

# REASSIGNMENT OF *MELODICHTHYS PAXTONI* TO THE GENUS *FIORDICHTHYS* (TELEOSTEI, BYTHITIDAE)

by

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**ABSTRACT.** - A comparison of the bythitids *Fiordichthys slartibartfasti* Paulin, 1995 and the two species of *Melodichthys*, *paxtoni* and *hadrocephalus* both Nielsen & Cohen (1986), clearly shows that *M. paxtoni* is much closer to *F. slartibartfasti* than to *M. hadrocephalus*. Consequently, *M. paxtoni* is reassigned to *Fiordichthys*. By examination of the copulatory organ it furthermore appeared that *Fiordichthys* belongs to the brosmophycine tribe Brosmophycini rather than to Dinematchthyini where it was originally referred.

**RÉSUMÉ.** - Réassignation de *Melodichthys paxtoni* au genre *Fiordichthys* (Teleostei, Bythitidae).

La comparaison des Bythitidae *Fiordichthys slartibartfasti* Paulin, 1995 et des deux espèces de *Melodichthys*, *paxtoni* et *hadrocephalus*, les deux Nielsen & Cohen (1986), montre clairement que *M. paxtoni* est plus proche de *F. slartibartfasti* que de *M. hadrocephalus*. Par conséquent, *M. paxtoni* est réassigné au genre *Fiordichthys*. L'examen de l'appareil copulateur a montré que le genre *Fiordichthys* appartient à la tribu des Brosmophycini plutôt qu'à celle des Dinematchthyini où il était placé auparavant.

Key words. - Bythitidae - *Melodichthys* - *Fiordichthys* - Taxonomy.

When Nielsen and Cohen (1986) described the genus *Melodichthys* for two new species, *hadrocephalus* (type species) caught off Brittany, France, and *paxtoni* taken off Victoria, Australia, they were aware that the two species were rather different from each other. In fact they appeared to agree chiefly in having a high number of developed gill rakers on the anterior arch, an unusual character among Bythitidae. They did not separate the two species at the generic level because each was known only from a single female. Nielsen *et al.* (1999: 124) remarked that the two species differ so much from each other that it may be necessary to classify them in separate genera.

During our ongoing revision of the bythitid tribe, Dinematchthyini, we discovered that *Melodichthys paxtoni* (Fig. 1B) is so similar to *Fiordichthys slartibartfasti* Paulin, 1995 (Fig. 1A) that they should both be referred to the same genus, *Fiordichthys*. This action leaves *Melodichthys* as a monotypic genus containing only *M. hadrocephalus* (Fig. 1C). Arguments for this reassignment are given below. Another result, discussed below, was that the examination of the copulatory organ of *Fiordichthys* showed that it does not belong to the Dinematchthyini to where it was originally referred (Paulin, 1995) but should be referred to the tribe Brosmophycini. A comparison with the rather similar brosmophycine genus *Bidenichthys* Barnard, 1934 showed that *Bidenichthys* and *Fiordichthys* are easily separated.

Institutional abbreviations follow Eschmeyer (1998).

## MATERIAL EXAMINED

*Bidenichthys beeblebroxi* Paulin, 1995. - 9 specimens, SL 65-95 mm: AMS I.18281001, I.18282007, Goat Island, New Zealand. - SMNS 14134, Colville Channel, New Zealand. - ZMUC P77800-803, Bay of Plenty, New Zealand.

*Bidenichthys capensis* Barnard, 1934. - 1 spm, SL 65 mm: ZMUC P77470, off Southeast Africa.

*Bidenichthys consobrinus* (Hutton, 1876). - 1 spm, SL 148 mm: NMNZ P.18430, Hinemoa Island, New Zealand.

*Fiordichthys slartibartfasti* Paulin, 1995. - 4 spms, SL 32-128 mm: NMNZ P.32145, Caswell Sound, New Zealand. - NMNZ P.35012, Milford Sound, New Zealand. - NMNZ P.35097, Milford Sound, New Zealand.

*Melodichthys hadrocephalus* Nielsen & Cohen, 1986. - 1 spm, SL 97 mm. - MNHN 1986-392, holotype, off Brittany, France.

*Melodichthys paxtoni* Nielsen & Cohen, 1986. - 1 spm, SL 74 mm. - AMS E.5264, holotype, off Victoria, Australia.

