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Edinburgh, 1985

ARH

Family NEPHTYIDAE P. Garwood

Important characters

The identification of members of this family relies upon the details of the following characters:

1. The direction of curve of the inter-ramal cirri (gills) which occur between the rami of the parapodia, at least in mid-body segments (Fig. 1a). In Nephtys, they curve downwards and outwards, in Aglaophamus, downwards and inwards (Fig. 1b).

2. The details of the structure of mid-body parapodia. In this family each ramus of a parapodium is made up of 3 elements, which are developed to varying extents according to species and age. These are the acicular lobes, which contain the aciculа, the pre-acicular lobes which lie anterior to them, and the post-acicular lobes which are posterior to the acicular lobes (Fig. 1a). Between the pre-acicular and acicular lobes lie the barred chaetae (Fig. 1c), and capillaries (Fig. 1d) and spinose (Fig. 1d) chaetae are found between the acicular and post-acicular lobes. To simplify comparisons, parapodia should always be viewed from the anterior, preferably removed from the animal and mounted in alcohol, glycerol or a permanent medium. It is advisable always to remove parapodia from the same side of specimens to aid orientation.

3. The segment (setiger) on which the inter-ramal cirri are first apparent. This can usually be seen when holding the specimen on its side, particularly if the cirrus is gently moved with a mounted needle. Some care is needed to distinguish between the dorsal cirrus and inter-ramal cirrus - if in doubt, mount the parapodia in question and examine more closely.

4. The degree of development of the dorsal cirri of setiger 1. In some species they are well developed and as prominent as the ventral

cirri on setiger 1 and the prostomial antennae, whilst in others it is barely distinguishable.

5. Although the chaetae of nephtyids are of little use taxonomically, geniculate forms (Fig. 2a) are found in N. cirrosa.

6. The everted proboscis can be seen to bear numerous papillae of various lengths. In Nephtys spp., 22 rows (longitudinal) are present, whilst in Aglaophamus, 14 rows are found (NB., Fauchald and Hutchings, 1977, describe 2 species of Aglaophamus with 22 rows). Single median dorsal and/or ventral papillae may also be present. Although the details of the papillae on the pharynx undoubtedly do vary between species, their value as a character for use in identification is limited as an everted pharynx is, ideally, required.

Family NEPHTYIDAE

Aglaophamus malmgreni

A. rubella

Nephtys caeca

N. cirrosa

N. ciliata

N. hombergii

N. hystricis

N. incisa

N. longosetosa

N. paradoxa

N. pente

Key to genera

1. Inter-ramal cirri (gills) curling downwards and outwards (recurved) ..... Nephtys

- Inter-ramal cirri curling downwards and inwards (involute) ..Aglaophamus

Key to species for adult animals - Nephtys

1. Prostomium yellow (may fade after preservation); chaetae include geniculate forms (Fig. 2a); in V. posterior segments, the dorsal cirrus of comparable size as the inter-ramal cirrus (Fig. 2b) ... N. cirrosa

- Prostomium not yellow; no geniculate chaetae; inter-ramal cirrus always longer than dorsal cirrus 2

2. Post-acicular lobes very well developed, particularly in the neuropodium, extending well beyond the acicular lobe (Figs. 2c, d, e); inter-ramal cirri first present on setiger 3 or 4 (occasionally 5)..3

- Post-acicular lobes poorly developed, either not extending beyond acicular lobes, or only just beyond them; inter-ramal cirri never

present anterior to setiger 5 5

3. Pre-acicular lobes well developed and bilobed, particularly in the notopodium (Fig. 2c); dorsal cirrus on setiger 1 reduced and hardly visible; inter-ramal cirri from setiger 4 (occasionally 5) ..N. hombergii

- Pre-acicular lobes developed only as low ridges (Figs. 2d,e); dorsal cirri of setiger 1 well developed and as prominent as ventral cirri and prostomial antennae (Fig. 2f); inter-ramal cirri from setiger 3 or 4 4

4. Neuropodial post-acicular lobe distinctly S- shaped (Fig. 2d); inter-ramal cirri from setiger 3 ..... N. longosetosa

- Neuropodial post- acicular lobe not S-shaped (Fig. 2e); inter-ramal cirri from setiger 4 ..... N. caeca (Chaetae many be v. long or short.

