

The Lophophorate phyla of British Columbia: Entoprocts, Bryozoans, Phoronids, and Brachiopods

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In older metazoan classifications it was customary to group the phyla which bear a lophophore together into a superphylum (sometimes a phylum) called the Lophophorata or Spiralia. In more recent classifications based on morphology, paleontology, and molecular work it become clear that this grouping is artificial. There is strong support for a classification of a group called the Lophotrochozoa, which includes the traditional lophophorates as well as the mollusks, annelids, nemerteans, and a few other phyla. It is likely that the lophophore (an unusual feeding appendage) is primitive in the group and has been lost in some surviving taxa while retained in others.

The list of Entoprocta and Bryozoa was taken from O'Donghue & O'Donoghue (1923, 1926) and Osburn (1950, 1952, 1953). More recent changes to the taxonomy were taken from the Bryozoa Home page (www.bryozoa.net), the Integrated Taxonomic Information System (ITIS, www.itis.gov), and the World register of marine species (WoRMS, www.marinespecies.org). It is highly likely that I have missed some changes in classification. With the species list I attempted to err on the side of caution so there are undoubtedly species missing from the list that have been named since 1953 or were subsequently discovered in BC since my last comprehensive source. The freshwater taxa are certainly incomplete (see note at end of checklist). A few additional species were added as listed by Lamb & Hanby (2005).

Phylum Entoprocta Nitsche, 1869

Order Solitaria Emschermann, 1972*

Family Loxosomatidae

Genus *Loxosoma* Keferstein, 1862

Loxosoma davenporti Nickerson, 1898

Genus *Loxosomella* Mortensen, 1911

Loxosomella nordgardi Ryland, 1951

Loxosomella spp. (= *Loxocalyx* sp. Osburn, 1953)

Order Coloniales Emschermann, 1972*

Family Loxokalypodidae Emscherman, 1972

Genus *Loxokalypus* Emscherman, 1972

Loxokalypus socialis Emscherman, 1972

Family Pedicellinidae Johnston, 1847

Genus *Myosoma* Robertson, 1900 †

Myosoma spinosa Robertson, 1900 †
 Genus *Pedicellina* Sars, 1835
 Pedicellina cernua (Pallas, 1771)
 Family Barentsiidae Emschermann, 1972
 Genus *Barentsia* Hincks, 1880
 Barentsia gracilis (Sars, 1835)
 Barentsia ramosa (Robertson, 1900)
 Barentsia robusta Osburn, 1953
 Genus *Urnatella* Leidy, 1851
 Urnatella gracilis Leidy, 1851**

Phylum Bryozoa Ehrenberg, 1831

Class Phylactolaemata Allman, 1856

Order Plumatellida Allman, 1856

Family Cristatellidae Allman, 1856
 Genus *Cristatella* Cuvier, 1798
 Cristatella mucedo Cuvier, 1798**
 Family Fredericellidae Hyatt, 1868
 Genus *Fredericella* Gervais, 1838
 Fredericella indica Annandale, 1909**
 Family Plumatellidae Allman, 1856
 Genus *Plumatella* Linnaeus, 1758
 Plumatella emarginata Allman, 1844**
 Plumatella fruticosa Allman, 1844**
 Plumatella rugosa Wood, Geimer & Massard, 1998**

Class Gymnolaemata Allman, 1856

Order Ctenostomata Busk, 1852

Suborder Carnosa Gray, 1841

Family Alcyonidiidae Johnston, 1838
 Genus *Alcyonidium* Lamouroux, 1813
 Alcyonidium gelatinosum (Linnaeus, 1761)
 Alcyonidium mammillatum Alder, 1857
 Alcyonidium pedunculatum Robertson, 1902
 Family Clavoporidae Osburn & Soule, 1953
 Genus *Clavopora* Busk, 1874
 Clavopora occidentalis (Fewkes, 1889)
 Family Flustrellidridae Bassler, 1953
 Genus *Flustrellidra* Bassler, 1953
 Flustrellidra corniculata (Smitt, 1871)
 Family Vesiculariidae Hincks, 1880
 Genus *Bowerbankia* Farre, 1837
 Bowerbankia gracilis Leidy, 1855
 Bowerbankia gracilis aggregata O'Donohugh & O'Donohugh, 1926

