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NOAA Technical Report NMFS SSRF-750

World Literature to Fish  
Hybrids With an Analysis  
by Family, Species, and  
Hybrid: Supplement 1

Frank J. Schwartz

November 1981



U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
National Marine Fisheries Service

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742. Water structure at Ocean Weather Station V, northwestern Pacific Ocean, 1966-71. By D. M. Husby and G. R. Seckel. October 1980, 18 figs., 4 tables.
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# World Literature to Fish Hybrids With an Analysis by Family, Species, and Hybrid: Supplement 1

FRANK J. SCHWARTZ<sup>1</sup>

## ABSTRACT

Supplement 1 comprises 1,814 citations published between 1971 and October 1980 which deal with fish hybrids of the world. Continuing the format of the original compilation, each reference has been read, analyzed, and referenced by author, family, species, and hybrid cross.

## INTRODUCTION

This supplement compilation is a continuation of the hybrid bibliography published by Schwartz in 1972 as: Publication 3 of the Gulf Coast Research Laboratory Museum, Ocean Springs, Miss., 328 p. The 1972 publication comprised 1,945 citations published prior to 1971. An additional 594 papers, published between 1820 and 1970 are included in the present publication. This supplement publication contains a total of 1,814 papers published between 1971 and October 1980. As in the original, each reference has been read, analyzed, and referenced by author, family, species, and hybrid cross.

Examination of this bibliography reveals that a handful of scientists from Europe, Asia, Japan, and the United States still dominate the world literature on fish hybrids. English, Russian, and German are the main languages in which hybrid papers are published. Contrary to the 1972 compilation, present day hybrid study emphasis has changed drastically from pure hybrid descriptions to DNA, allele, and isozyme crosses, to more work in producing hybrids to meet man's food needs (i.e., sturgeons in Russia, striped bass-white bass crosses in the United States, carp-goldfish-grass carp crosses in Israel and Asia). Misra's seven papers (1971-75) are the most extensive in attempting mathematical definition and testing of a hybrid's status and designation.

This supplement treats a total of 50 families of fishes with known hybrid crosses. The bulk of the hybrids are members of the families Centrarchidae, Cyprinidae, Poeciliidae, and Salmonidae. This contrasts with the original compilation.

## PROBLEMS WITH LITERATURE

An inherent problem in dealing with the world hybrid fish literature continued to be the definition of what was a hybrid. To sort out all the definitions and make arbitrary decisions as to an author's real meaning or interpretation would have taken far longer than the 8 yr spent in preparing this publication. I leave final decisions of definitions and interpretation to the reader.

Similarly, decisions relating to systematic status of many of the species or crosses listed are left to the reader. Currently,

families are being lumped or split, species are constantly being updated by recent work, and even old established species names have been changed. I am fully aware of these changes but rather than have to make again many arbitrary decisions of what should be a particular specie's or hybrid's true identity or to what species the author was really referring, I left them cited as originally found or spelled. Only the families have been updated (where lumped) to relieve the confusion of referring to family names not now recognized. Thus, the family Salmonidae is not treated by its subfamilies Coregoninae, Salmoninae, or Thymallinae. The remaining families which have had minor status changes have been updated (Scombridae to include Cybiidae) so that no subfamilies are treated.

Further problems existed in whether a reference was dealing with a natural or experimental hybrid. Few authors, other than those where experimental results were evident or so stated, specifically earmarked what they were studying.

While all would wish to find only one spelling of a species name, all variations were included. The same is true of author names which, in Russian, were often spelled many ways (i.e., Nikioljuki, Nikoljukin, Nikolukin, Nikolyukin).

One other problem that persisted, from the original publication, was that many authors, especially European, cited a hybrid cross by listing the male species first, followed by the female partner. Others, the majority, listed the female member of the hybrid first, with the male species second. I kept the entries as they were originally cited and, where known, have included the female (usually first) or male cross designations (i.e., *Cyprinus carpio* ♂ × *Carassius auratus* ♀).

Further problems arose in how to cite female workers. Most compilations spell out a woman's first name with only initials designating male authors. Herein, all names of women are listed by initial only, except those of Russian or Slavic origin where the "a" ending signifies a woman. Because this bibliography was computer created I have not included any diacritic marks for Germanic, Slavic, or other languages. Author's names, such as McAfee, have the "c" on the same line rather than one-half space upward. Another frustrating aspect of the bibliography was in dealing with Russian references published by *Rybnoe Khoziastvoe* as there are two journals with the same name, one published in Kiev, the other in Moscow. Most literature citations failed to note city of publication. This along with use of the issue numbers as volume numbers created havoc and delays in a citation's retrieval. I have noted the city of publication in every case, where feasible.

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## HOW TO USE THE BIBLIOGRAPHY

Each of the 1,814 references in this bibliography has been numbered. All references are listed alphabetically. The author, fish family, species, and hybrid indexes are listed alphabetically, regardless of systematic position or status of the family, species, or hybrid. Each reference was read in its entirety and all species or crosses therein are noted (rather than that which may be stated only in the title). Common names are interspersed alphabetically within the appropriate species or hybrid listings. Where recent papers were located or appeared in the literature, as the final typing was in preparation, 22 cases, the reference was given the next sequential number followed by an "a," etc. and inserted in the proper alphabetical position in the citation sections (i.e., 1221a follows 1221). Since this bibliography was so large and computer developed, merging the entries from four separate computer sources often prevented the desired sequential numerical order to the citations which, however, are listed alphabetically throughout. Thus, 23 numbers, 27, 47, 49, 55, 67, 69, 77, 305, 340, 368, 403, 877a, 891, 1,000, 1,183, 1,186, 1,421, 1,450, 1,571, 1,586, 1,665, 1,715, and 1,766 are missing as a result of deletion of duplicated citations which had entered the various files.

To use the bibliography when the author of a hybrid is known, proceed directly to the citation or author section to learn what papers have been included under his or her name. If one knows the author only, proceed to the author section and find (i.e., F. Anders published 45 papers) each of the numbered papers that he authored or coauthored. Knowing the fish family but not the author, etc., a check of that section will steer you to all papers dealing with hybrids known for that family (i.e., Cyprinidae, etc.). Likewise, if one knows F. Anders published a paper on swordtail-platyfish hybrids, go to the species or cross or author list to locate the species, remembering that if a taxonomic change has taken place the original generic notation will be found (i.e., presently *Poecilia* for *Molliepsis* of earlier references). I must reemphasize that one should check all possible spelling combinations for an author or species name before being satisfied all references have been located.

If a hybrid cross acted as a species in a cross then that hybrid cross was included in the species list. This prevailed with  $F_1$  and  $F_2$  back crosses (i.e.,  $((Salmo alpinus \times S. fontinalis) \times S. fontinalis)$  +  $S. fontinalis$ ) where each species was listed in addition to  $(S. alpinus + S. fontinalis)$  which was acting as a species in the species listing. Likewise, each hybrid cross has not been reversed in the hybrid cross section, unless attempted by the author (i.e.,  $S. alpinus \times S. fontinalis$  would not be listed for a pertinent reference unless the author attempted  $S. fontinalis \times S. alpinus$  and  $S. alpinus \times S. fontinalis$  crosses).