5. Acicular lobes distinctly bilobed and very prominent (Fig. 2g)..6

- Acicular lobes conical or rounded and largely hidden 7

6. Inter-ramal cirri from setiger 5, not markedly reduced in posterior segments ..... N. pente

- Inter-ramal cirri from setigers 7,8,9 or 10, reduced or absent in the last 20-30 setigers ..... N. ciliata

7. Pre-acicular lobes very well developed and bilobed (Fig. 2h); inter-ramal cirri from setiger 6,7 or 8 ..... N. incisa

- Pre-acicular lobes never bilobed; inter-ramal cirri usually begin on setiger 8 or more posteriorly 8

8. Inter-ramal cirri foliaceous (Fig. 2i); post-acicular lobes very short ..... N. paradoxa

- Inter-ramal cirri cirriform; post-acicular lobes distinct, though not well developed (Fig. 2j); posterior body segments K-shaped lacking inter-ramal cirri (Fig. 2k) ..... N. hystricis ✓

Key to species for adult animals - Aglaophamus

1. In ter-ramal cirri present from setiger 2; pre-acicular lobes of a quite complex form (Fig. 2l); ..... A. rubella

- Inter-ramal cirri present from setiger 8,9 or 10; pre-acicular lobes simple rounded ridges (Fig. 2m) ..... A. malmgreni

Juvenile nephtyids.

I am only familiar with 4 species as juveniles (animals down to approximately 1 cm in length) - N. caeca, N. cirrosa, N. hombergii and N. longosetosa. In juvenile nephtyids the various lobes of the parapodia may be poorly developed making identification difficult. Nevertheless, these 4 species at least may be separated relatively easily in all but the smallest specimens. A provisional key is provided, and it is hoped that this can be extended to include other species as material becomes available.

Key to separate the juveniles of N. caeca, cirrosa, hombergii and longosetosa.

1. Distinct dorsal cirri visible on setiger 1, as long as or slightly shorter than ventral cirri and prostomial antennae 2

- Dorsal cirri not recognisable on setiger 1 3

2. Post-acicular neuropodial lobe S-shaped (not visible in very small animals); inter-ramal cirri from setiger 3? ..... N. longosetosa