Suborder Paludicellea Allman, 1856

Family Nolellidae Harmer, 1915
 Genus *Nolella* Gosse, 1855
 Nolella stipata Gosse, 1855
 Suborder Stolonifera Ehlers, 1876
 Family Buskiidae Hincks, 1880
 Genus *Buskia* Alder, 1856
 Buskia nitens Alder, 1856
 Family Triticellidae Sars, 1873
 Genus *Triticella* Dalyell, 1848
 Triticella pedicellata (Alder, 1857)
 Order Cheilostomata Busk, 1852
 Suborder Anasca Levinsen, 1909
 Family Aeteidae Smitt, 1868
 Genus *Aetea* Lamouroux, 1812
 Aetea anguina (Linnaeus), 1758
 Aetea ligulata Busk, 1852
 Aetea truncata (Landsborough, 1852)
 Family Beaniidae Canu and Bassler, 1927
 Genus *Beania* Johnston, 1840
 Beania columbiana O'Donoghue, 1923
 Beania mirabilis Johnston, 1840
 Family Bicellariellidae Levinsen, 1909
 Genus *Bicellariella* Levinsen, 1909
 Bicellariella brevispina (O'Donoghue), 1923
 Bicellariella ciliata (Linnaeus, 1758)
 Bicellariella stolonifera O'Donoghue, 1926
 Genus *Corynoporella* Hincks, 1888
 Corynoporella spinosa Robertson, 1905
 Family Bugulidae Gray, 1848
 Genus *Bugula* Oken, 1815
 Bugula avicularia (Linnaeus, 1758)
 Bugula californica Robertson, 1905
 Bugula cucullifera Osburn, 1912
 Bugula longirostrata Robertson, 1905
 Bugula pacifica Robertson, 1905
 Bugula pugeti Robertson, 1905
 Genus *Caulibugula* Verrill, 1900
 Caulibugula californica (Robertson, 1905)
 Caulibugula ciliata (Robertson, 1905)
 Caulibugula occidentalis (Robertson, 1905)
 Genus *Dendrobeania* Levinsen, 1909
 Dendrobeania murrayana (Johnston, 1847)
 Dendrobeania curvirostrata (Robertson, 1905)
 Dendrobeania laxa (Robertson, 1905)
 Dendrobeania lichenoides (Robertson, 1900)
 Dendrobeania murrayana (Johnston, 1847)

- Dendrobeania simplex* (O'Donoghue, 1923)
- Family Calloporidae Norman, 1903
- Genus *Alderina* Norman, 1903
- Alderina brevispina* (O'Donoghue, 1926)
- Genus *Callopora* Gray, 1848
- Callopora armata* O'Donoghue, 1926
- Callopora exilis* (Hincks, 1882)
- Callopora horrida* (Hincks, 1880)
- Callopora inconspicua* (O'Donoghue, 1923)
- Callopora lineata* (Linnaeus, 1758)
- Genus *Copidozoum* Harmer, 1926
- Copidozoum tenuirostre* (Hincks, 1880)
- Copidozoum protectum* (Hincks, 1884)
- Genus *Doryporella* Norman, 1903
- Doryporella alcicornis* (O'Donoghue, 1923)
- Genus *Ellisina* Norman, 1903
- Ellisina levata* (Hincks, 1882)
- Genus *Tegella* Levinsen, 1909
- Tegella aquilirostris* (O'Donoghue, 1923)
- Tegella armifera* (Hincks, 1880)
- Tegella arctica* (d'Orbigny, 1851)
- Tegella circumclathrata* (Hincks, 1881)
- Tegella robertsonae* O'Donoghue, 1926
- Tegella unicornis* (Fleming, 1828)
- Family Cellariidae Lamouroux, 1821
- Genus *Cellaria* Ellis and Solander, 1786
- Cellaria diffusa* Robertson, 1905
- Cellaria mandibulata* Hincks, 1882
- Family Chapperiidae Bassler, 1935 (?)
- Genus *Chapperiopsis* Uttley, 1949 (?)
- Chapperiopsis patula* (Hincks, 1881) (?)
- Chapperiopsis varians* (O'Donoghue, 1926) (?)
- Family Cribrilinidae Hincks, 1880
- Genus *Colletosia* Jullien, 1886
- Colletosia radiata* (Moll, 1803)
- Genus *Cribrilina* Gray, 1848
- Cribrilina annulata* (Fabricius, 1780)
- Cribrilina corbicula* (O'Donoghue, 1923)
- Genus *Lyrula* Jullien, 1886
- Lyrula hippocrepis* Hincks, 1882
- Genus *Puellina* Jullien, 1886
- Puellina setosa* (Waters, 1899)
- Genus *Reginella* Jullien, 1886
- Reginella furcata* (Hincks, 1884)
- Family Electridae d'Orbigny, 1851
- Genus *Electra* Lamouroux, 1816

