

# KEY TO BC HERMIT CRAB FAMILIES

Karl P. Kuchnow

## Acknowledgements

I would like to acknowledge the work of Josephine Hart(1982),and Mary K Wicksten(2011) on which much of this online key is based, as well as the work by P. A. McLaughlin(1974) and A. Baldwin(unpublished key) for their work on the hermit crabs.

## Common Names

hermit crabs

## Taxonomy

<b>Class</b>	<b>Malacostraca</b>		
<b>Order</b>	<b>Decapoda</b>		
<b>Infraorder</b>	<b>Anomura</b>		
<b>Superfamily</b>	<b>Paguroidea</b>		
<b>Families</b>	<b>Diogenidae</b>	<b>Paguridae</b>	<b>Parapaguridae</b>

## Species List

	<b>Family Diogenidae</b>	
<i>Paguristes turgidus</i>	(Stimpson, 1857)	orange hairy hermit crab
<i>Paguristes ulreyi</i>	Schmitt, 1921	furry hermit crab
	<b>Family Paguridae</b>	
<i>Discorsopagurus schmitti</i>	(Stevens, 1925)	tubeworm hermit crab
<i>Elassochirus cavimanus</i>	(Miers, 1879)	purple hermit crab
<i>Elassochirus gilli</i>	(Benedict, 1892)	Pacific red hermit crab
<i>Elassochirus tenuimanus</i>	(Dana, 1851)	widehanded hermit crab
<i>Labidochirus splendescens</i>	(Owen, 1839)	splendid hermit crab
<i>Orthopagurus minimus</i>	(Holmes, 1900)	tuskshell hermit crab
<i>Pagurus aleuticus</i>	(Benedict, 1892)	Aleutian hermit crab
<i>Pagurus armatus</i>	(Dana, 1851)	black eyed hermit crab
<i>Pagurus beringanus</i>	(Benedict, 1892)	Bering hermit crab
<i>Pagurus capillatus</i>	(Benedict, 1892)	fuzzy hermit crab
<i>Pagurus caurinus</i>	Hart, 1971	greenmark hermit crab
<i>Pagurus confragosus</i>	(Benedict, 1892)	knobbyhand hermit crab
<i>Pagurus cornutus</i>	(Benedict, 1892)	hornyhand hermit crab
<i>Pagurus dalli</i>	(Benedict, 1892)	white knee hermit crab
<i>Pagurus granosimanus</i>	(Stimpson, 1858)	grainyhand hermit crab
<i>Pagurus hartae</i>	(McLaughlin and Jensen, 1996)	Hart's hermit crab
<i>Pagurus hemphilli</i>	(Benedict, 1892)	maroon hermit crab
<i>Pagurus hirsutiusculus</i>	(Dana, 1851)	hairy hermit crab
<i>Pagurus kennerlyi</i>	(Stimpson, 1864)	bluespined hermit crab
<i>Pagurus mertensii</i>	Brant, 1851	hermit crab
<i>Pagurus middendorffi</i>	Brant, 1851	hermit crab

<i>Pagurus ochotensis</i>	Brandt, 1851	Alaskan hermit crab
<i>Pagurus quaylei</i>	Hart, 1971	Quayle's hermit crab
<i>Pagurus samuelis</i>	(Stimpson, 1857)	blue band hermit crab
<i>Pagurus setosus</i>	(Benedict, 1892)	setose hermit crab
<i>Pagurus stevensae</i>	Hart, 1971	Steven's hermit crab
<i>Pagurus tanneri</i>	(Benedict, 1892)	longhand hermit crab
<i>Pagurus undosus</i>	(Benedict, 1982)	Pribilof hermit crab
<b>Family Parapaguridae</b>		
<i>Parapagurus benedicti</i>	de Saint Laurent, 1972	deep sea hermit crab

## THE KEY

This online key is based primarily on the existing keys of Hart 1982, Kozloff 1996 , McLaughlin 1974 and Wicksten 2011, for the Families Diogenidae, Paguridae, and Parapaguridae,

### BACKGROUND

One interesting subgroup within the anomurans is the Hermit Crabs, which are best known for living inside snail shells. Hermit crabs vigorously fight for snail shells by banging an opponents shell with their chelipeds (Reese 1963). The hermit crabs are found from the intertidal to deep water.

