: Clyde Est, Forth, Thames Est.
Monopylephorus irroratus: Clyde Est, Small estuaries in South West eg Axe.
Lumbriculus variegatus: Thames Est.
Lumbricillus lineatus: Clyde Est.
Limnodrilus udekemianus: Forth, Thames Est, Upper Wash Estuaries.
Limnodrilus hoffmeisteri: Clyde Est, Forth, Thames Est, Upper Wash Estuaries.
Limnodrilus claparedeianus: Thames Est.
Limnodrilus cervix: Thames Est.
Heterochata costata: Forth, Humber, Mersey, Solway, Throughout estuaries in South West, Upper Wash Estuaries
Enchytraidae: All Estuaries in Solway RPB region.
Clitellio arenarius: Some estuaries in South West.
Branchiura sowerbyi: Thames Est.
Aulodrilus pluriseta: Thames Est.
Amphichaeta sannio: Humber.

Oligochaetes reported from fully marine or near marine conditions.

Tubificoides swirenocoides: Forth, Loch Ryan.
Tubificoides scoticus: Offshore Northumberland.
Tubificoides pseudogaster: Forth, North Sea, Thames Est, Throughout estuaries in North East.
Tubificoides insularis?: Uncommon in estuaries in North East.
Tubificoides insularis: Firth of Clyde, Forth, Irvine Bay, Large estuaries in South West eg Tamar and Fal.
Tubificoides diazi: Liverpool Bay.
Tubificoides brownae: Outer Thames Est.
Tubificoides benedii: All Estuaries in Solway RPB region, Clyde Est, Firth of Clyde, Forth, Inverk Bay, Throughout estuaries in North East.
Tubificoides amplivasatus: Exemouth, Firth of Clyde, Forth, Garroch Hend, Harwich, Humber, Irvine Bay, Loch Ryan, North Sea, Off Tyne, Offshore Northumberland, Wash
Tub sp cf swirencoides: Coastal, Tamar.
Tub sp cf galiciensis (insularis): Coastal and Estuary Mouth in South West, Forth.
Paranais littoralis: Clyde Est, Firth of Clyde, Loch Ryan, Seal Sands, Tees.
Lumbricillus sp: Firth of Clyde, Girvan, Largs.
Limnodroides scandinavicus: Sullom voe.
Limnodriloides scandinavicus: Firth of Clyde, Irvine Bay.
Heterochaeta costata: Clyde Est, Garwick Est, Holy Loch.
Grania spp: Northern North Sea 61N 2E.
Grania sp: Firth of Clyde, Girvan, Loch Ryan, North Sea.
Enchytraidae: All Estuaries in Solway RPB region.
Enchytraidae: .
Enchytraidae spp: Sandford bay.
Enchytraeus albidus?: Cullercoats, Wansbeck.
Clitellio arenarius: Fenham flats, Forth, Inverkething Bay, Seal Sands (Tees), Tyne area shores.

Saline Intrusion of Freshwater Species

Some freshwater tubificids may penetrate the less saline regions of estuaries, or may be found; T*ubifex Tubifex* and *Limnodrilus hoffmeisteri* are commonly found together in these regions.

Tubifex Tubifex has a pointed prostomium, dorsal hair setae and anterior dorsal pectinate setae.

Limnodrilus hoffmeisteri has bifid setae. Mature specimens are characteristic in having *easily* seen penis sheaths, on dissection. The penis sheaths are large with a hooked end.

In areas of very low salinity it may be best to use a freshwater key.

Tubificidae Reported at Oligochaete '94

Species	Found	Salinity	Depth	Sediment	Reported by
Tubificoides swirenocoides	Tamar	ME	1	M	Peter Barfield & Treveor Baker
Tubificoides swirenocoides	Humber	LE	0&1	M	Helgi Gudmundson
Tubificoides swirenocoides		LE-NM	1	M	Roger Proudfoot
Tubificoides swirenocoides	Loch Ryan	FM	1	SiCl	David Rendall
Tubificoides swirenocoides	Humber & Tees & Solway	ME-LE	1	M	Martin Dyer
Tubificoides swirenocoides	Forth	ME-FM	1&2	M	Steve Hull
Tubificoides scoticus	Offshore Northumberland	FM	3	M	Roger Proudfoot
Tubificoides scoticus	Forth	ME-LE	1&2	M	Steve Hull
Tubificoides pseudogaster	Weston-Super-Mare	ME	0	M	Mitch&Sarah
Tubificoides pseudogaster	Dumbarton & Clyde Est	GE			Myles O'Reilly & Jeni boyle
Tubificoides pseudogaster	Thames Est	OE	1&2		Clare Dale
Tubificoides pseudogaster	Humber	ME	0	M	Liz Morris
Tubificoides pseudogaster	Throughout estuaries in South West	ME&LE	0&1	M	Peter Barfield & Treveor Baker
Tubificoides pseudogaster	Throughout estuaries in North East	ME-NM	1	M	Roger Proudfoot
Tubificoides pseudogaster	Forth & North Sea	ME-FM	1-4	M-S	Steve Hull
Tubificoides pseudogaster	Tay & Dundee foreshore	ME	0	G	
Tubificoides insularis?	Uncommon in estuaries in North East	LE-NM	1	M	Roger Proudfoot
Tubificoides insularis	Irvine Bay & Firth of Clyde	FM	1		Myles O'Reilly & Jeni boyle
Tubificoides insularis	Large estuaries in South West eg Tamar & Fal	NM	1&2	MSG	Peter Barfield & Treveor Baker
Tubificoides insularis	Forth	ME-FM	1&2	M-MS	Steve Hull
Tubificoides insularis	Tay & Braughty	LE	1	S-G	
Tubificoides heterochaetus	Thames Est	LE	1	MS	Clare Dale
Tubificoides diazi	Liverpool Bay	FM	2	MS	Marie Pendle
Tubificoides diazi	Wash & Harwich	GE-FM	1	M	Martin Dyer
Tubificoides diazi	Forth	ME	1	M	Steve Hull
Tubificoides crenacoleus	Tyne	ME	1	M	Elaine cunningham
Tubificoides brownae	Outer Thames Est	FM	2	MShS	Marie Pendle

Tubificidae Reported at Oligochaete '94

Species	Found	Salinity	Depth	Sediment	Reported by
Tubificoides benedii	Severn	ME	0	M	Andy Robinson
Tubificoides benedii	Clyde Est & Firth of Clyde	FM&GE			Myles O'Reilly & Jeni boyle
Tubificoides benedii	Thames Est	ME&LE	1&2	M-MS	Clare Dale
Tubificoides benedii	Humber	ME	0	M	Liz Morris
Tubificoides benedii	Staithes	Coastal with FW stream influence	0	S-M on rocky shore	Liz Morris
Tubificoides benedii	Throughout estuaries in South West	ME/LE&GE	0&1	M	Peter Barfield & Treveor Baker
Tubificoides benedii	Humber	ME-OE	0&1	M	Helgi Gudmundson
Tubificoides benedii	Throughout estuaries in North East	ME-NM	0&1	M	Roger Proudfoot
Tubificoides benedii	All Estuaries in Solway RPB region	UE-FM	0	S-SiCl	David Rendall
Tubificoides benedii	R Ythan	LE	0	M	Nicky Rowberry
Tubificoides benedii	Nycomed (Norwegain Fjord)				Sue Hamilton
Tubificoides benedii	Estuaries throughout the UK	UE-LE	1	M	Martin Dyer
Tubificoides benedii	Forth & Inverk Bay	UE-FM	0&1	M-S	Steve Hull
Tubificoides benedii	Tay Nshore	LE	0	G	
Tubificoides amplivasatus	Severn	ME	1	M	Andy Robinson
Tubificoides amplivasatus	Weston-Super-Mare	ME	0	M	Mitch&Sarah
Tubificoides amplivasatus	Off Tyne	FM	4	MS	Marie Pendle
Tubificoides amplivasatus	Irvine Bay & Garroch Hend & Firth of Clyde	FM			Myles O'Reilly & Jeni boyle
Tubificoides amplivasatus	Humber	LE-OE	1	M	Helgi Gudmundson
Tubificoides amplivasatus	Offshore Northumberland	FM	3	M	Roger Proudfoot
Tubificoides amplivasatus	Loch Ryan	FM	1	SiCl	David Rendall
Tubificoides amplivasatus	Harwich, Humber, Wash, Exemouth	FM/NM	1	MS	Martin Dyer
Tubificoides amplivasatus	Forth & North Sea	ME-FM	0-4	M-MS	Steve Hull
Tubificoides 'pseudogaster'	Humber	ME-OE	1	M	Helgi Gudmundson
Tubificidae sp (immature without hairs)	R Ythan	LE	0	M	Nicky Rowberry
Tubificidae indet	Tay & Braughty	LE	0&1	G	
Tubificidae indet	Drainage ditch/stream	UE	0	M	Roger Proudfoot
Tubifex tubifex	Clyde Est	UE&FW			Myles O'Reilly & Jeni boyle
Tubifex tubifex	Thames Est	UE&ME	1	GSM	Clare Dale

Species	Found	Salinity	Depth	Sediment	Reported by
Tubifex tubifex	Humber	UE	0	SM	Helgi Gudmundson
Tubifex tubifex	Upper Wash Estuaries	UE/FW	1	M	Martin Dyer
Tubifex tubifex	Forth	UE-FW	0&1	M	Steve Hull
Tubifex nerthus	Urr	ME	0	SiCl	David Rendall
Tubficioides sp cf galiciensis	Coastal & Estuary Mouth in South West	FM&NM	1&2	MS	Peter Barfield & Treveor Baker
Tubficioides sp cf galiciensis		LE-NM	1	M	Roger Proudfoot
Tubficioides sp cf galiciensis	Tees	LE	1	M	Martin Dyer
Tubficioides sp cf galiciensis	Forth	ME-FM	1&2	M	Steve Hull
Tub sp cf swirencoides	Tamar & Coastal	FM/NM	1	MS	Peter Barfield & Treveor Baker
Stylodirilus heringianus	Thames Est	UE	1	GSM	Clare Dale
Stylaria lacustris	Thames Est	UE	1	GSM	Clare Dale
Stylaria lacustris	Forth	UE/FW	1	M	Steve Hull
Stylaria lacustris	Clyde Est	UE&FW			Myles O'Reilly & Jeni boyle
Psammoryctides barbatus	Thames Est	UE&ME	1	GSM	Clare Dale
Psammoryctides barbatus	Wash estuaries	UE/FW	0	M	Martin Dyer
Potamothriz (Euilyodrilus) moldaviensis)	Thames Est	UE	1	GSM	Clare Dale
Potamothrix (Euilyodrilus) hammoniensis	Thames Est	UE&ME	1	GSM	Clare Dale
Phalodrilus prostatus	Tay	ME?	1	G	
Paranais littoralis	Firth of Clyde & Clyde Est	FM&GE	2		Myles O'Reilly & Jeni boyle
Paranais littoralis	Humber	UE&ME	0	M	Liz Morris
Paranais littoralis	Estuaries in South West		0	M	Peter Barfield & Treveor Baker
Paranais littoralis	Humber	LE-UE	0	M	Helgi Gudmundson
Paranais littoralis	Tees & Seal Sands	LE-NM	0	SM	Roger Proudfoot
Paranais littoralis	Loch Ryan	FM	1	SiCl	David Rendall
Paranais littoralis	R Don NE Scotland	LE	0	M	Nicky Rowberry
Paranais littoralis	Humber & Teignmouth	GE-FM	0	M	Martin Dyer
Paranais littoralis	Forth	ME	1	M	Steve Hull
Paranais littoralis	Eden	ME-LE	0	M	
Paranais frici	Humber	ME	0	M	Liz Morris
Nais elinguis?	Inner Farne & Tyne Estuary	UE			Roger Proudfoot
Nais elinguis	Clyde Est	UE			Myles O'Reilly & Jeni boyle

Tubificidae Reported at Oligochaete '94

Species	Found	Salinity	Depth	Sediment	Reported by
Nais elinguis	Thames Est	UE	1	GSM	Clare Dale
Nais elinguis	R Don NE Scotland	LE	0	M	Nicky Rowberry
Nais elinguis	Forth	UE/FW	1	M	Steve Hull
Monopylephorus irroratus	Clyde Est	UE			Myles O'Reilly & Jeni boyle
Monopylephorus irroratus	Small estuaries in South West eg Axe	UE	0	M	Peter Barfield & Treveor Baker
Monopylephorus irroratus	Cree	ME	0	SiCl	David Rendall
Monopylephorus irroratus	Gt Ouse	ME	1		Martin Dyer
Lumbriculus variegatus	Thames Est	UE	1	GSM	Clare Dale
Lumbricillus sp	Girvan & Largs & Firth of Clyde	FM	0		Myles O'Reilly & Jeni boyle
Lumbricillus lineatus?	Tyne Est & Lower Tees & Tweed Est	ME	0&1	M	Roger Proudfoot
Lumbricillus lineatus	Clyde Est	UE			Myles O'Reilly & Jeni boyle
Limnodroides scandinavicus	Sullom voe	FM			Sue Hamilton
Limnodrilus udekemianus	Thames Est	UE&ME	1	GSM	Clare Dale
Limnodrilus udekemianus	Upper Wash Estuaries	UE/FW	1	M	Martin Dyer
Limnodrilus udekemianus	Forth	UE-FW	0&1	M	Steve Hull
Limnodrilus hoffmeisteri	Severn	ME	0	S	Andy Robinson
Limnodrilus hoffmeisteri	Clyde Est	FW/GE	1		Myles O'Reilly & Jeni boyle
Limnodrilus hoffmeisteri	Thames Est	UE&ME	1	GSM	Clare Dale
Limnodrilus hoffmeisteri	Upper Wash Estuaries	UE/FW	1	M	Martin Dyer
Limnodrilus hoffmeisteri	Forth	UE-FW	0&1	M	Steve Hull
Limnodrilus claparedeianus	Thames Est	UE	1	GS	Clare Dale
Limnodrilus cervix	Thames Est	UE	1	GSM	Clare Dale
Limnodriloides scandinavicus	Irvine Bay & Firth of Clyde	FM	1		Myles O'Reilly & Jeni boyle
Heterochata costata	Thames Est	ME	1	SM	Clare Dale
Heterochata costata	Humber	UE	0	M	Liz Morris
Heterochata costata	Throughout estuaries in South West	UE&GE	0&1	M	Peter Barfield & Treveor Baker
Heterochata costata	Humber	UE	0	M	Helgi Gudmundson