Electra crustulenta arctica Borg, 1931
 Family Flustridae Lamouroux, 1821
 Genus *Terminoflustra* Silén, 1941
 Terminoflustra membranaceo-truncata (Smitt, 1868)
 Family Hincksinidae Canu and Bassler, 1927
 Genus *Cauloramphus* Norman, 1903
 Cauloramphus echinus (Hincks, 1882)
 Cauloramphus spiniferum (Johnston, 1832)
 Genus *Hincksina* Norman, 1903
 Hincksina alba (O'Donoghue, 1923)
 Hincksina minuscula (Hincks, 1884)
 Hincksina nigrans (Hincks, 1882)
 Hincksina pallida (Hincks, 1884)
 Hincksina polacantha O'Donoghue, 1926
 Hincksina velata (Hincks, 1881)
 Family Membraniporidae Busk, 1854
 Genus *Conpeum* Gray, 1848
 Conopeum reticulum (Linnaeus, 1767)
 Genus *Desmacystis* Osburn, 1950
 Desmacystis sandalia (Robertson, 1900)
 Genus *Membranipora* Blainville, 1830
 Membranipora serrilamella Osburn, 1950
 Family Microporidae Gray, 1848
 Genus *Micropora* Gray, 1848
 Micropora coriacea (Esper, 1791)
 Genus *Microporina* Levinsen, 1909
 Microporina borealis (Busk, 1855)
 Family Scrupocellariidae Levinsen, 1909
 Genus *Caberea* Lamouroux, 1816
 Caberea boryi Audouin, 1826
 Caberea ellisi (Fleming, 1828)
 Genus *Scrupocellaria* Van Beneden, 1845
 Scrupocellaria californica Trask, 1857
 Scrupocellaria diegensis Robertson, 1905
 Scrupocellaria inarmata O'Donoghue, 1926
 Scrupocellaria varians Hincks, 1882
 Genus *Tricellaria* Fleming, 1828
 Tricellaria erecta (Robertson, 1900)
 Tricellaria gracilis (Smitt, 1867)
 Tricellaria occidentalis (Trask, 1857)
 Tricellaria occidentalis catalinensis (Robertson, 1905)
 Tricellaria pribilofi (Robertson, 1905)
 Tricellaria ternata (Solander, 1786)
 Superfamily Scruparioidea Gray, 1848

