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# A revision of the *Brementia*-group of genera (Copepoda: Notodelphyidae), with descriptions of a new genus and four new species

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## Abstract

A new genus of parasitic copepod, *Paranoplodelphys*, is established in the family Notodelphyidae to accommodate a new, highly reduced species, *P. simplex* n. gen. et n. sp., collected from a tunicate host, *Didemnum dicolla* in Djibouti. The new genus retains only four paired limbs: antennules, legs 1, 2 and 5. Two new species of *Anoplodelphys*, *A. afri-*

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*cana* and *A.laubieri*, are described from tunicate hosts of the genus *Didemnum* collected in the Gulf of Suez and off the Kwazulu-Natal coast, respectively. A new species of *Achelidelphys*, *A. papuensis*, is described from a *Didemnum* species host collected off Papua New Guinea. New records are also reported for *Anoplodelphys corneci* and *Achelidelphys steinitzi* also from tunicate hosts. After re-examination of type material of most species, a phylogenetic analysis of relationships between the genera of the *Brementia*-group was performed using PAUP. This identified four main clades: *Brementia*, *Anoplodelphys*, *Paranoplodelphys* and the *Achelidelphys*-clade. There was no support for the continued recognition of *Cephalodelphys* and *Syndelphys* as valid separate genera, and it is proposed to treat as them synonyms of *Achelidelphys*. Both genera were monotypic and upon transfer *Cephalodelphys stellata* Lafargue & Laubier, 1977 becomes *Achelidelphys stellata* (Lafargue and Laubier, 1977) n. comb. and *Syndelphys reducta* Lafargue and Laubier, 1977 becomes *Achelidelphys reducta* (Lafargue and Laubier, 1977) n. comb.

**Key words**: Taxonomy, parasite, copepod, tunicate host, new genus

## Introduction

The family Notodelphyidae currently comprises 47 genera and an estimated 148 species (Boxshall & Halsey 2004; Boxshall & Marchenkov 2005), although there is considerable uncertainty surrounding the number of valid species since so many old descriptions are inadequate and best treated as species inquirenda (Illg 1958). Body morphology varies markedly within the family, ranging from typical cyclopiform shapes to highly modified forms, lacking any external segmentation and with extremely reduced or transformed limbs. Chatton and Brément (1915) proposed a new family, the Ophioseididae, to include three genera, *Ophioseides* Giard, 1873, *Brementia* Chatton and Brément, 1915 and *Ooneides* Chatton and Brément, 1915 showing extreme reduction of mouthparts. Illg (1958) pointed to the inadvisability in recognising such a grouping based on the loss of one or more of the mouthparts because of the difficulty in establishing whether the same mouthpart had been lost in different genera, and therefore, in establishing whether the series was monophyletic. However, the term "ophioseidimorph" has been widely utilised for the loose assemblage of modified genera lacking at least one pair of mouthparts (Bocquet & Stock 1961; Lafargue & Laubier 1977, 1978a,b; Laubier & Lafargue 1974). As explicitly stated by several of these authors (e.g. Lafargue & Laubier 1978a), this ophioseidimorph grouping is almost certainly polyphyletic and we see little merit in continuing to refer to it.

The discovery of new material of modified notodelphyids within the large collection of ascidicolous copepods made by Drs Claude and Françoise Monniot has allowed us to identify a likely monophyletic lineage amongst the modified notodelphyids. We refer to this lineage as the *Brementia*-group since *Brementia* is the oldest genus within the group. The apomorphic character states shared by genera of the *Brementia*-group include: 1, body fleshy and vermiform, lacking externally expressed segmentation; 2, body with internal brood pouch; 3, frontal margin of cephalosome with inflated rostrum; 4, labrum inflated; 5, antennule swollen, unsegmented; 6, legs 1 and 2 forming unsegmented, bilobate processes; 7, legs 3 and 4 also forming unsegmented bilobate or unilobate processes when present, sometimes lost; 8, caudal rami swollen, fused to urosome at base, 9, urosome indistinctly 2-segmented or unsegmented; and 10, body surface and surface of rostrum (when present), labrum, legs 1–4 (when present) and caudal rami densely ornamented with setules.

The current genera sharing these derived features are: *Brementia*, *Achelidelphys* Lafargue and Laubier, 1977, *Cephalodelphys* Lafargue and Laubier, 1977, *Syndelphys* Lafargue and Laubier, 1977 and *Anoplodelphys* Lafargue and Laubier, 1978. The genus *Pholeterides* Illg, 1958 exhibits all these characters with the exception of character 9. It retains a discrete, apparently 4-segmented urosome. However, it is an ideal outgroup for any phylogenetic analysis since it is probably the sister-taxon of the core members of the *Brementia*-group.

In their redescription of *Brementia balneolensis* Chatton and Brément, 1915, Laubier and Lafargue (1974) referred to the presence of four pairs of metasomal expansions. Their stated reason for using neutral terminology in preference to the term "péréiopodes" (= swimming legs), was that they considered these structures to