Tubificidae Reported at Oligochaete '94

Species	Found	Salinity	Depth	Sediment	Reported by
Heterochata costata	Throughout estuaries in North East	ME	0&1		Roger Proudfoot
Heterochata costata	All Estuaries in Solway RPB region	ME&GE	0	SiCl	David Rendall
Heterochata costata	R Ythan & R Deveron	LE	0	M	Nicky Rowberry
Heterochata costata	Upper Wash Estuaries & Mersey & Solway	UE/ME	1	M	Martin Dyer
Heterochata costata	Forth	UE-LE	0&1	M	Steve Hull
Heterochata costata	Tay & Dundee foreshore	ME	0	G	
Heterochaeta costata	Clyde Est & Garwick Est & Holy Loch	FM&GE			Myles O'Reilly & Jeni boyle
Grania spp	Northern North Sea 61N 2E	FM	4	S	Sue Hamilton
Grania sp	Girvan & Firth of Clyde	FM	0		Myles O'Reilly & Jeni boyle
Grania sp	Loch Ryan	FM	1	SiCl	David Rendall
Grania sp	Solway	GE	1	M	Martin Dyer
Grania sp	North Sea	FM	4	M-S	Steve Hull
Enchytraidae spp	Sandford bay	FM	0	S	Nicky Rowberry
Enchytraidae spp	R Don	LE	0	M	Nicky Rowberry
Enchytraidae spp	R Ythan	LE	0	M	Nicky Rowberry
Enchytraidae		ME-FM	0-2	M-S	Steve Hull
Enchytraidae	All Estuaries in Solway RPB region	UE-FM	0	S-SiCl	David Rendall
Enchytraid spp	Humber	GE	1	M	Helgi Gudmundson
Enchytraid indet.	Thames Est	ME	1	M	Clare Dale
Enchytraeus albidus?	Wansbeck & Cullercoats	FM	1	M	Roger Proudfoot
Enchytraeid sp					Peter Barfield & Treveor Baker
Clitellio arenarius	Thames Est	ME	1	M	Clare Dale
Clitellio arenarius	Some estuaries in South West	UE	0		Peter Barfield & Treveor Baker
Clitellio arenarius	Humber	ME/LE	0	MCl	Helgi Gudmundson
Clitellio arenarius	Fenham flats & Tyne area shores & Seal Sands (Tees)	NM-FM	1		Roger Proudfoot
Clitellio arenarius					Martin Dyer
Clitellio arenarius	Forth & Inverkething Bay	ME-FM	0&1	M	Steve Hull
Clitellio arenarius	Tay & Braughty	LE	0	G	
Branchiura sowerbyi	Thames Est	UE	1	GSM	Clare Dale
Aulodrilus pluriseta	Thames Est	UE	1	GSM	Clare Dale
Amphichaeta sannio	Humber	UE	0	M	Liz Morris

Tubificidae Reported at Oligochaete '94

Species	Found	Salinity	Depth	Sediment	Reported by
Amphichaeta sannio	Humber	UE	0	M	Helgi Gudmundson
Amphichaeta sannio	Forth	ME	1	M	Steve Hull

Key to depth, salinity, and sediment data in full list of oligochaetes reported table.

Depth

0	intertidal
1	<15m
2	<30m
3	<50m
4	>=50m

'Salinity'

FW	freshwater
UE	upper estuary
ME	mid estuary
LE	lower estuary
OE	outer estuary
GE	estuary
NM	near marine
FM	fully marine

Sediment

M	mud
S	sand
Sh	shell
G	gravel
Cl	clay
Si	silt

Preliminary key to British Marine and Estuarine Tubificids

Paul Wilson, Unicomarine. Oligochaete Workshop 1994.

1. Hair setae present — 2

   Hair setae absent — 6

2. Hair setae thin, easily broken, and twisted distally. 2-4 bifids with subequal teeth in dorsal and ventral bundles. Non papillate. ***Monopylephorus irroratus***

   Hair setea not twisted distally — 3

3. Open bifids dorsally in both anterior and posterior bundles. Papillate from III to VI. ***Tubificoides insularis***

   Non Hair setae, in posterior dorsal bundles, simple pointed. — 4

4. Anteriorly dorsal and ventral bifids closed. Not papillate or slightly papillate posteriorly. ***Tubificoides scoticus***

   Anterior dorsal and ventral bifids open — 5

5. Anterior dorsal bifids with closely applied short teeth. Papillate from VII. ***Tubificoides swirenocoides***

   Anterior dorsal bifids with widely separated teeth. Not papillate, but frequently bands of subdermal particles posteriorly. ***Tubificoides amplivasatus***

6. Bifids with small shard like upper tooth; may appear simple pointed. Heavily papillate from II or at least VI, rarely naked. ***Tubificoides benedii***

   Setae not as above. Not papillate. — 7

7. Spermethecal setae present ventrally in X. Other setae bifid. ***Limnodriloides ~~winkelmanni~~*** scandinavicus

   No genital setae — 8

8. Dorsal seteae in II to IV pectinate. Dorsal setae in V to XIV palmate. ***Tubifex costatus***

   All setae bifid — ***Tubificoides pseudogaster***
   Tubificoides diazi
   Tubificoides crenacoleus
   Ctitellio arenarius

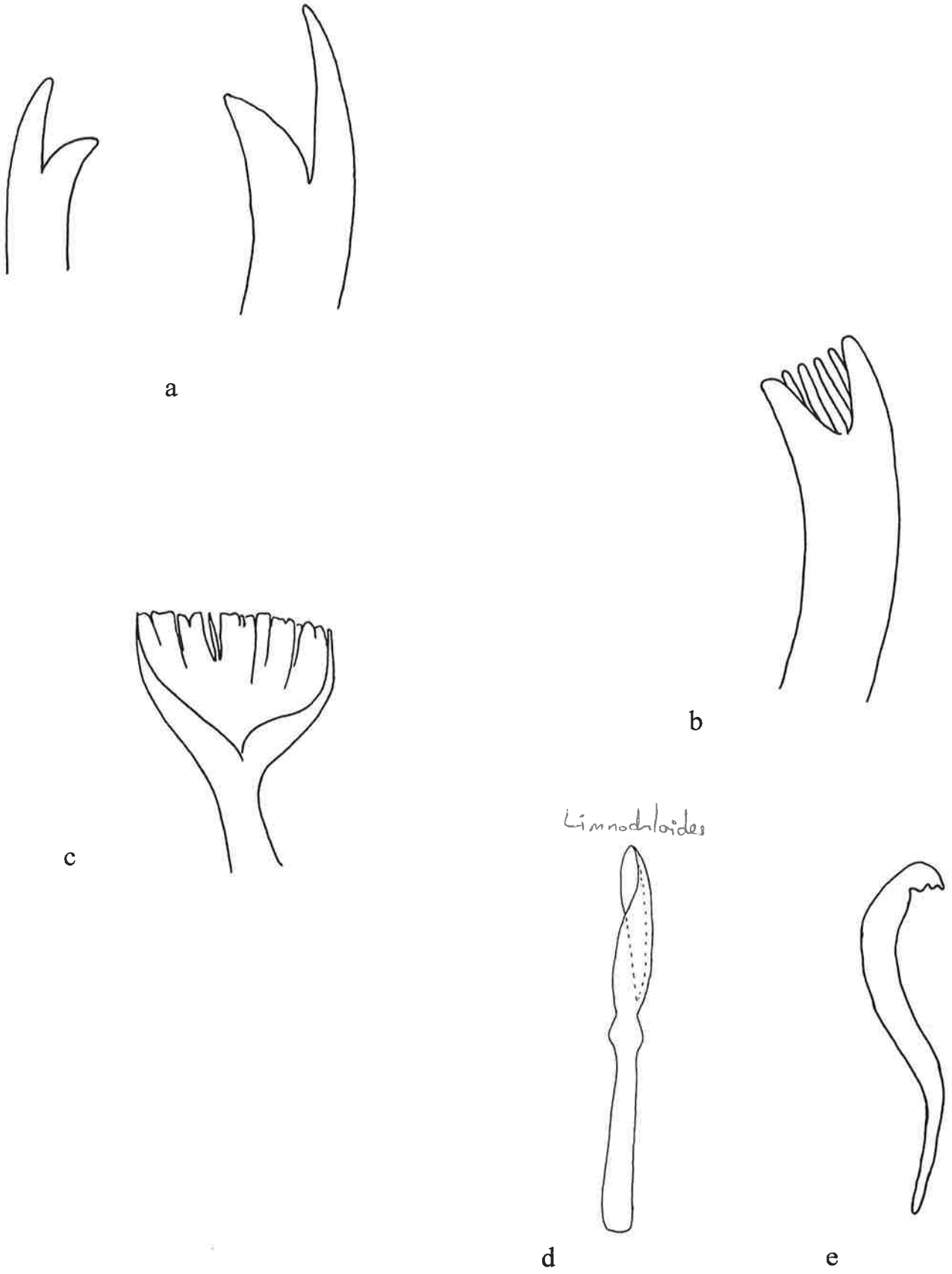


Fig 1. Tubificid setae. a bifid. b pectinate. c palmate. d spermethecal. e penial.

Table 1. Comparison of British species of *Tubificoides*, compiled from literature.

Species	Dorsal Setae: Hair (Bifid) Ant.	Dorsal Setae: Hair (Bifid) Post.	Body Wall Type	Vas Deferens Length (Width)	Atrial Length (Width)	Penis Length (Width)	Type Locality
With Hair Setae							
amplivasatus (Erseus, 1975)	2-4 (1-3)	1-3 (1-3)**	naked	300-500 (25-50)	260-360 (60-160)	30-45 (27)	Norway
insularis (Stepenson, 1992)	1-3(4) (1-3(4))	1 (1)	papillate	very long (40)	1110 (110)	100 (80)	Ireland
scoticus Brinkhurst, 1985	2-3(4) (2-3(4))	2-3(4) (2-3(4))**	naked	660-990 (25)	330 (75)	110 (25)	Scotland
swirencoides Brinkhurst, 1985	(1)(2-3)(4) (1)(2-3)(4)	1-2 (1-2)**	papillate	500-750 (33)	250 (50)	100 (50)	England
Without Hair Setae							
benedii (Udekeme, 1855)	0 (2(3))	0 (1)	papillate	very long (37)	370 (70)	102 (84)	British Channel
brownae Brinkhurst & Baker, 1979	0 (3-5)	0 (1)	naked	860 (36)	430 (50)	75 (33)	Delaware
crenacoleus Baker, 1983	0 (3-5(6))	0 (2-3)	naked	560 (23)	350-430 (44-60)	100 (40)	Beaufort Sea
diazi Brinkhurst & Baker, 1979	0 (3-5(6))	0 (2-3)	naked	720-1440 (17)	210-240 (45-53)	140 (30)	New Jersey
fraseri Brinkhurst, 1986	0 (2-3)	0 (1)	naked	325-585 (13-18)	260 (50)	52 (30)	British Columbia
heterochaetus (Michaelsen, 1926)	0 (4,5)	0 (1,2)**	papillate	330 (35)	315 (100)	46 (36)	Europe
motei Brinkhurst, 1986	0 ((2)3(4))	0 (2(3))	naked	190 (10)	190 (30)	50 (26)	West Florida
pseudogaster (Dahl, 1960)	0 (3-5(6))	0 (11)2(3))	naked	510-1390 (14-27)	430 (36-85)	94 (36)	Denmark
wasselli Brinkhurst & Baker, 1979	0 (2(3))	0 (1)	papillate	300-1500 (19-22)	380 (35)	48 (30)	Delaware

**Simple needle setae.

Tubificidae features table

	Body wall	Dorsal hair setae	Anterior dorsal other setae	Posterior dorsal other setae	Anterior ventral other setae	Posterior ventral other setae	Penis	Other
Tubificoides insularis	Papillate from III-VI	1-3(4) short bent ant. 1 post clit	1-3(4) UT shorter thinner LT.	1 bifid post clit.	3-4 bifid. UT shorter thinner lower.	1 post clit bifid. V thin UT	Sheath sharply conical with distended ectal end.	Resembles T benedii with haris
T swirencoides	Papillate from VII or at least behind clit	(1)2-3(4) ant. 1-2 form X	(1)2-3(3) closely applied short teeth. V-VII possibly extra teeth above UT	Simple pointed after X	2-3 short broad; UT slightly larger LT.	1-2 UT thinner & only little longer than LT	Sheath cylindircal. 2x long as broad	
T scoticus	Naked or coated in foreign matter. may be slightly papillate post.	2-3(4)	2-3(4) broad lance shaped bifids;UT shorter LT.	Simple pointed from VII	2-5 bifid	3-4 bifid	Sheath long cylindrical	
T amplivasatus	Naked. Subdermal particles may be present post.	Yes	Open bifids	Bifids reduced to simple pointed before clit	UT thinner same length LT	UT thinner same length LT	Sheath squat thimble-like	
T benedii	Densely papillate from II or at least from VI	No	Reduced or rudimentary UT.2-3 II-III;2 IV-XI	1 from XII	Reduced or rudimentary UT.2-3 II-III;2 IV-XI	1 from XII	Sheath slightly conical with inflated distal end.	Some animals naked. These may or may not be Clitellio arenarius
T pseudogaster	Naked	No	3-5(6) UT longer LT	(1)2(3) UT longer LT	3-5(6) UT longer LT	(1)2(3) UT longer LT	Sheath simple cylinder	Often used as label for non-papillated with just bifids
T diazi	Naked	No	(2)3-5(6); most in II&III. UT thinner shorter LT	(1)2(3) LT broad same length UT	(2)3-5(6); most in II&III. UT thinner shorter LT		Sheath curved frequently bearing sub-terminal spur	Long thin posterior
T crenacoleus	Naked	No	3-5(6) UT thinner as long or longer than LT	2-3 UT thinner as long or longer than LT	3-5(6) UT thinner as long or longer than LT	2-3 UT thinner as long or longer than LT. Absent in X	Sheath cone shaped with blunt projection on post edge	Sharply conical prostomium
T heterochaetus	Slightly papillate posteriorly	No	UT as long and thick as LT	2(3) with 1 simple pointed & rest with rudimentary LT.	UT as long and thick as LT	Simple pointed	Sheath thick small slightly cone shaped	