## RESULTS

### Comparison of *Melodichthys hadrocephalus*, *M. paxtoni* and *Fiordichthys slartibartfasti*

Table I shows the main meristic and morphometric characters of the three species. For *F. slartibartfasti* literature

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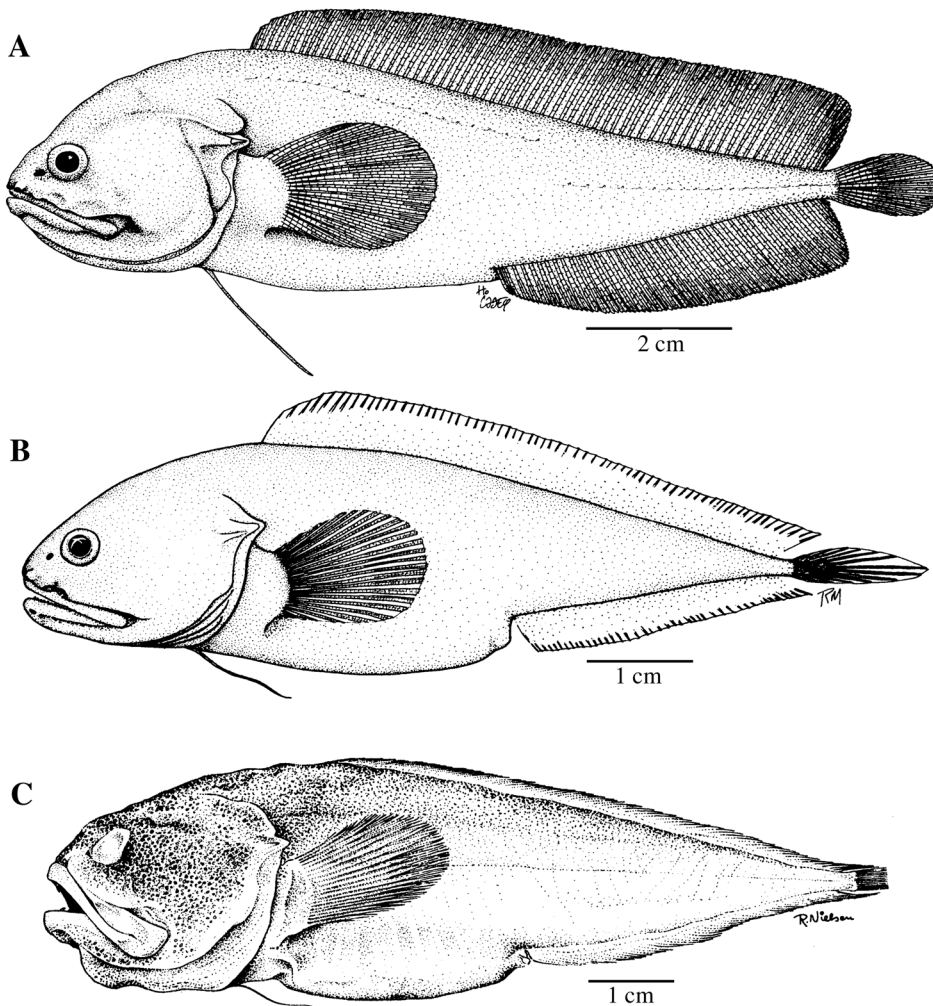


Figure 1. - A: Paratype of *Fiordichthys slartibartfasti*. NMNZ P.30313, SL 113 mm. B: Holotype of *Fiordichthys paxtoni*. AMS E.5264, SL 74 mm. C: Holotype of *Melodichthys hadrocephalus*. MNHN 1986-392, SL 97 mm.

data of the holo- and paratype have been included whenever possible. The column has been split into two: one shows the characters of the juvenile (SL 32 mm) and the other shows the five adults (SL 93-128 mm). Length of head and diameter of eye seem to show negative allometric growth.

The comparison shows that *M. paxtoni* is closer to *F. slartibartfasti* than to *M. hadrocephalus*. By reassigning *M. paxtoni* the two genera are now much better defined and separated. Table II shows the main characters separating the two genera. The reassignment also makes the geographical distribution more logical with the two species from New Zealand and Southeast Australia assigned to the same genus.

*F. slartibartfasti* differs from *F. paxtoni* by the former having tips of depressed neural spines blunt vs pointed, fewer pectoral fin rays (21-23 vs 26), lateral line head pore absent vs present and shorter distance between base of ventral fins to anal fin origin (33.5-39.5 vs 42.0% SL).

#### Tribal position of the genus *Fiordichthys* Paulin, 1995

Cohen and Nielsen (1978: 52) used the presence or absence of ossified parts of the male copulatory organ to define the brosmophycine tribes, Dinematchthyini and Brosmophycini, a character also used by Nielsen *et al.* (1999). However, in an unpublished "master of science thesis" Sedor (1985) showed that sclerification of the copulatory organ is widespread but not universal within the Dinematchthyini. Instead Sedor proposed the following tribal diagnostic character for the Dinematchthyini: "Copulatory organ located in the ventral body wall covered by a thick, fleshy, genital hood that originates on the posterior margin of the anus". This point of view is supported by our own observations showing that even specimens within the same species can be with or without sclerification.

