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Anaspidacea

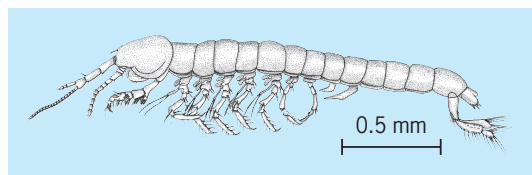
An extant order of the crustacean superorder Syncarida confined to freshwater and recorded from both surface and subterranean waters. Members of the order Anaspidacea (anaspidaceans) lack a carapace. The first thoracomere (thoracic somite) is incorporated in the head to form a cephalothorax, with its appendages modified as maxillipeds. The remaining thoracic legs have both epipods (outgrowths borne by the basal region of the appendages) and exopods (outer branches of the biramous appendages). There are six free pleomeres. The first antennae usually have statocysts, that is, sensory organs of equilibrium. The first two pairs of pleopods of the male are modified in a petasma for sperm transfer. *See* BATHYNELLACEA; CRUSTACEA; SYNCARIDA.

Description. Uniquely among the extant Malacostraca (the largest and most diversified class of the Crustacea), two epipods (typically with respiratory function) are found on the pereopods of some anaspidaceans. They originate close together, but separately, on the outer coxal margin and largely overlap in life, thereby functioning as a double lamella. *See* MALACOSTRACA.

The anaspidacean body is long and almost cylindrical (see **illustration**). The head does not bear a carapace and eyes may be on stalks, sessile on the head, or absent altogether. Antennules (antennae 1) are biramous or uniramous; the peduncle and flagellum are distinct; the endopod (inner branch) is reduced, vestigial, or absent; the exopod is well developed and whiplike; and the statocyst (located in the first segment of each antennule) may be present or absent. Antennae (antennae 2) are uniramous; the exopod is multiarticulated or may form a scaphocerite (a scalelike branch).

The first thoracic somite is fused to the head, whereas the remaining seven thoracic somites are free. The first thoracic appendage is modified as a maxilliped, that is, it has a different morphology from the remaining seven pairs of thoracic limbs, and is modified as a feeding structure.

Thoracic limbs (= pereopods) 2–8 have the endopod developed into full walking legs. On these appendages, the epipods function as flattened gills, and the exopods are in nearly constant motion, most likely circulating fresh oxygen-bearing water past the flaplike epipods. Sometimes, the exopods are not present. The pleopods may be strongly developed, reduced, or absent.



Parastygocaris andina Noodt: male, lateral view. [Modified from W. Noodt, *Anaspidacea (Crustacea, Syncarida) in der südlichen Neotropis*, *Verh. Dtsch. Zool. Ges. Wien*, 1962:568–578, 1963]

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The sexes are separate. Females shed their eggs externally. Larval development is anamorphic (indirect development, in which a series of similar larval stages are passed through after hatching) or epimorphic (direct development, in which the juvenile hatches with adult morphology).

The larger anaspidaceans are found generally in cool mountain streams, lakes, and swamps, whereas the smaller stygocaridideans dwell in the groundwater, living among the sand grains.

Classification. The order Anaspidacea, which arose during the Paleozoic Era (543–248 million years ago), has present-day representatives: five families (Anaspididae, Koonungidae, Patagonaspididae, Psammaspididae, and Stygocarididae), with 12 genera and 21 living species. Anaspidaceans show a classic Gondwana relict distribution pattern, being found only in Tasmania, southeastern Australia, New Zealand, and southern South America. The family Anaspididae is known only from a small number of localities in Tasmania and Victoria (Australia), whereas the Stygocarididae is more widely dispersed, with species known from Victoria (Australia), New Zealand, Chile, and Argentina.

The oculated family Anaspididae [with the genera *Allanaspides*, *Anaspides*, and *Paranaspides* (plus two monospecific Australian fossil genera)] and the Koonungidae (with the genera *Koonunga* and *Micraspides*) are the largest in size [7–55 mm (0.28–2.2 in.) in length] and exhibit a tail fan formed by the flat uropods grouped with the telson. The only genus of the family Patagonaspididae (*Patagonaspides*) is an inhabitant of phreatic groundwater (that is, groundwater in the zone of saturation) and differs from all the other South American species of Anaspidacea, which inhabit hyporheic (that is, beneath and adjacent to streams and rivers where surface water and groundwater mix) environments.