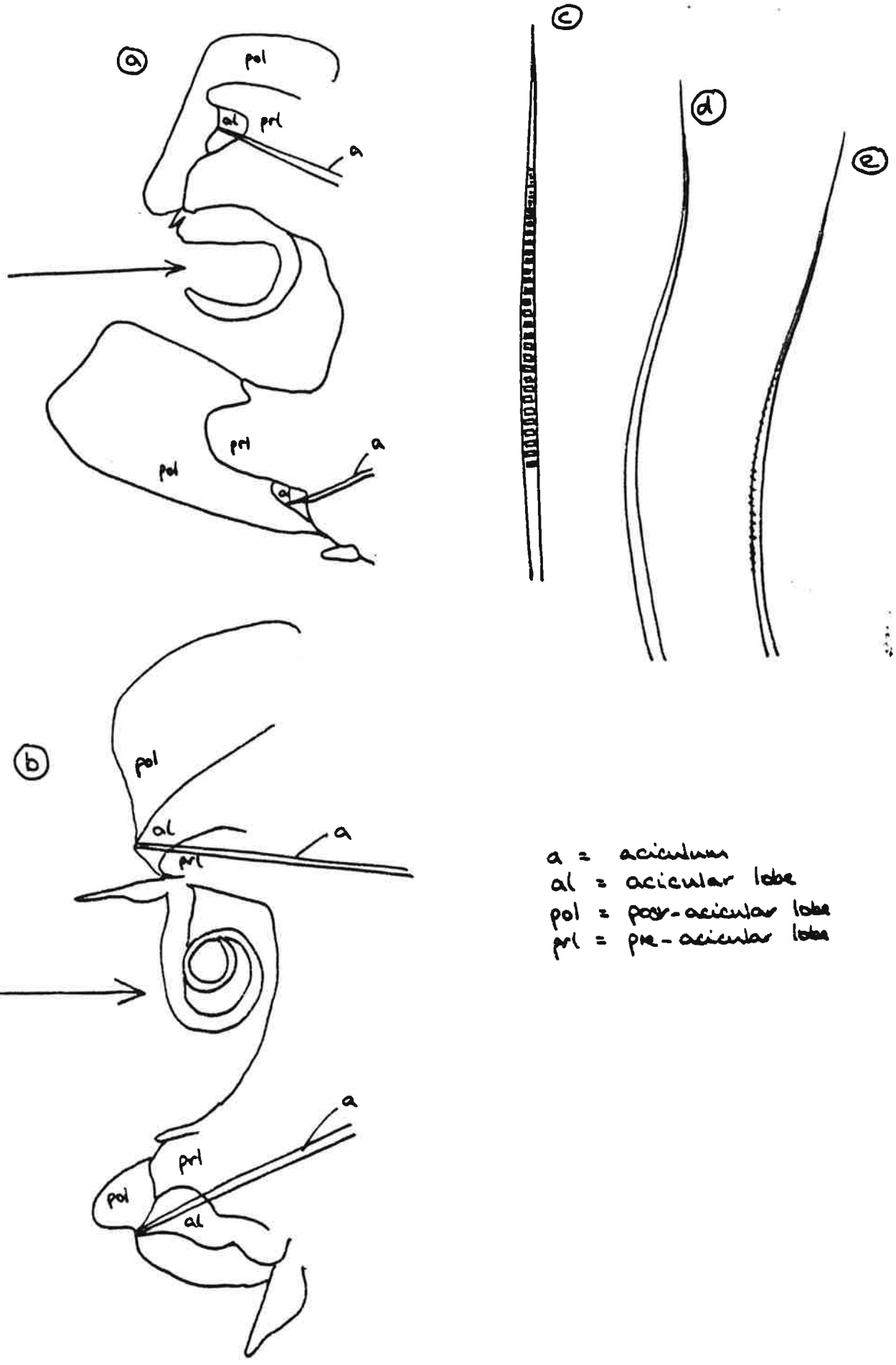
- Post- acicular lobe not S-shaped; inter-ramal cirri from setiger 1 ..... N. caeca

3. Geniculate chaetae present; notopodial post-acicular lobe not extending below aciculum (Fig.2n) ..... N. cirrosa

- No geniculate chaetae; notopodial post-acicular lobe extending below aciculum (Fig.2o) ..... N. hombergii

