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Notes on Recent Changes in Tanaidacean Terminology

Charles G. Messing

Nova Southeastern University, messingc@nova.edu

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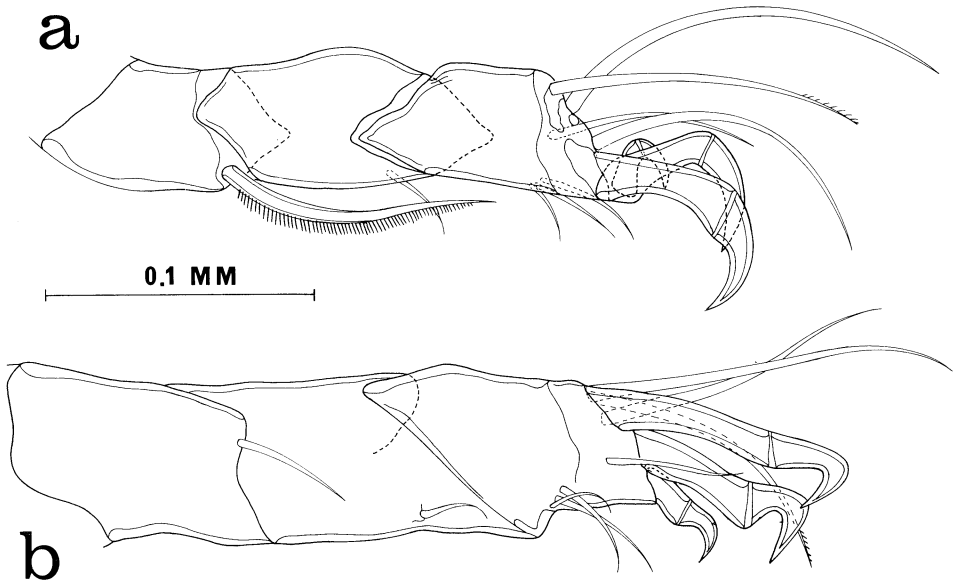


Fig. 1. *Anthessius nortoni* Illg, 1960. a, second antenna of male paratype, anterodorsal; b, second antenna of female paratype, posteroventral. Scale applies to both figures.

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NOTES ON RECENT CHANGES IN TANAIIDACEAN TERMINOLOGY

BY

CHARLES GARRETT MESSING

Division of Echinoderms, National Museum of Natural History, Washington, D.C. 20560,
U.S.A.

Although tanaidacean terminology achieved a measure of stability through the work of Lang (e.g., 1953a) and Wolff (1956), several changes have recently been made, primarily by Sieg (1973, 1977), that deserve comment.

Cephalothorax versus carapace. — Sieg uses cephalothorax in place of the widely accepted carapace. He follows Zimmer (1927) in defining

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cephalothorax as the anterior chitinous case (Chitinkapsel) formed by fusion of the head with one or more thoracic segments and restricting the term carapace to the chitinous fold (Chitinduplicatur) arising from the posterior margin of the head.

Although I agree that cephalothorax may be a more appropriate term for the anterior tagma, including internal components, taxonomic descriptions generally only refer to the external covering of the anterior tagma. Although carcinologists acknowledge the embryological origin of the malacostracan carapace as a postmaxillary fold (e.g., Manton, 1977), for descriptive purposes, a distinction is rarely drawn between the free fold and the cephalic and thoracic tergites with which it is fused; the practical definition refers to the entire shieldlike structure except the rostrum (Calman, 1909; Waterman & Chace, 1960; Moore & McCormick, 1969) or, even more simply, the external covering of the cephalothorax (Stebbing, 1893; Snodgrass, 1938). In addition, the concept of cephalothorax as incorporating one or more thoracic segments has sometimes been considered too diffuse. Waterman & Chace (1960) and Hessler & Rolfe (1969) restrict its use to the unit formed by fusion of the head with the entire thorax. The latter authors have also proposed the term gnathothorax to refer to cases in which “not all thoracic segments become fused, and the limbs of those that do become modified as mouthparts or for food capture.”

