Subclass Siphonophorae

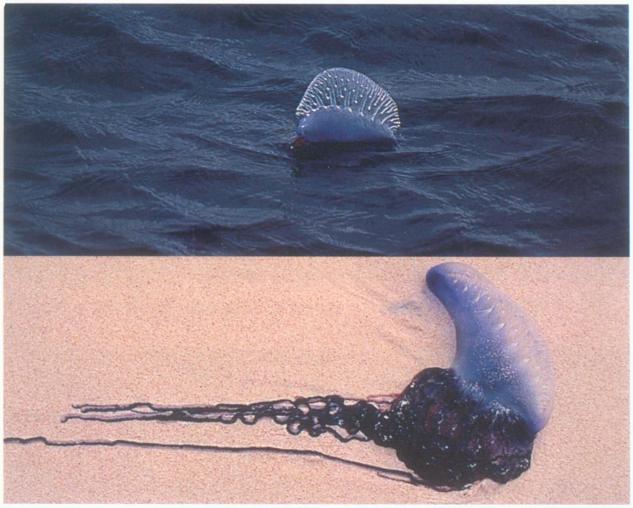
These exotic, chain-like carnivores are usually transparent and mostly oceanic, but landbound observers are in for a treat when these animals occasionally come inshore. A siphonophore may be as small as a few millimeters, or as long as many meters. Most have specific swimming behaviors that function to spread out their nematocyst-covered tentacles into a "net" for capturing prey. It is still debated whether siphonophores are colonies or individuals, but most specialists now prefer to think of them as individuals with many, well-integrated parts. Many of these parts are repeated multiple times by a budding process and are beautifully complex under the microscope; some are swimming bells, others serve for flotation, others are "stomachs," or have reproductive functions. These structures are mostly bilaterally symmetrical rather than radially symmetrical like the hydromedusae, to whom they are related.

Although there are only about 150 recognized species and many are cosmopolitan in distribution, the identification of siphonophores is not an easy task. There are relatively few images in the literature of entire animals, as most have been described from the various (mostly transparent) bits that become separated in plankton tows, either from the rigors of net collection, or from preservation in formaldehyde, which tends to separate even the nicest specimens into small pieces. Furthermore, many siphonophores bud off free-living sexual fragments, known as eudoxids, that swim away from their parent (or nurse) siphonophore, frequently even living at a different depth, and free-spawn gametes that develop into a new "nurse" siphonophore. All of the pieces of both the larger and eudoxid forms of each species must be described and connected with each other.

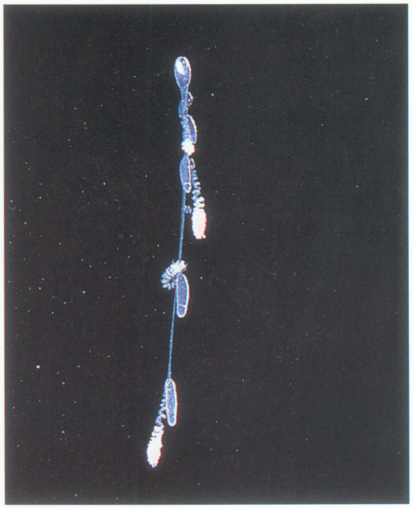
Because of the difficulties in identifying siphonophores to species, we have chosen to present only a few representative species in this guide, leaving the job of positive identification to the highly specialized taxonomic literature. For identification, we recommend first a small guidebook to British siphonophores by Kirkpatrick and Pugh (1984), which has considerable overlap with our west coast fauna; this can be augmented by the monographs of Totton (1965) or Bigelow (1911). The serious researcher will also need to consult the more recent, highly diverse, scientific literature. A review of siphonophore biology by Mackie *et al.* (1987) is particularly useful. Increasing publication of *in situ* siphonophore images taken by scientists using submersibles, ROVs, or even blue-water diving will help in the future for identification of intact specimens.

