

A new species of *Dactylopusioides* (Copepoda: Harpacticoida: Thalestridae) infesting brown algae, and its life history

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Abstract

A new species of harpacticoid copepod, *Dactylopusioides malleus* sp. nov., belonging to the family Thalestridae is described from central Japan. The species is obligately endophagous in dictyotalean brown algae (*Dictyota dichotoma* (Hudson) J.V. Lamouroux, *Dictyota maxima* Zanardini and *Dictyopteris undulata* Holmes). The species nests by burrowing into the algal tissue during the copepod naupliar stages, while copepodids and adults reside in a dome-shaped, transparent capsule made of mucus and formed on the algal tissue. In laboratory experiments, the new species progressed through its complete life cycle (i.e. from egg to adult) while feeding only on unialgal dictyotalean tissues; this confirmed the obligate relationship with the host. The new species shares the following morphological characters with other species of *Dactylopusioides*: 1) antennary exopod 1-segmented; 2) first segment of P1 endopod in female elongated with a long seta on the inner proximal margin; 3) baseoendopod and exopod of P5 in female with five setae. It differs from other species in the following ways: 1) antennary exopod with six setae; 2) a stout hammer-shaped inner spine on the basis of P1 in male; 3) terminal short seta on third segment of P2 endopod in male is plumose.

Key words: brown algal endophagy, *Dactylopusioides*, mucus capsule, Harpacticoida, life history

Introduction

Members of the harpacticoid family Thalestridae Sars are mostly marine, and include epi(endo)phytic species as well as many benthic species. For example, *Diarthrodes nobilis* (Baird) lives epiphytically on the filamentous red alga *Ceramium rubrum* C. Agardh (Ceramiales) in a capsule made of mucus, and feeds on bacteria and organic debris that adhere to the capsule (Hicks & Grahame 1979). The copepodid and adult stages of *Diarthrodes cystoeucus* Fahrenbach live on the thallus of *Fauchea laciniata* J. Agardh (Rhodymeniales) and other red algae in a dome-shaped, transparent capsule made of mucus; this copepod species also feeds on the macroalgal tissues (Fahrenbach 1954, 1962). As many as six species have been reported to excavate galleries or form gall-like swellings within the macroalgal tissue. For example, *Thalestris rhodymeniae* (Brady) lives in the algal tissue of the foliose red alga *Palmaria palmata* (Linnaeus) Kuntze (Palmariales), producing gall-like swellings (Harding 1954). *Diarthrodes feldmanni* Bocquet forms galleries in the tissue of several red algal species from different families (Bocquet 1953). *Amenophia orientalis* Ho and Hong and *Parathalestris infestus* Ho and Hong live in the brown alga *Undaria pinnatifida* (Harvey) Suringar (Laminariales; Ho & Hong 1988), producing galls with pinholes, while *Dactylopusioides macrolabris* (Claus) has been found in galleries between the two epidermal layers of the brown alga *Dictyota dichotoma* J. V. Lamouroux (Dictyotales: Brian 1928; Green 1958).

Recently Shimono *et al.* (2004) described *Dactylopusioides fodiens* Shimono, Iwasaki and Kawai; the second species in the genus. This species also excavates and lives in galleries within *D. dichotoma* and *Pachy-*