Data Collection on Intergeneric Hybrids and Basic Types: EVERTEBRATA

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https://www.wort-und-wissen.org/artikel/data-collection-basic-types/

EVERTEBRATA

Systematics according to en.wikipedia 2025

Tabl. 1: Numbers of hybrid records in several metazoan taxa, after Schwenk et al. (2008) Introduction, extent, processes and evolutionary impact of intergeneric hybridizations in animsals. Phil. Trans. R. Soc. B. 363, 2805–2811. doi:10.1098/rstb.2008.0055 ("Copyright © 2008 The Royal Society. This is an open-access article distributed under the terms of the Creative Commons Attribution License").

Results of database search in Zoological Record (1947–2007) for several metazoan taxa. (Information on the estimated number of currently described species for each taxon was obtained from the IUCN 2004 report; Baillie et al. 2004.)			
	number of…		
taxa	**hybrid records**	**total records**	**described species**
Arthropoda			
Insecta	4291	427279	950000
Crustacea	452	91275	52000
Arachnida	242	58445	73000
other Arthropoda	57	19361	13000
Chordata			
Mammalia	2094	180409	5416
'Amphibia'	999	33864	5743
'Reptilia'	536	58526	8163
Aves	2685	186024	9917
'Pisces'	3393	161095	28500
other Chordata	100	4715	3025
Mollusca			
Cephalopoda	18	10952	768
Bivalvia	323	25320	30000
Gastropoda	289	34557	75000
other Mollusca	81	39950	1950
Annelida	55	20536	15000
Echinodermata	144	16522	7000
Porifera	38	6384	5000
Nematoda	253	31866	20000

Abbreviations:

° = taxa actually not accepted in the rank of a genus, e. g. *Cerasus*° (= *Prunus* p. p.)

10: 50 etc. The numbers behind the names of families etc. refer to extant genera and species

IS = interspecific hybrid. **IG** = intergeneric hybrid. **IST** = intersubtribal hybrid.

IT = intertribal hybrid. **ISF** = intersubfamilial hybrid. **IF** = interfamilial hybrid.

EC = embryo culture or ovule culture

SO = somatic hybrid by cell fusion; normally these hybrids are asymmetric

AS = asymmetric hybrids, they do not equally express maternal and paternal features

HY = assumed intergeneric hybridogeneous origin of a taxon.

nat. hyb. = natural hybrid **art. hyb.** = artificial hybrid

Colours within the crosses:

Red letters: intergeneric hybrids (incl. former IG).

Violet letters: multigeneric = plurigeneric hybrids.

Gray letters: hybridity unconfirmed or erroneous.

Green letters: notes on tribes, subfamilies etc. involved in the hybridization.

Yellow shaded: Notes concerning basic types.

phylum ARTHROPODA

2 subphyla, 1.000.000 species

arthropods = Gliederfüßer

class BRANCHIOPODA

Anomopoda

Anomopoda: Daphniidae 5: 200

water fleas = Wasserflöhe

Hobæk A, Skage M & Schwenk K (2004) *Daphnia galeata* × *D. longispina* hybrids in western Norway. Hydrobiologia 526, 55–62. Interspecific hybrid IS.

Keller B et al. (2008) Spatial, environmental and anthropogenic effects on the taxon composition of hybridizing *Daphnia*. Phil. Trans. R. Soc. B 363, 2943–2952. doi:10.1098/rstb.2008.0044 Interspecific hybrid IS.