Readers wishing information regarding the listed references can correspond with me as about 95% are within my holdings as originals, Xerox, or photocopies.

## ACKNOWLEDGMENTS

I would like to single out several people who were most instrumental in aiding with this bibliography. To David Harris of Atlantic Analysis Corporation, Norfolk, Va., fell the enormous task to develop a computer program that would treat the hundreds of entries that are included herein. This was achieved by use of two Hewlett Packard 9830's sorting four computer disks simultaneously and 15 programs. His diligence in resolving the

myriads of program problems and aspects relating to information retrieval were tremendous. Helen Nearing was responsible for all program operations. She, along with Carolyn Morgan, deciphered all my raw hand scribbles onto standard input sheets prior to computer analysis. Helen Nearing, Janice Manyak, and Jacqueline Tate were instrumental in checking and verifying all information once out of the computer prior to final preparation and entry into an IBM System 6 Information Processor. Brenda Bright of the Institute of Marine Sciences spent many hours locating and requesting many of the references herein. The staff of Wilson Library main campus, University of North Carolina, were especially helpful with Russian citations and their location. Use of many other Institute of Marine Sciences, Morehead City, N.C., facilities is also acknowledged.

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I bear full responsibility for errors or omissions that may have crept into this publication. May this compilation be a stimulus and aid to your studies of fish hybrids. Where I have missed citations I hope you will call them to my attention.

Appreciation is also extended to the following who assisted in various ways with the literature research and retrieval. I hope I have neglected no one.

## United States

INDIVIDUALS—Alabama: J. Ramsey; California: J. Fitch, C. L. Hubbs (deceased), Patricia Powell; Colorado: R. Behnke; Washington, D.C.: C. Messick, M. Rose; Florida: F. Ware; Idaho: R. White; Illinois: B. Burr, M. Cimino, R. Mayden, L. Page, P. Smith; Iowa: B. Menzel; Maryland: Carolyn Essex, T. Koo, Chu-fa Tsai; Massachusetts: Jane Fessenden, S. Shapiro, R. Flescher; Michigan: R. Bailey; Missouri: A. Ming, W. Pfleiger; New Jersey: W. Burgess, Martha Ireland; New York: J. Atz, K. Kallman, C. L. Smith, D. Webster; North Carolina: Sue Applebaum, Brenda Bright, A. F. Chestnut, R. Goldstein, Ann Hall; Ohio: B. Grimstead; Oregon: C. Bond, Shirley Arndt, C. Schreck; Pennsylvania: J. Wright; Texas: J. Gold, M. Siciliano; Virginia: A. H. Underhill; Washington: C. Atkinson, A. Novotny, L. Smith; Wisconsin: Lynn Bellehumer, V. Cvancara, Betty Les; Wyoming: R. Simon.

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#### Foreign

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O. Oliva; **England**: Ethylwynn Trewavas; **Finland**: S. Segerstrale; **Germany**: F. Anders, Hertha Larga, N. Maron, M. Schwab, J. Vielkind, Ursula Vielkind; **Israel**: G. Hulata, R. Moav; **Japan**: T. Abe, S. Asano, T. Narita, Y. Ojima, A. Taniguchi, T. Terao; **Poland**: Matylda Gasowska; **Republic of China**: Yenpin Li; **Romania**: P. Banarescu; **Sweden**: L. Nyman, G. Svardson; **U.S.S.R.**: A. Kersakina.

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*Catostomus latipinnis* x *Catostomus commersoni* 745

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*Chaenobryttus cyanellus* x *Chaenobryttus gulosus* 1105

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*Cyprinodon atrorus* x (*Cyprinodon atrorus* x *Cyprinodon rubrofluviatilis*)  
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*Cyprinodon atrorus* ♂ x *Cyprinodon bifasciatus* ♀ 1620

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*Cyprinodon macularius* x *Cyprinodon nevadensis* 1620

*Cyprinodon macularius*♂ x *Cyprinodon nevadensis*♀ 1620

(*Cyprinodon macularius* x *Cyprinodon nevadensis*) x (*Cyprinodon macularius* x *Cyprinodon variegatus*) 1620

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(*Cyprinodon macularius* x *Cyprinodon variegatus* *variegatus*) 3)

*Cyprinodon macularius*♂ x *Cyprinodon radiosus*♀ 1620

*Cyprinodon macularius*♂ x *Cyprinodon salinus*♀ 1620

*Cyprinodon macularius* x *Cyprinodon variegatus* 980, 1620

*Cyprinodon macularius*♂ x *Cyprinodon variegatus*♀ 1620

*Cyprinodon macularius*♂ x *Cyprinodon variegatus* *variegatus*♀

*Cyprinodon macularius* x *Jordanella floridae* 448

*Cyprinodon macularius californicus* x *Cyprinodon atrorus* 44

(*Cyprinodon macularius californicus* x *Cyprinodon atrorus*)  
*Cyprinodon atrorus* 449

(*Cyprinodon macularius californicus* x *Cyprinodon atrorus*)  
♀ 449

*Cyprinodon macularius californicus* x (*Cyprinodon atrorus* x  
*Cyprinodon rubrofluviatilis*) 449

*Cyprinodon macularius californicus* x *Cyprinodon eximius* 449

*Cyprinodon macularius californicus* x *Jordanella floridae* 44

*Cyprinodon macularius californicus* x *Cyprinodon rubrofluviatilis* 449

*Cyprinodon macularius californicus* x *Cyprinodon* sp. 449

*Cyprinodon macularius californicus* x *Cyprinodon variegatus variegatus* 449

*Cyprinodon nevadensis*♂ x *Cyprinodon atrorus*♀ 1620

*Cyprinodon nevadensis*♂ x *Cyprinodon bifasciatus*♀ 1620

*Cyprinodon nevadensis*♂ x *Cyprinodon macularius*♀ 1620

*Cyprinodon nevadensis*♂ x *Cyprinodon radiosus* ♀ 1620

*Cyprinodon nevadensis* x *Cyprinodon salinus* 1619

*Cyprinodon nevadensis*♂ x *Cyprinodon salinus*♀ 1620

*Cyprinodon nevadensis*♀ x *Cyprinodon variegatus*♂ 1530

*Cyprinodon nevadensis*♂ x *Cyprinodon variegatus*♀ 1620

*Cyprinodon nevadensis amargosae* x *Cyprinodon atrorus* 448, 449

(*Cyprinodon nevadensis amargosae* x *Cyprinodon atrorus*) x  
*Cyprinodon atrorus* 449

*Cyprinodon nevadensis amargosae* x (*Cyprinodon atrorus* x  
*Cyprinodon rubrofluviatilis*) 449

(*Cyprinodon nevadensis amargosae* x (*Cyprinodon atrorus* x  
*Cyprinodon rubrofluviatilis*)) x *Cyprinodon rubrofluviatilis*  
449

