



## Notes on the morphology and ecology of the adult females of *Nesippus* species (Siphonostomatoida: Pandaridae) with a key for identification

SUSAN M. DIPPENAAR & BEA P. JORDAAN

Department of Biodiversity, University of Limpopo, Private Bag X1106, Sovenga, 0727, South Africa.

E-mail: susan.dippenaar@ul.ac.za

### Abstract

*Nesippus* Heller, 1868 species are members of Pandaridae without dorsal plates on the second free thoracic segment. Currently there are five accepted species, namely *N. orientalis* Heller, 1868, *N. crypturus* Heller, 1868, *N. vespa* Kirtisinghe, 1964, *N. tigris* Cressey, 1967 and *N. nana* Cressey, 1970. Members of *Nesippus* were collected from a variety of elasmobranch hosts caught in the nets of the Natal Sharks Board, set off the KwaZulu-Natal coast, South Africa. Of these, representatives of *N. orientalis* were the most cosmopolitan and commonly encountered and the easiest to identify. Specimens of *N. vespa* and *N. tigris* were fairly host specific, often encountered and also relatively easy to identify. Difficulty in the identification of specimens of *N. crypturus* and *N. nana* is mainly due to morphological variations observed in specimens of *N. crypturus* which is also a relatively widely distributed species. However, the main distinguishing features of the different species are highlighted and a key is provided to assist in the identification of the adult females. Additionally, ecological aspects like prevalence, mean intensity and mean abundance of each species are also calculated and reported.

**Key words:** Copepoda, Elasmobranchs, South Africa, symbiotic, comparison

### Introduction

Pandaridae Milne-Edwards, 1840 consists of 14 accepted genera (Izawa 2010b; Boxshall & Halsey 2004), which are found on elasmobranch fishes (Boxshall & Halsey 2004; Kabata 1979) and are relatively host and site specific (Benz 1986). The genus *Nesippus* Heller, 1868 belongs to the group of pandarids with a second free thoracic segment without dorsal plates (Kabata 1979). Currently *Nesippus* consists of five species (Cressey 1970; Cressey 1967), namely *N. orientalis* Heller, 1868; *N. crypturus* Heller, 1868; *N. vespa* Kirtisinghe, 1964; *N. tigris* Cressey, 1967 and *N. nana* Cressey, 1970. These copepods are mostly found on the gill arches and inside the mouth of their hosts, while *N. tigris* is found inside the nasal cavities of its host (Izawa 2010a; Dippenaar & Jordaan 2006; Cressey 1970; Cressey 1967). Although several descriptions of *Nesippus* species exist (Izawa 2010a; Dippenaar & Jordaan 2006; Pillai 1985; Cressey 1970; Cressey 1967; Kirtisinghe 1964) the authors struggled to identify the species of some of the collected specimens and thus decided to do this comparative study of all the known species in an attempt to simplify future identifications.

### Material and methods

Specimens of *Nesippus* were collected from the gill arches, mouths and nasal cavities of a variety of sharks captured in the nets of the Natal Sharks Board set along the KwaZulu-Natal coast, South Africa. Collected specimens were fixed and preserved in 70% ethanol. Specimens were studied using the wooden slide technique (Humes & Gooding 1964) after being cleared in a solution of lactic acid with a pinch of lignin pink. Measurements were done using a micrometer and the drawings were made with the aid of drawing tubes. For scanning electron microscopy (SEM), selected specimens were prepared for sputter-coating with gold-palladium, by dehydrating them through a graded ethanol series (70, 80, 90, 96, 100%) followed by immersion in a small volume of hexamethyldisilazane.