Petrusek, A et al. (2008) *Daphnia* hybridization along ecological gradients in pelagic environments: the potential for the presence of hybrid zones in plankton. Phil. Trans. R. Soc. B 363, 2931–2941. doi:10.1098/rstb.2008.0026 Interspecific hybrid IS.

class
INSECTA

Blattodea 800: 7000
cockroaches and termits = Schaben und Termiten

Blattodea: Blaberidae
giant cockroaches

Aeluropoda insignis × *Princisia vanwaerebeki "Tiger"* Oxyhaloinae Gromphadorini

(not scientifically proven)
https://www.reddit.com/r/roaches/comments/ya52so/aeluropoda_insignis_x_princisia_vanwaerebeki/?rdt=53822, https://www.invertebratedude.com/p/aeluropoda-insignis-x-gromphadorhina-sp.html and https://www.roachforum.com/topic/8331-amateur-pure-hobby-hisser-key/

Coleoptera 400.000 species

beetles = Käfer

http://biostor.org/reference/76491.text
many references on natural interspecific hybrids exist.

Coleoptera: Carabidae 85: 40.000

carabids = Laufkäfer

IS: for interspecific hybrids see the references below

Chrysotribax° (= *Carabus* p. p.) × *Megodontus* (= *Carabus* p. p.) Auvray & Machard 1995
Pagocarabus° (= *Carabus* p. p.) × *Pseudocoptolabrus* (= *Carabus* p. p.) Deuve 2005

References:

Auvray C & Auvray N (1998) Un remarquable hybride intergénérique de carabes (Coleoptera, Carabidae). [A remarkable intergeneric carabid hybrid (Coleoptera, Carabidae).] Bulletin de l'Entomologie Tourangelle 19 (1–2), 4–7.

Auvray C & Machard P (1995) Carabidae from Turkey: Description of four new species and breeding results (Coleoptera: Carabidae). Entomologiste (Paris) 51 (6), 273–278.

Decobert O (2006) Hybridization and speciation of carabids Coleoptera Carabidae Hybridation & speciation chez les carabes Coleoptera Carabidae. Bulletin de la Societe Entomologique du Nord de la France 2eme trimestre 319, 16–19.

Deuve T (2005) Description d'un nouvel hybride "intersubgenerique" dans le genre *Carabus* & de deux nouveaux *Archaeocarabus* & *Cychrus* de Chine (Coleoptera, Carabidae). [Description of a new "intersubgeneric" hybrid in the genus *Carabus* and two new *Archaeocarabus* and *Cychrus* of China (Coleoptera, Carabidae).] Coleopteres 11 (16), 187–195.

Morgan-Richards M et al. (2009) A review of genetic analyses of hybridisation in New Zealand. J. Royal Soc. New Zealand 39 (1), 15–34. http://www.tandfonline.com/doi/pdf/10.1080/03014220909510561

Mossakowski D et al. (1990) Hybridization in natural populations of ground beetles (Coleoptera, Carabidae). Can. J. Zool. https://cdnsciencepub.com/doi/abs/10.1139/z90-259?journalCode=cjz Subgenus *Chrysocarabus* **IS**

Diptera 150.000 species

flies = Fliegen

Diptera: Limoniidae 4: 10.000

limoniid crane flies = Stelzmücken

Dicranomyia dicranomyia × *Limonia limonia* Limoniinae Farr 2003

Farr J (2003) Transgeneric cross of crane-flies (*Limonia limonia* × *Dicranomyia dicranomyia*) found in Jamaica, West Indies. http://www.sas.org/E-Bulletin/2003-01-03/fieldNotes/fieldNotes.html

Hymenoptera 132 families, 150.000 species

sawflies, wasps, bees = Hautflügler

Hymenoptera: Formicidae 14.000–20.000 species

ants = Ameisen

IS: for interspecific hybrids see the references below.

Feldhaar H, Foitzil S & Heinze J (2008) Review. Lifelong commitment to the wrong partner: hybridization in ants. Phil. Trans. Royal Soc. 363, 2891–2899. http://journals.royalsociety.org/content/h103t7114542746u/?p=c962bbc028b04da7bba2a2b7278d7610&pi=9

Seifert B, Kulmuni J & Pamilo P (2010) Independent hybrid populations of *Formica polyctena* × *Formica rufa* wood ants (Hymenoptera: Formicidae) abound under conditions of forest fragmentation. Evolutionary Ecology 24/5:1219–1237. **IS**