In rejecting the use of carapace for the entire cephalothoracic shield, Sieg states that the free carapace fold (Zimmer’s carapace) is small in tanaidaceans and encloses only small respiratory chambers and cites Dennell (1937) for the information. Dennell, however, states that the carapace is small in relation to the entire animal, only two thoracic segments being incorporated. The structure is certainly not significantly smaller than in some cumaceans in which three thoracic segments are incorporated. Dennell’s figure (1937: 66, fig. 6), although indicating that the branchial chambers are partly filled by chelipedal coxae and associated muscles, illustrates that the free carapace folds are as extensive in transverse section as in many decapods (see, for example, Kaestner, 1970; Huxley, 1937). In monokonophoran tanaidaceans that I have examined (species of *Apseudes*, *Kalliapseudes* and *Pagurapseudes*), the free carapace fold occupies most of the posterior half of the unit formed by fusion of the head and anterior two thoracic segments. Even in the dikonophoran *Neotanais*, which has large, lateral, chelipedal coxae, the free fold is extensive.

Thus, in the context of descriptive taxonomy, because reference is generally made to the external, shieldlike covering of the anterior tagma rather than the tagma itself and because the structure is basically similar in tanaidaceans, cumaceans, mysidaceans, hoplocaridans and eucaridans, the term carapace should be retained.

Limits of the pereon. — Sieg (1973, 1977) also suggests that the pereon correctly begins with the first free thoracic segment and that the thoracic appen-

dages should be labelled maxilliped, cheliped, pereopods I-VI, rather than the system in current use [maxilliped, cheliped (= pereopod I), pereopods II-VII] (e.g., Lang, 1973; Gardiner, 1975). As Wolff (1956, 1962) noted, Bate (1856) introduced the term in his treatment of amphipods: “*Thoracic segments (Pereion*)*. The seven annules which posteriorly follow the cephalic portion are in the higher order protected by the carapace... in the Amphipoda each segment is formed into a perfect ring,..” Subsequently, Bate took part in describing the genus *Tanais* as having the “Cephalon and first segment of pereion confluent” (Bate & Westwood, 1868). Similarly, the first pereonite is almost completely fused with the “cephalon” (head plus first thoracic segment) in many caprellid amphipods. Sieg’s contention that the pereon is composed only of free thoracic segments (1973: 10) is, therefore, not justified.

Although Bate’s interpretation of the Greek word from which he derived the term pereon (“From *περραιόω*, to walk about: pereion, part which supports the walking legs”) suggests that his emphasis was on the locomotory nature of the appendages, thereby strengthening Sieg’s position, Bate also wrote of the two anterior “pereipoda”: “the probability is that they are never used except as supplying organs to the mouth, unless to assist in climbing occasionally” (Bate, 1856: 27). These supposedly non-locomotory pereopods became known as gnathopods although they remained attached to the pereon (Bate, 1856: pl. 16). As a result, the third pereonite was said to bear the first pereopod, an unfortunate practice that was followed for a while in tanaidacean taxonomy (Bate & Westwood, 1868; Norman & Stebbing, 1886) but has persisted in amphipod taxonomy (Barnard, 1969), though not universally (Chevreux & Fage, 1925; McCain, 1968; Bousfield, 1973).

Alternatively, all thoracic appendages may be called thoracopods, thus avoiding problems in both the use and spelling (not treated here) of pereon. Of course, one must remember that the posterior limit of the malacostracan head, although generally and for a long time recognized as the posterior margin of the second maxillary somite, is also an arbitrary demarcation (Snodgrass, 1938). Use of the terms legs or walking legs is purely a functional reference and carries no pretense of indicating homology.

Nature and enumeration of manca instars. — Zimmer (1926: 58) was the first to use the term manca to designate a developmental stage: “Bekanntlich verlassen die Cumaceen das mütterliche Marsupium in einem Zustand, worin ihnen der letzte Cormopod fehlt. Ich bezeichne dieses Stadium als *manca*-Stadium (nach *Diastylis manca*, G. O. Sars, wo dem Typus offenbar als Neotenie gleichfalls der letzte Cormopod fehlt).” [“As is known, the Cumacea leave the maternal marsupium in a condition in which the last cormopod (= pereopod) is absent. I name this stage the *manca*-stage (after *Diastylis manca*, G. O. Sars, in which the type, evidently neotenic, likewise lacks the last cormopod).”]