- Family Scrupariidae Gray, 1848
 - Genus *Scruparia* Oken, 1915
 - Scruparia ambigua* (d'Orbigny, 1841)
- Family Eucrateidae Johnston, 1847
 - Genus *Eucratea* Lamouroux, 1812
 - Eucratea loricata* (Linnaeus, 1758)
- Suborder Ascophora Levinsen, 1909
 - Family Celleporidae Busk, 1852
 - Genus *Holoporella* Waters, 1909
 - Holoporella brunnea* (Hincks, 1884)
 - Genus *Trematoecia* Osburn, 1940
 - Trematoecia porosa* (Canu and Bassler, 1930)
 - Genus *Costazia* Neviani, 1895
 - Costazia robertsoniae* Canu and Bassler, 1923
 - Costazia nordenskjoldi* (Kluge, 1929)
 - Costazia surcularis* (Packard, 1863)
 - Costazia ventricosa* (Lorenz, 1886)
 - Family Cheiloporinidae Bassler, 1936
 - Genus *Cheilopora* Levinsen, 1909
 - Cheilopora praelonga* (Hincks, 1883)
 - Cheilopora praelucida* (Hincks, 1884)
 - Genus *Lagenipora* Hincks, 1877
 - Lagenipora punctulata* (Gabb and Horn, 1862)
 - Lagenipora spinulosa* Hincks, 1883
 - Lagenipora socialis* Hincks, 1877
 - Family Eurystomellidae Levinsen, 1909
 - Genus *Eurystomella* Levinsen, 1909
 - Eurystomella bilabiata* (Hincks, 1884)
 - Family Gigantoporidae Bassler, 1935
 - Genus *Cylindroporella* Hincks, 1877
 - Cylindroporella tubulosa* (Norman, 1868)
 - Family Hippoporinidae Osburn, 1952
 - Genus *Hippoporella* Canu, 1917
 - Hippoporella nitescens* (Hincks, 1884)
 - Genus *Lacerna* Jullien, 1888
 - Lacerna fistulata* (O'Donoghue, 1923)
 - Family Hippothoidae Fischer, 1866
 - Genus *Celleporella* Gray, 1848
 - Celleporella hyalina* (Linnaeus, 1758)
 - Genus *Hippothoa* Lamouroux, 1821
 - Hippothoa divaricata* Lamouroux, 1821
 - Genus *Trypostega* Levinsen, 1909
 - Trypostega claviculata* (Hincks, 1884)
 - Family Mamilloporidae Canu and Bassler, 1927
 - Genus *Mamillopora* Smitt, 1873
 - Mamillopora cupula* Smitt, 1873

- Family Microporellidae Hincks, 1880
- Genus *Fenestrulina* Jullien, 1888
Fenestrulina malusi (Audouin, 1926)
Fenestrulina malusi umbonata O'Donoghue, 1926
- Genus *Microporella* Hincks 1877
Microporella ciliata (Pallas, 1766)
Microporella ciliata stellata (Verrill, 1875)
Microporella umbonata (Hincks, 1884)
Microporella vibraculifera (Hincks, 1884)
Microporella cribrosa Osburn, 1952
Microporella californica (Busk, 1856)
Microporella setiformis O'Donoghue, 1923
- Family Myriozoidae Smitt, 1867
- Genus *Myriozoum* Donati, 1750
Myriozoum coarctatum (Sars, 1850)
Myriozoum subgracile d'Orbigny, 1852
Myriozoum tenue O'Donoghue, 1923
- Family Reteporidae Smitt, 1867
- Genus *Lepraliella* Levinsen, 1916
Lepraliella bispina (O'Donoghue, 1923)
- Genus *Phidolopora* Gabb and Horn, 1862
Phidolopora pacifica (Robertson, 1908)
- Genus *Rhynchozoon* Hincks, 1895
Rhynchozoon bispinosum (Johnston, 1849)
Rhynchozoon grandicella Canu and Bassler, 1923
Rhynchozoon rostratum (Busk, 1855)
Rhynchozoon tumulosum (Hincks, 1882)
- Genus *Schizoretepora* Gregory, 1893
Schizoretepora tessellata Hincks, 1878
- Genus *Schizotheca* Hincks, 1877
Schizotheca fissurella (Hincks, 1882)
- Family Schizoporellidae Jullien, 1883
- Genus *Arthropoma* Levinsen, 1909
Arthropoma cecili (Audouin, 1826)
- Genus *Dakaria* Jullien, 1903
Dakaria dawsoni (Hincks, 1883)
Dakaria ordinata (O'Donoghue, 1923)
Dakaria pristina (Hincks, 1883)
- Genus *Hippodiplosia* Canu, 1916
Hippodiplosia insculpta (Hincks, 1882)
- Genus *Hippomonavella* Canu and Bassler, 1934
Hippomonavella longirostrata (Hincks, 1883)
- Genus *Schizomavella* Canu and Bassler, 1917
Schizomavella auriculata (Hassall, 1842)
Schizomavella auriculata ochracea (Hincks, 1880)
- Genus *Schizoporella* Hincks, 1877