Examination of male specimens of *Fiordichthys slartibartfasti* showed that the copulatory organ (Fig. 2) is not covered by a fleshy flap or hood but is an integrated part of

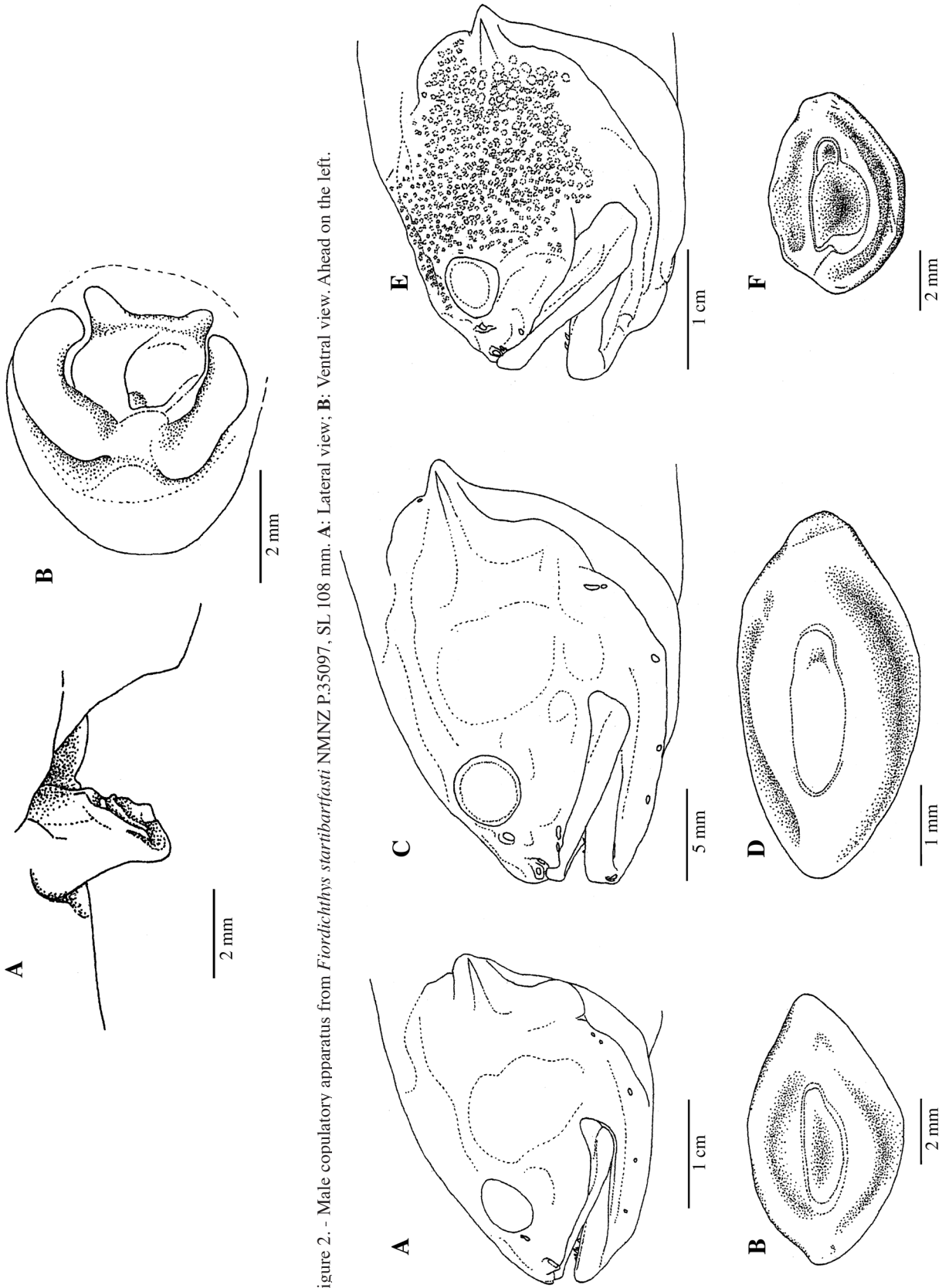


Figure 2. - Male copulatory apparatus from *Fiordichthys starribarfasti* NMNZ P.35097, SL 108 mm. **A**: Lateral view; **B**: Ventral view. Ahead on the left.