Clit- clitellium; post- Posterior; ant- anterior; UT- upper tooth; LT- lower tooth
T for *Tubificoides*

	Body wall	Dorsal hair setae	Anterior dorsal other setae	Posterior dorsal other setae	Anterior ventral other setae	Posterior ventral other setae	Penis	Other
Tubifex costatus	Naked	No	Pectinate about II-IV. Palmate about V-XIV	Bifid	UT longer than LT	UT longer than LT	Sheath tub shaped	
Limnodriloides scandinavicus	Naked	No	2-3 UT thinner and shorter LT	1-2 post clit UT thinner and shorter LT	2-3 UT thinner and shorter LT	As dorsal. Genital setae on X or absent. XI absent	Penes eversible. No sheath.	Blind ending gut divertiula in IX. Hard to see.
Monopylephorus rubroniveus	Naked	No	2-6 robust bifid. UT thinner & as long as LT	Fewer setae posteriorly	2-6 robust bifid. UT thinner & as long as LT	Fewer setae posteriorly	Tall protrusible pseudopenes. No sheaths, no true penes.	
T brownae	Naked	No	3-5 UT shorter thinner LT.	1 UT thinner same length LT; teeth divergent	3-5 UT shorter thinner LT.	1 UT thinner same length LT; teeth divergent	Sheath thin, conical, often crumpled in whole mounts	
T motei	Naked. Grooved and ridged behind clit.	No	(2)3(4) UT usually shorter thinner LT; short teeth	2(3) UT usually shorter thinner LT; short teeth	(2)3(4) UT usually shorter thinner LT; short teeth	2(3) UT usually shorter thinner LT; short teeth	Sheath broadly conical tapering to narrow distal end	
T fraseri	Naked	No	2(3) UT thinner shorter LT	1 UT thinner shorter or same length LT	2(3) UT thinner shorter LT	1 UT thinner shorter or same length LT	Sheath conical to cylindrical. 2 x long as wide	Golden yellow tint posteriorly
T wasselli	Papillate behind clit	No	2(3) UT shorter than LT	From VI or VII 1 with thick recurved LT	2(3) UT shorter than LT	From VI or VII 1 with thick recurved LT. X-XI absent	Conical 2x as long as broad	Prostomium retractile

Clit- clitellium; post- Posterior; ant- anterrior; UT- upper tooth; LT- lower tooth
T for *Tubificoides*

Tubificidae features table: references

1: Baker HR and RO Brinkhurst 1981. A revision of the genus Monopylephorus and redefination of the subfamilies Rhyacodrilinae and Branchiurinae (Tubificidae: Oligochaeta). Can J Zool: 59: 939-965.
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6: Brinkhurst, RO 1986. Taxonomy of the genus Tubificoides Lastockin (Oligochaeta, Tubificidae): species with bifid setae. Can J Zool. 64: 1270-1279.
7: Brinkhurst, RO and HR Baker 1979. A review of the marine Tubificidae (Oligochaeta) of North America. Can J Zool. 57: 1553-1569.
8: Erseus C 1982. Taxonomic Revision of the Marine Genus Limnodriloides (Oligochaeta: Tubificidae). Verh. naturwiss. Ver. Hamburg.

Tubificidae features table (ver. 2)

	Body wall	Dorsal hair setae	Anterior dorsal other setae	Posterior dorsal other setae	Anterior ventral other setae	Posterior ventral other setae	Male reproductive organs	Other	Ref
Tubificoides benedii	Densely papillate from II or at least from VI (usually)	No	Reduced or rudimentary UT 2-3 II-III 2 IV-XI	1 from XII	As dorsal	As dorsal	Sheath slightly conical with inflated distal end	Naked animals may be confused with Clitellio arenarius	6
Tubificoides brownae	Naked	No	3-5 UT shorter thinner LT	1 UT thinner same length LT; teeth divergent	3-5 UT shorter thinner LT		1 UT thinner same length LT; teeth divergent	Sheath thin, conical often crumpled in whole mounts	6
Tubificoides crenacoleus	Naked	No	3-5(6) UT thinner as long or longer than LT	2-3 UT thinner as long or longer than LT	As dorsal	As dorsal Absent in X	Sheath cone shaped frequently bearing sub terminal spur	Sharply conical prostomium	6
Tubificoides diazi	Naked	No	(2)3-5(6); most in II&III UT thinner shorter LT	(1)2(3) LT broad same length UT	As dorsal	As dorsal	Sheath cone shaped with blunt projection on post edge	Long thin posterior	6
Tubificoides heterochaetus	Slightly papillate posteriorly	No	UT as long and thick as LT	2(3) with 1 simple pointed & rest with rudimentary LT	As dorsal	*Simple pointed?*	Sheath thick small slightly coned shaped		6
Tubificoides pseudogaster	Naked	No	3-5(6) UT longer LT	(1)2(3) LT broad same length UT	As dorsal	As dorsal	Sheath simple cylinder Always parallel sided		6
Tubificoides amplivasatus	Naked Sub-dermal particles may be present post	2-3(4)	2-3(4) broad lance shaped bifids; UT shorter LT,	Bifids reduced to simple pointed before clit	UT thinner same length LT	As dorsal	Sheath squat thimble like		5
Tubificoides scoticus	Naked or coated in foreign matter May be slightly papillate post	2-3(4)	2-3(4) broad lance shaped bifids; UT shorter LT	Simple pointed from VII	2-5 bifid	3-4 bifid	Sheath long cylinder		5
Tubificoides sp cf galiciensis (Roger Proudfoot's worms)	Papillate from 12-16	2-3 ant 1-2 post	2-3 widely seperated bifids UT slightly shorter LT	1-2 bifids similar to ant	3-5 similar to dorsal	1 similar to dorsal	????	Found in NE england estuaries	5

Abbreviations:
clit-clitellium, post-posterior(ly), ant-anterior(ly), UT-upper tooth, LT-lower tooth

Tubificidae features table (ver. 2)

	Body wall	Dorsal hair setae	Anterior dorsal other setae	Posterior dorsal other setae	Anterior ventral other setae	Posterior ventral other setae	Male reproductive organs	Other	Ref
Tubificoides insularis	Papillate III-VI	1-3(4) short bent ant 1 post clit	1-3(4) UT shorter thinner LT	1 bifid post clit	3-4 bifid UT shorter thinner lower	1 post clit bifid V thin UT	Sheath sharply conical with distended ectal end	Resembles T benedii with hairs	5
Tubificoides swirenocoides	Papillate from VII or at least behind clit	(1)2-3(4) ant 1-2 from X	(1)2-3(3) closely applied short teeth V-VII possibly extra teeth above UT	Simple pointed after X	2-3 short broad UT slightly larger LT	1-2 UT thinner only slightly longer than LT	Sheath cylindrical 2x long as broad		5
Monopylephorus rubroniveus	Naked	No	2-6 bifids	fewer	As dorsal	As dorsal	Non ciliated pseudopenes		7
Monopylephorus parvus	Naked	No	3-4(5) UT as thick LT/variable	As dorsal?	2? 1 or both simple pointed?	As dorsal?	Upright protusible pseuodopenes	Descriptions unclear	7
Monopylephorus irroratus	Naked	1-2 thin spirally twisted, easily broken	2-4 bifids	2-4 bifids	As dorsal	As dorsal	Tall eversible non-ciliated pseudopenes	Hair setae frequently broken	7
Limnodriloides scandinavicus	Naked	No	2-3 UT thinner and shorter LT	1-2 post clit UT thinner and shorter LT	As dorsal	As dorsal Genital setae on X or absent No genital setae on XI	Penes eversible No sheath		8
Heterochaeta costata	Naked	No	Pectinate about II to IV Palmate bout V-XIV	Bifid	UT longer than LT	As dorsal	Sheath tub shaped		4
Clitellio arenarius	Naked	No	2-3 reduced or rudimentary UT	2-3 reduced or rudimentary UT	Fewer than ant	Fewer than ant	No cuticular penes sheaths		4

Abbreviations:
clit-clitellium, post-posterior(ly), ant-anterior(ly), UT-upper tooth, LT-lower tooth

SPECIES LIST OF MARINE AND BRACKISH WATER OLIGOCHAETES OF THE BRITISH ISLES Includes Scandinavia.

NAIDIDAE

AMPHICHAETA SANNIO
CHAETOGASTER CRYSTALLINUS } Predaceous
C. DIAPHAPHANUS
C. LANGI
NAIS ELINGUIS } extremely difficult to separate.
N. VARIABILIS
PARANAIS LITTORALIS – only truly estuarine species.
P. FRICI
STYLARIA LACUSTRIS – Proboscis present.

TUBIFICIDAE

RHYACODRILINAE

MONOPYLEPHORUS IRRORATUS – spirally twisted hair setae.
M. PARVUS — 7, 8, 9, 13 ventral setae modified
M. RUBRONIVEUS

TUBIFICINAE

CLITELLIO ARENARIUS – no prostate – degenerated!
HETEROCHAETA COSTATA Palmate setae
LIMNODRILOIDES MONOTHECUS single dorsal spermatheca
Limnodriloides is sub-tropical
L. SCANDINAVICUS – paired spermathecal setae.
LIMNODRILUS HOFFMEISTERI – moult reproduce in saline water.
TUBIFEX TUBIFEX hair setae + tub-shaped penis sheath.
TUBIFICOIDES AMPLIVASATUS
T. BENEDII
T. BROWNAE — Rare U.S. only? 1 seta/bundle post. clit.
T. CRENACOLEUS
T. DIAZI
T. FRASERI
T. HETEROCHAETUS
T. INSULARIS
T. MOTEI — Rare U.S. only? 2 setae/bundle post clit.
T. PSUEDOGASTER
T. SCOTICUS
T. SWIRENCOIDES
T. WASSELLI — Rare U.S. only.

PHALLODRILINAE

AKTEDRILUS MONOSPERMATHECUS – Small interstitial worm – upper branches single mid-dorsal spermatheca
ADELODRILUS COOKI penial chaetae – 2 diff. shapes
A. PUSILLUS
BATHYDRILUS RARISETUS Norway, Scotland
INERMIDRILUS GEORGEI Scotland, Ireland, very very difficult! – shape of Atrium!
PHALLODRILUS PARTHENOPEUS – most common See Erseus 1990 paper.
SPIRIDION INSIGNE
modified spermathecal setae plus penial setae
or 10
with large
upper tooth

includes a few N. European/Scandanavian spp

SPECIES LIST OF MARINE AND BRACKISH WATER OLIGOCHAETES OF THE BRITISH ISLES

NAIDIDAE – have eyes + proboscis (Stylaria only)

AMPHICHAETA SANNIO
CHAETOGASTER CRYSTALLINUS
C. DIAPHAPHANUS
C. LANGI
NAIS ELINGUIS – also get
N. VARIABILIS
PARANAIS LITTORALIS – most common
P. FRICI
STYLARIA LACUSTRIS

Enchytraeidae

Marionina + Enchytraeus common in saltmarsh.
+ Grania – setae start 4V + 10D

TUBIFICIDAE – see Baker + Brinkhurst 1980 for justification of splits.

RHYACODRILINAE – long atrium + short vas deferens, diffuse prostate along length of atrium. Possess coelomocytes. Fairly large worms. Easy to identify spp. Usually found with Spartina?

MONOPYLEPHORUS IRRORATUS
M. PARVUS
M. RUBRONIVEUS

TUBIFICINAE – penis sheaths may be more or less cuticularised. Easily seen on clearing in Amman's Lactophenol.

CLITELLIO ARENARIUS
HETEROCHAETA COSTATA = Tubifex costatus
LIMNODRILOIDES MONOTHECUS – dorsal spermatheca between 10–11.
L. SCANDINAVICUS – has spermathecal setae. (Clyde).
LIMNODRILUS HOFFMEISTERI + L. udekemianus? easy.
TUBIFEX TUBIFEX easy. + Tubifex nerthus?
TUBIFICOIDES AMPLIVASATUS
T. BENEDII
T. BROWNAE – ~~prob not~~ yes – Thames
T. CRENACOLEUS
T. DIAZI
T. FRASERI
T. HETEROCHAETUS – may or may not be papillated
T. INSULARIS
T. MOTEI – prob not
T. PSUEDOGASTER
T. SCOTICUS
T. SWIRENCOIDES
T. WASSELLI – prob not

PHALLODRILINAE – penial setae. Shape + no of penial setae on segment 11 are unique for each spp.

AKTEDRILUS MONOSPERMATHECUS – common in UK
ADELODRILUS COOKI
A. PUSILLUS
BATHYDRILUS RARISETUS – Norwegian – found in Scotland!
INERMIDRILUS GEORGEI – Scotland + Ireland – hard to identify
PHALLODRILUS PARTHENOPEUS – most common.
SPIRIDION INSIGNE

Phallodrilus prostatus – in Tay
Thalassodrilus

Erseus 1989 – paper on Phallodrilinae

Genus. ***Paranais* Czerniavsky, 1880**

Type Species. *Paranais litoralis* (Muller, 1784)

Diagnosis. Eyes, proboscis and caudal appendages absent. All setae bifid, similar in shape. Dorsal setae from V. Ventral setae from II, those on II generally longer than the rest. Body wall frequently covered with foreign matter or papillae. Penial setae present.

Remarks. Lack of hair setae, all setae bifid, similar in shape, and dorsals starting on V separates this genus from all other Naidids.

Four species are currently considered valid. Brinkhurst and Coates (1985) review of this genus resulted in combining *Wapsa* Marcus, 1965, with it and questioning the validity of eight species previously included in *Paranais* or *Wapsa*. All four valid taxa all reported from North America, with three likely to be collected in Florida.