- Schizoporella linearis inarmata* (Hincks, 1884)
 - Schizoporella cornuta* (Gabb and Horn, 1862)
 - Schizoporella unicornis* (Johnston, 1847)
 - Family Smittinidae Levinsen, 1909
 - Genus *Codonellina* Canu and Bassler, 1934
 - Codonellina anatina* (Canu and Bassler, 1927)
 - Codonellina cribriformis* (O'Donoghue, 1923)
 - Genus *Mucronella* Hincks, 1880
 - Mucronella ventricosa* (Hassall, 1842)
 - Mucronella major* (Hincks, 1884)
 - Genus *Parasmittina* Osburn, 1952
 - Parasmittina trispinosa* (Johnston, 1838)
 - Genus *Porella* Gray, 1848
 - Porella acutirostris* Smitt, 1867
 - Porella columbiana* O'Donoghue, 1923
 - Porella concinna* (Busk, 1854)
 - Porella porifera* (Hincks, 1884)
 - Genus *Rhamphostomella* Lorenz, 1886
 - Rhamphostomella cellata* (O'Donoghue, 1923)
 - Rhamphostomella costata* Lorenz, 1886
 - Rhamphostomella bilaminata* (Hincks, 1877)
 - Rhamphostomella curvirostrata* O'Donoghue, 1923
 - Genus *Smittina* Norman, 1903
 - Smittina arctica* (Norman, 1894)
 - Smittina landsborovi* (Johnston, 1847)
 - Smittina spathulifera* (Hincks, 1884)
 - Family Stomachetosellidae Canu and Bassler, 1917
 - Genus *Pachyegis* Osburn, 1952
 - Pachyegis brunnea* (Hincks, 1889)
 - Genus *Stomachetosella* Canu and Bassler, 1917
 - Stomachetosella cruenta* (Norman, 1864)
 - Stomachetosella limbata* (Lorenz, 1886)
 - Stomachetosella sinuosa* (Busk, 1860)
 - Family Umbonulidae Canu, 1904
 - Genus *Umbonula* Hincks, 1880
 - Umbonula arctica* (Sars, 1851)
- Class Stenolaemata Borg, 1926
 - Order Cyclostomatida Busk, 1852
 - Suborder Articulina Busk, 1859
 - Family Crisiidae Johnston, 1847
 - Genus *Bicrisia* d'Orbigny, 1853
 - Bicrisia edwardsiana* (d'Orbigny, 1839)
 - Genus *Crisia* Lamouroux, 1812
 - Crisia maxima* Robertson, 1910
 - Crisia occidentalis* Trask, 1857
 - Crisia operculata* Robertson, 1910

Crisia pugeti Robertson, 1910
Crisia serrulata Osburn, 1953
 Genus *Crisidia* Milne-Edwards, 1838
Crisidia cornuta (Linnaeus, 1758)
 Genus *Filicrisia* d'Orbigny, 1853
Filicrisia geniculata (Milne-Edwards, 1838)
 Suborder Cancellata Gregory, 1896
 Family Cytididae d'Orbigny, 1854
 Genus *Discocyttis* d'Orbigny, 1854
 Discocyttis canadensis O'Donoghue, 1926
 Suborder Cerioporina Hagenow, 1851
 Family Heteroporidae Waters, 1880
 Genus *Heteropora* Blainville, 1830
 Heteropora alaskensis (Borg, 1933)
 Heteropora magna O'Donoghue, 192
 Heteropora pacifica Borg, 1933
 Suborder Fascicullina
 Family Frondiporidae Busk, 1859
 Genus *Filifascigera*
 Filifascigera fasciculata (Hincks, 1880)
 Suborder Rectangulata Waters, 1887
 Family Lichenoporidae Smitt, 1867
 Genus *Disporella* Harmer, 1915
 Disporella astraea Osburn, 1953
 Disporella fimbriata (Busk, 1875)
 Disporella hispida (Fleming, 1828)
 Disporella separata Osburn, 1953
 Genus *Lichenopora* Defrance, 1823
 Lichenopora verrucaria (Fabricius, 1780)
 Suborder Tubuliporina Milne-Edwards, 1838
 Family Diaperoeciidae Canu, 1918
 Genus *Diaperoecia* Canu, 1918
 Diaperoecia intermedia (O'Donohugh, 1923)
 Diaperoecia johnstoni (Heller, 1867)
 Genus *Diaperoforma* Soule, Soule & Chaney, 1995
 Diaperoforma californica (d'Orbigny, 1852)
 Family Diastoporidae Gregory, 1899
 Genus *Diplosolen* Canu, 1918
 Diplosolen obelium (Johnston, 1838)
 Genus *Plagioecia* Canu, 1918
 Plagioecia patina (Lamarck, 1816)
 Plagioecia sarniensis (Norman, 1864)
 Family Entalophoridae Reuss, 1869
 Genus *Entalophora* Lamouroux, 1821
 Entalophora capitata Robertson, 1900
 Entalophora clavata d'Orbigny, 1850

