# PHYLUM ARTHROPODA

## Subphylum Chelicerata

In the great group of chelicerates are included a variety of "arachnoid" types, most of which are in highly specialized terrestrial groups. Marine representatives include the primitive and ancient Xiphosurida ("horseshoe crabs"), the small and specialized order of Pycnogonida ("sea spiders") of obscure affinities, and the marine mites (Order Acarina, Family Halacaridae). Of the latter, about 20 species have been recorded from southern New England, but the study of these small creatures presents difficulties, and the interested student is referred to the comprehensive work of Newell, I. M., 1947. A systematic and ecological study of the Halacaridae of eastern North America. Bull. Bingham Oceanogr. Coll., 10: 1-232.

## Class Xiphosurida

Limulus polyphemus (Linnaeus), the common "horseshoe crab", has been almost universally known as Limulus, except for a brief period in which the name Xiphosura polyphemus was unfortunately used. Briefly: in 1928 the International Commission on Zoological Nomenclature placed Limulus of O. F. Müller 1785 on the "Official List of Generic Names in Zoology" in the mistaken belief that this name was available and valid. However, Xiphosura was later found to have been used by Brünnich in 1771 for this animal, and so had priority. The discovery that the 1928 Opinion was made in error led some workers to consider it "not binding", and in the period around 1950 the authors of several works (including "Selected Invertebrate Types") used Xiphosura. In 1955, the International Commission, acting under its plenary powers (suspension of the rules) invalidated the priority of Xiphosura as a generic name of the American horseshoe crab. Opinion 320, including the letters expressing the views of specialists, makes instructive reading.

## Class Pycnogonida

Despite the abundance of pycnogonids (about 50 genera and 500 species) in the seas of the world, the fauna of Woods Hole includes only three common species: Tanystylum orbiculare, Callipallene brevirostris, and Anoplodactylus lentus. This group has received little attention in recent years, although the first good systematic report on them in America was that on New England Pycnogonida by E. B. Wilson, and their embryology was described by T. H. Morgan in his doctoral thesis (1891). Most shore pycnogonids feed upon hydroids and the young stages of many species encyst or form galls in hydroids. Since our information is still incomplete, collectors would do well to note the associated coelenterate in making collections. The following key will separate the common local species, plus one common north of the Cape; for anything that will not key out, consult Hedgpeth (1948).

### KEY TO COMMON PYCNOGONIDS
(Figure references are to Plate 11)

1. Chelifores present; palpi lacking (fig. 1) . . . . . 2
1. Chelifores absent; palpi present, of 4-7 joints (fig. 4); small species (TANYSTYLIDAE) . . . . . Tanystylum orbiculare

2. Ovigerous legs 10-jointed and present in both sexes; (fig. 3) (PALLENIDAE) . . . . . Callipallene brevirostris
2. Ovigerous legs less than 10-jointed, and lacking in females (fig. 6) . . . . . PHOXICHILIDIIDAE 3

3. Cephalic segment extended forward as a short neck, overhanging base of proboscis (fig. 5) . . . . . Anoplodactylus lentus
3. Cephalic segment not forming a neck (fig. 2) (common north of Cape) . . . . . Phoxichilidium femoratum

## ANNOTATED LIST OF PYCNOGONIDS REPORTED FROM THE CAPE COD REGION

Anoplodactylus lentus Wilson, 1878. Breeds in August at Woods Hole. Dawson has described the colored blood corpuscles (Biol. Bull., 66: 1934). Rare north of Cape. In Morgan's embryological work, called Phoxichilidium maxillare.

Callipallene brevirostris (Johnson, 1837). The smallest of the common pycnogonids at Woods Hole. Found among hydroids and on pilings. Referred to by Morgan as Pallene empusa.

Endeis spinosa (Montagu, 1808). Not in key. Occasional at Woods Hole upon drifting Sargassum.

Pycnogonum littorale (Ström, 1762). Not in key. No record for Woods Hole, although within the reported range.

Phoxichilidium femoratum (Rathke, 1799). Has been taken abundantly on Tubularia north of the Cape.

Tanystylum orbiculare Wilson, 1878. Common but small and easily overlooked; found on pilings and among ascidians and hydroids.

## REFERENCES

Hedgpeth, J. W., 1948. The Pycnogonida of the western North Atlantic and the Caribbean. Proc. U. S. Nat. Mus., 97: 157-342.

Morgan, T. H., 1891. A contribution to the embryology and phylogeny of the pycnogonids. Studies from the Biol. Lab., Johns Hopkins Univ., 5: 1-76, pl. I-VIII.

Wilson, E. B., 1878. Synopsis of the Pycnogonida of New England, Trans. Conn. Acad. Arts & Sci., 5: 1-26.

Plate 11

PYCNOGONIDA, CIRRIPEDIA

(1-6) Pycnogonids after Hedgpeth (scale bars = 1 mm); (7-18) barnacles after Zullo; all redrawn by Bruce Shearer.