Valid Species

P. birsteini Sokolskaya, 1971
P. frici Hrabe, 1941
P. grandis (Harman, 1977)
P. litoralis (Muller, 1784)

Dubious Species

P. botniensis Sperber, 1948
P. Macrochaeta Cernosvitov, 1939
P. mobilis Liang, 1958
P. multisetosa Finegenova, 1972
P. palustris Udaltsov, 1907
P. salina Cernosvitov, 1939
P. simplex Hrabe, 1936
Wapsa evelinae Marcus, 1965

Key to Species *Paranais* in Florida

1A) Upper tooth of all setae distinctly longer than lower tooth. -- 2

B) Upper tooth distinctly longer than lower only on II, teeth more or less equal in all other segments. -- *P. litoralis*

2(1A)A Ventrals on II 6-7 per bundle, all other segments 3 per bundle. Body wall papillate -- *P. grandis*

B Ventrals on II 2-4 per bundle, all other segments 1-2 per bundle. Papillae absent, but thin layer of foreign matter present -- *P. frici*

***Paranais frici* Hrabe, 1941**

Paranais frici Hrabe, 1941:20-22, Fig. 16-19; Sperber 1948:86-87, Fig. 8E-14; Brinkhurst and Jamieson 1971:319; Brinkhurst and Coates 1985:306-307, Fig. 1-3; Brinkhurst 1986:56-57.

Diagnosis. Length: 2.7-5.7mm (preserved), 9mm (living); segments: 13-14. All setae bifid similar in shape with upper tooth much longer than lower. Dorsal setae from V, 1-2 per bundle. Ventral setae on II, 2-4 per bundle, all other segments 1-2 per bundle. Penial setae bifid, thicker than somatic setae. Cuticle with thin layer of foreign matter.

Distribution and Habitat. Africa, Europe, widespread in North America. Rivers and bays, generally coastal in brackish water, but also occurs in fresh water.

Remarks. This species is separated by all congeners by the longer upper tooth of all setae, with only 1-2 setae per bundle except ventrally on II, which has 2-4 setae per bundle.

This species is occasionally found in coastal rivers of Florida.

***Paranais grandis* (Harman, 1977)**

Wapsa grandis Harman, 1977:83, Fig 1.
Paranais grandis; Brinkhurst and Coates 1985:310, Fig. 2-3; Brinkhurst 1986:56-57.

Diagnosis. Length: 3-4mm; segments: 28+. Dorsal setae from V, bifid, upper tooth longer than lower, 2-3 per bundle. Ventral setae on II longer than all others with upper tooth much longer than lower, 6-7 per bundle. Ventral setae in all other segments also with long upper tooth, but only 3 setae per bundle. Penial setae present, bifid. Body wall papillate.

Distribution and Habitat. Texas and Louisiana. Boggy areas with about 16‰ salinity.

Remarks. This species has long upper teeth similar to *P. frici*, but has a greater number of setae in all bundles: 6-7 on II, and 3 on all others in *P. grandis*, v. 2-4 on II and 1-2 on all others in *P. frici*. The presence of papillae is also shared with *P. birsteini*.

This species is strictly coastal and has as yet not been reported from Florida, but does occur elsewhere in the Gulf of Mexico and may be expected in the panhandle.

Paranais litoralis (Müller, 1784)

Nais litoralis Muller, 1784:120-123, Plate LXXX, fig. 2-6.
Paranais litoralis; Sperber 1948:83-86, Fig. 8A-D, Plate III, fig. 1; Brinkhurst and Jamieson 1971:318-319; Brinkhurst and Coates 1985:304-305, Fig. 1-4; Brinkhurst 1986:56-57.

Diagnosis. Length: 9-14mm (living, 2-3.5mm (preserved); segments: 13-46. Dorsal setae from V, slightly thinner than ventrals. Teeth approximately equal in length, 2-4, mostly 3, per bundle. Ventral setae on II with upper tooth longer than the rest, 4-7 per bundle, slightly longer than the rest; both teeth nearly equal with 2-3 setae per bundle on remaining segments. Penial setae 3-7 per bundle with small bifid tips. Body wall frequently with attached foreign material.

Distribution and Habitat. Hong Kong, Australia, Africa, Europe, widespread throughout North America. Salt or brackish water, generally coastal.

Remarks. The ventral setae on II with long upper teeth with equal teeth on all other setae, and lack of cuticular papillations, separates this from all congeners. This is the most common naidid in coastal rivers of Florida.

Genus. ***Stylaria* LaMarck, 1816**

Type Species. *Stylaria lacustris* (Linnaeus, 1767)

Diagnosis. Eyes usually present, long proboscis present, pigmented anteriorly. Dorsal bundles from VI, composed of non-serrated hairs and simple needles without a nodulus. Ventral setae bifid, lower tooth reduced, shaft with double angular bend proximally, 4-14 per bundle. Penial setae present.

Remarks. This genus is characterized by the long narrow proboscis which may or may not project from a notch between two lateral lobes, the absence of bifid needles and uniquely shaped ventral setae with the characteristic double bend.

Stylaria is considered a monospecific taxon. Specimens with the proboscis arising terminally, not projecting from a notch, have been considered as a separate species. Currently, the accepted viewpoint is that they are the same species, since this character has exhibited a great deal of variation within cultures.

This is a cosmopolitan species distributed throughout the world and North America. This genus is represented by a single species.

Valid Species: *Stylaria lacustris* (Linnaeus, 1767)

***Stylaria lacustris* (Linnaeus, 1767)**

Mille-Pieds a dard Trembley, 1744:80-81, Plate VI, fig. 1.
Nereis lacustris Linnaeus, 1767:1085 (partim).
Nais Proboscidea Muller, 1773:21-22.
Stylaria paludosa LaMarck, 1816:223-224.
Stylaria lacustris; Johnston 1845:443; Sperber 1948:147-149, Fig. 15L, Plate X, XI; Brinkhurst and Jamieson 1971:352-353, Fig. 7.11A-C; Brinkhurst 1986:70-71.
Stylaria fossularis Leidy, 1852c:287; Sperber 1948:149-150; Brinkhurst and Jamieson 1971:354, Fig. 7.11B.

Diagnosis. Length: 5.5-18mm; segments: 23-49. Eyes present, long proboscis present which may or may not arise from between lateral lobes of the prostomium. Dorsal bundles begin on VI with 1-3 non-serrate hairs, and 3-4 simple needles without a nodulus. Ventral setae all similar with a reduced lower tooth, shafts with a double angular bend proximally, 4-14 setae per bundle. Penial setae 1 per bundle, simple, ectally hooked.

Distribution and Habitat. Europe, Asia, Africa, widely distributed throughout North America. Fresh and brackish water, rivers, lakes and ponds, frequently associated with littoral aquatic plants.

Remarks. This species is distinguished from all others by the presence of a long thin proboscis, dorsal hairs and simple needles from VI, and the characteristically shaped ventral setae.

This species is very common throughout North America. Although it is more common north of Florida, it is present in Florida waters, primarily rivers and estuaries where it can withstand salinities from 5-8‰.

Genus. ***Spiridion Knöllner, 1935***

Type Species. ***Spiridion insigne Knöllner, 1935***

Diagnosis. Somatic setae bifid, upper tooth thinner and shorter than lower. Penial setae straight, single pointed with curved tips, 4-11 per bundle. Vas deferens enters atrium apically. Atrium curved with a single prostate attached entally, posterior prostate present in one freshwater species. Ectal part of atrium modified into a complex pseudopenis. Spermathecae paired with short distinct ectal ducts and ental ampullae. Sperm arranged in a random mass.

Remarks. This genus is distinguished by all other Phallodrilinae by the presence of multiple hook-shaped penial setae and the absence of a posterior prostate. Three species are included within this genus. Only *S. insigne* has been reported from the British Isles (Scotland). The remaining taxa have only been reported from Yugoslavia (*Spiridion modricensis* Hrabe, 1973) or freshwater systems in France (*Spiridion phreaticola* Juget, 1987).

Spiridion insigne has 4-6 hooked shaped penial setae on XI. Somatic setae are all bifid with the upper tooth shorter and thinner than lower, 3-5 anteriorly, 1-2(3) posteriorly.

Genus. ***Aktedrilus Knöllner, 1935***

Type Species. ***Aktedrilus monospermathecus Knöllner, 1935***

Diagnosis. Somatic setae bifid. Genital setae absent. Spermathecal pore unpaired or absent, middorsal in anterior of X (except in posterior of IX in *A. dentatus* (Erseus, 1983). Vas deferens enters atrium apically. Atrium curved with an anterior and posterior prostate. Penes present with or without cuticular penis sheath. Spermatheca unpaired with loose masses of sperm, or external spermatophores present.

Remarks. This genus is characterized by the single middorsal spermatheca, anterior and posterior prostates, and a well developed penis, usually with a cuticular sheath. Although this genus is represented by 28 species, only *A. monospermatheca* is known from Britain. This is a small meiobinthic species common in the interstitial, littoral marine beaches. This species is characterized by the absence of a well developed cuticular penis sheath, lack of genital setae, somatic setae with upper tooth thinner and shorter than lower, (2)3-4(5) per bundle anteriorly, (1)2-3(4) per bundle in post-clitellar region.

Genus. ***Phallodrilus Pierantoni, 1902***

Type Species. ***Phallodrilus parthenopaeus Pierantoni, 1902***

Diagnosis. Somatic setae bifid. Modified genital setae present in X and XI. Penial setae of XI single pointed, 2 per bundle. Vas deferens enters atrium apically. Atrium, erect with two prostates. Anterior prostate attached medially to anterior face of atrium, posterior prostate attached ectally to posterior face of atrium. Spermathecae paired with distinct ectal ducts and enlarged ampullae. Sperm arranged in a random mass.

Remarks. This genus is distinguished from other phallodrilins by the presence of a single pair of simple pointed penial setae and a slightly modified spermathecal seta.

Phallodrilus, sensu stricto is now regarded as a monospecific genus (Erseus, 1992). Although the type species was described from Naples, Italy, subsequent records from Britain are now available (Erseus, 1980). This species is unique in having modified spermathecal setae with the upper tooth longer than the lower, a pair of single pointed penial setae, with the inner ends expanded. Somatic setae are bifid with equal teeth, 4 per bundle anteriorly. 2 per bundle in post-clitellar region.

Genus. ***Limnodriloides monothecus*** **Cook, 1974**

Type Species. ***Limnodriloides monothecus*** Cook, 1974: 131-132, Fig. 3; Erseus 1990: 280-283, Fig. 26 A-H.

Diagnosis. Length: 6.5 - 9.2 mm; segments: 53-62. Gut diverticula in IX. All setae bifid; (1) 2-4 setae per bundle anteriorly; 1-2 per bundle in postclitellar segments. Modified genital setae absent. Male pores paired in XI. Spermathecal pore unpaired, located mid-dorsally in X.

Vas deferens enters atrium apically. Prostate attached medially on atrium. Ectal region of atrium produced into a long, convoluted duct terminating in a pseudopenis.

Spermatheca with a very short duct and elongate, slender, ampulla. Sperm arranged as discrete spermatozeugmata.

Remarks. The presence of a gut diverticula in IX, a dorsal unpaired elongate spermatheca in X, the elongate ectal atrial duct, and absence of spermathecal setae distinguish this species from all other Limnodriloidinae.

Erseus (1990) recently separated this species from other closely allied species sharing dorsal unpaired spermatheca by the morphology of the spermathecae. All other species in this complex have smaller more globular ampullae.

This is the only species of Limnodriloidinae currently identified from the British Isles. However, *Limnodriloides winckelmanni* Michaelsen, 1914 has been reported from Scandinavia and may occur in the vicinity of Great Britain. It is easily distinguished from *L. monothecus* by having paired ventral spermathecae and modified spermathecal setae.

Distribution and Habitat. East and west coasts of North America, Scotland, Mediterranean Sea, Bermuda. Subtidal sand and mud to 583 m. most frequently occurring in lower estuaries and nearshore coastal regions.

Genus. ***Limnodriloides*** **Pierantoni 1903**

Type Species. ***Limnodriloides appendiculatus*** Pierantoni 1903

Diagnosis. Coelomocytes small, sparse or absent. All somatic setae bifid crotchets. Papillae absent. Pharyngeal glands conspicuous in IV-V. Gut modified in IX, either a pair of anteriorly directed diverticula or enlarged gut plexus. Genital setae may be present as spoon shaped spermathecal setae in X. Male and spermathecal pores paired or unpaired.

Vas deferens cileated entering non-ciliated atrium apically or subapically. Atrium with a broadly attached prostate connected by a "prostatic pad." Ectal portion of atrium forming a narrow duct terminating in either true penes or pseudopenes.

Spermathecae bipartite, comprised of an ectal duct and variously shaped ental ampulla. Sperm arranged as either a loose mass or in tight bundles, not of the Tubificinae type.

Remarks. As with other genera within the subfamily Limnodrilordinae, this genus is almost exclusively tropical in distribution. Only one species has been reported from the vicinity of the British Isles, *Limnodriloides monothecus*. Dr. C. Erseus has currently revised this genus, separating it into ten genera. His results are currently in press and will be available shortly. Therefore, at the present time a further discussion of this genus is not warranted.

Genus. ***Monopylephorus* Levinsen 1884**

Type Species. ***Monopylephorus rubroniveus***

Diagnosis. Coelomocytes large, abundant. Hair setae present or absent. Vas deferens very short or absent. Modified genital setae absent. Atrium long, tubular covered by a diffuse prostate. Ectal end of atrium enters a short ejaculatory duct terminating in an eversible or protrusible pseudopenis. Spermathecae paired or unpaired, comprised of an ectal duct and an ental ampulla. Sperm arranged in loose masses.

Remarks. The extremely short vas deferens, long tubular prostate covered atrium and lack of genital setae separates *Monopylephorus* from other Ryacodrilinae.

This is the only species of Ryacodrilinae occurring in the British Idles, and is readily distinguished from all other tubificids by the presence of large, abundant "Ryacodrilinae-type" coelomocytes.

These species are readily discriminated based on the presence of hairs and morphology of the bifid crotchets.

Genus. ***Monopylephorus rubroniveus* Levinsen, 1884**

Type Species. ***Monopylephorus rubroniveus*** Levinsen, 1884: 225; Brinkhurst and Jamieson 1971: 556-557, Fig. 8.35E; Baker and Brinkhurst 1981: 942-944, Fig. 1.