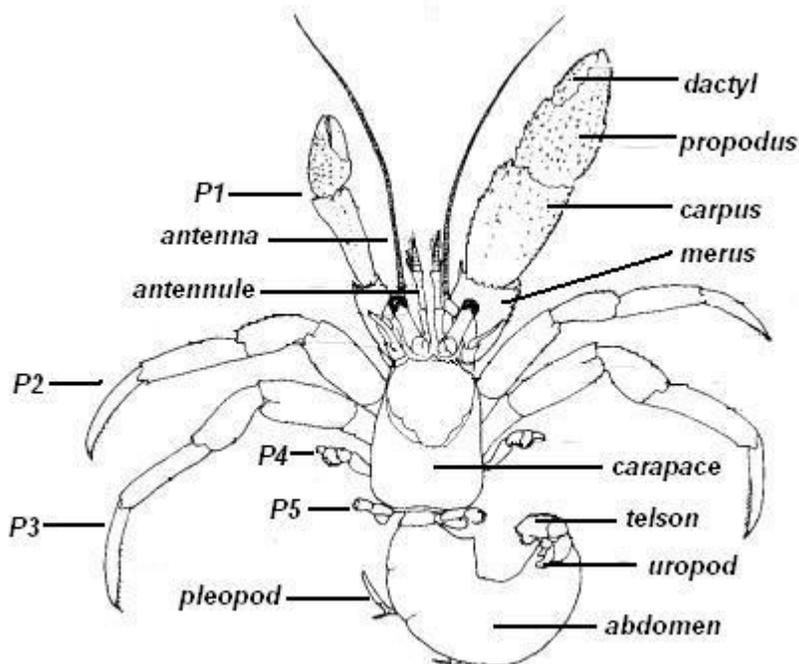
The hermit crabs appear to have only three pairs of pereopods: a pair of chelipeds and two pairs of walking legs. The two most posterior pairs of pereopods are reduced and kept inside the shell it carries. These small legs are used to hold on to the shell and to move within the shell (Kuris *et al.* 2007).

The anomurans are not hermaphroditic and may or may not be sexually dimorphic. Fertilization is internal and takes place immediately after the female undergoes ecdysis. The female may copulate several times, either with the same male or several different males (Brusca and Brusca 1990; Jensen 1995). Male hermit crabs will often hold onto the female crab's shell and may even rap on the shell to induce her to come out (Briffa and Elwood 2001).

There are 53 species of Anomura known to live in the waters of British Columbia (Baldwin 2010). Of these 31 species are hermit crabs.