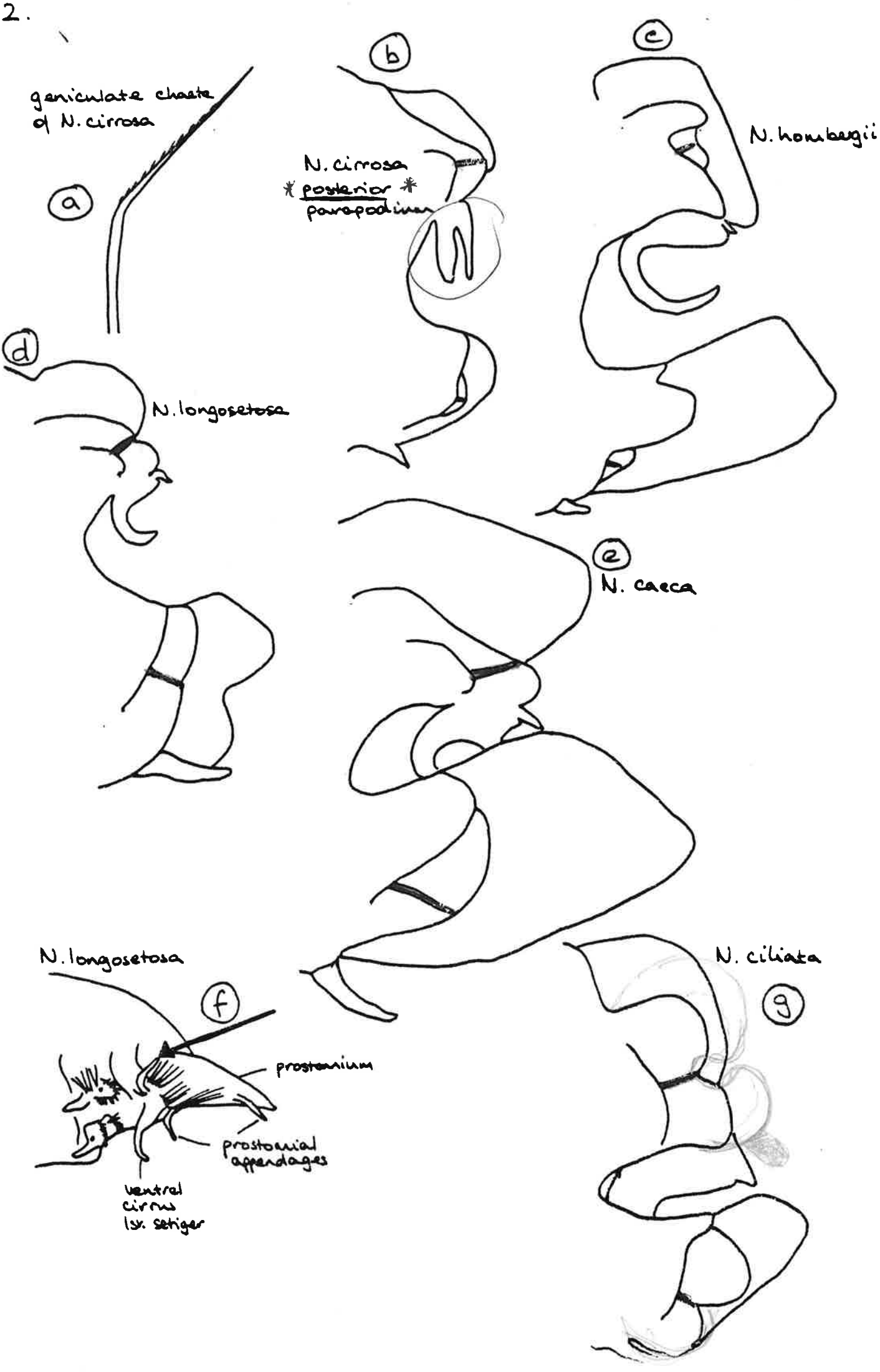
Small specimens of N, hystricis (about 0.8 mm body width) have their first inter-ramal cirrus on setiger 8 or 9, as in the adults, and can thus be recognised from the 4 species included in the key above. Undoubtedly differences in the shape of the prostomium may be useful in distinguishing species in small specimens (Gibbs 1969, JMBA separates very young specimens of N. hombergii and N. cirrosa using this feature) but personally I find it difficult to compare the head of a specimen with drawings - especially my own.