Diagnosis. Length: 10-40 mm; segments: 48-74. Setae all bifid, teeth of variable proportions and may be simple pointed, 2-6 per bundle. Genital setae absent. Male pores exit into median copulatory bursa in posterior of XI. Spermathecal pores closely joined or united midventrially in extreme anterior of X. Vasa deferens rudimentary. Tubular atrium long and narrow, covered with diffuse prostate, ectally entering a short ejaculatory duct terminating in a tall protrusible pseudopenis. Pseudopenes enter median copulatory bursa laterally. Spermathecae small, oval with loose masses of sperm.

Distribution and Habitat. Cosmopolitan. Denmark, Britain, France, east coast of North America, Brazil, Black Sea. Common in littoral regions of estuaries and salt marshes.

Remarks. Interspecific variation of the setal morphology has led to a great deal of confusion of this species and has resulted in a considerable amount of synonymy. The primary distinctions separating *M. rubroniveus* from its congeners are: extreme anterior placement and diminutive size of the paired spermathecae, the lack of hair setae, and the relative size of the pseudopenes bearing an indistinct cuticular sheath.

This species differs from the two other species of *Monopylephorus* found in Great Britain by the lack of twisted hair setae (present in *Monopylephorus irroratus*) and paired spermathecae (unpaired in *Monopylephorus parvus*). This species is generally the most common tubificid in salt marsh habitats.

Genus. ***Monopylephorus irroratus* (Verrill, 1873)**

Type Species. ***Clitellio irrorata*** Verrill, 1873 (in part): 324; *Monopylephorus irroratus* Brinkhurst and Jamieson 1971: 559-560, Fig. 8.34A-B; Baker and Brinkhurst 1981: 947-948, Figs. 4-5A, B.

Diagnosis. Length: 15-35 mm; segments: 79-90. Dorsal bundles with 2-4 bifid or slightly pectinate setae, teeth subequal, and 1-2 thin spirally twisted hair setae. Ventral setae 2-4 per bundle, similar to dorsal crotchets. Male pores paired, spermathecal pores located adjacent to anterior margin of X. Vas deferens rudimentary. Tubular atrium long, covered with diffuse prostate, ectally entering a short ejaculatory duct which terminates in a tall eversible pseudopenis. Pseudopenis with 1-3 small internal cuticular processes. Spermathecae paired with short ducts and large ampullae. Sperm arranged in loose masses.

Distribution and Habitat. Cosmopolitan. East coast of North America, France, Britain. Common in estuaries and coastal marine habitats.

Remarks. The thin twisted hair setae immediately separate this species from all other tubificid taxa.

This is a common estuarine species collected through Britain.

Genus. ***Monopylephorus parvus* Ditlevsen, 1904**

Type Species. ***Monopylephorus parvus*** Ditlevsen, 1904: 427, Plate XVI, figs. 25, 26; Brinkhurst and Jamieson 1971: 557-558; Baker and Brinkhurst 1981: 945-946, Fig. 2.

Diagnosis. Length: 8-15 mm; segments: 38-64. Setae all bifid, teeth approximately equal anteriorly, may be simple pointed posteriorly. In mature specimens the upper tooth of ventrals longer than lower in VII, VIII, IX and XII. Genital setae absent. Male pores open into a common large median bursa on XI. Spermathecal pore single, opening medially on anterior portion of X. Vas deferens short entering narrow prostate covered atrium, ectally entering a short ejaculatory duct terminating in an upright protrusible pseudopenis. Pseudopenis enters a common median bursa. Spermatheca single, only present on the left side; with a short duct and elongate ampulla containing loose sperm mass.

Distribution and Habitat. Cosmopolitan. East and west coasts of North America, India, South Africa, Brazil, Denmark. Common in littoral regions of estuaries and salt marshes.

Remarks. This species is readily distinguished from all congeners by lack of hair setae, modified ventral setae in VII, VIII, IX and XII, and a single spermatheca in X. Genitalia are frequently shifted anteriorly for a variable number of segments in the Ryacodrilinae. Some specimens of this species have been observed to have a single spermatheca in both IX and X.

This species commonly occurs in the vascular tissue of salt marsh grass co-occurring with enchytraeids.

Genus. ***Tubificoides*** **Lastockin, 1937**

Type Species. ***Tubificoides heterochaetus*** Lastockin, 1937 = ***T. swirencowi*** Jaroschenko, 1948

Diagnosis. Coelomocytes small, sparse or absent. Prostomium frequently retractable. Dorsal setae may include hairs, bifids, single pointed or pectinate crotchets. Ventral setae bifid or simple pointed crotchets. Modified genital setae absent. Male pores paired, located ventrally or laterally in posterior part of XI. Spermathecal pores paired located medially on ventrum of X.

Male ducts paired in XI. Vas deferens ciliated, entering atrium subapically opposite a large prostate. Ental portion of atrium caplike, heavily granulated. Main body of atrium cylindrical, erect or variously comma shaped. Ectal end of atrium terminating in an eversible penis bearing a cuticular penis sheath (except in *Tubificoides inops* Erseus, 1989, which lacks a penis sheath).

Spermathecae bipartite, comprised of an ectal cylindrical canal, and an ental rounded or pear-shaped ampulla. Sperm arranged in slender, spindle-shaped spermatozeugmata.

Remarks. The distinctive shape of the atrium terminating in a cuticular penis sheath separates this genus from all other tubificids. Additionally, this is the only marine genus which may have hair setae in the dorsal bundles. Only one other marine genus, *Tectidrilus*, includes species with cuticular papillation and a retractable prostomium. But these genera are immediately separable by the presence of spermatozeugmata in *Tubificoides*, whereas *Tectidrilus* has loosely bundled sperm in the spermatheca and a pair of gut diverticula in IX.

The presence or absence of papillae, morphology and number of setae per bundle, and shape of the cuticular penis sheath are the primary diagnostic characters for specific discrimination.

Species Reported from the Vicinity of Great Britain

T. amplivasatus (Erseus, 1975)
T. scoticus Brinkhurst, 1985
T. swirencoides Brinkhurst, 1985
T. insularis (Stephenson, 1922)
T. pseudogaster (Dahl, 1960)
T. crenacoleus Baker, 1983
T. diazi Brinkhurst & Baker, 1979
T. brownae Brinkhurst & Baker, 1979
T. heterochaetus (Michaelsen, 1926)
T. benedii (Udekeme, 1855)

Genus. ***Clitellio* Savigny, 1820**

Type Species. ***Lumbricus arenarius*** Muller, 1776

Diagnosis. Coelomocytes absent. Dorsal and ventral setae simple or faintly bifid. Male and spermathecal pores paired, located in line with ventral setae in XI and X respectively.

Male pores paired. Vas deferens ciliated entering tubular atrium. Prostates absent. Atrium terminating ectally in a protrusible penis.

Spermathecae with discrete ducts and oval ampullae. Sperm arranged in slender spermatozeugmata.

Remarks. The lack of prostates on a very simple tubular atrium separates this genus from all others.

This is a large worm frequently occurring with *Tubificoides benedii* in estuaries. Currently this genus is only comprised of two species. The type species is frequently abundant in the temperate regions of North America and Europe, and can be distinguished by its congener, *Clitellio saxosus* Finogenova, 1985 by the simple pointed or slightly bifid setae in C. *arenarius*. *C. saxosus* has only been reported from the eastern USSR.

MARINE & BRACKISHWATER TUBIFICIDAE Marintub. Lst

Oct. 1993

SUBFAMILY LIMNODRILOIDINAE

52 genera
461 species

~~Thalassodrilides Brinkhurst & Baker, 1979~~

Thalassodrilides Brinkhurst & Baker, 1979

gurwitschi (Hrabe, 1971*).
belli (Cook, 1974)
? milleri Brinkhurst & Baker, 1979, sp.dub.
ineri (Righi & Kanner, 1979)
bruneti Erséus, 1990*
briani Erséus, 1992*

Mike Milligan
P.O. Box 37534
Sarasota
Florida 34278
0101
Fax & 813-365-5540

Parakaketio Erséus, 1982

longiprostatus Erséus, 1982*.

Doliodrilus Erséus, 1984

tener Erséus, 1984*.
diverticulatus Erséus, 1985*
puertoricensis Erséus & Milligan, 1988

Tectidrilus Erséus, 1982*)

squalidus Erséus, 1982*.
gabriellae (Marcus, 1950)
verrucosus (Cook, 1974)
bori (Righi & Kanner, 1979)
diversus Erséus, 1982*
pictoni (Erséus, 1984*)
arabicus Erséus, 1985*
achaetus Erséus & Qi, 1985
intermixtus Finogenova, 1986
pranzoi Erséus, 1987*
probus Erséus, 1991*
profusus Erséus, 1991*

Smithsonidrilus Brinkhurst, 1966

marinus Brinkhurst, 1966
hummelincki (Righi & Kanner, 1979)
westoni Erséus, 1982*
luteolus (Erséus, 1983*)

grandiculus (Erséus, 1983*)
minusculus (Erséus, 1983*)
tuber (Erséus, 1983*)
capricornae (Erséus, 1983*)
sacculatus (Erséus, 1983*)
irregularis (Erséus, 1983*)
vesiculatus (Erséus, 1984*)
tenuiculus (Erséus, 1984*)
peruanus (Finogenova, 1986)
assimilis (Erséus, 1990*)
appositus Erséus, 1990*
pauper Erséus, 1990*
multiglandularis Erséus, 1990*
involutus Erséus, 1990*
edgari Erséus, 1993*
exspectatus Erséus, 1993*

?Nododrilus gen.n. (in prep.; NOT BE QUOTED)

rubicundus (Erséus, 1982*)
baculatus (Erséus, 1982*)
hastatus (Erséus, 1982*)
parahastatus (Erséus, 1985*)
tarutensis (Erséus, 1986*)
adversus (Erséus, 1990*)
flumineus (Erséus, 1990*)

Limnodriloides Pierantoni, 1903

appendiculatus Pierantoni, 1903
winckelmanni Michaelsen, 1914
agnes Hrabe, 1967
medioporus Cook, 1969*
pierantonii (Hrabe, 1971*)
maslinicensis (Hrabe, 1971*)
barnardi Cook, 1974
monothecus Cook, 1974
victoriensis Brinkhurst & Baker, 1979
vespertinus Erséus, 1982*
sphaerothecus Erséus, 1982*
atriotumidus Erséus, 1982*
validus Erséus, 1982*
virginiae Erséus, 1982*
ascensionae Erséus, 1982*
tenuiductus Erséus, 1982*

uniampullatus Erséus, 1982*
australis Erséus, 1982*
scandinavicus Erséus, 1982*
armatus Erséus, 1982*
toloensis Erséus, 1984*
fuscus Erséus, 1984*
bipapillatus Erséus, 1985*
basilicus Finogenova, 1986
clavellatus Finogenova, 1986
hrabetovae Erséus, 1987*
faxatus Erséus & Milligan, 1988
olearius Erséus & Milligan, 1989*
hawaiiensis Erséus & Davis, 1989
insolitus Erséus, 1989*
thrushi Erséus, 1989*
stercoreus Erséus, 1990*
problematicus Erséus, 1990*
cribensis Erséus, 1990*
macinnesi Erséus, 1990*
biforis Erséus, 1990*
anxius Erséus, 1990*
major Erséus, 1990*
sacculus Erséus, 1990*
triplus Erséus, 1990*
fraternus Erséus, 1990*
brycei Erséus, 1990*
janstocki Erséus, 1992*
callosus sp.n.

SUBFAMILY RHYACODRILINAE

Heterodrilus Pierantoni, 1902

arenicolus Pierantoni, 1902
subtilis (Pierantoni, 1919)
queenslandicus (Jamieson, 1977)
ersei (Giere, 1979)
minisetosus Erséus, 1981
ascensionensis Erséus, 1981
lacertosus Erséus, 1981
scitus Erséus, 1981
keenani Erséus, 1981
claviatriatus Erséus, 1981
jamiesoni Erséus, 1981
occidentalis Erséus, 1981
pentcheffi Erséus, 1981

bulbiporus Erséus, 1981
quadrithecatus (Erséus, 1981)
inermis (Erséus, 1981)
maccaini Erséus, 1985
hispidus Erséus, 1986
perkinsi Erséus, 1986
paucifascis Milligan, 1987
maiusculus Erséus, 1988
flexuosus Erséus, 1990
rarus Erséus, 1990
modestus Erséus, 1990
virilis Erséus, 1992
amplus Erséus, 1992
salmonensis Erséus, 1993
apparatus Erséus, 1993

Heronidrilus Erséus & Jamieson, 1981

fastigatus Erséus & Jamieson, 1981
bihamis Erséus & Jamieson, 1981
heronae (Erséus & Jamieson, 1981)
hutchingsae Erséus, 1990
gravidus Erséus, 1990
clayi Erséus, 1993

Ainudrilus Finogenova, 1982

oceanicus Finogenova, 1982 (=Vadicola aprostatus Baker, 1982)
lutulentus (Erséus, 1984)
gibsoni Erséus, 1990
taitamensis Erséus, 1990
geminus Erséus, 1990

(freshwater:billabongus (Brinkhurst, 1984))

Paupidrilus

breviductus Erséus, 1990

Torodrilus Cook, 1970

lowryi Cook, 1970

Rhizodrilus Smith, 1990

(type species, freshwater: lacteus Smith, 1900)

pacificus (Brinkhurst & Baker, 1979)
russus Erséus, 1990

(freshwater: africanus (Michaelsen, 1913; ??arthingtonae (Jamieson, 1978))

Monopylephorus Levinsen, 1884

rubroniveus Levinsen, 1884
irroratus (Verrill, 1873)
parvus Ditlevsen, 1904
aucklandicus (Benham, 1909)
evertus Baker & Brinkhurst, 1981
cuticularis Baker & Brinkhurst, 1981

(freshwater: limosus (Hatai, 1898); kermadecensis (Banham, 1915); moleti Brinkhurst & Marchese, 1897)

Jolydrilus Marcus, 1965

jaulus Marcus, 1965

SUBFAMILY PHALLODRILINAE

Phallodrilus Pierantoni, 1902

parthenopaeus Pierantoni, 1902

Somalidrilus Erséus, 1992

elongatus (Erséus, 1990)

Milliganius Erséus, 1992

sabulosus (Erséus, 1979)
compactus (Erséus, 1990)