Kulmuni J et al. (2010) Segregation distortion causes large-scale differences between male and female genomes in hybrid ants. PNAS 107 (16): 7371–7376. **IS**

Lepidoptera 130 families, 180.000 species

butterflies and moths = Schmetterlinge

Crompton N (2023) Schmetterlinge und Mendel'sche Artbildung. W+W Special Paper B-23-2 https://www.wort-und-wissen.org/wp-content/uploads/b-23-2_Schmetterlinge.pdf

Crompton N & Junker R (2024) Schmetterlinge und Mendel'sche Artbildung. Vielfalt durch Variationsprogranme bei den „Jezebels". Stud. Integrale J. 31, 83–91.

Urbahn E (1977) Zur Frage nach gattungsfremden Freilandpaarungen. Entomologische Zeitschrift mit Insektenbörse (Essen) 87 (13), 144. only copula, no hybrids. *Zygaena meliloti; Aphantopus hyperantus; Maniola jurtina; Procris heuseri.*

Lepidoptera: Nymphalidae 12 subfamilies, 6000 species

brush footed butterflies = Edelfalter

Hafernik JE (1982) Phenetics and ecolgy of hybridization in Buckeye Butterflies (Lepidoptera: Nymphalidae). Univ. of California Publications in Entomology. vol. 96. 109 pages. interspecific **IS**.

Lepidoptera: Pieridae 4 subfamilies, 76: 1100

Weißlinge

Delias 240: This genus is the main subject of basic type-studies by Crompton & Junker 2024. Hybrids are not mentioned.

A hybrid example is listed here: https://www.delias-butterflies.com/species/group-geraldina/delias-hikarui

Crompton N & Junker R (2024) Schmetterlinge und Mendel'sche Artbildung. Vielfalt durch Variationsprogranme bei den „Jezebels". Stud. Integrale J. 31, 83–91.

Lepidoptera: Saturniidae 2–9 subfamilies, 165: 2300

saturniids = Pfauenspinner

Actias sinensis × *Graellsia isabelae galliaegloria* *Saturniinae Saturniini* Ades & Vuattoux 2005

Antheraea vamamai × *Telea°* (= *Antheraea) polyphemus*) **IS** *Saturniinae Saturniini* en.wikipedia (interestingly, *Telea* was reclassified to *Antheraea* due to this hybridization!)

References:

Ades D & Vuattoux R (2005) Hybridation en retour entre l'hybride [male] (*Graellsia isabelae galliaegloria* ♂ × *Actias sinensis* ♀) & *Actias sinensis* ♀ (Lepidoptera Saturniidae). [Backcross between a hybrid ♂ (*Graellsia isabelae galliaegloria* ♂ × *Actias sinensis* ♀) and *Actias sinensis* ♀ (Lepidoptera Saturniidae). Lambillionea 105 (4), 593–599 (Tome II).

en.wikipedia: "In the late 1950s, amateur lepidopterist Gary Botting hybridized the *Polyphemus* moth (then known as *Telea polyphemus*) with *Antheraea yamamai* from Japan and, later, *Antheraea mylitta* from India by transferring the pheromone-producing scent sacs from female "*T. polyphemus*" to the *Antheraea* females and allowing *T. polyphemus* males to mate with them. The resultant hybrids were displayed in his winning U.S. National Science Fair exhibit "Intergeneric hybridization among giant silk moths". After Botting consulted with genetic statistician J.B.S. Haldane and his wife, entomologist Helen Spurway, the *Polyphemus* moth was reclassified, becoming *Antheraea polyphemus*." (https://en.wikipedia.org/w/index.php?title=Antheraea_polyphemus&oldid=1253138432, CC-BY-SA 4.0)

Lepidoptera: Sphingidae 200: 1200–1450

sphinx moths = Schwärmer

3 subfamilies:

Macroglossinae *Daphnis, Deilephila, Hyles, Macroglossum, Proserpinus ….*

Smerinthinae *Laothoe, Mimas, Smerinthus ….*

Sphinginae *Agrius, Sphinx …*

IS: For a long list of interspecific and intergeneric hybrids see Pittaway 2024

Deilephila (= *Pergesa°*) × *Hyles* (= *Celerio°*) Macroglossinae Benz 1952 (*D. elpenor* × *H. centralasiae*), Dannenberg 1934 (*D. porcellus* × *H. vespertilio*)

Deilephila × *Hyles* Macroglossinae Baumgartner 1986 (*D .porcellus* × *H. tithymali*), Pittaway 2024 (nat. hyb.: *D. elpenor* × *H. euphorbiae*, *D. porcellus* × *H. euphorbiae*, art. hyb.: *D. elpenor* × *H. dahlii, gallii, hippophes, livorica, mautritanica, tithymali, vespertilio)*

Laothoe × *Smerinthus* Smerinthinae Pittaway 2024 (art. hyb: *L. austauti* × *S. ocellatus*, nat. hyb.: *L. austauti* × *atlanticus*, *L. populi* × *S. kindermannii* (*L. populi* × *S. ocellatus*))

Mimas tiliae × *Smerinthus ocellatus* Smerinthinae Pittaway 2024 (art. hyb.)

References:

Baumgartner A (1986) *Hyles euphorbiae tithymali* × *Deilephila porcellus*, a putative new genus hybrid (Lepidoptera, Sphingidae). [German] Entomologische Zeitschrift mit Insektenboerse (Essen) 96 (6), 65–68.

Benz F (1952) *Celerio* hybr. *aliceae* Benz (= *C. vespertilio* Esp. ♂ × *Pergesa porcellus* L. ♀), ein neuer primärer *Porcellus*-(Gattungs)-Bastard. Mitt. Ent. Ges. Basel (N.F.) 1952, 73-79.

Dannenberg E (1934) Ein neuer Gattungsbastard (*Cel. centralasiae* Stgr. × *Perg. elpenor* L.). Ent. Z. 48 (2), 12–15.

Pittaway AR (2024) Sphingidae of the Western Palaearctic (including Europe, North Africa, the Middle East, western Siberia and western Central Asia). https://tpittaway.tripod.com/sphinx/morph.htm

Orthoptera 20.000 species

grasshoppers etc. = Heuschrecken

Orthoptera: Acrididae 25 subfamilies, 10.000 species

grasshoppers = Feldheuschrecken

Ognevia longipennis × *Podisma sapporensis* Podisminae Podismini Ito 2004

References:

Ito G (2004) An intergeneric hybrid between a *Podisma sapporensis* female and an *Ognevia longipennis* male (Orthoptera: Acrididae). Tettigonia 24 (6), 5–10.

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phylum ECHINODERMATA

class ASTEROIDEA

starfish= Seesterne

Forcipulatida

Forcipulatidae: Asteriidae

Asterias × *Leptasterias* (= *Asterias*) Hamel & Mercier 1994. These crosses do not succeed early embryonic stages as necessary for the basic type definition.

Hamel J-F & Mercier A (1994) Occurrence of interspecific cross-fertilization among echinoderms and mollusks. Invertebrate Reproduction & Development 26 (3), 221–228.

class ECHINOIDEA

sea urchins etc. = Seeigel

In the class Echinoidea several interordinal cases of hybridization have been reported, but it is unconfirmed if they comply the basic type criterion.
The **order Camarodonta** is possibly a basic type because 4 of the 8 families are connected by hybridization. But possibly the basic type is even largeer.

en.wikipedia 2025, 2 subclasses:
subclass Perischoechinoidea (1 order Cidaroida)
subclass Echinoidea
superorder Atelostomata: Cassiduloida, Spatangoida
superorder Diadematacea: ...
superorder Echinacea: Arbacioida, Camarodonta (8 families: Echinidae 5, Echinometridae 9, Paraselinidae 1, Parechinidae 4, Strongylocentrotidae 5, Temnopleuridae 13, Toxopneustidae 8, Trigonocidaridae 6)
superorder Gnathostomata: Clypeasteroida, Holectypoida