Order Cystonecta

Cystonect siphonophores are characterized by an apical gas-filled float, or pneumatophore, and they lack the swimming bells typical of other orders of siphonophores. Below the pneumatophore, cystonects have a stem region, or siphosome, which can be very long and is composed of a central stem, which buds multiple polypoid or medusoid structures. The float is either horizontal, as in *Physalia*, or vertical, as in the rest of the Cystonectae. Most if not all members of this small group have a sting that is painful to humans.



59. ***Physalia physalis*** T. Heeger



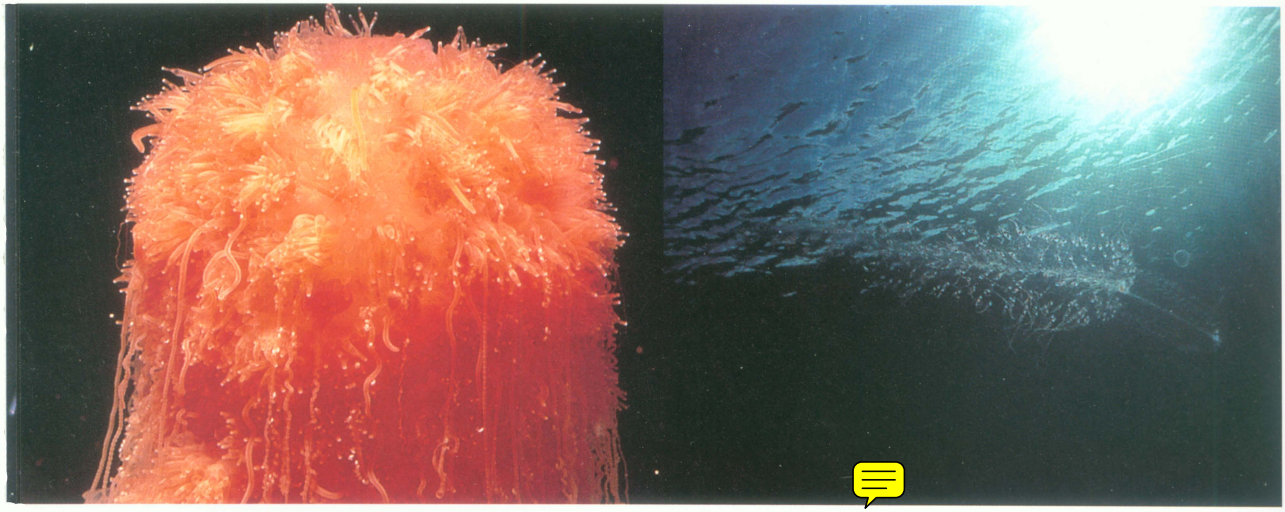
60. ***Rhizophysa* sp.** G. Dietzmann

Order Physonecta

Physonect siphonophores possess both an apical gas-filled float, or pneumatophore, and a close-fitting set of swimming bells, the nectophores. Below the swimming bells, physonects have a long stem region that includes both feeding and reproductive structures; these do not normally detach from the parent siphonophore, and their gametes mature in place. Most physonects are hermaphroditic, and some, including *Physophora*, can inflict painful stings. Some of the longest oceanic siphonophores are in this order.

