



A taxonomic revision of the genus *Habrobathynella* Schminke, 1973, with the description of four new species from southeastern India (Crustacea, Malacostraca, Bathynellacea)

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Table of contents

Abstract	1
Introduction	2
Methods	3
Systematics	4
Order Bathynellacea Chappuis, 1915	4
Family Parabathynellidae Noodt, 1965	4
Genus <i>Habrobathynella</i> Schminke, 1973	4
<i>Habrobathynella krishna</i> n. sp.	4
<i>Habrobathynella vaitarini</i> n. sp.	13
<i>Habrobathynella savitri</i> n. sp.	20
<i>Habrobathynella vidua</i> n. sp.	29
Discussion	35
Revised diagnosis of <i>Habrobathynella</i> Schminke 1973	45
Interspecies relationships	45
Ecology	48
Biogeography	50
Conservation	51
Acknowledgments	51
References	51

Abstract

The genus *Habrobathynella* Schminke, 1973, presently contains six species. Four new species of the genus *Habrobathynella*, viz. *H. krishna* n. sp., *H. vaitarini* n. sp., *H. savitri* n. sp. and *H. vidua* n. sp. are described and illustrated herein and their taxonomic position in the genus *Habrobathynella* discussed. Inhabiting certain rivers and borewells in the State of Andhra Pradesh, southeastern India, these new species introduce several morphologic features that are unique to either the genus or the family Parabathynellidae. The spine row on the uropodal sympod now displays five character states, and high diversity is also seen in the male thoracopod VIII.

The salient morphologic characters and their various states in all the habrobathynellid species are reviewed and the original generic diagnosis revised. The palpless mandible with somewhat pyriform pars molaris, bearing 5–6 teeth, is recognised as a signal synapomorphy of *Habrobathynella*. Two more synapomorphies based on the male thoracopod VIII and caudal furca are added. Considering its special importance in taxonomy, the male thoracopod VIII of the four already known Indian species, viz. *H. nagarjunai* Ranga Reddy, 2002; *H. schminkei* Ranga Reddy, 2004; *H. indica*

Ranga Reddy & Schminke, 2005 and *H. plenituda* Ranga Reddy & Schminke, 2009, has been reexamined based on topotypes and freshly illustrated with line drawings and digital images, and errors in the original accounts are corrected. Also, the ecology, biogeography and conservation of *Habrobathynella* species are briefly discussed.

Key words: stygofauna, Syncarida, Parabathynellidae, distribution

Introduction

The order Bathynellacea comprises two families, viz. Bathynellidae and Parabathynellidae, which as of now contain 87 species plus 13 subspecies and 150 species plus 3 subspecies, respectively (Schminke, pers. commun.). In India, to date only seven bathynellacean species are described, which include four species of the genus *Habrobathynella* Schminke, 1973b, one species each of *Atopobathynella* Schminke, 1973b and *Chilobathynella* Noodt, 1963, all belonging to the Parabathynellidae, and one monotypic genus *Serbanibathynella* Ranga Reddy & Schminke, 2005b to the Bathynellidae. This is despite the fact that the first fortuitous encounter in August 1998 of a hyporheic bathynellacean (*Habrobathynella indica* Ranga Reddy & Schminke, 2005a) has since prompted sustained faunistic surveys of a host of hyporheic habitats, borewells, some caves and estuaries, especially in the peninsular region.

As could be expected, the Indian stygofauna display obvious morphologic and biogeographic affinities with their counterparts on Gondwana landmasses (Ranga Reddy 2006, Ranga Reddy & Defaye 2008). Not surprisingly, none of the bathynellacean taxa hitherto reported from other parts of Asia (Camacho 2005, 2006; Cho et al. 2008) is as yet noticed in India. What is particularly baffling, however, is the utter truancy of the likes of the primitive Australian genera (*Billibathynella*, Cho 2005; *Kimberleybathynella* Cho, Park & Humphreys, 2005; *Brevisomabathynella* Cho, Park & Ranga Reddy, 2006, etc.), the predominantly Gondwanan *Cteniobathynella*-group of 14 genera barring *Habrobathynella*, and also the cosmopolitan *Hexabathynella* Schminke, 1972a. On the whole, a decade-long study of the Indian subterranean groundwaters shows that the bathynellacean group is not as much diversified as it is in Australia (Humphreys 2008), despite the predictable biogeographic affinities in the ancient stygofauna of these two Gondwana landmasses.

Habrobathynella is a derived genus in the *Cteniobathynella*-group. Currently, it contains six species in the world: two (*H. milloti* (Delamare Deboutteville & Paulian, 1954) and *H. jeanneli* (Delamare Deboutteville & Paulian, 1954)) from Madagascar and four (*H. nagarjunai* Ranga Reddy, 2002; *H. schminkei* Ranga Reddy, 2004; *H. indica* Ranga Reddy & Schminke, 2005a and *H. plenituda* Ranga Reddy & Schminke, 2009) from peninsular India. Incidentally, species of this genus are the most common bathynellaceans in the hyporheic habitats of the coastal belt of peninsular India. On the other hand, the genus is not described from Africa, Australia and South America.

Investigations under the auspices of an ongoing Major Research Project on the biodiversity of subterranean groundwaters of India, with special reference to Copepoda and Bathynellacea, have yielded, inter alia, four new species of *Habrobathynella*, viz. *H. krishna* n. sp., *H. vaitarini* n. sp. and *H. savitri* n. sp. from hyporheic habitats, and *H. vidua* n. sp. from a borewell, thus raising the number of the known habrobathynellid species to ten. This paper, besides giving an illustrated description of these four new species, evaluates the morphologic characters and their various states in the species of this genus and provides a revised genus definition. Considering its special importance in taxonomy, the male thoracopod VIII of the already known Indian species has been reexamined based on topotypes and freshly illustrated, and the anomalies in the original accounts are corrected. A brief note on the ecology, biogeography and conservation of *Habrobathynella* species is added.