Figure 3. - **A** and **B**: Head and right sagitta from *Fiordichthys slartibarfasti*. NMNZ P.35097, SL 94 mm. **C** and **D**: Head and right sagitta from holotype of *Fiordichthys paxtoni*. AMS E.5264, SL 74 mm. **E** and **F**: Head and right sagitta from holotype of *Melodichthys hadrocephalus*. MNHN 1986-392, SL 97 mm.

	<i>Fiordichthys slartibartfasti</i> * HT, PT + 4 spms	<i>Fiordichthys paxtoni</i> Holotype	<i>Melodichthys hadrocephalus</i> Holotype
Standard length	32, 93-128*	74	97
Meristic characters			
Dorsal fin rays	70, 66-71*	69	64
Caudal fin rays	14, 14-15*	14	14
Anal fin rays	44, 42-44*	42	43
Pectoral fin rays	21, 21-23*	26	22
Vertebrae	13+33, 15-16 + 29-31*	12+34	13+32
Total vertebrae	46, 45-46*	46	45
Pseudobranchial filaments	2, 2	1-2	3
Long rakers on ant. gill arch	12, 12-13	11	15
Total gill rakers	18, 18-21*	18	27
Ant. dorsal ray above vertebra no.	5, 5-6	6	6
Ant. anal ray below dorsal ray no.	26, 29-30	32	23
Ant. anal ray below vertebra no.	19, 20	21	19
Supraorbital pores	0, 0	1	0
Infraorbital pores	2, 2	2	0
Preopercular-mandib. pores	6, 6-7	7	2
Lateral line head pore	0, 0	1	0
Morphometric characters			
In % of SL			
Head length	33.5, 28.5-31.0*	30.5	31.5
Depth at 1st anal ray	17.0, 17.5-20.0	18.0	18.5
Upper jaws length	16.5, 14.0-16.5*	15.5	17.5
Horizontal eye window	5.6, 4.2-5.0	6.1	4.9
Postorbital length	21.5, 17.5-20.0	20.5	20.0
Preanal length	58.0, 58.0-65.0*	64	63
Predorsal length	35.5, 30.5-34.0*	31.5	35.0
Base of ventral fin - anal fin origin	34.4, 33.5-39.5	42.0	40.0
Pectoral fin length	20.0, 15.5-21.0*	20.0	20.0
Ventral fin length	19.5, 17.5-18.0	18.0	14.5
Otoliths			
Status of colliculi	Fused	Fused	Separate
Otolith length: height	1.8, 1.8-2.0	2.0	1.5

Table I. - Meristic and morphometric characters of *Fiordichthys* and *Melodichthys* spp. \* = Some data of holotype (HT, SL 94 mm) and paratype (PT, SL 113 mm) from Paulin (1995) included.

the hood which is characteristic for the tribe Bromophycini (Sedor, 1985). The free caudal fin (Fig. 1A) excludes it from the bythitid subfamily Bythitinae.

Since the holotype and only known specimen of the now monotypic genus *Melodichthys* is a female it must await the capture of a male before this genus can be placed in either of the two tribes. However, the otolith pattern (mainly the organization of the large, nearly fused sulcus and the very prominent ventral furrow) and the head pore pattern (lack of any posterior infraorbital pores and of 1st lateral line pore) suggest a placement in Bromophycini as well (Fig. 3).

**Remarks**

*Fiordichthys* seems rather similar to the genus

*Bidenichthys* which is represented by two species off New Zealand and one off Southeastern Africa. However, the two genera can be separated i. a. by the former having 3-4 long rakers on anterior gill arch (vs 11-13) and fewer sensory pores in the mandibular row (2 vs 5-6).

**Acknowledgments.** - We are indebted to the following persons for providing material and data: Guy Duhamel and Patrice Pruvost (MNHN), Mark McGrouther (AMS) and Chris Paulin (NMNZ). Daniel M. Cohen (CAS) offered valuable comments to the ms. This study was supported by the Carlsberg Foundation and by a Visiting Collection Fellowship grant from Australian Museum, Sydney.

	<i>Fiordichthys</i>	<i>Melodichthys</i>
Scales on head	No	Yes
Skin	Thin	Thick
End of maxillary	Sheathed	Free
Total gill rakers on anterior arch	18-21	27
Length of rakers short:long	1:2	1:4
Head pores (cf. Tab. I)	9-12	Few
Dorsal fin origin vs pectoral basis	Well in front	Above
Status of colliculi of otolith	Fused	Separate

Table II. - Diagnostic characters of *Melodichthys* and *Fiordichthys*.

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Reçu le 05 mai 2003.

Accepté pour publication le 18 septembre 2003.