(*Cyprinodon nevadensis amargosae* x *Cyprinodon atrorus*) x  
(*Cyprinodon* sp. x *Cyprinodon bovinus*) 449

*Cyprinodon nevadensis amargosae* x (*Cyprinodon nevadensis amargosae* x *Cyprinodon rubrofluviatilis*) 449

*Cyprinodon nevadensis amargosae* x *Cyprinodon rubrofluviatilis*  
448, 449

(*Cyprinodon nevadensis amargosae* x *Cyprinodon rubrofluviatilis*)  
x *Cyprinodon rubrofluviatilis* 449

*Cyprinodon nevadensis amargosae* x *Jordanella floridae* 448, 449

*Cyprinodon nevadensis armagosa* x *Cyprinodon atrorus* 94

(*Cyprinodon nevadensis armagosa* x *Cyprinodon atrorus*) x  
*Cyprinodon rubrofluviatilis* 94

*Cyprinodon macularius* x (*Cyprinodon atrorus* x *Cyprinodon rubrofluviatilis*) 448

*Cyprinodon macularius*♂ x *Cyprinodon bifasciatus*♀ 1620

*Cyprinodon macularius*♂ x *Cyprinodon eximius*♀ 980

*Cyprinodon macularius* x *Cyprinodon nevadensis* 1620

*Cyprinodon macularius*♂ x *Cyprinodon nevadensis*♀ 1620

(*Cyprinodon macularius* x *Cyprinodon nevadensis*) x (*Cyprinodon macularius* x *Cyprinodon variegatus*) 1620

*Cyprinodon macularius*♂ x *Cyprinodon nevadensis* *mionectes*♀ 980

*Cyprinodon macularius*♂ x *Cyprinodon nevadensis* *nevadensis*♀ 980

(*Cyprinodon macularius* x *Cyprinodon nevadensis* *nevadensis*) x  
(*Cyprinodon macularius* x *Cyprinodon variegatus* *variegatus*)  
980

*Cyprinodon macularius*♂ x *Cyprinodon radiosus*♀ 1620

*Cyprinodon macularius*♂ x *Cyprinodon salinus*♀ 1620

*Cyprinodon macularius* x *Cyprinodon variegatus* 980, 1620

*Cyprinodon macularius*♂ x *Cyprinodon variegatus*♀ 1620

*Cyprinodon macularius*♂ x *Cyprinodon variegatus* *variegatus*♀ 980

*Cyprinodon macularius* x *Jordanella floridae* 448

*Cyprinodon macularius californicus* x *Cyprinodon atrorus* 449

(*Cyprinodon macularius californicus* x *Cyprinodon atrorus*) x  
*F*<sub>2</sub> 449

*Cyprinodon macularius californicus* x (*Cyprinodon atrorus* x  
*Cyprinodon rubrofluviatilis*) 449

*Cyprinodon macularius californicus* x *Cyprinodon eximius* 449

*Cyprinodon macularius californicus* x *Jordanella floridae* 449

*Cyprinodon macularius californicus* x *Cyprinodon rubrofluviatilis*  
449

*Cyprinodon macularius californicus* x *Cyprinodon* sp. 449

*Cyprinodon macularius californicus* x *Cyprinodon variegatus variegatus* 449

*Cyprinodon nevadensis*♂ x *Cyprinodon atrorus*? 1620

*Cyprinodon nevadensis*♂ x *Cyprinodon bifasciatus*? 1620

*Cyprinodon nevadensis*♂ x *Cyprinodon macularius*? 1620

*Cyprinodon nevadensis*♂ x *Cyprinodon radiosus*? 1620

*Cyprinodon nevadensis* x *Cyprinodon salinus* 1619

*Cyprinodon nevadensis*♂ x *Cyprinodon salinus*? 1620

*Cyprinodon nevadensis*♀ x *Cyprinodon variegatus*♂ 1530

*Cyprinodon nevadensis*♂ x *Cyprinodon variegatus*? 1620

*Cyprinodon nevadensis amargosae* x *Cyprinodon atrorus* 448, 449

(*Cyprinodon nevadensis amargosae* x *Cyprinodon atrorus*) x  
*Cyprinodon atrorus* 449

*Cyprinodon nevadensis amargosae* x (*Cyprinodon atrorus* x  
*Cyprinodon rubrofluviatilis*) 449

(*Cyprinodon nevadensis amargosae* x (*Cyprinodon atrorus* x  
*Cyprinodon rubrofluviatilis*)) x *Cyprinodon rubrofluviatilis*  
449

(*Cyprinodon nevadensis amargosae* x *Cyprinodon atrorus*) x  
(*Cyprinodon* sp. x *Cyprinodon bovinus*) 449

*Cyprinodon nevadensis amargosae* x (*Cyprinodon nevadensis amargosae* x *Cyprinodon rubrofluviatilis*) 449

*Cyprinodon nevadensis amargosae* x *Cyprinodon rubrofluviatilis*  
448, 449

(*Cyprinodon nevadensis amargosae* x *Cyprinodon rubrofluviatilis*)  
x *Cyprinodon rubrofluviatilis* 449

*Cyprinodon nevadensis amargosae* x *Jordanella floridae* 448, 449

*Cyprinodon nevadensis armagosa* x *Cyprinodon atrorus* 94

(*Cyprinodon nevadensis armagosa* x *Cyprinodon atrorus*) x  
*Cyprinodon rubrofluviatilis* 94

*Cyprinodon nevadensis armagosa* x *Cyprinodon rubrofluviatilis*  
94

*Cyprinodon nevadensis nevadensis* x *Cyprinodon atrorus* 449

*Cyprinodon nevadensis nevadensis* x *Cyprinodon rubrofluviatilis*  
92, 448, 449

*Cyprinodon ovinus*♂ x ((*Cyprinodon radiosus*♂ x *Cyprinodon nevadensis nevadensis*♀)♂ x (*Cyprinodon macularius*♂ x *Cyprinodon variegatus variegatus*♀)♀)♀ 980

*Cyprinodon pecosensis* x *Cyprinodon macularius californicus* 449

*Cyprinodon pecosensis* x *Cyprinodon macularius macularius* 449

*Cyprinodon pecosensis* x *Cyprinodon rubrofluviatilis* 449

(*Cyprinodon pecosensis* x *Cyprinodon rubrofluviatilis*) x  $F_2$  449

*Cyprinodon pecosensis* x *Jordanella floridae* 449

*Cyprinodon radiosus* x *Cyprinodon nevadensis* 980, 1620

(*Cyprinodon radiosus* x *Cyprinodon nevadensis*) x (*Cyprinodon macularius* x *Cyprinodon variegatus*) 980, 1620

*Cyprinodon radiosus*♂ x *Cyprinodon nevadensis nevadensis*♀ 980

(*Cyprinodon radiosus* x *Cyprinodon nevadensis nevadensis*) x  
(*Cyprinodon macularius* x *Cyprinodon variegatus variegatus*)  
980

*Cyprinodon rubrofluviatilis* x *Cyprinodon atrorus* 94, 449

(*Cyprinodon rubrofluviatilis* x *Cyprinodon atrorus*) x *Cyprinodon atrorus* 449