Phallodriloides Erséus, 1992

exiguus (Erséus, 1979)

lobatus (Erséus, 1983)
macmasterae (Erséus, 1986)
singularis (Erséus, 1990)
pinnulatus Erséus, 1992

Albanidrilus Erséus, 1992

wellsi (Erséus, 1990)
magnificus Erséus, 1993

Abyssidrilus Erséus, 1992

profundus (Cook, 1970)
remus (Erséus, 1979)
altus (Erséus, 1980)
segonzaci (Erséus, 1986)
stilus (Erséus, 1986)
hessleri (Erséus, 1989)
opulentus Erséus, 1992
potens Erséus, 1992
altoides Erséus, 1992

(freshwater: cuspis Erséus & Dumnicka, 1988; subterraneus Rodriguez & Giani, 1989)

Paraktedrilus Erséus, 1992

bakeri (Kossmagk-Stephan & Erséus, 1985)

Aktedrilus Knöllner, 1935

monospermathecus Knöllner, 1935
ponticus (Hrabe, 1973)
svetlovi Finogenova, 1976
arcticus Erséus, 1978
parvithecatus (Erséus, 1978)
longitubularis Finogenova & Shurova, 1980
magnus Erséus, 1980
brevis Erséus, 1980
curvipenis Erséus, 1980
floridensis Erséus, 1980
locyi Erséus, 1980
parviprostatus Erséus, 1980

mediterraneus (Erséus, 1980)
labeosus (Baker & Erséus, 1982)
sphaeropenis Erséus & Kossmagk-Stephan, 1982
oregonensis Strehlow, 1982
dentatus Erséus, 1983
martiniquensis Erséus, 1983
sinensis Erséus, 1984
mortoni Erséus, 1984
cuneus Erséus, 1984
paradentatus Erséus, 1985
parvulus Erséus, 1987
knoellneri Erséus, 1987
sardus Erséus, 1987
fissilis Erséus, 1990
triplex Erséus, 1990
cavus Erséus, 1990

(freshwater: argatxae Giani & Rodriquez, 1988)

Jamiesoniella Erséus, 1981

athecata Erséus, 1981
bahamensis Erséus, 1981
enigmatica Erséus, 1990

Uniporodrilus Erséus, 1979

granulothecus Erséus, 1979
scirpiculus (Erséus, 1985)
nasutus (Erséus, 1990)
bipartitus (Erséus, 1990)
furcatus Erséus, 1992
purus Erséus & Milligan, 1993

Nootkadrilus Baker, 1982

compressus Baker, 1982
frigidus (Brinkhurst, 1971)
longisetosus (Brinkhurst & Baker, 1979)
verutus Baker, 1982
hamatus Baker, 1982
grandisetosus Baker, 1982
gracilisetosus Baker, 1982

Inermidrilus Erséus, 1992

georgei (Erséus, 1987)

Gianius Erséus, 1992

(type sp., freshwater: aquaedulcis (Hrabe, 1960))

cristolatus (Erséus, 1983)
densespectinis (Erséus, 1987)
monnioti (Erséus, 1987)

(freshwater: riparius (Giani & Martinez-Ansemil, 1981); crypticus (Rodriguez & Giani, 1989); labouichensis (Rodriguez & Giani, 1989))

Mexidrilus Erséus, 1992

constrictus (Erséus, 1988)
postspermathecatus (Erséus, 1980)
grasslei (Erséus, 1984)
davisi (Erséus, 1984)
christeri (Davis, 1985)
minutissimus (Erséus, 1987)
nidarosiensis (Erséus, 1987)
vescus (Erséus, 1989)
obtusus Erséus, 1992
immodicus Erséus, 1993

Peosidrilus Baker & Erséus, 1979

biprostatus Baker & Erséus, 1979
coeloprostatus (Cook, 1969)
obscurus (Cook, 1969)
simplidentatus (Erséus, 1979)
acochlearis (Erséus & Loden, 1981)
boeschi (Erséus, 1984)
caviatriatus (Erséus, 1984)
dorsospermatheca (Davis, 1985)
hirsutus (Erséus, 1986)
vicinus (Erséus, 1990)
dalei Erséus, 1992
aduncus Erséus, 1992
riseri Erséus, 1992

Peosidriloides Erséus & Milligan, in press

flabellifer (Erséus, 1984)
hornensis Erséus & Milligan, in press

Adelodrilus Cook, 1969

anisosetosus Cook, 1969
voraginus (Cook, 1970)
kiselevi (Finogenova, 1972)
(? borcei (Hrabe, 1973); = kiselevi??)
pusillus Erséus, 1978
cooki Erséus, 1978
magnithecatus Erséus, 1979
multispinosus Erséus, 1979
fimbriatus Erséus, 1983
cristatus Erséus, 1983
inopinatus Erséus & Davis, 1984
correptus Erséus & Davis, 1984
pilatus Erséus & Davis, 1984
bacrionis Davis, 1985

Bermudrilus Erséus, 1979

peniatus Erséus, 1979

Atlantidrilus Erséus, 1982

styloatriatus (Erséus, 1979)
quadrisetis Erséus, 1982
vulnus (Erséus, 1983)
biparis (Erséus, 1983)
rostratus (Erséus, 1984)
vestigium (Davis, 1985)
peregrinus Erséus, 1989
hamulus Erséus, 1992

Thalassodrilus Brinkhurst, 1963

prostatus (Knöllner, 1935)
hallae (Cook & Hiltunen, 1975)
firmus (Erséus, 1979)
klarae Erséus, 1987
bicki Erséus, in press

Pirodrilus Erséus, 1992

minutus (Hrabe, 1973)
parviatriatus (Cook, 1971)
pinguis (Erséus, 1983)
messanensis (Erséus, 1987)

Pirodriloides Erséus, 1992

albanensis (Erséus, 1990)

Marionidrilus Erséus, 1992

inconspicuus (Erséus, 1979)
antarcticus Erséus, in press
weddellensis Erséus, in press

Spiridion Knöllner, 1935

insigne Knöllner, 1935
modricensis (Hrabe, 1973)

(freshwater: phreaticola (Juget, 1987))

Pectinodrilus Erséus, 1992

rectisetosus (Erséus, 1979)
deminutius (Erséus, 1979)
marionensis (Erséus, 1979)
heronensis (Erséus, 1981)
tempestatis (Baker, 1981)
timmi (Finogenova, 1985)
duplex (Erséus, 1987)
molestus (Erséus, 1988)
ampullarius (Erséus & Davis, 1989)
granifer (Erséus, 1990)
nervosus (Erséus, 1990)
multiplex (Erséus, 1990)
disparatus Erséus, 1992
hoihaensis Erséus, 1992
vitreus Erséus, 1993

Pacifidrilus Erséus, 1992

vanus (Erséus, 1984)
darvelli (Erséus, 1984)
aquilinus (Erséus & Davis, 1989)

Pseudospiridion Erséus, 1992

distinctus (Erséus & Davis, 1989)

Coralliodrilus Erséus, 1979

leviatriatus Erséus, 1979
abjornseni (Michaelsen, 1907)
atriobifidus Erséus, 1981
oviatriatus Erséus, 1981
parvigenitalis Erséus, 1981
longiductus Erséus, 1983
tyndarensis Erséus, 1983
giacobbei Erséus, 1983
statutus Erséus, 1983
hamatilis Erséus, 1985
corpulentus Erséus, 1986
aequalis Erséus & Davis, 1989
kirkmani Erséus, 1990
mirus Erséus, 1990
regius Erséus, 1990
priscus Erséus & Milligan, 1992
mollis Erséus, 1993
unicus Erséus, 1993
angustiductus Erséus, 1993
bidentatus Erséus, 1993

Bathydrilus Cook, 1970

asymmetricus Cook, 1970
adriaticus (Hrabe, 1971)
rarisetis (Erséus, 1975)
rohdei (Jamieson, 1977)
atlanticus Erséus, 1979
hadalis Erséus, 1979
meridianus Erséus, 1979
graciliatriatus Erséus, 1979
longus Erséus, 1979
superiovasatus Erséus, 1981

medius Erséus, 1983
longiatriatus Erséus, 1983
argentinae Erséus, 1983
sandersi Erséus, 1983
desbruyeresi Erséus, 1983
litoreus Baker, 1983
torosus Baker, 1983
edwardsi Erséus, 1984
ingens Erséus, 1986
formosus Erséus, 1986
macroprostatus Erséus, 1986
notabilis Erséus & Milligan, 1988
connexus Erséus, 1988
exilis Erséus & Davis, 1989
munitus Erséus, 1990
vetustus Erséus, 1990
egenus Erséus, 1990
parkeri Erséus, 1991
rusticus Erséus, 1991

Duridrilus Erséus, 1983

tardus Erséus, 1983
piger Erséus, 1984
tectus Erséus, 1985
pastoralis Erséus, 1990
kimi Erséus, 1993

Inanidrilus Erséus, 1979

bulbosus Erséus, 1979
leukodermatus (Giere, 1979)
extremus (Erséus, 1979)
falcifer Erséus & Baker, 1982
mexicanus Erséus & Baker, 1982
speroi Erséus, 1984
fijiensis Erséus, 1984
bonomii Erséus, 1984
carterensis Erséus, 1984
gustavsoni Erséus, 1984
wasseri Erséus, 1984
scalprum Erséus, 1984
belizensis Erséus, 1984
aduncosetis Erséus, 1984
vacivus Erséus, 1984
triangulatus Erséus, 1984

ernesti Erséus, 1984
manae Erséus, 1984
renaudae Erséus, 1984
dutchae Erséus & Davis, 1989
reginae Erséus, 1990
elaboratus Erséus, 1990

Olavius Erséus, 1984

(Olavius) longissimus (Giere, 1979)
(Olavius) alius Erséus, 1984
(Olavius) tantulus Erséus, 1984
(Olavius) pravus Erséus, 1990
(Coralliodriloides) avisceralis (Erséus, 1981)
(Coralliodriloides) loisae Erséus, 1984
(Coralliodriloides) hanssoni Erséus, 1984
(Coralliodriloides) strigosus Erséus & Davis, 1989
(Coralliodriloides) mokapuensis Erséus & Davis, 1989
(Coralliodriloides) rottnestensis Erséus, 1993
albidus (Jamieson, 1977)
tenuissimus (Erséus, 1979)
caudatus (Erséus, 1979)
planus (Erséus, 1979)
geniculatus (Erséus, 1981)
filithecatus (Erséus, 1981)
comorensis (Erséus, 1981)
clavatus (Erséus, 1981)
imperfectus Erséus, 1984
propinquus Erséus, 1984
cornuatus Davis, 1984
pellucidus Erséus, 1984
macer Erséus, 1984
manifae Erséus, 1986
verpa Erséus, 1986
latus Erséus, 1986
bullatus Finogenova, 1986
crassitunicatus Finogenova, 1986
parapellucidus Erséus & Davis, 1989
finitimus Erséus, 1990
vacuus Erséus, 1990
tannerensis Erséus, 1991
rallus Erséus, 1991
separatus Erséus, 1993
patriciae Erséus, 1993
fusus Erséus, 1993
prodigus Erséus, 1993

SUBFAMILY TUBIFICINAE

Tubificoides Lastockin, 1937

swirenkowi Jaroschencko, 1937
benedii (d'Udekem, 1855)
insularis (Stephenson, 1922)
heterochaetus (Michaelsen, 1926)
pseudogaster (Dahl, 1960)
apectinatus (Brinkhurst, 1965)
longipenis (Brinkhurst, 1965)
euxinicus (Hrabe, 1966)
intermedius (Cook, 1969)
aculeatus (Cook, 1970)
dukei (Cook, 1970)
maritimus (Hrabe, 1973)
amplivasatus (Erséus, 1975)
diazi Brinkhurst & Baker, 1979
brownae Brinkhurst & Baker, 1979
wasselli Brinkhurst & Baker, 1979 (=foliatus Baker, 1983)
denouxi Shirley & Loden, 1982
kozloffi Baker, 1983
palacoleus Baker, 1983
cuspisetosus Baker, 1983
crenacoleus Baker, 1983
scoticus Brinkhurst, 1985
pseudapectinatus Brinkhurst, 1985
parapectinatus Brinkhurst, 1985
imajimai Brinkhurst, 1985
motei Brinkhurst, 1986
fraseri Brinkhurst, 1986
annulus Erséus, 1986
bermudae Råsmark & Erséus, 1986
aguadillensis Milligan, 1987
bobi Helgason & Erséus, 1987
uncinatus Helgason & Erséus, 1987
parviductus Helgason & Erséus, 1987
vestibulatus Erséus & Bonomi, 1987
galiciensis Martinez-Ansemil & Giani, 1987
crinitus Erséus, 1989
panamensis Erséus, 1989
inops Erséus, 1989
bruneli Erséus, 1989.
paracrinitus Erséus & Milligan, 1989
pequegnatae Erséus & Milligan, 1989
pulvereus Erséus & Davis, 1989
pollex Milligan, 1991

lunatus Milligan, 1991

?? additional spp. - check literature once more..

(freshwater: galarzai Giani & Rodriguez, 1988)

Clitellio Savigny, 1820

arenarius (Müller, 1776)
saxosus Finogenova, 1985
poseidonicus (Finogenova, 1985) (in subgenus Clitelloides Finogenova, 1985, according to Finogenova 1991)
orientalis Finogenova, 1991 (placed in subgen. Clitelloides by Finogenova)

Tubifex Lamarck, 1816

(type sp., freshwater: tubifex (Müller, 1774))

nerthus Michaelsen, 1908

(other spp. in freshwater)

Christerius Holmquist, 1985

litoralis (Erséus, 1976)

Heterochaeta Claparède, 1863

costata Claparéde, 1863

Isochaetides Hrabe, 1966

hamata (Moore, 1905)
michaelseni (Lastockin, 1937)

(other spp. in freshwater)

Psammoryctides Hrabe, 1964

deserticola (Grimm, 1877)
lastoschkini (Jaroschenko, 1948)

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[61] pp. 1270-1283

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[99] pp. 337-342

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Barton, D.R. 1988

Distribution of some common benthic invertebrates in nearshore Lake Erie, with emphasis on depth and type of substratum.

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Bass, D. 1992

Colonization and succession of benthic macroinvertebrates in Arcadia Lake, a South-Central USA reservoir.