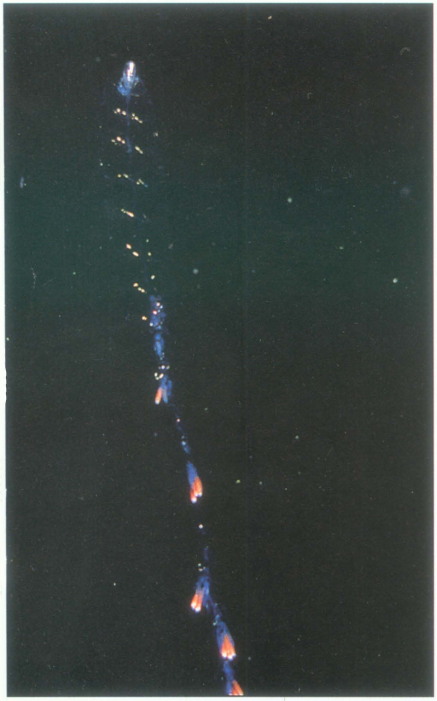
61. ***Apolemia uvaria***

62. ***Athorybia rosacea*** G. Dietzmann

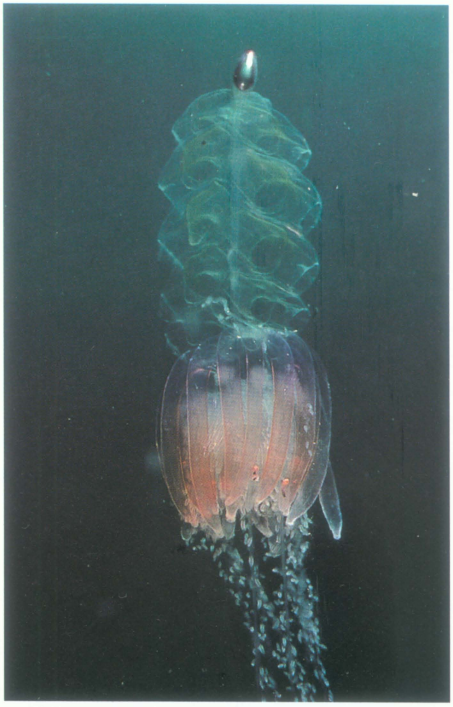


63. ***Dromalia alexandri***

64. ***Forskalia edwardsi***



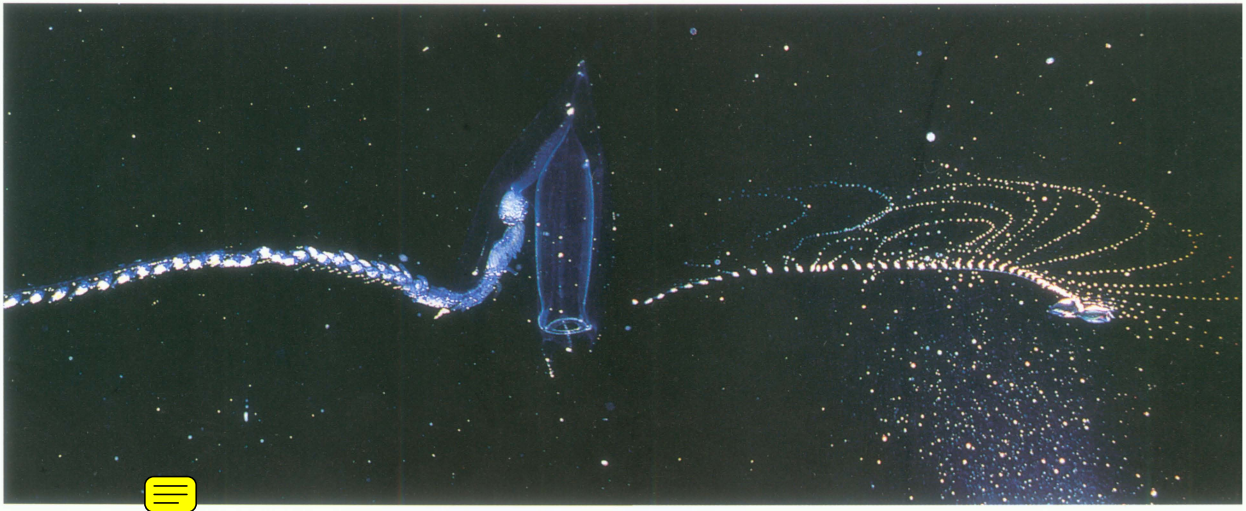
65. ***Nanomia bijuga***



66. ***Physophora hydrostatica***

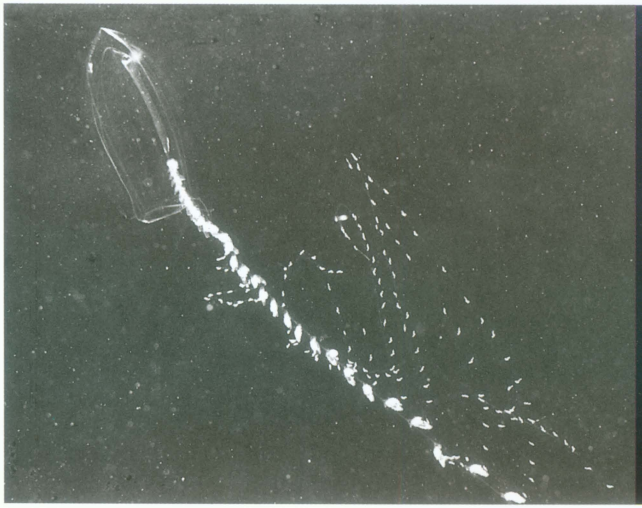
Order Calycophora

This group lacks the apical gas-filled float, or pneumatophore, but has swimming bells, or nectophores. On the stem below the swimming bells, calycophorans have multiple identical units, each composed of several