*Cyprinodon rubrofluviatilis* x (*Cyprinodon atrorus* x (*Cyprinodon atrorus* x *Cyprinodon rubrofluviatilis*)) 448

((*Cyprinodon rubrofluviatilis* x *Cyprinodon atrorus*) x *Cyprinodon atrorus*) x *Cyprinodon rubrofluviatilis* 449

((*Cyprinodon rubrofluviatilis* x *Cyprinodon atrorus*) x *Cyprinodon atrorus*) x  $F_2$  449

(*Cyprinodon rubrofluviatilis* x *Cyprinodon atrorus*) x *Cyprinodon nevadensis amargosae* 449

(*Cyprinodon rubrofluviatilis* x *Cyprinodon atrorus*) x (*Cyprinodon nevadensis nevadensis* x *Cyprinodon rubrofluviatilis*) 449

- Cyprinodon rubrofluviatilis* x (*Cyprinodon atrorus* x *Cyprinodon rubrofluviatilis*) 94, 448
- (*Cyprinodon rubrofluviatilis* x *Cyprinodon atrorus*) x *Cyprinodon rubrofluviatilis* 94, 449
- (*Cyprinodon rubrofluviatilis* x *Cyprinodon atrorus*) x ((*Cyprinodon rubrofluviatilis* x *Cyprinodon atrorus*) x *Cyprinodon atrorus*) 449
- ((*Cyprinodon rubrofluviatilis* x *Cyprinodon atrorus*) x *Cyprinodon rubrofluviatilis*) x  $F_2$  449
- ((*Cyprinodon rubrofluviatilis* x *Cyprinodon atrorus*) x *Cyprinodon rubrofluviatilis*) x ((*Cyprinodon rubrofluviatilis* x *Cyprinodon atrorus*) x *Cyprinodon atrorus*) 449
- (*Cyprinodon rubrofluviatilis* x (*Cyprinodon atrorus* x *Cyprinodon rubrofluviatilis*)) x (*Cyprinodon rubrofluviatilis* x (*Cyprinodon atrorus* x *Cyprinodon rubrofluviatilis*)) 94
- Cyprinodon rubrofluviatilis* x *Cyprinodon bovinus* 94, 448, 449
- (*Cyprinodon rubrofluviatilis* x *Cyprinodon bovinus*) x *Cyprinodon bovinus* 94
- (*Cyprinodon rubrofluviatilis* x *Cyprinodon bovinus*) x *Cyprinodon rubrofluviatilis* 449
- Cyprinodon rubrofluviatilis* x *Cyprinodon eximius* 449
- Cyprinodon rubrofluviatilis* x *Cyprinodon macularis* 94
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- Cyprinodon rubrofluviatilis* x (*Cyprinodon macularius* x *Cyprinodon variegatus*) 980
- Cyprinodon rubrofluviatilis* ♂ x (*Cyprinodon macularius* ♂ x *Cyprinodon variegatus* ♀)♀ 1620
- Cyprinodon rubrofluviatilis* ♂ x (*Cyprinodon macularius* ♂ x *Cyprinodon variegatus* variegatus ♀)♀ 980
- Cyprinodon rubrofluviatilis* x *Cyprinodon nevadensis* 94
- (*Cyprinodon rubrofluviatilis* x *Cyprinodon nevadensis*) x *Cyprinodon rubrofluviatilis* 94
- Cyprinodon rubrofluviatilis* x *Cyprinodon nevadensis amargosae* 449

*Cyprinodon rubrofluviatilis* x *Cyprinodon nevadensis nevadensis*  
92, 94, 448, 449

(*Cyprinodon rubrofluviatilis* x *Cyprinodon nevadensis nevadensis*)  
x (*Cyprinodon atrorus* x *Cyprinodon rubrofluviatilis*) 94,  
448

(*Cyprinodon rubrofluviatilis* x *Cyprinodon nevadensis nevadensis*)  
x F<sub>2</sub> 449

(*Cyprinodon rubrofluviatilis* x *Cyprinodon nevadensis nevadensis*)  
x *Cyprinodon macularius* 448

(*Cyprinodon rubrofluviatilis* x *Cyprinodon nevadensis nevadensis*)  
x *Cyprinodon macularius californicus* 449

*Cyprinodon rubrofluviatilis* x (*Cyprinodon nevadensis nevadensis*  
x *Cyprinodon rubrofluviatilis*) 449

(*Cyprinodon rubrofluviatilis* x *Cyprinodon nevadensis nevadensis*)  
x *Cyprinodon rubrofluviatilis* 94, 448, 449

((*Cyprinodon rubrofluviatilis* x *Cyprinodon nevadensis nevadensis*)  
x *Cyprinodon rubrofluviatilis*) x F<sub>2</sub> 449

*Cyprinodon rubrofluviatilis* x *Cyprinodon pecosensis* 449

*Cyprinodon rubrofluviatilis* x (*Cyprinodon pecosensis* x *Cyprinodon*  
*rubrofluviatilis*) 449

*Cyprinodon rubrofluviatilis* x (*Cyprinodon rubrofluviatilis* x  
*Cyprinodon bovinus*) 449