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Composition and diversity of the profundal macrobenthic community in the polluted Lake Nemi (central Italy), 1979-1980.

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Oligochaetes reported from estuarine conditions.

Tubificoides swirenocoides: Forth, Humber, Solway, Tamar, Tees.
Tubificoides scoticus: Forth.
Tubificoides pseudogaster: Clyde Est, Dumbarton, Dundee foreshore, Forth, Humber, North Sea, Tay, Throughout estuaries in North East, Throughout estuaries in South West, Weston-Super-Mare.
Tubificoides insularis?: Uncommon in estuaries in North East.
Tubificoides insularis: Braughty, Forth, Tay.
Tubificoides heterochaetus: Thames Est.
Tubificoides diazi: Forth, Harwich, Wash.
Tubificoides crenacoleus: Tyne.
Tubificoides benedii: All Estuaries in Solway RPB region, Clyde Est, Estuaries throughout the UK, Firth of Clyde, Forth, Humber, Inverk Bay, R Ythan, Severn, Staithes, Tay Nshore, Thames Est, Throughout estuaries in North East, Throughout estuaries in South West
Tubificoides amplivasatus: Forth, Humber, North Sea, Severn, Weston-Super-Mare.
Tubificidae sp (immature without hairs): R Ythan.
Tubificidae indet: Braughty, Tay.
Tubifex tubifex: Thames Est.
Tubifex nerthus: Urr.
Tub'pse': Humber.
Tub sp cf galiciensis (insularis): Forth, Tees.
Psammoryctes barbatus: Thames Est.
Potamothrix (Euilyodrilus) hammoniensis: Thames Est.
Phalodrilus prostatus: Tay.
Paranais littoralis: Clyde Est, Eden, Firth of Clyde, Forth, Humber, R Don NE Scotland, Seal Sands, Tees, Teignmouth.
Paranais frici: Humber.
Nais elinguis: R Don NE Scotland.
Monopylephorus irroratus: Cree, Gt Ouse.
Lumbricillus lineatus?: Lower Tees, Tweed Est, Tyne Est.
Limnodrilus udekemianus: Thames Est.
Limnodrilus hoffmeisteri: Clyde Est, Severn, Thames Est.
Heterochata costata: All Estuaries in Solway RPB region, Dundee foreshore, Forth, Mersey, R .
Heterochaeta costata: Clyde Est, Garwick Est, Holy Loch.
Grania sp: Solway.
Enchytraidae: All Estuaries in Solway RPB region.
Enchytraidae spp: R Don, R Ythan.
Enchytraid spp: Humber.
Enchytraid indet.: Thames Est.
Deveron, R Ythan, Solway, Tay, Thames Est, Throughout estuaries in North East, Throughout estuaries in South West, Upper Wash Estuaries.
Clitellio arenarius: Braughty, Forth, Humber, Inverkething Bay, Tay, Thames Est.
Amphichaeta sannio: Forth.

Oligochaetes reported from upper estuarine or freshwater conditions.

Tubificoides benedii: All Estuaries in Solway RPB region, Estuaries throughout the UK, Forth, Inverk Bay.
Tubificidae indet: Drainage ditch/stream.
Tubifex tubifex: Clyde Est, Forth, Humber, Thames Est, Upper Wash Estuaries.
Stylodirilus heringianus: Thames Est.
Stylaria lacustris: Clyde Est, Forth, Thames Est.
Psammoryctes barbatus: Thames Est, Wash estuaries.
Potamothriz (Euilyodrilus) moldaviensis): Thames Est.
Potamothrix (Euilyodrilus) hammoniensis: Thames Est.
Paranais littoralis: Humber.
Nais elinguis?: Inner Farne, Tyne Estuary.
Nais elinguis: Clyde Est, Forth, Thames Est.
Monopylephorus irroratus: Clyde Est, Small estuaries in South West eg Axe.
Lumbriculus variegatus: Thames Est.
Lumbricillus lineatus: Clyde Est.
Limnodrilus udekemianus: Forth, Thames Est, Upper Wash Estuaries.
Limnodrilus hoffmeisteri: Clyde Est, Forth, Thames Est, Upper Wash Estuaries.
Limnodrilus claparedeianus: Thames Est.
Limnodrilus cervix: Thames Est.
Heterochata costata: Forth, Humber, Mersey, Solway, Throughout estuaries in South West, Upper Wash Estuaries
Enchytraidae: All Estuaries in Solway RPB region.
Clitellio arenarius: Some estuaries in South West.
Branchiura sowerbyi: Thames Est.
Aulodrilus pluriseta: Thames Est.
Amphichaeta sannio: Humber.

Oligochaetes reported from fully marine or near marine conditions.

Tubificoides swirenocoides: Forth, Loch Ryan.
Tubificoides scoticus: Offshore Northumberland.
Tubificoides pseudogaster: Forth, North Sea, Thames Est, Throughout estuaries in North East.
Tubificoides insularis?: Uncommon in estuaries in North East.
Tubificoides insularis: Firth of Clyde, Forth, Irvine Bay, Large estuaries in South West eg Tamar and Fal.
Tubificoides diazi: Liverpool Bay.
Tubificoides brownae: Outer Thames Est.
Tubificoides benedii: All Estuaries in Solway RPB region, Clyde Est, Firth of Clyde, Forth, Inverk Bay, Throughout estuaries in North East.
Tubificoides amplivasatus: Exemouth, Firth of Clyde, Forth, Garroch Hend, Harwich, Humber, Irvine Bay, Loch Ryan, North Sea, Off Tyne, Offshore Northumberland, Wash
Tub sp cf swirencoides: Coastal, Tamar.
Tub sp cf galiciensis (insularis): Coastal and Estuary Mouth in South West, Forth.
Paranais littoralis: Clyde Est, Firth of Clyde, Loch Ryan, Seal Sands, Tees.
Lumbricillus sp: Firth of Clyde, Girvan, Largs.
Limnodroides scandinavicus: Sullom voe.
Limnodriloides scandinavicus: Firth of Clyde, Irvine Bay.
Heterochaeta costata: Clyde Est, Garwick Est, Holy Loch.
Grania spp: Northern North Sea 61N 2E.
Grania sp: Firth of Clyde, Girvan, Loch Ryan, North Sea.
Enchytraidae: All Estuaries in Solway RPB region.
Enchytraidae: .
Enchytraidae spp: Sandford bay.
Enchytraeus albidus?: Cullercoats, Wansbeck.
Clitellio arenarius: Fenham flats, Forth, Inverkething Bay, Seal Sands (Tees), Tyne area shores.

Key to depth, salinity, and sediment data in full list of oligochaetes reported table.

Depth

0	intertidal
1	<15m
2	<30m
3	<50m
4	>=50m

'Salinity'

FW	freshwater
UE	upper estuary
ME	mid estuary
LE	lower estuary
OE	outer estuary
GE	estuary
NM	near marine
FM	fully marine

Sediment

M	mud
S	sand
Sh	shell
G	gravel
Cl	clay
Si	silt

Tubificidae Reported at Oligochaete '94

Species	Found	Salinity	Depth	Sediment	Reported by
Tubificoides swirenocoides	Tamar	ME	1	M	Peter Barfield & Treveor Baker
Tubificoides swirenocoides	Humber	LE	0&1	M	Helgi Gudmundson
Tubificoides swirenocoides		LE-NM	1	M	Roger Proudfoot
Tubificoides swirenocoides	Loch Ryan	FM	1	SiCl	David Rendall
Tubificoides swirenocoides	Humber & Tees & Solway	ME-LE	1	M	Martin Dyer
Tubificoides swirenocoides	Forth	ME-FM	1&2	M	Steve Hull
Tubificoides scoticus	Offshore Northumberland	FM	3	M	Roger Proudfoot
Tubificoides scoticus	Forth	ME-LE	1&2	M	Steve Hull
Tubificoides pseudogaster	Weston-Super-Mare	ME	0	M	Mitch&Sarah
Tubificoides pseudogaster	Dumbarton & Clyde Est	GE			Myles O'Reilly & Jeni boyle
Tubificoides pseudogaster	Thames Est	OE	1&2		Clare Dale
Tubificoides pseudogaster	Humber	ME	0	M	Liz Morris
Tubificoides pseudogaster	Throughout estuaries in South West	ME&LE	0&1	M	Peter Barfield & Treveor Baker
Tubificoides pseudogaster	Throughout estuaries in North East	ME-NM	1	M	Roger Proudfoot
Tubificoides pseudogaster	Forth & North Sea	ME-FM	1-4	M-S	Steve Hull
Tubificoides pseudogaster	Tay & Dundee foreshore	ME	0	G	
Tubificoides insularis?	Uncommon in estuaries in North East	LE-NM	1	M	Roger Proudfoot
Tubificoides insularis	Irvine Bay & Firth of Clyde	FM	1		Myles O'Reilly & Jeni boyle
Tubificoides insularis	Large estuaries in South West eg Tamar & Fal	NM	1&2	MSG	Peter Barfield & Treveor Baker
Tubificoides insularis	Forth	ME-FM	1&2	M-MS	Steve Hull
Tubificoides insularis	Tay & Braughty	LE	1	S-G	
Tubificoides heterochaetus	Thames Est	LE	1	MS	Clare Dale
Tubificoides diazi	Liverpool Bay	FM	2	MS	Marie Pendle
Tubificoides diazi	Wash & Harwich	GE-FM	1	M	Martin Dyer
Tubificoides diazi	Forth	ME	1	M	Steve Hull
Tubificoides crenacoleus	Tyne	ME	1	M	Elaine cunningham
Tubificoides brownae	Outer Thames Est	FM	2	MShS	Marie Pendle

Tubificidae Reported at Oligochaete '94

Species	Found	Salinity	Depth	Sediment	Reported by
Tubificoides benedii	Severn	ME	0	M	Andy Robinson
Tubificoides benedii	Clyde Est & Firth of Clyde	FM&GE			Myles O'Reilly & Jeni boyle
Tubificoides benedii	Thames Est	ME&LE	1&2	M-MS	Clare Dale
Tubificoides benedii	Humber	ME	0	M	Liz Morris
Tubificoides benedii	Staithes	Coastal with FW stream influence	0	S-M on rocky shore	Liz Morris
Tubificoides benedii	Throughout estuaries in South West	ME/LE&GE	0&1	M	Peter Barfield & Treveor Baker
Tubificoides benedii	Humber	ME-OE	0&1	M	Helgi Gudmundson
Tubificoides benedii	Throughout estuaries in North East	ME-NM	0&1	M	Roger Proudfoot
Tubificoides benedii	All Estuaries in Solway RPB region	UE-FM	0	S-SiCl	David Rendall
Tubificoides benedii	R Ythan	LE	0	M	Nicky Rowberry
Tubificoides benedii	Nycomed (Norwegain Fjord)				Sue Hamilton
Tubificoides benedii	Estuaries throughout the UK	UE-LE	1	M	Martin Dyer
Tubificoides benedii	Forth & Inverk Bay	UE-FM	0&1	M-S	Steve Hull
Tubificoides benedii	Tay Nshore	LE	0	G	
Tubificoides amplivasatus	Severn	ME	1	M	Andy Robinson
Tubificoides amplivasatus	Weston-Super-Mare	ME	0	M	Mitch&Sarah
Tubificoides amplivasatus	Off Tyne	FM	4	MS	Marie Pendle
Tubificoides amplivasatus	Irvine Bay & Garroch Hend & Firth of Clyde	FM			Myles O'Reilly & Jeni boyle
Tubificoides amplivasatus	Humber	LE-OE	1	M	Helgi Gudmundson
Tubificoides amplivasatus	Offshore Northumberland	FM	3	M	Roger Proudfoot
Tubificoides amplivasatus	Loch Ryan	FM	1	SiCl	David Rendall
Tubificoides amplivasatus	Harwich, Humber, Wash, Exemouth	FM/NM	1	MS	Martin Dyer
Tubificoides amplivasatus	Forth & North Sea	ME-FM	0-4	M-MS	Steve Hull
Tubificoides 'pseudogaster'	Humber	ME-OE	1	M	Helgi Gudmundson
Tubificidae sp (immature without hairs)	R Ythan	LE	0	M	Nicky Rowberry
Tubificidae indet	Tay & Braughty	LE	0&1	G	
Tubificidae indet	Drainage ditch/stream	UE	0	M	Roger Proudfoot
Tubifex tubifex	Clyde Est	UE&FW			Myles O'Reilly & Jeni boyle
Tubifex tubifex	Thames Est	UE&ME	1	GSM	Clare Dale

Tubificidae Reported at Oligochaete '94

Species	Found	Salinity	Depth	Sediment	Reported by
Tubifex tubifex	Humber	UE	0	SM	Helgi Gudmundson
Tubifex tubifex	Upper Wash Estuaries	UE/FW	1	M	Martin Dyer
Tubifex tubifex	Forth	UE-FW	0&1	M	Steve Hull
Tubifex nerthus	Urr	ME	0	SiCl	David Rendall
Tubficioides sp cf galiciensis	Coastal & Estuary Mouth in South West	FM&NM	1&2	MS	Peter Barfield & Treveor Baker
Tubficioides sp cf galiciensis		LE-NM	1	M	Roger Proudfoot
Tubficioides sp cf galiciensis	Tees	LE	1	M	Martin Dyer
Tubficioides sp cf galiciensis	Forth	ME-FM	1&2	M	Steve Hull
Tub sp cf swirencoides	Tamar & Coastal	FM/NM	1	MS	Peter Barfield & Treveor Baker
Stylodirilus heringianus	Thames Est	UE	1	GSM	Clare Dale
Stylaria lacustris	Thames Est	UE	1	GSM	Clare Dale
Stylaria lacustris	Forth	UE/FW	1	M	Steve Hull
Stylaria lacustris	Clyde Est	UE&FW			Myles O'Reilly & Jeni boyle
Psammoryctides barbatus	Thames Est	UE&ME	1	GSM	Clare Dale
Psammoryctides barbatus	Wash estuaries	UE/FW	0	M	Martin Dyer
Potamothriz (Euilyodrilus) moldaviensis)	Thames Est	UE	1	GSM	Clare Dale
Potamothrix (Euilyodrilus) hammoniensis	Thames Est	UE&ME	1	GSM	Clare Dale
Phalodrilus prostatus	Tay	ME?	1	G	
Paranais littoralis	Firth of Clyde & Clyde Est	FM&GE	2		Myles O'Reilly & Jeni boyle
Paranais littoralis	Humber	UE&ME	0	M	Liz Morris
Paranais littoralis	Estuaries in South West		0	M	Peter Barfield & Treveor Baker
Paranais littoralis	Humber	LE-UE	0	M	Helgi Gudmundson
Paranais littoralis	Tees & Seal Sands	LE-NM	0	SM	Roger Proudfoot
Paranais littoralis	Loch Ryan	FM	1	SiCl	David Rendall
Paranais littoralis	R Don NE Scotland	LE	0	M	Nicky Rowberry
Paranais littoralis	Humber & Teignmouth	GE-FM	0	M	Martin Dyer
Paranais littoralis	Forth	ME	1	M	Steve Hull
Paranais littoralis	Eden	ME-LE	0	M	
Paranais frici	Humber	ME	0	M	Liz Morris
Nais elinguis?	Inner Farne & Tyne Estuary	UE			Roger Proudfoot
Nais elinguis	Clyde Est	UE			Myles O'Reilly & Jeni boyle