## Anatomy

### hermit crab



## Glossary of Terms

**Abdomen:** posterior part of body.

**Abdominal pleuron (pleura):** paired lateral flat extensions on some abdominal segments of the body

**Accessory tooth:** adjacent to crista dentata on the inner margin of the outer maxilliped.

**Antenna (antennae):** anterior jointed sensory appendage, with one flagellum

**Antennule:** anterior jointed sensory appendage, with two flagella.

**Article:** a unit of an appendage.

**Basis (bases) basipodite:** second article from body of appendage

**Bifid, bifurcate:** divided by a deep cleft into two equal parts.

**Bristle:** stiff seta or hair.

**Calcareous or calcified:** limy, containing carbonate of lime.

**Cardiac:** relatively large, unpaired median region in posterior half of carapace

**Carpus (carpi):** 5th article or segment of appendage.

**Chela (chelae) and chelate:** pincer, prehensile claw, "hand";  
composed of propodus and dactyl.

**Cheliped:** whole appendage with chela or pincer.

**Corneous:** horn-like

**Coxa (coxae):** first segment of appendage attached to body.

**Crista dentata:** row of corneous teeth on inner margin of outer maxilliped (mxp3)

**Endopod or endopodite:** inner ramus of biramous appendag

**Epipodite:** outgrowth of coxa of maxillipeds and some pereopods.

**Eyescale:** flattened projection at base of eyestalk.

**Eyestalk:** peduncle bearing cornea

**Exopod or expodite:** outer ramus of biramous appendage.

**Finger:** the movable finger of hand is the dactyl; the immovable or fixed finger, a projection of the propodus.

**Flagellum (flagella):** whip-like multiarticulate appendage

**Fossa:** type of valve sculpture

**Hand:** chela; **propodus and dactylus of cheliped**

**Gastric region:** relatively large, unpaired region of carapace overlying stomach

**Gonopod:** pleopod of male modified for copulation.

**Gonopore or genital pore:** small opening in integument through which eggs or sperm are released.

**Ischium( ischia):** 3rd article or segment from attachment of pereopod

**Maxillipeds:** outer, or 3rd pair of maxillipeds are appendages anterior to pereopods and usually cover mouth parts.

**Merus (meri):** 4th article, or segment, from body of appendage.

**Operculiform:** having a plate or valve-like appendage.

**Palm:** propodus or hand without fingers

**Pediform:** foot-like appendage.

**Pereopods:** paired thoracic appendages used for seizing food and/or locomotion

**Pleopods:** ventral abdominal appendages, paired or single, which may occur on first five segments, or be missing, especially in males; serve for swimming and/or a deposit for fertilized eggs in females.

**Propod or propodus:** 6th article or segment from body of appendage

**Protopod:** fused basis and coxa of an appendage

**Pubescent:** having a soft velvet-like mass of setae

**Quadrate:** square or rectangular

**Rasp:** specialized setae on last two pairs of walking legs and on uropods of hermit crabs.

**Rostral horns:** rostrum divided into two elongated parts in some spider crabs

**Rostrum:** "a beak"; a forward projection of carapace, between the eyes in Crustacea

**Scale:** overlapping plates, or article on peduncle of antenna and eyestalk

**Scaphocerite:** In antenna, variously shaped outer branch (exopod) projecting from peduncle.

**Serrate:** having a saw-like edge

**Seta (setae) setose:** hair-like or needle-like structure on exoskeleton

**Shield:** anterior calcified portion of carapace of hermit crabs

**Somite:** segment of body

**Sternite:** ventral plates of body segments.

**Stria and striation:** linear marks on surface; may be slight ridges or furrows.

**Sub:** as a prefix- near; subequal, almost equal;

**Subchelate:** resembling a chela, but with thumb missing or short.

**Suture:** seamlike articulation of two parts; junction

**Tail fan:** sixth segment of abdomen, telson and uropods; used in swimming in some species.

**Telson:** terminal segment of abdomen, with anus opening ventrally.

**Uropods:** modified pleopods of sixth segment of abdomen and part of tail fan; may be used in swimming or for holding hermit crabs within their shell.

**Walking legs:** pereopods 2-5.

## References

**Baldwin, A.** Unpublished Key: Paguridae

**Baldwin, A. 2010.** Checklist of the shrimps, crabs, lobsters and crayfish of British Columbia 2010 (order Decapoda). In *E-Fauna BC: Electronic Atlas of the Fauna of British Columbia* edited by Brian Klinkenberg. Accessed January 6, 2011.  
<http://www.geog.ubc.ca/biodiversity/efauna/SpeciesChecklists.html>

**Briffa, M. and R.W. Elwood. 2001.** Decision rules, energy metabolism and vigor of hermit-crab fights. *Proceedings of the Royal Society of London Biological Sciences.* 268(1478):1841-1848.

**Brusca, R.C. and G.J. Brusca. 1990.** The crustaceans. Pp. 618-658. In *Invertebrates.* Sunderland: Sinauer Associates.