*Cyprinodon rubrofluviatilis* x *Cyprinodon* sp. 449

*Cyprinodon rubrofluviatilis* ♀ x *Cyprinodon variegatus* ♂ 1530

*Cyprinodon rubrofluviatilis* ♂ x *Cyprinodon variegatus variegatus* ♀  
980

*Cyprinodon salinus* x *Cyprinodon atrorus* 449

*Cyprinodon salinus* ♂ x *Cyprinodon macularius* ♀ 980

*Cyprinodon salinus* x *Cyprinodon nevadensis* 1619

*Cyprinodon salinus* ♀ x *Cyprinodon nevadensis* ♂ 1618

*Cyprinodon salinus* ♂ x *Cyprinodon nevadensis* ♀ 1618, 1620

*Cyprinodon salinus* ♂ x *Cyprinodon radiosus* ♀ 1620

- Cyprinodon salinus*♂ × *Cyprinodon rubrofluviatilis*♀ 1620  
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*Cyprinodon variegatus*♂ × *Cyprinodon atrorus*♀ 1620  
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*Cyprinodon variegatus*♀ × *Cyprinodon macularis* ♂ 1530  
*Cyprinodon variegatus*♂ × *Cyprinodon macularius* ♀ 1620  
*Cyprinodon variegatus*♀ × *Cyprinodon nevadensis*♂ 1530  
*Cyprinodon variegatus*♂ × *Cyprinodon nevadensis*♀ 1620  
*Cyprinodon variegatus*♂ × *Cyprinodon radiosus*♀ 1620  
*Cyprinodon variegatus*♀ × *Cyprinodon rubrofluviatilis*♂ 1530  
*Cyprinodon variegatus*♂ × *Cyprinodon rubrofluviatilis*♀ 1620  
*Cyprinodon variegatus*♀ × *Cyprinodon salinus* ♂ 1530  
*Cyprinodon variegatus ovinus*♂ × *Cyprinodon macularius*♀ 980  
*Cyprinodon variegatus ovinus*♂ × ((*Cyprinodon radiosus*♀ ×  
    *Cyprinodon nevadensis*♀)♂ × (*Cyprinodon macularius*♂ ×  
    *Cyprinodon variegatus*♀)♀) 1620  
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*Esox americanus americanus* x *Esox niger* 1157  
*Esox lucium* x *Esox masquinongy* 738  
*Esox lucius* x *Esox americanus* 1046  
*Esox lucius* x *Esox masquinongy* 498, 1575  
*Esox lucius* x *Esox masquinongy* ♀ 106  
*Esox lucius* x *Esox niger* 479, 498, 1075  
*Esox lucius* x *Esox reicherti* 498, 499  
*Esox masquinongy* x *Esox lucius* 498, 499, 1247  
*Esox masquinongy* ♀ x *Esox lucius* ♂ 313  
*Esox niger* x *Esox americanus* 479, 1157  
*Esox niger* ♀ x *Esox lucius* ♂ 1631  
*Esox reicherti* ♀ x *Esox americanus americanus* ♂ 482  
*Esox reicherti* ♂ x *Esox americanus vermiculatus* ♀ 482  
*Esox reicherti* x *Esox lucius* 482  
*Esox reicherti* ♂ x *Esox lucius* ♀ 482  
*Esox reicherti* ♀ x *Esox lucius* ♂ 482  
(*Esox reicherti* x *Esox lucius*) x *Esox reicherti* 482  
*Esox reicherti* ♀ x *Esox masquinongy* ♂ 482  
*Esox reicherti* ♂ x *Esox masquinongy* ♀ 482  
*Esox reicherti* ♂ x *Esox niger* ♀ 482  
*Etheostoma blennioides newmani* x *Etheostoma blennioides gutselli* 1071  
*Etheostoma camarum* x *Etheostoma tippecanoe* 1807  
*Etheostoma chlorobranchium* x *Etheostoma rufilineatum* 1807  
*Etheostoma flabellare* *flabellare* x *Etheostoma lineolatum* 1480  
*Etheostoma gracile* x *Percina maculata* 1239  
*Etheostoma lepidum* ♀ x *Stizostedion vitreum* ♂ 767  
*Etheostoma nigrum* x *Etheostoma olmstedi* 1044

*Etheostoma nigrum digitale* x *Etheostoma nigrum maculiceps* 611

*Etheostoma nigrum nigrum* x *Etheostoma nigrum eulepis* 545

*Etheostoma olmstedi atromaculatus* x *Etheostoma olmstedi olmstedi* 1424

*Etheostoma radiosum cyanorum* x *Etheostoma spectabile* 736

*Etheostoma spectabile* ♂ x *Etheostoma caeruleum* ♀ 1125

*Etheostoma spectabile* x *Etheostoma radiosum* 539, 542

*Etheostoma spectabile* x *Percina sciera* 736

*Etheostoma spectabile* ♀ x *Stizostedion vitreum* ♂ 767

*Etheostoma squamiceps* x *Etheostoma kenicotti* 1237, 1238

*Etheostoma whipplei* x *Etheostoma caeruleum* 1019

*Eupomotis gibbosus* x *Heleoperca macrochrysps* 1193

*Euxiphipops sexstriatus* x *Euxiphipops xanthometapon* 1525

*Exoglossum* x *Hybognathus* 1042

*Exoglossum* x *Margariscus* 1042

*Exoglossum* x *Nocomis* 1042

*Exoglossum* x *Notemigonus* 1042

*Exoglossum* x *Notropis* 1042

*Exoglossum* x *Pimephales* 1042

*Exoglossum* x *Rhinichthys* 1042

*Exoglossum* x *Semotilus* 1042

*Extrarius* x *Gila* 1042

*Extrarius* x *Hybognathus* 1042

*Extrarius* x *Hybopsis* 1042

*Extrarius* x *Macrhybopsis* 1042

*Extrarius* x *Nocomis* 1042

*Extrarius* x *Notemigonus* 1042

*Extrarius* x *Notropis* 1042

*Extrarius* x *Opsopoedus* 1042

*Extrarius* x *Phenacobius* 1042

*Extrarius* x *Pimephales* 1042

*Extrarius* x *Platygobio* 1042

*Extrarius* x *Rhinichthys* 1042

*Extrarius* x *Semotilus* 1042

-F-

*F*<sub>1</sub> x *Salvelinus fontinalis* 859

*Flier* x crappie, white 1480

*Flounder*♀ x *dab*♂ 1331

*Flounder* x halibut 1299

*Flounder* x *plaice* 1298, 1299, 1368, 1514

*Flounder*♀ x *plaice*♂ 1331

*Flounder*♂ x *plaice*♀ 1300

*Flounder* x sole, lemon 1299

*Funa* x *Acheilognathus moriokae* 782

*Funa* x carp 1204, 1224

*Funa*♀ x *carp*♂ 691, 1224, 1543

(*Funa* x carp) x *funa* 691

(*Funa* x carp) x carp 1224, 1543

*Funa* x carp, koibuna 782

*Funa* x *Cyprinus carpio* 131

*Funa* x goldfish 131, 1543

*Funa*♀ x loach♂ 873

*Funa* x *Misgurnus anguilllicaudatus* 131

*Funa* x *Pseudorasbora parva* 782

*Funa* x *Tinca tinca* 782

*Funa* x *ryukin* 1543

*Fundulus* x *Adinia* 528

*Fundulus* x *Ctenolabrus* 873, 1193, 1431

*Fundulus* x *Lucania* 528

*Fundulus* x *Menidia* 1514, 1515, 1517

*Fundulus* ♀ x *Menidia* ♂ 1516

*Fundulus* x *Prionotus* 873

*Fundulus catenatus* ♀ x *Fundulus grandis* ♂ 528

*Fundulus catenatus* ♀ x *Fundulus olivaceus* ♂ 528

*Fundulus catenatus* ♀ x *Fundulus zebrinus* *zebrinus* ♂ 528

*Fundulus catenatus* ♀ x *Lucania parva* ♂ 528

*Fundulus chrysotus* ♀ x *Fundulus confluentus* ♂ 528

*Fundulus chrysotus* ♀ x *Fundulus grandis* ♂ 528

*Fundulus chrysotus* ♀ x *Fundulus zebrinus* *kansae* ♂ 528

*Fundulus confluentus* ♀ x *Fundulus grandis* ♂ 528

*Fundulus diaphanus* x *Fundulus heteroclitus* 415, 691

*Fundulus diaphanus* ♂ x *Fundulus heteroclitus* ♀ 596

*Fundulus diaphanus* *diaphanus* x *Fundulus heteroclitus* 333

*Fundulus diaphanus* *diaphanus* x *Fundulus heteroclitus* *macrolepidotus* 1193, 1424