Entalophora vancouverensis (O'Donohugh, 1923)
Family Oncousoeciidae Canus, 1918
Genus *Proboscina* Audouin, 1826
Proboscina major (Johnston, 1847)
Genus *Stomatopora* Bron, 1825
Stomatopora granulata (Milne-Edwards, 1836)

Odonohugh & Odonohugh (1926) list the following species under genus *Diaperoecia* but listed as *Stomatopora* by Osburn (1953). I could not locate any information on validity of these species.

Stomatopora expansa (d'Orbigny, 1851)
Stomatopora depressa (O'Donoghue, 1923)
Family Tubuliporidae Johnston, 1838
Genus *Bathysoecia* Osburn, 1953
Bathysoecia bassleri Osburn, 1953
Genus *Tubulipora* Lamarck, 1816
Tubulipora flabellaris (Fabricius, 1780)
Tubulipora pacifica Robertson, 1910
Tubulipora pulchra MacGillivray, 1885
Tubulipora tuba (Gabb and Horn, 1862)
Tubulipora tuba fasciculifera (Hincks, 1884)

Odonohugh & Odonohugh (1926) list the following species under genus *Diaperoecia* but listed as *Tubulipora* by Osburn (1953). I could not locate any information on validity of these species.

Tubulipora labiata (O'Donoghue, 1923)
Tubulipora striata (O'Donoghue, 1923)

Phylum Phoronida Hatschek, 1888

Family Phoronidae Hatschek, 1888
Genus *Phoronis* Wright, 1856
Phoronis ijimai Oka, 1897
Phoronis ovalis Wright, 1856
Phoronis pallida (Schneider, 1862)
Genus *Phoronopsis* Gilchrist, 1907
Phoronopsis harmeri Pixel, 1912

Phylum Brachipoda Duméril, 1806

Class Inarticulata Huxley, 1869
Order Acrotredita Kuhn, 1949
Suborder Craniidina Waagen, 1885
Superfamily Cranioidea Menke, 1828
Family Craniidae Menke, 1828
Genus *Neocrania* Lee and Brunton, 1986

Neocrania californica (Berry, 1921)

Class Articulata Huxley, 1869
 Order Rhynchonellida Kuhn, 1949
 Superfamily Rhynchonelloidea Gray, 1848
 Family Frieleidae Cooper, 1959
 Genus *Frieleia* Dall, 1895
 Frieleia halli Dall, 1895
 Family Hemithyrididae Rzhonsnitskaya, 1956
 Genus *Hemithiris* d'Orbigny, 1847
 Hemithiris psittacea (Gmelin, 1790)
 Order Terebratulida Waagen, 1883
 Suborder Terebratulidina Waagen, 1883
 Superfamily Cancellothyridoidea Cooper, 1973
 Family Cancellothyrididae Thompson, 1926
 Genus *Terebratulina* D'orbigny, 1847
 Terebratulina crossei Davidson, 1882
 Terebratulina unguicula (Carpenter, 1865)
 Suborder Terebratellidina Muir-Woods, 1955
 Superfamily Terebratelloidea King, 1850
 Family Laqueidae Hatai, 1965
 Genus *Laqueus* Dall, 1870
 Laqueus californianus (Koch, 1848)
 Family Dallinidae Beecher, 1893
 Genus *Terebratalia* Beecher, 1893
 Terebratalia transversa (Sowerby, 1846)

*The entoproct orders Solitaria and Coloniales are not used in more recent publications and the Integrated Taxonomic Information System list the taxa as invalid. I use them here both for convenience and because I could not find a publication detailing an updated classification.

**These are freshwater species. It is likely that the list of FW entoprocts and bryozoans is incomplete as most of my references were for marine forms.

†Kozloff (1996) erroneously lists this genus as *Myxosoma* in the corrections and additions pages.

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