In outlining the development of the dikonophoran *Heterotanais oerstedii* (Krøyer), Bückle-Ramirez (1965) designated animals that had just hatched but had yet to develop considerably before leaving the marsupium as the first of three manca stages. He characterized this first stage by lecithotrophy, incomplete segmentation and a thinly chitinized integument. Thus defined, however, it is structurally and functionally closer to the late, pre-hatching embryo than to the newly released manca (his manca 2). In fact, the manca 1 stage of *H. oerstedii*, by Bückle-Ramirez' definition (followed by Sieg, 1972, 1978), corresponds with the third embryonic stage of the isopod *Jaera albifrons* Leach as described by Forsman (1944).

The lecithotrophic hatchling differs enough from the newly released manca to warrant some distinction. However, because it is unknown if loss of lecithotrophy and completion of segmentation occur in concordance and, more importantly, because no ecdysis separates the two "stages," such a clear distinction as manca 1-manca 2 should not be applied. Either the lecithotrophic hatchling should be called just that or, as suggested by L. B. Holthuis (personal communication), it could be considered as an early stage of development of the manca 1 instar. In either case, Bückle-Ramirez' manca 2 is actually the first true manca (see also Gardiner, 1975).

The instar following the manca 1 (my usage) in tanaidaceans bears rudimentary pereopods VII and may or may not bear rudimentary pleopods. This is the second and last manca instar (manca 3 of Bückle-Ramirez, 1965, and Sieg, 1972, 1978). Although Gardiner (1975) used these designations, in an earlier paper (1973) he referred to a specimen with rudimentary pereopods VII as a manca 1 and thus did not differentiate between juveniles and mancas 2. The very small specimen with genital cones that he called a manca 2 is actually an immature male. The practice of calling the instar with rudimentary pereopods VII a manca as well as that lacking any trace of these appendages apparently began with Forsman (1944) and is now widely followed (Lang, 1953b; Wolff, 1956, 1962; Hessler, 1970; Gardiner, 1975) although such a stage was not originally recognized in the Cumacea (Zimmer, 1926).

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OPPORTUNISTIC FEEDING BEHAVIOUR IN A PREDATORY ISOPOD

BY

D. M. HOLDICH

Department of Zoology, The University, Nottingham, NG7 2RD, England

Introduction. — Isopods of the family Cirolanidae are well known as active predators (Dahl, 1952; Johnson, 1976) but opportunistic feeding also plays a part in their feeding behaviour (Johnson, 1976). Examination of the gut contents of littoral species has revealed the presence of many different marine food items (Jones, 1968; Johnson, 1976) but there are few records of the remains of terrestrial arthropod material in the gut. The observations described below show that such elements of the fauna may form a substantial food source for *Eurydice affinis* Hansen when the opportunity arises. This isopod is a common predator on beaches in S.W. England and S.W. France (Jones, 1967; Salvat, 1966).

Observations. — The warm period of weather over most of the British Isles in early April, 1980 prompted the emergence of many different species of insect. On the north coast of Cornwall many living insects, and some arachnids, were found floating on the surface of the incoming tide and others were found on the surface of pools on rocky shores.

At Trevone (S.W. 888759) *Eurydice affinis* is found inhabiting fairly coarse sand on the exposed beaches. Individuals often get stranded in pools on the nearby rocky shores when the tide ebbs. On a day-time low spring tide a large number (50+) of *E. affinis* were seen swimming in an apparently random manner just below the surface of a large mid-tidal pool measuring 5 m by 8 m in area and 3 m in depth. The isopods were actively feeding on dipteran, coleopteran and hemipteran insects which were trapped in the surface film of the pool. The isopods did not take their prey below the water but attacked them from below, grasping them with their pereopods and feeding on them for a few minutes whilst propelling them around the pool's surface. They then let go and swam randomly around the pool until they either collided with another food item or viewed it from below.

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