*Fundulus diaphanus* *diaphanus* x *Fundulus zebrinus* *zebrinus* 94

*Fundulus grandis* ♀ x *Cyprinodon variegatus* ♂ 528

*Fundulus grandis* ♀ x *Lucania parva* ♂ 528

*Fundulus grandis* ♀ x *Fundulus confluentus* ♂ 528

*Fundulus grandis* ♀ x *Fundulus pulvereus* ♂ 528

*Fundulus grandis* ♀ x *Fundulus similis* ♂ 528

*Fundulus grandis* ♀ x *Fundulus xenicus* ♂ 528

- Fundulus grandis*♀ × *Fundulus zebrinus kansae*♂ 528  
*Fundulus grandis*♀ × *Fundulus zebrinus zebrinus*♂ 528  
*Fundulus heteroclitus*♀ × *Cynoscion regalis*♂ 1744  
*Fundulus heteroclitus* × *Fundulus diaphanus* 414, 415  
*Fundulus heteroclitus*♂ × *Fundulus diaphanus*♀ 596  
*Fundulus heteroclitus*♀ × *Fundulus luciae*♂ 378  
*Fundulus heteroclitus* × *Fundulus majalis* 414, 691  
*Fundulus heteroclitus*♀ × *Fundulus majalis*♂ 412  
*Fundulus heteroclitus* × *Menidia notata* 1193  
*Fundulus heteroclitus* × *Tautogolabrus adspersus* 1431  
*Fundulus kansae* × *Fundulus sciadicus* 1193  
*Fundulus kansae* × *Fundulus zebrinus* 94  
*Fundulus luciae*♀ × *Fundulus heteroclitus*♂ 378  
*Fundulus majalis* × *Fundulus heteroclitus* 1510  
*Fundulus majalis*♀ × *Fundulus heteroclitus*♂ 412, 1193  
*Fundulus notatus* × *Fundulus olivaceus* 302  
*Fundulus notatus*♂ × *Fundulus olivaceus*♀ 484  
*Fundulus notatus*♀ × *Fundulus olivaceus*♂ 528  
*Fundulus notatus*♀ × *Fundulus zebrinus zebrinus*♂ 528  
*Fundulus notti*♀ × *Fundulus olivaceus*♂ 528  
*Fundulus notti*♀ × *Fundulus zebrinus kansae*♂ 528  
*Fundulus notti*♀ × *Fundulus zebrinus zebrinus*♂ 528  
*Fundulus olivaceus* × *Fundulus notatus* 677  
*Fundulus olivaceus*♂ × *Fundulus notatus*♀ 484  
*Fundulus olivaceus*♀ × *Fundulus notatus*♂ 528  
*Fundulus olivaceus*♀ × *Fundulus pulvereus*♂ 528  
*Fundulus olivaceus*♀ × *Fundulus zebrinus zebrinus*♂ 528

- Fundulus parvipinnis* ♀ × *Salmo gairdneri* ♂ 491  
*Fundulus pulvereus* ♀ × *Fundulus confluentus* ♂ 528  
*Fundulus pulvereus* ♀ × *Fundulus grandis* ♂ 528  
*Fundulus pulvereus* ♀ × *Fundulus olivaceus* ♂ 528  
*Fundulus pulvereus* ♀ × *Fundulus zebrinus kansae* ♂ 528  
*Fundulus pulvereus* ♀ × *Fundulus zebrinus zebrinus* ♂ 528  
*Fundulus similis* ♀ × *Fundulus grandis* ♂ 528  
*Fundulus similis* ♀ × *Fundulus notatus* ♂ 528  
*Fundulus similis* ♀ × *Fundulus notti* ♂ 528  
*Fundulus similis* ♀ × *Fundulus olivaceus* ♂ 528  
*Fundulus similis* ♀ × *Fundulus pulvereus* ♂ 528  
*Fundulus similis* ♀ × *Fundulus xenicus* ♂ 528  
*Fundulus similis* ♀ × *Fundulus zebrinus kansae* ♂ 528  
*Fundulus similis* ♀ × *Fundulus zebrinus zebrinus* ♂ 528  
*Fundulus thierryi* × *Aphyosemion arnoldi* ♂ 91  
*Fundulus xenicus* ♀ × *Cyprinodon variegatus* ♂ 528  
*Fundulus xenicus* ♀ × *Fundulus confluentus* ♂ 528  
*Fundulus xenicus* ♀ × *Fundulus grandis* ♂ 528  
*Fundulus xenicus* ♀ × *Lucania parva* ♂ 528  
*Fundulus xenicus* ♀ × *Fundulus zebrinus kansae* ♂ 528  
*Fundulus zebrinus kansae* ♀ × *Fundulus chrysotus* ♂ 528  
*Fundulus zebrinus kansae* ♀ × *Fundulus confluentus* ♂ 528  
*Fundulus zebrinus kansae* ♀ × *Fundulus grandis* ♂ 528  
*Fundulus zebrinus kansae* ♀ × *Fundulus olivaceus* ♂ 528  
*Fundulus zebrinus kansae* ♀ × *Fundulus xenicus* ♂ 528  
*Fundulus zebrinus kansae* ♀ × *Fundulus zebrinus zebrinus* ♂ 528  
*Fundulus zebrinus zebrinus* ♀ × *Fundulus grandis* ♂ 528  
*Fundulus zebrinus zebrinus* ♀ × *Fundulus olivaceus* ♂ 528

*Fundulus zebrinus zebrinus* ♀ x *Fundulus pulvereus* ♂ 528

*Fundulus zebrinus zebrinus* ♀ x *Fundulus zebrinus kansae* ♂ 528

-G-

*Gadus macrocephalus* x *Oncorhynchus keta* 1466

*Gadus macrocephalus* ♂ x *Oncorhynchus keta* ♀ 491

*Gadus morrhua* x *Pleuronectes flesus* 688

*Gambusia affinis* x *Gambusia aurata* 1101

*Gambusia affinis* x *Gambusia heterochir* 618, 1101, 1193

*Gambusia affinis* x *Gambusia rhizophorae* 618

*Gambusia affinis affinis* ♀ x *Gambusia affinis holbrooki* ♂ 303

*Gambusia affinis holbrooki* ♀ x *Gambusia affinis affinis* ♂ 303

*Gambusia heterochir* x *Gambusia affinis* 90

*Gambusia marshi* ♀ x *Gambusia affinis affinis* ♂ 1104

*Gambusia punctata* x *Gambusia rhizophorae* 618

*Gambusia rhizophorae* x *Gambusia affinis* 618

*Gardonus rutilus* x *Blicca bjoerkna* 1359

*Gardonus rutilus* x *Brama brama* 1359

*Gasterosteus aculeatus* ♀ x *Gasterosteus wheatlandi* ♂ 1361

*Gasterosteus aculeatus* x *Pungitius pungitius* 1777

*Gasterosteus aculeatus* ♀ x *Pungitius pungitius* ♂ 1176

*Gasterosteus aculeatus leuirus* x *Gasterosteus aculeatus trachurus* 1776, 1777

*Gasterosteus aculeatus microcephalus* ♀ x *Gasterosteus aculeatus williamsoni* ♂ 1355