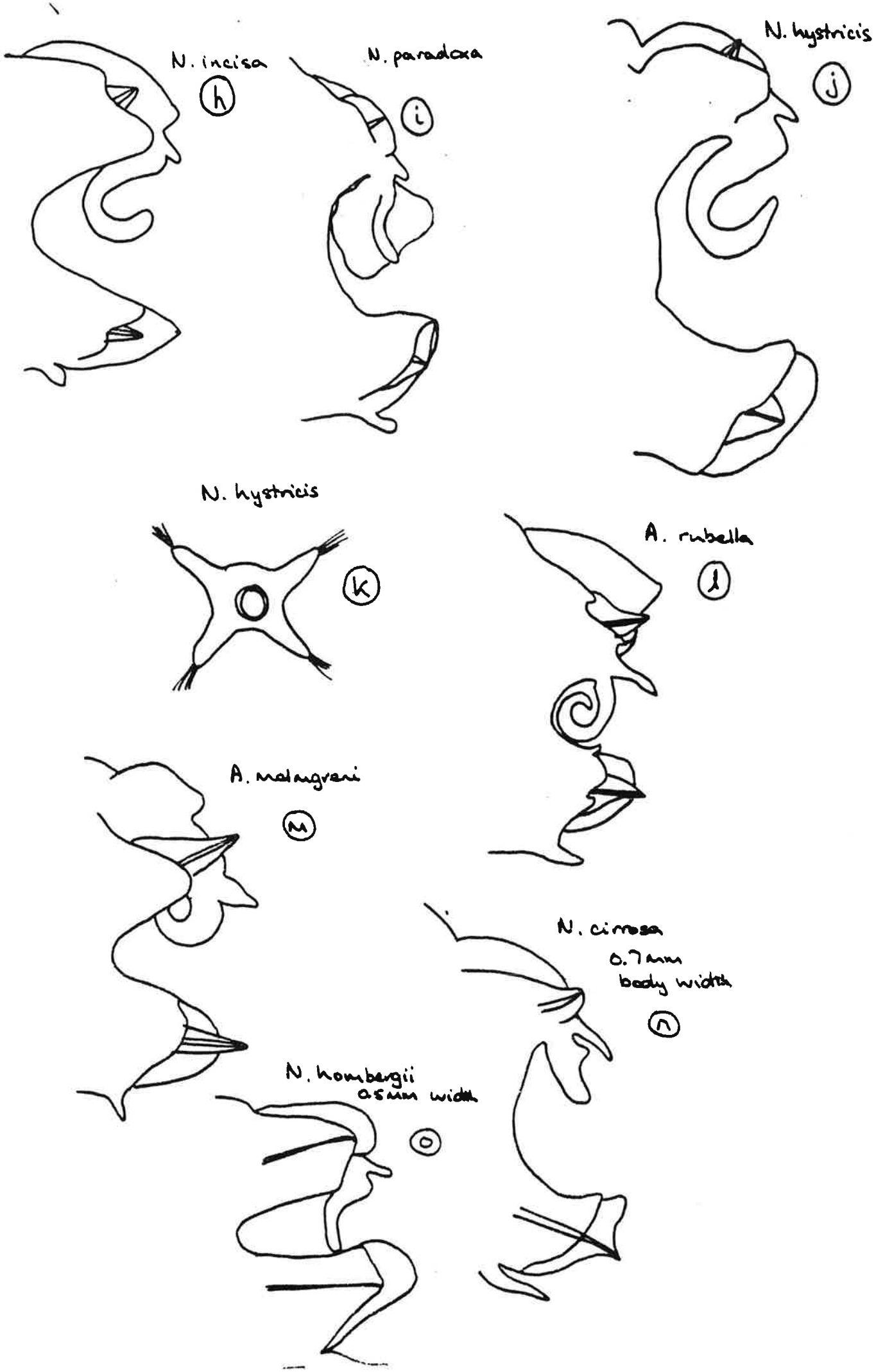
FIG 1.



a = aciculum
al = acicular lobe
pol = post-acicular lobe
prl = pre-acicular lobe

FIG 2.


geniculate chaeta of N. cirrosa
a
b
N. cirrosa
* posterior *
parapodium
c
N. hombergii
d
N. longosetosa
e
N. caeca
N. longosetosa
f
prostomium
prostomial appendages
ventral cirrus 1sv. setiger
N. ciliata
g


N. incisa
h
N. paradoxa
i
N. hystricis
j
N. hystricis
k
A. rubella
l
A. malangrani
m
N. cirrosa
0.7mm
body width
n
N. hombergii
o
0.5mm width

Family NEPHTYIDAE

Important references:

FAUCHALD, K., 1963. Nephtyidae (Polychaeta) from Norwegian waters. Sarsia, 13: 1-32.

GARWOOD, P.R. and P.J.W. CLIVE, 1981. The significance of the long chaetal form of Nephtys caeca (Polychaeta, Nephtyidae) and its relationship to N. longosetosa. Sarsia, 66:195-202.

HEINEN, A., 1911. Die Nephtydeen und Lycorideen der Nord- und Ostsee, einschliesslich der verbindenden Meeresteile. Wiss. Meeresuntersuch., 13:1-87.