**Hart, J.F.L. 1982** Crabs and their relatives of British Columbia. Handbooks British Columbia Provincial Museum. 40:1-266 + figures 1-102.

**Jensen, G.C. 1995.** *Pacific Coast Crabs and Shrimps.* Monterey: Sea Challengers.

**Kozloff, E.N. 1996.** Phylum Arthropoda: subphylum crustacea: class malacostraca: order decapoda. Pp 404-411. In *Marine invertebrates of the Pacific Northwest.* Seattle and London: University of Washington Press

**Kuris, A.M., P.S. Sadeghian, J.T. Carlton and E. Campos. 2007.** Decapoda. Pp. 632-656. In *The Light and Smith manual – intertidal invertebrates from central California to Oregon, 4th ed.* edited by J.T. Carlton. Berkley and Los Angeles: University of California Press.

**McLaughlin, P.A. 1974.** The hermit crabs(Crustacea Decapoda, Paguridea) of Northwestern North America. *Zoologische Verhandlingen* No. 130. Leiden, E.J Brill

**Reese, E.S. 1963.** The behavioral mechanisms underlying shell selection by hermit crabs. *Behaviour.* 21(1-2): 78-126.

**Wicksten, M.K. 2011.** Decapod Crustacea of the Californian and Oregonian Zoogeographic Provinces. UC San Diego Scripps Institution of Oceanography Library, Scripps Institution of Oceanography. <http://escholarship.org/uc/item/7sk9t2dz>

## Photographs

The following individuals and organizations have provided photographs for use by the RBCM for this online key:

Aaron Baldwin University of Alaska  
Alaska Department of Fish & Game  
Dave Cowles

<http://www.wallawalla.edu/academics/departments/biology/rosario/inverts/>

## FAMILY DIOGENIDAE

The Diogenidae are a family of hermit crabs, sometimes known as "left-handed hermit crabs" because in contrast to most other hermit crabs, the left chela (claw) is enlarged, instead of the right. It comprises 429 extant species, making it the second-largest family of marine hermit crabs, after the Paguridae.

### Geographic Range:

Worldwide except Arctic and Antarctic

### Habitat:

Subtidal

### Morphology:

**Carapace** cylindrical or subcylindrical, carapace longer than wide or as long as or wider than long; carapace with linea anomurica; outer orbital spines absent; **rostrum** reduced, or absent. **Eye** cornea well developed, or reduced; ocular acicles present. **Antenna 1** flagellum biramous. **Maxilliped 3** bases close together; crista dentata present; accessory tooth absent; dactylus simple. **Pereopod 1** chelate; cheliped left largest, or equal or subequal, or right largest. Pereopods 2 to 4 pereopods 2 and 3 similar, pereopod 4 greatly reduced; 2-4 with basis and ischium fused; dactyli of pereopods 2 to 3 simple. Pereopod 3 about the same length as pereopod 2, or shorter than pereopod 2; pereopods 3 dactyli and propodi of right and left similar, or dactyli and propodi of right and left dissimilar. Pereopod 4 chelate. **Sternum** partially divided; sternite of pereopod 5 reduced, widely separated from preceding sternite; somite of pereopod 5 not fused with first abdominal somite. **Abdomen** well developed, carried posteriorly or reduced, carried posteriorly, abdomen with distinct somites or with indistinct somites. Epimera (pleura) absent. Male **pleopods** 3-5 unpaired; none modified as gonopods, or pleopod 1 with one or both modified as gonopods, or pleopod 2 with one or both modified as gonopods, or pleopods 1 and 2 modified as gonopods. Male with single gonopore, or with indications of female gonopores; female with no sexual modifications, or with single gonopore, or with first pleopods paired and modified as gonopods, or with brood pouch developed. **Uropods** present, uropods positioned ventrolaterally, not forming tailfan; rami with propodal rasps. **Telson** present, entire.

### References:

**McLaughlin, P., S. Ahyong & J.K. Lowry (2002 onwards).** 'Anomura: Families.' Version: 2 October 2002. <http://crustacea.net>'.