Attention: some interordinal hybrids have been achieved, but confirmation is still lacking, confer Boveri (1918).
In invertebrates, gynogenesis is quite common, especially if only the larval stage is reached. This could even include different phyla: "Examples of hybridization between different phyla include separate crosses of the sea urchin *Anthocidaris crassispina* (♀) of Echinodermata with mollusks *Acmaea nanshaensis* (♂) and *Mytilus edulis* (♂) and the annelid *Nereis succinea* (♂). Larvae of all three hybrids are similar to those of *Anthocidaris crassispina*. Although sperm from the male parent is introduced into the egg, distant male and female nuclear fusion is difficult. Because the male chromosomes are eventually degraded, they are not incorporated into the next generation's nuclei. The hybrid larvae thus resemble the larvae of Anthocidaris crassispina, the maternal parent." (Zhang et al. 2014, doi: 10.1007/s11427-014-4707-1)
However, real hybridization events require the expression of chromosomes of both parents, which did not happen in these examples collected by Zhang et al.

Arbacia × *Echinocardium* **IO** Arbacioda Arbaciidae × Spatangoida Loveniidae Vernon 1898
Arbacia × *Psammechinus* (= *"Echinus"*) *microtuberculatus* **IO** Arbacioda Arbaciidae × Camarodonta Parechinidae Vernon 1898
Arbacia × *Paracentrotus* (= *Strongylocentrotus*°) *lividus* **IO** Arbacioda Arbaciidae × Camarodonta Parechinidae Vernon 1898, Baltzer & Bernhard 1955
Arbacia × *Sphaerechinus granularis* **IO** Arbacioda Arbaciidae × Camarodonta Toxopneustidae Vernon 1898
Cidaris (= *Dorocidaris*°) × *Paracentrotus* (= *Strongylocentrotus*°) *lividus* **IO** Cidaroida: Cidaridae × Camarodonta Parechinidae Vernon 1898
Cidaris × *Toxopneustes* **IO** Cidaroida Cidaridae × Camarodonta Toxopneustidae Tennent 1913
Dendraster excentricus × *Strongylocentrotus purpuratus* **IO** Clypeasteroida Dendrasteridae × Echinoida Strongylocentrotidae Badman & Brookbank 1969
Echinocardium × *Psammechinus* (= *"Echinus"*) *microtuberculatus* **IO** Spatangoida Loveniidae × Camarodonta Parechinidae Vernon 1898, Shearer et al. 1914 ("larvae unhealthy")
Echinocardium × *Paracentrotus* (= *Strongylocentrotus*°) *lividus* **IO** Spatangoida Loveniidae × Camarodonta Parechinidae Vernon 1898

Echinocardium cordatum × *Psammechinus* (= *Parechinus*°) *microtuberculatus* **IO** Spatangoida Loveniidae × Camarodonta Parechinidae Altrogge 1935, Hagström 1959 (*E. cordatum* × *Ps. miliaris*: only chimaeras)

Echinocardium × *Sphaerechinus* **IO** Spatangoida Loveniidae × Camarodonta Toxopneustidae Vernon 1898

Gracilechinus (*"Echinus"*) *acutus* × *Paracentrotus* (= *Strongylocentrotus*°) *lividus* **IF** Camarodonta Echinidae × Camarodonta Strongylocentrotidae Vernon 1900

Echinus esculentus × *Psammechinus* (= *Echinus*°) *miliaris* **IF** Camarodonta Echinidae × Camarodonta Parechinidae Shearer et al. 1914

Psammechinus (= *Echinus*°) *microtuberculatus* × *Sphaerechinus granularis* **IF** Camarodonta Parechinidae × Camarodonta Toxopneustidae Vernon 1898

Echinus acutus × *Psammechinus* (= *Echinus*°) *microtuberculatus* **IF** Camarodonta Echinidae × Camarodonta Parechinidae Vernon 1900