*Gasterosteus aculeatus trachurus* x *Gasterosteus aculeatus leuirus* 1777

*Gasterosteus aculeatus-red* x *Gasterosteus aculeatus-black* 1590

*Gasterosteus aculeatus williamsoni* ♀ x *Gasterosteus aculeatus microcephalus* ♂ 1355

*Gasterosteus leuris* x *Gasterosteus trachurus* 685, 686

*Gasterosteus* sp. x *Gasterosteus aculeatus* 278

*Gasterosteus trachiurus* x *Gasterosteus leiurus* 1156

*Gasterosteus wheatlandi* ♀ x *Gasterosteus aculeatus* ♂ 1361

*Gengoro* ♀ x *kin-buna* ♂ 1543

Genotype

38 At Sc♀x 1765-11 Cam Cb ♂ 816  
38 At Sc♀x 1765-13 Cb ♂ 816  
1765-1+♀x unknown ♂ 816  
1765-2+♀x unknown ♂ 816  
1765-3+♀x unknown ♂ 816  
1797-1+♀x 1765-11 Cam Cb ♂ 816  
1800-1+♀x 1800-12 Cb ♂ 816  
1889b-1 Cb+♀x 1860-11 At Sc ♂ 816  
1889b-2 Cam Cb+♀x 1962-11+ ♂ 816  
1889b-4+♀x 1889a-11 At Sc ♂ 816  
2043-1 Sc Cb+♀x 2088-12 Cam Cb ♂ 816  
2043-2 Cb+♀x 2085-13 Cam Cb ♂ 816  
2043-3+♀x 2096-11 At ♂ 816  
2085-1 Cb+♀x 1889a-11 At Sc ♂ 816  
2085-3+♀x 2085-14+ ♂ 816  
2096-1 At+♀x 2085-11 Cb ♂ 816  
2096-2 Cam+♀x 2085-11 Cb ♂ 816  
2096-3+♀x 2043-11 Sc Cb ♂ 816  
2202-1♀x 2214-12 Cb ♂ 816

*Geophagus brasiliensis* ♂ x *Cichlasoma nigrofasciatum* ♀ 966

*Gibelio* x *carp* 835

*Gila* x *Hesperoleucas* 1042

*Gila* x *Iotichthys* 1042

*Gila* x *Lavinia* 1042

*Gila* x *Lepidomeda* 1042

*Gila* x *Meda* 1042

*Gila* x *Moapa* 1042

*Gila* x *Mylocheilus* 1042

*Gila* x *Mylopharodon* 1042

*Gila* x *Notemigonus* 1042

*Gila* x *Notropis* 1042

*Gila* x *Orthodon* 1042

*Gila* x *Pimephales* 1042  
*Gila* x *Plagopterus* 1042  
*Gila* x *Platygobio* 1042  
*Gila* x *Pogonichthys* 1042  
*Gila* x *Ptychocheilus* 1042  
*Gila bicolor* x *Rhinichthys osculus* 1496  
*Gila bicolor* x *Richardsonius egregius* 1496  
*Gila crassicauda* x *Lavinia exilicauda* 1496  
*Gila elegans* x *Gila cypha* 1105  
*Gila mohavensis* x *Gila orcutti* 90, 928, 1511  
*Gila nigrescens* x *Rhinichthys cataractae* 1496  
*Gila orcutti* x *Gila mohavensis* 664  
*Gila orcutti* x *Hesperoleucus symmetricus* 1212  
*Gila orcutti* x *Hesperoleucus symmetricus subditis* 663, 664  
*Gila orcutti* x *Siphateles mohavensis* 1193  
*Gila robusta grahami* x *Campostoma ornatum pricei* 1105  
*Gila robusta robusta* x *Gila elegans* 1105  
*Gila robusta robusta* x *Gila intermedia* 1105  
Ginbuna ♀ x kinbuna ♂ 880  
*Gnathopogon* x *Pseudogobio* 1545  
*Gnathopogon elongatus* x *Gnathopogon biwae* 1554  
*Gnathopogon elongatus* x *Pseudorasbora parva* 1543  
*Gnathopogon elongatus* x *Pseudogobio esocinus* 1543, 1554  
*Gnathopogon elongatus* x *Pseudogobius esocinus* 1549  
*Gnathopogon elongatus elongatus* ♂ x *Gnathopogon japonicus* ♀ 405  
*Gnathopogon elongatus elongatus* ♂ x *Pseudorasbora parva* ♀ 405  
*Gnathopogon elongatus elongatus* x *Pseudogobio esocinus* 1549  
*Gnathopogon elongatus elongatus* ♀ x *Pseudogobio esocinus* ♂ 1545

*Gobio gobio* x *Abramis brama* 1193  
*Gobio gobio* x *Carassius carassius* 1369, 1370  
*Gobio gobio* x *Chondrostoma nasus* 1193, 1369, 1370  
*Gobio gobio* x *Gobio albipinnatus* 919  
*Gobio gobio* x *Leuciscus cephalus* 1193, 1370  
*Gobio gobio* x *Rutilus rutilus* 1369, 1370  
*Gobio gobio* x *Scardinius erythrophthalmus* 1193  
*Gobio gobio sarmaticus* x *Gobio kessleri* 1341  
*Gobio kessleri* x *Gobio gobio* 919  
*Gobius jozo* x *Gobius capito* 1193  
*Gobius melanostomus* x *Gobius fluviatilis* 1274  
*Gobius paganellus* x *Gobius cobitis* 1275  
Goldfish x bass, white 1513  
Goldfish x carp 131, 229, 709, 1413, 1425, 1480  
Goldfish x carp grass 1516  
Goldfish x carp, grass 1513  
(Goldfish x carp) x goldfish 1413  
Goldfish x *Cyprinus carpio* 131  
Goldfish x *Gnathopogon elongatus elongatus* 131  
Goldfish x loach 1168  
Goldfish x *Rhodeus sinensis* 131  
Goldfish x tamoroko 1543  
Goldgiebel x nuduskarpfen 131  
Gorbuscha x akula 1062  
Gorbuscha x osetr 1062  
Gostera x cazan 1193

