

## Generic Revision and Relationships of the Family Onuphidae (Annelida: Polychaeta)

HANNELORE PAXTON

School of Biological Sciences, Macquarie University,  
North Ryde, NSW 2113, Australia.

**ABSTRACT.** The general morphology, reproduction and development of the family Onuphidae are reviewed and supplemented with new observations, emphasizing ontogenetic changes. The following features were found to be associated with the juvenile state: distinctive colour pattern, ceratophores of antennae with few rings, absence of frontal palps and tentacular cirri, presence of eyes, smaller number of modified setigers, lesser developed branchiae, early occurrence of subacicular hooks, presence of compound falcigers in anterior and far posterior setigers.

Five new genera are described, bringing the number of recognized genera in the family to 22. A key, diagnoses and illustrated definitions to all genera are given.

The relationships within the family are analyzed using morphological, ecological and life history characters. Two subfamilies: Hyalinoeciinae, n. subf., and Onuphinae are erected. The two subfamilies differ in the presence or absence of notosetae, position of subacicular hooks and lower limbate setae, number of anal cirri, primary envelope of oocytes and arrangement of their nurse cells. Two groups of genera are recognized in each subfamily. The Hyalinoeciinae includes the *Nothria* group (consisting of *Nothria* and *Anchinothria*, n. gen.) and the *Hyalinoecia* group (consisting of *Hyalinoecia*; *Leptoecia*; *Neonuphis*; *Hyalospinifera*). The Onuphinae includes the *Diopatra* group (consisting of *Notonuphis*; *Paradiopatra*; *Diopatra*; *Epidiopatra*; *Brevibrachium*, n. gen.; *Longibrachium*, n. gen.; *Rhamphobrachium*; *Americanuphis*) and the *Onuphis* group (consisting of *Australonuphis*; *Hartmanonuphis*, n. gen.; *Hirsutonuphis*, n. gen.; *Aponuphis*; *Kinbergonuphis*; *Mooreonuphis*; *Onuphis*; *Heptaceras*).

It is hypothesized that the Onuphidae have a southern centre of origin and radiated from epifaunal habitats to world-wide distributions from the shallowest to the deepest depths.

PAXTON, HANNELORE, 1986. Generic revision and relationships of the family Onuphidae (Annelida: Polychaeta). Records of the Australian Museum 38(1): 1-74.

### CONTENTS

INTRODUCTION .....	2
MATERIALS AND METHODS .....	3
GENERAL MORPHOLOGY .....	4
Prostomium .....	5
Peristomium .....	9
Parapodia .....	9
Setae .....	12
Eversible Pharynx .....	14

Pygidium .....	16
Tubes .....	16
Size .....	16
REPRODUCTION AND DEVELOPMENT .....	16
Reproduction .....	16
Juvenile Development .....	18
General Juvenile Characters of Onuphidae .....	19
TAXONOMIC ACCOUNT .....	22
Key to Genera of Onuphidae .....	23
Family Onuphidae .....	25
Hyalinoeciinae n. subf. ....	25
<i>Nothria</i> Malmgren .....	25
<i>Anchinothria</i> n. gen. ....	27
<i>Hyalinoecia</i> Malmgren .....	29
<i>Leptoecia</i> Chamberlin .....	30
<i>Neonuphis</i> Kucheruk .....	32
<i>Hyalospinifera</i> Kucheruk .....	34
Subfamily Onuphinae .....	35
<i>Notonuphis</i> Kucheruk .....	35
<i>Paradiopatra</i> Ehlers .....	36
<i>Diopatra</i> Audouin & Milne Edwards .....	38
<i>Epidiopatra</i> Augener .....	41
<i>Brevibrachium</i> n. gen. ....	41
<i>Longibrachium</i> n. gen. ....	43
<i>Rhamphobrachium</i> Ehlers .....	44
<i>Americonuphis</i> Fauchald .....	45
<i>Australonuphis</i> Paxton .....	46
<i>Hartmanonuphis</i> n. gen. ....	49
<i>Hirsutonuphis</i> n. gen. ....	51
<i>Aponuphis</i> Kucheruk .....	53
<i>Kinbergonuphis</i> Fauchald .....	54
<i>Mooreonuphis</i> Fauchald .....	56
<i>Onuphis</i> Audouin & Milne Edwards .....	56
<i>Heptaceras</i> Ehlers .....	58
PHYLOGENETIC RELATIONSHIPS .....	60
Discussion of Characters and Their States .....	61
Relationships Within the Onuphidae .....	65
Identikit Picture of the Uronuphid .....	68
ZOOGEOGRAPHY AND CONCLUSION .....	68
ACKNOWLEDGEMENTS .....	70
REFERENCES .....	70

Members of the family Onuphidae (order Eunicida) are mostly tubicolous, range from a few centimetres to the longest polychaetes ever reported (3 metres) and occur in all oceans from intertidal to the deepest depths. Onuphids used to be considered as predominantly deep-water species (McIntosh, 1910) that lived permanently in rather sturdy tubes (Pettibone, 1963). However, many shallow water species with fragile tubes are now known (Fauchald, 1980). A number of species, some of large size with very fragile, temporary tubes occur in sandy beaches, predominantly in the southern oceans. The largest of these, species of *Australonuphis*, occur in

Central and South America and in eastern Australia. They are known as 'beachworms' in Australia and are highly sought after for fishing bait, collected from surf beaches during low tides by amateurs and professional collectors. The study of these beachworms (Paxton, 1979) has led to the present revision of the family.

**Order Eunicida.** The order Eunicida includes seven of the 81 extant families of polychaetes (Fauchald, 1977) and eight of the extinct families (Kielan-Jaworowska, 1966). Members of the order share the possession of a ventral eversible pharynx with a complex jaw apparatus consisting of ventral mandibles and dorsal maxillae. The