components, that can detach and become free-swimming sexual "eudoxids." Small calycophoran species may have a rocket ship-shaped swimming bell and can dart about quite rapidly; they have very precise behaviors for setting their tentacles as a fishing net (most are in the family *Diphyidae*).



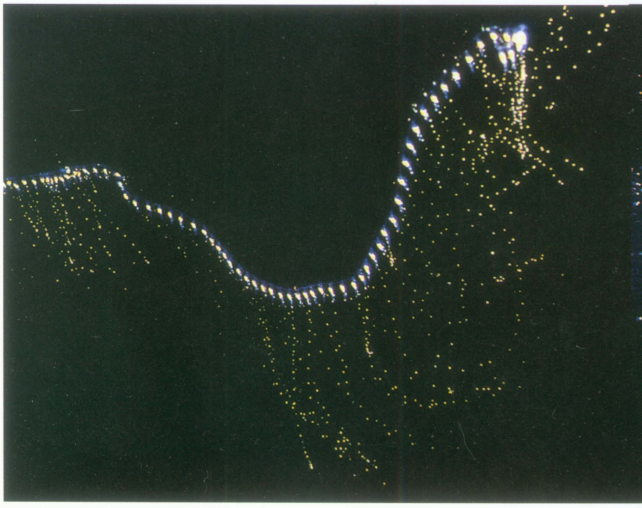
67. ***Unidentified calycophoran***

68. ***Unidentified diphyid*** G. Dietzmann

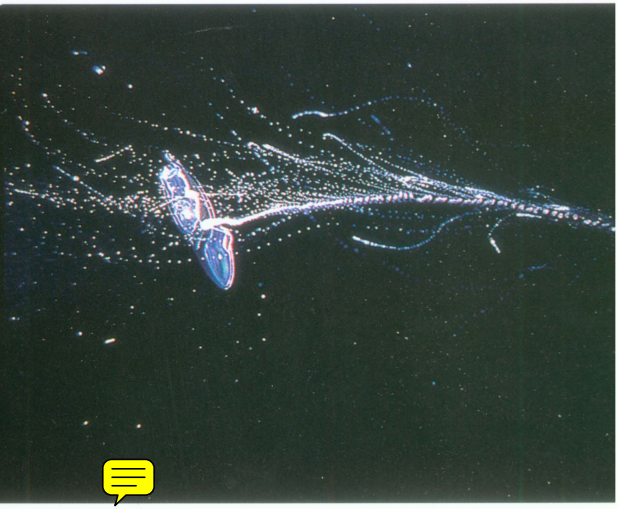


69. ***Muggiaea atlantica***

70a. ***Praya sp. (swimming bells)***



70b. ***Praya sp. (stem)***



71. ***?Sulculeolaria sp.*** G. Dietzmann