Encope × *Mellitta* Clypeasteroida Melittidae Ashley 2004

Heliocidaris × *Strongylocentrotus* **IF** Camarodonta Echinometridae × Camarodonta Strongylocentridae Zhan et al. 2020 (*H. crassispina* × *S. intermedius*)

Lytechinus pictus × *Strongylocentrotus purpuratus* **IF** Camarodonta Toxopneustidae × Camarodonta Strongylocentrotidae Brandhorst & Davenport 2001

Lytechinus variegatus × *Tripneustes esculentus* Camarodonta Toxopneustidae Badman & Brookbank 1969

Paracentrotus (= *Strongylocentrotus*°) *lividus* × *Sphaerechinus granularis* **IF** Camarodonta Parechinidae × Camarodonta Toxopneustidae Vernon 1898, Vernon 1900, Herbst 1906, Landauer 1922, von Ubisch 1955

Paracentrotus (= *Strongylocentrotus*°) *lividus* × *Psammechinus* (= *Echinus*°) *microtuberculatus* **IF** Camarodonta Parechinidae × Camarodonta Toxopneustidae Vernon 1900

Toxopneustes × *Tripneustes ventricosa* (= *Hipponoe*° *esculenta*) Camarodonta Toxopneustidae Tennent 1910

References:

Altrogge H (1935) On reciprocal bastard crossbreeds of *Echinocardium cordatum* and *Parechinus microtuberculatus*. Wilhelm Roux Archiv für Entwicklungsmechanik der Organismen 133, 269–309.

Ashley A (2004) Intergeneric hybridization between the sand dollars *Encope michelini* and *Mellita isometra* (Echinodermata: Echinoidea: Mellitidae). Research Training Program. 204. http://www.nmnh.si.edu/rtp/students/2004/virtualposters/poster_2004_ashley.html, http://elibrary.unm.edu/sora/jrr/v039n04/p00386-p00393.pdf

Badman WS & Brookbank JW (1969) Serological studies of two hybrid sea urchins. Developmental Biology 21, 243–256. http://www.sciencedirect.com/science/article/pii/0012160670900709

Baltzer F & Bernhard M (1955) Further observations on lethality and genetic drift in the sea urchin bastard *Paracentrotus* ♀ × *Arbacia* ♂. Exp. Cell Res. Suppl. 3, 16–26.

Boveri T (1918) Zwei Fehlerquellen bei Merogonieversuchen und die Entwicklungsfähighkeit merogonischer und partiellmerogonischer Seeigelbastarde. Archiv für Entwicklungsmechanik der Organismen 44, 417–471 https://doi.org/10.1007/BF02554388

Brandhorst BP & Davenport R (2001) Skeletogenesis in sea urchin interordinal hybrid embryos. Cell and Tissue Research 305 (1), 159–167.

Driesch (1898) Über rein mütterliche Charaktere an Bastardlarven der Echiniden. Archiv für Entwicklungsmechanik der Organismen 7, 65–102.

Driesch H (1903) Sea urchin bastards. Archiv für Entwicklungsmechanik der Organismen 16, 713–722. http://www.springerlink.com/content/l577l037578861x6/