**McLaughlin, P.; Türkay, M. (2012).** Diogenidae. In: Lemaitre, R.; McLaughlin, P. (2012) World Paguroidea & Lomisoidea database. Accessed through: World Register of Marine Species at <http://www.marinespecies.org/aphia.php?p=taxdetails&id=106736> on 2012-12-04

## FAMILY PAGURIDAE

**Taxon Authority** Latreille, 1802

**Common Names** Right-handed hermit crabs

**Geographic Range**  
Worldwide

### Morphology

**Carapace** cylindrical or subcylindrical or dorsoventrally flattened, carapace longer than wide or as long as or wider than long; carapace with linea anomurica; outer orbital spines absent; rostrum reduced, or absent. **Eye** cornea well developed, or reduced, or absent; ocular acicles present. **Antenna 1** flagellum biramous. **Maxilliped 3** bases widely separated; crista dentata present, or absent; accessory tooth present, or absent. **Pereopods: 1** chelate; cheliped equal or subequal, or right largest. P2 and 3 similar, P4 greatly reduced; 2-4 with basis and ischium fused; **dactyli** of P2 to 3 simple. **Sternum** partially divided; sternite of P5 reduced, widely separated from preceding sternite. **Abdomen** well developed, carried posteriorly or reduced. **Epimera (pleura)** absent. **Male pleopods** 3-5 unpaired; none modified as gonopods. **Uropods** present, positioned ventrolaterally, not forming tailfan; rami with propodal rasps. **Telson** present, entire or partially divided longitudinally.

### References

**basis of record:** Türkay, M. (2001). Decapoda, *in*: Costello, M.J. *et al.* (Ed.) (2001). *European register of marine species: a check-list of the marine species in Europe and a bibliography of guides to their identification*. Collection Patrimoines Naturels, 50: pp. 284-292

**McLaughlin, P., S. Ah Yong & J.K. Lowry (2002 onwards).** 'Anomura: Families.' Version: 2 October 2002. <http://crustacea.net>

## FAMILY PARAPAGURIDAE

### Geographic Range

Worldwide

### Morphology:

**Carapace** cylindrical or subcylindrical, carapace longer than wide or as long as or wider than long; carapace with linea anomurica; outer orbital spines absent; rostrum reduced.

**Eye** cornea well developed, or reduced, or absent; ocular acicles present. Antenna 1 flagellum biramous. Maxilliped 3 bases widely separated; crista dentata present; accessory tooth present; dactylus simple. **Pereopod 1** chelate; cheliped right largest. Pereopods 2 to 4 pereopods 2 to 4 all of similar form; 2-4 with basis and ischium fused; dactyli of pereopods 2 to 3 simple. Pereopod 3 about the same length as pereopod 2, or noticeably longer than pereopod 2; pereopods 3 dactyli and propodi of right and left similar. Pereopod 4 semichelate. **Sternum** partially divided; sternite of pereopod 5 reduced, widely separated from preceding sternite; somite of pereopod 5 not fused with first abdominal somite. **Abdomen** reduced, carried posteriorly, abdomen with indistinct somites. **Epimera** (pleura) absent. Male **pleopods** 3-5 unpaired; none modified as gonopods, or pleopod 1 with one or both modified as gonopods, or pleopod 2 with one or both modified as gonopods, or pleopods 1 and 2 modified as gonopods. Male with no other sexual modifications; female with single gonopore. **Uropods** present, uropods positioned ventrolaterally, not forming tailfan; rami with propodal rasps. **Telson** present, entire.

### References

**basis of record: Türkay, M. (2001).** Decapoda, in: Costello, M.J. et al. (Ed.) (2001). European register of marine species: a check-list of the marine species in Europe and a bibliography of guides to their identification. Collection Patrimoines Naturels, 50: pp. 284-292

**McLaughlin, P., S. Ah Yong & J.K. Lowry (2002 onwards).** 'Anomura: Families.' Version: 2 October 2002. <http://crustacea.net>