Tubificidae Reported at Oligochaete '94

Species	Found	Salinity	Depth	Sediment	Reported by
Nais elinguis	Thames Est	UE	1	GSM	Clare Dale
Nais elinguis	R Don NE Scotland	LE	0	M	Nicky Rowberry
Nais elinguis	Forth	UE/FW	1	M	Steve Hull
Monopylephorus irroratus	Clyde Est	UE			Myles O'Reilly & Jeni boyle
Monopylephorus irroratus	Small estuaries in South West eg Axe	UE	0	M	Peter Barfield & Treveor Baker
Monopylephorus irroratus	Cree	ME	0	SiCl	David Rendall
Monopylephorus irroratus	Gt Ouse	ME	1		Martin Dyer
Lumbriculus variegatus	Thames Est	UE	1	GSM	Clare Dale
Lumbricillus sp	Girvan & Largs & Firth of Clyde	FM	0		Myles O'Reilly & Jeni boyle
Lumbricillus lineatus?	Tyne Est & Lower Tees & Tweed Est	ME	0&1	M	Roger Proudfoot
Lumbricillus lineatus	Clyde Est	UE			Myles O'Reilly & Jeni boyle
Limnodroides scandinavicus	Sullom voe	FM			Sue Hamilton
Limnodrilus udekemianus	Thames Est	UE&ME	1	GSM	Clare Dale
Limnodrilus udekemianus	Upper Wash Estuaries	UE/FW	1	M	Martin Dyer
Limnodrilus udekemianus	Forth	UE-FW	0&1	M	Steve Hull
Limnodrilus hoffmeisteri	Severn	ME	0	S	Andy Robinson
Limnodrilus hoffmeisteri	Clyde Est	FW/GE	1		Myles O'Reilly & Jeni boyle
Limnodrilus hoffmeisteri	Thames Est	UE&ME	1	GSM	Clare Dale
Limnodrilus hoffmeisteri	Upper Wash Estuaries	UE/FW	1	M	Martin Dyer
Limnodrilus hoffmeisteri	Forth	UE-FW	0&1	M	Steve Hull
Limnodrilus claparedeianus	Thames Est	UE	1	GS	Clare Dale
Limnodrilus cervix	Thames Est	UE	1	GSM	Clare Dale
Limnodriloides scandinavicus	Irvine Bay & Firth of Clyde	FM	1		Myles O'Reilly & Jeni boyle
Heterochata costata	Thames Est	ME	1	SM	Clare Dale
Heterochata costata	Humber	UE	0	M	Liz Morris
Heterochata costata	Throughout estuaries in South West	UE&GE	0&1	M	Peter Barfield & Treveor Baker
Heterochata costata	Humber	UE	0	M	Helgi Gudmundson

Tubificidae Reported at Oligochaete '94

Species	Found	Salinity	Depth	Sediment	Reported by
Heterochata costata	Throughout estuaries in North East	ME	0&1		Roger Proudfoot
Heterochata costata	All Estuaries in Solway RPB region	ME&GE	0	SiCl	David Rendall
Heterochata costata	R Ythan & R Deveron	LE	0	M	Nicky Rowberry
Heterochata costata	Upper Wash Estuaries & Mersey & Solway	UE/ME	1	M	Martin Dyer
Heterochata costata	Forth	UE-LE	0&1	M	Steve Hull
Heterochata costata	Tay & Dundee foreshore	ME	0	G	
Heterochaeta costata	Clyde Est & Garwick Est & Holy Loch	FM&GE			Myles O'Reilly & Jeni boyle
Grania spp	Northern North Sea 61N 2E	FM	4	S	Sue Hamilton
Grania sp	Girvan & Firth of Clyde	FM	0		Myles O'Reilly & Jeni boyle
Grania sp	Loch Ryan	FM	1	SiCl	David Rendall
Grania sp	Solway	GE	1	M	Martin Dyer
Grania sp	North Sea	FM	4	M-S	Steve Hull
Enchytraidae spp	Sandford bay	FM	0	S	Nicky Rowberry
Enchytraidae spp	R Don	LE	0	M	Nicky Rowberry
Enchytraidae spp	R Ythan	LE	0	M	Nicky Rowberry
Enchytraidae		ME-FM	0-2	M-S	Steve Hull
Enchytraidae	All Estuaries in Solway RPB region	UE-FM	0	S-SiCl	David Rendall
Enchytraid spp	Humber	GE	1	M	Helgi Gudmundson
Enchytraid indet.	Thames Est	ME	1	M	Clare Dale
Enchytraeus albidus?	Wansbeck & Cullercoats	FM	1	M	Roger Proudfoot
Enchytraeid sp					Peter Barfield & Treveor Baker
Clitellio arenarius	Thames Est	ME	1	M	Clare Dale
Clitellio arenarius	Some estuaries in South West	UE	0		Peter Barfield & Treveor Baker
Clitellio arenarius	Humber	ME/LE	0	MCl	Helgi Gudmundson
Clitellio arenarius	Fenham flats & Tyne area shores & Seal Sands (Tees)	NM-FM	1		Roger Proudfoot
Clitellio arenarius					Martin Dyer
Clitellio arenarius	Forth & Inverkething Bay	ME-FM	0&1	M	Steve Hull
Clitellio arenarius	Tay & Braughty	LE	0	G	
Branchiura sowerbyi	Thames Est	UE	1	GSM	Clare Dale
Aulodrilus pluriseta	Thames Est	UE	1	GSM	Clare Dale
Amphichaeta sannio	Humber	UE	0	M	Liz Morris

Tubificidae Reported at Oligochaete '94

Species	Found	Salinity	Depth	Sediment	Reported by
Amphichaeta sannio	Humber	UE	0	M	Helgi Gudmundson
Amphichaeta sannio	Forth	ME	1	M	Steve Hull

Table 1. Comparison of British species of *Tubificoides*, compiled from literature.

Species	Dorsal Setae: Hair (Bifid) Ant.	Dorsal Setae: Hair (Bifid) Post.	Body Wall Type	Vas Deferens Length (Width)	Atrial Length (Width)	Penis Length (Width)	Type Locality
With Hair Setae							
amplivasatus (Erseus, 1975)	2-4 (1-3)	1-3 (1-3)**	naked	300-500 (25-50)	260-360 (60-160)	30-45 (27)	Norway
insularis (Stepenson, 1992)	1-3(4) (1-3(4))	1 (1)	papillate	very long (40)	1110 (110)	100 (80)	Ireland
scoticus Brinkhurst, 1985	2-3(4) (2-3(4))	2-3(4) (2-3(4))**	naked	660-990 (25)	330 (75)	110 (25)	Scotland
swirencoides Brinkhurst, 1985	(1)(2-3)(4) (1)(2-3)(4)	1-2 (1-2)**	papillate	500-750 (33)	250 (50)	100 (50)	England
Without Hair Setae							
benedii (Udekeme, 1855)	0 (2(3))	0 (1)	papillate	very long (37)	370 (70)	102 (84)	British Channel
brownae Brinkhurst & Baker, 1979	0 (3-5)	0 (1)	naked	860 (36)	430 (50)	75 (33)	Delaware
crenacoleus Baker, 1983	0 (3-5(6))	0 (2-3)	naked	560 (23)	350-430 (44-60)	100 (40)	Beaufort Sea
diazi Brinkhurst & Baker, 1979	0 (3-5(6))	0 (2-3)	naked	720-1440 (17)	210-240 (45-53)	140 (30)	New Jersey
fraseri Brinkhurst, 1986	0 (2-3)	0 (1)	naked	325-585 (13-18)	260 (50)	52 (30)	British Columbia
heterochaetus (Michaelsen, 1926)	0 (4,5)	0 (1,2)**	papillate	330 (35)	315 (100)	46 (36)	Europe
motei Brinkhurst, 1986	0 ((2)3(4))	0 (2(3))	naked	190 (10)	190 (30)	50 (26)	West Florida
pseudogaster (Dahl, 1960)	0 (3-5(6))	0 (11)2(3))	naked	510-1390 (14-27)	430 (36-85)	94 (36)	Denmark
wasselli Brinkhurst & Baker, 1979	0 (2(3))	0 (1)	papillate	300-1500 (19-22)	380 (35)	48 (30)	Delaware

**Simple needle setae.

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Tubificidae features table (ver. 2)

	Body wall	Dorsal hair setae	Anterior dorsal other setae	Posterior dorsal other setae	Anterior ventral other setae	Posterior ventral other setae	Male reproductive organs	Other	Ref
Tubificoides benedii	Densely papillate from II or at least from VI (usually)	No	Reduced or rudimentary UT 2-3 II-III 2 IV-XI	1 from XII	As dorsal	As dorsal	Sheath slightly conical with inflated distal end	Naked animals may be confused with Clitellio arenarius	6
Tubificoides brownae	Naked	No	3-5 UT shorter thinner LT	1 UT thinner same length LT; teeth divergent	3-5 UT shorter thinner LT		1 UT thinner same length LT; teeth divergent	Sheath thin, conical often crumpled in whole mounts	6
Tubificoides crenacoleus	Naked	No	3-5(6) UT thinner as long or longer than LT	2-3 UT thinner as long or longer than LT	As dorsal	As dorsal Absent in X	Sheath cone shaped frequently bearing sub terminal spur	Sharply conical prostomium	6
Tubificoides diazi	Naked	No	(2)3-5(6); most in II&III UT thinner shorter LT	(1)2(3) LT broad same length UT	As dorsal	As dorsal	Sheath cone shaped with blunt projection on post edge	Long thin posterior	6
Tubificoides heterochaetus	Slightly papillate posteriorly	No	UT as long and thick as LT	2(3) with 1 simple pointed & rest with rudimentary LT	As dorsal	*Simple pointed?*	Sheath thick small slightly coned shaped		6
Tubificoides pseudogaster	Naked	No	3-5(6) UT longer LT	(1)2(3) LT broad same length UT	As dorsal	As dorsal	Sheath simple cylinder Always parallel sided		6
Tubificoides amplivasatus	Naked Sub-dermal particles may be present post	2-3(4)	2-3(4) broad lance shaped bifids; UT shorter LT,	Bifids reduced to simple pointed before clit	UT thinner same length LT	As dorsal	Sheath squat thimble like		5
Tubificoides scoticus	Naked or coated in foreign matter May be slightly papillate post	2-3(4)	2-3(4) broad lance shaped bifids; UT shorter LT	Simple pointed from VII	2-5 bifid	3-4 bifid	Sheath long cylinder		5
Tubificoides sp cf galiciensis (Roger Proudfoot's worms)	Papillate from 12-16	2-3 ant 1-2 post	2-3 widely seperated bifids UT slightly shorter LT	1-2 bifids similar to ant	3-5 similar to dorsal	1 similar to dorsal	????	Found in NE england estuaries	5

Abbreviations:
clit-clitellium, post-posterior(ly), ant-anterior(ly), UT-upper tooth, LT-lower tooth

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Tubificidae features table (ver. 2)

	Body wall	Dorsal hair setae	Anterior dorsal other setae	Posterior dorsal other setae	Anterior ventral other setae	Posterior ventral other setae	Male reproductive organs	Other	Ref
Tubificoides insularis	Papillate III-VI	1-3(4) short bent ant 1 post clit	1-3(4) UT shorter thinner LT	1 bifid post clit	3-4 bifid UT shorter thinner lower	1 post clit bifid V thin UT	Sheath sharply conical with distended ectal end	Resembles T benedii with hairs	5
Tubificoides swirenocoides	Papillate from VII or at least behind clit	(1)2-3(4) ant 1-2 from X	(1)2-3(3) closely applied short teeth V-VII possibly extra teeth above UT	Simple pointed after X	2-3 short broad UT slightly larger LT	1-2 UT thinner only slightly longer than LT	Sheath cylindrical 2x long as broad		5
Monopylephorus rubroniveus	Naked	No	2-6 bifids	fewer	As dorsal	As dorsal	Non ciliated pseudopenes		7
Monopylephorus parvus	Naked	No	3-4(5) UT as thick LT/variable	As dorsal?	2? 1 or both simple pointed?	As dorsal?	Upright protusible pseuodopenes	Descriptions unclear	7
Monopylephorus irroratus	Naked	1-2 thin spirally twisted, easily broken	2-4 bifids	2-4 bifids	As dorsal	As dorsal	Tall eversible non-ciliated pseudopenes	Hair setae frequently broken	7
Limnodriloides scandinavicus	Naked	No	2-3 UT thinner and shorter LT	1-2 post clit UT thinner and shorter LT	As dorsal	As dorsal Genital setae on X or absent No genital setae on XI	Penes eversible No sheath		8
Heterochaeta costata	Naked	No	Pectinate about II to IV Palmate bout V-XIV	Bifid	UT longer than LT	As dorsal	Sheath tub shaped		4
Clitellio arenarius	Naked	No	2-3 reduced or rudimentary UT	2-3 reduced or rudimentary UT	Fewer than ant	Fewer than ant	No cuticular penes sheaths		4

Abbreviations:
clit-clitellium, post-posterior(ly), ant-anterior(ly), UT-upper tooth, LT-lower tooth