Hagström BE (1959) Experiments on hybridization of sea urchins. Arkiv för zoologi (Stockholm) 2. Ser. 12 (10), 127–135.
Herbst C (1906) Genetics. I. A plan for the rational studies on genetic occurrences. II. The influence of temperature on the formation of sea urchin bastards. III. Is the „damage“ one of the two sexual products of the influence on the prominence of paternal or maternal characters? Archiv für Entwicklungsmechanik der Organismen 21, 173–305.
Landauer W (1922) Untersuchungen über dieVerschiebung der Vererbungsrichtung bei Echinodermen-Bastardlarven unter dem Einfluß von Ammoniak. [German][Investigations on the shift in the direction of heredity in Echinoderm bastard larvae under the influence of ammonium.] Archiv für Entwicklungsmechanik der Organismen 52, 1–94.
Shearer C, Morgan W de & Fuchs HM (1914) On the experimental hybridization of Echinoids. Phil. Trans. Royal Soc. London B 204, 255–362. http://ia600502.us.archive.org/29/items/philtrans00692862/00692862.pdf pdf
Schmidt FJ (1936) Comparing investigations in cross-breeds and bastards of sea urchin plutei. Wilhelm Roux Archiv für Entwicklungsmechanik der Organismen 135, 211–252.
Tennent DH (1910) The dominance of maternal or of paternal characters in Echinoderm hybrids. Archiv für Entwicklungsmechanik Org. 29, 1+.
Tennent DH (1913) Echinoderm hybridization. Science 37 (953), 535–537. https://www.jstor.org/stable/1638325?seq=1
Ubisch L von (1955) On Sea Urchin bastards – *Sphaerechinus granularis* ♀ × *Paracentrotus lividus* ♂. Exp. Cell Res. Suppl. 3, 358–365.
Vernon HM (1898) The relations between the hybrid and parent forms of Echinoid larvae. Proc. Roy. Soc. London 63, 228–231. http://rspl.royalsocietypublishing.org/content/63/389-400/228.full.pdf
Vernon HM (1898 b) The relations between the hybrid and parent forms of Echinoid larvae. Phil. Trans. Roy. Soc. London B 190, 465–528. http://ia600600.us.archive.org/31/items/philtrans09348341/09348341.pdf detailed information
Vernon HM (1900) Cross fertilisation among Echinoids. Developmental Genes & Evolution. 9 (3), 464–478. http://www.springerlink.com/content/j45246035g9x5j44/ https://colab.ws/articles/10.1007%2Fbf02156627 with further references
Zhan Y et al. (2020) Distant hybrids of *Heliocidaris crassispina* (♀) and Strongylocentrotus *intermedius* (♂): identification and mtDNA heteroplasmy analysis. BMC Evol. Biol. 20, 101 https://doi.org/10.1186/s12862-020-01667-8

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phylum
MOLLUSCA

class
BIVALVIA 106 families, 9200 species

Ostreoida

Ostreoida: Ostreidae 18

true oysters = Austern

Crassostrea × *Saccostrea* **ISF** Crassostreinae × Saccostreinae Charoensit 1995, cf. Su et al. 2016 (unviable)

Charoensit P (1995) Hybridization in commercial oysters. M. Sc. thesis. Bangkok, Thailand: Chulalongkorn University. http://www.thaithesis.org/detail.php?id=1082537001003

Su J et al. (2016) Early embryo and larval development of inviable intergeneric hybrids derived from *Crassostrea angulata* and *Saccostrea cucullata*. J. Ocean Univ. China 15, 515–522.

Pectinoida

Pectinoda: Pectinidae 30: 350

Scallops = Kammmuscheln

Argopecten × *Placopecten* **ISF** Pectinidae × Chlamydinae intersubfamilial Zicheng 1994, United States Patent Application 20080229437 (2011).

Chlamys farreri × *Patinopecten yessoensis* **IT** Pedinae Chlamydini × Pedinae Fortipectinini Lu et al. 2006, He et al. 2007

He B et al. (2007) ISSR analysis of the F_1 hybrids of scallop *Chlamys farreri* ♀× *Patinopecten yessoensis* ♂. J. Dalian Fisheries Univ. 2007-4. http://en.cnki.com.cn/Article_en/CJFDTOTAL-DLSC200704007.htm, see also: http://www.latest-science-articles.com/Agricultural_Science/Cytogenetic-and-Molecular-Analysis-of-Hybridization-between-Chlamys-Farreri-and--25407.html

Lu Z-M et al. (2006) Preliminary cytological identification and immunological traits of hybrid scallop from *Chlamys farreri* ♀ × *Patinopecten yessoensis* ♂. J. Fishery Sciences of China 13 (4), 597–602.