RAINER, S., 1984. Nephtys pente sp. nov. (Polychaeta:Nephtyidae) and a key to Nephtys from Northern Europe. J. mar. biol. Ass. U.K., 64:899-907.

RAINER, S. and P. HUTCHINGS, 1977. Nephtyidae (Polychaeta; Errantia) from Australia. Rec. Aust. Mus., 31:307-347.

	1st GILL INTERRAMAL CIRRUS	PRE-ACICULAR LOBES	ACICULAR LOBES	POST-ACICULAR LOBES	DORSAL CIRRUS 1st SETIGER	MAX SETIGER No.	MAX. BODY LGTH (cm)
N. carca	4	SIMPLE RIDGES	ROUNDED	WELL DEVEL * + V. PROMINENT	WELL DEVEL. + CIRRIFORM *	155 (150)	20 (25)
N ciliata	7-10	SIMPLE RIDGES NEURO BETTER DEVELOPED	DISTINCTLY BILOBED *	WELL DEVEL. *	WELL DEVEL. *	(132)	(20)
N cirrosa	4	SIMPLE RIDGES NEURO BETTER DEVEL.	ROUNDED	WELL DEVEL. *	REDUCED	100 (95)	10 (10)
N hombergii	4-5	BOTH BILOBED (PARTIC IN NOTOPODIUM) *	CHARACTERISTIC SHAPES *	WELL DEVEL + V. PROMINENT *	REDUCED	142 (200)	20 (20)
N. hystricis	8-9	SIMPLE BUT WELL DEVELOPED	CONICAL *	POORLY DEVEL.	REDUCED	(70)	(4.5)
N. incisa	6-8	BOTH BILOBED *	CONICAL *	WELL DEVEL *	REDUCED CONICAL	(70)	(6.5)
N. longosetosa	3 *	SIMPLE RIDGES	ROUNDED	WELL DEVEL * + PROMINENT * NEURO S-SHAPED	WELL DEVEL. + CIRRIFORM *	122 (120)	15 (10)
N paradoxa	(5) 8-10 (14)	SIMPLE RIDGES	ROUNDED (SLIGHT POINT ON NEURO)	POORLY DEVEL. SHORTER THAN ACICULOBES	REDUCED	?	20)
N pente	5 *	SIMPLE RIDGES NEURO BETTER DEVELOP.	DISTINCTLY BILOBED *	WELL DEVEL	WELL DEVEL. *	90 (Rainer's data)	14
A. malmgreni	8-10	SIMPLE RIDGES	CONICAL	POORLY DEVEL. SHORTER THAN ACICULAR	?	(80)	(12)
A. rubella	2	CHARACTERISTIC SHAPE	CONICAL	WELL DEVEL. IN NOTO. NEURO. SHORTER THAN ACICULAR	REDUCED	(120)	(8)

* useful characters

Family NEPHTYIDAE

According to Fauchald (1963) with additional personal observations, members of this family can be divided into 2 groups - shallow water (<50m) and deeper water (50m - 3000m) forms.

Shallow water forms:
N. caeca
N. cirrosa
N. ciliata
N. hombergii
N. hystricis
N. longosetosa
N. pente

Deeper water forms:
N. incisa
N. paradoxa
A. malmgreni
A. rubella

In Britain, the commonest intertidal species are N. cirrosa and N. hombergii. N. caeca and N. longosetosa may also be found and may be locally abundant.

Outstanding problems:

Two subspecies of N. hombergii, N. hombergii kersivalensis and N. hombergii ehlersi, have been described, though their status is in doubt. Both are characterised by reduced post-acicular lobes, kersivalensis with short chaetae, ehlersi with long ones, and it has been suggested that the latter represents an epitokous breeding stage. This seems unlikely, and both would appear to be young N. hombergii s. str., though further work is needed.

N. incisa var bilobata requires further investigation, although Fauchald (1963) regards it as one end of a range of variation, with N. incisa s. str. at the other.

There is a possibility that N. paradoxa may in fact include another species, N. brachycephala, which Ushakov (1955) distinguishes by details of the foliaceous inter-ramal cirri. Fauchald (1963) gives some discussion on this point.