*Gostera x krasnoperka* 1193, 1302

*Gostera x leshch* 1193, 1302

*Gostera x liny* 1193

*Gostera x okleya* 1302

*Gourami, green x gourami, pink* 760

*Gourami, green ♀ x gourami, pink ♂* 562

*Gourami, pink x gourami, green* 760

*Grilse ♀ x trout, sea ♂* 1272

*Grilse ♀ x (grilse ♀ x trout, sea ♂) ♂* 1272

*(Grilse x trout, sea) x salmon* 1272

*(Grilse x trout, sea) x trout, sea* 1272

*Guppy, gold x guppy, blond* 1261

*Guppy, wild ♀ x guppy, gold ♂* 1261

*Gwiniad x trout* 1363, 1364

*Gymnocephalus cernua x Gymnocephalus baloni* 744

-H-

*Hadropterus maculatus x Percina caprodes* 1760

*Hadropterus sciarus x Percina caprodes* 528

*Helioperca x Apomotis* 1070

*Helioperca x Xenotis* 1070

*Hemichromis fasciatus B ♂ x Aequidens rivulatus ♀* 966

*Hemiculter eigenmanni ♀ x Aristichthys nobilis ♂* 996

*Hemiculter eigenmanni ♀ x Cyprinus carpio ♂* 996

*Hemiculter eigenmanni ♀ x Hypophthalmichthys molitrix ♂* 996

*Hemigrammus serpae x Macropodus sweglesi* 118

*Hemitremia x Hybopsis* 1042

*Hemitremia x Nocomis* 1042

*Hemitremia* x *Notemigonus* 1042  
*Hemitremia* x *Notropis* 1042  
*Hemitremia* x *Phenacobius* 1042  
*Hemitremia* x *Pimephales* 1042  
*Hemitremia* x *Rhinichthys* 1042  
*Hemitremia* x *Semotilus* 1042  
Herring, lake x bloater 390  
*Hesperoleucas* x *Lavinia* 1042  
*Hesperoleucas* x *Mylopharodon* 1042  
*Hesperoleucas* x *Notemigonus* 1042  
*Hesperoleucas* x *Orthodon* 1042  
*Hesperoleucas* x *Pogonichthys* 1042  
*Hesperoleucas* x *Ptychocheilus* 1042  
*Hesperoleucas* x *Rhinichthys* 1042  
*Hesperoleucus symmetricus* x *Gila orcutti* 665  
*Hesperoleucus symmetricus subditis* ♀ x *Gila orcuttii* ♂ 664  
*Heterandria formosa* x *Poecilia lebistes-reticulata* 1261  
Hime-masu ♀ x biwa-masu ♂ 1543  
Hime-masu x kawa-masu 1543  
Hime-masu ♀ x yamame ♂ 1543  
Hine masu x salmon chum 1789  
Hitch x blackfish 1147  
Hitch x chub thicktail 356  
Hitch x roach California 1147  
Hitch x roach Monterey eastern 356  
*Holacanthus bermudensis* x *Holacanthus ciliaris* 568  
*Holacanthus ciliaris* x *Holacanthus bermudensis* 84

*Holacanthus ciliaris* x *Holacanthus isabelita* 1304

*Holacanthus isabelita* x *Holacanthus ciliaris* 219

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*Huso* ♀ x *Acipenser* ♂ 406

*Huso huso* x *Acipenser (Euacipenser) ruthenus* 185

*Huso huso* x *Acipenser guldenstadti* 1191, 1193, 1698

*Huso huso* x *Acipenser guldenstaedti colchicus* 241

*Huso huso* x *Acipenser nudiventris* 241, 1191, 1193, 1197, 1698

*Huso huso* x *Acipenser ruthenus* 196, 215, 372, 610, 1018, 1057, 1191, 1192, 1193, 1197, 1198, 1346

*Huso huso* x *Acipenser ruthenus ruthenus* 241

*Huso huso* ♀ x (*Acipenser ruthenus* ♀ x *Huso huso* ♂) ♂ 254

*Huso huso* x (*Acipenser ruthenus* x (*Acipenser ruthenus* x *Acipenser stellatus*)) 1193

*Huso huso* x (*Huso huso* x *Acipenser ruthenus*) 1192

(*Huso huso* x *Acipenser ruthenus*) x *Acipenser ruthenus* 1018

(*Huso huso* x *Acipenser ruthenus*) x *Huso huso* 1018, 1198

*Huso huso* x *Acipenser stellate* 1119

*Huso huso* x *Acipenser stellatus* 1191, 1193, 1197, 1698

*Huso huso* x *Acipenser stellatus stellatus* 241

*Huso dauricus* x *Acipenser schrenki* 1191

*Hybognathus* x *Hybopsis* 1042

*Hybognathus* x *Macrhybopsis* 1042

*Hybognathus* x *Margariscus* 1042

*Hybognathus* x *Nocomis* 1042

*Hybognathus* x *Notemigonus* 1042

*Hybognathus* x *Notropis* 1042

*Hybognathus* x *Opsopoeodus* 1042

*Hybognathus* x *Phenacobius* 1042  
*Hybognathus* x *Pimephales* 1042  
*Hybognathus* x *Platygobio* 1042  
*Hybognathus* x *Rhinichthys* 1042  
*Hybognathus* x *Semotilus* 1042  
*Hybognathus hankinsoni* x *Notropis heterolepis* 1496  
*Hybopsis* x *Macrhybopsis* 1042  
*Hybopsis* x *Nocomis* 1042  
*Hybopsis* x *Notemigonus* 1042  
*Hybopsis* x *Notropis* 1042  
*Hybopsis* x *Opsopoedus* 1042  
*Hybopsis* x *Parexoglossum* 1042  
*Hybopsis* x *Phenacobius* 1042  
*Hybopsis* x *Pimephales* 1042  
*Hybopsis* x *Platygobio* 1042  
*Hybopsis* x *Rhinichthys* 1042  
*Hybopsis* x *Semotilus* 1042  
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*Hybopsis plumbea* x *Rhinichthys cataractae* 1170  
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*Hypophthalmichthys molitrix* x *Aristichthys nobilis* 139, 1646  
*Hypophthalmichthys molitrix* ♂ x *Aristichthys nobilis* ♀ 1565  
*Hypophthalmichthys molitrix* ♀ x *Aristichthys nobilis* ♂ 728  
*Hypophthalmichthys molitrix* ♀ x carp ♂ 998  
*Hypophthalmichthys molitrix* x *Catla catla* 139, 728  
*Hypophthalmichthys molitrix* ♂ x *Catla catla* ♀ 1565  
*Hypophthalmichthys molitrix* x *Ctenopharyngodon idella* 1007, 1645

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*Parexoglossum* x *Pimephales* 1042

*Parexoglossum* x *Rhinichthys* 1042

*Parexoglossum* x *Semotilus* 1042

*Parophrys vetulus* x *Pltichthys stellatus* 710

*Peled* x *chir* 1679

*Pelvicachromis pulcheri* ♂ x *Pelvicachromis subocellatus* ♀ 966

*Pelyad* x *chir* 309, 1680

*Pelyad* ♀ x *whitefish* ♂ 889

*Pelyad* ♀ x *whitefish broad* ♂ 890

*Pelyady* x *chir* 644

*Pelydy* x *chir* 310

*Pelyly* x *chir* 1677  
*Perca* x *Stizostedion* 767  
*Perca fluviatilis* x *Acerina acerina* 1193  
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Perch, yellow ♀ x *Cichlasoma cyanoguttatum* ♂ 767  
Perch, yellow ♀ x *Etheostoma blennioides* ♂ 767  
Perch, yellow ♀ x *Etheostoma caeruleum* ♂ 767  
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*Percina caprodes* ♀ x *Percina macrolepida* ♂ 1529  
*Percina caprodes* x *Percina maculata* 736, 1239  
*Percina caprodes* x *Percina sciera* 736  
*Percina caprodes* ♀ x *Stizostedion vitreum* ♂ 767  
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