United States Patent Application 20080229437: Intergeneric bivalve shellfish hybrid and method for producing. http://www.freepatentsonline.com/y2008/0229437.html
" ... Provided by this invention are novel intergeneric bivalve shellfish hybrids, including clams and scallops. Also provided are methods for producing the novel hybrids and their progeny...."

Zicheng CLW (1994) Effects of temperature on the fertilization and embryonic development of *Argopecten irradians* Lamarck, *Patinopecten yessoensis* Jay and their hybrids. J. Dalian Fisheries Univ. http://en.cnki.com.cn/Article_en/CJFDTOTAL-DLSC404.000.htm

Veneroida

Veneroida: Mactridae 56

trough shells or duck clams = Trogmuscheln

Mulinia × *Spisula* Mactrinae Lindell et al. 2006, United States Patent Application 20080229437.

References:

Lindell S, Walton B, Simmons J & Roberts S (2006) Hybridization between two genera of

shellfish. J. Shellfish Res. 25 (2).
United States Patent Application 20080229437. Intergeneric bivalve shellfish hybrid and method for producing. http://www.freepatentsonline.com/y2008/0229437.html

class
CEPHALOPODA

Belemnoidea

First example of a supposed fossil intergeneric hybrid:

Remin Z (2010) *Fusiteuthis polonica* – an intergeneric belemnite hybrid; proofs and discussion. 8th Int. Symp. Cephalopods – Present and Past. http://www.u-bourgogne.fr/cephalopods/8ISCPP_provisional_program.pdf

class
GASTROPODA

Caenogastropoda

Caenogastropoda: Strombidae 26 + 10 extinct genera

true conchs = Flügelschnecken

no subdivision

Harpago chiragra × *Lambis lambis* De Turck et al. 1999, Kronenberg 2008a
Lambis lambis × *Sinustrombus latissimus* Kronenberg 2008b

References on Strombidae:

De Turck K et al. (1999) The family Strombidae. In Poppe GT & Groh K, eds. A Conchological Iconography 1–58, pls. 1–130. Hackenheim.
Kronenberg GC (2008a) Family Strombidae. In Poppe, G. T. ed., Philippine marine mollusks. 1 Gastropoda 1, 514–568, pls. 202—230. Hackenheim.
Kronenberg GC (2008b) An intergeneric hybrid (Gastropoda: Caenogastropoda: Strombidae) with remarks on the subdivision of the Indo-Pacific *Tricornis.* Basteria 72, 331–341.

Stylommatophora

air-breathing land snakes = Landlungenschnecken

Stylommatophora: Cerionidae 2: 600 + extinct species

Cerion 600, Mexistropha 1

IS: Interspecific hybrids in the genus *Cerion* are common.
Probably basic type **family Cerionidae** (see Junker 2007).

References:

Junker R (2007) „Grundtypstudie“ von Stephen Jay Gould. Stud. Integrale J. 14 (1), 28–29. https://www.wort-und-wissen.org/publikationen/studium-integrale-journal/

Stylommatophora: Lauriidae (= Pupillidae p. p.) 3

IS: see Whitehead 2007 (“intergeneric”)

Whitehead PF (2007) Another Gloucestershire locality for *Lauria sempronii* (Charpentier, 1837) (Gastropoda, Stylommatophora, Pupillidae) with observations on the species. J. Conchology 39 (4), 377–379.

Vetigastropoda

Vetigastropoda: Haliotidae 1: 55–130 + extinct species

sea ears, abalones = Seeohren

Haliotis.

Basic type **family Haliotidae** (Crompton 2018): Monogeneric family with a large number of interspecific hybrids.

References:

Crompton N (2018) Die genetische Familie der Haliotidae – Hybridisierung, Fortpflanzungsisolation und sympatrische Artbildung. W+W Special Paper B-18-2. www.wort-und-wissen.de/artikel/sp/b-18-2_haliotidae.pdf.