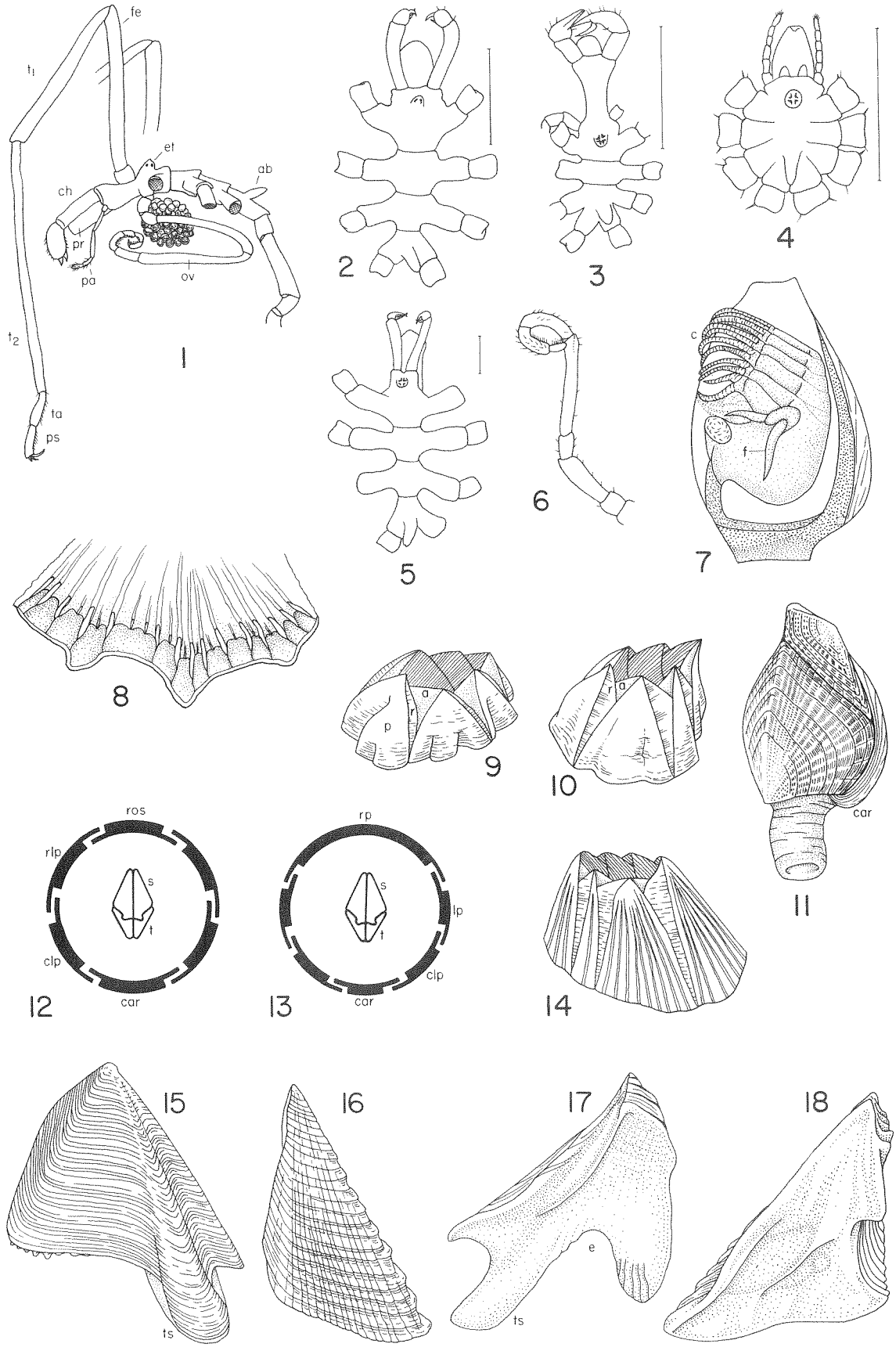
1. Anatomy of a generalized pycnogonid:
2. Phoxichilidium femoratum.
3. Callipallene brevirostris.
4. Tanystylum orbiculare.
5. Anoplodactylus lentus.
6. Ovigerous leg of male A. lentus.

Abdomen (ab)
Eye tubercle (et)
Chelifore (ch)
Palp (pa)
Proboscis (pr)
Ovigerous leg (ov)
Femur (f)
Tarsus (t)
Tibia, first, second ($t_1$, $t_2$)
Propodus (p)

7. Generalized lepadomorph barnacle with capitular sheath cut away to show cirri and filamentary appendages.
8. Balanus balanus, base of shell wall seen from below, showing internal ribs and septa.
9. Balanus improvisus, shell only, showing radius only partly overlapping ala.
10. Balanus eburneus, shell only, showing extensive overlap of ala by radius.
11. Lepas anserifera, seen from right side.
12. Diagram of plate arrangement in Chthamalus.
13. Diagram of plate arrangement in Balanus.
14. Balanus amphitrite niveus, showing color pattern of longitudinal striae.
15. Exterior of tergum of Balanus improvisus, showing tergal spur.
16. Exterior of scutum of B. eburneus, showing radial striations.
17. Interior of tergum of B. eburneus, showing excavation on carinal side of basal margin.
18. Interior of scutum of B. amphitrite amphitrite, showing adductor ridge (diagonal line near center).

ala (a)
carina (car)
carinolateral plate (clp)
cirri (c)
excavation of tergum (e)
filamentary appendages (f)
lateral plate (lp)
paries (p)
radius (r)
rostral plate (rp)
(rp = fused ros + rlp)
rostrolateral plate (rlp)
rostrum (ros)
scutum (s)
tergal spur (ts)
tergum (t)

Plate II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