The smaller interstitial family Psammaspididae (with the genera *Eucrenonaspides* and *Psammaspides*) and the Stygocarididae (with the genera *Oncostygaris*, *Parastygaris*, *Stygocarella*, and *Stygocaris*) measure only 1.4–14 mm (0.055–0.55 in.) in length. They have no eyes and no tail fan.

Estela C. Lopretto

Key Words: Anaspidacea; freshwater crustacean; Syncarida; morphology; taxonomy; surface and subterranean waters; South Hemisphere distribution

Bibliography. A. I. Camacho and A. G. Valdecasas, Global diversity of syncarids (Syncarida, Crustacea) in freshwater, pp. 257–266, in E. V. Balian et al. (eds.), *Freshwater Animal Diversity Assessment (Development in Hydrobiology 198)*, Springer, Dordrecht, the Netherlands, 2008; N. Coineau, Sous-classe des Eumalacostracés (Eumalacostraca Grobben, 1892), Super-ordre des syncarides (Syncarida Packard, 1885), pp. 897–900, in J. Forest (ed.), *Traité de Zoologie sous la Direction de P.-P. Grassé, Tome 7 Crustacés, Fasc. 2, Généralités (suite) et Systématique (Céphalocarides à Syncarides)*, Masson et Cie, Paris, 1996; N. Coineau, Syncarida, pp. 863–876, in C. Juberthie and V.

125 Decu (eds.), *Encyclopaedia Biospeologica Tome 2*,
 126 Soci t  de Biosp ologie, Bucharest, Romania, 1998;
 127 A. Kaestner, Superorder Syncarida, order Anaspi-
 128 dacea, pp. 257–261, in *Invertebrate Zoology*, vol. 3:
 129 *Crustacea*, Wiley-Interscience, New York, 1970;
 130 F. R. Schram, Anaspidacea, pp. 74–86, in *Crustacea*,
 131 Oxford University Press, New York, 1986.
 132 Additional Readings. L. E. Grosso and M. Peralta, *Patag-*
 133 *onaspides* gen. n.; *P. sandroruffoi* sp. n. (Crustacea,
 134 Syncarida): First phreatobite species of a new anaspi-
 135 dacean family discovered in Patagonia with cladis-
 136 tic analysis of Stygocaridinea (Anaspidacea), *Boll.*
 137 *Mus. Civ. Stor. Nat. Verona Bot. Zool.*, 26:105–
 138 118, 2002; B. Knott and P. S. Lake, *Eucrenonaspi-*
 139 *des oinotheke* gen. et sp. n. (Psammaspididae) from
 140 Tasmania, and a new taxonomic scheme for Anaspi-
 141 dacea (Crustacea, Syncarida), *Zool. Scr.*, 9:25–33,
 142 1980; E. C. Lopretto and J. J. Morrone, Anaspi-
 143 dacea, Bathynellacea (Crustacea, Syncarida), gener-
 144 alised tracks, and the biogeographical relationship
 145 of South America, *Zool. Scr.*, 27(4):311–318, 1998;
 146 H. K. Schminke, *Psammaspides williamsi* gen. n.,
 147 sp. n., ein Vertreter einer neuen Familie mesop-
 148 sammaler Anaspidacea (Crustacea, Syncarida), *Zool.*
 149 *Scr.*, 3:177–183, 1974; R. Swain et al., *Allanaspi-*
 150 *des belonomus* gen. et sp. nov. (Crustacea: Syncar-
 151 ida) from Tasmania, *Rec. Queen Vic. Mus.*, 35:1–13,
 152 1970; W. D. Williams, Ecological notes on Tasma-
 153 nian Syncarida (Crustacea: Malacostraca), with a de-
 154 scription of a new species of *Anaspides*, *Int. Rev.*
 155 *Gesamten Hydrobiol.*, 50(1):95–126, 1965.

URLs**Anaspidacea**

http://zipcodezoo.com/Key/Animalia/Anaspidacea_Order.asp

Anaspidacea: Families

<http://crustacea.net/crustace/anaspidacea/index.htm>

Anaspides Photography

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